COMMONWEALTH OF VIRGINIA
DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINED LAND RECLAMATION
DRAWER 900, BIG STONE GAP, VA 24219

Project Name: McCoy Refuse Project

Site Location: Approximately 0.5 miles north of McCoy, Virginia on State Route 652 in Montgomery County, Virginia.

Nomination Submitted by:
Virginia Department of Mines, Minerals and Energy
Division of Mined Land Reclamation
P. O. Drawer U
Big Stone Gap, Virginia
540-523-8208

Project Summary:

Project start date:	August 8, 1997
Project completion date:	March 8, 1998
Construction costs:	$252,528.83
Contractor:	R&A Excavating, Inc. Abingdon, VA
Project Design	Mike Washburn, VA DMME
Inspector	Garry Cole, VA DMME
Contracting Coordinator	Rita Chandler, VA DMME

Submittal Date: March 15, 2000

McCoy Refuse Project

I. Background

A. Introduction

Underground mining in the Merrimac Seam (Big Bed or Big Vein Seam) in this county began in 1920 with the opening of the Superior Anthracite Mines, Inc. which later became Virginia Anthracite Coal Corporation. Operations ceased on December 14, 1957.

Hazards resulting from the mine operations endangered an unsuspecting public for many years. This site is about fifteen miles southwest of the Virginia Polytechnic Institute and State University at Blacksburg, Virginia, and is about one-half mile east of the New River. It is adjacent to State Route 652, a direct artery from Blacksburg to the New River and is bordered by the Jefferson National Forest. Predictably, this area experiences extensive recreational use. Because of its proximity to the New River and the easy access to the property, this site became a public gathering place for unauthorized fishing, swimming, casual target shooting, and public drinking. Thousands of spent cartridges were found in several areas on this project. These activities occurred primarily in the nighttime hours. This site was also used as an illegal dump for household and light industrial debris and logging waste. The landowners attempted unsuccessfully to restrict access by the public to this property, but they were unable to do so. The site was an attractive nuisance because of the hazards that had been left by the mining operations.

****Historical Note****

McCOY -- Here, 52 years ago yesterday, a gas explosion seared through the mile-deep shafts of a coal mine. The hellish conflagration killed 12 men; 46 other miners barely escaped by scrambling through 5,500 feet of smoke and fumes to daylight.
The Great Valley Mine disaster of April 18, 1946, stands as the deadliest day in Montgomery County's history. On that horrific morning, the cold shrill of the mine's untimely whistle notified the people of McCoy that something was dreadfully wrong. They immediately left their homes and the nearby McCoy elementary school and walked to the mine's mouth. There they found a scene of anxious confusion: miners with blackened faces, ambulances, rescue teams. Hours later, they watched in stunned silence as the dead miners' bodies, wrapped in burlap, were borne out of the mine in a coal-hopper cortege.
- ROBERT FREIS, THE ROANOKE TIMES - Sunday, April 19, 1998

B. Physical Hazards at the Site

Because of the extent and duration of the mining operation, diverse hazards were created over approximately 11 acres. Coal refuse was dumped over the entire project area. In the early to mid 1960's this refuse caught fire and it burned until the early 1970's. The by-product of this burning refuse was a hard, abrasive material known as "reddog". Huge, artificial boulders were formed when pockets of reddog become cemented from the heat of the burning refuse. Some of these artificial boulders had a circumference of 25 feet or more and reached 15 feet in height. Often, material was excavated from the

base of these configurations, resulting in unstable formations that could easily roll or collapse. There was evidence of visitation all around and on top of some of these boulder-like structures. Recreational discharge of guns was also a problem near these reddog boulders. Bullets that might ricochet off these hard surfaces were a danger not only to the shooters, but also to site visitors, local traffic, and even local residents. Many of these boulders were located near the site entrance, within 50 feet of State Route 652. *(See photograph number one)*.

Local residents have often used reddog to surface or build roads, and reddog from other areas of the site was excavated for use as fill material. This left pits of refuse and reddog, sometimes 30 feet deep, with vertical walls of unstable material. Large amounts of trash had been placed in the pits. Tire tracks seen at the edge of the pits indicated that local residents were completely unaware that the walls of these pits could have collapsed at any time. *(See photograph number 2).*

There were other dangers as well. A dangerous impoundment was created by refuse that had been placed across a small stream. The impoundment was relatively shallow, but the bottom was extremely soft and consisted of many fine, clay-like particles. This area attracted both swimmers and fishermen. Tracks from ATV's (all terrain vehicles) were seen all around the pond despite the fact that it would have been easy for someone to become mired in the mud and drown. An ATV could easily have overturned and trapped the rider under water. This area of the project was also near the entrance and within 125 feet of the state road. *(See photograph number 3).*

There were five vertical openings to be sealed, one of which was located approximately 250 feet north of the main site at the base of Brush Mountain and bordering Jefferson National Forest. This area is used extensively by hikers, hunters and ATV drivers. The opening was situated in a hollow at the base of a small hill and could not be seen from the hill unless one approached directly from the north (i.e., from the top of Brush Mountain). It was possible to walk over the hill and fall into the mine entry. The gradient of the entries is in excess of 27°, and it would be difficult if not impossible to climb out of the entry.

Other vertical openings were in a hollow in the middle of the project area. The slopes into all the vertical openings were in excess of 27° and there was water at the bottom of all the entries. One of entries was located in the fanhouse in the center of the hollow. This is a simple block structure, but through consultation with the Virginia State Historical Preservation Officer, it was determined that this structure might be considered to have historical significance. Therefore, it was necessary to preserve the integrity and historical setting of the building while preventing entry into the mine works.

The vertical entry on the west side of the project area is in a hollow about 175 feet from State Route 652. This entry had collapsed, but there was water flowing from this portal at a rate of about 25 – 50 gallons per minute. This is on the downdip side of the mine and a potentially large amount of water was impounded in the mine. During operation of the mine, it was reported that approximately 250 gallons of water per minute had been pumped from the mine continuously during certain eight hour-shifts. Any blockage of this

flow could have resulted in a mine blow-out that would have blocked or destroyed part of State Rt. 652.

Many dilapidated structures were left onsite. A coal tipple and chute spanned the hollow about 200 feet east of Rt. 652. There were various outbuildings, sheds, underground storage tanks, storage ponds, and miscellaneous equipment and debris on the site.

C. Environmental Hazards

Many environmental problems were associated with this site as well. All discharges from the project area flow into an unnamed tributary and then into the New River about 0.5 miles east of the site. The New River was designated as a National Heritage River by President Clinton in 1997.

Whenever there was significant rainfall, water flowed across unprotected, and non-vegetated refuse. Erosion caused gullies as deep as 10 feet in many places. Large loads of sediment were carried into the New River or deposited in and around state highway and railroad culverts between the site and the New River. These structures required continuous maintenance.

Additionally, the iron content of the discharge from the mine combined with seepage from the surrounding refuse was greater than 10 mg/l. The pH was within an acceptable range of 6 – 6.5 and flow rates were estimated to be between 25 and 50 gpm.

Several situations called for attention to state regulations. Underground storage tanks at the site were found to contain no petroleum products, but their disposal was still regulated by state law. It was also determined that grass carp—a species prohibited in Virginia—lived in the pond. Caution was required in eliminating the pond to ensure that none of these fish found their way into the New River.

II. Site Reclamation

A. Considerations

Before construction could begin, several issues had to be resolved. This project was situated on several privately owned tracts of land, so realty was a major concern. Approximately 330 heirs had an ownership interest in the primary tract of land on which most of the project was located and no single person had clear authority to act on behalf of the others. As many landowners as possible were contacted, but the Department of Mines, Minerals and Energy ultimately used authority granted in the Virginia Coal Surface Mining Control and Reclamation Act of 1979 to enter the property and conduct reclamation activities.

Additionally, there were three property owners with an interest in the pond that was classified as a hazardous body of water. Two of the landowners wanted the pond to remain and agreed to accept liability for the pond. The third landowner refused to accept any future liability and requested that the pond be removed. Since the pond had been rated as a dangerous body of water, and it was not feasible to eliminate only part of the

pond, it was decided that the entire pond should be eliminated resulting in the reestablishment of the natural drainage pattern.

The 1990 Wetlands Inventory prepared by the U. S. Department of the Interior classified the pond as a permanently flooded Palustrine system. The project design included plans to construct a functionally equivalent wetland area and to replace the loss of open water. A constructed wetland area provided the auxiliary benefit of treating the iron water discharge.

Studies were conducted by the Department of Mines, Minerals and Energy in order to determine if endangered species of bats occupied any of the mine openings, or if any of the openings were suitable as a bat habitat. Although there were no indications that bats inhabited any of the mine entries, it was determined that three of the openings could serve as potential bat habitat. Regrettably, two of the three possible habitat areas were destroyed when debris and other garbage was dumped into two of the openings. A batgate was constructed on the third entry to preserve the possible bat habitat.

B. Construction

Overview

Project plans were completed in the summer of 1997. R&A Excavating, Inc. of Abingdon, Virginia was the successful bidder on this project. Work began August 8, 1997 and was completed in March, 1998.

Our initial strategy was to focus on reducing the threat of additional offsite damage. Sediment ponds were constructed in drainways and silt fencing was erected around the downstream boundary of the project. The onsite, pre-existing pond was sustained throughout the reclamation process in order to provide additional sediment control.

All dilapidated and non-historic structures were razed, and the debris from the structures was placed onsite in pits excavated in the reddog areas. None of the structures were burned, but the debris generated from the structures was compacted and covered with at least two feet of clay-like material.

Regrading

The contractor eliminated all vertical walls, pits, subsidence prone areas and other unstable zones, as well as residential waste areas, by backfilling and regrading. Material was blended around all large masses of reddog that could not be moved without blasting. Dangerous piles and embankments were regraded to a stable configuration, with gentle slopes and features that would enhance drainage. Approximately 11 acres were regraded and covered with a minimum of six inches of suitable growth medium. Cover material was taken from forested areas at the project boundaries. All disturbed areas were seeded with a mixture of Kentucky 31 Tall Fesuce, ryegrass, various clovers, and redtop.

Mine Closures

The vertical entries were located in hollows with either permanent or ephemeral streams. There were two objectives in closing the entries. The first and primary objective was to seal the mine entries in order to prevent anyone from entering the mine. Because of gradients over 27° at the mine entrances, it was necessary to either completely backfill the slopes or to construct closures that would not slide into the mine. This was accomplished by excavating flat, shelf-like areas in front of the mine entrances. Rock-fall netting used in highwall stabilization was anchored over the mine entries. Gabion baskets (wire baskets filled with 6 – 8 inch stone) were then placed in front of the mine openings in a stair-step pattern. All voids around the entries were filled with stone. Cover material was placed over the entries and grass was sown.

The second objective in sealing the mine was to prevent drainage from the hollows from entering the mine works. The dip of the mine is westward toward State Route 652, and consequently there was an high probability that a mine blow-out could block or destroy part of the state road. To prevent drainage from the hollow from entering the mines, an impermeable liner was placed under rock-lined ditches to convey water from the hollows past the mine entries.

Another entry was located inside the fanhouse, which is in the main hollow near three of the other entries. The same conditions existed at this entry as were found at the other portals, although inside the block structure. This entry was suitable as bat habitat, and the external structure (the fanhouse) is historically significant. The structure had to be preserved, and access had to be maintained for bats. Batgates were constructed at each passage into the fanhouse. Supporting posts for the batgates were placed in the ground and not attached to the structure. The ventilation fan and other machinery was left intact, and protective fencing was placed around the entire structure. The fencing was placed far enough away from the structure so that it would not interfere with the flight of bats employing this opening.

The last vertical opening in the main hollow was sealed using Class I riprap and 8 inch plastic pipe. This allowed accumulated water to drain freely from the mine.

Wetland Construction

The iron content of seepage from the refuse as well as mine drainage is greater than 10 mg./l. In order to treat this discharge and to mitigate the loss of an open body of water for wildlife, a one-half acre wetland was constructed. The wetland consists of four individual cells arranged in series. Each cell was carefully excavated and topsoil was placed in the bottom of each cell so that the depth of water in each cell was eight inches. Inlets and outlets were arranged so that water meandered through a maximum area of each cell. Logs were placed in the cells to break the flow of water through the cell. The following wetland species were established: Cattail (Typha latifolia); joe-pye weed (Eupatorium spp.); Woolgrass (Scirpus cyperinus), giant smartweed (Polygonium pennsylvanicum); and redtop (Agrostis alba).
Total iron discharge from the wetland system was reduced from more than 10 mg/l to less than 1.0 mg/l with a pH of 6.5. *(See photograph number 6).*

Pond Removal

The dangerous impoundment was left until most of the work on the site was completed. This provided additional sediment control throughout the project. In order to reestablish drainage in the natural hollow, refuse was excavated to depths of nineteen feet below the existing ground surface. A rock-lined channel with 2:1 side slopes was constructed in the original drainway. Pumping the water from the pond and cutting through the embankment eliminated the pond. The discharge from the pond was continuously monitored for suspended solids, iron and pH. Once the pond was eliminated, there was a considerable amount of trash and household debris that had to be removed. This proved to be very difficult because the unconsolidated bottom would not safely support either the weight of a man or machinery, so this work was done by hand. When the task was accomplished, wetland species as well as clovers, fescue, and ryegrasses were established in this area. *(See photograph number 5).*

C. Project Evaluation

Accomplishments

- Elimination of 5 vertical openings
- Removal of 6 dangerous structures
- Stabilization of 11 acres of dangerous pile and embankment
- Elimination of 1 acre of dangerous body of water
- Reduction of potential mine blow-out
- Reduction of iron discharge into the New River (to less than 1 mg/l)
- Elimination of a dangerous industrial and residential waste pile
- Preservation of a historical structure
- Protection of bat habitat
- Conversion of unproductive and dangerous site to hay producing acreage
- Reestablishment and protected natural drainways
- Restricted trespassing and undesirable activities on private property