

# **A Photo Report of the Sunset Roadless Area and Threats from Coal Mining and Exploration at the West Elk Mine**

*Gunnison County, Colorado*

**July 2, 2013**



Aerial view of West Elk coal mine facilities, photo by Theo Colborn.

**Prepared by Jeremy Nichols**  
(all Photos by Jeremy Nichols unless otherwise noted)

## Introduction

The West Elk Coal Mine in Colorado's North Fork of the Gunnison River Valley is the second largest coal mine in the state. Using underground, longwall mining techniques, the mine produced 5.896 million tons of coal in 2011. The mine is the 32nd largest in the United States. See Coal Production Data from the U.S. Energy Information Administration, <http://www.eia.gov/coal/annual/pdf/table9.pdf>. Arch Coal Company, headquartered in St. Louis, owns and operates the West Elk Mine. See Arch Coal's website, <http://www.archcoal.com/aboutus/westelk.aspx>. The coal that it mines is largely federally owned and therefore managed by the U.S. Bureau of Land Management. The mine primarily provides fuel for Tennessee Valley Authority coal-fired power plants in Alabama, Kentucky, and Tennessee. See U.S. Energy Information Administration, EIA Form 923 Data for 2012, <http://www.eia.gov/electricity/data/eia923/>.

Located in northwestern Gunnison County in western Colorado west of the towns of Somerset and Paonia, the main mine facilities are located directly south of Highway 133, which follows the North Fork of the Gunnison River. Its underground workings extend south from Highway 133 several miles underneath the Grand Mesa, Gunnison, and Uncompahgre National Forest, which is managed by the U.S. Forest Service. The mine lies to the north of the West Elk Mountains (and the West Elk Wilderness Area), south of the Grand Mesa, and west of the Ragged Mountains (and the Raggeds Wilderness Area). The maps below illustrate the location of the mine.



Google Earth map showing location of West Elk Mine in Colorado.  
Prepared June 2013



Above, Google Earth map showing location of West Elk Mine in relation to surrounding counties. Below, map showing location of Mine in relation to Somerset, Highway 133, and the West Elk Mountains to the south.





Above, view of Ragged Mountains to west above West Elk Mine. Picture taken June 30, 2010. Below, view of Mount Gunnison and West Elk Mountains to south of Mine area. Picture taken June 8, 2009.



## Methane Venting

The West Elk Mine is a gassy mine. Although normally, methane gas, which is hazardous, is vented through a central ventilation system, the West Elk Mine must vent methane through drainage wells that are drilled above the mine. The U.S. Forest Service has explained:

In recent years, the coal mines operating in the Somerset coal field have experienced the build-up of methane gas in the underground workings after the overlying rock strata have subsided into the mine void (called the gob)....

Typically, the in-mine ventilation system cannot effectively keep methane levels within safe working range, therefore additional methane liberation methods have to be employed. Existing operations at the West Elk Mine, as well as other mines in the North Fork Valley, have used a system of methane drainage wells (MDWs) to assist in liberating methane from underground mine workings. These MDWs are drilled from the land surface into the strata overlying the coal, and use an exhausting blower to pull gas from the rock formation, and subsequently air from the mine....Due to the large amount of methane found in the West Elk Mine, the agency requires MDWs to be placed every 1,000 to 750 ft. along the longwall panel....Methane drainage well construction is essential for operating longwall operations in the North Fork Valley.

U.S. Forest Service, *Final Environmental Impact Statement, Federal Coal Lease Modifications COC-1362 and COC-67232* (August 2012) at 51 (hereafter referred to as the "FEIS").

It is estimated that the West Elk Mine vents 58,663 tons of methane annually through its venting wells and ventilation system. FEIS at 506. Methane is a potent greenhouse gas that the U.S. Environmental Protection Agency estimates has 25 times more heat trapping ability than carbon dioxide. See U.S. Environmental Protection Agency, "2013 Revisions to the Greenhouse Gas Reporting Confidentiality Determinations for New or Substantially Revised Data Elements," Proposed Rule, 78 Fed. Reg. 19802, 19809 (April 2, 2013). This means that the total amount of methane vented equals 1,466,575 tons of carbon dioxide.

Not only that, but methane is natural gas and therefore a valuable product. Current prices for natural gas are around \$3.30 per thousand cubic feet, or mcf. See Energy Information Administration Natural Gas Prices data, [http://www.eia.gov/dnav/ng/ng\\_pri\\_sum\\_dc\\_u\\_nus\\_m.htm](http://www.eia.gov/dnav/ng/ng_pri_sum_dc_u_nus_m.htm). According to a U.S. Environmental Protection Agency conversion website (<http://www.epa.gov/cmop/resources/converter.html>), 58,663 tons of methane equals 2,763,156 mcf, which means that on an annual basis, methane venting wastes \$9,118,414.

The practice of methane venting also has impacts on the landscape. The practice has turned the surface lands above the West Elk Mine into a literal natural gas field. The lands above the mine are now pockmarked with well pads, some several years old, and covered with a spaghetti-like network of roads. The pictures below illustrate the impacts of methane venting on the surface lands above the West Elk Mine.



Above, Google Earth image showing methane venting well pad and road network above West Elk Mine. Below, Google Earth view of methane venting well pads with view of West Elk Wilderness in background.





Above, methane venting operation at well site above West Elk coal mine. Venting involves operating a blower to help extract methane from within the ground. Below, view of well pad and venting machinery with view of Mt. Gunnison in far background. Photos taken June 22, 2013.





Above, road cut through aspen/spruce/fir forest to methane venting well pad. Venting involves operating a compressor engine to help extract methane from within the ground. Below, well pad with wellhead sticking out of ground. Photos taken June 22, 2013.





Above, slash pile on edge of well pad. Below, well pad with wellhead sticking out of ground. Below, well pad with Mount Gunnison in background. Mount Gunnison is in the West Elk Wilderness. Photos taken June 22, 2013.





Above, well pad cut into top hill. Photo taken June 8, 2009. Below, overview of lands above West Elk Mine and methane venting well pads, view looking north to Grand Mesa. Photo taken June 22, 2013.



## **Sunset Roadless Areas in the Path of West Elk Mine**

As the West Elk Mine has expanded, it has pushed further south toward the West Elk Wilderness Area. This has put the Sunset Roadless Area, which is contiguous with the West Elk Wilderness, in the path of the coal mine.

The Roadless Area sits directly to the north of Mount Gunnison, an iconic 12,719 foot mountain that is within the West Elk Wilderness. Probably the most iconic feature of the Sunset Roadless Area is a landslide area that has created a large scarp, or cliff face. This scarp is very visible in the area. The Forest Service has described this as a, “striking geologic feature.” FEIS at 480. Springs at the base of the scarp are the headwaters for Deep Creek, a tributary to the North Fork of the Gunnison River.

Another defining feature of the Sunset Roadless Area is the Sunset Trail. Although maintained by use, it provides access to the area for hikers, backpackers, backcountry horsemen, hunters, and other recreationists. The trail passes through tall aspen forest, lush fern and lupine, through meadows, and through thick spruce/fir forest.

Totaling more than 5,800 acres in size, the Forest Service has asserted that more than 3,000 are “capable” of wilderness protection. FEIS at 479. However, the entire the area appears to qualify for wilderness protection given its size, undeveloped character, lack of roads, and opportunities for solitude and backcountry recreation. Below are pictures of the Sunset Roadless Area.



The iconic scarp and the Sunset Roadless Area with Mount Gunnison looming in the background. Photo taken June 22, 2013.



Above, looking up at scarp from Deep Creek. Photo taken June 30, 2010.  
Below, view of Mount Gunnison from meadow in Sunset Roadless Area.  
Photo taken August 17, 2011.





Above, view from atop scarp. Photo taken August 17, 2011. Below, meadow of lupine in bloom along Sunset Trail. view of Mount Gunnison from meadow in Sunset Roadless Area. Photo taken June 22, 2013.





Above, beaver pond in Sunset Roadless Area. Photo taken August 17, 2011. Below, view of the Marcellina Mountain in the Raggeds Wilderness from within the Sunset Roadless Area. Photo taken June 22, 2013.





At the beginning of the Sunset Trail, traveling through aspen forest. Photo taken June 22, 2013.

## **Coal Lease Modifications and Exploration in Sunset Roadless Area**

The Forest Service and Bureau of Land Management have authorized two new lease modifications and now coal exploration in 1,701 acres of the Sunset Roadless Area.

Through their approval of the lease modifications, the Agencies disclosed that road construction and methane venting well construction and operation would be required to facilitate the mining of coal beneath the Roadless Area. The Agencies estimated that 48 methane venting wells would be required in addition to 24 miles of road construction in what are considered to be “roadless” lands in the Sunset Trail Roadless Area. FEIS at 56.

Most recently, the Agencies approved the Sunset Trail Area Coal Exploration Plan. This Plan calls for the development of 10 exploration wells (as well as associated well pad construction) and the construction of 6 miles of roads. all within the Sunset Roadless Area.

The approval of the lease modifications, and more immediately the coal exploration, means that the Sunset Roadless Area will be degraded as a result of road construction and well pad construction, operation, and maintenance. Already, one can see flagging and taking in the area indicating where roads and exploration well pads will be constructed, mostly in completely untouched forest. It has been suggested that the exploration well pads and road system will ultimately be utilized for the construction and operation of methane venting wells as the lease modifications are developed.

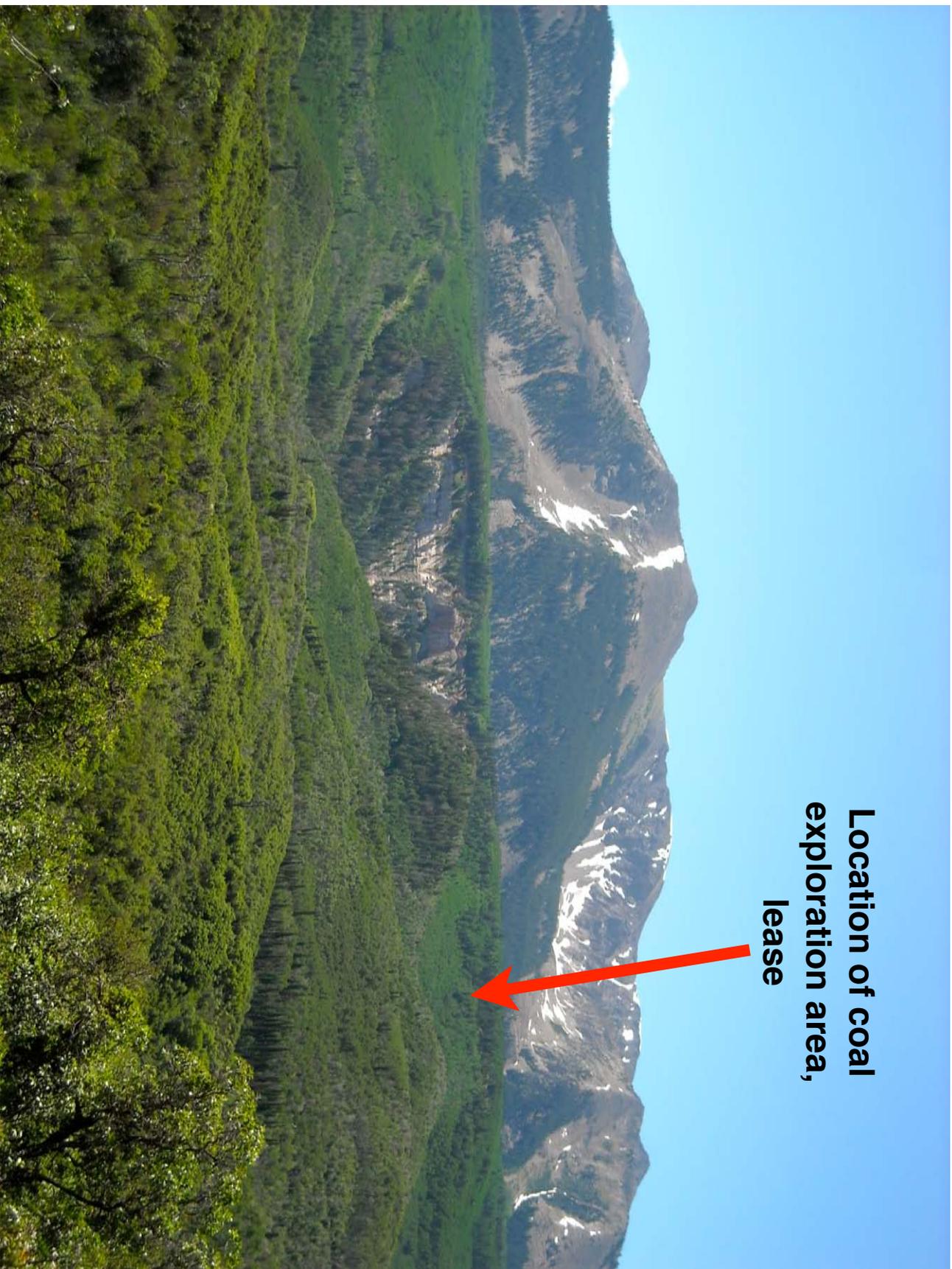
Road construction and well pad construction is not a benign activity. Although the Forest Service asserts the impacts are “temporary,” the impacts of exploration and methane venting well development appear to leave long-lasting impacts on the landscape.

Below are pictures showing the location of the lease modifications and coal exploration area, as well as pictures documenting the impending threats to the Sunset Roadless Area from the Agencies’ decisions.



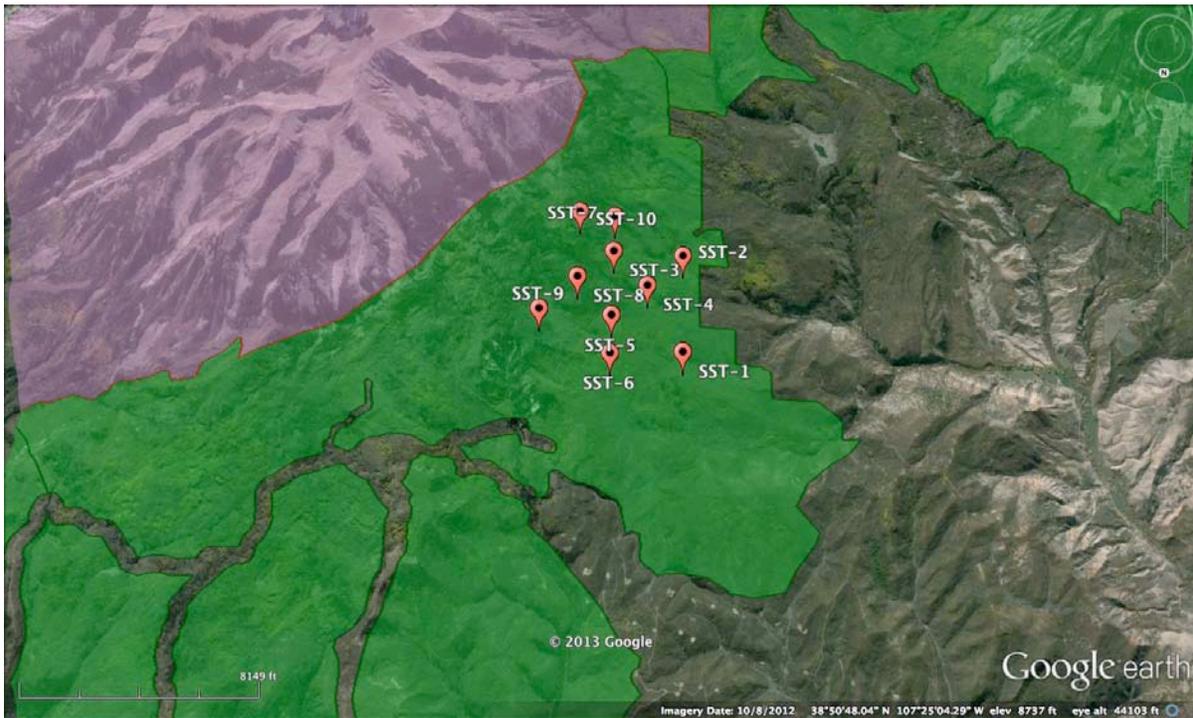
I was able to determine the location of the proposed exploration wells using township, range, and section data available as a Google Earth file, and to correlate the locations of the proposed exploration wells listed on page 4 of the Bureau of Land Management's Sunset Trail Area Coal Exploration Plan Environmental Assessment. Above is the Township, Range, and Section grid. Below is the general location of the exploration well sites mapped in Google Earth. The locations are general (i.e., within 40 feet of actual location) because the Environmental Assessment only provided location data to the nearest quarter-quarter section. Note the scarp identifying the Sunset Roadless Area on the left hand side of the map.



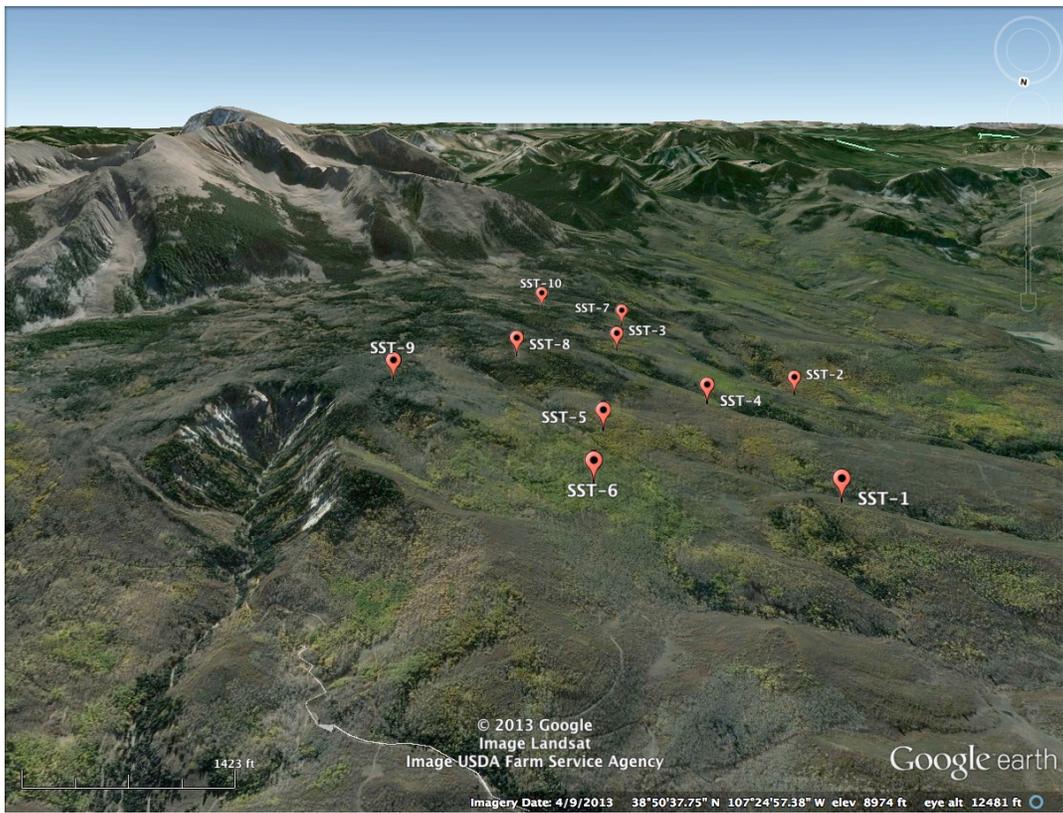


**Location of coal  
exploration area,  
lease**

This area generally correlates to the lands west and south of the iconic scarp of the Sunset Roadless Area.



Above, a Google Earth map showing the general location of the exploration wells with the Roadless Area boundaries in green and West Elk Wilderness boundary in purple (this data was obtained from the U.S. Forest Service). Below, a Google Earth image illustrating the location of the exploration wells in relation to the scarp and Mount Gunnison.





Above, a stake identifying where the northern access road to the exploration well sites will be constructed off of Forest Road 711. Below, stakes identifying where road will be constructed to access exploration area. Although there is an old road bed here, it is largely grown over and will require extensive reconstruction to access the exploration sites. Photos taken June 22, 2013.





A portion of northern access road begins as an older, relatively unmaintained road. I was able to determine our location and correlate it to points within the exploration area using a global position system application on my iphone. Photo taken June 22, 2013.



Above, the unmaintained road ends at what appears to be a monitoring well site that has long been cleared of timber and other shrubs. The road proposed to be built to access the exploration well sites would be constructed straight ahead into the forest beyond the person in the foreground where there currently is no road or trail. Below, forest that will have a road constructed through it. Photos taken June 22, 2013.





Above, aspen trees in the area appear already marked for cutting. Below, pink flagging seems to indicate where the roads to access exploration well sites will be constructed. The pink flags indicate the road will travel through an extensive amount of untouched forest that has never before been roaded or had trails constructed in it. Photos taken June 22, 2013.





Above, more pink flagging in forest that is untouched. Below is the area that appeared to correlate to the location of where exploration site SST-6 would be constructed and drilled. Numerous pink flags were in this area, indicating it was likely the location of proposed well pad. The forest here is thick and completely untouched, there are no trails; it would presumably be cleared for exploration activities. Photos taken June 22, 2013.





Above, this area appeared to correlate to the location of exploration site SST-9. There were many flagged trees in this area. Below, one can see the many aspen with pink flagging. This area, which is directly west of the scarp, was completely untouched. There was no constructed trail in this area, only game trails. The forest floor was thick with ferns and other vegetation. Photos taken June 22, 2013.



## **Exploration Impacts at the Nearby Elk Creek Mine**

The impacts of exploration have been documented at the nearby Elk Creek Coal Mine, which is located to the north of Highway 133 in the North Fork of the Gunnison River Valley. Elk Creek also uses longwall mining and methane venting practices. Pictures taken by the mine's owner, Oxbow, as well as pictures I have taken, indicate that the impacts of exploration can be significant and long lasting. These pictures provide just a small glimpse of the impacts of exploration and illustrative of the fact that exploration impacts in the Sunset Roadless Area will be irreparable.



The pictures above and below, which were taken by Oxbow and obtained from the Bureau of Land Management, show exploration activities, including the exploration well pad and drilling activities. Note West Elk Mountains in background on photo below. Photos taken in August of 2008.





Even after exploration was completed, the impacts persisted on the landscape. Below are pictures of the same exploration area taken in June of 2009--nearly one year later--showing an exploration well pad and abandoned drill hole. Photos taken June 8, 2009.





Above and below is the same well pad. Nearly one year later, the pad was still devoid of vegetation and part of it has turned into a water pit. Photos taken June 8, 2009.





The impacts of road construction persisted. The pictures above and below show a road constructed for the exploration. Although the road was closed and debris strewn upon it, the impacts continued and were obvious. Photos taken June 8, 2009.





The well pad above and below is considered by Oxbow to be reclaimed. However, while the pad was cut into oak scrub, oak has not been reestablished on the site. Furthermore, the site appeared to be dominated by weeds, including nonnative grasses. Boulders and broken branches were strewn across the pad. Photos taken August 17, 2011.





Below is a road cut through oak scrub. Although some grasses are growing in the road, the road bed is still an obvious impact and no oak is being reestablished. Below is another road that remains obvious on the landscape. Although boulders have been strewn on the road, it has not been fully reclaimed. Oak has not been restored and weeds are abundant in the disturbed road bed. Photos taken August 17, 2011.





The pictures above and below show two more well pads. There is less bare dirt, but vegetation has not returned to pre-impact conditions. Furthermore, weeds like thistles, and cheat grass appeared abundant in much of the disturbed area. Photos taken August 17, 2011.



## Conclusion

Development of the lease modifications in the Sunset Roadless Area, and importantly development of Arch Coal's Sunset Trail Coal Exploration Plan, will certainly alter the roadless and wilderness characteristics of the Roadless Area through the construction of several miles of roads, well pads for both exploration and methane venting, and through ongoing maintenance activities. Although both the Forest Service and the Bureau of Land Management assert that impacts will be temporary or small in scale, given that the Sunset Roadless Area is currently an intact and untouched landscape, the impacts will certainly be more long-term and larger in scale than what the Agencies indicate.

This is especially true given that the latest lease modification and exploration decisions will allow Arch to penetrate into more forested land than it has previously impacted. The majority of the land above the West Elk Mine consists of oak scrub vegetation. Now, however, to access the lease modification and exploration area within the Sunset Roadless Area, Arch will have to clear large areas of aspen and spruce/fir forest, which will take years to fully recover, if ever.

The impacts of coal development on the surface above the West Elk Mine are already extensively visible and have drastically altered the landscape, turning it into a network of roads and well pads that appears industrial in nature. Well pads are visible from virtually any vantage point in the area. It appears that the latest lease modifications and exploration will continue this trend and further alter this beautiful landscape at the foot of Colorado's iconic West Elk Mountains.