



## **COLORADO**

**Division of Reclamation,  
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215  
Denver, CO 80203

**DATE:** November 30, 2016

**TO:** Water Quality Control Commission

**FROM:** Virginia Brannon, Division Director  
Tony Waldron, Minerals Regulatory Program Director  
Mike Boulay, Coal Regulatory Program Director  
Jeff Graves, Abandoned Mine Land Program Director

**RE:** FY 2015-2016 SB 89-181 Annual Report

We appreciate the working relationship between the Division of Reclamation, Mining and Safety and the Water Quality Control Division and are pleased to submit the attached 2015-2016 Annual Report.

Attachments



## **SB 89-181 Annual Report FY 2015-2016**

This annual report to the Water Quality Control Commission (WQCC) is required under the provisions of SB 89-181 and the Memorandum of Understanding (MOU) adopted by the Mined Land Reclamation Board (MLRB) and the WQCC. The Division of Reclamation, Mining and Safety (DRMS) is an implementing agency under the provisions of SB 89-181. As such, DRMS is responsible for ensuring that mine operators comply with state ground water quality standards. It is the responsibility of the WQCC to classify waters of the state and set standards for those classified waters.

If the WQCC has not set site specific ground water standards, DRMS uses the numeric protection levels, referenced in the WQCC adopted narrative ground water standards, to set appropriate permit conditions to protect ground water.

### **Minerals Program**

DRMS analyzes all operations that have the potential to be classified as Designated Mining Operations (DMO) to ensure that their operations are protective of ground waters. Under HB 08-1161, all conventional and in situ uranium mines have DMO status. DRMS also requires non-DMO mining operations, including some aggregate operations, to initiate ground water sampling where there is a potential for impacts to ground water quality.

As of this reporting period, the Minerals Program requires approximately 32 mine sites to conduct some type of ground water quality monitoring. Of these sites, 27 are hard rock mining operations, and 5 are construction material extraction operations.

Please see the attached activity status, summaries and table for specific information about these sites.

### **Coal Program**

The Colorado Coal Program currently regulates a total of thirty-three coal mines, of which nine were actively producing in at least part of FY15-16. The Coal Program also regulates one facility that is a load out only. The producing mines are both surface and underground operations. Twenty-one mines are in various phases of reclamation or temporary cessation. In addition, four mines are reclaimed sites for which the permits were revoked. One new underground mine permit is approved, but a reclamation liability bond has not been posted, so permit issuance has not yet occurred. Approximately 75 percent of Colorado's coal production comes from underground mining operations. The predominant method of underground mining is longwall mining.

During the 2015 - 2016 reporting period, the Coal Program accomplished the following functions:

- The Coal Program effectively implemented various rules pertaining to ground water protection at Colorado coal mines. The Coal Program's current requirements for ongoing monitoring and detailed pre-disturbance permitting will continue to provide proper ground water quality protection.
- The Coal Program conducted reviews of Annual Hydrologic Reports submitted by operators. This allows for timely identification of hydrology sampling anomalies and deficiencies, in addition to water quantity and quality trends.
- The Coal Program continued to focus coal mine permitting activities regarding minimization of impacts to the hydrologic balance and prevention of material damage. These activities included the ongoing review and update of Cumulative Hydrologic Impact Analyses (CHIAs).
- The Coal Program continued to focus regular coal mine field inspections and monitoring activities regarding minimization of impacts to the hydrologic balance and prevention of material damage. During FY 2015-16, the Coal Program conducted 316 inspections.
- The Coal Program and WQCD communicated regularly during the last year to discuss specific issues of mutual concern.

Please see the attached table for specific information about these sites.

## **Abandoned Mine Land Program**

### **Nonpoint Source and Water Quality Improvement Projects**

Since October 2015, final reclamation construction work was completed on 6 legacy mining-related water quality improvement projects, and investigations and design is ongoing at 8 other sites. Mine sites undergoing reclamation construction in 2016 include:

- Venture Mine waste rock project, Lake Co.
- Bullion King Mine waste rock reclamation maintenance, San Juan Co.
- Atlas Mill, Ouray Co.
- Suncup/Centennial mine remediation project, Dolores Co.
- Pennsylvania Mine C-Level Bulkhead, Summit Co.
- Lancaster Mine site, Summit Co.

There are eight mine site projects currently underway to investigate, characterize, and develop final reclamation designs:

- Waldorf Mine on Leavenworth Creek, Clear Creek Co.
- Daisy Mine waste rock reclamation, Gunnison Co.
- Nelson Tunnel Remedial Investigation, Mineral Co.
- Perigo Mine drainage investigation, Gilpin Co.

- Carbonero Mine Bulkhead Investigation, San Miguel Co.
- Gunsight Processing Area, Gunnison Co.
- Puzzle/Willard/Ouray Mines, Summit Co.
- Bonita Peaks Mining District, San Juan Co.

In addition to these on-ground projects, DRMS continues to provide technical assistance to watershed groups and federal agency partners, and provides matching funds for additional projects sponsored by those groups. In 2016, DRMS and CDPHE continued implementing the statewide initiative to develop and bring mining related water quality improvement projects to a “shovel-ready” state on priority watersheds using funding from the State Power Authority. Most of those projects are complete or nearing final construction.

DRMS, in cooperation with CDPHE-WQCD, began a statewide evaluation of approximately 140 draining mine sites deemed potentially influential to water quality. DRMS field personnel collected water samples and made field observations of the various sites, while WQCD provided lab analysis and coordination during the 2016 field season. DRMS and WQCD anticipate data review and organization during the winter with a final report and data summary published in spring 2017.

In State FY 15-16, DRMS expended \$1,192,865 on legacy mining-related water quality improvement projects. This total encompasses funding from all sources, including CDPHE NPS grants, PA funding, grants and agreements from BLM, USFS, EPA, private contributions, as well as state sev-tax matching funds and local watershed grants.

The AML Program table includes details of each of these projects.

## Hard Rock Mining Operations

Company-Mine Name- Permit #	Site Conditions	FY15-16 Activity
<b>AGC RESOURCES LLC CASH AND WHO DO MINES (Permit No. M-1983-141) Boulder County</b>	<p>The Operator began a ground water characterization program in 2007. This included sampling of two surface water stations and the Cash Mine water pool, and installation and sampling of monitoring wells above and below the mine. A comprehensive report of these activities was submitted in March 2009.</p>	<p>No mining has occurred since the end of 2008</p> <p>The Division approved the Operator's request to place the site into Temporary Cessation. The period of Temporary Cessation will last from June 13, 2013 until June 13, 2018, or until the Operator notifies the Division that active mining operations have resumed. Groundwater monitoring will continue on a quarterly basis.</p> <p>In October 2013, DRMS approved Technical Revision No. 7 (TR-7). TR-7 revised the monitoring plan to address the following:</p> <ol style="list-style-type: none"> <li>1) Eliminate the following parameters from the sampling suite: aluminum, chromium, cobalt, copper, fluoride, iron, lead, lithium, mercury, nickel, selenium, and vanadium.</li> </ol> <p>The Cash Well monitoring location was eliminated and replaced with the Cash Mine Pool from the 3rd Level Adit.</p>
<b>AGC RESOURCES LLC GOLD HILL MILL (Permit No. M-1994-117) Boulder County</b>	<p>The mill is inactive. The permit requires monitoring of the four monitoring wells located below the mill tailings impoundment on a quarterly basis for verifying the integrity of the geo-membrane liner. Although not required by the permit, the Operator has previously sampled the pond in the tailings impoundment, the Times/Wynona Mine located above the tailings impoundment, the Hazel A Adit located below the tailings impoundment, and Left Hand Creek.</p>	<p>No milling has occurred since the end of 2008.</p> <p>The Division approved the Operator's request to place the site into Temporary Cessation. The period of Temporary Cessation will last from June 13, 2013 until June 13, 2018, or until the Operator notifies the Division that active milling operations have resumed. Groundwater monitoring will continue on a quarterly basis.</p> <p>In October 2013, DRMS approved Technical Revision No. 9 (TR-9). TR-9 revised the</p>

		<p>monitoring plan to address the following:</p> <ol style="list-style-type: none"> <li>1) Eliminate the following parameters from the sampling suite: aluminum, chromium, cobalt, copper, fluoride, iron, lead, lithium, mercury, nickel, selenium, and vanadium.</li> <li>2) Remove Left Hand Creek water sampling location.</li> <li>3) Remove Hazel A water sampling location.</li> <li>4) Cease collection of samples from Wynona Mine until such time as the mine is used for water storage.</li> </ol> <p>MW1 (mill well) was established as the compliance point for Gold Hill Mill.</p>
<p><b>CLIMAX MOLYBDENUM COMPANY HENDERSON MINE AND MILL (Permit No. M-1977-342) Clear Creek and Grand Counties</b></p>	<p>Permit conditions protective of groundwater at the Henderson Mine and Mill include groundwater interception wells and seepage collection canals located at the toe of the tailings dams to pump potentially contaminated groundwater back into the mill water circuit for reuse. The seepage pipelines are tested for integrity at least once per year and a description of the testing and results are provided in the annual reclamation report.</p> <p>The groundwater monitoring plan includes quarterly monitoring of the one point of compliance well at the mine and four point of compliance wells at the mill.</p>	<p>An Environmental Protection Plan (EPP) and Groundwater Monitoring Plan were approved by the Division in 2012 and implementation of the plans by Climax Molybdenum Company at the Henderson Mine and Mill facilities started in 2012.</p> <p>Monitoring activities at the site have continued in 2013. The Groundwater Monitoring Plan is evaluated for the mill and mine facilities based on the results of the groundwater monitoring results.</p>
<p><b>BATTLE MOUNTAIN RESOURCES INC. SAN LUIS PROJECT (Permit No. M-1988-112) Costilla County</b></p>	<p>The San Luis Project is currently in reclamation mode and cyanide processing has not occurred since 1996. The permit requires ground water monitoring at twenty-one wells, including several water wells located outside the permit area (Shalom Ranch and the San Luis Town Well).</p> <p>Ground water monitoring is conducted at this site to verify containment of cyanide solution at the lined mill tailings facility and to assess the progress of ground water management in the West Pit. West Pit groundwater quality is managed by pumping to prevent contact with</p>	<p>Monitoring activities at the site have continued unchanged during the past year with the exception of replacement of monitoring well M-14, due to erratic TDS values. A new M-14 was installed and the Division is monitoring the new data. At this time, the monitoring data indicate compliance and successful containment of cyanide solutions.</p>

	polluting strata. The pumped water is then treated and discharged as regulated by the WQCD.	
<b>CATALIX INTERNATIONAL, LLC PRECIOUS MINE (Permit No. M-2013-008) Crowley County</b>	This 110d permit was approved in 2013 and includes an Environmental Protection Plan. Shale will be mined in open pits and processed using acids in aqua regia treatments for leaching out gold and platinum. Piezometers will be installed around the pits. Ground water quality will be monitored in a down gradient ground water point of compliance well.	Permit was issued 10/30/2014 after required Financial Warranty was submitted. Mining activities have not yet commenced at this site.
<b>EXXONMOBIL COLONY OIL SHALE PROJECT (Permit No. M-1980-047) Garfield County</b>	In the past, ExxonMobil has conducted ground and surface water monitoring programs of varying scopes with various objectives. However, the only reporting requirements were for surface discharge at Pond 5 as specified by the NPDES program. In June 2007 ExxonMobil implemented a water monitoring program taking monthly water levels and quarterly samples for chemical analysis in three wells (one up-gradient and two down-gradient). In January 2008 a fourth well was installed down-gradient of an electrofrac experiment location to provide rapid detection of any groundwater impact from the experiment. Drilling and fracturing tests were conducted in 2008.	No mining activity is currently being conducted at the site.
<b>OCCIDENTAL OIL SHALE, INC. LOGAN WASH (Permit No. M-1977-424) Garfield County</b>	Final reclamation of the main facilities began during summer 2003 and continued through 2008. Maintenance of reclamation and remaining facilities continues. Discharge of water from within the sealed mine consists of mine water and retort water. Mine water from the lower portal and from the research portal are monitored for flow rate and sampled on a weekly, monthly and quarterly schedule (depending on analyte) when the site is accessible and flow is present at the outfall. NPDES monitoring is reported to the WQCD.	Mine water and retort water are monitored monthly at the portal locations for flow rate. The retort water discharges to an evaporation pond.
<b>LKA INTERNATIONAL, INC. GOLDEN WONDER MINE (Permit No. M-1978-091 UG) Hinsdale County</b>	LKA International, Inc., (LKA) collects water from a shallow off-site sampling well on Deadman Gulch and from the Lake Fork above and below the confluence with Deadman Gulch. During 2006 and 2007 LKA collected surface water from several points along Deadman Gulch and ground water from the underground mine workings. Except during seasonal runoff periods, Deadman Gulch is dry.  Adit discharge has not been observed or reported for several years, since the operator has impounded water in an underground sump in the	Lined diversion structures appear to be functioning effectively, as no seeps were noted at the toe of the waste dump in 2013 or 2015. Diversion structure consists of welded polyethylene pipe and limestone-lined open ditch.



	<p>workings. Operator neutralizes underground impounded water with sodium bicarbonate. Ground water monitoring locations are shallow sumps on and below the waste rock dump, acting as wells.</p> <p>During 2007 through 2009 a series of small seeps were observed issuing from the waste rock dump, and additional sampling ensued to determine sources of the water. The operator installed lined diversion structures to isolate the waste dump from surface run-on, and installed two piezometers to monitor for possible connection of underground mine water and seep flow. Piezometer sampling was approved to be discontinued when the piezometers were found to be dry.</p>																							
<p><b>COTTER CORPORATION SCHWARTZWALDER MINE (Permit No. M-1977-300) Jefferson County</b></p>	<p>This underground uranium mine operated from 1953 to 2000, and is now in reclamation. The mine is a Designated Mining Operation. Mine pool water and ground water in alluvial fill are contaminated with uranium, sulfate, and other constituents.</p> <p>The operator treats mine pool water using an in-situ biological process. The site also has a reverse osmosis system for treating pumped mine pool water and an ion exchange system for treating alluvial ground water that is captured in underground sumps.</p> <p>The operator monitors ground water quality in 11 alluvial wells, 8 bedrock wells, and in the mine pool. Concentrations of selected analytes in mine pool water sampled on August 19, 2016 were: :</p> <table border="0" data-bbox="597 1325 1019 1688"> <thead> <tr> <th colspan="2"><u>Analyte Standard Concentration</u></th> </tr> </thead> <tbody> <tr> <td>Manganese</td> <td>0.96 mg/L</td> </tr> <tr> <td></td> <td>0.05 mg/L</td> </tr> <tr> <td>Molybdenum</td> <td>0.316 mg/L</td> </tr> <tr> <td></td> <td>0.035 mg/L</td> </tr> <tr> <td>Radium 226</td> <td>91.3 pCi/L</td> </tr> <tr> <td></td> <td>5 pCi/L</td> </tr> <tr> <td>Sulfate</td> <td>1300 mg/L</td> </tr> <tr> <td></td> <td>250 mg/L</td> </tr> <tr> <td>Uranium</td> <td>6.1 mg/L</td> </tr> <tr> <td></td> <td>0.03 mg/L</td> </tr> </tbody> </table>	<u>Analyte Standard Concentration</u>		Manganese	0.96 mg/L		0.05 mg/L	Molybdenum	0.316 mg/L		0.035 mg/L	Radium 226	91.3 pCi/L		5 pCi/L	Sulfate	1300 mg/L		250 mg/L	Uranium	6.1 mg/L		0.03 mg/L	<p>The Operator completed repair of the access road in August 2015. The RO system is operational and the mine pool is currently being pumped and treated. The mine pool was at an elevation of 6,561.77 ft. (40.23 ft. below Steve Level) on August 31, 2016. Ion exchange treatment of alluvial water has continued.</p> <p>In October 2016, the Division approved Technical Revision No. 24 to relocated the water treatment facility to a new industrial water treatment plant (IWTP) located adjacent to the Steve Level adit. The Operator is currently constructing the new IWTP and is in the process of commissioning the new treatment trains.</p>
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<p><b>DEADWOOD GULCH MINING CO. INCAS MINE (Permit No. M-1986-076)</b></p>	<p>The facility is permitted for a cyanide vat leach system to leach gold and silver, and previously produced small (~10 tons per year) quantities of tailings. The site is permitted as a DMO, and is</p>	<p>This site is in Temporary Cessation. There was no mining or milling activity during 2015-16, and no water</p>																						

<p><b>La Plata County</b></p>	<p>required to sample surface and groundwater during the seasons that its mill and leaching facility is active. The site is monitored for pH, EC, TDS, sulfate and WAD cyanide. The site has an NPDES permit for historic adit discharge.</p>	<p>quality samples were taken. The operation was put into temporary cessation in June of 2014 after verification that all hazardous materials had been removed from the site.</p>
<p><b>WILDCAT MINING CORPORATION IDAHO MILL (Permit No. M-1981-185) La Plata County</b></p>	<p>The permit was converted to a 112d in 2011 through approval of CN-01, which included the old permit area under M-2006-069 and M-2010-003. The operator has installed groundwater monitoring wells at the site, and surface water sample locations have been established in order to provide baseline conditions for 5 quarters. Mining and milling are not yet approved at this site.</p>	<p>On September 16, 2011, WQCD issued a correspondence, clarifying the historic mine drainage from the Idaho No. 1 Adit must be permitted through the NPDES process.</p>
<p><b>RESURRECTION MINING CO. BLACK CLOUD MINE (Being Reclaimed under a Consent Decree File No. M-2008-083) Lake County</b></p>	<p>The approved ground water monitoring plan specifies quarterly monitoring of six wells and one surface water sampling station cross gradient and down gradient from the tailing impoundment. A point of compliance is established down gradient of the impoundment and numeric protection levels are established. The Black Cloud Mine pool is pumped and piped to the Yak Tunnel Water Treatment Plant.</p>	<p>Site under reclamation.</p>
<p><b>ENERGY FUELS RESOURCES CORPORATION, INC. WHIRLWIND MINE (Permit No. M-2007-044) Mesa County</b></p>	<p>The mine was on standby status as of October 2008. The Division placed the mine into temporary cessation on May 6, 2013. The operator installed a monitor well below proposed mine dump areas in October of 2008 as part of the requirements for a DMO EPP. An existing upgradient well is utilized for sampling to establish baseline data. Sampling was conducted from October 2008 through April 2010 on a bimonthly schedule. Ground water sampling is, as of June 2010, required to be conducted and submitted to DRMS on an annual basis. The mine has a water treatment and discharge permit through WQCD. No treatment or discharge occurred in 2013-14. A mine pool developed in historic workings over several decades. The mine pool water was used for drill water, dust control, and pumped to the surface during recent mine activities. It is anticipated that the pool will reform over an extended period of time. The operator is monitoring pool levels and can turn on pumps if they reach undesirable levels prior to reactivation of the mine.</p>	<p>Annual well sampling and annual reporting continues.</p>
<p><b>RIO GRANDE SILVER, INC. BULLDOG MINE (Permit No. M-1977-215) Mineral County</b></p>	<p>Water monitoring was terminated by the former operator. Rio Grande Silver (RGS) has applied for a permit amendment consisting of an Environmental Protection Plan (EPP) which</p>	<p>The mine is in Temporary Cessation (TC) status, and no construction, mining, or processing is occurring. Water</p>

	includes a water sampling and monitoring program. The EPP amendment must be approved and a WQ baseline established before the mine can be reactivated or possible mill constructed,. There is currently no observed discharge to the surface. RGS has been voluntarily sampling surface water throughout their unpatented claim area.	sampling will occur on an annual basis while permit is in TC.
<b>COTTER CORPORATION JD-7 PIT (Permit No. M-1979-094HR) Montrose County</b>	Due to HB-1161 this mine is a Designated Mining Operation (DMO) and the Division required the operator to submit an Environmental Protection Plan (EPP). The EPP was approved on February 21, 2014. The site is currently in temporary cessation. During mining, water accumulated in the underground mine is treated and discharged in accordance with an NPDES permit.	The site is in temporary cessation. There was no activity during the fiscal year.
<b>COTTER CORPORATION JD-9 MINE (Permit No. M-1977-306) Montrose County</b>	Due to HB-1161 this mine is a Designated Mining Operation (DMO) and the Division required the operator to submit an Environmental Protection Plan (EPP). The EPP was approved on February 11, 2014. The site is currently in temporary cessation. During mining, water accumulated in the underground mine is treated and discharged in accordance with an NPDES permit.	The site is in temporary cessation. There was no activity during the fiscal year.
<b>CAMP BIRD COLORADO, INC. CAMP BIRD MINE (Permit No. M-1982-090) Ouray County</b>	After several years of reclamation activity, the operator began new surface activity in the fall of 2012 including reconstruction of a sedimentation pond and a pipeline conveying portal discharge to the pond. The operator has applied for a new or renewed discharge permit from WQCD. Upstream and downstream surface water sampling has begun on a quarterly basis.	The operators have filed for bankruptcy and future financial status of the operator is unknown.
<b>FORTUNE REVENUE SILVER MINES, INC. REVENUE MINE (Permit No. M-2013-032) Ouray County</b>	Operation was approved as a 112d-1 permit in 2013, and included an EPP. The main portal discharges water that is piped to lined settling pond, to reduce suspended zinc before it is released to Sneffels Creek. Operator is required to monitor surface and groundwater and implement mine water handling plan. Onsite water treatment will be considered if found to be needed. Sampling plan includes five locations for groundwater and four locations for surface water.  A permit transfer from Star Mine Operations to Fortune Revenue Silver Mines was completed in October 2014.	Operator began quarterly surface and groundwater sampling in 2012. The Division approved a mine water handling plan to involve on site treatment. The operator has announced a reduction in work force and a slowdown in activities. Water sampling and monitoring will continue as required.
<b>AMERICAN SODA, LLC YANKEE GULCH PROJECT (Permit No. M-1999-002)</b>	American Soda ceased production in 2004 and started reclamation of the site.	Ground water quality monitoring is continuing at a reduced rate for both the

<p><b>Rio Blanco County</b></p>		<p>interim status period and for the possibility that commercial production may once again resume.</p>
<p><b>NATURAL SODA, INC. NAHCOLITE PROJECT (Permit No. M-1983-194) Rio Blanco County</b></p>	<p>Thirty two active monitoring wells are located at the mine with water quality samples obtained from discrete zones. A total of seventeen wells are equipped with continuous water level measurement transducers and data acquisition and storage systems. Ground water monitoring includes water levels and over 50 water quality parameters. An annual monitoring report is submitted to DRMS, the BLM and the EPA.</p>	<p>Monitoring activities at the site have continued unchanged during the past year.</p>
<p><b>COLORADO GOLDFIELDS, INC. PRIDE OF THE WEST MILL (Permit No. M-1984-049) San Juan County</b></p>	<p>Operations at the Pride of the West Mill (previously named Howardsville Mill) site were both historic and modern. The site is currently under a Cease and Desist Order from the Board. The operator is precluded from importation of ore materials for metallurgical processing or reactivation of the milling circuits until corrective actions are satisfied. The operator must fully demonstrate the proposed mining and milling activities will comply with the requirements of the Act and Rules.</p>	<p>During 2015-16, the Division brought enforcement action against the operator for failure to implement portions of the plans approved through TR-11 and advance final reclamation for the upper tailing pond, the lower tailing pond and the mill drain pond. On June 27, 2011, DRMS approved TR-11, addressing final reclamation of the existing upper tailings pond, lower tailings pond and the mill drain pond. On July 20, 2012 DRMS conditionally approved AM-03, addressing Environmental Protection Plans for 8 of the 10 Environmental Protection Facilities proposed at the site. DRMS did not approve the EPP for the mill tailings repository; therefore, the operation is approved for site maintenance, water monitoring, and commencement of final reclamation. Milling activities are prohibited until a new location for tailings disposal is permitted. On July 23, 2015 the property and all associated assets were sold as result of a litigation decision. No succession of operator has been filed yet, but is anticipated. The permit remains under Cease and Desist order.</p>

<p><b>SUNNYSIDE GOLD CORPORATION</b>  <b>SUNNYSIDE MINE</b>  <b>(Permit No. M-1977-378)</b>  <b>San Juan County</b></p>	<p>Approximately 36 spring and seep locations were monitored semi-annually in accordance with the DRMS/WQCD Consent Decree for drainage associated with the mine pools of the American and Terry Tunnels. The Consent Decree was subsequently terminated by the parties. Terry Tunnel bulkhead final closure occurred on October 5, 2000. American Tunnel Bulkhead No. 1 was closed May 14, 2001; Bulkhead No. 2 was closed August 31, 2001; and Bulkhead No. 3 was closed on December 3, 2002. Sunnyside Gold Corporation also removed the water treatment plant pursuant to a court order. Water monitoring continues twice per year in the Animas River above and below the Mayflower Mill site and in Cement Creek above and below the American Tunnel complex.</p>	<p>Sunnyside Gold Corporation continues towards completion of final reclamation, release of warranties, and termination of its reclamation permit. The Operator is conducting a comprehensive voluntary groundwater study of the mill tailings pond 4 area as well as a geotechnical stability study.</p>
<p><b>PINON RIDGE MINING, LLC</b>  <b>SUNDAY MINE</b>  <b>(Permit No. M-1977-285)</b>  <b>San Miguel County</b></p>	<p>Lower portions of the underground workings accumulate groundwater, which was managed during periods of active mining by using it for drill water, underground dust control and by pumping it elsewhere in the extensive workings. No pumping or other water management is currently occurring. Accumulation of mine pool water has apparently equilibrated, during several years of temporary cessation, and the flooded portion of the workings is not expanding.</p> <p>Due to HB-1161 this mine is now a DMO and the Division required the former operator to submit an EPP.</p> <p>A permit transfer from Energy Fuels Resources to Pinon Ridge Mining was completed in October 2014.</p>	<p>The Environmental Protection Plan (EPP) that was approved in 2012 includes a groundwater monitoring plan. Up-gradient and down-gradient monitoring well locations were determined, as well as compliance well locations farther down-gradient near the permit boundary. The wells will be located on the adjacent permit area for the Topaz Mine (M-1980-055HR).</p> <p>Well installation approved under the EPP was completed in 2013. Five quarters of data were collected. The mine is in temporary cessation and no additional sampling has occurred.</p>
<p><b>PINON RIDGE MINING, LLC</b>  <b>WEST SUNDAY MINE</b>  <b>(Permit No. M-1981-021)</b>  <b>San Miguel County</b></p>	<p>Lower portions of the underground workings accumulate groundwater, which was managed during periods of active mining by using it for drill water, underground dust control and by pumping it elsewhere in the extensive workings. No pumping or other water management is currently occurring. Accumulation of mine pool water has apparently equilibrated during several years of temporary cessation, and the flooded portion of the workings is not expanding.</p>	<p>The Environmental Protection Plan (EPP) that was approved in 2012 includes a groundwater monitoring plan. Up-gradient and down-gradient monitoring well locations were determined, as well as compliance well locations farther down-gradient near the permit boundary. These wells will be located on</p>

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<p><b>PINON RIDGE MINING, LLC TOPAZ MINE (Permit No. M-1980-055 HR) San Miguel County</b></p>	<p>Lower portions of the underground workings accumulated groundwater, which was managed during periods of active mining by using it for drill water, dust control, and by pumping it elsewhere in the extensive workings. No pumping or other water management is currently occurring. Accumulations of mine pool water has apparently equilibrated during several years of temporary cessation, and the flooded portion of the workings is not expanding.</p> <p>Due to HB-1161 this mine is now a DMO and the Division required the former operator to submit an EPP.</p> <p>A permit transfer from Energy Fuels Resources to Pinon Ridge Mining was completed in October 2014.</p>	<p>The operator Environmental Protection Plan (EPP) that was approved in 2012 includes a groundwater monitoring plan. Up-gradient and down-gradient monitoring well locations were determined, as well as compliance well locations farther down-gradient near the permit boundary.</p> <p>Well installation approved under the EPP was completed in 2013. Five quarters of data were collected. The mine is in temporary cessation and no additional sampling has occurred.</p>
<p><b>CLIMAX MOLYBDENUM COMPANY CLIMAX MINE (Permit No. M-1977-493) Summit, Lake, and Eagle Counties</b></p>	<p>Groundwater monitoring has continued as approved in the EPP for the site.</p> <p>All previously existing measures to protect groundwater, including the groundwater cutoff walls and pump-back systems, the 5-Shaft dewatering pumps, and the water treatment plant are still in place and operational.</p> <p>A possible groundwater to surface water seep(s) has been recently identified near the Storke yard collection area and characterization is ongoing by Climax. DRMS directed Climax to contact CDPHE regarding this feature in Oct. 2013. To-date Climax is still monitoring these seeps while awaiting further direction from CDPHE.</p>	<p>Climax will submit additional information to DRMS for review to determine if table value standards are appropriate for analytes of concern (primarily Mn) when establishing site NPLs.</p>
<p><b>CRIPPLE CREEK &amp; VICTOR GOLD MINING COMPANY CRESSON PROJECT (Permit No. M-1980-244) Teller County</b></p>	<p>CC&amp;V continues to monitor ground water at the Cresson Project. The monitoring plan was most recently revised with the approval of permit amendment No. 10 on September 12, 2012. The plan requires quarterly monitoring of nine wells in the permit area, and two additional compliance wells in Grassy Valley.</p>	<p>The mine was in compliance with its monitoring plan during the reporting year, and there were no ground water exceedances. CC&amp;V continues to pump Arequa Gulch groundwater back into the mine water circuit. The</p>

		mine added new compliance wells downgradient in Arequa Gulch in 2013, and new Grassy Valley and Squaw Gulch wells were sampled beginning the 2nd Qtr of 2014.
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### Construction Materials Operations

Company-Mine Name- Permit #	Site Conditions	FY13-14 Activity
<b>CEMEX, INC.</b> <b>LYONS QUARRY</b> <b>(Permit No. M-1977-208)</b> <b>Boulder County</b>	<p>Ground water monitoring is required at the Lyons Quarry to verify that the disposal of cement kiln dust (CKD) into the mined out limestone quarry (C-Pit) does not cause ground water degradation. Ground water protection requirements include: backfilling the pit with overburden and shale from ongoing quarry operations for reducing ponded water in C Pit to less than one-half acre, and lining portions of the Boulder Feeder Canal near C-Pit to reduce seepage into the pit.</p> <p>The monitoring program requires continuous monitoring of water elevation in the C-pit and in an up gradient well, and quarterly monitoring of water elevation in a deep down gradient well. Water quality samples are collected quarterly from the C-Pit and from down gradient alluvial and bedrock wells.</p> <p>DRMS approved Technical Revision No. 12 (TR-12). TR-12 revised the numeric standards for chloride and sulfate. The previous numeric standards for chloride and sulfate were based on drinking water standards. The drinking water standards were not appropriate as the groundwater down-gradient from the operation is not used for drinking. A chemical analysis of chloride and sulfate was performed on the water in C-Pit using a stiff diagram. The average concentrations of chloride and sulfate in C-Pit were used to establish the revised numeric standards.</p>	<p>In March 2014, the Operator requested a revision to the monitoring plan (TR-12), which DRMS approved, which demonstrated the exceedances of chloride and sulfate in CEM-004 could not be attributed to migration of water from C-Pit. The revised numeric standards for chloride and sulfate are:</p> <p style="padding-left: 40px;">1) Chloride (mg/L): 1,053</p> <p style="padding-left: 40px;">Sulfate (mg/L): 2,641</p>
<b>HOLCIM US, INC.</b> <b>PORTLAND LIMESTONE</b> <b>(Permit No. M-1977-344)</b> <b>Fremont County</b>	<p>Holcim monitors ground water to evaluate potential release of contaminants from cement kiln dust (CKD) stored on site. Holcim completed the collection of five quarters of baseline data and submitted their report on June 7, 2004. Three wells are designated as compliance and monitoring wells to be monitored for TDS, sulfate (SO<sub>4</sub>), potassium (K), sodium (Na), iron (Fe) and manganese (Mn). In February 2015 the DRMS approved a technical revision requested by Holcim to replace the Na standard with K: Na ratio using 0.5 as a numeric protection limit.</p>	<p>Data are collected and submitted to DRMS annually. The required parameters and numeric protection levels for MW-7 and MW-13, respectively are:</p> <p style="padding-left: 40px;">1) TDS (mg/L): 3918, 4026</p> <p style="padding-left: 40px;">2) SO<sub>4</sub> (mg/L): 2080, 2200</p> <p style="padding-left: 40px;">3) K (mg/L): 17, 13</p>

		<p>4) Na: K ratio: 0.5  5) Fe (mg/L): 4.5, 0.13  6) Mn (mg/L): 0.88, 0.30</p>
<p><b>HOLCIM, INC.  BOETTCHER QUARRY  (Permit No. M-1977-348)  Larimer County</b></p>	<p>The Boettcher Quarry and cement plant were permanently closed in 2002 and the cement plant was demolished in 2004. The site has been largely reclaimed, and the Cement Kiln Dust (CKD) disposal area has been capped and revegetated. Groundwater monitoring to date indicates a very tight formation with deep groundwater and little groundwater movement. Additional groundwater monitoring is being conducted at this time to determine if the site can be considered for final closure. Three additional monitoring wells were installed in 2013 to help characterize current conditions. Additional monitoring data and site characterization information continue to be collected.</p>	<p>DRMS is evaluating the ongoing monitoring results and will determine if additional enhanced groundwater monitoring will be required, or if the site is eligible for final closure.</p> <p>Barium levels in several monitoring wells continue to exceed the MCL of 2mg/l, however this may be due to naturally elevated background levels of this element.</p>
<p><b>GCC RIO GRANDE, INC.  PUEBLO CEMENT  PLANT AND LIMESTONE  QUARRY (Permit No. M-2001-004)  Pueblo County</b></p>	<p>GCC conducts semi-annual monitoring of an up gradient well.</p>	<p>DRMS approved a permit revision in March 2013 that eliminated monitoring of four alluvial wells, based on a lack of hydrologic connection between them and the facility. DRMS is evaluating a location for a new downgradient monitoring well that would be within the groundwater flow path downgradient from the facility.</p>
<p><b>AGGREGATE  INDUSTRIES – WCR, INC.  PLATTE VALLEY  OPERATION  (PERMIT NO. M-1989-120)  Weld County</b></p>	<p>This sand and gravel mining operation has three open water basins. The Operator allows importation of inert material to backfill into the pit excavations. CDPHE inspected the site and found Broda Inert Fill (Broda) had possibly imported unauthorized waste to the site without obtaining a Certificate of Designation. CDPHE required Broda to install three groundwater monitoring wells at the site to test groundwater quality. These wells and a monitoring plan were incorporated into the DRMS mining and reclamation plan. These wells will be monitored on a quarterly basis and results sent to CDPHE and also reported to DRMS annually</p>	<p>On August 25, 2016, Aggregate Industries submitted the quarterly groundwater measurement data collected by Aggregate Industries as well as groundwater quality monitoring and measurement data collected at the site. This data was also submitted to the Colorado Department of Public Health and Environment as required under the recycling license held by Broda Inert Fill and in accordance with Technical Revision No. 03.</p>
<p><b>VENTURE RESOURCES,  INC.</b></p>	<p>Venture Resources monitors groundwater in upgradient and downgradient monitoring wells to ensure there is no release of process water from the</p>	<p>On January 27, 2016 Venture Resources was issued a violation for the</p>



<b>HUKILL GULCH MILLSITE (PERMIT NO. M-2009-076) Gilpin County</b>	lined tailings impoundment. The wells are monitored and reported on a monthly basis.	unauthorized use of the tailings impoundment. As a result, the certification of the tailings impoundment as an Environmental Protection Facility (EPF) is void. The Operator may not process ore in the mill or place tailings within the tailings impoundment until such time as the Division reviews and accepts certification of the EPF.
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# Colorado Coal Mines – Activity Status

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## **Bowie No. 2 Mine (Non-Producing) – C-1996-083**

**Delta County**

Company Name: Bowie Resources, LLC  
Mine Name: Bowie No. 2 Mine  
Mine Type/Status: Underground/Federal/Temporary Cessation  
FY15-16 Production: 764,622 tons (July 2015-June 2016)  
No. Miners: 7  
Permit Acres: 10,987.40 (5262.90 federal surface and 9,029.40 federal coal)  
Affected Acres: 7051.01  
Disturbed Acres: 405.93  
Bond Amount: Required - \$10,607,060.05; Actual Held - \$12,446,699.61

The Bowie No. 2 Mine is an underground longwall mine located near Paonia, Colorado. The mine went into Temporary Cessation in February 2016. In September 2016, the Division approved a Bond Release Application, reducing the mine's reclamation liability by approximately \$1.5 million dollars. During FY15-16, the Division approved three Technical Revisions that modified the mine's approved water monitoring programs.

## **Colowyo Mine (Producing) – C-1981-019**

**Moffat and Rio Blanco Counties**

Company Name: Colowyo Coal Company L.P.  
Mine Name: Colowyo Coal Mine  
Mine Type/Status: Surface/Federal/Active  
FY15-16 Production: 1,822,563 tons (July 2015-June 2016)  
No. Miners: 172  
Permit Acres: 27,521.24 (3,573.07 federal surface and 22,910.97 federal coal)  
Affected Acres: 6,180.70  
Disturbed Acres: 6,171.20  
Bond Amount: Required - \$188,170,191.31; Actual Held - \$80,517,829.00\*

Mining operations began in 1976 with the East Pit, a multi-seam coal operation with eight coal seams. Extraction of coal from the East Pit was terminated in 2006, and currently the only ongoing operation in the East Pit is reclamation of the final cut, including backfilling and grading of the pit and highwall reduction. Coal extraction from the multi-seam West Pit, including highwall mining, concluded in 2015. In 2006, Colowyo expanded the permit boundary by approximately 6,000 acres to the west and south into the South Taylor/Lower Wilson area. Mining, including highwall mining, in the South Taylor Pit will continue until 2017, with reclamation continuing until 2025. Permit Revision PR-04, which changes the mine plan for the "Collom Area" originally approved with Permit Revision PR-03, was approved in September 2016.

\*The difference between the amount of bond required and the amount of bond held is due the Division's approval of Permit Revision PR-04. Although this Permit Revision changed Colowyo's bond liability, the Office of Surface Mining has not approved the mine plan. Prior to disturbing any surface, Colowyo will be required to submit the appropriate reclamation bond.

## **Deserado Mine (Producing) – C-1981-018**

**Moffat and Rio Blanco Counties**

Company Name: Blue Mountain Energy, Inc.  
 Mine Name: Deserado Mine  
 Mine Type/Status: Underground/Federal/Active  
 FY15-16 Production: 1,647,632 tons (July 2015-June 2016)  
 No. Miners: 150  
 Permit Acres: 13,645.01 (13,325.01 federal surface and 13,645.01 federal coal)  
 Affected Acres: 8,209.79  
 Disturbed Acres: 492.64  
 Bond Amount: Required - \$5,756,339.68; Actual Held - \$5,808,383.08

The Deserado Mine is an underground longwall mine that is currently mining in the B-Seam. All coal mined from Deserado Mine is shipped by train directly to the Bonanza Power Plant located near Bonanza, Utah. The Deserado Mine continually drills into their current longwall workings to allow nitrogen to be pumped into the mine as a fire preventative measure.

### **Foidel Creek Mine (Producing) – C-1982-056**

### **Routt County**

Company Name: Twentymile Coal, LLC  
 Mine Name: Foidel Creek Mine  
 Mine Type/Status: Underground/Federal/Active  
 FY15-16 Production: 3,799,038 tons (July 2015-June 2016)  
 No. Miners: 286  
 Permit Acres: 22,607 (6070 federal surface and 8478 federal coal)  
 Affected Acres: 19,961.33  
 Disturbed Acres: 753.10  
 Bond Amount: Required - \$10,019,162.40; Actual Held - \$10,056,089.00

The Foidel Creek Mine is an underground longwall mine located near Oak Creek, Colorado. Mining at the Foidel Creek Mine has historically occurred in the Wadge seam. In December 2014, the Division approved Technical Revision TR83 to allow for development mining of the deeper Wolf Creek seam. During 2015 and 2016, the company ramped down to, and conducted development mining in, the Wolf Creek seam. Permit Revision PR11, allowing longwall mining of the Wolf Creek seam, received final Approval in March 2016. Longwall mining in the Wadge seam ended in June 2016. Longwall mining in the Wolf Creek seam began in September 2016.

### **King Coal Mine (Producing) – C-1981-035**

### **La Plata County**

Company Name: GCC Energy, LLC  
 Mine Name: King Coal Mine  
 Mine Type/Status: Underground/Federal/Active  
 FY15-16 Production: 717,194 tons (July 2015-June 2016)  
 No. Miners: 108  
 Permit Acres: 2,658.00 (81.30 federal surface and 1,346.20 federal coal)  
 Affected Acres: 1,654.70  
 Disturbed Acres: 49.59  
 Bond Amount: Required - \$ 884,249.71; Actual Held - \$ 884,814.76

The King Coal Mine, permitted by GCC Energy, LLC (GCC), is an underground mine located 13 miles west of Durango in La Plata County. Mining at the original mine (King I) was completed in 2009 and those portals have been sealed. Expansion from the King I Mine to the King II Mine was approved by DRMS in 2006.

Coal extraction began from the King II mine in 2007. The King II mine's surface facilities were constructed in 2008. Coal is mined from the "A" seam of the Menefee Formation using conventional room-and-pillar methods. The coal is hauled from the site by truck to a railhead located in Gallup, NM. Much of the King II coal is federally owned and located beneath surface lands owned by the Ute Mountain Tribe. All of the King II surface facilities fall under the jurisdiction of the Division as they are situated upon State-owned lands, but OSM is the permitting agency for the federal coal beneath the Ute lands.

### **New Elk Mine (Non-Producing) – C-1981-012**

### **Las Animas County**

Company Name: New Elk Coal Company, LLC  
Mine Name: New Elk Mine  
Mine Type/Status: Underground/Private/Active (Idled)  
FY15-16 Production: 107 tons (July 2015-June 2016)  
No. Miners: 3  
Permit Acres: 4,198.90 (0 federal surface and 0 federal coal)  
Affected Acres: 2,899.21  
Disturbed Acres: 222.60  
Bond Amount: Required - \$4,157,143.98; Actual Held - \$4,133,137.02\*

The New Elk Mine is an underground room and pillar mine located approximately 25 miles west of Trinidad, Colorado. The operation has an off-site loadout located on the western edge of Trinidad.

In July of 2012, the mine suspended production and went into Temporary Cessation for an initial period of 60 days. In September 2012, this Temporary Cessation was extended indefinitely "pending improved market conditions". In May 2014, the permit status was returned to Active. During CY14, 14,238 tons of coal were mined and delivered to a prospective customer on a test-burn basis. No coal was mined in FY15-16, however, 107 tons of stockpiled coal were shipped off-site in July 2015.

\*The difference between the bond amount required and the amount held is due to the approval of Technical Revisions 65 and 66 in August 2012, which allow for the construction of a new development waste pile and a haul road. Prior to disturbing any surface, New Elk will be required to submit the appropriate reclamation bond.

### **New Horizon North Mine (Producing) – C-2010-089**

### **Montrose County**

Company Name: Elk Ridge Mining and Reclamation, LLC  
Mine Name: New Horizon North Mine  
Mine Type/Status: Surface/Private/Active  
FY15-16 Production: 219,492 tons (July 2015-June 2016)  
No. Miners: 21  
Permit Acres: 328.70 (0.00 federal surface and 0.00 federal coal)  
Affected Acres: 288.70  
Disturbed Acres: 288.70  
Bond Amount: Required - \$5,304,168.17; Actual Held - \$5,500,000.00

The New Horizon North Mine is a surface mine located west of Nucla, Colorado and ships its coal to the Nucla Generating Station. Overburden removal is accomplished with trucks and excavators

In October 2016, the Division approved a permit transfer that changed the name of the permittee from Western Fuels-Colorado LLC to Elk Ridge Mining and Reclamation, LLC. In October 2016, Tri-State Generation and Transmission, the mine's parent company, informed the Division that the Nucla

Generating Station was going to be retired by December 31, 2022, and that the station had already been shut down on a temporary basis. The Nucla station is being retired as part of an agreement with CDPHE, EPA, WildEarth Guardians and the National Parks Conservation Association to propose revisions to the Colorado Visibility and Regional Haze State Implementation Plan. Coal extraction at the mine will probably cease in April 2017, with final reclamation of the mine beginning soon after.

### **Trapper Mine (Producing) – C-1981-010**

### **Moffat County**

Company Name: Trapper Mining, Inc.  
Mine Name: Trapper Mine  
Mine Type/Status: Surface/Federal/Active  
FY15-16 Production: 1,949,817 tons (July 2015-June 2016)  
No. Miners: 149  
Permit Acres: 11,156.69 (0.00 federal surface and 5,540.43 federal coal)  
Affected Acres: 3,437.20  
Disturbed Acres: 3,437.20  
Bond Amount: Required - \$23,396,030.36; Actual Held - \$23,400,000.00

The Trapper Mine, permitted by Trapper Mining, Inc (TMI), is a surface mine located south of Craig. Draglines, excavators, loaders and trucks are used to mine the coal. The coal is trucked directly to the Craig Power Plant located adjacent to the mine site.

In May 2013, TMI submitted Permit Revision PR-7 to add approximately 774 acres to the mine's permit area and to update their mining plan. Final Approval of PR-7 occurred in October 2015.

In May of 2015, a US District Court determined that the US Department of Interior inappropriately approved a federal mine plan modification in November 2009. TMI, OSM and DRMS worked under a court-approved agreement to re-prepare the mine plan modification, which was approved in April 2016.

Technical Revision 115, submitted in February 2016, requested 49.7 acres of new disturbance. It was approved in August 2016. Bond Release Application SL17, seeking bond release of 450.2 acres, was submitted to DRMS in October 2015. The Division partially approved the bond release application in November 2016.

In October 2016, Tri-State Generation and Transmission, the company that operates the three power generating units at the Craig Power Plant, announced that Unit No.1, the oldest unit, would be retired by December 31, 2025 as part of an agreement with CDPHE, EPA, WildEarth Guardians and the National Parks Conservation Association to propose revisions to the Colorado Visibility and Regional Haze State Implementation Plan.

### **West Elk Mine (Producing) – C-1980-007**

### **Delta and Gunnison Counties**

Company Name: Mountain Coal Company, LLC  
Mine Name: West Elk Mine  
Mine Type/Status: Underground/Federal/Active  
FY15-16 Production: 3,739,365 tons (July 2015-June 2016)  
No. Miners: 350  
Permit Acres: 17,154.90 (11,758.40 federal surface and 13,795.00 federal coal)  
Affected Acres: 14,632.10  
Disturbed Acres: 560.28

Bond Amount: Required - \$14,023,599.02; Actual Held - \$15,000,000.00

The West Elk Mine is an underground longwall mine that is producing coal from the E-Seam. The operator is currently mining in the sixth longwall panel in the southern mining area. Complications with obtaining a lease to the south has led the operator to pursue new workings in the B-Seam. A project to establish access to the B-Seam from the existing workings is ongoing. The existing coal wash plant and refuse pile are expected to provide sufficient capacity for the remaining life of mine. The operator continues to construct and reclaim mine ventilation boreholes, and their associated drill pads and light-use roads.

Colorado Coal Mines			
(November 21, 2016)			
Permit #	Mine	Total Permitted Acreage	Inspections Required
	Active		
C-1980-007	West Elk Mine*	17,154.90	12
C-1981-010	Trapper Mine*	11,156.69	12
C-1981-012	New Elk Mine	4,198.90	12
C-1981-018	Deserado Mine*	13,645.01	12
C-1981-019	Colowyo Mine*	27,521.24	12
C-1981-022	Elk Creek Mine	15,676.51	12
C-1981-035	King Coal Mine*	2,658.00	12
C-1982-056	Foidel Creek*	22,607.00	12
C-1983-059	Terror Creek Load Out	20.00	12
C-2010-089	New Horizon North Mine*	328.70	12
	TOTAL ACTIVE	114,966.95	120
	Reclamation and Cessation		
C-1980-004	McClane Canyon Mine (Temporary Cessation)	2,560.50	4
C-1981-008	New Horizon Mine	913.92	12
C-1981-013	Golden Eagle Mine	1.20	12
C-1981-014	Southfield Mine	2,735.20	12
C-1981-020	Munger Canyon Mine	1,028.00	12
C-1981-025	North Thompson Mine (Phase II released)	411.80	4
C-1981-028	Keenesburg Mine	555.40	12
C-1981-038	Bowie No. 1	5,035.20	12
C-1981-041	Roadside Portals	732.50	12
C-1981-044	Williams Fork Mines (Temporary Cessation)	6,363.00	4
C-1982-057	Seneca IIW Mine	3,878.50	12
C-1984-065	Coal Ridge No. 1 Mine (Phase II released)	2,484.30	4
C-1992-080	Carbon Junction (Phase II released)	164.34	4
C-1992-081	H-G Loadout	391.20	12
C-1994-082	Yoast Mine	2,318.30	12
C-1996-083	Bowie No. 2 (Temporary Cessation)	10,987.40	4
C-1996-084	Lorencito Canyon Mine	384.00	12
C-2009-087	Peabody Sage Creek Mine	10,164.00	12
C-2010-088	Fruita Loadout (Temporary Cessation)	208.60	4
	TOTAL RECLAMATION AND CESSATION	51,317.36	172
	Revoked		
C-1980-002	O.C. Mine No. 2	88.50	2
C-1981-015	Fruita No. 1 & 2	16.00	4
C-1981-033	Bear Mine	1,108.40	12
C-1981-037	GEC Strip Mine	890.00	2
	TOTAL REVOKED	2,102.90	20
	New		
C-2006-085	Northfield Mine (pending bond)	1,157.00	0
	TOTAL NEW	1,157.00	0
	<b>Total</b>	<b>169,544.21</b>	<b>312</b>
	* Actively Producing Mines		

**COLORADO ABANDONED MINE LAND PROGRAM  
NONPOINT SOURCE AND WATER QUALITY IMPROVEMENT PROJECTS  
November 2016**

**SAN JUAN RIVER WATERSHED**

Project	Status	Partners
<p><b><u>Red and Bonita Mine Investigation-Cement Creek-San Juan County</u></b></p> <p>The Red and Bonita Mine site is located in upper Cement Creek, approximately 10 miles north of the town of Silverton, Colorado. EPA contractors de-watered and ventilated the mine workings in summer 2013. In 2014 At EPA’s request, DRMS provided technical assistance in conducting an underground assessment of the condition of the workings and the geology and structural attributes of the mine workings for potential bulkhead feasibility. Underground mapping and inspection of approximately 2,500 of mine workings last entered in 1905 was performed in August 2014. Based on the mine mapping, locations of groundwater inflows, and preliminary geologic evaluations, DRMS completed recommendations and specifications for a pressure bulkhead, which was successfully installed in August, 2015. DRMS provided underground inspection of the bulkhead construction during 2015 work. The bulkhead project is now complete and ready for implementation. A plan is under development for staged pressurization of the mine pool behind the Red and Bonita bulkhead with concurrent monitoring of nearby mines, streams, and piezometers. Until that plan is completed and approved by EPA, the valve on the bulkhead will remain open.</p>	<p>COMPLETED in 2015</p>	<p>DRMS, EPA</p>
<p><b><u>Bonita Peaks Mining District</u></b></p> <p>The Bonita Peaks Mining District (BPMD) was designated as a Superfund site by EPA following the 2015 Gold King event and renewed focus on impacts by “legacy” mines to the Animas River. DRMS is currently providing technical assistance to BLM, USFS, EPA, CDPHE and other partners within the BPMD. DRMS has been given funding by</p>	<p>Ongoing</p>	<p>DRMS, BLM, USFS, EPA, CDPHE, ARSG</p>



Project	Status	Partners
<p>BLM to provide technical assistance, reclamation project design, and potential implementation of reclamation projects on BLM managed mine sites. DRMS anticipates being funded by both USFS and CDPHE to also provide technical assistance, design and implementation of additional mine reclamation projects within the BPMD.</p>		
<p><b><u>Bullion King Mine Waste Reclamation</u></b></p> <p>The Bullion King Mine site is located at the headwaters of Porphyry Gulch, a tributary to Mineral Creek. This mine-waste consolidation and capping project was bid out and reclamation construction completed in summer 2015, but subsequent instability in the waste repository resulted in the need for maintenance during the summer of 2016. DRMS managed contractor procurement and construction oversight for the ARSG for both the initial reclamation and maintenance work.</p> <p>The Bullion King mine waste is the last mine waste site in Mineral Creek which was identified by the Animas River Stakeholders Group (ARSG) for remediation that was not remediated. The site contains a large waste rock pile that continually leaches heavy metals into the gulch during spring runoff. The Bullion King Mine project is designed to reduce erosion and leaching of metals from the mine site into Porphyry Gulch by consolidating, capping and revegetating the waste rock pile and installing run on and run off controls. The waste repository is approximately one acre in area. The entire area reclaimed, including the repository, water diversion channels, and removal areas is approximately 2 acre.</p>	<p>COMPLETED 2016</p>	<p>DRMS, ARSG, CDPHE</p>

**LOWER COLORADO RIVER WATERSHED**

Project	Status	Partners
<p><b><u>Uncompahgre Watershed Partnership NPS 319 grant</u></b></p> <p>The Uncompahgre Watershed Partnership (UWP) is a 501 c(3) organization located in Ridgway, Colorado whose mission is to focus on the Upper Uncompahgre watershed. The UWP has been in existence since 2007 and is headed by a Board of Directors with consultation from the previous watershed coordinator. The UWP was awarded a NPS 319 grant in 2014 for 3 projects located on 3 separate 303(d) listed waters. The WQCD has assisted in water quality sampling to characterize water quality.</p> <p><u>The Atlas Mill</u> site is located on Sneffels Creek 8 miles from Ouray on Camp Bird Road and consists of legacy tailings located in the floodplain and on the banks of Sneffels Creek. The project was completed in July 2016 and involved re-channeling a stream braid that was eroding the tailings and flowing through the tailings and back in to Sneffels Creek. The landowner, Ouray Silver Mines who are the operators of the Revenue Mine donated boulders for vane arms and Western Stream Works provided design and construction. Additional willow planting and revegetation will be ongoing.</p> <p><u>The Michael Breen Mine</u> site is located on the Uncompahgre River on Engineer Pass Rd approximately two miles above the confluence with Red Mountain Creek. A draining adit seeps through the existing waste rock and small tailings area and discharges into the Uncompahgre River. The Michael Breen project was completed mainly in October 2014 to divert the draining adit away from the waste rock pile and loadout structure. Some additional revegetation of the waste rock pile was completed in July 2015. Stabilization work of the loadout structure was achieved by diverting the draining adit and adding structural support funded by DRMS.</p> <p><u>The Vernon Mine</u> is located near the headwaters of Gray Copper Gulch, tributary to Red Mountain Creek. The Vernon Mine</p>	<p>Underway</p> <p>Completed 2016</p> <p>Completed 2014</p> <p>Completed 2015</p>	<p>DRMS, UWP, CDPHE</p> <p>USFS, Ouray Silver Mines, Western Stream Works</p> <p>USFS</p> <p>Private Landowner</p>

Project	Status	Partners
<p>Project was completed in September 2015 and included removing waste rock and diverting a draining adit. Approximately 1500 cubic yards of waste rock was removed from the banks of Gray Copper Gulch and placed in an upland repository. The disturbed areas were revegetated with native seed, woody compost and excelsior mulch. DRMS conducted a mine safety closure project simultaneously on the private mining claim.</p>		
<p><b><u>Carbonero Mine, Howard Fork/ San Miguel River Watershed-</u></b></p> <p>DRMS staff is assisting the local watershed group, USFS, CDHPE and EPA with investigating metals loading to the Howard Fork of the San Miguel River in SW Colorado. Work in this watershed has been ongoing over the past 11 years by the CDPHE, CDRMS, the USEPA and the USFS. Results indicate that one of the most significant sources of metals is the Carbonero mine drainage. Successful remediation of the metals load from the Carbonero adit drainage is complicated by: (a) the complex hydrogeologic setting that controls the rates and a long term sustainability of the inflow of ground water into the mine, (b) the high rate of discharge from the mine adit, in excess of 5 cubic feet per second in 2015, (c) the steep, deeply eroded and undercut setting of the portal of the draining adit.</p> <p>In summer 2011 DRMS's drilling contractor completed installation of the second test well in close proximity to the flooded mine workings. The USGS conducted geophysical and hydraulic logging in one of these holes in 2012, and a bore-hole camera survey of the boring closest to the crosscut was performed. Based on the results of drilling, the crosscut appears free-flowing and is not impounding water above the crown, however the structural-quality of rock in the vicinity of the test borings is less than optimal.</p> <p><u>Bulkhead Feasibility Investigation/Implementation</u></p>	<p>Investigation Completed</p> <p>Project Postponed</p>	<p>DRMS, EPA, CDPHE, USFS</p>

Project	Status	Partners
<p>The primary objective of the next project phase is to rehabilitate the Carbonero Mine portal to allow an underground assessment of the crosscut section of the mine workings in order to determine the feasibility of installing a structural bulkhead to reduce mine discharge. The bulkhead would serve to prevent blow-out events which have reportedly occurred in the past, and could provide a sound structure for penstock water intake to any future micro-hydropower installation. If the micro-hydropower option is not pursued, the bulkhead could be permanently sealed, eliminating an estimated 75 to 80% of the metals load currently discharging from the Carbonero portal.</p> <p><u>Current Work</u> The portal re-habilitation work was scheduled for late summer/fall 2015, but temporarily postponed until results of the Gold King investigations were released. The work was indefinitely postponed in 2016 due to lack of funding. DRMS is investigating potential funding sources and awaiting any additional technical guidance and recommendations for portal rehabilitation work before proceeding.</p> <p><u>Cost Estimate/Funding</u> The Carbonero Mine was reportedly last entered in the 1980s; the crosscut section was in good condition at that time. The primary variable relative to the cost of this project is the type and extent of ground control measures needed to safely conduct the investigation. DRMS estimates that the work will cost approximately \$500,000 depending on the conditions encountered underground.</p>		
<p><b><u>Redwell Basin/ Daisy Mine, Slate River/ Gunnison River watershed</u></b></p> <p>High and low flow sampling were completed in July and September of 2015. Results from the water sampling efforts between 2011 and 2015 indicate a significant drop in acidity, Cd and Zn in the receiving stream, specifically Oh Be Joyful below the confluence with Redwell Creek. These data suggest the borehole closure project,</p>	Underway	DRMS, CDPHE, BLM, CCWC

Project	Status	Partners
<p>completed in 2013 was successful at mitigating the effects of the acidic, metals laden water into Redwell Creek and Oh Be Joyful Stream.</p> <p><u>Gunsight Processing Area</u>  The Gunsight Processing Area is located outside of the Town of Crested Butte on lands managed by the Bureau of Land Management. The site comprises approximately 3 acres of disturbed lands, with approximately 3,000 cubic yards of ore and waste rock, presumably transported to the site in the mid-1950's from Redwell Basin likely the Daisy Mine. This site has significant run-off and seeps and springs associated with the waste rock/ore dump. Surface waters potentially impacted are Oh Be Joyful Creek, the Slate River, and associated wetland areas. The site has been funded by the BLM and the 319 Non-point source program for reclamation in summer/fall 2017. Project partners include the Coal Creek Watershed Coalition and the Gunnison Field Office of the BLM. 2016 sitework included drilling groundwater monitoring wells, furnishing those wells with pressure transducers, and excavating soil pits to determine the depth of waste and potential locations for "borrow" soil. Project design will be completed in the winter of 2016/2017, and project bidding will occur in June 2016.</p> <p><u>Daisy Mine</u>  The Daisy mine is the largest anthropogenic source of metals loading into Redwell Creek, Oh Be Joyful Creek, and the Slate River. High levels of Pb, Zn, As, Cu, and Cd run-off the waste rock area and contaminate the receiving streams. Low pH conditions within the waste rock dumps and draining adit facilitate the transport of metals from the site. 2016 site work included mapping of the site, water sampling of the draining adit, and soil sampling. Pending landowner approval and securing of funds, the site reclamation plan will be designed in the winter of 2016/2017, and reclamation will occur in summer/fall 2017 or 2018.</p>		

Project	Status	Partners
<p><b><u>Yellowstone Mill Tailings, Henson Creek/Gunnison River watershed</u></b></p> <p>The Yellowstone mill tailings contributed acidic stormwater runoff with high levels of arsenic and soluble lead and zinc to the north fork of Henson creek, a tributary to Henson Creek and the Lake Fork of the Gunnison River. The Yellowstone Mill tailings were identified as a significant As, Pb and Zn loading source during watershed characterization work in 2006.</p> <p>With BLM funding, DRMS contractors completed an in-situ reclamation of the mill tailings and contaminated soils on steep slopes by adding lime and compost to the soils, thoroughly mixing amendments using a mixing bucket, and then revegetating the entire site. Vegetation establishment has been successful. Site will be monitored for 5 years to ensure reclamation effectiveness.</p>	Completed	DRMS, BLM, FMI
<p><b><u>Suncup/Centennial Mine Remediation Project, Dolores River Watershed</u></b> <u>Project Site Description</u></p> <p>The inactive Centennial and Sun Cup Uranium Mines are located on U. S. Bureau of Land Management (BLM) managed lands in Disappointment Valley, seven miles east of the town of Slick Rock in western San Miguel County. The waste rock piles are located in or adjacent to drainages. Erosion of the waste rock is transporting selenium bearing and radioactive materials downstream. The BLM has identified these sites as high priority for remediation.</p> <p>The Centennial and Sun Cup mines drain into Disappointment Creek, a tributary to the Dolores River. Disappointment Creek below the confluence with Morrison Creek is identified as segment 3a. of the Lower Dolores River. Segment 3a. is on the Colorado Department of Public Health and Environment, Water Quality Control Division's (CDPHE-WQCD) Evaluation and Monitoring List for selenium and <i>E. coli</i>.</p>	Nearly Complete	DRMS, BLM, FMI, CWCB, CDPHE

Project	Status	Partners
<p>Proposed remediation at the Centennial and Sun Cup Mines intends to stabilize the severely eroding waste rock with earthwork to reduce steep slopes, reconstruction of drainage channels impacted by mine waste and revegetation of the waste rock piles. Reducing erosion of mine waste rock piles and subsequent transport of fine grained mine waste will control a source of materials contributing selenium (and uranium) into Disappointment Creek.</p> <p>Site assessment was conducted during the Fall of 2015. Test pit excavation was conducted, as well as pre-construction Aerial Imaging, and elevation and mapping. Stream Restoration Design Plans drawings and narrative were prepared over the winter, and a site showing to potential contractors occurred during the spring of 2016. Construction occurred from September through the November, 2016.</p>		
<p><b><u>Rico Argentine Mine Complex, St. Louis, Blaine, and Argentine Tunnels, Dolores River Watershed</u></b></p> <p>In April 2016, EPA, ARCO, and DRMS gave a presentation to Town and County officials with jurisdictions along the Dolores River about the investigations and reclamation work that have been completed and future reclamation plans. During 2016, ARCO and EPA installed horizontal drains in the St. Louis Tunnel to facilitate continued drainage of the mine workings.</p>	<p>Ongoing, EPA and ARCO testing of semi-passive treatment at St. Louis Tunnel.</p>	<p>DRMS, EPA, ARCO</p>

**UPPER COLORADO RIVER**

Project	Status	Partners
<p><b><u>Pennsylvania Mine Project- Summit County-Blue River Watershed Restoration Group, Trout Unlimited, Summit County Open Space, USEPA, USFS, USGS, DRMS technical assistance:</u></b></p> <p>DRMS continues to provide in-kind technical assistance to the various agencies and groups investigating ways to develop a treatment alternative for the Pennsylvania (Penn) Mine</p>	<p>Investigation &amp; Three Bulkheads Completed</p>	<p>DRMS, EPA, CDPHE, USFS, Summit County Open Space</p>



Project	Status	Partners
<p>on Peru Creek, in addition to improving overall water quality along Peru Creek. Because of the perpetual cost concerns related to active water treatment alternatives, DRMS, state and county efforts have been focused on developing other alternative approaches to addressing the mine discharge. To that end, DRMS in cooperation with EPA, CDPHE, USFS, and Summit County Open Space began both Penn Mine portal rehab and underground rehab in 2012 and 2013. Following completion of that work, an initial concrete bulkhead seal was placed along the cross-cut in Level F in 2014. Plans for an additional bulkhead along Level F were developed during the winter of 2014, and resulted in installation of a second bulkhead along the Level F crosscut in 2015.</p> <p>The valve on the first bulkhead was closed in 2014 and resulted in an overall flow reduction at the Level F portal of approximately 65%. Following completion of the second bulkhead and valve closure in 2015, flow at the Level F portal was reduced an additional 20%, resulting in an overall reduction in flow of approximately 85% at the portal. Head pressure on the inner bulkhead reached a maximum of 188-ft during the summer of 2015, and began declining along with the local hydrograph. Pressure transducers installed behind both the inner and outer bulkheads record pressure on 6-hour intervals throughout the year and are periodically downloaded. The mountainside and hydrologic system are being closely watched to see how well the mine pool is contained. At present there is no surface discharge entering the creek from this mine. If any significant seepage develops, a follow-up program to seal joints and fractures in the enclosing rock mass with various types of pressure-grouting will be evaluated.</p> <p>During 2016, it was determined that an additional bulkhead seal installed on the Level C crosscut would provide a failsafe in the event that the mine pool impounded by bulkheads on Level F reached the elevation</p>		



Project	Status	Partners
<p>of Level C and began discharging from the portal. The bulkhead was constructed during the late summer of 2016, and the valve will be closed following pressure grouting in early summer 2017. Future potential for In-situ treatment of the mine pool with specific metals-fixing bacteria injected through drill holes may also be evaluated.</p>		
<p><b><u>Puzzle/Ouray Mine Site, Willard Tunnel, Blue River Watershed</u></b></p> <p>The CDPHE, EPA, USFS, USGS, USFWS, DRMS and Trout Unlimited (TU) have been investigating abandoned mine impacts to water quality in Illinois Gulch, a tributary to the Blue River, since 2012. These investigations have proceeded in consultation with local landowners, Summit County, and the Town of Breckenridge. In 2015, DRMS led a tour for the stakeholders of the surface expression of the Puzzle/Ouray vein and associated mine workings and DRMS used a borehole camera to investigate an open shaft on the vein. Also in 2015, EPA and DRMS installed three flumes with data logging transducers into mine discharges into Illinois Gulch, and conducted rigorous flow measurements in the gulch near the Puzzle Extension Shaft, which is a potential conduit for water that drains from the Willard Tunnel. These investigations led the project partners to conclude that additional investigations of the potential hydrologic connections between Illinois Creek and the Puzzle Mine underground workings were warranted.</p> <p>In May of 2015 the project partners held a public information session in Breckenridge to provide local government and the interested public with information about the investigations and plans for dye tracer and tracer dilution studies to be conducted in 2016. In June 2016 DRMS led a dye tracer study with the support of the project partners to evaluate the potential flow pathways from the Puzzle Extension shaft to downgradient draining mine adits that are the primary source of contamination to</p>	<p>Dye tracer and tracer dilution studies conducted in 2016. Evaluation of the results and planning for 2017 ongoing</p>	<p>DRMS, CDPHE, EPA, USGS, USFS, USFWS, TU</p>

Project	Status	Partners
<p>Illinois Creek. In August 2016, using the results of the dye tracer study and with the support of the project partners, USGS led a tracer dilution study to quantify the share of creek water contribution to the drainage from the mine adits.</p>		
<p><b><u>Lancaster Mine Site, Snake River Watershed</u></b></p> <p>The upper, middle and lower Lancaster mine sites are located in North Morgan Gulch just north of the Town of Montezuma in Summit County. In 2011, the U.S. Forest Service and Colorado Mountain College Leadville campus sampled and characterized the drainage from these mines and the mine waste rock dumps and determined that the mines were impacting surface and ground water quality and the metals concentrations in the mine dumps posed a risk to human health and the environment. In 2014, USFS contractors produced an Engineering Evaluation and Cost Assessment that included recommendations for reclamation of the mine waste dumps.</p> <p>In the autumn of 2016, DRMS contracted and managed a project at the lower Lancaster site to remove mine waste from North Morgan Gulch during the low flow period for the perennial stream. The mine waste was placed in a constructed onsite disposal cell and amended with pulverized limestone and compost to establish vegetation. The stream channel was reconstructed and North Morgan Creek was returned to its natural flow path for the first time in more than 100-years. In 2017, the DRMS contractor will re-mobilize to reclaim mine waste at the middle Lancaster site and install run-on and runoff controls at upper Lancaster. The project is jointly funded by USFS and State of Colorado Severance Tax designated for water quality improvement projects.</p>	<p>Lower Lancaster reclamation completed in 2016. Reclamation at middle and upper Lancaster to be conducted in 2017</p>	<p>DRMS, USFS, Colorado Mountain College, Summit County</p>

**SOUTH PLATTE RIVER WATERSHED**

Project	Status	Partners
<p><b><u>Waldorf Mine Site, Wilcox Tunnel and Santiago Mine, Clear Creek Watershed</u></b></p> <p>The USFS, CDPHE, EPA, USGS, DRMS and Trout Unlimited (TU) have been investigating abandoned mine impacts to water quality in Leavenworth Creek, a tributary to South Clear Creek, since 2011. These investigations have led to the completion of three remediation projects. The Wilcox Tunnel drainage was diverted around the mine waste dump in a project funded by the USFS and implemented by DRMS in 2012. The Waldorf Mill dispersed tailings were reclaimed in a joint USFS/TU project in 2015. Santiago Mine and mill waste rock and tailings were reclaimed and the Santiago Mill was decontaminated in a joint USFS/TU project in 2016.</p> <p>The USFS and TU have issued a Request for proposals to conduct an Engineering Evaluation and Cost Assessment for potential reclamation and source control projects at the Wilcox Tunnel and mine waste dump.</p>	<p>Ongoing, reclamation and source control design in 2017.</p>	<p>DRMS, USFS, CDPHE, EPA, USGS, TU</p>
<p><b><u>London Butte Tailings</u></b></p> <p>The London Butte mine is located directly adjacent to South Mosquito Creek in Park County, Colorado. The 2014 project work at the London Butte involved demolition and removal of structures and debris, removing tailings material adjacent to South Mosquito Creek and placement of the tailings into a consolidation area. The tailings were capped with dolomite material excavated from historic dump piles placed along the creek. Clean cover soil was excavated from designated borrow locations and used to cover the dolomite and tailings consolidation areas. Donated compost was transported from the Climax Mine and spread over the reclaimed area. The 5-acre area was seeded, fertilized, and mulched, and tree planting and wetlands restoration planting was completed in 2015.</p>	<p>Completed</p>	<p>DRMS, CDPHE, FMI</p>

Project	Status	Partners
<p><b><u>Gamble Gulch- Perigo/ Mine Drainage Investigation</u></b>  The Perigo/Tip Top Mine is located in Gamble Gulch, in Gilpin County. Gamble Gulch is a tributary to Boulder Creek. Boulder Creek (Segment COSPBO04a Gamble Gulch) has been on the State’s 303(d) list of water quality impaired waterbodies for non-attainment of water quality standards for pH, dissolved copper and dissolved zinc since 2006.</p> <p>Sampling activities conducted for the TMDL indicated that the background copper concentration was twelve percent (12%) of the observed concentration. The remaining eighty-eight percent is attributed to mining influence. The background zinc concentration was one percent (1%) of the observed concentration. The remaining ninety-nine percent is attributed to mining influence. Again, the major source contributing to the elevated level of metals in Gamble Gulch is the Perigo/ Tip Top Mine and non-permitted discharge from the mine property. Additional water sampling of Gamble Gulch was conducted in the fall of 2011 and 2013 and the spring of 2012 and 2014. These data confirm that the major source of heavy metals in Gamble Gulch is the Perigo/Tip Top Mine and non-permitted discharge from the mine property.</p> <p><b><u>Bulkhead Feasibility Investigation</u></b>  An initial investigation of the Perigo Mine in Gamble Gulch was completed in 2014 and a report detailing the findings of the investigation was finalized in Spring 2015. The investigation included surficial survey of associated mine workings and discharges, local groundwater wells, local geology, and a subsurface (drilling) survey of the Lower Perigo Crosscut. Initial investigations of the mine indicate that it may be possible to control the release of contaminated water from the adit by installing a bulkhead seal. However, the adit is presently inaccessible, and is impounding significant contaminated mine water.</p>	<p>Initial Investigation Completed</p> <p>Postponed</p>	<p>DRMS, USFS, EPA, CDPHE</p>

Project	Status	Partners
<p><u>Additional Investigation, Portal Rehab and Bulkhead Implementation</u></p> <p>Additional work to open and investigate the upper Perigo Portal to determine additional water inflows and determine potential conditions that would be encountered when excavating the lower Perigo Portal is planned. This funding will also be used to develop and implement a lower Perigo Portal rehab project. If sufficient funding remains, implementation of a bulkhead seal remedy will be pursued. DRMS is awaiting any additional technical guidance and recommendations for the upper portal rehabilitation work before proceeding.</p>		

### ARKANSAS RIVER WATERSHED

Project	Status	Partners
<p><b><u>Venture Mine Complex, (Sugarloaf Mountain Mine Waste Erosion Mitigation) Lake Fork, Lake County Colorado</u></b></p> <p>The Gertrude-Venture Mine Complex, located on Sugarloaf Mountain five miles west of Leadville, approximately ¼-mile southwest of the Tiger Tunnel, is another significant source of metals and sediment loading in the Lake Fork of the Arkansas Watershed. Colorado Mountain College completed the initial characterization of the site and identified eight additional waste rock piles requiring removal within Little Frying Pan Gulch. This material will be consolidated with the Venture waste in a single containment cell.</p> <p>Construction was completed in 2016. 14,100 cubic yards of acidic mine waste material was removed from the Little Frying Pan Drainage and compacted in a one-acre containment cell located on BLM managed land. The containment cell was capped with three feet of native soil, amended, seeded and mulched. In the footprint of the waste piles, the stream channel was reconstructed and armored with onsite rock and banks were stabilized with erosion control netting. Colorado Mountain College will conduct</p>	Completed	DRMS, BLM, CDPHE, CMC, FMI

Project	Status	Partners
three years of post-construction WQ monitoring.		
<p><b><u>Chalk Creek / Mary Murphy Mine, Golf Tunnel Hydrologic-Bulkhead, Chaffee County-CDPHE, EPA, USFS, DRMS:</u></b></p> <p>DRMS continues to coordinate with the USFS and EPA in addition to other stakeholders regarding ongoing monitoring and long term data collection within Chalk Creek. DRMS is also assisting in the development of a site wide O&amp;M plan to not only help establish success of the reclamation work within the watershed, but to provide a mechanism for addressing any maintenance needs that may arise. Future work within Chalk Creek may entail construction of a hydrologic bulkhead seal on the 1400 Level of the Mary Murphy to address discharge associated with the Golf Tunnel mine pool.</p>	Reclamation Complete/Ongoing Monitoring	DRMS, EPA, CDPHE, USFS

#### **RIO GRANDE RIVER WATERSHED**

Project	Status	Partners
<p><b><u>Nelson Tunnel Source Controls Remedial Investigation and Feasibility Study (RIFS), West Willow Creek- CDPHE, EPA, DRMS:</u></b></p> <p>The EPA, CDPHE and DRMS continue to investigate the feasibility of implementing source control measures at the Nelson Tunnel, Creede, Colorado. During this process, DRMS continues to provide technical assistance pertaining to RIFS documents and underground related information.</p> <p>Future tasks for DRMS may involve facilitation of additional underground investigations, review and analysis of existing data, development of additional cost analysis for installation of multiple bulkheads, facilitation and cooperation with potential sampling well installations, and development of potential source control remedies.</p>	Ongoing	DRMS, EPA, CDPHE

#### **STATEWIDE MINING NPS INITIATIVES**

Project	Status	Partners
<p><b><u>Reclamation of Water Quality Impairments at High Priority Abandoned Hardrock Mine Sites in Colorado</u></b></p> <p>In 2013 DRMS received a grant from CDPHE to improve water quality in Colorado through the implementation of structural best management practices addressing legacy mining impacts due to nonpoint sources of pollution.</p> <p>The project includes development and implementation of reclamation projects at a number of high priority “legacy” hardrock sites that are currently impairing water quality. The best management practices employed at the various project sites includes, mine waste and tailings consolidation and capping, storm water flow diversions, hydraulic seal bulkheads, and other appropriate BMPs.</p> <p>Specifically, the grant provides funding for DRMS personnel to six main activities:</p> <p><u>Activity #1:</u> Conduct site and stream segment characterization at the Perigo/Tip Top Mine.</p> <p><u>Activity #2:</u> Conduct site engineering and design at the Carbonero Mine.</p> <p><u>Activity #3:</u> Implement the London Mine, the Rattler Tunnel and the Pennsylvania Mine reclamation Projects.</p> <p><u>Activity #4:</u> Implement the Daisy Mine reclamation project.</p> <p><u>Activity #5:</u> Implement Phase I in the reclamation of the Perigo/Tip Top Mine project.</p> <p><u>Activity #6:</u> Conduct Statewide Mine Adit Characterization.</p>	<p></p> <p>Completed</p> <p>Deleted</p> <p>Completed</p> <p>Defunded</p> <p>Postponed</p> <p>Ongoing</p>	<p>CDPHE, USFS, USGS, EPA</p>
<p><b><u>2013 Mine-Related Total Maximum Daily Load (TMDL) Implementation - UPDATES</u></b></p>	<p></p>	<p></p>

<p>In 2013 DRMS received a grant from CDPHE to improve water quality in Colorado by providing technical assistance in the characterization and assessment of watershed planning processes as they relate to "legacy" mine in the state, by the development of local partnerships to ensure that projects are implemented technically correctly and by the implementation of mine reclamation projects.</p> <p>The DRMS provides assistance in all aspects of watershed restoration including watershed planning, site characterization, project planning, project implementation, 319 proposal review, and financial assistance. Division personnel have attended watershed meetings, participated in sampling events, conducted reconnaissance activities, and provided project management and technical assistance to numerous watershed groups, and various government agencies. The grant also has provided funding for DRMS to work with the CDPHE and other government entities to outline a list of mining impaired "priority watersheds" in the State and assist with the updating of the management plan.</p> <p>Specifically, the grant provides funding for DRMS personnel to implement two main activities:</p> <p><u>Activity 1:</u> Provide technical assistance to watershed groups, government agencies and private individuals in developing and implementing TMDLs and/or watershed plans using best management practices.</p> <p><u>Activity 2:</u> Implement Bullion King Mine Reclamation Project.</p> <p><u>List of Watershed Groups and partners to which DRMS provides technical assistance with funds from the Technical Assistance Grant:</u></p> <p>Willow Creek Reclamation Committee  Snake River Watershed Group  Animas River Stakeholders  Clear Creek Watershed Association/Foundation  Coal Creek Coalition</p>	<p>Ongoing</p> <p>Completed</p>	
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<p>Lake Fork of the Arkansas  Lake Fork of the Gunnison  Uncompaghre Watershed  Blue River Watershed  Coalition of the Upper South Platte  San Miguel Watershed Group  Lefthand Watershed Group  James Creek Watershed Group  Uncompaghre Watershed Group  San Juan RC&amp;D  Colorado Mountain College  Aspen Source Water Protection Group  Sheep Mountain Alliance</p>		
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