



December 13, 2013

Monica D. Sheets, Esquire  
Hazardous Materials and Waste Management Division  
Colorado Department of Public Health and Environment  
4300 Cherry Creek S. Drive  
Denver, Colorado 80246

Re: U.S. Energy Corp. Voluntary Cleanup Plan Application

Dear Ms. Sheets:

The Red Lady Coalition appreciates the opportunity to submit these comments on the U.S. Energy Corp. application for a Voluntary Cleanup Plan ("VCUP"). Red Lady Coalition is a non-profit association of citizens and organizations in Crested Butte, Colorado and surrounding Gunnison County. The Coalition is dedicated to protecting Mount Emmons (referred to locally as the "Red Lady") to assure the safety of the Crested Butte municipal water supply, and the underpinnings of the Gunnison Valley economy. The Coalition believes that U.S. Energy is ineligible to apply for the VCUP program and approval of its application by the Department would adversely affect public health and the environment in our region.

#### I. Background

The U.S. Energy application is for two adjacent parcels of land -- one privately-owned by the company and the other owned by the Federal Government (administered by the U.S. Forest Service). These two parcels are physically and operationally integrated and generally viewed as a single site. On this integrated property sits the old Keystone Mine, tailing ponds, a water treatment plant and other buildings and fixtures relating to the prior mining operations of heavy metals (copper, lead, cadmium, and zinc) and U.S. Energy's proposed future use of the property for molybdenum mining operations.

There has been a long history associated with contamination from this property that has had a direct effect on the community's watershed and the surrounding environment. Indeed, in the 1970s, pollution from the site was so bad that Coal Creek, which flows through the middle of the Town, turned orange, and the Town's watershed was contaminated. As a consequence, in 1979, the Colorado Water Quality Control Division of the Department of Public Health and Environment brought an action relating to the site under CRS 25-8-601 et seq., and ultimately a consent order was entered that provided for the construction and maintenance of a water treatment plant to handle the contaminated wastewater resulting from the mining operations. (See attached 1979

Amax-CDPHE Consent Order) Since that time, the site owner has been responsible for maintaining effluent limits pursuant to an NPDES permit. U.S. Energy is currently the site owner, bears this responsibility, and is the NPDES permittee. Since the contamination problems in the mid-1970s, the Crested Butte Community has been concerned about all actions taken on the property and their possible consequences for public health and the environment.

In addition, the U.S. Forest Service has stated that any clean-up operation on the public parcel must be handled as a CERCLA action and meet the requirements of that statute.

## II. Relevant Law and Guidance

The Colorado "Voluntary Clean-Up and Redevelopment Act" ("VCUP"), CRS 25-16-301, is designed to protect human health and the environment while encouraging prompt cleanup of contaminated properties. The General Assembly assumed that the cleanup procedure would be used primarily for smaller properties not already subject to the requirements of other environmental programs – both State and Federal – such as CERCLA, RCRA, and those relating to the treatment, storage and disposal of hazardous waste, and water quality.

Section 303(3)(b) of the statute states that the VCUP program will not apply to: (1) property that is listed or proposed for listing on the national priorities list of superfund sites; (2) property that is the subject of corrective action under RCRA; (3) property that is subject to an order issued by or an agreement with the water quality control division pursuant to part 6 of article 8 of title 25; (4) a facility which has or should have a permit or interim status relating to the treatment, storage, or disposal of hazardous waste; or (5) property that is subject to the provisions of state law relating to leaking underground storage tanks.

In 2008, to assist the public in understanding the VCUP program, the Department issued the "Voluntary Cleanup Roadmap – A How-To-Guide." On page 7 of the Roadmap, the Department states that the "Voluntary Cleanup Act was passed to address sites not covered by existing regulatory programs and provide a mechanism to approve clean-up plans. The Act specifically recognizes existing regulatory programs and excludes sites covered by these programs from participating in the Voluntary Cleanup Program." The Roadmap goes on to discuss each of the exclusions in more detail.

In Subsection 4, "Property that is subject to an order issued by or an agreement with the Water Quality Control Division pursuant to C.R.S. 25-8-601 et seq.," the Department makes three points to explain the exclusion:

a. Any property with groundwater contamination for which the owner/operator is responsible is subject to an order. These owners should pursue cleanup with the Water Quality Control Division. (However, the Water Quality Control Division may choose to

defer to the VCUP program if the contamination does not present an imminent threat to human health such as low concentrations confined to the applicant's property).

b. Contamination created by a previous owner is not subject to an order, and therefore is eligible for VCUP.

c. In addition, any site that has a continuous discharge to waters of the state (i.e. draining mine adits) should be permitted under the water quality regulations. There is no variance from those permitting requirements, which remain as long as there is a discharge.

### III. Discussion

#### A. U.S. Energy Site Excluded from VCUP

In its VCUP application, U.S. Energy states that its site is not excluded from the program. U.S. Energy has taken a very narrow reading of the exclusions when it makes that statement.

First, the original consent order between Amax Inc., then-owner of the Keystone Mine, and the Water Quality Control Division is an order/agreement made pursuant to CRS 25-8-601 et seq. The order/agreement addresses the contamination from the mine and recognizes that Amax is in the process of constructing a water treatment plant to treat the contamination. The consent order directs the company to use due diligence in completing its construction and comply with specific effluent limitations in a given NPDES permit issued by the State. This order/agreement remains with the site and is valid today. Thus, U.S. Energy's site is subject to the order/agreement with the Water Quality Control Division.

Second, U.S. Energy appears to be arguing that it is not responsible for the contamination, and such contamination was due to actions by a previous owner. However, by its own statement in the VCUP application (at p. 9), U.S. Energy stated that it owned and operated the mine in periods prior to the consent agreement/order with the Water Quality Control Division. Thus, the discharge of the mine drainage contributed to a portion of the contamination that was the subject of the 1979 consent order.

Third, the site has continuous mine drainage running into state waters and is or should be permitted under the water quality programs administered by the Water Quality Control Division.

Fourth, more information is required to determine whether the site has been, or may be, the subject of corrective action under RCRA or has or should have had a permit or interim status relating to the treatment, storage or disposal of hazardous wastes.

Fifth, the site is not presently listed or proposed for listing as a Superfund site. However, the U.S. Forest Service has indicated that any action taken on the federal parcel would have to be taken pursuant to CERCLA. Such actions could include listing the site on the National Priorities List. Therefore, more information is needed pertaining to the Forest Service's planned actions under CERCLA before a voluntary cleanup program application could be approved.

Accordingly, based on these facts, the exclusions of the Voluntary Clean-Up and Redevelopment Act, and the guidance of the Voluntary Cleanup Roadmap, the U.S. Energy site (and the adjacent site owned by the Federal Government) are excluded from consideration under the VCUP program.

#### IV. Additional Impacts on the Environment

##### A. HCCA Comments

Red Lady Coalition understands that the High Country Citizens' Alliance ("HCCA") is submitting more detailed comments on the potential impact the proposed VCUP remediation could have on the Crested Butte watershed and the area's environment in general. Red Lady Coalition agrees with HCCA's concerns and endorses its comments.

##### B. Heavy Metal Contamination of Streams and Rivers

The economy of the Gunnison-Mt. Crested Butte corridor is characterized by the surrounding natural environment which provides for fishing, hiking, skiing, hunting and a myriad of other outdoor activities, which, in turn, compliment cultural and educational activities, all of which encompass what is referred to as an amenity driven economy. As of 2012, approximately 54% to 55% of Gross Regional Product in the Gunnison-Mt. Crested Butte corridor is represented by the amenity economy. These percentages translate into approximately 5,000 jobs and approximately \$300 million of Gross Regional Product.

Our rivers and streams are an important underpinning of our tourism economy, including numerous designated "gold medal" waterways used for fishing. The in-stream insects which nourish the fish are extremely sensitive to heavy metals. The current water treatment facility operated by U.S. Energy seems to adequately treat for these pollutants – assuming that no molybdenum mining is conducted.

However, in 2009, the Department of Zoology of the University of Wisconsin – Madison prepared a letter that discusses the anticipated adverse effects the proposed molybdenum mining operations would have on the local streams and rivers. (A copy of that letter is attached). While not directly on point regarding the VCUP application under consideration today, the University of Wisconsin letter explains how difficult it is to remediate pollution from heavy metals. Based on this discussion and the level of

concern identified about even small amounts of heavy metals, it raises significant questions about the ability of a proposed, untested, passive remediation system to achieve the effluent limitations met by the water treatment plant. Therefore, Red Lady Coalition asks that the Department also take these facts into consideration during its review of the U.S. Energy VCUP application.

V. Conclusion

Based on the foregoing, Red Lady Coalition strongly urges the Department to disapprove the VCUP application:

1. The site is ineligible for clean-up under the VCUP program. It is excluded because it is currently subject to and regulated by other State and Federal Programs identified in the authorizing statute; and

2. Environmental concerns raised by these comments and those of other members of the Crested Butte Community indicate that, even assuming that the site is eligible for consideration under VCUP, the proposed remediation plan would not protect public health and the environment.

Red Lady Coalition would be pleased to respond to any questions or provide additional information that the Department may believe is helpful in its review of the U.S. Energy application.

Thank you for your consideration of this most important matter.

Respectfully submitted,

William G. Ronai  
Chairman

Attachments

cc: The Honorable John W. Hickenlooper  
The Honorable Michael F. Bennet  
The Honorable Mark Udall  
The Honorable Gail Schwartz  
The Honorable Mille Hamner  
Dr. Larry Wolk, Executive Director, Colorado Department of Public Health & Environment  
Mike King, Executive Director, Colorado Department of Natural Resources  
Board of County Commissioners for Gunnison County  
Mr. Scott Armentrout, Forest Supervisor, GMUG National Forests, U.S. Forest Service

COLORADO DEPARTMENT OF HEALTH  
DIVISION OF ADMINISTRATION  
HL WJ HUGG

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IN THE MATTER OF

AMAX INC. - MT. EMMONS PROJECT,  
GUNNISON COUNTY, COLORADO  
NPDES PERMIT NO. CO-0035394.

CONSENT ORDER

TO: AMAX INC.

Pursuant to the authority vested in the Division of Administration of the Colorado Department of Health by parts three, five and six of article 8, title 25, C.R.S. 1973, which authority has been delegated to me by the executive director, I hereby make the following findings of fact and issue the following consent order.

FINDINGS OF FACT

1. AMAX Inc. purchased an inactive lead-zinc mine, known as the Keystone Mine, as part of the Mt. Emmons molybdenum project. Acid mine drainage from the Keystone Mine has been and continues to enter Coal Creek from point sources approximately two and a half miles west of Crested Butte, in Gunnison County, Colorado.

2. Coal Creek is "state waters" as defined by the Colorado Water Quality Control Act.

3. AMAX has recently completed the work of stabilizing a series of old tailings dams. This stabilization project was essential to the elimination of the potential failure of these tailings storage structures which pre-date AMAX's purchase of the Keystone Mine. The company is presently designing and pilot testing a treatment plant intended to

treat the mine drainage and tailings leachate, as well as collected runoff from disturbed and un reclaimed areas in the vicinity of the Keystone mine.

4. Concurrently with this order, and in response to its application, AMAX is being issued NPDES permit No. CO-003394, to regulate point source discharges from the Keystone Mine area.

5. AMAX is discharging to a "water quality limited" segment of Coal Creek, which is presently classified as B1 - Cold Water Fishery. Therefore the permit effluent limitations are designed to achieve an effluent which would not be toxic to aquatic life, even should the town of Crested Butte divert all of Coal Creek for its drinking water supply just above AMAX's point of discharge.

6. Data supplied by AMAX, and the division's own sampling results, indicate that AMAX's use of the present settling pond does not provide adequate treatment to meet permit effluent limitations, and that that system was not designed to meet these limitations. The settling pond was integral, however, to the design and pilot testing of the treatment facility being implemented by AMAX.

#### CONSENT ORDER

Based upon the foregoing findings of fact, and pursuant to the provisions of C.R.S. 1973, 25-6-605, AMAX Inc. is hereby ordered:

1. To use due diligence in completing construction of all facilities necessary to achieve compliance with the effluent limitations in permit CO-003394, but in any event to achieve such compliance no later than June 30, 1981.

2. During the interim period from the present until June 30, 1981, or until completion of the treatment plant, whichever occurs earlier, to meet the following effluent

limitations. These limitations are based on the principle of non-degradation of the quality of the discharge to Coal Creek from its condition immediately after ANAX's completion of tailings pond stabilization:

Parameter	Concentration
Total Suspended Solids	30 mg/l on 30 day average 45 mg/l daily maximum
Total Calcium	2.7 lb/day daily maximum
Total Copper	12 lb/day daily maximum
Total Lead	4.0 lb/day daily maximum
Total Iron & Manganese	205 mg/l 30 day average
Total Zinc	405 lb/day daily maximum
pH	between 8.0 and 9.0 standard units

3. Prior to completion of the new treatment plant, the monitoring point for effluent limitations shall be at the parshall flume at the outfall from the retention ponds.

4. All terms and conditions of permit CO-0035304, including the effluent limitations except as specifically modified by interim limits established in paragraph two, are and shall be in full force and effect.

5. ANAX Inc., by its signature below, accepts and agrees to all findings and conditions of this order, and waives its rights to hearing thereon.

ANAX INC.

COLORADO DEPARTMENT OF HEALTH  
DIVISION OF ADMINISTRATION

By *[Signature]*

*[Signature]*  
FRANK J. ROZICH  
Director  
Water Quality Control Division

DATE 8/27/79

DATE 8/28/79

AG File No. DNR/MUCG/ZCE

## DEPARTMENT OF ZOOLOGY

ZOOLOGY RESEARCH BUILDING  
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UNIVERSITY OF WISCONSIN - MADISON

Mr. John Norton  
C/o Red Lady Coalition  
PO Box 2765  
Crested Butte, CO 81224

23 November, 2009

Dear Mr. Norton:

We are aquatic biologists with well over 100 years of collective experience doing research on streams and ponds in Gunnison and adjacent counties. Bobbi Peckarsky began working in the area in 1974, Wendy Brown in 1985, Scott Wissinger in 1988, Will Clements in 1989, and Brad Taylor in 1992. We wanted to provide our perspective to your organization on the potential that the development of a molybdenum mine on Mt. Emmons will have deleterious effects on the aquatic habitats of the region, because we understand how important clean rivers and streams are to the economic well-being of Gunnison County. We hope our biological evaluation will provide some fundamental issues on which you can make an economic argument why the mine should not be developed.

Development of a mine to extract molybdenum from Mt. Emmons would negatively affect the aquatic resources of at least two and more likely three drainage basins (Coal Creek, Ohio Creek and Splains Gulch). The mine would be located in the Coal Creek drainage, which runs into the Slate River and eventually the Gunnison and Colorado Rivers. Coal Creek downstream of the old Keystone Mine and water treatment plant is listed on the 2008 Colorado 303d list as impaired for Cd and Zn. New mining activity would increase the impact to an already impaired segment of river listed as a high priority for cleanup.

The most recently proposed location of the tailings pond is on the east side of the Ohio Creek drainage, which would essentially inundate and contaminate that entire area (a "sacrifice zone"). Thompson Creek Metals Company has purchased a ranch including water rights in the Carbon Creek drainage, which drains into the upper Ohio Creek valley. One of the previous mining plans included a 1000 acre-foot reservoir located at the Carbon Creek ranch. There are also unpatented "mill site" claims on public land around the ranch held by US Energy. They may be used for ancillary facilities, not actual mining.

Mining on Mt. Emmons would also affect transportation corridors between the mine and the tailings site, and between ore processing and distribution centers. Tailings may be transported up Splains Gulch for disposal in the Ohio Creek valley. Road building and heavy truck use would increase sedimentation in the streams of that drainage basin as well.

While negative effects of mine development and operations will dissipate over time and space (downstream), the temporal and spatial scales of those effects may be very large. Because mine tailings persist for geologic time scales, even when capped and revegetated, at best full recovery is a long-term proposition. For example, while most of the metals arising from mining activity in the Upper Arkansas River drainage basin remain in the system and are distributed throughout the stream in organisms and sediments, a small fraction have been detected in sediments all the way downstream to the Pueblo Reservoir. The headwater streams that would be affected by a mine on Mt. Emmons are connected all the way to California and Mexico. In that regard, by our location we are inadvertently stewards of the drinking water for millions of people and other animals downstream.

Below we enumerate some of the documented deleterious effects of hard rock mining on rivers and streams that would undermine their value as an economic resource to the recreation industry of Gunnison County. Effects are direct and indirect, and would jeopardize the potential for trout fishing, rafting, hiking and backpacking (metals cannot be filtered out of drinking water). Our information comes from sources very close to home: one study done when a tailings dam broke releasing contaminated effluent into Coal Creek from the old Keystone Mine (Peckarsky and Cook 1980), and the other a robust series of studies by Will Clements, his students and colleagues (see citations below) documenting the downstream effects of the California Gulch Superfund site on the Arkansas River. Those latter studies have been touted as the standard for ascribing anthropogenic causation to environmental impact assessment, because they combined monitoring of stream conditions over time and space with laboratory and field experiments (Carlisle and Clements 2006). Furthermore, results from those studies can be generalized to streams of the Southern Rocky Mountain ecoregion (Clements et al. 2000).

- Heavy metal contamination (Zn, Cu, Cd) is toxic not only to salmonid fishes, but also to stream invertebrates.
- Tailings dam failures can reduce invertebrate populations by well over 90%, indirectly affecting salmonid fisheries by eliminating their food resources.
- Brown trout in the Arkansas River switch from feeding on mayflies and stoneflies at the upstream (clean) sites to feeding on *Brachycentrus* caddisflies and orthoclad midges at the downstream (polluted) sites (Clements and Rees 1997).
- Species richness (diversity) and abundance of stream invertebrates, especially mayflies, may be reduced for long distances downstream of metal inputs and for many years.
- Mayflies and stoneflies are the most sensitive to heavy metal pollution. Some caddisflies (net-spinning hydropterygids) bioaccumulate heavy metals, effects of which can be transmitted up the food chain to fish.

- Effects of heavy metals or acid mine drainage on stream organisms may vary with season, stream size, and acid neutralizing capacity, which is a function of the underlying geology.
- Communities of aquatic invertebrates from the headwaters of streams are more sensitive to heavy metals than communities living in lower elevation streams. Therefore, protective criteria in high elevation streams need to be more stringent.
- *Rhithrogena hageni*, a flat-headed mayfly (Heptageniidae) is most sensitive to metal contamination in the summer when larvae are small (high mortality), but not as sensitive in spring when larvae are large and in later developmental stages.
- Chronic exposure to contaminated substrates reduces growth of grazing mayflies.
- Some stream invertebrates may become tolerant of chronic exposure to heavy metals, but are more sensitive to increased acidity (pH < 4.5).
- Metal tolerant communities are less tolerant to UVB radiation, suggesting additional problems for organisms already stressed by metals (mayflies, caddisflies and dipterans)
- Flat-headed mayflies, highly sensitive to metal pollution in the Arkansas River, are also responsible for a disproportionate amount of total energy flow to higher levels of the food chain, resulting in depletion of food energy in the ecosystem.
- Invertebrates and trout are more sensitive to mixtures of heavy metals (Zn, Cd and Cu) than to each alone.
- Drift of invertebrates downstream in the water column increases, and community respiration and stream metabolism decrease in response to heavy metal contamination.
- A survey of 27 sites in Colorado Rockies showed that high Zn concentrations slowed leaf litter breakdown, probably mediated by reduced populations of invertebrates that shred decaying leaves, and reduced microbial activity (Niyogi et al. 2001). The implications of this survey are that metal-contaminated streams could accumulate leaf litter, and reduce the quality of this important food resource for stream insects.
- Remediation of metal contamination may be possible, but needs to be sustained indefinitely. For example, remediation of the Clark Fork River Superfund site in western Montana started in 1990 and is ongoing. While Cu and Cd levels have declined, levels of arsenic have increased because remediation of cations mobilizes toxic anions. High flows did not dilute metals as expected, but instead redistributed contaminants throughout the river (Hornberger et al. 2009). This study illustrates that metal contamination is difficult if not impossible to remediate, and at best, takes a very long time.
- Although remediation of metal contamination in streams can be very expensive. If water can be treated and sources of metals can be eliminated or controlled, fish and macroinvertebrates can recover usually within 10-20 years. The Arkansas River is a reasonably good success story, but the price tag was many millions \$\$\$. Nonetheless, experimental evidence indicates that the stream invertebrates are still degraded because these "recovered" populations are more susceptible to novel stressors (e.g., acidity, UV radiation). Furthermore, the treated streams in the Arkansas system cannot handle larger than average spring flows; so they get a relatively large pulse of metals every few years depending on snow pack. We

would expect a similar problem with remediation of the streams that would be affected by mining in Mt. Emmons.

While such effects of hard rock mining on *water quality* generally receive the most discussion, there are equally important potential negative impacts of mining and associated construction activities on *water quantity* in streams as a consequence of water extraction for mining operations:

- Water extraction reduces availability of local habitat to support of salmonid fisheries, which are already affected by low flows during the late summer months.
- Climate change is associated with increases in extreme events, such as floods and droughts, which directly affect the stream biota. Decreased stream flow (discharge) and lower stream depth during summer increases exposure of invertebrates to ultra-violet radiation and increases photo-oxidation of dissolved organic matter, which determines toxicity and bio-availability of metals to stream organisms (Clements et al. 2008).
- Reducing stream water quantity affects the total maximum daily loads (TMDL) of nutrients allowable for discharge by sewage treatment facilities downstream. For example, reducing the amount of water in the stream needed to dilute discharged nutrients may necessitate upgrading of the Crested Butte Water Treatment Plant, which could be very expensive. Reduced flow in the Slate River will increase the effect of pollution from Redwell Basin via O-Be-Joyful Creek.

Even under scenarios where mining companies have the best intentions and implement maximal mitigation measures, failures are virtually inevitable. This statement is corroborated by a recent study by Maest et al. (2006), which reviewed 70 Environmental Impact Statements for modern-era hard rock mines (between 1978-2004), and compared the predicted impacts on water resources to actual impacts using 24 case studies where data were available. In 75% of those cases, water quality impacts were underestimated in the pre-mining EIS. Close proximity to surface or groundwater influences, moderate to high acid mine drainage and contaminant leaching potential were most likely to require perpetual treatment to guarantee acceptable water quality.

The consequences of mine remediation on groundwater were dramatically illustrated in Leadville recently when there was concern that the Leadville Mine Drainage Tunnel was about to flood, potentially discharging millions of gallons of toxic metals into the Arkansas River and flooding residents downstream. There was a House Bill introduced to fund a large evacuation of the water, but the bill failed. Residents downstream remain very skeptical (see summary of events: <http://www.waterinfo.org/taxonomy/term/1032>). The location of the proposed molybdenum mine in the drainage basin where the town of Crested Butte obtains its drinking water is precarious, given the potential for flooding. Therefore, if the mine is developed the intake site of the Crested Butte town water should probably be moved upstream, which would be a very costly proposition.

We hope this information is useful to your campaign to stop the development of the mine on Mt. Emmons.

Sincerely,

Barbara (Bobbi) Peckarsky, Honorary Fellow and Adjunct Professor, University of Wisconsin, Madison; Emeritus Professor, Cornell University, Ithaca, NY

William Clements, Professor, Colorado State University, Ft. Collins, CO

Wendy Brown, Investigator, Rocky Mountain Biological Laboratory, Crested Butte, CO

Scott Wissinger, Professor, Allegheny College, Meadville, PA

Brad Taylor, Professor, Dartmouth College, Hanover, NY

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