

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

U.S. Department of the Interior



Annual Evaluation Report for the
Abandoned Mine Land Program

Administered by New Mexico's Energy Minerals and Natural Resources Department



For Evaluation Year 2015
July 1, 2014 to June 30, 2015
Prepared by Denver Field Office
Sept 2015

EXECUTIVE SUMMARY

This Annual Report has been prepared by the Office of Surface Mining Reclamation and Enforcement (OSMRE), Program Support Division (PSD) to provide a summary of New Mexico's Abandoned Mine Reclamation Program (NMAMLP) for Evaluation Year 2015, which covers the period of July 1, 2014 through June 30, 2015. The following summary captures the highlights of this evaluation year. Specifically, this report identifies and highlights New Mexico's program administration, noteworthy accomplishments, technical assistance provided by OSMRE, and New Mexico's public participation and outreach efforts. Additionally, this report discusses the results of topic-specific evaluations performed in coordination with New Mexico's staff. Details regarding the required AML Grant and Administrative Reviews along with information NMAMLP entered into the electronic Abandoned Mine Land Inventory System (e-AMLIS) for this evaluation year are also included in this report.

OSMRE utilized two basic methods of analysis when constructing this report. The first method includes various administrative reviews that enabled OSMRE staff to accomplish the valuable oversight components such as grants and e-AMLIS. The second method performed includes communication with the NMAMLP staff and field visits that are an essential element of the agencies oversight process. This element provides insight to the actual on-the-ground reclamation that NMAMLP reported for the current evaluation year.

NMAMLP actively participated in public outreach with education and awareness regarding abandoned mine lands. Efforts included press releases, worked with a film company to assist in a documentary, maintained an exhibit at the State Fair, wrote an article published in the Western Bat Working Group Newsletter, and accepted an award from Bureau of Land Management for the Harding Pegmatite Mine Safeguard Project.

Major accomplishments include nine projects being completed including concrete plugs, bat gates, polyurethane foam, improvements to previous projects, backfilling 23 mine openings and cohosting the National Association of Abandoned Mine Lands Programs conference with the Navajo AML program.

NMAMLP was effective in abatement for each feature reviewed by OSMRE. The sites included: Madrid Projects low-impact drain, maintenance and French adit; Harding Pegmatite Mine; Ortiz Mine Shaft Cupola and Benton Headframe; and Cerrillos Mine Safeguard Project.

OSMRE provided technical assistance and technology support by providing training including TIPS classes and use of FLIR video camera used to collect data on bat and monarch butterfly habitat.

All calculations are entered into e-AMLIS by NMAMLP staff and are utilized in this report to depict the different categories of interest. These results can be found in Tables 1-4 and Graphs 1-2 of this report.

TABLE OF CONTENTS

I.	INTRODUCTION.....	54
II.	ACRONYMS	45
III.	OVERVIEW OF COAL MINING INDUSTRY IN NEW MEXICO	7
IV.	OVERVIEW OF THE PUBLIC PARTICIPATION AND OUTREACH EFFORTS.....	8
V.	MAJOR ACCOMPLISHMENTS AND INNOVATIONS.....	109
VI.	OVERSITE REVIEW.....	11
VII.	OSMRE ASSISTANCE.....	11
	TITLE IV: SUMMARY OF CORE DATA TO CHARACTERIZE THE AML PROGRAM	18

Cover Page Photograph: San Pedro Airflow Closure, Golden, New Mexico, 2015

I. ACRONYMS

The following acronyms are used in this report:

OSMRE	Office of Surface Mining Reclamation and Enforcement
SMCRA	Surface Mining Control and Reclamation Act of 1977
AML	Abandoned Mine Lands
AMLIS	Abandoned Mine Land Inventory System
BLM	Bureau of Land Management
EA	Environmental Assessment
FAM	Federal Assistance Manual
FLIR	Looking Infrared Radiometer
FONSI	Finding of No Significant Impact
FTE	Full time equivalent
GCS	Geosynthetically Confined Soil
GIS	Geographic Information System
GPRA	Government Performance and Results Act
GPS	Global Positioning System
MOA	Memo of Authority
NEPA	National Environmental Policy Act
NMAMLP	New Mexico Abandoned Mine Land Program
NOV	Notice of Violation
PA	Programmatic Agreement
PUF	Polyurethane Foam
ROE	Right of Entry
SHPO	State Historical Preservation Officer
TIPS	Technology Innovation and Professional Services
UAS	Unmanned Aerial System
USFS	United States Forest Service
WR	Western Region
XRF	X-ray Florescence

II. INTRODUCTION

The Surface Mining Control and Reclamation Act of 1977 (SMCRA) created the Office of Surface Mining Reclamation and Enforcement (OSMRE) in the Department of the Interior. SMCRA provides authority to OSMRE to oversee the implementation of and provide federal funding for the state regulatory programs and abandoned mine land programs that have been approved by the Secretary of the Interior as meeting the minimum standards specified by SMCRA. Title IV of the Surface Mining Control and Reclamation Act of 1977 (SMCRA or “the Act”), as amended, provides moneys to States and Tribes from the Abandoned Mine Reclamation Fund (the Fund) and the general Treasury of the United States. The OSMRE administers Title IV of SMCRA on behalf of the Secretary of the Interior. The primary purpose of Title IV is to pay the costs of mitigating the adverse effects of past coal mining, though it also allows AML Programs to address certain non-coal problems. On December 20, 2006, the President signed the Tax Relief and Health Care Act of 2006 (P.L. 109-432). That legislation included the Surface Mining Control and Reclamation Act Amendments of 2006 (the 2006 Act or the 2006 SMCRA amendments). The 2006 Act amended Title IV of SMCRA to make significant changes in the abandoned mine reclamation fee and the abandoned mine land (AML) program. OSMRE published final regulations implementing the 2006 Act in the November 14, 2008, Federal Register (73 FR 67576).

OSMRE awards grants to States and Tribes with moneys from the Fund and the general Treasury to pay for their administration costs and abandoned mine reclamation. SMCRA puts the highest priority on correcting the most serious AML problems that endanger public health, safety, and property. As amended, it also allows AML Programs to address certain lower priority coal problems if they are in conjunction with or adjacent to, higher priority problems. OSMRE, State, and Tribal AML Programs work together to achieve the goals of the national program. Additionally, OSMRE works cooperatively with the States and Tribes to evaluate their AML Programs.

The Secretary of the Interior approved New Mexico’s AML reclamation plan (the Plan) under Title IV of SMCRA. That approval allows the New Mexico Abandoned Mine Land Program (NMAML) to reclaim abandoned mines in the State for non-emergency AML projects. NMAML is part of the Energy Minerals and Natural Resources Department (EMNRD). It administers New Mexico’s AML Program under the State’s approved plan. The Denver Field Division of OSMRE’s Western Region works with NMAML to fund and approve AML projects in New Mexico and to evaluate AML reclamation and other aspects of the Program.

Directive AML-22 generally describes how OSMRE evaluates State and Tribal AML reclamation programs. Directive AML-22 was revised last evaluation year (March 28, 2013). Those revisions incorporated changes required by the 2006 SMCRA amendments, made distinctions between certified and uncertified programs, identified core program data to be reported annually, updated outreach and public participation requirements, replaced terminology of “enhancement and performance reviews” with “topic-specific reviews,” and established the

reporting cycle on the evaluation year (July 1 – June 30). The topic specified this evaluation year is: Does completed reclamation meet the goals of the project?

In addition to conducting oversight of approved state programs, OSMRE provides technical assistance, staff training, financial grants and assistance, as well as management assistance to each state program. This report contains summary information regarding the New Mexico’s program and the effectiveness of the New Mexico’s Abandoned Mine Land program in meeting the applicable purposes of SMCRA as specified in Section 102. This report covers the Evaluation Year (EY) July 1, 2014 to June 30, 2015.

Detailed background information and comprehensive reports for the program elements evaluated during the EY are available for review and copying at the OSMRE, Denver Field Office, 1999 Broadway, Denver, CO 80202. To arrange an appointment time, contact OSMRE via telephone (303)293-5000.

The reports are also available at the OSMRE Oversight Documents website at <http://odocs.osmre.gov/>. Adobe Acrobat Reader® is needed to view these documents. Acrobat Reader® is free and can be downloaded at <http://get.adobe.com/reader/>. Follow these steps to gain access to the document of interest:

1. Select New Mexico from the drop down box labeled “State”. Also select 2015 as the “Evaluation Year”, and then click “Submit”. The search can be narrowed by choosing selections under the “Keyword” or “Category” headings.
2. The oversight documents and reports matching the selected state and evaluation year will appear at the bottom of the page.
3. Select “View” for the document that is of interest and the report will appear for viewing, saving, and/or printing.

III. OVERVIEW OF COAL MINING INDUSTRY IN NEW MEXICO

Coal is the most abundant fossil fuel in the world. The United States holds the world's largest estimated recoverable reserves of coal at approximately 27%. Based on current production levels, the United States has enough estimated recoverable reserves of coal to last more than 200 years. Coal production has played a significant role in the economic development of New Mexico beginning the 1850's. Today, mining companies are required to provide full bonded reclamation plans before they are able to obtain permits to mine in the State of New Mexico. But mining operations in the past were not held accountable for reclaiming disturbed land, leaving the mined areas as they were during active mining creating safety or environmental hazards.

NMAMLP is part of the Mining and Minerals Division and is responsible for reclamation of historical (pre-1977) mining-related disturbances. The Division also contains the Mining Act Reclamation Program, which permits hard rock mining operations; the Coal Mine Reclamation Program, which permits coal mining operations; and the Mine Registration and Reporting Program, which registers all active mines in the state.

To date, NMAMLP has addressed many long-abandoned mine sites. These sites contained hazardous mining features (open adits, shafts, pits and dilapidated structures) and exhibited serious erosion problems. Now many of these old mines have been safeguarded and revegetated. As abandoned mine sites around the state are inventoried, they are evaluated to determine if they qualify for AML funding. Federal policy requires that priority one and two projects be completed first. Priority three coal projects can be completed in conjunction with priority one and two projects or after all priority one and two projects have been completed. The three reclamation priorities are:

1. Protection of public health, safety, general welfare and property from extreme danger resulting from the adverse effects of past mineral mining practices.
2. Protection of public health, safety and general welfare from adverse effects of past mineral mining and processing practices, which do not constitute an extreme danger.
3. Restoration of eligible lands and waters and the environment previously degraded by adverse effects of past mineral mining and processing practices, including measures for the conservation and development for soil, water (excluding channelization), woodland, fish and wildlife, recreation resources, and agricultural productivity.

The NMAMLP was formed in 1981 after an agreement was signed between the State of New Mexico and the Department of Interior's Office of Surface Mining (OSM). Under SMCRA, priority is to be given to reclamation of abandoned coal mines and affected lands and water. Non-coal reclamation projects can be funded on a case-by-case basis upon the request by the

Governor of the State indicating that reclamation of the site is necessary for the protection of the public health, safety and general welfare from extreme danger.

To be eligible for SMCRA funding, sites to be reclaimed must have been mined or affected by mining processes and abandoned or left in an inadequate reclamation status prior to August 3, 1977 (or prior to August 28, 1974 for U.S. Forest Service administered lands; and November 26, 1980 for U.S. Bureau of Land Management administered lands). A proposed SMCRA reclamation site cannot be within an area that has been designated for remedial action under the Uranium Mill Tailings Radiation Control Act (UMTRCA) or under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

IV. OVERVIEW OF THE PUBLIC PARTICIPATION AND OUTREACH EFFORTS

The NMAML P provides opportunities for public participation and interacts with the local associations, citizens, environmental organizations and other groups to:

- Determine areas of concern and receive suggestions relative to AML reclamation; and
- Provide timely information about OSMRE activities to interested groups.

The public can also access OSMRE annual reports and Performance Agreements (PA) via the internet at the OSMRE Oversight Documents website at <http://odocs.osmre.gov/>. The Introduction section of this report (page 3) details how to access information using this website. Public participation for this year includes:

In September 2014, a reporter from the Journal North interviewed Steve Carson of Rangeland Hands, Lori Lindsey, owner of the Mine Shaft Tavern and Old Coal Town Museum, and John Kretzmann on the Madrid erosion control project, following EMNRD's press release on the project. The Journal North published an article, which is available online at: <http://www.abqjournal.com/460838/news/preventing-another-flood-in-historic-madrid.html>. John and Lori were also later interviewed about the project for a television spot that aired Wednesday evening on KOAT (www.koat.com/news/flooding-leads-to-facelift-in-old-nm-mining-town/27992332).

In October 2014, the Bureau of Land Management (BLM) presented its "Fix a Shaft Today!" award to the AML Program for its Harding Pegmatite Mine Safeguard Project in a ceremony in Washington, D.C. John Kretzmann accepted the award on behalf of the Program. In addition to an award from the National Association of Abandoned Mine Land Programs in 2013, this is the second national award this project has garnered. Both EMNRD and BLM issued news releases on the award. For the BLM release, see http://www.blm.gov/wo/st/en/info/newsroom/2014/october/nr_10_29_2014.html.

Abandoned mines was the subject of a talk at the Cerrillos Hills State Park October 2014. Chris Teske of the BLM shared his experiences of the safeguarding and inventory work they did in partnership with the New Mexico AML Program in the Cerrillos area over the prior year.

A public meeting for Gage Mine Safeguard Project – Phase II was held on Friday, May 8, 2015 at Western New Mexico University (The Learning Center) in Deming, N.M. An article announcing the meeting appeared in the Deming Highlight: http://www.demingheadlight.com/deming-news/ci_27969048/public-meet-gage-phase-ii-mine-safeguarding. No one attended and no comments were received.

In May 2015, AML staff responded requests for information from Red Lotus Films, a company working on a documentary of the Dawson Coal Mine, perhaps the most significant coal mine in early twentieth century New Mexico history. See <http://www.dawsondocumentary.org/#!teaser-1/c110x>.

AML staff attended several meetings during the year with the East Mountain Regional Trail Council to discuss long-term plans to safeguard abandoned mines in the San Pedro Mountains and the relationship of the safeguarding projects and the development of public hiking and biking trails on public (BLM, Santa Fe County) lands and perhaps private parcels.

NM AML continues to maintain its exhibit on abandoned mine land safety and N.M. mining history at the State Fair in September in Albuquerque. The Program's website, <http://www.emnrd.state.nm.us/MMD/AML/amlmain.html>, also continues to provide information on abandoned mines to the public, including links to its webpages on work in Madrid and at Boston Hill in Silver City.

Linda DeLay wrote an article published in the Western Bat Working Group Newsletter Fall/Winter 2014. See

<http://wbwg.org/wp-content/uploads/2015/03/WBVGNewsFallWinter2014.pdf>, page 22. The WBWG is a nonprofit that reaches out to all bat conservation enthusiasts which include public, agency biologist, teachers, researchers, etc.

The Mining and Minerals Division staff is working with EMNRD Information Technologies Office to publish Story Map Journals on the intranet website as a form of public outreach. The Story Map/Story Map Journal is a recent form of Esri Web Mapping application that offers the use of templates available on the Esri ArcGIS Online internet environment in order to relate web maps to narrative text, hyperlinked text and multimedia such as photos and video. Staff has been developing the plans (storyboard) and gaining permissions to use the ArcGIS Online for Organizations account to premiere a Story Map Journal that educates and informs the public about NMAMLP projects and initiatives.



Figure 1: Exhibit on AML safety and N.M. mining History.

V. MAJOR ACCOMPLISHMENTS AND INNOVATIONS

In Evaluation Year 2015 AML completed nine abandoned mine safeguarding and reclamation projects, including six small construction projects. These small construction projects were to install a concrete plug at a hard-rock mine subsidence in the village of Santa Clara in Grant County; to construct two bat gates at Cookes Peak for a scientific study on the effects of gating on bats; to fill a coal mine adit and subsidence in Madrid; to plug a coal mine vent shaft near Madrid using polyurethane foam; to safeguard a couple of other coal mine openings and to maintain previous bat compatible mine closures near Madrid; and to seed and mulch bare areas at the Swastika coal mine reclamation site near Raton.



Figure 3: Sugarite remedial reclamation on steep slopes.

In August 2014, remedial reclamation of gob (coal mine waste) piles in Sugarite Canyon State Park and in nearby Yankee Canyon in Colfax County was completed in the Sugarite Gob Reclamation Phase VIII project. In September 2014, the Grants Uranium – Hogan Mine Phase I Project in Grant County was completed to safeguard a uranium mine shaft using a cap of precast concrete panels. Another project, the Vermejo Park Ranch – Swastika Mine Stream Crossing Maintenance Project, removed storm-damaged culverts installed in an earlier reclamation project and replaced them with a hardened low-water crossing in September and October 2014. The San Pedro Phase I Mine Safeguard Project was completed in



Figure 4: Swastika Mine Stream Construction Maintenance Project.

May 2015 to backfill 23 mine openings, construct bat compatible closures at six mine openings, and temporarily fence several mine openings until full clearances are received. By May 2015, construction in Madrid on an erosion control project on and near gob piles on hill slopes above businesses and residences and improvements to the drainage channel that carries water from the hill slopes to a N.M. Department of Transportation drop inlet was complete; only final

documentation and any needed short-term maintenance work on sediment and erosion control measures remains for this project. In June 2015, work was begun

on a project to safeguard numerous, scattered hazardous mine openings in the Cerrillos Hills in Santa Fe County. In addition, AML Program staff assisted Sandia Pueblo with design and construction monitoring of a Pueblo-funded project to safeguard a mine adit in the Sandia Mountains, completed in December 2014.

The Program continues to develop abandoned mine land projects in New Mexico, including major projects with numerous hard rock openings at Cookes Peak, Silver City, Gage

and Hansonburg in the southern half of the state; a couple of uranium safeguarding and mine cleanup near Grants, which will be partially funded using Bureau of Land Management funds; and coal safeguarding and coal seam fire extinguishment projects in Gallup and La Plata.

The major initiative which the NMAMLP has taken on this year has been cohosting with the NMAMLP the National of Abandoned Mine Land Programs annual conference in Santa Fe in late September 2015. This has involved significant planning efforts to line up the hotel and overflow hotels, speakers for the plenary and technical sessions, conference tours, the awards banquet, executive business meeting, barbeque, and other conference events.

The Madrid project in particular used innovative methods for managing stormwater on steep hillslopes above the town. Both the community and State Historic Preservation Office required that the visual impacts to the coal gob piles be left as intact as feasible, in order to preserve the historic coal mining viewshed at a site on the National Register of Historic Places. The solution involved routing stormwater around the gob piles in machine- and hand-built rock channels, using rock that closely matches the color of the existing rock armor on the hill and which is seeded so that the channels will blend even further into the surrounding landscape. To carry the stormwater from the hillslope safely (a storm in 2013 had carried significant gob debris into historic structures on private property), the deteriorating concrete box culvert, built during the mining era and which is routed beneath several buildings, was upgraded by lining and grouting into place a steel pipe. The storm pipe smoothly directs flow, without the constrictions and changes in culvert sizes of the original storm system, to a N.M. Department of Transportation drop inlet that carries flow to the main arroyo that flows through the community.

VI. NATIONAL PRIORITY AND GENERAL OVERSIGHT TOPIC REVIEWS

National priority reviews and general oversight topic reviews can be located and reviewed at OSMRE's website as listed at the Introduction (page 3) of this report. Individual reports prepared by OSMRE are part of the oversight process of each state and contains findings and details regarding the evaluation of specific elements of the state program. Principle of Excellence: 1. The State's on-the-ground reclamation is successful.

Performance Measure: (a) Does completed reclamation meet the goals of the project?

Background:

By successfully reclaiming historic mine hazards, the New Mexico AML program achieves the primary goal of Title IV of the SMCRA; to abate hazards to public health and safety. Generally, reclamation project goals should reflect the need to reclaim abandoned mine lands and abate their attendant hazards and improving overall site conditions while complying with applicable laws and regulations. Performance measure 1(a) requires the OSMRE New Mexico AML review Team to determine if ongoing or completed reclamation meets these goals.

Population / Sample:

The population for this review included all AML abatement methods previously completed by New Mexico. The Team selected the Madrid, Harding Pegmatite Mine, Ortiz

Mine Shaft Cupola and Benton Shaft Headframe, and Cerrillos Mine Safeguard Projects for this topic-specific review.

Review Scope and Methodology:

The Team reviewed each sample AML project to determine whether the State's completed reclamation met the goals of the project. These goals include (1) the successful abatement of hazards to the public's health and safety and/or the environment and (2) improving the condition of abandoned mine lands compared to their condition prior to reclamation (e.g. restoring, creating, or preserving wildlife habitat). Prior to evaluating each feature in the field, Team members reviewed available information including Engineering plans and specifications, National Environmental Policy Act documentation, Endangered Species Act and National Historic Preservation Act consultation documentation, and closeout reports to ensure compliance of interagency consultation.

During the field evaluations, the Team had an opportunity to observe the completed projects (and one project currently under construction) and discuss NMAMLP's method for abatement-type selection. We based our determination of reclamation success by evaluating whether the completed reclamation met the goals of the project.

Findings and Conclusions:

1) Madrid Project (includes Madrid low-impact, Madrid maintenance, and Madrid French Adit Project Sites)—In June, 2014, construction started on an erosion control project on steep hill slopes in Madrid, south of Santa Fe. In September 2013, during a series of significant storm events that affected Colorado and New Mexico, a historic gob pile blew out, sending gob into buildings at the Old Coal Town Museum and across the state highway that runs through the town of Madrid. Shortly afterwards, the NMAMLP spent \$96,000 on an accelerated preliminary response for immediate protection of public health and property. Because residents of the town wanted to see the gob piles left largely undisturbed, New Mexico took care to design the project with no adverse impacts to cultural resources, including preservation of the mining landscape view shed. The AML Program diverted storm water around the gob piles in rock-lined channels and swales. Additionally, the State stabilized erosion directly on two previously-reclaimed gob piles using low rock structures. Both machine and hand work was utilized to build the rock structures. The permanent erosion control work was completed in September, 2014 at a cost of \$705,000. OSMRE conducted a field evaluation of the Madrid project in June, 2015. Nearly 2000 seedlings were planted and a drip system was utilized to irrigate the seedlings. This system was to be uninstalled at the end of June 2015. The vegetation on the hillside is establishing itself nicely. This will help control erosion from the hillside. The four rock step drainages that were installed to divert storm water flow around historic gob piles are well constructed and appear to be functioning as designed. The State Historic Preservation Office requested that NMAMLP use rocks that would blend in with the existing view scape. The Program did an excellent job of choosing the rock material to achieve this. One rock step drainage was handmade and the other

three machine built. All were built to capture and slow the flow of storm water around the gob area.

A temporary water tank is located near the top of the hillside. A wall constructed of rock material surrounds the water tank. Material from above the water tank has accumulated on the uphill side of the rock wall. The Team discussed increasing the wall height and clearing the collected material to ensure that the rock wall is protecting the water tank and the downhill gob pile from erosion.

2) Harding Pegmatite Mine (Taos County) – The Harding Pegmatite Mine, situated five miles east of Dixon in north central New Mexico, is a historic and geologic treasure that has made significant contributions to the scientific understanding of the origin of pegmatites and associated



Figure 2: Harding Pegmatite Mine bat gate closure that allows passage for tours.

mineral resources. From the early 1900s through the World War II era, the pegmatites at the Harding Mine were a source of strategically-important minerals for the United States. The tantalum-bearing mineral microlite (associated with lepidolite) was found here, and the mine was the world’s largest producer of microlite between 1942 and 1947, as it was needed to manufacture walkie-talkies and radios for the armed services and war effort.

Other strategically important minerals mined at the site include beryl (used to make non-sparking tools needed in the development of atomic weapons at the nearby Los Alamos National Laboratory), spodumene (a lithium mineral used for ceramics and compounds used in thermonuclear bombs) and optical grade calcite. While the mine was active, it gave many local families a much needed source of cash income. When

mining activities at the Harding Pegmatite Mine ceased in the 1950s, it left a remarkably well-preserved and exposed pegmatite source. In 1978, Dr. Arthur Montgomery, the mine’s owner, donated this world class mine to the Department of Earth and Planetary Sciences at the University of New Mexico (UNM). It has remained under UNM’s supervision since then. Today, geology and mineralogy students use the mine as an outdoor laboratory, and geology enthusiasts are allowed to collect minerals.

Given the high visitation rate and the presence of ten hazardous abandoned mine openings, UNM was interested in better controlling access to the site and underground mine workings. Consultation with the *UNM Department of Earth and Planetary Sciences* and the site caretaker resulted in a unified strategy to close or secure the mine openings in the project area. Reclamation methods included backfilling with mine waste rock, construction of bat grates, installation of a corrugated steel pipe to allow airflow at one adit, and the installation of barbed-wire fence along a dangerous highwall feature. Additionally, post locations for a self-guided

tour and two interpretive signs which describe OSMRE's and NMAMLPS's roles related to the Harding Pegmatite Mine Project were installed. These signs also contain information about the history and mineralogy of the site, and include historic photographs.

During our site visit, OSMRE evaluated numerous closure methods. Of particular relevance were the bat grate closures. Designs needed to minimize the visual impact on this historic site and, where feasible, to enhance the visitor experience. All closures were designed to be both aesthetic and functional, while being located to reduce the visual impact as much as practicable. Exposed steel used in the project is corrosion-resistant weathering steel which forms a reddish-brown patina that blends well into the setting. Additionally, the closures were designed and located so as to not hide any significant geologic features (large crystals, contacts between different minerals etc.) that are often located near the mine openings. The closures were also designed to minimize restrictions to natural ventilation, which is important to both the bat population and other wildlife and human visitors to the underground workings.

Completion of this abandoned mine land project gives UNM an enhanced ability to control access to both the site and the mine workings which helps to preserve this treasured area, while greatly improving the safety of visitors, including scientists, students, mineral enthusiasts and school children.

After our field evaluation of the mine closures, we visited one of the ancillary gates to the Harding Mine. The chain and lock across this access road have been cut. The caretaker requested that NMAMLP consider designing a more robust gate to deter vandals and ATV enthusiasts from destroying the gate and accessing the private mine. The state will determine if it is able to complete a maintenance AML project at this location to help reduce trespasser access using this ancillary access road. This AML reclamation project won the National Association of Abandoned Mine Land Programs Small Project Award in 2013.

3) Ortiz Mine Shaft Cupola and Benton Shaft Headframe (Cerrillos, NM) – These two reclaimed AML features were part of the Real de Delores Mine Safeguard Project. This area has a long mining history that began in 1821 when the Mexican government opened the borders of its New Mexico province to traders from the U.S. This perpetuated the need for gold mining in the Ortiz Mountains, located 25 miles south of Sante Fe. By 1822, the Real de Delores Mining Camp was established and several thousand people were searching the mountains for placer gold. Historic mining in the Ortiz Mountains continued into the 1940's, and the State Historic Preservation Division has designated the site as historically significant. As part of its AML survey in the early 1990's, the Program located many shafts, adits, pits, open stopes, and a standing timber headframe.

OSMRE visited the Ortiz Shaft and the Benton Shaft headframe as part of our field evaluation. It was discovered that the Ortiz Shaft was being utilized by Townsend's big-eared bats for both summer maternity and winter hibernation sites. The NMAMLP took great care in developing a closure method that would allow the bats to continue using the underground mine workings of the Ortiz Shaft. The project utilized polyurethane foam (PUF) to secure a

corrugated steel riser pipe that the bats could navigate through. A large steel grate cage was then constructed at the ground surface to protect visitors and provide a wonderful viewing opportunity for those wanting to participate in public bat counts (the Santa Fe Botanical Garden maintained the site and offered educational programming to the public until earlier this year when it transferred ownership to Santa Fe County). The structure itself is quite impressive and beautifully designed. A large rock wall and bench seating areas have been constructed to allow for an intimate bat viewing experience.

OSMRE also visited the Benton Shaft Headframe reclamation. The Benton Mine was active between the 1880s and the 1930's. The timber lining for the shaft had partially collapsed which created an unstable debris plug 35 feet below ground surface. NMAML P excavated the collapsed material and utilized a nine-foot thick PUF plug to fill the void. The PUF was then covered with five feet of lightweight scoria fill. This reclamation effort preserved the Ortiz Mining District's only remaining headframe structure and the near-surface remnants of the timber collar for the shaft. OSMRE commends the NMAML P for careful project planning to preserve this rare historic mining feature.

4) Cerrillos Mine Safeguard Project (Cerrillos, NM) – This project was currently under construction during our field evaluation. The project includes a variety of closure methods including backfilling of 44 mine features using machinery and handwork when necessary, PUF closures, bat cupola closures, steel mesh coverings, and permanent fencing. OSMRE observed active backfilling by two dozers at the project site during our visit. OSMRE intends to revisit the site in a future evaluation year to evaluate the completed reclamation for the Cerrillos Mine Safeguard Project.

Conclusions and Recommended Corrective Actions:

New Mexico was effective in selecting the appropriate abatement methods for each feature included in the evaluated projects to ensure that the completed reclamation met the goals of each project. Most notably, (1) NMAML P designed and implemented a draining system that blends with the natural view scape and protects the Madrid gob piles from future destruction, (2) NMAML P utilized unique closure methods at the Harding Pegmatite Mine to ensure visitor safety and preservation of this unique and valuable historic mining area, (3) the Program maintained and possibly enhanced bat habitat at the Ortiz Shaft Cupola and afforded the public an educational experience for bat viewing, and (4) the Program took care in preserving a unique piece of Ortiz Mountain gold mining history with the Benton Shaft Headframe project. The NMAML P should plan to perform maintenance on the features identified from the Madrid and Harding Mine projects to protect public health, safety, and general welfare from these hazards created by past coal and non-coal mining practices.

VII. OSMRE ASSISTANCE

- A) OSMRE provides technical assistance and technology support to state Regulatory and AML Programs at the individual state level on project specific efforts, and at the national level in the form of national meetings, forums, and national initiatives. The OSMRE provides direct technical assistance in project and problem investigation, developing technical guidelines, training and support. OSMRE initiated a regional Technology Transfer Team in 2004 to support and enhance the technical skills needed to operate regulatory and reclamation programs which each state, including New Mexico has a representative. Program staff member have completed a variety of classes TIPS offered this year in their respective areas such as: TIPS – Introduction to earth Vision 2D and 3D Modeling, Introduction to GIS, and How to Teach Online. Use of OSMRE-TIPS FLIR Video in N.M. AML Program Projects

NMAMLP checked out a FLIR video camera from TIPS to continue collecting data on bat exit counts at abandoned mines either pre- or post-construction. This year the emphasis has been in areas of Southwest New Mexico: Cookes Peak West pre-construction site (multiple times over the warm season, Fig. 1) and post-construction Granite Gap and Lake Valley sites. Bat use of wetland restoration at the VPR Swastika Mine and Dutchman Canyon Reclamation Project continues. FLIR video recording was also part of the long-term monitoring at selected



Figure 3: FLIR poised to capture exits of bats at sunset.

sites using the USGS North American Bat Monitoring Program protocol.

- B) Pilot project: Milkweed Habitat in Support of Monarch Butterflies and Native Bees in N.M. AML Program Reclamation.

Landscape-wide loss of milkweed, the only larval food source for monarch butterflies, is recognized by conservationists as a major factor in monarch butterfly declines. Milkweed provides nectar to a large suite of pollinators which include native bees also suffering population declines, especially bumble bees (*Bombus* spp.) which have recently attracted great conservation concern. NMAMLP initiated seeding and planting of the perennial *Asclepias speciosa* (Showy Milkweed, Fig. 2) and *A. tuberosa* (Butterfly Milkweed) at the VPR Swastika Mine and Dutchman Canyon Reclamation Project. Plans include



Figure 4: Showy Milkweed monitoring site.

monitoring milkweed emergence and growth as well as visitation by Monarchs and selected pollinators. Two wildlife cameras have been set up to test the use of time-lapse capture of plant phenology and wildlife use of wetlands in the milkweed vicinity.

Title IV: Summary of Core Data to Characterize the New Mexico AML Program

The following tables present summary data pertinent to abandoned mine land activities under the NMAMLP. Unless otherwise specified, the reporting period for the data contained in the tables is the Evaluation Year. Other data and information used by OSMRE in its evaluation of New Mexico performance are available for review in the evaluation file maintained by OSMRE. Because of the enormous variations from state to state and the differences between state programs, the summary data should not be used to compare one state to another.

List of Tables and Graphs

- Table 1 Status of AML Inventory All Priority 1, 2, and 3 Hazards
- Table 2 Accomplishments in Eliminating Health and Safety Hazards Related to Past Mining Priority 1 and 2 Hazards
- Table 3 Accomplishments in Eliminating Health and Safety Hazards Related to Past Mining Priority 3 and SMCRA Section 403(b) Hazards
- Table 4 Public Well-Being Enhancement
- Graph 1 Number of FTEs
- Graph 2 Current AML Project Status

Table 1 –New Mexico Status of AML Inventory all Priority 1, 2, and 3 Hazards on June 30, 2015

	High Priority		Elevated Priority 3	Stand-Alone Priority 3 (Not adjacent or in conjunction w/ P1&2)	Total
	Priority 1	Priority 2			
UNFUNDED					
GPRA Acres	9.10	67.20	N/A	80.30	156.6
Dollars	2,027,556	10,803,460	N/A	6,570,000	19,401,016
FUNDED					
GPRA Acres	1.6	12.20	141.20	23	176
Dollars	54,936	889,497	13,426,060	683,154	1,5053,647
COMPLETED					
GPRA Acres	125.90	88.10	63.50	86.40	63,350.4
Dollars	7,082,276	2,518,094	4,146,113	2,892,142	16,638,625

Table 2 - New Mexico Accomplishments in Eliminating Health and Safety Hazards Related to Past Mining Priority 1 and 2 Hazards As of June 30, 2015

PROBLEM TYPE (keyword)													
	Clogged Stream (CS) (miles)	Dangerous Pile or Embankment (DPE)(acres)	Hazardous Equip. /Facilities (HEF) (count)	Hazardous Water Body (HWB) (count)	Portal (P) (count)	Polluted Water:Agri/Industrial (PWAI)(count)	Polluted Water: Human Consumption (PWHC)(count)	Subsidence (S) (acres)	Surface Burning (SB) (acres)	Underground Mine Fire (UMF) (acres)	Vertical Opening (VO) (count)	TOTAL	
UNRECLAIMED/REMAINING HAZARDS (Unfunded)													
Units		40	16	1.0	51	3	0.0	3	4	1	16.0	N/A	
GPRA Acres		40	1.6	5.0	5.10	15	0.0	3	4	1	1.6	76.3	
Dollars		8,440,960	1,094,500	15,000	812,000	610,000	0.0	322,556	1,010,000	250,000.0	276,000	12,555,016	
ANNUAL RECLAMATION - EY2015 only (Completed)													
Units	1	0	0	0	4	0	0	0	0	0	2	N/A	
GPRA Acres	5	0	0	0	0.4	0	0	0	0	0	.2	5.6	
Dollars	2,700	0	0	0	6,099	0	0	0	0	0	14,500	23,299	
HISTORICAL RECLAMATION - EY1978 - 2015 (Completed)													
Units	1.5	40	16.0	0.0	258	2.0	1.0	48.3	35.0	32.0	85	N/A	
GPRA Acres	10	40	1.6	0.0	25.7	10.0	5.0	48.3	35.0	32.0	8.5	216.1	
Dollars	155,000	8,440,960	118,840	0.0	1,170,563.0	1,300,000.0	1,728.0	2,946,118	696,036.0	234,984.0	835,480	15,899,709	

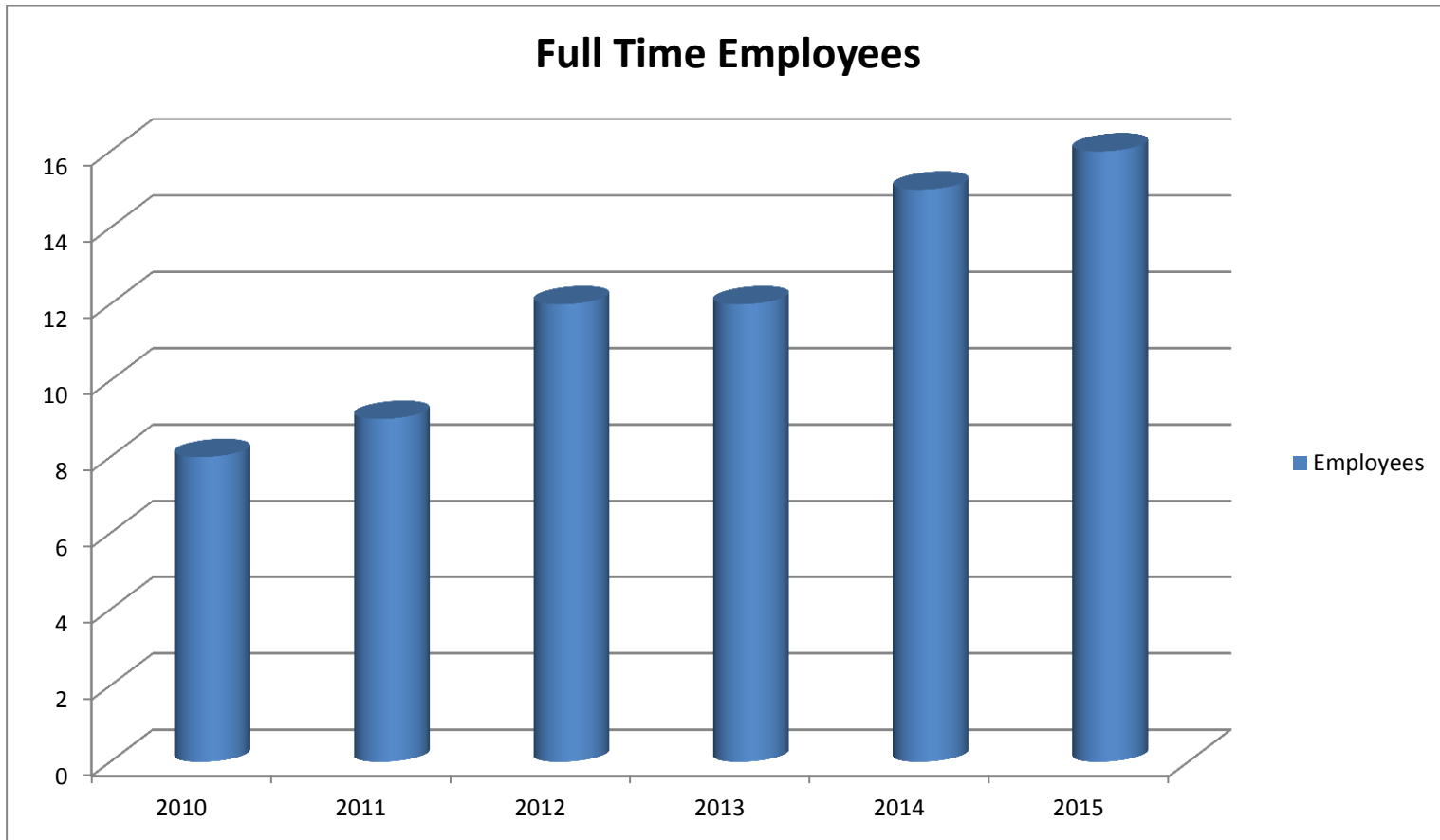
Table 3 - New Mexico Accomplishments in Eliminating Environmental Problems Related to Past Mining Priority 3 and SMCRA section 403(b) Hazards As of June 30, 2015

PROBLEM TYPE (keyword)											
	Bench , Solid Bench, Fill Bench (BE) (acres)	Equipment and Facilities (EF) (count)	Gob (GO) (acres)	Haul Road (HR) (acres)	Mine Opening (MO) (count)	Pit, Open Pit, Strip Pit (PI) (acres)	Spoil, Spoil Bank (SA) (acres)	Slurry (SL) (acres)	Water (WA) (gallons)	TOTAL	
UNRECLAIMED/REMAINING HAZARDS (Unfunded)											
Units	9	5	160	8	15	0	39.5	0	3	N/A	
GPRA Acres	9	0.5	160	8	1.5	0	39.5	0	0	218.5	
Dollars	720,000	350,000	16,284,060	580,000	142,000	0	1,720,000	0	200,000	19,996,060	
ANNUAL RECLAMATION - EY2015 only (Completed)											
Units			25	5						N/A	
GPRA Acres			25	5						30	
Dollars			668,131	10,000						678,131	
HISTORICAL RECLAMATION - EY1978 - 2015 (Completed)											
Units	3	11	103.5	36.5	13	2	2	2	0	N/A	
GPRA Acres	3	1.1	102	36.5	1.3	2	2	2	0	149.9	
Dollars	7,301	13,634	3,833,171	3,054,417	123,540	3,890	2,301	1	0	7,038,255	

**Table 4 – New Mexico Public Well-Being Enhancement
 (All Priority 1, 2, and 3 AML projects completed during EY 2015)**

#	PAD Number	Project Name	Problem Type(s) Reclaimed	GPRA Acres	Cost	Number of People with Reduced Exposure Potential (State Estimated /or/ Census Data)
1	NM000073	Rogersville Phase II	CSL,P,VO	5.2	9,700	17
2	NM000074	Jones Vent shaft	VO	0.1	10,500	17
3	NM000075	Madrid French Adit	P	0.3	3,099	17
4						
5						
6						
7						
8						
9						
10						
TOTAL				5.6	23299	51

Graph 1: Number of Full Time Employees



Graph 2: Current AML Project Status

