2005 Abandoned Mine Land Reclamation Awards Nomination

Project Name:
Burnham AML Coal Reclamation Project

Nomination Submitted by:
Navajo Abandoned Mine Land Reclamation Program (NAMLRP)
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Project Starting Date:
August 2, 2004

Completion Date:
September 17, 2004

Construction Cost:
$205,180.00

Contractor:
Clawson Excavating Inc.
397 South State Street
P.O. Box 4191
Wales, Utah 84667
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Nomination submittal date:
March 18, 2005

Navajo Nation and History:

The Navajo Nation is a vast land mass of over 26,000 square miles, located within the states of New Mexico, Arizona, and Utah. The land varies from the low deserts to the high mountainous terrain. Weather ranges from the cold winter months to the hot summers. Mining has a legacy that goes back to the late 1800's for minerals such as coal and the early 1900's for minerals such as uranium, vanadium, copper, and sand & gravel. The Navajo Nation also has other natural resources such as natural gas, oil, timber, and water.

The community of Burnham is located an average of 60 miles from the three nearest major communities of Gallup, Farmington, and Shiprock, New Mexico in the Four Corners area of the Southwest. The name, Burnham, was given after a Mormon Trader who built the first trading post in the area in 1934. The first chapter house was built in 1960. The community is very small with a population of 245 people, and there is no school located within the community (chapter) boundary. All of the children are bused to nearby schools within 30 miles. There are limited paved roads and about 60% of the residents have no basic infrastructure of electricity, running water and gas heating. Coal is still a major source of heating during the cold weather months for many Navajo homes, as well as hauling water. Again, the nearest major clinic and hospital is about 55 miles.

Burnham is the home to some scenic attractions such as the Bisti Badlands and Chaco River Valley. These are natural carved soil structures made of gray, mixed with white clay structures creating a natural beauty against the background brown soil. The Burnham area is located within the large geologic structure known as the San Juan Basin. The geologic structures are within the Cretaceous age and the coal reserves within the Fruitland Formation. Hiking these valleys is a major activity of many Four Corners and outside visitors. The valleys and plains have the potential for livestock production and ranching. The land was once richly covered with grass and other vegetation, it has suffered from overgrazing and recent drought conditions.

Project Background:

Within our lands lie large coal reserves of over 2 billion tons. There are three (3) large strip mining operations currently on-going, with approximately 18 million tons of coal mined per year. The Navajo Nation coal reserves are sought after because of the low sulfur and ash content and overall BTU's ranging from 8,000 to 14,000. The early utilization of coal was for the railroads, Bureau of Indian Affairs schools, home heating and power plants. Current uses continue to be by the coal burning power plants and some individual family heating. The 3 strip mining industries contribute huge economic opportunities to the Navajo Nation and surrounding communities such as business growth, requirements for supplies and materials, taxation, payments of royalties to the Navajo Nation and the Abandoned Mine Land (AML) fund, per the Surface Mining Control and Reclamation Act (SMCRA) of 1977.

The Burnham area has scattered outcrop coal mining within a 30 mile range. This project is located within 200 feet of a heavily travel BIA dirt road that leads from the Burnham area into the Farmington, New Mexico and Active Title V mine, Navajo Mine, being operated by BHP Billiton. NAMLRP was notified of this project's dangerous coal outcrop fire in 2003. The dangers associated with this site include the coal fire being located near the BIA dirt road, and

evidence of visitation by the public, livestock and wildlife. No known injuries have been documented at this mine site. Following an initial consultation with the Denver Regional OSM office as to the criteria for an emergency project, NAMLRP initiated reclamation designs.

This coal outcrop fire was grouped with other shallow open pits within the vicinity. A total of three projects were address under the Burnham AML Coal Reclamation Project. The project addressed a total of 33.6 acres, which included 17.2 acres of pits, 1,700 linear feet of highwalls, 16 acres and/or 36,000 bcyds of gob piles, 3,140 linear feet of drainage channels, and 16 acres revegetated.

Mine problems and Reclamation Plan:

The problems associated with this project includes the coal outcrop fire, highwalls, gob piles, vegetation, nearby highway, location for undesired social activities, illegal solid waste disposal site, possible dangers to livestock, and wildlife and a lack of topsoil for coverage. The project was also located within different Chapter boundaries (communities), thus multiple land approvals were required as well as multiple family consents.

NAMLRP's major obstacle was developing a plan to address the coal outcrop fire due to the distance to a viable water source and also to stockpile some respectable topsoil material. Prior to any work, whatever topsoil that was available was stockpiled for final contouring.

The Plan was to fully excavate the coal outcrop fire to expose the natural coal seam. During this process, water was very important. The nearest water source was located approximately 20 miles one-way and a round trip took approximately 2.5 hours. The contractor was required to have a water source at the construction site at all times during the fire reclamation phase, thus they utilized multiple water trucks and equipment. The fire line was estimated to stretch a distance of 200 linear feet. Upon excavating the fire line, there were three main pockets that were actively burning. Since the coal seam was relatively shallow, the excavation, drenching and mixing of materials was performed with a bulldozer. Removing the blinding ashes and seeking out the source of the fire was challenging. The intensity of the heat from the coal fire, caused the surrounding rock to build up heat, which transferred to the heavy equipment as they remove the top soil to get to the fire.

The contractor was working a standard 4 days, 10 hour day, but since the work on the coal outcrop began late in the week, we had to work with the contractor to work into the weekend. This was negotiated to ensure that the fire was properly put out and not allowed to start burning again. The coal outcrop fire was successfully extinguished within 3 days, then a buffer of sandy material was placed adjacent to the coal seam and over the hot bedrock as a safeguard against re-igniting.

NAMLRP followed standard grading techniques to reduce the associated highwalls and a selective backfilling methodology to backfill the pits with gob piles. Topsoil material was carefully stockpiled by the use of an excavator. All highwalls were reduced and major open pits were backfilled with gob material. Drainage patterns were designed to meander through the middle of the pit. A small stand of tamarix shrubs that existed within the northern part of the pit

were allowed to remain for wildlife purposes, mainly due to the very limited natural vegetation within this area. The perimeter drainages were diverted around the project site by constructing drainage channels, while the excavated soil from the channels were utilized for the final contouring. The final contours were very gently sloped with small terraces and rough contouring implemented. The drainage designs blended with the surrounding terrain. Overall reclamation was successful.

Overall benefits:

The overall benefit of this 33-plus acre Burnham AML Coal Reclamation Project was substantial to the community, livestock, wildlife, topography in eliminating the physical and environmental problems. This area can continue to be utilized for outdoor recreational purposes and open range for livestock. The overall topography was restored to its natural setting. The drainage structures installed will also play a role in catching storm water run off because water is very scarce. The run offs without coal refuse will create livestock ponds for both domestic animals and wildlife. The reseeding of blue-grama grass will re-introduce some grass that died off from the drought and over grazing, and to keep the top soil from blowing away.

The communities, including Burnham Chapter, were satisfied with the project. Navajo AML worked very closely with the surrounding residents to stay away from the uncovered coal fire pit. They no longer have to live with the coal fire smell, worrying that the kids are partying near the coal fire, and no longer have to look at the dark gray coal refuse pile when they drive by. The livestock no longer will consume pond water near or on the coal refuse pile.

The partnering concept was fully utilized during this project. Navajo AML and OSM partnership efforts have again created a win-win situation by restoring the lands for Burnham chapter where the end product, the customer, is satisfied. Partial funding for this project was obtained from the Casper, Wyoming OSM field office in terms of a grant under the Coal Outcrop Fires. Navajo AML's work with the contractor was also very important in considering the safety hazards associated with this coal fire. The contractor was very supportive of any efforts brought forth during the project. This project gave the Navajo AML program some very valuable experience in addressing a coal outcrop fire. The project was completed within time and budget.

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Photographic log

Photo #1: Overview of the Burnham AML project looking at the open pit, gob piles, native vegetation and coal seams.

Photo #2: Close-up view of the coal outcrop fire.

Photo #3: Construction view of the project during the outcrop fire extinguishing phase. Equipment on site includes a bulldozer, water truck and excavator.

Photo #4: Construction view of the project during the final contouring phase. The topsoil material had been previously stockpiled and is now being utilized for the final cover.

Photo #5: Post reclamation view, the slopes have been reduced, a final cover of soil applied, the area revegetated with native species, rough contouring on the slopes, and positive drainage patterns implemented. Overall, successful reclamation and the lands returning to blend in with the existing topography.

Photo #6: Besides the work on the reclamation site, this is an example (badlands) of the natural beauty of the surrounding that attracts people. Reclamation is a win-win situation that ensures the safety of the public, livestock and wildlife from abandoned mine lands (AML).