TECHNICAL SPECIFICATIONS
Klondike AMD Passive Treatment System Rehabilitation

General

Personnel from both Hedin Environmental and Babb Creek Watershed Association (BCWA) will perform construction oversight and will direct all activities of the Successful Bidder (hereafter called "Contractor").

Please refer to the attached plans which show a plan view of the construction site as well as details of critical features. IMPORTANT NOTE: For any instances where the attached sheets and this document conflict, information in this document takes precedence.

System Concept

The Klondike passive treatment system is located on Tioga State Forest land in Bloss Township, Tioga County. The purpose of this project is to improve the performance of an existing AMD treatment system through replacement of treatment substrate. The Klondike passive treatment system treats an acidic deep mine discharge to Lick Creek which is a tributary of Babb Creek in the Pine Creek watershed. The treatment system was designed and constructed in 1997 by DEP and DCNR when passive treatment technology was in its infancy. The treatment system suffers from permeability problems and as a result treatment is unreliable and the system requires frequent maintenance. Over the years the BCWA has attempted to maintain the permeability of the system by mixing and replacing the organic substrate on several occasions only to have permeability problems return.

The existing system treats the discharge by passing the flow through a vertical flow pond (VFP). A VFP is a pond with a layer of organic material covering a layer of limestone. Water flows vertically downward through the organic material then the limestone before being discharged through pipes installed at the base of the limestone layer. The proposed work involves removal of the existing organic substrate and installation of new plumbing, limestone and organic substrate on top of the existing limestone layer.

Work in this project falls under four general categories. More details are provided in the following sections about all of these work items.

General Requirements

Contractor must take any reasonable precautions necessary to prevent soil erosion, water pollution and other conditions detrimental to the environment.

Contractor shall not permit human waste, garbage, kitchen or laundry wash, manure, sawdust or other mill refuse, oil or any other substance harmful to human, aquatic or fish life to enter any spring, stream, water course, dam, pond or lake.

Oil drained from equipment shall be placed in suitable containers and disposed of properly.

Upon project completion, the project site shall be free of construction waste or other garbage.

Tasks

The tasks involved in this project will be:

A. Mobilization Demobilization and Road Bonding
B. Organic Substrate Removal and Disposal
C. Replacement of VFP and All System Components
D. Site Stabilization, Restoration and Revegetation

The contractor is responsible for securing any Road Bonds necessary to use public roads to mobilize equipment and deliver materials to the project. All work for this project will take place on Tioga State Forest lands and will require approval from Forestry before work is initiated. This includes the proposed staging area near Landrus Rd.

It is the responsibility of the Contractor to make all necessary calls to the PA One Call System prior to construction.

Detailed Task Descriptions

A. Mobilization, Demobilization and Road Bonding

Task A includes transporting equipment to the site and general preparations to perform work as well as removal of equipment from site once the project is complete.

Task A also includes establishment of a staging area where materials can be delivered, handled and stored during the project. The staging area will be in an existing clearing along Landrus Road 1 mile west of Arnot, Pa. Contractor will need to obtain a Road Use Agreement with Bureau of Forestry covering 3 miles of road. A copy of the Road Use Agreement Fee Schedule is attached. Additional access roads to the site may require bonding. All road bonding is the responsibility of the bidder.

A bid and performance bond is required for this project.

B. Organic Substrate Removal and Disposal

This task removes the existing organic substrate from the VFP and disposes it in the location shown on the plans. The contractor should lower the VFP water level to just below top of limestone aggregate. This will allow treatment of water during renovation. After allowing the substrate to drain for a period of two days, all organic substrate should be removed. It is estimated that approximately 1,000 cubic yards of organic substrate is present in the VFP. Disposal involves transporting the organic substrate to the specified location then dumping into a pile while maintaining smallest amount of footprint possible. This material will be saved for future use by Bureau of Forestry.

C. VFP Construction

This task involves the installation of new plumbing, limestone and organic substrate in the VFP. Once the existing organic substrate is removed (Task B) the existing limestone layer will be exposed and used as the base upon which the new materials are installed. It is believed that the limestone layer is not level. If the existing limestone aggregate surface is not level, it must be made level to allow for installation of plumbing, aggregate and substrate in a level uniform manner.

Plumbing. Underdrain plumbing shall be installed according to the project plans on top of the existing limestone layer that has just been made level. All plumbing will be SDR 35 PVC.

The existing 8" PVC outlet plumbing from the buried limestone bed will be abandoned in place. New outlet plumbing will be installed using the top of the existing limestone (leveled, if necessary) as the new bottom of the VFP. A new water level control structure will be installed in the berm that transfers water from the new VFP underdrain to the existing polishing pond. All penetrations through the berms shall provide for maximum compaction around the new pipe by filling and compacting in 10 inch lifts using vibratory foot tamper or equivalent vibratory mechanism. All precautions shall be taken to prevent leakage of water to prevent flow following the pipe.

Limestone. A uniform layer of 2,300 tons AASHTO #3 limestone aggregate shall be installed over the plumbing and existing limestone layer. The exact dimensions of the existing VFP are not known. Once the existing organic substrate is removed the available volume will be measured and an appropriate placement depth determined. The AASHTO #3 limestone must have a minimum calcium carbonate content of 90%. Adequate cover must be maintained over the underdrain plumbing to prevent damage by equipment. All limestone is to be delivered and placed directly into the VFP. No stockpiling or double handling of limestone will be allowed.

Organic Substrate. A uniform layer of alkaline organic substrate shall be placed over the new AASHTO #3 limestone. The exact dimensions of the existing VFP are not known. Once the existing organic substrate is removed the available volume will be measured and an appropriate placement depth determined. Organic substrate consists of spent mushroom compost mixed with limestone fines at a ratio of 3 parts spent mushroom compost to 1 part limestone fines by volume. The limestone fines shall have a minimum calcium carbonate content of 90%.

Buried Limestone Bed Outlet Pipe Replacement. The existing flow control box will have additional boards installed to prevent water from flowing over top. A 1 inch hole will be drilled into a board that is located 1 foot below standing water. HE will assist in location of installing the hole. Additional boards will be sought to raise water level in the box. A new water level control structure will be installed in the berm that transfers water from the VFP underdrain to the existing polishing pond. All penetrations through the berms shall provide for maximum compaction around the new pipe by filling and compacting in 10 inch lifts using vibratory foot tamper. All precautions shall be taken to prevent leakage of water to prevent flow following the pipe.

D. Site Stabilization, Restoration and Revegetation.

The contractor is responsible for site stabilization and restoration. This task is to provide for restoration of all affected areas covered by construction activity including compost mixing and disposal areas and to prevent any potential erosion by stabilizing all affected areas upon completion of the project. The parking area near access road entrance at confluence with Landrus Rd can be used to stockpile compost and limestone fines that are used to amend the compost. Once all amended compost is removed the site is to be cleaned of debris and seeded and mulched.

All affected areas associated with construction activities are to be seeded and mulched promptly upon completion of work. In areas where earth disturbance due to equipment ramps to the system and pipe penetration from inside the pond to the outside are to be seeded and mulched upon completion. Access road to the site from Landrus Rd is to be maintained and returned to its original condition. Care is to be taken to not use the road when conditions become saturated that will lead to permanent damage to the road.

All disturbed areas should be graded to a condition suitable for public use, seeded and mulched per the following rates.

Straw/Hay Mulch	2.5 tons/acre or 100 bales/acre. Must use chain flail mulching machine or mulched by hand if using square bales. Mulching machines with knives are not to be used.
Fertilizer (10-20-20)	400 lbs/acre
Perennial Rye Grass	10 lbs/acre
Red Fescue Grass	10 lbs/acre
White Dutch Clover	5 lbs/acre
Crimson Clover	5 lbs/acre
Birdsfoot Trefoil	3 lbs/acre
Rye or Wheat Grain	2 bushel/acre
Lime	6 tons/acre

Additional Work

This project involves maintenance and improvements to an existing mine water treatment system. As such, the exact configuration of existing features is not known. To accommodate any unforeseen conditions, hourly rates are requested as part of this bid. Any work outside this scope will be completed on a time and materials basis at the rates provided. Please include excavator, dozers, rubber tire loader, water pumps, skid steer and dump truck when providing hourly rates.

ESTIMATED QUANTITIES LIST
Klondike AMD Treatment System Rehabilitation

The following list is provided in order to assist bid preparation. The bidder is responsible for verifying quantities. Additional materials specifications are provided below. Substitutions to this list must be approved by Hedin Environmental prior to use.

Task A Mobilization, Access , Demobilization and Bonding

Item	Quantity	Units
Mobilization and Demobilization	1	LS
Bid and Performance Bonds	1	LS
Road Bonding and Maintenance	1	LS

Task B Organic Substrate Removal and Replacement

Item	Quantity	Units
Compost Removal and Disposal	1,000	Cubic Yards

Task C VFP Construction

Item	Quantity	Units
Spent Mushroom Compost	900	Cubic Yards
AASHTO #10 Limestone Fines	400	Tons
AASHTO #3 Limestone	2,300	Tons
12” Solid SDR 35 Pipe	260	Feet
12” SDR 35 45° Elbow	1	Each
4" Perf. SDR 35 Pipe (Field Perforated)	1,760	Feet
12”X12” X4” SDR 35 Reducing Tee	16	Each
12”X4” SDR 35 Reducing Coupling	1	Each
4” SDR 35 90° Elbow	1	Each
4" Fittings and End Caps	16	Each
Boards for existing Inline Flow Control box	4	Each
Inline Flow Control Box (INLINE10X08P)	1	Each

Task D Site Stabilization and Restoration

Item	Quantity	Units
Seed and Mulch	0.5	Acres

Materials

- Material quantities have been estimated by Hedin Environmental personnel. The Contractor is responsible for ensuring that the materials list is complete and that the quantities are accurate.
- The Contractor is responsible for purchasing, delivering, preparing and maintaining stockpile areas, and securing all project materials.
- The Contractor is responsible for any equipment, personnel and tools required to complete the job as described.
- Contractor is responsible for obtaining Road Use Agreement through Bureau of Forestry and any road bond leading up to Landrus Rd.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Bureau of Forestry

STATE FOREST ROAD USE AGREEMENTS

Fee Schedule (Rates)

ROAD USE AGREEMENTS:

Light Hauling (gross vehicle weight less than 10 tons)
Basic rate per mile (rounded up to the next whole mile):

- Rate for the first mile or fraction thereof per year **$25.00**
- * Rate for each additional mile or fraction thereof per year **$10.00**

Heavy Hauling (gross vehicle weight more than 10 tons)
Basic rate per mile (rounded up to the next whole mile):

- One month of less **$50.00**
- Period not to exceed six (6) months **$100.00**
- Period in excess of six (6) months, but less than one (1) year..... **$200.00**

BONDING FOR ROAD USE AGREEMENTS:

Light hauling - A minimum of $**1,000.00 per mile**, rounded up to the next whole mile,
plus $2,500 per bridge used.

Heavy hauling - A minimum of **$5,000.00 per mile**, rounded up to the next whole mile

for **improved earthen** roads, plus $7,500.00 for each bridge used.

- A minimum of **$10,000.00 per mile**, rounded up to the next whole mile

for **paved** roads, plus $7,500.00 for each bridge used.

- A minimum of **$25,000.00 per mile**, rounded up to the next whole mile

for **DSA** roads, plus $7,500.00 for each bridge used.