BLM

# U.S. Department of the Interior
# Bureau of Land Management

# Decision Record,
# Finding of No Significant Impact, and
# Environmental Assessment
# for the
# Daneros Mine Project

Monticello Field Office
365 N. Main Street
Monticello, Utah 84535

May 2009

# Finding of No Significant Impact and Decision Record

***Project:***
Daneros Mine Project
Plan of Operations
Environmental Assessment UT-090-07-43
Casefile Number: UTU-74631

***Applicant/Address:***
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May 2009

# Finding of No Significant Impact / Decision Record
# Monticello Field Office

## INTRODUCTION:

The Bureau of Land Management (BLM), Monticello Field Office (MFO) has conducted an environmental analysis to assess the potential impacts associated with the proposed Daneros Mine Project. The environmental analysis is documented in the attached Environmental Assessment (EA No. UT-090-07-43). The Daneros project is a proposed small underground uranium mine situated in Bullseye Canyon in San Juan County, Utah. The Daneros mine property comprises 65 unpatented mining claims located on public lands. These lands are subject to location under the mining laws of the United States. Pursuant to Federal regulations at 43 CFR Subpart 3809 which apply to operations authorized by the mining laws on public lands, Utah Energy Corporation (UEC) submitted a Mining Plan of Operations (MPO) to the BLM in October 2008. The MPO essentially constitutes the Proposed Action in the EA.

Under the Proposed Action, uranium ore would be produced from the Daneros property using conventional underground mining methods. A total of 100,000 tons of uranium ore would be produced during the seven-year operation. No ore processing would occur at the site. Ore would be transported by truck on existing county and state roads to Denison Mines' White Mesa Mill near Blanding, Utah. Twin declines would be developed into the uranium orebody for purposes of ore haulage, mine ventilation and a secondary escape route. Two 7-foot diameter mine ventilation boreholes would be drilled. A total of 22 development holes would be drilled to further delineate the orebody. A well would be drilled on site to provide water for dust suppression and drilling operations. Surface facilities would include a mine yard/portal area, office/shop area, ore stockpile area, waste rock disposal area, two topsoil stockpile areas, and two ventilation borehole areas. Total surface disturbance would be 4.5 acres, the majority of which (3.5 acres) would occur within areas of preexisting mining disturbance. For a detailed description of the Proposed Action the reader should refer to the attached EA.

The Proposed Action would meet the underlying need for UEC to mine a valuable deposit of uranium from unpatented mining claims under the authority of the mining laws of the United States, while ensuring that operations are conducted in a manner that prevents unnecessary or undue degradation of public lands and conforms to the management prescriptions in the BLM land use plan.

The BLM considered two alternatives, as documented in the EA: the No Action Alternative and the Proposed Action.

## PLAN CONFORMANCE AND CONSISTENCY:

The Proposed Action is in conformance with multiple management objectives and decisions of the BLM MFO Record of Decision and Resource Management Plan (RMP), approved in November 2008 (BLM 2008a). The RMP provides for a variety of mineral exploration and development activities within the planning area. BLM's goals and objectives for management of mineral resources, as stated in the RMP, are to "continue to meet local and national energy and other public mineral needs to the extent possible," and to "provide opportunities for

environmentally responsible exploration and development of mineral and energy resources subject to appropriate BLM policies, laws, and regulations" (BLM 2008a:79).

Specific management decisions in the RMP include those pertaining to locatable minerals (BLM 2008a:82–83). The RMP identifies lands available for mineral entry and makes recommendations for withdrawal. All public domain lands in the MFO overlying federal minerals are available for operations conducted under the mining laws unless specifically withdrawn (Management Decisions Min-4, Min-16, and Min-17, BLM 2008a:82). The proposed Daneros project area is not recommended in the RMP for withdrawal and remains open to mineral entry under the General Mining Law of 1872, as amended.

The BLM's primary purpose for considering the Proposed Action is to "evaluate all operations authorized by the mining laws in the context of its requirement to prevent unnecessary or undue degradation of Federal lands and resources" and to ensure that "consistent with the rights afforded claimants under the mining laws, operations will conform to the management prescriptions in the plan" (BLM 2008a: 82–83; Min-18).

## FINDING OF NO SIGNIFICANT IMPACT DETERMINATION:

Based upon a review of the EA and the supporting documents, I have determined that the project is not a major federal action and will not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27, and do not exceed those effects as described in the MFO Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) (BLM 2008b). Therefore, an environmental impact statement is not needed. This finding is based on the context and intensity of the project as described below.

## Context:

The Daneros mine project is a site-specific action directly involving approximately 4.5 acres of BLM-administered land that by itself does not have international, national, regional, or state-wide importance. The project is located in a remote but easily accessible area of San Juan County, Utah, where uranium mining has occurred in the past. Three small uranium mines are located in Bullseye Canyon within 0.5 mile of the proposed mine location. The proposed mine would occupy a portion of one of the old waste rock dumps.

## Intensity:

The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27 and incorporated into BLM's Critical Elements of the Human Environment list (H-1790-1), and supplemental Instruction Memorandum, Acts, regulations and Executive Orders. The following have been considered in evaluating intensity for this proposal:

### 1. Impacts may be both beneficial and adverse.

The environmental impacts of the Proposed Action are fully disclosed in the EA. Mitigating measures to reduce impacts were incorporated into the Proposed Action. None of the environmental effects discussed in detail in the EA and associated appendices are considered significant, nor do the effects exceed those described in the MFO Proposed RMP/FEIS (BLM 2008b).

Adverse effects include minor impacts to air quality, vegetation, soils, desert bighorn sheep, visual resources, recreation, and human health and safety that would occur during the seven-year mine operation. Closure of the old McCarty–Coleman Decline and reclamation of a part of the old waste rock dump would result in minor beneficial cumulative impacts to water quality, air quality, and human health and safety. Minor beneficial impacts to non-motorized recreationalists would result from the seven-year restriction of public access on County Road D0029. Uranium produced from the project would be used to generate electricity by cleaner nuclear fuel technologies which may result indirectly in a small beneficial reduction in global carbon dioxide levels.

**2. The degree to which the selected alternative will affect public health or safety**.

The issue of human health and safety is analyzed in detail in the EA. Adverse effects considered include health risks for mine workers and the general public from radiation hazards and transportation. These impacts are expected to be minimal based on the protective measures described in the Proposed Action. Closure of the old McCarty–Coleman Decline and reclamation of a part of the old waste rock dump would have a minor beneficial effect by reducing the public's exposure to radiation on site.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wilderness, wild and scenic rivers, or ecologically critical areas**.

As listed in Appendix A of the EA, the following Critical Elements of the Human Environment will not be affected because they are not present in the project area: Areas of Critical Environmental Concern (ACEC), Prime or Unique Farmlands, Wetlands or Riparian Zones, Wild or Scenic Rivers, and Designated Wilderness or Wilderness Study Areas (WSA). Cultural resource inventories were conducted for the Area of Potential Effect (APE). No National Register of Historic Places (NRHP)-eligible or otherwise significant cultural resources were found in the APE. No historic properties would be affected by the Proposed Action.

**4. The degree to which the effects on the quality of the human environment are likely to be highly controversial**.

Public input regarding the Proposed Action has been solicited through a scoping and public review process initiated in September 2007. The MPO was made available to several federal, state, and local agencies and the general public for a 30-day review and scoping period beginning on November 12, 2008. As stated in Section 1.7 of the EA, the BLM received 12 responses during the scoping period which helped focus detailed analysis in the EA to the following four issues: air quality, water quality, wildlife, and human health and safety. The EA was released for a 30-day public review and comment period, which ended on April 13, 2009, during which the BLM received six written comment letters, two from members of the general public, two from organizations, and two from state or local governmental entities.

Three respondents were in favor of the project because of its economic benefits to the local community. One respondent, the Utah Division of Water Rights, commented that mining disturbance may impair existing water rights and recommended monitoring of Bullseye Spring and Well. The BLM added a discussion of impacts to the water quantity section of the EA and accepted the State's recommendation to require water monitoring. Two organizations, Southern Utah Wilderness Alliance and Uranium Watch, raised several concerns about the adequacy of the

EA, including alternatives considered and impacts to air quality, water quality, and human health and safety.

Several changes were made to the EA as a result of public comments. Changes ranged from minor editorial corrections to additional discussion of environmental impacts, none of which resulted in identification of significant new impacts or affected the scope of the analysis. The BLM's responses to public comments, including required changes to the EA, are summarized in Appendix M of the EA. Although changes were made to the EA to address public concerns about the project, it is likely that the project will remain contentious for certain groups or members of the public who are generally opposed to uranium mining in this part of Utah. However, based on the number and content of the comments received from the public, the effects on the quality of the human environment are not considered highly controversial.

**5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks**.

The Proposed Action is not unique or unusual. Uranium mining has a long history in southeast Utah and other parts of the Colorado Plateau. The environmental effects to the human environment are fully analyzed in the EA. There are no predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

**6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

The Proposed Action neither establishes a precedent for future BLM actions with significant effects nor represents a decision in principle about a future consideration.

**7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts – which include connected actions regardless of land ownership.**

No individually or cumulatively significant impacts were identified for the Proposed Action. A complete disclosure of the effects of the project is contained in Chapter 4 of the EA. The minor adverse and beneficial impacts identified for the Proposed Action, in conjunction with any impacts of other past, present, or reasonably foreseeable future actions will have negligible cumulative impacts on the human environment.

***8.*** **The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

Intensive cultural resource inventories were conducted for the APE, including buffer areas around all project components and access roads. No Historic Properties (NRHP-eligible sites) were found in the APE. The Utah State Historic Preservation Office (USHPO) was consulted pursuant to Section 106 of the National Historic Preservation Act (NHPA), and that office concurred with the BLM's findings that no historic properties would be affected. Consultations were also conducted with 15 tribal entities in order to identify any concerns related to traditional cultural properties or sacred sites. No specific sites or areas of concern to the tribes were identified as a result of these consultations. The project will not adversely affect districts, sites, highways, structures, or other

objects listed in or eligible for listing in the National Register of Historic Places, nor will it cause loss or destruction of significant scientific, cultural, or historical resources.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973, or the degree to which the action may adversely affect: 1) a proposed to be listed endangered or threatened species or its habitat, or 2) a species on BLM's sensitive species list**.

Based on surveys and habitat assessment conducted by SWCA Environmental Consultants in May 2008 (see Appendix B of the EA), it was determined that none of the 10 federally listed species have the potential to occur within the proposed project area (PPA). The habitat is not suitable for any of the listed species and is not within any designated critical habitat for Mexican spotted owls or the four endangered fish species. The site survey indicates there are no federally listed or BLM special-status plant species within the PPA. Consultation with the U.S. Fish and Wildlife Service is not required since there are no known threatened or endangered species and associated habitat within or near the PPA, and listed species would not be affected by the Proposed Action.

**10. Whether the action threatens a violation of a federal, state, local, or tribal law, regulation or policy imposed for the protection of the environment, where non-federal requirements are consistent with federal requirements.**

The project does not violate any known federal, state, local, or tribal law or requirement imposed for the protection of the environment. Federal, state, local, and tribal interests were given the opportunity to participate in the environmental analysis process. Although several comments were received, none of the respondents identified a violation of applicable environmental laws, regulations, or other requirements. In addition, the project is consistent with applicable land management plans, policies, and programs.

## DECISION:

It is my decision to authorize UEC's Mining Plan of Operations (MPO) for the Daneros Mine, as analyzed under the Proposed Action of the EA. This decision is contingent upon: 1) UEC fulfilling environmental commitments by implementing all protective mitigation measures incorporated into its MPO and by adhering to the mitigation measures described in the EA and stipulated in Attachment A of this decision and, 2) UEC implementing the monitoring requirements in Attachment B of this decision.

**Authorities:**
The authority for this decision is contained in the Federal Land Policy and Management Act (FLPMA) of 1976.

**Compliance and Monitoring:**
The BLM will routinely inspect operations to verify compliance with the approved MPO and regulations at 43 CFR 3809 and 3715.

The specific monitoring programs that UEC will be required to implement are listed in Attachment B. These include the monitoring programs proposed by UEC in its MPO, as well as others required by the BLM as conditions of approval.

**Terms / Conditions / Stipulations:**
Potential impacts are mitigated through environmental commitments which are integral to the Proposed Action. These protective/mitigation measures are incorporated into UEC's MPO. The Proposed Action also incorporates the requirements of all applicable federal, state, and local laws, regulations, and permits as specified in Section 1.6 of the EA, and all applicable management actions prescribed in the BLM land use plan, including best management practices, standard operating procedures, and stipulations. One additional mitigation measure (stockpiling of inert waste rock) was identified and described fully in the EA. This measure was designed to mitigate minor impacts associated with the waste rock dump.

The conditions of approval that BLM has chosen to include in this decision are stipulated in Attachment A. The conditions of approval include the mitigation measure identified in the EA as well as specific environmental commitments and standard conditions incorporated into the Proposed Action.

## Alternatives Considered:

The EA considered two alternatives: the No Action Alternative and the Proposed Action Alternative. BLM has selected the Proposed Action Alternative. The No Action Alternative was not selected because the No Action Alternative does not meet the purpose and need for this project. According to 43 CFR 3809.411(d)(3), the proponent has a valid and existing right to develop the uranium resource if done so in an environmentally responsible manner. The environmental analysis documented in the EA shows that the Proposed Action would cause only minor environmental impacts and would not cause unnecessary or undue degradation of public lands, thereby precluding the need to select the No Action Alternative.

Section 2.4 was added to the EA for the purpose of considering an action alternative which was suggested by the public. Under this alternative, UEC would be required to clean up the old waste rock dump at the McCarty–Coleman Decline before commencing new mining activity. This alternative was not carried forward for detailed analysis because, as stated in Section 2.4 of the EA, this alternative is not needed to resolve conflicts or mitigate impacts of the Proposed Action and it does not meet the underlying need for the proposal.

## Rationale for Decision:

As explained previously, the Proposed Action is in conformance with the management decisions in the MFO RMP, approved in November 2008 (BLM 2008a). Approval of UEC's Mining Plan of Operations, with stipulations, would allow UEC to mine a valuable deposit of uranium under the authority of the mining laws of the United States while ensuring that operations are conducted in a manner that will prevent unnecessary or undue degradation as defined at 43 CFR 3089.5. The BLM has determined that the Daneros Mine operations will not cause unnecessary or undue degradation of public lands for the following reasons:

- Adherence to the approved Mining Plan of Operations would meet the performance standards at 43 CFR 3809.420.
- Operations are reasonably incident to prospecting, mining, or processing operations as defined at 43 CFR 3715.0-5.
- Based on the environmental analysis as documented in the EA, the Daneros mining operations, with proposed and required mitigation, would have minor impacts on the human environment.

Public input regarding the Proposed Action was solicited through a scoping and public review process initiated in September 2007. The MPO was made available to several federal, state, and local agencies and the general public for a 30-day review and scoping period beginning on November 12, 2008. The BLM received 12 responses during the scoping period which helped focus detailed analysis in the EA to the following four issues: air quality, water quality, wildlife and human health and safety. The EA was released for a 30-day public review and comment period, which ended on April 13, 2009, during which the BLM received a total of six written comment letters; two from individual members of the general public, two from organizations and two from state or local governmental entities.

Each comment was carefully reviewed by the BLM. Responses were prepared for each comment and are summarized in Appendix M of the EA. Several changes were made to the EA as a result of public comments. Changes ranged from minor editorial corrections to additional discussion of environmental impacts, none of which resulted in the identification of significant new impacts or affected the scope of analysis. As a result of public comments, the following changes were made to the EA: 1) a discussion of impacts resulting from restricting public access on County Road D0029 was added to Appendix A; 2) information was added to the air quality section, including updated estimates of criteria pollutant emissions from the project; 3) a discussion of impacts associated with the proposed temporary use of water from Fry Spring for dust suppression was added to Chapter 4 under water quality; 4) a discussion of potential impacts to the Bullseye Spring and Well was added to Chapter 4 under water quantity; and 5) Section 2.4 was added to consider an action alternative which would require UEC to clean up the old waste rock dump before commencing new mining activity.

**Appeals Language:**

If you do not agree and are adversely affected by this decision, you may request that the Utah BLM State Director review this decision. If you request a State Director Review, the request must be received in the Utah BLM State Office at 440 West 200 South, P.O. Box 45155, Salt Lake City, Utah 84145-0155, no later than 30 calendar days after you receive or have been notified of this decision. The request for State Director Review must be filed in accordance with the provisions in 43 CFR 3809.805. This decision will remain in effect while the State Director Review is pending, unless a Stay is granted by the State Director. If you request a Stay, you have the burden of proof to demonstrate that a Stay should be granted.

If the State Director does not make a decision on your request for review of this decision within 21 days of receipt of the request, you should consider the request declined and you may appeal this decision to the Interior Board of Land Appeals (IBLA). You may contact the Utah BLM State Office to determine when BLM received the request for State Director Review. You have 30 days from the end of the 21day period in which to file your Notice of Appeal with this office at Monticello Field Office at 365 North Main Street, P.O. Box 7, Monticello, Utah 84535, which we will forward to IBLA.

If you wish to bypass a State Director Review, this decision may be appealed directly to the IBLA in accordance with the regulations at 43 CFR 3809.801(a)(1). Your Notice of Appeal must be filed in this office at Monticello Field Office at 365 North Main Street, P.O. Box 7, Monticello, Utah 84535, within 30 days from receipt of this decision. As the appellant you have the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulations 43 CFR 4.21 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the IBLA, the petition for a stay must accompany your Notice of Appeal. Copies of the Notice of Appeal and petition for a stay must also be submitted to each party named in the decision and to the Office of the Solicitor at Federal Building Rm-6201, 125 South State Street, Salt Lake City, Utah 84138, at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted based on the standards listed below.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied;
2. The likelihood of the appellant's success on the merits;
3. The likelihood of immediate and irreparable harm if the stay is not granted; and
4. Whether the public interest favors granting the stay.

Authorized Officer

5/26/09
Date

**ATTACHMENT A**

**Conditions of Approval**
**Daneros Mine Plan of Operations**

1. UEC shall stockpile the inert waste rock removed from the two ventilation shafts. The shaft waste rock will be used for reclamation purposes as additional cover material applied evenly over the graded waste rock dump prior to applying topsoil. The stockpile shall be located within the area of potential affect (APE) which has been previously surveyed for cultural resources.

2. All waste rock will be checked with a gamma meter prior to disposal to ensure that material placed on the dump does not exceed 0.015 percent U3O8. Any sub-ore material exceeding 0.015 percent U3O8 will be placed in an interim stockpile and mixed with ore and shipped to the mill, or placed back in worked-out areas of the mine.

3. All operations shall be conducted in a manner that complies with pertinent federal, state, and local laws and regulations, including all permit requirements.

4. UEC will provide BLM with a copy of permits, plans, and monitoring reports issued or required by other local, state, and federal entities, including: U.S. Department of Labor Mine Safety and Health Administration (MSHA) mine permits, plans, and monitoring reports; State of Utah stream alteration permit, Utah Pollution Discharge Elimination System (UPDES) permit, water well permit, water right allocation; and San Juan County building permit.

5. UEC shall implement dust suppression measures including tarping of truck beds on ore haul trucks prior to leaving the mine, and application of water and/or other approved dust suppressants on the mine haulage road and other areas of the mine.

6. UEC shall implement all control measures in its Fugitive Dust Control Plan throughout the life of the operation.

7. The ore haulage contractors shall obtain all necessary permits and clearances, following U.S. Department of Transportation and Utah Department of Transportation regulations including establishment of an Emergency Response Plan.

8. UEC shall consult with the San Juan County Road Department for the placement and installation of all safety and directional signs and cattle guards on county roads.

9. UEC shall obtain any necessary gravel for the truck haul route from an authorized county material source and shall coordinate with the San Juan County Road Department prior to use.

10. Buildings and other facilities shall be painted a BLM-approved color from either the chart of Standard Environmental Colors or the chart of Supplemental Environmental Colors.

11. All chemicals and hydrocarbon products (including used oil) shall be contained and controlled in accordance with proposed containment measures and the Spill Prevention Control and Countermeasure (SPCC) Plan prepared pursuant to 40 CFR 112.

12. The BLM Hazardous Material Coordinator shall be notified as soon as possible if a spill occurs during ore transport or if an incident occurs resulting in the spill of petroleum products. Spill containment shall be initiated immediately and contaminated material shall be moved to the nearest approved landfill or disposal facility as appropriate.

13. In accordance with 29 CFR 1910.1200(g), UEC shall maintain a file containing Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances which are utilized during the course of construction, mining, and reclamation operations. This file shall be available for reference and inspection at all times at the site.

14. A roll-off container for disposal of solid waste shall be located on site. All solid waste shall be placed in the container and transported to an approved land fill.

15. Any solid wastes that qualify as low-level wastes for radiation contamination, per Nuclear Regulatory Commission (NRC) guidelines (i.e., not a product or a by-product of ore extraction or production), shall be handled in accordance with the Low-Level Radioactive Waste Policy Amendments Act of 1985 at an NRC-approved facility.

16. Recycling of applicable materials such as batteries, scrap metal, used oils, tires, and antifreeze shall take place during mine operations.

17. If a solvent station is installed to clean parts, it shall consist of a sink mounted on a small drum of solvent. The solvent shall be recycled to the drum after each use.

18. The operator shall immediately notify the BLM authorized officer of any cultural resources discovered as a result of operations under this authorization. The operator shall suspend all activities in the vicinity of such discovery and protect it until notified to proceed by the authorized officer.

19. All UEC employees and subcontractors must be informed by UEC before commencement of operations that any disturbance to, defacement of, or collection or removal of archaeological, historic, or sacred material will not be permitted and persons knowingly disturbing historic or archaeological sites will be subject to prosecution.

20. The BLM authorized officer must be notified by telephone immediately if human remains, funerary items, sacred objects, or objects of cultural patrimony are discovered. Further, the operator must stop activities in the vicinity of the discovery and protect it until notified to proceed by the authorized officer.

21. If vertebrate fossil(s) are encountered during mining operations, UEC shall immediately cease work in that area of the mine and notify the BLM authorized officer of the discovery.

22. UEC shall implement reclamation measures specified in its MPO but shall increase its proposed seed broadcast rate from 2 lbs/acre to 4 lbs/acre.

23. All topsoil shall be salvaged from disturbed areas and stockpiled prior to surface-disturbing activities.

24. All drill holes shall be plugged in accordance with Utah Division of Oil, Gas and Mining Rule R647-2-108.

25. As part of site reclamation, UEC shall excavate the ore stockpile area to remove all radionuclide-bearing rock with values above background. The rock shall either be transported to the White Mesa Mill for treatment or shall be returned to the mine workings.

26. UEC shall implement a Storm Water Pollution Prevention Plan and shall install erosion control devices before stripping of topsoil and grading. Erosion and sediment control devices shall be maintained throughout the life of the mining operations.

27. Safety signs and a gate shall be installed on County Road D0029 at the entrance to the mine to allow access by authorized mine personnel only.

28. UEC shall not install road signs directing the public onto County Road D5319.

29. UEC's Weed Control Plan shall be implemented throughout the life of the mining operation and during reclamation.

30. If necessary, UEC shall consult with the BLM and County weed control staff regarding problematic weed infestation areas, and appropriate control measures will be agreed upon prior to initiation.

31. Water samples shall be taken and analyzed from the new well and a report shall be submitted to BLM prior to using water for dust suppression.

32. Ore haul trucks shall be checked for radiation levels prior to leaving the mine site and the mill site on the return leg. If gamma readings are found to exceed the standards of Title 49 CFR 173, (that the external dose rate may not exceed an external radiation level of 1,000 millirems per hour [mrem/hr] at 3 meters from the unshielded material), the ore truck shall be cleaned using power wash or other method to meet appropriate radiation standards.

33. Portable sanitation facilities shall be provided on site during mining and reclamation operations and disposal shall be at an approved facility.

34. The mine shall operate in accordance with federal regulations that are designed to protect the mine workers and general public from radiation exposure.

35. Workers shall be protected through establishment of adequate ventilation and monitoring of radiation levels in the underground work areas in accordance with MSHA regulations at Title 30 CFR 57.5037 and Title 30 CFR 57.5047.

36. UEC shall notify BLM of temporary cessation of operations and shall secure the site using locked closures on all mine openings and buildings, and by maintaining structures, equipment, and facilities in an otherwise safe and environmentally acceptable condition.

37. No surface-disturbing activities or occupancy are allowed from April 1 to June 15 for lambing and from October 15 to December 15 for rutting desert bighorn sheep. The BLM Field Manager may grant an exception if it is determined that the animals are not present in the project area or the activity can be completed so as to not adversely affect the animals.

38. During times of temporary cessation (longer than one month), the entrance to the mine will be closed to exclude bats from entering the mine. The preferred method for exclusion of bats from an adit or shaft is to block the portal or collar with 1-inch–diameter chicken wire.

39. Raptor management will be guided by *Best Management Practices for Raptors and Their Associated Habitats in Utah* (BLM 2008b:Appendix M). If mining operations are scheduled to begin between the dates of January 1 and September 31, raptor surveys will be required prior to operations. Field surveys will be conducted as determined by the authorized officer of the BLM. Based on the result of the field survey, the authorized officer will determine if appropriate buffers and timing limitations are necessary.

40. Underground mine equipment with internal combustion engines shall meet MSHA emission standards.

41. The generator must meet strict U.S. Environmental Protection Agency (EPA) New Source Performance Standards for emissions at 40 CFR Part 60.

42. Stationary mine equipment located on the surface, such as generators, with internal combustion engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams (g) of nitrogen oxides (NOx) per horsepower-hour. Equipment with 300 design-rated horsepower must not emit more than 1 g of NOx per horsepower-hour. This requirement does not apply to engines of less than or equal to 40 design-rated horsepower.

43. UEC shall use clean low-sulfur fuels for all diesel engines.

## ATTACHMENT B

### Compliance and Monitoring Requirements
### Daneros Mine Plan of Operations

1. UEC shall monitor flow rates at the Bullseye Spring and Well on a quarterly basis beginning immediately prior to mine development and continuing until reclamation is completed. An annual report shall be submitted to the BLM. Copies of the reports shall be submitted to the water rights owner. If it is determined that flow rates are diminished as a result of mining activity, UEC shall be required to mitigate potential damage to the livestock operations through a replacement well or other water replacement measures to be determined by BLM in consultation with the Division of Water Rights.

2. Composite samples shall be made from quarterly waste rock grab samples taken from the waste rock dump and analyzed once per year to ensure that the material is still considered inert. This data and an annual summary report shall be provided to the BLM. If waste rock sampling indicates acid forming potential, UEC shall prepare and submit a mitigation plan to the BLM for approval.

3. UEC shall measure radon levels and flow rates in the mine exhaust air consistent with the standards of EPA regulations at 40 CFR Part 61. This data would then be input into an EPA air-modeling program to predict radiation levels at the nearest residence. The collected data and modeling results shall be reported annually to the Utah Division of Air Quality. UEC shall provide copies of these reports to the BLM.

4. Personal monitoring and active ventilation for radon emissions and gamma exposure rates in the mine workings shall be implemented as required by MSHA safety provisions.

5. UEC shall implement the monitoring and control measures outlined in the Noxious Weed and Invasive Plant Control Plan. Annual reports shall be submitted to the BLM and San Juan County pursuant to Section 8.0 of the Plan.

6. A gamma survey by a certified Radiation Safety Officer shall be conducted on the waste rock dump after application of cover material and prior to seeding. The survey report shall be submitted to BLM. If the gamma radiation dose, assuming a 14-day exposure period, is found to exceed 0.1 mrem/yr over background, then UEC shall apply additional cover material to meet this standard

7. All waste rock will be checked with a gamma meter prior to disposal to ensure that material placed on the dump does not exceed 0.015 percent U3O8. Any sub-ore material exceeding 0.015 percent U3O8 will be placed in an interim stockpile and mixed with ore and shipped to the mill, or placed back in worked-out areas of the mine.

# U.S. Department of the Interior
# Bureau of Land Management

# Environmental Assessment
# for the
# Daneros Mine Project

Applicant/Address:

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Prepared for:

Monticello Field Office
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Monticello, Utah 84535

May 2009

# Table of Contents

## List of Appendices



## List of Tables

# 1 PURPOSE AND NEED

## 1.1 Introduction

Utah Energy Corporation (UEC) proposes to develop a small conventional underground uranium mine on the Daneros mine property in southeast Utah (Proposed Action). This Environmental Assessment (EA) has been prepared to analyze the potential impacts to the environment that could result from implementation of the Proposed Action or the No Action Alternative. This EA analyzes the site-specific impacts associated with the Proposed Action and its alternatives, identifies mitigation measures to potentially reduce or eliminate those impacts, and provides agency decision makers with detailed information upon which to approve or deny the Proposed Action or an alternative. It will assist the U.S. Department of the Interior (USDOI) Bureau of Land Management (BLM) in project planning, ensuring compliance with the National Environmental Policy Act (NEPA) of 1969, and in making a determination as to whether any significant impacts could result from either of the analyzed Alternatives.

This EA complies with the requirements of NEPA and federal regulations found in 40 Code of Federal Regulations (CFR), Chapter V, and 43 CFR 4.413. The project record contains an interdisciplinary analysis to support the findings in this document and is located at the BLM Monticello Field Office (MFO). Pursuant to 40 CFR 1508.28 and 1502.21, this site-specific EA tiers to the information and analysis contained in the BLM MFO Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) of August 2008 (BLM 2008b). Tiering to a NEPA document containing broader impact analysis allows the BLM to consider a narrower range of alternatives for this Proposed Action. In particular, this EA tiers to the cumulative impact analysis contained in the FEIS, coupled with the level of development proposed by the Reasonable Foreseeable Development (RFD) Scenario for the broader impacts of mineral development.

Significance is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of Finding of No Significant Impact (FONSI). A Decision Record, which includes a FONSI statement, is a document that briefly presents the reasons why implementation of the Proposed Action would not result in significant environmental impacts beyond those already addressed in the BLM MFO RMP dated November 17, 2008 (BLM 2008a). If the decision-maker determines that this project has significant impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the Alternative selected.

## 1.2 Background

In October 2008, UEC submitted to the BLM a detailed Mining Plan of Operations (MPO) for the proposed Daneros Mine pursuant to 43 CFR Subpart 3809, which regulates surface operations conducted under the General Mining Law of 1872 and other applicable laws and regulations. The complete MPO received in October 2008 corrected deficiencies in UEC's initial filing, which was received by BLM in September 2007. The BLM is the lead agency for preparation of this EA, and the BLM MFO manager is the authorizing officer.

There is a growing regional and national demand for a continuous, reliable energy supply, and a need to reduce U.S. dependence on foreign energy supplies. Total electricity consumption in the United States is projected to grow from 3,814 billion kilowatt-hours in 2006 to 4,972 billion kilowatt-hours in 2030, increasing at an average annual rate of 1.1 percent (Energy Information Administration [EIA] 2008).

Foreign energy supplies accounted for 30 percent of U.S. energy consumption in 2007 and are projected to decrease to 27 percent in 2030 (EIA 2008).

Uranium ore is needed for the continued operation of existing nuclear reactors in the United States as well as the future operation of new nuclear reactors proposed for construction. As of December 31, 2007, there were 104 commercial nuclear reactors licensed by the U.S. Nuclear Regulatory Commission (NRC), and there are 24 new reactors proposed for construction. In 2005, existing U.S. nuclear reactors required 48.5 million pounds of uranium fuel to operate; at that time, uranium-mining production in the United States was only 3.0 million pounds (EIA 2008).

## 1.3 Proposed Project Location

The Daneros Mine property is located in Bullseye Canyon, in the central portion of the Colorado Plateau in southeastern Utah (Appendix K:Figure 1). The Daneros Mine is located approximately 4 miles southwest of Fry Canyon, Utah, in San Juan County, within the NE ¼ of the SW ¼ and the NW ¼ of the SE ¼ of Section 6, Township 37 South, Range 16 East, Salt Lake Meridian (Appendix K:Figure 2). The mine is accessed via County Road B258 (Radium King Road) and County Road D0029.

## 1.4 Purpose and Need for the Proposed Action

The BLM MFO Record of Decision and RMP of November 2008 specifies that BLM will "provide opportunities for environmentally responsible exploration and development of mineral and energy resources subject to appropriate BLM policies, laws, and regulations" (BLM 2008a:79). The Federal Land Policy and Management Act of 1976 (FLPMA) and regulations at 43 CFR Subpart 3809 mandate that operations authorized by the mining laws are conducted in a manner that will prevent unnecessary or undue degradation of public lands. Accordingly, the BLM's primary purpose for considering the Proposed Action, as stated in the 2008 RMP, is to "evaluate all operations authorized by the mining laws in the context of its requirement to prevent unnecessary or undue degradation of Federal lands and resources" and to ensure that "consistent with the rights afforded claimants under the mining laws, operations will conform to the management prescriptions in the plan" (Management Decision MIN-18; BLM 2008a:82). To accomplish its primary purpose, BLM must ensure that operations meet the performance standards outlined at 43 CFR 3809.420. These include compliance with federal and state air quality and water quality standards, and measures to protect public safety and cultural and wildlife resources.

As required by federal regulations at 43 CFR 3809.11, UEC has filed a MPO for the development of a small conventional underground uranium mine. The underlying need for the Proposed Action is for UEC to mine a valuable deposit of uranium from unpatented mining claims under the authority of the Mining Law of 1872, as amended. These lands are not withdrawn from mineral entry and therefore, are subject to location under the mining laws of the United States (Management Decisions MIN-4, MIN-16 and MIN-31; BLM 2008a:79, 82, 84).

The BLM manages public lands for multiple uses, including the exploration and development of locatable minerals. The Record of Decision and RMP declares BLM's policy as: "Continue to meet local and national energy and other public minerals needs to the extent possible" (BLM 2008a:79). The Energy Policy Act of 2005 emphasizes adding energy supplies from diverse sources including nuclear power. The Energy Independence and Security Act of 2007 was enacted, in part, to move the United States toward greater energy independence. The BLM recognizes that public lands are an important source of the nation's energy and mineral resources. The Proposed Action would provide a domestic source of uranium

that may help fuel nuclear power plants in the United States, and therefore would help meet BLM's broad policy objectives.

## 1.5 Conformance with BLM Land Use Plan

The Proposed Action is in conformance with the RMP, which was approved by the Record of Decision on November 17, 2008. The RMP provides for a variety of mineral exploration and development activities within the planning area. Page 79 of the RMP reads as follows: "Continue to meet local and national energy and other public mineral needs to the extent possible. Provide opportunities for environmentally responsible exploration and development of mineral and energy resources subject to appropriate BLM policies, laws, and regulations" (BLM 2008a:79). The RMP identifies lands available for mineral entry. The Proposed Action is in conformance with Minerals Decision 16 of the RMP: "All public domain lands overlying federal minerals are available for mining claim location unless specifically withdrawn from mineral entry by Secretarial Order or public law or segregated from mineral entry under specific reservations, such as an R&PP lease" (BLM 2008a:82). The proposed project area (PPA) is not recommended for withdrawal in the RMP but remains open to mineral entry under the General Mining Law, as amended.

## 1.6 Relationship to Statutes, Regulations, or other Plans

Mining operations are subject to a wide range of federal, state, and local requirements. Many of these require permits, approvals or consultations before the mining operations commence, whereas others mandate the submission of various documents, or establish specific prohibitions or standards (EPA 1994). The following section describes the purposes and requirements of the major federal, state, and local statutes. The Proposed Action would be subject to following laws, regulations, and policies where applicable:

- **27 CFR 555 Commerce in Explosives –** authorizes the Bureau of Alcohol, Tobacco and Firearms to regulate the sale, transportation, and storage of explosives.

- **43 CFR 3715 Use and Occupancy Under the General Mining Laws** – regulates residency or seasonal occupancy of mining claims by mining claimants and requires that BLM concur with the use and occupancy of public lands for the development of locatable mineral deposits by limiting such use or occupancy to that which is reasonably incident.

- **43 CFR 3809 Mining Claims Under the General Mining Laws** – requires proper permits and authorizations for mineral exploration, mining, and reclamation actions on the public lands administered by BLM and sets performance standards for preventing undue and unnecessary degradation of federal lands.

- **Clean Air Act** – establishes National Ambient Air Quality Standards to control air pollution. Impacts to air quality from mineral development are controlled by mitigation measures developed on a case-by-case basis. The Utah Division of Air Quality oversees air quality regulations and standards for stationary sources of air pollution.

- **Comprehensive Environmental Response, Compensation and Liability Act** (CERCLA) – requires owners/operators to report to the government releases of hazardous substances to the environment and inventory chemicals handled.

- **Endangered Species Act** – mandates protection for plants and animals that are federally listed as threatened with or in danger of extinction. Concurrence from the U.S. Fish and Wildlife Service

would be required, were the Proposed Action to potentially or adversely affect any threatened, endangered, or candidate species, as determined by the authorizing agency.

- **Executive Order 12898 of 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations –** requires federal agencies to ensure that proposed projects under their jurisdictions do not cause a disproportionate environmental impact that would affect any group of people because of a lack of political or economic strength. Environmental justice requires "the fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

- **Federal Land Policy and Management Act (FLPMA)** – requires the Secretary of the Interior to manage public lands under principles of multiple use and sustained yield and authorizes the Secretary to regulate the use of public land for the prevention of unnecessary or undue degradation.

- **Federal Mine Safety and Health Act –** authorizes the U.S. Department of Labor Mine Safety and Health Administration (MSHA) to regulate more effective means and measures to improve the working conditions and practices in the nation's mines, in order to prevent death and serious physical harm, and in order to prevent occupational diseases originating in such mines. To comply with these standards, UEC would be required to obtain the necessary MSHA mine permit and to submit an MSHA-approved miner training plan, escape and evacuation plan, and ventilation plan.

- **Federal Water Pollution Control Act (Clean Water Act [CWA])** – directs standards to be set for surface water quality and for controlling discharges to waters of the U.S. Under Section 402 of the Clean Water Act (as amended), the EPA was directed to develop a phased approach to regulate stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. Industrial activities disturbing more than 1 acre of land may require an NPDES permit for stormwater discharge. Depending on the acreage disturbed, either a Phase I industrial activity (5 or more acres of disturbance) or a Phase II small construction activities (between 1 and 5 acres of disturbance) permit may be required. Additionally, a U.S. Army Corps of Engineers Section 404 permit and associated Section 401 certification for the discharge of dredge and fill materials into waters of the U.S. may be required.

- **General Mining Law of 1872 –**allows private U.S. citizens and businesses to prospect for, discover, locate and extract certain valuable minerals on federal public domain lands that are open for that purpose. Later amendments, including the Hard Rock Mining Act, withdrew particular public lands from mining (Kubiszewski 2008).

- **Migratory Bird Treaty Act** – prohibits the taking, killing, or possessing of migratory bird species.

- **National Environmental Policy Act (NEPA)** – requires interdisciplinary approach to ensure disclosure of proper consideration being given to the environment prior to undertaking any federal action that may impact the environment.

- **National Historic Preservation Act (NHPA) –** requires federal agencies to inventory and protect historic and archaeological resources. Concurrence from the State Historic Preservation Officer is required, if any historic properties may be affected by the Proposed Action.

- **Resource Conservation and Recovery Act (RCRA)** – regulates the generation, storage, and disposal of hazardous waste and management of solid, non-hazardous waste. Under the **Bevill Amendment**, wastes that are uniquely associated with the extraction of ores and minerals are

exempt from RCRA requirements, but not wastes generated at mining sites that are not uniquely associated with the mining operations, such as solvents, lubricants, or degreasers (EPA 2009).

- **Safe Drinking Water Act** – directs standards to be set for quality of drinking water supplied to the public (states are primary authorities) and regulates underground injection operations.

Other requirements that would be met include building permits from the San Juan County Building Department; submission to the Utah Division of Oil, Gas and Mining (UDOGM) of a Notice of Intent to Conduct Small Mining Operations and issuance of a Small Mine Permit by the UDOGM. The Utah Division of Air Quality may require a New Source Review, including an Approval Order and an Operating Permit. A State of Utah permit to drill a water well has been received and is on record with the Project File.

## 1.7 Identification of Issues

Appropriate scoping helps identify resources that could be impacted, reducing the chances of overlooking a potentially significant issue or reasonable alternative. The scoping process for this EA meets the public involvement requirements of FLPMA and NEPA. The process includes soliciting input from interested agencies, organizations, and individuals on issues, concerns, needs, and resource uses. For internal scoping, BLM resource specialists utilized the Interdisciplinary Team Checklist found in Appendix A. As part of the public scoping effort, letters and news releases solicited input from agencies and the public (see Chapter 5).

Public scoping for this EA started on September 13, 2007, when BLM posted the proposal on its Environmental Notification Bulletin Board. On October 27, 2008, the BLM sent letters to 15 tribal entities requesting comments on the Proposed Action. BLM again informed the public on November 12, 2008, in local newspapers regarding the proposal and asking for further input. Letters and a copy of the MPO were also sent to interested parties. Finally, on December 20, 2008, a letter was sent to several State of Utah agencies requesting any input on issues and concerns.

The BLM received 11 comment letters on the Proposed Action during the scoping period. These letters, presenting a range of information, allegations, and issues, were carefully considered and helped drive both issue identification and impact analysis. Not all of the comments presented during scoping are actual resource issues to be discussed in detail in this EA. Some comments are outside the scope of this EA, some are addressed through standard operating procedures because they are required by federal law, rule, or regulation, and some are issues that will be discussed in detail in this EA.

NEPA requires that the discussion of issues and concerns are commensurate with the potential impacts. Federal Council on Environmental Quality (CEQ) Regulations (1500.5(c)) state "impacts shall be discussed in proportion to their significance." Other CEQ Regulations (1501.7 (3)) make it clear that discussion of all resources is not necessary, only those that are significant. This allows the BLM to narrow the discussion of the issues in the EA to a brief presentation (e.g., Interdisciplinary Team Checklist in Appendix A) of why the Proposed Action would not have a significant effect, and focus the discussion on relevant resources that may be impacted.

The national BLM NEPA handbook no longer requires a listing of the "Critical Elements of the Human Environment," however, the Utah NEPA Guidebook and direction from the Utah BLM State Office allows use of the Interdisciplinary Checklist found in Appendix A. Based on scoping, the BLM found four issues/resources that required detailed discussion in the EA. All comment letters were carefully reviewed and responses to scoping comments are found in Chapter 5.

There were a range of comments, the majority concerning the NEPA process, human health and safety, inadequacy of the MPO, water resources, reclamation, transportation, cultural resources, cumulative impacts, and air quality. Upon completion of the scoping process, the following issues were identified as warranting further analysis in this EA:

### *1.7.1 Air Quality*

- Would federal and state emission thresholds for air pollutants be exceeded?
- What would the effect of regional haze be on any Class I areas*?*

### *1.7.2 Water Quality*

- Would state water quality standards be exceeded?
- What would the effect of the presence of metals and hazardous materials be on surface and groundwater resources?

### *1.7.3 Wildlife*

- The increase in human presence and activity may cause desert bighorn sheep to abandon crucial habitat in Bullseye Canyon.

### *1.7.4 Human Health and Safety*

- Exposure of employees and the public to unsafe levels of radon gas and gamma radiation.
- Increased travel of large vehicles on public roads and increased likelihood of spills and accidents.

## 1.8 Summary

This chapter has presented the Purpose and Need for the Proposed Action, as well as the relevant issues, i.e., those elements of the human environment that could be affected by the implementation of the Proposed Action. In order to meet the purpose and need of the Proposed Action in a way that resolves the issues, the BLM has developed Alternative A – Proposed Action, with much of the mitigation built in. Alternative B – No Action would not meet the purpose and need of this project. It provides baseline environmental data and serves as comparison for analysis of the potential resource impacts of Alternative A. These alternatives are presented in Chapter 2. The affected environment is presented in Chapter 3, focusing on only that part of the environment that might be impacted to the degree that detailed analysis is necessary. The potential environmental impacts or consequences resulting from the implementation of each Alternative are then analyzed in Chapter 4 for each of the identified issues.

# 2 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

## 2.1 Introduction

This document analyzes two alternatives: the Proposed Action Alternative and the No Action Alternative. Under the Proposed Action Alternative, underground uranium mining would occur at the Daneros mine property. Under the No Action Alternative, the MPO would not be approved and mining operations would not occur. The No Action Alternative is included to provide a baseline for analysis. No issues or unresolved conflicts were identified that would necessitate consideration of other action alternatives.

## 2.2 Alternative A – Proposed Action

UEC proposes to develop a small conventional underground uranium mine called the Daneros Mine. The project location is shown in Figures 1 and 2 (see Appendix K). Included in the Proposed Action are plans to drill 22 development holes, primarily on existing roadbeds, to delineate the orebody. Plans also include development of two portals (a main portal and a vent portal), a mine yard area, stockpile areas, waste pile areas, two mine ventilation boreholes, and an office/shop area where there would be a water well. Ore would be transported by truck on existing county roads to the existing Denison Mines' White Mesa Mill near Blanding, Utah. No ore processing would occur at the site. Mining would continue through 2016. The total amount of uranium ore proposed for extraction is 100,000 tons. Mining would begin once all authorizations (required bond, water rights, etc.) are received.

The Proposed Action summarizes more detailed information provided in the MPO. Some key information is included as appendices to the EA; the entire MPO is incorporated by reference. The Proposed Action incorporates the requirements of all applicable federal, state, and local laws, regulations, and permits as specified in Section 1.6. The Proposed Action also incorporates all applicable management actions prescribed in the BLM Land Use Plan, including Best Management Practices (BMPs), Standard Operating Procedures (SOPs), and stipulations. Mitigation or design measures are included in the Proposed Action to reduce the impacts to sensitive resources. These built-in mitigation measures include public and worker protection from radiation exposure (Appendix I and Appendix D), stormwater pollution prevention measures (Appendix E), weed control (Appendix H), proper waste disposal (UEC 2008:10), and approved revegetation and reclamation methods (UEC 2008:Item H); these are discussed below and presented as an integral part of the Proposed Action. The mine would operate in accordance with federal regulations that are designed to protect the mine workers and general public from radiation exposure.

### *2.2.1 Mine Development*

There are three primary mine development activities being proposed: the construction of the area where the mine and vent portals, shop/office yard, and stock and waste piles are located; the drilling of 22 development drill holes; and the drilling of two vent holes. Total surface disturbance would be 4.5 acres, which includes 3.5 acres of previous disturbance. New surface disturbances include 0.86 acre for topsoil and the mine and shop yards. Existing disturbance includes the McCarty–Coleman waste pile, ore pad, two vent pads, drill roads, and access roads. The mine property consists of 65 unpatented mining claims located on public lands administered by the BLM. Surface activity would only occur on six of the 65 mining claims (Appendix K:Figure 2).

The mine portal would be an excavated 30-foot cut to produce a highwall with a 1:1 slope. The excavation of the main portal would produce 3,030 cubic yards of waste rock which would be used for fill material at the mine and shop/office yards. The slope would be stabilized with rock anchors on a 2.5 by 2.5–foot pattern and with chain-link fabric and sealant approved by the MSHA.

Twin declines would be developed to access the underground ore (Appendix K:Figure 3). The main decline would serve as the main access and haul route and would measure 10 feet wide, 12 feet high, and 990 feet long at a 7.6 percent decline. The vent decline would be used for ventilation as well as a secondary escape route and would measure 7 feet wide, 7 feet high, and 970 feet long at a 7.7 percent decline. Two 8-foot-high, 12-foot-wide drifts would be cut through the orebody with cross-cuts and connectors every 100 feet. See Appendix K, Figures 4 and 5 for simplified geologic information of the PPA.

Twenty-two development drill holes (Appendix K:Figure 3) would be drilled to delineate the ore body and would be located largely on existing roads. The holes would be approximately 6 inches in diameter and 400–500 feet deep. Because the holes are relatively shallow, a truck-mounted drill rig is used to drill the holes; therefore no drill pads are constructed for the drilling. Drilling would be completed using only air, however, if water is encountered then drilling fluids would be required so a small shallow mud pit would be constructed near the drill rig to contain drilling fluids and cuttings. These mud pits would be a concave impression in the ground approximately 8 feet in diameter and 1–2 feet deep. Drill holes would be plugged and drill sites would be reclaimed concurrent with operations.

Two vent holes (380 and 525 feet deep, respectively) would be drilled during mine development. The surface holes would be 7 feet in diameter with a 6-foot casing, and would be screened on top to prevent entry. Vents would have a concrete foundation approximately 2 feet above ground level and 20 feet in diameter. The surface structures associated with the vent holes would be placed within existing disturbed roads and drill pads. Access to the vent hole surface location would be on existing roads shown on Figure 3 (see Appendix K). The vent pilot holes would be drilled from the surface and the main vent holes drilled from the bottom up. This would be accomplished by running drill steel from a drilling machine at the surface through the pilot holes to the underground mine workings and connecting it to a 7-foot-diameter boring bit hauled underground. The large boring bit would then be rotated and pulled to the surface by the drilling machine, creating a 7-foot-diameter borehole. Waste rock from the ventilation shafts would be hauled out the main access and haulage route, eliminating the need to haul waste rock from the surface vent location. All mine openings would be secured with locked gates or grates to ensure public safety. An appropriate closure would be placed on the old McCarty–Coleman Decline to prevent bat colony establishment until the old decline is eventually covered by waste rock as mining progresses. No bats, guano, or insect parts (evidence of bat foraging) were found during surveys of the mine opening, implying that this mine opening holds little to no bat-habitat value.

**Surface Support Facilities**

The location of proposed surface facilities, including the portal and service areas, are shown on Figure 3, Appendix K. Plan 6 of the MPO (UEC 2008) shows the location and nominal size of specific buildings, which would consist of a shop and an office. The shop would be a single-story structure measuring 30 by 40 feet, built on a concrete slab. The office would be a single-story structure, 8 by 40 feet, also built on a concrete slab. Buildings would be painted a color from the BLM standard color palette to minimize visual contrast. Construction would require a building permit from San Juan County and would comply with all applicable building codes as specified by the San Juan County Building Inspector. Utility-supplied power is unavailable at the mine site. One 350-kilowatt generator would be located at the portal site and used to supply power to surface facilities and to the underground fans. A power line would run underground from the generator to the fans.

Fuel for the operation would be stored on site in a 2,000-gallon fuel storage container. The fuel storage tank would be 110 feet from the mine portal in the office/shop area. The fueling station would be surrounded by 2-foot-high compacted soil berms and lined with a 6 mil high-density polyethylene plastic liner to contain any fuel spills or leaks. The 4,000-gallon containment area is designed to contain 200 percent of the 2,000-gallon storage container (4,000 gallons) plus precipitation from a six-hour rain event. Other oils, lubricants, and chemicals would be stored in a partitioned and locked area within the shop. UEC would be required to have a Spill Prevention Control and Countermeasure (SPCC) Plan under EPA regulations at 40 CFR Part 112. The SPCC Plan would be posted near the fuel storage and shop areas.

Up to 5,000 gallons of water per day would be required for mine operations and dust suppression. A well to the Cutler White Rim aquifer would be drilled near the shop as shown on Plan 6 of the MPO (UEC 2008). The well would be six inches in diameter with an estimated depth of 400 feet. The well would be cased and grouted. A down-hole pump would pump water through a 2-inch pipeline to a 1,000-gallon pressure holding tank. An application to drill the water well has been approved by the State of Utah. An application to use the well water is pending at this time. All necessary authorizations would be received prior to use of the water well. Until the well is permitted, water would be temporarily hauled from the existing Fry Spring for drilling operations and dust suppression. Water from the Fry Spring would be required for up to 4–6 months, allowing time for the State water well permits and construction of the shop/office pad. An agreement with Sandy Johnson, the water right holder, is on file and an Application for Temporary Change of Water has been filed with the State of Utah, Division of Water Rights. Drinking water would be provided by contract with Culligan Water Company; shower water would be transported from and pumped back to holding tanks supplied by contract with Prairie Dawg Portable Services. Chemical toilets would also be provided and maintained by Prairie Dawg Portable Services.

**Storm Water Prevention Control Measures**

All erosion control measures would be in place prior to clearing, stripping of topsoil, or grading. Approved sediment control measures would be in place at all times: silt fences would be placed and adequately maintained, and seeded areas would be regularly monitored to ensure proper function and the timely soil stabilization of denuded areas. Additionally, stripped topsoil would be stockpiled, and all seeded areas protected until growth has been established. Erosion control measures would be implemented around the perimeter of all soil-disturbing activities. Such measures consist of proper signage, adequate drainage of all disturbed areas, diversion dikes, earthen berms, silt fences, straw rolls, and other sediment-trapping measures.

Specifics are found in Plan 10-A and 10-B of the MPO, Storm Water Prevention Plan Notes, and would follow San Juan County standards, Utah Department of Environmental Quality standards and specifications, and generally accepted Best Management Practices. A Joint Permit Application Form for the U.S. Army Corps of Engineers (CWA Section 404 and Rivers and Harbors Act Section 10) and the Utah State Engineer's Office (for Natural Stream channels) has been submitted and is awaiting approval.

**Topsoil Stockpile**

Approximately 12 inches of soil material from an area totaling approximately 0.77 acre would be salvaged and stockpiled. The area from which topsoil would be salvaged includes the shop/office yard and the mine yard. The areas that would be disturbed consist of well-drained alluvial soils. The alluvial sandy loams are good candidates for topsoil salvage and borrow because of their greater thickness. Based on information in the MPO, the northern portion of the proposed disturbed area has between 10 and 15 inches of strippable soil, and the southern portion has between 5 and 10 inches of strippable soil. If average soil depths of 12.5 inches and 7.5 inches are assumed over the 0.77-acre area of soils, the volume of soil available for stripping and stockpiling would total 1,217 bank cubic yards. These soils are from previously undisturbed areas. This topsoil material would be stockpiled north of the shop/office area

(Topsoil stockpile 1). Waste pile cover material would be excavated from an area 10 feet wide by 150 feet long on the toe of the existing slope and stockpiled slightly north of the existing road crossing over an unnamed stream (Topsoil stockpile 2). This would provide 746 cubic yards of additional topsoil cover material for a total of 1,963 cubic yards. Topsoil would not be stripped from the two topsoil stockpile areas. Stockpiles will be designed to avoid runoff into the stream from any rain event.

Soil stripping would be performed primarily with a tracked bulldozer, although a front-end loader may also be used. Stockpiles would range from 6 to 10 feet in depth. Equipment would not be allowed to cross over the piles so that compaction is minimized. The topsoil pile locations would be located above the peak flood zone (defined by the hydrology report, Appendix G), and protected from erosion by 4-foot-high berms constructed from near-surface portal development waste to minimize erosion losses. Berms would also be established on the margins of the ore storage area and the services area, to prevent surface runoff from the mine operations area and roads from intersecting the topsoil piles.

Topsoil piles would have a maximum height of 10 feet and would be contoured, furrowed, and seeded in late fall with a BLM-approved seed mix to maintain soil viability and prevent surface wind and water erosion. Vegetation success on the stockpiles would be monitored by the BLM, and stockpiles would be reseeded where vegetation is sparse.

**Roads and Public Access**

One designated route provides access in Bullseye Canyon. The route (County Road D0029) is a county-maintained road which traverses the proposed mine site. For public safety purposes, access on County Road D0029 would be restricted for the duration of mine operations. Safety signs and a gate would be placed on County Road D0029 at the entrance to the mine to allow access for authorized mine personnel only. Public access would be restored once mining operations are completed in approximately 2016.

San Juan County Road Department has agreed to post a sign on State Highway 95 and County Road B258, which would notify the public of increased truck traffic. There would be no new roads constructed. County Road D0029 from County Road B258 to the mine would be kept clear and safely passable by periodic grading and watering for dust suppression as necessary. No roads would be widened or realigned, but if road conditions warrant, County Road D0029 may need to be graveled to support heavy truck traffic. If that becomes necessary, a County-approved off-site material source would be used.

## *2.2.2 Mine Production*

Because the ore is not in one single large deposit, the mine would be developed using random room-and-pillar extraction methods to follow the irregular location of ore bodies. All waste and ore would be transported to the surface through the main access and haulage route and either placed on the ore pad or disposed of in the waste rock dump. After mine development is complete and all sections of the mine are at full production, the mine would achieve monthly ore production of approximately 4,000 tons. This would be accomplished with six to nine miners, one mechanic, and one supervisor working two shifts per day. Total mine production would be 100,000 tons of ore. Ore production would average less than 1,200 tons per month over the seven-year mine operation. This includes the development and reclamation phases of the operation during which no ore would be produced.

The proposed mine operations would be required to comply with stringent safety and health standards administered by the MSHA through federal regulations at Title 30 CFR Parts 1 through 199 and, in particular, Part 57. These MSHA regulations include requirements for ground support systems, mine ventilation, electrical systems, combustible fluid storage, underground shops, equipment specifications and maintenance, explosives storage and handling, dust control, monitoring and reporting requirements,

alarm systems, worker personal safety equipment, and restrictions for public access. To comply with these standards, UEC would be required to obtain the necessary MSHA mine permit and an MSHA-approved miner training plan, escape and evacuation plan, and ventilation plan.

Ventilation fans would be located underground. The fans, in combination with the two portals and two ventilation boreholes, would allow the Daneros mine to maintain a minimum adequate airflow to meet the requirements of the ventilation plan as submitted to MSHA. This is necessary to comply with MSHA regulations to protect the miners from radiation exposure through the establishment of adequate mine ventilation (30 CFR 57.2223). A radon-daughter monitoring program would be established, in accordance with Title 30 CFR§57.5037, in which exposure levels would be monitored and recorded. If radiation levels in a working area are found to be in excess of MSHA standards (in excess of 0.3 working level units in an active working area) the ventilation would be corrected immediately and more frequent monitoring would be implemented to verify compliance. In addition, gamma radiation surveys of underground workings are required by regulations at Title 30 CFR 57.5047 and workers would wear dosimeters to monitor gamma radiation exposure and ensure that MSHA standards are not exceeded.

The general public would be protected by monitoring of radiation emissions from the mine using EPA-approved methods and adhering to ore transportation regulations established by the U.S. Department of Transportation. Although not required based on total ore production over the life of the mine, UEC proposes to implement radon monitoring and reporting procedures consistent with the NESHAP Subpart B standards as outlined at 40 CFR Part 61. Pursuant to NESHAP standards, "emissions of radon-222 to the ambient air from an underground uranium mine shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y." Monitoring data would then be put into an EPA air-modeling program to predict radiation levels at the nearest residence. The collected data and modeling results would be reported annually to the Utah Division of Air Quality.

**Ore Stockpiles**

The ore stockpile pad would be located on a 17-foot-thick historical waste dump from the nearby McCarty–Coleman Decline. Approximately 100,000 tons of ore would be mined over seven years. The maximum production of ore over a two-week period would be 4,000 tons. The ore stockpile would cover approximately 0.26 acre of the old waste rock dump. No processing of ore would occur at the site. Ore would have an average grade of 0.3 percent U308, sulfur levels would average 2.6 percent in shipping ore, and average copper grade would average 1.0 percent. Levels of other metals such as lead, zinc, nickel, mercury, and arsenic are low. The ore is carbonate rich, in the form of dolomite and calcite. Ore would not be stored on site for long periods but would be transported to the White Mesa Mill near Blanding on a daily or near-daily basis. Ore would be transported via County Road D0029 to County Road B258 and then to State Highway 95.

**Waste Rock Stockpiles**

Approximately 14,860 cubic yards of waste rock are projected to be produced (UEC 2008:Item C). The waste would be stored on the portal pad, the mine yard, and the waste dump shown on Plan 6 of the MPO. The Daneros waste dump would be located on the historic waste dump of the McCarty–Coleman Decline. The existing McCarty–Coleman waste rock pile is approximately 17 feet thick with an average radium isotope (Ra-226) concentration of 11 average picocuries per gram (pCi/g) (UEC 2008:Item N). The McCarty–Coleman Decline waste dump has a larger footprint than what would be covered by the Proposed Action, which would only cover approximately 0.41 acre towards the southern end of the existing waste rock pile. The final waste rock pile would average 25 feet thick (personal communication, John Hasleby 2009) with a resulting Ra-226 level of 8.7 pCi/g. Additional information regarding waste rock can be found in Appendix I.

Approximately 13,420 cubic yards (90%) of the waste rock generated during extraction, primarily from construction of the ventilation shafts and declines, would be mudstone and sandstone of the basal Chinle Formation and underlying Moenkopi Formation. Core samples were analyzed for a broad spectrum of 70 elements by American Assay Laboratories. Based on this analysis, no appreciable radiological or heavy metal elements are present in decline development waste rock and this waste rock has little or no acid forming potential. This inert non-mineralized rock would average about 1.05 pCi/g (UEC 2008:Item N).

Much of the mineralized waste rock (rock with sub-economic mineralization), extracted during ore production as a normal function of the mine waste removal process, would be returned or remain in depleted sections of the mine as space becomes available. However it is anticipated that approximately 1,440 cubic yards (10%) of the waste dump material would consist of this mineralized waste rock. This material would be less than 0.05% U3O8 (the current proposed ore cut of grade). Based on mixing and dilution, anticipated values are more likely to be less than 100 ppm U3O8 (0.01%) (personal communication, John Hasleby 2009). Sub-ore from the ore zones that exceed 0.015% U308 would be placed on part of the ore stockpile and either mixed with ore and shipped to the mill, or returned to mined-out areas of the mine.

Detailed characterization of the mineralization is documented in the MPO (UEC 2008:Item J, pages 1–2). Because the low-grade mineralized rock for the Daneros Mine would be produced from the same sandstone-type uranium deposits in the Shinarump Member that were the source of a portion of the waste rock material at the McCarty–Coleman Decline, and since the material is essentially from the same geologic setting with similar ore controls, and considering the close proximity of the two uranium deposits, the low-grade mineralized rocks are expected to be very similar.

Based on the information above it is reasonable to estimate that the total volume of waste rock, approximately 14,860 cubic yards consisting of a blend of 13,420 cubic yards of inert rock with the 1,440 cubic yards of low-grade mineralized rock, would produce a blend similar to the existing McCarty–Coleman waste rock pile on which it would be placed. Based on a weighted average and random mixing of the two sources of rock the material in the final waste rock stock pile is expected to be less than 100 ppm U3O8 (0.01%). The reason the waste rock pile material would be 0.01% when the cut-off grade is 0.05% is because UEC proposes to sort and place the "sub-ore" material onto an intermediate stockpile located on part of the ore stockpile areas for mixing with ore or hauling the material back into the mine workings before final abandonment. Sub-ore is mineralized material that is less than the cut-off grade of 0.05% but can be mixed with higher grade ore to meet milling specifications.

**Oils, Chemicals, and Trash**

Oils, lubricants, and any chemicals would be stored in locked, partitioned areas within the shop building. Training, labeling, listing of chemicals, disposal, and material data sheets would be maintained. An 18- to 30-cubic-yard solid waste container would be kept adjacent to the shop and office buildings. Trash disposal would be commercially contracted and requires the trash bin be emptied on a scheduled basis (not less than monthly) and hauled to a licensed local landfill.

All scrap metal and other recyclables that are not above ambient levels of radiation would be handled as regular construction waste. Any solid wastes that qualify as low-level wastes for radiation contamination, per NRC guidelines (i.e., not a product or a by-product of ore extraction or production), would be handled in accordance with the Low-Level Radioactive Waste Policy Amendments Act of 1985 at an NRC-approved facility or Utah Division of Radiation Control-approved facility.

**Transportation**

The Daneros Mine proposes up to six ore trucks per day traveling to and from the mine site, utilizing State Highway 95, County Road B258 and County Road D0029. In addition to the ore trucks, an additional 10 trips per day are anticipated for employee traffic and support vehicles, for a total of 16 vehicle round trips per day. Safety signs and a gate would be placed on County Road D0029 to allow access to authorized mine personnel only. Public access would be restored once mining operations are completed in approximately 2016. San Juan County Road Department has agreed to post a sign on State Highway 95 and County Road B258 which would notify the public of increased truck traffic. Cattle guards would be installed where necessary, and speeds limited as road surfaces and alignment dictate.

UEC would follow the "Transportation Policy for Shipments of Colorado Plateau Uranium Ores to the White Mesa Uranium Mill." This policy, found in Appendix D, implements the U.S. Department of Transportation requirements of Title 49 CFR 171 and requires that "there is not any leakage of uranium ore from the truck trailer" and also stipulates dust and contamination control measures such as "tarpaulin covers and tailgate closer requirements." The policy also requires the transportation contractor prepare an emergency response plan for transportation of the uranium ore to the White Mesa Mill.

In accordance with the Utah Department of Environmental Quality (DEQ) Division of Radiation Control, ore trucks would be covered with tarps and checked for radiation levels before leaving the mine site, and prior to returning to the mine from the processing facility. If gamma readings are found to exceed the standards of Title 49 CFR 173, (that the external dose rate may not exceed an external radiation level of 1,000 millirems per hour [mrem/hr] at 3 meters from the unshielded material), the ore truck would be washed using a power wash (with captured water) or other approved method to meet appropriate radiation standards. This measure would be enforced by the Utah Division of Radiation Control (DEQ 2009).

**Dust Suppression**

Dust emissions could occur from waste rock storage piles, topsoil storage piles, drilling of the 22 drill holes, construction of the vent holes, and vehicle traffic on dirt roads. Dust suppression would be accomplished by enforcing speed limits, using a water truck to spray waste rock and ore storage piles and access roads within the permit area as needed, lowering the drop points for front-end loaders and other mine equipment and completing re-vegetation of disturbed areas as soon as practicable. The Fry Spring would be used as a temporary water source until a water well can be completed on site. Prior to using water from the well, water analyses would be done to ensure that water quality standards are met for its intended use. Topsoil storage piles would be seeded with a temporary fast-growing, weed-free seed mix, and upon reclamation, a BLM-approved reclamation seed mix. These control measures are described in UEC's Fugitive Dust Control Plan submitted as part of the MPO.

**Temporary Cessation of Operations**

In the event of temporary cessation of mine operations, UEC would: provide notice to BLM and secure the site using locked gates on portals, locked metal grates on vent holes, and locks on buildings; maintain the buildings, drainage structures, roads, and other surface facilities in a safe and environmentally acceptable condition; and remove all ore from the surface and place it back into the mine or haul it to the White Mesa Mill. For closures during snow-free conditions, topsoil would be temporarily seeded and the waste rock stockpile bermed and graded to ensure it is stable. To prevent establishment of bat colonies in the mine during temporary cessation of mine operations, mine openings would be closed with appropriate closures approved by the BLM.

**Workforce and Workforce Support**

The mine is expected to employ up to 14 miners and support personnel. No on-site accommodations would be provided; employees would be housed at the Fry Canyon Lodge, 14 miles from the mine site, or in other local area communities. Services that would be provided for employees at the site would consist of drinking water delivered as needed in 5-gallon containers, portable chemical toilets, showers, and locker buildings. These facilities would be located in the office/shop area. Sewage would be contained in holding tanks and chemical toilets and disposed of at an approved facility by the contractor. Contracted services would also include drinking water for employees housed at the Fry Canyon Lodge.

## *2.2.3 Mine Reclamation*

At the end of the project, all areas disturbed by UEC would be reclaimed, including those areas of pre-existing surface disturbance that are redisturbed by UEC's operations. Previously disturbed areas would remain if they are not redisturbed by proposed operations.

All disturbed areas associated with the mine would be decompacted, covered with stockpiled topsoil, and seeded with a BLM-approved seed mix in late fall. Some reclamation activities would be conducted concurrently with operations. Waste rock material would be deposited at a 2:1 slope. The waste rock material would be wheel-compacted, furrowed, covered with 1 foot of topsoil material, and seeded each fall on the final reclaimed areas.

The ore stockpile area would be excavated to remove all radionuclide-bearing rock with values above background. The rock would either be transported to the White Mesa Mill for treatment or would be placed within the mine workings. As with the waste rock pile, the excavated ore stockpile area would be covered with 1 foot of topsoil material and seeded. Reclamation of the old McCarty–Coleman waste rock dump would be limited to only that part disturbed by the Daneros operations. Therefore, the toe (fill slope) of the old waste rock dump would not be reclaimed since no new waste rock material would be added to the fill slope of the old waste rock dump.

At the completion of mining operations, all buildings and structures would be removed. The office/shop yard area would be reclaimed at a 2:1 slope and seeded using the approved seed mix. The portals of the declines would be reclaimed by placing waste rock backfill from 30 feet inside each decline to the portal. Backfill would be placed and contoured to appear natural and similar to the surrounding talus slopes. A minimum of 12 inches of topsoil would be spread over the backfilled surface, pocked with a backhoe or excavator, and seeded by hand with a BLM-approved reclamation seed mix in the fall.

The 22 drill holes would be reclaimed concurrent with operations. Dry holes would be filled with the cuttings to within 5 feet from the surface and then plugged to the surface with a cement plug. If groundwater were encountered then the hole would be plugged subsurface to prevent aquifer contamination in accordance with Utah Division of Oil, Gas and Mining Rule R647-2-108. Based on previous drilling, groundwater is not present at the mine level and encountering small amounts of groundwater approximately 300 feet above the mine level is infrequent. Mud pits would be allowed to dry out and would then be backfilled, graded, and seeded. The two vent holes would be sealed with 6 feet of foam and then capped with a minimum of 6 inches of reinforced concrete. The concrete cap would be covered by 3 to 4 feet of backfill and soil and then seeded.

**Revegetation and Reseeding Plan**

As part of the Proposed Action, a Revegetation and Reseeding Plan (UEC 2008:Item H) is incorporated and includes specifications for a BLM-approved "weed-free" seed mixture. Seed would be broadcast by hand at a rate of 2 lbs/acre to 4 lbs/acre per species. All disturbed areas would be ripped, seeded, and covered with soil in the late fall. The areas near the vent holes would also be treated in a similar manner.

**Weed Control Plan**

The weed control plan is part of the overall operations and reclamation plans. The purpose of the plan is to prevent and control the spread of noxious weeds and invasive plants during and following construction, operations, and reclamation. The area for the treatment and control of noxious weeds and invasive plants includes all lands disturbed by drilling 22 exploration holes and construction activities (approximately 4.5 acres plus a 10-foot buffer area around the disturbances). Methods to control weeds include cleaning equipment, weed identification training, flagging to avoid areas already infested prior to construction, proper storage of equipment, and timely reseeding of disturbed areas. Only BLM-approved "weed-free" seed mix would be used (UEC 2008:Item Y).

## 2.3 Alternative B – No Action

The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated Proposed Actions, the No Action Alternative generally means that the proposed activity would not be approved. This option is provided in 43 CFR 3162.3-1 (h)(2). The No Action Alternative is presented for baseline analysis of resource impacts.

Under the No Action Alternative, the BLM would not approve UEC's MPO if the proposed operations were determined by BLM to cause unnecessary or undue degradation of public lands. If mine operations are not approved, uranium would not be extracted from the proposed location, the associated surface disturbances would not occur, and other uses such as livestock grazing, hunting, and off-highway vehicle use would continue. The remnants of historic mining activity, including the open portal of the McCarty–Coleman Decline and the associated waste rock dump, would remain in place. Additionally, the PPA and County Road D0029 would remain accessible to the public.

## 2.4 Alternatives Considered, but Eliminated from Further Analysis

As a result of public comments on the EA, one additional alternative was considered but not carried forward for detailed analysis. Under this alternative, UEC would be required to clean up the old waste rock dump at the McCarty–Coleman Decline before commencing new mining activities. This alternative was eliminated from further analysis because it is not needed to resolve conflicts or mitigate impacts of the Proposed Action and because it does not meet the underlying need for the proposal.

Based on environmental analysis documented in Chapter 4, no impacts were identified that would require additional mitigation through the implementation of a separate action alternative. Environmental impacts associated with UEC's proposed use of a part of the historic waste rock dump for ore storage and waste rock disposal would be minor. Protective measures incorporated into the Plan of Operations would contain surface run-off and dust on site during operations and the proposed reclamation would stabilize the site after operations are complete. Under the Proposed Action, much of the historic waste rock dump

would be reclaimed. This would result in beneficial impacts to air quality, water quality, and human health and safety. Thus, clean up of the historic waste rock dump would not be an alternative designed for the purpose of avoiding or mitigating impacts of the Proposed Action, but rather a separate action designed for the purpose of improving the existing environment. Such action does not meet the underlying need to mine a valuable uranium deposit.

UEC has no legal obligation to reclaim historic mine disturbances as a precondition to mining. Operations authorized by the mining laws must be conducted in a manner that prevents unnecessary or undue degradation of public lands. This standard requires that a mine operator reclaim areas disturbed by its operation. Under the Proposed Action, UEC would reclaim all areas disturbed by its operations, including part of the old McCarty–Coleman waste rock dump.

Removal and relocation of the historic waste rock dump would require a suitable repository location and an additional source of material to cover the waste rock dump. This would cause greater surface disturbance than the Proposed Action. The historic waste rock dump would have to be moved a minimum of one-half mile to a suitable location away from the ephemeral drainage of Bullseye Canyon. This would add substantial costs to the small mine operation.

## 2.5 Summary Comparison of Environmental Impacts

This section provides a summary of the impacts discussed in detail in Chapter 4. It is intended to assist the reader and the decision maker. Table 1 presents a summary of the impacts from each Alternative.

**Table 1. Summary of Impacts to Resources from Each Alternative**

| Resource or Issue | Alternative A: Proposed Action | Alternative B: No Action |
|---|---|---|
| Air Quality | The Daneros Mine ventilation emissions are considered a minor source. Mitigation measures have been proposed in the MPO which minimize impacts to air quality. Emission calculations for the project show that, with these control measures, the proposed project would be a small contributor of criteria pollutants. Operation of the Daneros Mine would not result in exceedences of the National Ambient Air Quality Standards. Impacts to air quality as a result of mine operations and ore transportation would be minor and the proposed project would not degrade visibility in any Class I area.<br><br>Radon emissions from proposed vent shafts and portals could result in minor air quality impacts. However, in the open air, the amount of radon gas is very small and does not pose a health risk.<br><br>Emissions from fossil fuel combustion would contribute a minor incremental increase in greenhouse gases but impacts may be offset by cleaner fuel technologies of the nuclear power generation industry. | The Daneros Mine would not be developed and there would be no increased emissions of criteria pollutants. Radon emissions through the existing mine openings would continue unmonitored. There would be no beneficial impact to air quality through cleaner fuel technologies. |
| Water Quality | The proposed mine operations, including the temporary use of water from Fry Spring for dust suppression, would not affect surface water quality at the Daneros site. All tributaries within Red Canyon's watershed are ephemeral; it is highly unlikely that the use of 5,000 gallons per day would contribute to any measurable flow, as water would be applied uniformly to roads and mine disturbances and would be absorbed rapidly by soils or evaporate under the dry/dusty conditions. Calculations show that an undetectable increase | Mining would not take place. No ancillary facilities requiring water would be built. No well drilling or hauling of water from Fry Spring, or elsewhere, would occur. The No Action Alternative results in continued surface exposure of the historical waste rock dump, posing a greater risk for off-site transport of contaminated material than the |

**Table 1. Summary of Impacts to Resources from Each Alternative**

| Resource or Issue | Alternative A: Proposed Action | Alternative B: No Action |
|---|---|---|
| | in uranium concentration in on-site soils would result from the temporary application of Fry Spring water for dust suppression. Water applied to the mine disturbances would also be contained by measures in the Storm Water Pollution Prevention Plan (SWPPP).<br><br>Mitigation measures incorporated into the Proposed Action would minimize the potential for surface-disturbing activities to impact surface water quality through erosion and sedimentation into streams. The SWPPP features erosion control devices such as diversion ditches for all disturbed areas and places earthen berms around the ore and waste piles.<br><br>Detailed sampling of the existing waste rock dump and core through the orebody indicated a very low likelihood of acid rock drainage (ARD). This is likely due to the low sulfur levels and high carbonate content of the waste rock (Appendix J).<br><br>Inert waste rock generated by the Proposed Action, covered with native soils and vegetation, would reduce the potential for downstream transportation of toxic materials from the older waste rock dump. Precipitation events would be absorbed by the new waste rock material, meaning a portion of the historical waste rock dump would be sheltered from direct exposure. With the revegetated pile in place, less runoff would occur, as the vegetated and topsoiled slopes absorb and stabilize rainwater erosion more effectively than the currently barren waste rock pile. Moreover, the Proposed Action includes construction for a drainage diversion channel through the mine site to capture runoff from surrounding up-gradient slopes and areas on the property. Mineralized waste rock produced from mining activities would be retained within the worked-out area of the mine, or mixed with ore and shipped to the mill.<br><br>A groundwater well would be constructed for dust suppression and drilling. The proposed well would target a known confined aquifer in the White Rim Sandstone. This confined aquifer is a minimum of 800 feet below the elevation of the spring and well in Bullseye Canyon, which are fed by a shallow perched aquifer. The shallow aquifer that feeds these water sources is hydrologically separated from the lower Cutler aquifer that would supply water to the mine. Underground mine workings would be 300 feet below the perched aquifer. The Proposed Action is not expected to result in water drawdown from the upper aquifer and diminution of water flows feeding the spring and well because data indicates that there would be little or no hydrologic connectivity between the mine and the upper aquifer through bedrock fracturing or faulting. Protective measures are sufficient to effectively seal drill holes and ventilation boreholes and prevent groundwater from flowing from the aquifer and into the mine through these openings. Therefore, existing water rights would not be impacted. | Proposed Action. Any radioactive minerals or other compounds contained within the old waste rock dump may continue to leach from the pile after precipitation events, although it is unlikely that hazardous concentrations of these materials would significantly affect local watershed characteristics.<br><br>. |
| Desert bighorn sheep | Increased traffic, noise, human presence and activity, and removal of habitat in Bullseye Canyon may disrupt normal movement patterns and use of a water source, and displace individuals from the area during the seven-year life of the project. | Under the No Action Alternative, mining operations would not take place. There would be no change in the existing environment and thus no impacts on desert bighorn sheep or habitat. |

**Table 1. Summary of Impacts to Resources from Each Alternative**

| Resource or Issue | Alternative A: Proposed Action | Alternative B: No Action |
|---|---|---|
| | Overall, minimal new habitat disturbance, regulated traffic patterns, and adherence to seasonal restrictions prescribed in the RMP and agency best-management practices would ensure that impacts to bighorn sheep would be minimal and that the long-term health of the bighorn sheep population would not be affected. | |
| Human Health and Safety Concerns | The impact to public health and safety from radiation exposure and transportation is expected to be minimal based on the protective measures described in the MPO.<br><br>The public would not be permitted to pass over the waste dump or ore pad during the life of operations. Prior to reclamation, all radiation-hazardous material would be stripped from the ore pad and either shipped to the mill or interred within the abandoned mine workings. The waste rock dump would be covered by inert rock material and topsoil to a necessary thickness. Based upon residual radiation modeling and a comparative study presented in Appendix I, the exposure rate would be reduced to 0.1 mrem/y for someone camping atop the reclaimed waste rock pile for 14 days. This would only be 0.1 percent of the NRC guideline of 100 mrem/yr over background. Workers are protected through MSHA regulations. Closure of the old McCarty–Coleman Decline and reclamation of a part of the old waste rock dump would have a minor beneficial effect by reducing the public's exposure to radiation on site.<br><br>The additional traffic created would not have any noticeable impact on the Levels of Service (LOS) for State Highways 95 and 191, and would not measurably affect traffic flow and patterns. The additional trips created by the Daneros Mine would not degrade the existing LOS A for State Highway 95 or the existing LOS B for State Highway 191.<br><br>The proposed 16 round trips per day from the Daneros Mine traffic would bring total trips to less than 20 vehicle trips per day. Per the National Cooperative Highway Research Program's Report #362 *Roadway Widths for Low-Traffic-Volume Roads*, "accident experience does not appear significantly different for unpaved vs. paved surfaces at traffic volume levels of 250 vehicles per day (vpd) or less." | The No Action Alternative results in continued surface exposure of the historical waste rock dump, posing a greater risk to human health than the Proposed Action. Recreation users would not be kept out of the current mining site and the road would not be closed, which would allow recreation users to traverse the PPA and be exposed to some hazards. The public may also be exposed to gamma radiation and radon at the existing mine portal and waste rock dump. Based on the results of residual radioactivity modeling, a camper who resides on the existing waste rock area for a 14-day period would be exposed to radiation at a rate of about 0.2 mrem/yr. This rate is only 0.2 percent of NRC's 100 mrem/yr guideline, although it is twice the exposure rate which would be attained under the Proposed Action.<br><br>The increase in truck traffic and corresponding risk of accidents would not occur. |

# 3 AFFECTED ENVIRONMENT

## 3.1 Introduction

This chapter presents the existing environment (i.e., the physical, biological, social, and economic values and resources) of the PPA as identified in the Interdisciplinary Team Checklist (Appendix A). This chapter provides the baseline for comparison of the impacts and consequences described in Chapter 4.

BLM Handbook H-1790-1, Supplemental Authorities to be Considered, lists authorities other than NEPA that the BLM must consider when considering a proposal in an environmental analysis. There may be other law, regulation, or policy that applies to this Proposed Action.

Although the H-1790-1 Handbook does not require an interdisciplinary team checklist (Appendix A), the Utah NEPA Guidebook allows for use of such a checklist to discover which resources: (1) are not present in the PPA; (2) are present but would not be impacted to a degree that requires detailed analysis; or (3) would require detailed analysis. This checklist is the basis for screening issues and resources so that the discussion of issues and concerns is commensurate with the potential impacts (per 40 CFR 1500.1 (c)) and impacts are discussed in proportion to their significance.

## 3.2 General Setting

The region surrounding the PPA is characterized by mesas cut by deep canyons. There are narrow benches on the mesa shoulders in some areas, and near-vertical, 500-foot cliffs in other areas. Elevations within the PPA range from 5,800 feet to approximately 6,800 feet above mean sea level. The area is semiarid (7–9 inches annual precipitation) with stands of piñon-juniper in rocky soils, along with sage and other brush, forbs, and grasses.

## 3.3 Resources Eliminated from Further Analysis

The Interdisciplinary Team Checklist (Appendix A) is the basis for screening issues and resources so that the discussion of issues and concerns is commensurate with the potential impacts (1500.4 (c)) and impacts are discussed in proportion to their significance. Resources which are not present in the project area, as noted in Appendix A, were not brought forward in this EA for detailed analysis. Those resources include: Areas of Critical Environmental Concern; unique or prime farmlands; floodplains; threatened, endangered or candidate plant species; wetlands/riparian zones; wild and scenic rivers; and wilderness areas/characteristics. Resources potentially present in the project area but that would not be impacted by the Proposed Action include: cultural resources; environmental justice; invasive, non-native species; Native American religious concerns; threatened, endangered or candidate animal species; wastes (hazardous or solid); livestock grazing; rangeland health standards; woodlands; vegetation including Special-Status Plants other than candidate or listed species; fish and wildlife including Special-Status Plants other than candidate or listed species; soils; recreation; visual resources; mineral resources/potential energy production; paleontology; lands/access; socioeconomics; and climate change. Rationale for not bringing these resources forward for detailed analysis in the EA is provided in Appendix A.

## 3.4 Resources/Issues Brought Forward for Analysis

The general setting and current condition of the resources of concern (as identified in Appendix A) that require further analysis follow. These resources or topics are air quality, water quality, wildlife (a complete Biological Survey Report is provided in Appendix B), and human health and safety.

### *3.4.1 Air Quality*

Air pollution can affect human health and reduce visibility. Air quality in southeast Utah is affected by various factors. Industrial point sources such as power plants in the Four Corners region, mines, and oil and gas extraction activities contribute to local and regional air pollution. Urbanization and tourism may create emissions known as *area sources* that affect air quality over a wider area. These area sources include wood smoke, motor vehicle exhaust, and dust from unpaved roads and the de-icing of paved roads in winter. Air pollutants generated by motor vehicles in southeast Utah include tailpipe emissions and dust from travel over dry, unpaved road surfaces. Wildfires and controlled burns are also an air quality concern when smoke inundates communities and other sensitive areas. In some communities where wood burning is a primary source of heat, smoke can create elevated respirable particulates under stagnant atmospheric conditions.

#### 3.4.1.1 REGULATORY SETTING

##### 3.4.1.1.1 Federal Clean Air Act

The Clean Air Act outlines different levels or classes of air quality protection. Generally, Class I areas are the most pristine, and any substantial emission sources located in or near them have strict limits set by regulatory agencies. Class I areas include national parks and federal wilderness areas that are 5,000 acres or greater in size and designated as such before August 5, 1977. These areas have the most stringent degree of protection from emission sources that can cause air quality degradation. Under the Clean Air Act, federal agencies generally have an affirmative responsibility to protect the air quality-related values within a Class I area. These responsibilities focus on protecting views and expansive vistas, and subsequently, human health, through lessened respirable particulates and other pollutants (such as sulfur dioxide [$SO_2$]).

Any area that is not designated Class I is by default considered Class II. In Class II areas, regulators set emission limits to meet or maintain the criteria pollutant standards (discussed further below). Class II areas usually experience ambient pollution levels that limit visibility for many days of the year. The PPA and much of the surrounding area are categorized as Class II, with some exceptions (Table 2). The geographic areas listed in Table 2 are within 100 miles of the PPA.

**Table 2. Federal Air Quality Classifications for the PPA Region**

| Federal Classification | Geographic Area |
|---|---|
| Class I areas | Canyonlands National Park |
| | Mesa Verde National Park |
| Class II areas with special concern for visibility | Glen Canyon National Recreation Area |
| | Hovenweep National Monument |
| | Natural Bridges National Monument |

Note: Data from National Park Service (2008)

### 3.4.1.1.2 National Emission Standards for Hazardous Air Pollutants

Federal law regulates radon emissions from uranium mines. Particularly relevant are National Emission Standards for Hazardous Air Pollutants (NESHAP) Part A and NESHAP Subpart B, National Emission Standards for Radon Emissions from Underground Uranium Mines (40 CFR 61.20 contain the relevant sections). Mine operators are responsible for identifying and meeting the regulations that apply specifically to their operations and activities.

Fugitive dust (respirable particulates 10 microns or smaller, called PM10) emissions are the primary air pollutant associated with uranium mining activities, and expected emissions of PM10 and other criteria pollutants from the proposed project are listed in Chapter 4, Table 8. Lesser pollutants are diesel engine exhaust and radon gas. The State of Utah requires that mining operations limit dust to 20 percent opacity on site and 10 percent opacity at the property boundary. In this case, the boundary would be the mine permit boundary.

The NESHAP's Subpart B regulations, "National Emission Standards for Radon Emissions from Underground Uranium Mines," apply to an underground uranium mine that "(a) Has mined, will mine or is designed to mine over 100,000 tons of ore during the life of the mine; or (b) Has had or will have an annual ore production rate greater than 10,000 tons, unless it can be demonstrated … that the mine will not exceed total ore production of 100,000 tons during the life of the mine." For any mine meeting this definition, the mine operator must comply with the emission standard for radon-222 as required at 40 CFR 61.22 and is subject to the annual NESHAP Subpart B reporting requirements as outlined at 40 CFR 61.24. "Emissions of radon-222 to the ambient air from an underground uranium mine shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/y (40 CFR 61.22)." The proposed Daneros Mine would not produce more than 100,000 tons of ore during the life of the mine so ambient air radon tests and annual radon reporting is not required per 40 CFR Part 61 subpart B. However, UEC proposes to implement radon monitoring and reporting procedures consistent with the NESHAP standards as outlined at 40 CFR Part 61Subpart B.

## 3.4.1.2 REGULATED AIR QUALITY COMPOUNDS

The Clean Air Act authorizes the EPA to set standards for various air pollutants. Table 3 shows the seven federally regulated criteria pollutants. These are called the criteria pollutants because they identify a chemical compound, describe a time period for measurement, and define a maximum allowable concentration.

**Table 3. National Ambient Air Quality Standards**

| | Primary Standards | | Secondary Standards | |
|---|---|---|---|---|
| **Pollutant** | **Level** | **Averaging Time** | **Level** | **Averaging Time** |
| Carbon Monoxide | 9 ppm (10 $mg/m^3$) | 8-hour* | None | |
| | 35 ppm (40 $mg/m^3$) | 1-hour* | | |
| Lead | 0.15 $\mu g/m^3$† | Rolling 3-Month Average | Same as Primary | |
| | 1.5 $\mu g/m^3$ | Quarterly Average | Same as Primary | |
| Nitrogen Dioxide | 0.053 ppm (100 $\mu g/m^3$) | Annual (Arithmetic Mean) | Same as Primary | |
| Particulate Matter ($PM_{10}$) | 150 $\mu g/m^3$ | 24-hour‡ | Same as Primary | |
| Particulate Matter ($PM_{2.5}$) | 15.0 $\mu g/m^3$ | Annual§ (Arithmetic Mean) | Same as Primary | |
| | 35 $\mu g/m^3$ | 24-hour¶ | Same as Primary | |

**Table 3. National Ambient Air Quality Standards**

| Pollutant | Primary Standards Level | Primary Standards Averaging Time | Secondary Standards Level | Secondary Standards Averaging Time |
|---|---|---|---|---|
| Ozone | 0.075 ppm (2008 std) | 8-hour** | Same as Primary | |
| | 0.08 ppm (1997 std) | 8-hour †† | Same as Primary | |
| | 0.12 ppm | 1-hour ‡‡ (Applies only in limited areas) | Same as Primary | |
| Sulfur Dioxide | 0.03 ppm | Annual (Arithmetic Mean) | 0.5 ppm (1300 µg/m$^3$) | 3-hour* |
| | 0.14 ppm | 24-hour* | | |

Note: Data from EPA (2008a); µg/m3 = micrograms per cubic meter; ppm = parts per million.
* Not to be exceeded more than once per year.
† Final rule signed October 15, 2008.
‡ Not to be exceeded more than once per year on average over three years.
§ To attain this standard, the three-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
¶ To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
** To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
†† (a) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm; (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
‡‡ (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1; (b) As of June 15, 2005, EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

### 3.4.1.3 BACKGROUND CONCENTRATIONS

Ambient air monitoring and meteorology recording is conducted at a number of locations in southeast Utah and northeast Arizona. No publicly available monitoring data has been recorded at the site of the Proposed Action; however, the following information is useful for a general characterization of the region's air quality. Please note that no PM2.5 data is available from EPA for San Juan County, Utah. However, according to data from the Utah Division of Air Quality (UDAQ) (UDAQ 2008a), the entire state of Utah is in attainment for PM2.5.

Background ozone is usually about 0.040 ppm. Levels shown in Tables 4 and 5, below, indicate that human-made sources are creating emissions that cause ozone to be nearly double the background levels on the worst days. However, the ozone concentrations shown in Table 4 are within federal health limits and, therefore, the area is considered in attainment of the federal government's National Ambient Air Quality Standards.

**Table 4. Ozone Ambient Air Quality Levels in Southeast Utah**

| County | Year | Second Max 8-hour (ppm) | Fourth Max 8-hour (ppm) |
|---|---|---|---|
| San Juan County, Utah | 2005 | 0.078 | 0.069 |
| | 2006 | 0.075 | 0.070 |
| | 2007 | 0.079 | 0.072 |

Note: Data from EPA (2008a); ppm = parts per million.

**Table 5. PM10 Ambient Air Quality Levels in Southeast Utah**

| County | Year | Second Max 24-hour µg/m3 | Annual Average µg/m3 |
|---|---|---|---|
| San Juan County, Utah | 2005 | 25 | 14 |
| | 2006 | 106 | 28 |
| | 2007 | 99 | 30 |

Note: Data from EPA (2008a); µg/m3 = micrograms per cubic meter.

### 3.4.1.4 VISIBILITY

Visibility is usually expressed in terms of light extinction or diminishment of visible sight (e.g., one can see 100 miles on an unpolluted day but only 50 miles on a day with considerable haze). In typical dry conditions, without any human-made pollutants, visibility that is measured in western national parks can range up to 140 miles. The parks where visibility measurements have been documented include Mesa Verde, Canyonlands, and Bryce Canyon. The Four Corners area is considered a unified air basin and emissions in one part of the area can affect national parks and other important viewsheds.

#### 3.4.1.4.1 Regional Emission Sources – Criteria Pollutants and Visibility

A number of primary fine particulate matter (PM10) and NOx emission sources exist in the southeast Utah/northeast Arizona region. Emissions can roughly be divided into human-caused (or anthropogenic) and natural sources. Anthropogenic emissions vary according to the season. In colder months, residential wood smoke is a large source of PM10 near settlements and campgrounds. Because of winter meteorological conditions wood smoke tends to stay near the emissions source. In drier summer months, motor vehicles can emit exhaust pollutants and stir up dust on dirt roads that can travel for long distances. Natural sources of PM10 and NOx include wildfires and dust storms.

In addition to PM10 and NOx, vehicle emissions include hydrocarbons and carbon monoxide. Travel on unsurfaced roads can substantially increase local atmospheric concentrations of fine particulate matter unless those roads are treated for dust abatement. Surfaced roads usually emit very little particulate, but where cinders and sand are applied to facilitate traction during icy conditions, significant short-term dust can occur once the roads dry out. This is usually a short-term condition but worthy of control (e.g., sweeping) in settled areas.

Non-anthropogenic sourced pollutants in southeast Utah fall into two broad categories: fine particulate that reduces visibility and may affect health, and non-particulate sources. Fine particulate generally comes from naturally occurring fires (e.g., started by lightning) and wind-blown soil and dust (that may include ash). Non-particulate sources usually are complex organic molecules emitted by vegetation (such as terpenes from conifer trees). Terpenes and similar volatile organic compounds react with ozone to form a whitish haze, and can produce this haze over southeast Utah when ozone is present in sufficient quantity. As seen in Table 4, ozone levels occur well above background (about 0.04 ppm) and therefore haze may be naturally generated in this fashion. The Proposed Action's contribution to emissions that can create regional haze (i.e., NOx) is minimal and is addressed in the impact section of this EA.

The State of Utah noted in a recent letter to the BLM (2008) that "monitoring data at these locations (national parks in the Four Corners area) demonstrates a gradual upward trend in ozone levels, raising questions about ozone levels region-wide." In the region, some studies have been conducted to evaluate air pollutants that reduce visibility. These are summarized for the two National Park Service units closest

to the Daneros Mine site, as shown in Table 6. These parks are approximately 100 and 34 miles from the PPA, respectively.

**Table 6. Sources of Visibility-Reducing Compounds in Class I Areas near the Proposed Mine**

| Compound | Sulfates | Crustal Materials (soil dust) | Elemental Carbon (soot) | Organic Carbon | Nitrates |
|---|---|---|---|---|---|
| **Sources** | **Utility and Industrial Boilers** | **Roads, Construction, and Agriculture** | **Combustion of Wood, Diesel, and Other Materials** | **Autos, Trucks, and Industrial Processes** | **Motor Vehicles and Industrial Boilers** |
| Mesa Verde National Park | 46% | 23% | 7% | 18% | 6% |
| Canyonlands National Park | 38% | 29% | 8% | 17% | 8% |

Note: Data from National Park Service (2005).

Table 6 shows that approximately one-quarter of the visibility impairment at these sites comes from wind-blown dust (crustal materials). The bulk of other visibility-impairing compounds are from combustion of either fossil fuel or wood. Sulfur dioxide emissions from combustion of diesel fuels often becomes sulfate, one of the primary pollutant compounds which can reduce visibility.

## *3.4.2 Water Quality*

Water pollution can affect human health and the chemical, physical, and biological integrity of affected waters, resulting in reduced beneficial uses of the water. Water quality in southeast Utah is affected by various factors. Industrial point sources of discharge such as power plants in the Four Corners region, mines, and oil and gas extraction activities contribute to local and regional water pollution. Nonpoint source discharges often result from urbanization and industrialization, and may affect water quality over a wider area. Nonpoint sources include runoff from stormwater or snowmelt, agricultural irrigation, and drainages from abandoned mines. Drainages from active mines are considered point sources and are regulated by state and federal laws. Nonpoint source discharges are managed by the Utah Nonpoint Source Management Plan, under the Utah DEQ (DEQ 2008). As listed on that plan, there are currently five abandoned mines in San Juan County, including Fry Canyon and Red Canyon, that are considered eligible for clean-up activities (DEQ 2008).

In Utah, the DEQ's Water Quality Board and Division of Water Quality, and the Utah Drinking Water Board and Division of Drinking Water, are responsible for the protection of the state's water quality. Pursuant to Utah Administrative Code R317-2, numeric criteria have been established for domestic, recreational, and agricultural uses. The maximum numeric criteria for uranium in water is 30 micrograms per liter (µg/L), and for radium-226 and radium-228 it is 5 picocuries per liter (pCi/L). Surface water samples collected from Bullseye Canyon and Fry Canyon indicate uranium activities of 28 and 67 µg/L, respectively, which is consistent with background levels in the area. One sample taken underground at the base of the old Bullseye Decline has an understandably high uranium activity of nearly 24,000 µg/L.

### 3.4.2.1 REGULATORY SETTING

#### 3.4.2.1.1 Federal Water Pollution Prevention Act (Clean Water Act):

The Clean Water Act (CWA) is the "cornerstone of surface water quality protection in the United States" (EPA 2008b). It does not address groundwater or general water quantity. The tools provided by the CWA

are designed to limit and reduce direct discharges of pollutants into the waters of the U.S., and to manage polluted runoff.

### 3.4.2.2 SURFACE WATER

There are no perennial or intermittent watercourses on or within the PPA. One distinct ephemeral drainage collects storm runoff from erosional features along the face of the side-slopes of Wingate Mesa above the mine. This drainage eventually traverses through Bullseye Canyon, North Fork Red Canyon, Red Canyon, and finally reaches the Colorado River, which is the nearest perennial water, approximately 28 miles from the proposed mine operations. No stream gauges exist through this distance, and it is reasonable to expect that flow occurs in the on-site wash only during significant precipitation events. No historical record of flows exists for these tributaries (U.S. Geological Survey 2008). The final stretch of this drainage before the Colorado River experiences intermittent flow below approximately 3,800 feet. This is in part a result of seepage from surrounding up-gradient subsurface movements. No subsurface flow is associated with the drainage through the PPA. No permanent springs or bodies of water are directly related to surface conditions within the PPA or the side canyon in which it resides. The nearby perennial Bullseye Spring is located at an elevation of 6,070 feet, the same elevation as the second proposed air vent site and 380 feet in elevation above the proposed decline portals and waste dump. Bullseye Spring is a small perched spring/seep with its source water percolating from the adjacent Wingate Mesa, which rises 800 feet above the spring (see Appendix K:Figure 4). Discharges to the spring occur at a rate of approximately 0.25 gallon per minute (15 gallons per hour).

Previous mining operations in the PPA resulted in a waste-rock pile adjacent to the primary drainage leading to the base of Bullseye Canyon. The waste pile contains elevated levels of radium and thorium, according to soil samples taken and analyzed in mid-2008 (Energy Laboratories 2008; see Appendix F in this EA).

### 3.4.2.3 GROUNDWATER

Groundwater in southeast Utah is yielded primarily from fractures in consolidated rocks such as basalt, limestone, and sandstone. This part of the state is generally an area where groundwater is not significantly developed (Utah Division of Water Resources 2008) because of the low population in San Juan County: there are roughly two persons per square mile, according to the U.S. Census Bureau (2000). There is limited agricultural and livestock irrigation development, but other water-intensive commercial development in the area is generally absent. However, commercial mining and processing for uranium has existed in the county since at least the 1940s (State of Utah 2001). In the remote areas of San Juan County, uranium mining has become the principal water-demanding industry, although very few wells have been drilled in the region (Utah Division of Water Rights 2007).

There has been little ground water development in Bullseye Canyon. There are no wells on the proposed mine site. According to the State of Utah Division of Water Rights, there are two existing water rights in the canyon, Bullseye Spring and Bullseye Well. The spring and the well are used for livestock watering purposes. Historically, the well was drilled and used as a source of water for past mining operations in the canyon. The spring and well are located east of, and roughly at or slightly below the elevation of the proposed mine vents. The Bullseye well extends 200 feet deep (Appendix K:Figure 4). According to Utah Division of Water Rights records, the well produces less than 1 gallon per minute.

The well produces a small quantity of water from a shallow perched aquifer which is approximately 300 feet above the level of the mine. This is the same shallow aquifer that feeds Bullseye Spring. The perched water table conditions result from meteoric waters moving downward from the area of recharge on Wingate Mesa through unsaturated strata comprising permeable sandstones of the Kayenta and Wingate

Sandstone Formations. A low-permeability layer in the Chinle Formation is believed to intercept the downward movement of water, causing water to accumulate on top of the low-permeability layer as a small perched zone of saturation. Water in the perched water table moves laterally above the low-permeability layer until it discharges at the outcrop in Bullseye Canyon (Bullseye Spring). A water sample taken from Bullseye Spring and analyzed shows that the spring meets the State of Utah's numeric standard for uranium.

A second more substantial aquifer occurs at depth below the PPA. This aquifer is in the Cutler Group estimated to be a minimum of 500 feet below the mine level. The Cutler White Rim aquifer is confined by low-permeability layers in the overlying Moenkopi Formation, which shares a distinct unconformable border with the Chinle Formation above it (Utah Geological Survey 2000). Because there has been very little development completed in the PPA in regards to its groundwater resources, the hydrogeologic system is not well understood and the degree of connectivity between the shallow perched and deeper Cutler groundwater aquifer systems is relatively unknown. The two aquifer systems are likely hydrologically separated because the Chinle and Moenkopi Formations have low permeability and transmissivity which confine upward movement to shallower aquifers (Howells 1990).

Drilling results seem to support the assumption of isolated aquifer systems. Core samples to test for ore concentration were taken at depths ranging from 360 to 560 feet below ground surface and none encountered groundwater within the mine interval. With all appreciable local groundwater occurring well below the mine level, underground mine workings are not expected to encounter any groundwater which would require mine dewatering through pumping and treatment at the surface.

The MPO includes an on-site well for dust suppression and a source of water to operate drilling equipment. The proposed well would target the Cutler White Rim aquifer. This confined aquifer is used elsewhere for water supply at the Fry Canyon Lodge. UEC has received approval to drill the new water well in the proposed office/shop area. An application to appropriate from the Utah Division of Water Rights is pending. Water would be tested before utilization can be granted.

In Fry Canyon, 3.5 miles northeast of the PPA, shallow groundwater in the Cutler aquifer emerges along the Fry Creek drainage as several springs along Fry Creek (a low-flowing perennial stream in parts). UEC would temporarily draw water from Fry Spring to use for dust suppression and drilling operations until the on-site well becomes operational. UEC has an agreement with the water rights owner, Mr. Sandy Johnson, to extract water from Fry Spring. Samples taken from the Fry Spring indicate that uranium levels are 67.7 µg/L (Energy Laboratories 2008). Whereas this level exceeds Utah's Numeric Standards of 30.0 µg/L for domestic use (Utah Administrative Code §R317-2-14), water from Fry Spring would not be used for domestic purposes; it would be used solely for dust suppression and drilling operations.

#### 3.4.2.4 WATER QUANTITY

Between 1989 and 1998, less than 3,000 acre-feet per year of groundwater was developed in the Blanding area of southeast Utah (State of Utah 2001). Little data are available for this area, but the State estimates annual groundwater pumping to be at or below annual recharge values.

### *3.4.3 Wildlife*

The only wildlife species that could be affected by the Proposed Action is the desert bighorn sheep. See Appendix A for a brief explanation of species which are present but do not require detailed analysis and why they need not be analyzed further.

#### 3.4.3.1 DESERT BIGHORN SHEEP

The PPA occurs within designated desert bighorn sheep (*Ovis canadensis nelsoni*) crucial habitat. The designated crucial habitat totals approximately 380,000 acres within the BLM MFO, excluding Lockhart Basin. Crucial habitat is designated in areas where lambing and rutting are likely to take place. Lambing usually occurs in the spring, between April 1 and June 15. Rutting typically occurs in late fall, between October 15 and December 15.

Desert bighorn habitat is extremely rugged, and is characterized by canyons, gulches, talus cliffs, steep slopes, mountaintops, and river benches (Utah Division of Wildlife Resources [UDWR] 2008). They inhabit naturally remote and inaccessible terrain. They are often found in open habitats with nearby steep rocky areas which they will use to escape danger and for safety (UDWR 2008). Desert bighorns generally do not migrate, but use suitable habitat all year long.

The PPA occurs within the South San Juan bighorn sheep herd unit. This unit holds a population of approximately 200 sheep, with a herd objective of 300 sheep (personal communication, Brad Crompton 2009; UDWR 2008). The population within this herd unit is increasing (UDWR 2008). The South San Juan herd unit has served as a source population for two transplant efforts: 12 sheep released in the San Rafael North area in 1979, and 19 sheep released in the John's Canyon area of the San Juan in 2008 (UDWR 2008).

During biannual aerial surveys of the area, there are typically 20 to 30 bighorn sheep individuals in the habitat surrounding the PPA (personal communication, Tammy Wallace 2009). These animals traverse along the steep talus slopes in order to travel up and down drainages. The heads of many of the canyons in the area contain small water sources (personal communication, Brad Crompton 2009). Other water sources, such as seeps, wildlife water catchments, and springs are also available for bighorn sheep use in nearby canyons. A small seep at the head of Bullseye Canyon provides a source of water for the bighorn sheep. The seep is located approximately 1.5 miles northeast of the proposed mine site at an elevation approximately 600 feet above the portal.

### *3.4.4 Human Health and Safety Concerns*

Rocks and soils in the vicinity of the Daneros Mine PPA contain naturally occurring radioactive material (U.S. Department of Energy [DOE] 2007). Most of the natural radioactivity is derived from the uranium-238 and uranium-235 decay chains. One of the products in the uranium-238 decay chain is radium-226 (Ra-226), which is the principal radionuclide of concern for characterizing the distribution of radioactivity in the environment. Ra-226 decays to radon, an invisible, odorless gas.

Uranium is a naturally occurring radioactive material and uranium mines typically contain materials that have radioactivity above background. During the mining process overburden and protore (uranium ore not rich enough to meet market demand and price) are removed to allow extraction of the uranium ore. As defined by EPA (2008c), when naturally occurring radioactive materials have been concentrated or exposed to the accessible environment as a result of human activities such as manufacturing, mineral extraction, or water processing, the material is considered *technologically enhanced naturally occurring radioactive material* (TENORM). TENORM is often characterized by its more hazardous decay product, Ra-226.

Background levels of Ra-226 are normally present in soil in trace concentrations of about 1 picoCurie per gram (pCi/g); however, background concentrations within ore-bearing formations may be as high as hundreds of thousands of pCi/g. EPA (1991) reports that background concentrations of Ra-226 in mine-waste rock piles typically average 23.7 pCi/g. In lease tracts in western Colorado, the concentration of

Ra-226 in mine-waste rock piles is about 110 pCi/g (DOE 2007); it is expected that similar conditions could be present for the PPA but are dependent on the local geology.

Laboratory analyses of rock samples collected from the existing ore stockpile and waste dumps at the Daneros Mine provide an indication of the Ra-226 levels currently present. These analyses are found in Item N of the MPO (UEC 2008:Item N), available at the BLM MFO. Ra-226 levels in the existing waste rock ranged from 2.2 to 30.2 pCi/g (samples DX04 and DX05) whereas Ra-226 levels in the existing ore pad ranged from 226 to 261 pCi/g (samples DX01 to DX03).

Nationwide, people are exposed to an average of about 300 millirems per year (mrem/yr) of natural background radiation (National Council on Radiation Protection and Measurements 1987). Table 7 presents a summary of radiation doses reported by DOE (2007) from natural background for the nation and representative doses for the region. The Daneros Mine PPA doses would be similar but may be assumed to be a little higher than those shown in Table 7, as these measurements were near Blanding, Utah.

**Table 7. U.S. and Daneros Mine Project Area Regional Natural Background Radiation Doses**

| Radiation Source | U.S. Average Natural Background Radiation Dose (mrem/yr) | Daneros Mine Project Area Regional Natural Background Radiation Dose (mrem/yr) Near Blanding, Utah |
|---|---|---|
| Cosmic and cosmogenic radioactivity | 28 | 68 |
| Terrestrial radioactivity | 28 | 74 |
| Internal radioactivity | 40 | 40 |
| Inhaled radioactivity | 200 | 260 |
| Total | 300 | 440 |

Note: Data from DOE (2007); mrem/yr = millirems per year.

The largest natural source is inhaled radioactivity, mostly from radon-222 and its radioactive decay products in homes and buildings, which accounts for about 200 mrem/yr. Additional natural sources include radioactive material in soils (primarily external radiation from the uranium and thorium decay series), radioactive material in the body (primarily potassium-40), and cosmic rays from space filtered by the atmosphere.

On August 22, 2008, Denison Mines Corporation personnel conducted a gamma survey of the Daneros Mine site. The survey was conducted using a Ludlum Model 3 (SN 237483), calibrated on March 13, 2008. Exposure rates were recorded in units of milli-Roentgens per hour (mR/hr). The results of this survey are provided in Item X of the MPO (UEC 2008:Item X) and indicate that background exposure rates of 0.02 to 0.04 mR/hr are present in undisturbed areas near the Daneros Mine property, along County Road B258. Gamma radiation exposure rates ranging from 0.02 to 0.50 mR/hr were detected in disturbed areas, with the highest emissions associated with the waste rock area.

The radiation dose values that correspond to the results of this gamma survey indicate that background doses range from approximately 150 to 300 mrem/yr.

Underground uranium mines do not require licensing under NRC regulations and, therefore, mine operators are not required to meet the standard dose limit for the public specified at 10 CFR 20.1301(a)(1). However, the NRC standard (100 mrem/y over background) is considered a guideline for the protection of human health and safety.

**Transportation**

The Daneros Mine proposes up to six ore trucks per day traveling to and from the mine site, utilizing State Highway 95 and County Roads B258 and D0029. In addition to the six ore trucks, an additional 10 trips per day are anticipated for employee traffic and support vehicles, for a total of 32 vehicle trips per day (16 round trips).

The ore truck haul route is from the mine to the uranium mill south of Blanding via State Highways 95 and 191. Utah Department of Transportation's (UDOT) Traffic Volume Map for 2007 (UDOT 2007) lists a total of 555 vehicle trips per day for the segment of State Highway 95 between State Highway 261 and State Highway 191, and lists a total of 2,505 vehicle trips per day for that segment of State Highway 191 between State Highway 95 and the uranium mill south of Blanding.

State Highways 95 and 191 are each two-lane divided highways with minimum 12-foot lane widths along the proposed haul route corridor. Per Exhibit 12-15 of the Highway Capacity Manual (HCM2000), a Class I highway with a Free Flow Speed of 60 mph in rolling terrain is capable of accommodating up to 130 vehicles per hour (vph) with a Level of Service (LOS) A condition (State Highway 95), and is capable of accommodating up to 290 vph with a LOS B (State Highway 191).

# 4 ENVIRONMENTAL CONSEQUENCES

## 4.1 Introduction

The resources identified by internal and external scoping are analyzed in this chapter. The environmental consequences of the implementation of each Alternative described in Chapter 2 are presented for each of the resources.

## 4.2 Direct/Indirect Impacts Alternative A – Proposed Action

### *4.2.1 Air Quality*

Potential impacts from mine development would be dust generation, diesel engine exhaust, and radioactive dust and gases released into the atmosphere. These potential impacts would be created by mine operations and truck travel on dirt roads. The approved BLM MFO RMP contains 10 Management Actions intended to meet and comply with federal, state, and local laws and regulations (BLM 2008a:57–58). These actions are included as part of the Proposed Action.

To implement these Management Actions, UEC would be required to keep dust from operations and transportation to a minimum. The on-site fugitive dust specification is 20 percent opacity, a measure that gives inspectors an objective tool to determine compliance with particulate control measures. UEC would also be required to use clean fuels and diesel engines to minimize exhaust impacts. UEC would conduct ambient air radon tests and annual radon reporting to ensure that public and worker health is protected. The MPO includes a Fugitive Dust Control Plan.

These and other measures incorporated in the Proposed Action are designed to control dust generated by mining and ore transportation, minimize NOx and other pollutant emissions from diesel engines, reduce worker exposure to radon and prevent radioactive material from being spread by wind or during transport. With these built-in mitigation measures, operation of the Daneros Mine would not result in exceedences of the National Ambient Air Quality Standards (see Table 3). As described below, impacts to air quality

as a result of mine operations and ore transportation would be minor and would not cause a violation of state or federal air quality standards or degrade any Class I area in the region.

### 4.2.1.1 MINE VENTILATION

Particulate emissions from mine ventilation were calculated based on the maximum allowable in-mine level of PM10. Based on this level and conservatively estimated maximum emission levels, PM10 emissions from the vents are considered a minor source. By regulation, the annual PM10 emissions cannot exceed 4.1 tons per year and visible emissions cannot exceed 20 percent opacity (DEQ 2005).

Radon is primarily a health concern only in confined spaces due to its concentration and accumulation, which is why the EPA has mounted a concerted effort to have people test their homes for radon and take action if necessary. Radon emissions from the PA could result in air quality health concerns for workers if radon became concentrated in buildings used by mine staff. The MPO positions all buildings well away from the vent shafts to protect worker health. As a result of radon's propensity to dissipate very quickly in open air, radon should not be an air quality concern near the top of a vent shaft or portals. In the open air, the amount of radon gas at areas accessible to the public is very small and does not pose a health risk (Health Canada 2007). Ambient air radon tests and annual radon reporting is not required per 40 CFR Part 61 subpart B because the Daneros Mine operation would not produce more than 100,000 tons of ore during the life of the mine. However, UEC proposes to implement radon monitoring and reporting procedures consistent with the NESHAP Subpart B standards as outlined at 40 CFR Part 61. This testing would ensure that public and worker health is protected.

Potentially harmful levels of radon are most likely to be found in the confined space of the underground mine workings infrastructure, not in the open air outside of the mine workings. Because radon is the heaviest noble gas, it would tend to sink to the bottom of the shaft rather than move to the top. Under MSHA safety requirements, the mine would be adequately ventilated at all times during human occupancy. Workers would wear radiation monitoring devices to maintain exposure to legally allowable levels.

The UEC would submit a ventilation plan to MSHA once that agency issues a mine permit number. As described in Section 2.2.2, this plan proposes two declines at the Daneros Mine. One decline, measuring 7 feet wide, 7 feet high, and 970 feet long, would be used for ventilation and as a secondary escape route. Two vent holes would be drilled during mine development. The two vent holes would be 7 feet in diameter with a 6-foot casing and a protection screen over the top. Large fans would be located underground to force fresh air through the mine whenever workers are present. The combination of declines, vent holes, and underground fans would maintain adequate ventilation for worker safety.

### 4.2.1.2 POTENTIAL EMISSIONS SOURCES – FOSSIL FUEL COMBUSTION AND DUST FROM SURFACE FACILITIES

The Proposed Action would create pollutants from several different sources. These sources include road dust from vehicle travel, mining processes, wind-blown dust from the ore and waste pile, and diesel exhaust from the electric generator, mining equipment, and ore haul trucks.

Each of these sources was carefully considered. The amount of criteria pollutants that would be generated from these sources is shown in Table 8 below. These generated amounts are compared to allowable emission levels published by agencies with jurisdiction and expertise to determine if detailed modeling is recommended. Agency thresholds also help assess possible emission impacts to the environment resulting from the Proposed Action. The total amount of pollutants is accounted for but, pollutants are also discussed and presented in a manner consistent with agencies' guidelines to make a

comparison easier. Calculations for this project were completed based on site-specific information such as fuel consumption, length of travel on dirt roads, silt content of the dirt roads, the type of vehicles, and speed of vehicles. The detailed information and assumptions are listed in Appendix L.

Although the calculations and agency comparisons be difficult to follow there are two important findings. First, according to UDAQ guidelines, the proposed project does not exceed the thresholds for stationary sources that trigger air modeling for any of the criteria pollutants emitted by the project (UDAQ 2008b). This indicates that impacts would be negligible as the amount of increase in ambient pollutants would be too small to measure. Secondly, the guidelines from the Federal Land Managers Air Quality Working Group (FLAG), which utilize a quantity (Q) of pollutants and distance (D) from important and protected viewsheds (such as Canyonlands National Park Class I area), would not be exceeded by the project. The federal criterion is expressed as a Q/D ratio. The Q/D ratio for this project was calculated as 3.0, which is far below the modeling threshold value of 10 recommended by the FLAG. This indicates that no modeling is necessary and that the quantities are sufficiently small that impacts are likely to be negligible.

**Table 8. Project Emissions of Criteria Pollutants (tons/year)**

| Pollutant | Could Require Modeling If Emissions from Stationary Sources Exceed* | Daneros Project Emission Levels from Stationary Sources Subject to Permit | Daneros Project Emission Levels from Other Sources, (Mobile and Blasting) |
|---|---|---|---|
| SO2 | 40 | 0.0033 | Negligible |
| NOx | 40 | 10.7 | 118.2 |
| PM10 | 15 | 0.2 | 33.5 |
| C0 | 100 | 4.0 | 165.8 |
| Lead | 0.6 | Negligible | Negligible |
| PM2.5 | n/a† | 0.02 | 3.4 |

*Modeling would be required by UDAQ
† Not a listed value

State and federal agencies generally regulate pollutants slightly differently. For example, the State of Utah considers whether the source is stationary or non-stationary, whereas the FLAG makes initial screening based upon a Q/D ratio. Table 1 of the UDAQ published guidelines lists emission rates for pollutants that when exceeded could require detailed modeling (UDAQ 2008b).

CRITERIA POLLUTANTS

PM10

A total of 33.5 tons/year of PM10 would be emitted by the project, the vast majority of which would be fugitive dust from vehicle travel on the 13.2 miles of dirt road and equipment use on the mine site. An additional 1.2 tons/year comes from travel along the paved roads. Permitted stationary sources only account for 0.2 tons/year of PM10. PM10 is one of the major compounds of concern to state and federal officials responsible for protecting air quality in Utah. The UDAQ guidelines would not be exceeded by the Proposed Action. A Tier 3 generator is required for the project which would limit PM10 output. The FLAG have adopted a screening criteria that uses three compounds (NOx, SO2, and PM10), along with H2SO4 (sulfuric acid), as a guideline for possible further action to protect AQRVs (visibility and acid deposition). The FLAG Q/D ratio for the project is 3.0, well below the accepted guideline of 10.

Particulate matter is the main source of haze that reduces visibility. Some dust is unavoidable from motor vehicle travel over unpaved roads. UEC would employ state control measures and operating procedures to minimize fugitive particulate emissions into the atmosphere, as specified by Utah Administrative Code R307-205-7. UEC submitted, as part of the MPO, a formal Fugitive Dust Control Plan to control dust from the sources noted above. The plan includes spraying the unpaved haul roads twice daily with water. If dust is prevalent, as noted by observations of prominent dust plumes, more frequent watering may be

indicated. UEC may also propose using dust palliatives, which bind soil particles, and lessen demand for water. This could occur during dry periods when dust is most common. These practices can usually reduce dust by approximately 80 percent and when implemented, would reduce PM10 levels from the project to a level of insignificance. The UEC Fugitive Dust Control Plan for the Daneros Mine would limit haul-truck speeds on unpaved roads. Per Sanders (2008), reducing vehicle speeds from 30 mph to 20 mph for a three-minute duration reduced dust production by over 60 percent (e.g., 4.2 g at 30 mph vs. 1.6 g at 20 mph). The Dust Control Plan would help control PM10 to protect human health and minimize impacts on visibility in the region and at nearby Class 1 areas (national parks). The FLAG recognizes in their accepted air modeling protocols that almost all PM10 drops out within 36 km of the source (Countess et al. 2001). Based on this protocol, PM10 from the proposed project would not degrade visibility in Class I areas because the nearest national park is about 56 km away.

PM2.5

A standard engineering estimate for the amount of PM2.5 is 10–15 percent of total PM10. This practice of estimating PM2.5 is accepted by the FLAG. An estimate of PM2.5 for the proposed project is approximately 3.5 to 5.0 tons/year from all sources combined. There is no guidance from FLAG or the UDAQ recommending modeling for PM2.5 emissions. The impacts to Canyonlands National Park visibility would also be small and incremental as the relative amount of PM2.5 is minor. In fact, based on the small amount of PM2.5 from the project (3.5 to 5.0 tons/year) and the distance from the Class I area (54 km), a Q/D ratio indicates that the value would be negligible and would not be sufficient for modeling to effect a reliable estimate of the minor incremental increase.

Carbon Monoxide

Carbon monoxide (CO) disperses rapidly in the atmosphere and is not considered a problem in ambient air in the United States, except for some crowded and congested traffic areas in major cities. In fact, all parts of the United States now attain the CO standard except for Clark County, Nevada (Las Vegas). Ambient levels are so low in most of rural Utah that CO monitoring was discontinued. For the proposed project, the bulk of the CO would be created by the six ore trucks hauling to the mill in Blanding – about 65 miles away. These emissions would be dispersed over the length of that trip and diluted by local air movements, so CO emissions are not a concern for human health.

Sulfur Dioxide

Sulfur dioxide (SO2) is one of the major compounds of concern to state and federal officials responsible for protecting air quality in Utah. Recent federal rules have reduced sulfur in diesel fuel from 500 ppm to less than 15 ppm. Thus, SO2 emissions from diesel vehicles have fallen dramatically. The Proposed Action would create only .0033 tons/year of SO2. Coal burning and copper smelting now represent the major sources of SO2 emissions in the Four Corners region. The FLAG screening criteria includes SO2. As stated above, the Q/D ratio for the proposed project is well below the accepted guideline and shows that no air modeling is required to protect AQRVs (visibility and acid deposition). UEC would comply with clean engine standards and use low-sulfur fuel for all mine equipment and generators, which would help control nitrate and sulfates that could degrade visibility.

Nitrogen Oxides

There would be about 10.7 tons/year of NOx emissions from the generator, a potentially permitted stationary source. This is well below the 40 tons/year threshold that triggers modeling and permitting by the UDAQ. An additional 118.7 tons/year of NOx would be contributed from mobile equipment, blasting, and on-road vehicles (see Table 8). Canyonlands National Park is the closest Class I area, about 54 km northwest of the proposed mine's access roads. As discussed above, all sources, including NOx, were used to evaluate the need for modeling to protect AQRVs at Class I areas. For the proposed project the Q/D ratio is 3.0, which is well below the FLAG guideline of 10. The small Q/D ratio shows that impacts to visibility are likely to be negligible.

Lead

There are National Ambient Air Quality Standards for lead as a gas or particulate. Airborne lead was once a wide-spread problem because it was in gasoline. Lead was found as a particulate in the air, and also as a deposit on surfaces and in soil throughout the United States, especially in areas with high traffic volumes. Since leaded gasoline was phased out in the late 1970s, the only major sources now are lead smelters or other large stationary sources that use or process lead. There are no impacts from lead associated with this project because there is essentially no emission source for it.

OTHER EMISSIONS

Carbon Dioxide

Carbon dioxide is a greenhouse gas. Approximately 690 tons/year of CO2 emissions would be generated primarily by diesel fuel combustion. An unknown amount of CO2 would also be generated by blasting activities (there are no EPA emission factors for CO2). The amount of CO2 from the proposed project would be small and dispersed over a large area. Refer to Appendix A for a summary of impacts on global climate.

Sufuric Acid

Sufuric acid (H2SO4) is formed in the atmosphere when SO2 combines with water vapor. H2SO4 was part of the calculation for modeling under the FLAG protocol (Q/D). No impacts would occur from H2SO4 as the amount would be undetectable based on the negligible amount of SO2 from the project.

SUMMARY OF IMPACTS

The proposed project includes control measures to mitigate impacts to air quality. These control measures include the use of low-sulfur diesel fuel, a dust control plan to achieve 80 percent reduction in dust emissions, and a Tier 3 generator to meet strict new source performance standards for emissions. Emission calculations for the project show that, with these control measures, the proposed project would be a small contributor of criteria pollutants. The proposed project would not result in exceedences of the National Ambient Air Quality Standards and would not degrade the visibility in Class I areas. Screening protocols of the FLAG and guidelines of UDAQ indicate that dispersion modeling is not needed as impacts would be minor.

#### 4.2.1.3 POTENTIAL EMISSIONS SOURCES – GENERATOR

A 350-kilowatt (approximately 500 horsepower [hp]) diesel electricity generator would be located at the Daneros Mine portal site for electric power. The generator would create about 8 percent of the Proposed Action's total NOx emissions. The generator would meet strict Tier 3 New Source Performance Standards for emissions. Assuming a 500-hp engine operated for 12 hours per day, 360 days per year, NOx emissions would be approximately 10.7 tons/year, below the amount requiring an air permit (40 CFR 89).

#### 4.2.1.4 POTENTIAL EMISSIONS SOURCES – RADIATION

Uranium mining impacts are generally similar to those of other metallic mineral mines (i.e., dust and engine exhaust). Radioactive dust and gases (e.g., radon) from mining uranium ore require some special management, in addition to the general environmental controls of any mine.

Uranium mining releases radon into the atmosphere. Underground mines potentially pose a higher radon risk to both the public and workers because radon tends to sink and persist inside the mine. Conversely, open-pit and in-situ mining sites have been monitored by federal agencies, and found to pose a low risk to the public.

In addition to mine ventilation discussed in Section 4.2.1.1, other sources of radon include the ore stockpile, waste rock dump, and the open portal of the old McCarty–Coleman Decline. As with radon gas vented to the surface from the underground mine, radon emission at the ore and waste rock dumps would dissipate very quickly in open air and would not be an air quality concern. Proposed measures including concurrent reclamation of the site, closure of the McCarty–Coleman Decline, daily transport of ore, and restricting access to the public during mine operations would further reduce any potential exposure to radon gas.

The ore from the Proposed Action would be trucked approximately 65 miles on public roads and highways to an existing processing facility in Blanding, Utah. There is a potential for ore dust to blow out of the haul trucks and, over the seven-year life of the project, spread uranium ore along public roads and adjoining areas. Dust controls and other measures including tarpaulin covers and tailgate closer requirements for haul trucks would be required to avoid spreading ore in transport, as specified in the Transportation Policy for Shipments of Colorado Plateau Uranium Ores to the White Mesa Uranium Mill (Appendix D).

### *4.2.2 Water Quality*

The Proposed Action would require approximately 5,000 gallons of water per day for mining and dust suppression. This would be derived and hauled in from Fry Spring initially, until a water well is completed in the Cutler White Rim aquifer. As discussed in Section 3.4.2.3, the aquifer is confined by low-permeability layers of the Moenkopi Formation. Also, the well bore would be cased and otherwise sealed to prevent migration of surface water into the well annulus; thus, the quality of the lower aquifer would not be affected by operations on the ground.

Uranium-tainted water poses a health risk when used for human consumption due to uranium's chemical toxicity. Detrimental effects on the renal system have been documented for several compounds containing uranium. Appropriate treatment is recommended for domestic water supplies exceeding 100 µg/L uranium (Roberts 2008). Preliminary water quality samples from Fry Spring indicate that uranium levels ranged from 58.0–67.0 µg/L. This exceeds Utah's Division of Water Quality numeric standard of 30.0 µg/L for domestic use. However, water from Fry Spring would not be used for domestic purposes, it would be used temporarily for dust suppression and drilling operations. Other constituents tested

included radionuclides, other metals, and suspended/dissolved solids, none of which exceeded Utah's numeric standard. Temporary use of water from the Fry Spring for dust suppression would not affect surface water quality at the Daneros site, as there are no permanent or intermittent surface water bodies within the approximate 28 miles between the PPA and the Colorado River. All tributaries within Red Canyon's watershed are ephemeral and it is highly unlikely that the use of 5,000 gallons per day would contribute to any measurable flow. This is because water would be applied uniformly to mine disturbances and roads and would only be used when dry or dusty conditions warrant. Under these conditions, water would be absorbed rapidly by the soil and evaporation rates would be high. Containment measures in the SWPPP would ensure that the Fry Spring water applied to the primary mine disturbance (i.e., office/shop and portal areas and ore and waste rock storage areas) would be prevented from migrating off site during mining operations. The long term stability of the site would be accomplished with proposed reclamation. The haul route would not be reclaimed after mining operations are complete but would be returned to public use. Based on the uranium concentration at Fry Spring (58 µg/L), and assuming that water from the spring would be applied to the 0.75 acre access route at a rate of 1,000 gallons per day for a maximum of six months, and that the uranium would be attenuated in the top 2 inches of soil, then the resulting increase in the amount of uranium in the soil can be calculated as follows:

180 days × 1,000 gal/day / 32,670 sq. ft. = 5.5 gal/sq. ft.

5.5 gal/sq. ft. × 58 µg/L × 3.79 L/gal = 1,209 µg/sq.ft.

0.17 cubic feet × 78 lbs/cubic feet / 2.2 kg/lb = 6.0 kg

1209 µg/6 kg = 0.2 mg/kg uranium in soil.

Background in the western U.S. is 2–7 mg/kg (Schacklette and Boergen 1984) so the use of Fry Spring water for dust suppression would cause an undetectable increase in uranium concentration in on-site soils, particularly on the ore and waste rock area where uranium concentrations would be much higher than western U.S. background levels in general. Calculations show that the increased amount of uranium in soils on the haul route would be insignificant.

Water or approved wetting agents would be used on the waste rock storage piles during operations. Water would be obtained from a new on-site well located in the mine/office area away from the influence of the waste dump. The well would be drilled to the underlying Cutler aquifer and water would be tested to ensure good quality before being used for dust suppression. Waste rock from the Daneros Mine would be comprised of sandstone and mudstone produced from a 100-foot-thick stratum of Chinle Formation during development of the twin declines and the two ventilation shafts. No significant radiological elements are present in this waste rock that would be produced from this interval above the ore zone. Acid rock drainage (ARD) is a concern when acid formation occurs and is discharged in groundwater from mines or surface water in contact with waste rock dumps with a high sulfur content. Because of the lack of groundwater, water would not be discharged from the underground mine workings. To characterize the mineralized waste rock material that would be produced from the ore horizon at the Daneros Mine and determine the potential acid mine drainage, UEC collected samples from diamond cores through the ore zone and from the nearby waste rock dumps at the McCarty–Coleman Decline of the Lark Mine. The samples were sent to American Assay Laboratories of Sparks, Nevada. The results (see Appendix J of this EA) show that there is minimal risk for acid formation. The likelihood of acid formation is minimal due to the low sulfur levels and high carbonate content of the waste rock. Furthermore, the waste rock storage pile generated by mining operations would undergo reclamation and stabilization procedures pursuant to the Mined Land Reclamation Act (Title 40-8-12.5, Utah Code). Approximately 1 foot of reclaimed

topsoil would be placed on the entire waste rock pile and ore stockpile area and revegetated with a BLM-approved native seed mixture to reduce erosion and sedimentation.

The waste pad would be located on the former waste rock pile of the McCarty–Coleman Decline so reclamation of the proposed waste rock pile would have the added benefit of helping to stabilize the old McCarty–Coleman waste rock pile. High levels of thorium and radium and low levels of arsenic were detected in the soil sample taken on the top of the existing waste rock dump. Because it abuts the drainage of Bullseye Canyon, there may be potential for materials to slowly travel downstream into larger tributaries and eventually the Colorado River. The Proposed Action would not adversely change these conditions. Rather, planned operations reduce the potential for conveyance of radiological materials from the existing contaminated waste rock dump by either removing contaminated material or capping it with inert material. Material that is to be removed would be excavated to natural land surface and either consigned to the mill or permanently stored in the new underground workings. Material that is to be capped would be covered with inert, unmineralized waste from the proposed new operations and topped with native soils and vegetation, thus reducing the potential for downstream transportation of toxic materials from the older waste dump. By placing soil material over the waste rock dump and re-establishing vegetation, precipitation events would be absorbed by the new waste rock material, meaning a portion of the historical waste rock dump would be sheltered from direct exposure. With the revegetated pile in place, less runoff would occur, as the vegetated and topsoiled slopes absorb and stabilize rainwater erosion more effectively than the currently barren waste rock pile. Moreover, the Proposed Action includes construction for a drainage diversion channel through the mine site to capture runoff from surrounding up-gradient slopes and areas on the property. This is specifically to keep maximum anticipated flows (100-year, six-hour storms) from the local watershed from running into the planned ore stockpile and waste storage pile. Mineralized waste rock produced from mining activities would be retained within the worked-out area of the mine, or stored on the ore pad until mixed with ore for shipment to the mill or until space is available within the mine for interment.

Surface-disturbing activities have the potential to impact surface water quality through erosion and sedimentation in streams (BLM 2008b). The SWPPP required for the Proposed Action (see Appendix E) features erosion control devices such as diversion ditches for all disturbed areas and places earthen berms around the ore and waste piles. The CWA, under the NPDES program, also requires facilities that discharge pollutants into waters of the U.S. to be covered either by an individual or general permit, which establishes pollution limits, and specifies monitoring and reporting requirements. EPA has the authority under the CWA (and other environmental laws) to regulate radioactive materials not specifically addressed under the Atomic Energy Act (e.g., TENORM). With regard to the CWA, any regulated pollutant discharged from a point-source from uranium mines is subject to either water quality- or technology-based effluent limits developed by EPA (see 40 C.F.R § 440.30-34), unless a specific Total Maximum Daily Load (TMDL) study has been completed or proposed for a specific waterbody or watershed in the state; in a TMDL scenario, the regulated source would need to meet the limits allocated to them. The State of Utah has not completed or proposed any TMDL study near Fry Canyon or Red Canyon. No point-source pollutants would be discharged directly into waters of the U.S. by the proposed mine, thus no individual permit would be required. The required stormwater general permit for on-site activities has been obtained through Utah DEQ.

Fuel for the operation would be stored on site in a 2,000-gallon fuel storage container. The fueling station would be surrounded by 2-foot-high compacted soil berms and lined with a 6 mil high-density polyethylene plastic liner to contain any fuel spills or leaks. The 4,000-gallon containment area is designed to contain 200 percent of the 2,000-gallon storage container (4,000 gallons) plus precipitation from a six-hour rain event. Other oils, lubricants, and chemicals would be stored in a partitioned and locked area within the shop. These containment measures, in addition to those incorporated into SWPPP,

would effectively contain any spilled fuel, lubricant, or chemicals and prevent these contaminants from migrating off site.

Groundwater quality can be degraded if contaminated surface water is allowed to migrate into aquifers through drill holes or other vertical openings. One 7-foot-diameter ventilation borehole would penetrate the level of the shallow perched aquifer at a depth of approximately 100 feet. The collar elevation of the second ventilation borehole is approximately the same elevation or slightly lower than the projected level of the aquifer so it is not expected to penetrate the aquifer. However, a 6-foot-diameter casing would be placed in the boreholes from the surface through the interval of the shallow aquifer and grouted with cement slurry. Similarly, the proposed water well would be cased and grouted according to the terms of the State of Utah's water well permit, and the 22 development drill holes would be plugged in accordance with Utah Division of Oil, Gas and Mining Rule R647-2-108. The casing and grouting of the water well and the ventilation boreholes and the plugging of the development drill holes would effectively seal the drill bores and prevent surface water from migrating into the perched aquifer which supplies water to the existing well and spring, or into the deeper Cutler aquifer which would supply water for mine operations.

No other wells exist for mining or other purposes in the area. Drinking water and water for other domestic uses (such as showers) would come from contracted, hauled-in sources. Any water contaminated with low radioactivity levels, as a result of worker contact or other means of transfer (such as wind-blown dust from the mine portal or ore stockpile) would be minimal. Such water is not considered a solid waste or listed/characteristic hazardous waste and is not regulated under RCRA (see 40 CFR Parts 261.2, 261.30, 261.20 and 261.4). As a result, water used on-site for maintenance does not need to be stored and transported by approved hazardous-waste handlers.

There are no perennial or intermittent streams supporting aquatic life immediately adjacent to the proposed haul routes. In the event an accident occurred where the load of uranium ore was dumped into an ephemeral drainage, the relatively low concentrations of the hazardous constituents of uranium ore, consisting mostly of large cobbles, could easily be removed from the drainage (DOE 2007).

#### 4.2.2.1 WATER QUANTITY

According to the State of Utah, Division of Water rights, there are two existing water rights in the canyon, Bullseye Spring and Bullseye well. The spring and the well are used for livestock watering purposes. The spring yields approximately 0.25 gallon of water per minute and the well produces less than 1.0 gallon per minute. The spring and well are fed by a shallow perched aquifer approximately 300 feet above the level of the mine workings. A deeper aquifer system is projected to be a minimum of 500 feet below the level of the mine workings.

The new well is proposed to draw approximately 5,000 gallons per day from the deeper aquifer over the life of the mine, which would amount to approximately 39 acre-feet (assuming a seven-year operation, 365 days per year). Yields from the proposed new well to be drilled into the Cutler White Rim aquifer below the PPA are unknown but the largely untapped Cutler aquifer likely contains adequate supplies for a small mining operation. The Cutler aquifer lies below the Chinle and Moenkopi Formations, which have low permeability and transmissivity and confines upward movement to shallower aquifers (Howells 1990). The Cutler aquifer is believed to be hydrologically isolated from the upper aquifer because of the overlying confining layers and because of the thickness of strata (a minimum of 800 feet) separating the Cutler aquifer from the upper aquifer. Therefore, it is highly unlikely that water withdrawn from the new well would result in diminution of water flows in the shallow perched aquifer which feeds the spring and well. Water from Fry Spring would be used temporarily until the new well is completed on site. Fry Spring occurs in Fry Canyon, located northeast approximately 3.5 miles from the mine site in an area with

a high water table. An agreement to use water from Fry Spring has been negotiated with the water rights holder Mr. Johnson. The only other predominant water use in the region is local ranching activity.

Although withdrawal of water from the new well is not expected to affect flow rates from the upper aquifer, mining activities may potentially cause sufficient disturbance to the bedrock formations that pathways for water flow would be established into the underlying mine workings from the upper perched aquifer via faults and fractures (Stilson 2009). This could occur as mine openings below the upper aquifer intercept bedrock faults or fractures which are hydrologically connected to the overlying aquifer. If significant faults or fractures are encountered, the hydrodynamic balance of the aquifer system could be altered and downward flow paths from the upper aquifer could be established resulting in water drawdown from the upper aquifer and diminution of water flows feeding the spring and well.

The extent of fracturing or faulting, which could create downward flow paths for water, is difficult to ascertain from surficial geologic studies and field investigations. However, empirical data suggests that the degree of hydrologic connectivity between the mine and the upper aquifer through bedrock fracturing or faulting in the PPA is minor. The Royal Mine, with underground workings terminating 350 feet northwest of Bullseye Spring, is at the same horizon as the proposed Daneros Mine. There is a similar relationship between Bullseye Spring and the proposed Daneros Mine, except that the Daneros lies southwest of the spring. Information provided by the previous operator of the Royal Mine indicates that the Royal workings were dry, with no influx of groundwater into the mine (Jim Butt, 2009). The lack of groundwater in the Royal workings, coupled with the fact that Bullseye Spring continues to flow 30 years after cessation of mining, indicates: 1) an absence of bedrock fractures or faults; or 2) that these secondary pathways are not sufficiently connected to the overlying aquifer for mining to affect flow patterns.

In addition to mine workings that may intercept natural fractures and faults, other bedrock disturbance that may create pathways for water flow from the upper aquifer include: vertical openings such as drill holes and ventilation boreholes which penetrate the aquifer and connect it with the underlying mine workings; and bedrock fracturing from caving or subsidence of overlying strata as ground support is removed by mine excavation. The collar elevations of the proposed water well and one of the ventilation boreholes are below the elevation of the upper aquifer so they would not penetrate the aquifer. The 22 proposed development drill holes and the second ventilation borehole would be plugged or cased and grouted. This would effectively seal the openings and prevent groundwater from flowing from the aquifer and into the mine through the openings. The mine is on a channel that would be worked to a width of 100 feet. The position of the ore body within and beneath a sequence of massive sandstone, at relatively shallow depths of between 100 and 400 feet below surface, would provide a stable environment for operations. The mine would use a roof support system of random pillars of average 40 feet separation to prevent caving while working. If there is complete extraction from the mine, caving would occur to a maximum height above the mine of 25 feet. The caving height is based on broken rock expansion of 40 percent and a back (roof) height of 8 feet. The mine workings would be 300 feet below the aquifer which is ample allowance to accommodate a collapse zone of 25 feet.

Based on analysis, the Proposed Action is not expected to affect existing water rights as a result of water drawdown from the upper aquifer and diminution of water flows feeding the spring and well.

### *4.2.3 Wildlife*

Impacts specific to the desert bighorn sheep are discussed in the following section.

### 4.2.3.1 DESERT BIGHORN SHEEP

The PPA occurs within crucial desert bighorn sheep habitat totaling approximately 380,000 acres. This habitat is important for sheep year-round, but especially during the lambing and rutting seasons. Bullseye Canyon provides a total of approximately 1,200 acres of bighorn sheep habitat, or roughly 0.3 percent of the total available crucial habitat. Bullseye Canyon, in addition to numerous other canyons surrounding Wingate Mesa, provides habitat for a current group of approximately 20 to 30 bighorn sheep. This represents approximately 10 percent of the total bighorn sheep population in the South San Juan bighorn sheep herd unit.

Human actions not only impact bighorn sheep behavior, but can also degrade and fragment habitat, affect forage quality and availability, and impact movement patterns. Desert bighorn sheep are known to abandon an area, either temporarily or permanently, when the limit of their tolerance to disturbance is exceeded. However, there is also evidence that in some circumstances, desert bighorn sheep may habituate to predictable human activity (Longshore et al. 2007).

The Proposed Action would not result in the permanent loss of desert bighorn sheep habitat. Approximately one acre of new surface disturbance would result. Surface disturbance would be reclaimed after mining operations are complete (seven years). The mine would be located near the bottom of the canyon, below a steep talus slope (Appendix K:Figure 4). The mine's location near the canyon bottom would minimize disruption to the normal movement patterns for sheep in the PPA since sheep tend to traverse the talus slopes to travel up and down canyon. However, the noise and human activity from the mine may push the sheep either further up the talus slope or down the canyon in order for them to avoid the mine location. This disruption in movement patterns could require additional energy expenditures and add stress to sheep individuals in order to avoid human activity. This could affect population health in the near term, although the disruption to movement patterns may mitigate as sheep habituate to human activity in the canyon.

The increase in human activity associated with the proposed mine operation, including construction noise and human presence, may cause sheep to abandon habitat in Bullseye Canyon during the seven-year life of the mine. This would include a small seep at the head of the canyon used by sheep as a source of water. Displacement of bighorn sheep from the 1,200 acres of habitat in Bullseye Canyon during the mine life would likely have little or no long-term affect to overall population health, given the large amount of suitable habitat immediately adjacent to the PPA which would meet the needs of the 20 to 30 sheep which inhabit the area.

Sheep are most vulnerable during critical times of year, such as lambing and rutting seasons. If sheep were displaced by the initiation of mine operations during the lambing and rutting seasons, displacement would be especially stressful to the sheep and may cause a reduction in survival and reproductive success, thereby affecting population health in the long term. In accordance with management prescriptions in the MFO RMP, the initiation of surface disturbing activities would be precluded during the lambing and rutting seasons if determined that lambing or rutting activity is occurring in the area of proposed operations. This measure would effectively prevent disturbance to the sheep during these critical periods and avoid long-term impacts to the health of the bighorn sheep population.

## *4.2.4 Human Health and Safety Concerns*

### 4.2.4.1 RADIATION

#### 4.2.4.1.1 Radiation Exposure Data Studies

The 1990 Radiation Exposure Compensation Act was passed to provide compensation to uranium miners, millers, and ore transporters who contracted cancer or other specified diseases as a result of exposure to high levels of radon. Today, the governing laws have decreased the health risks to uranium miners by requiring adequate ventilation and prohibiting smoking, among other requirements.

Recent studies in the Montrose County, Colorado and Colorado Plateau areas, as well as the Karnes County, Texas area, have been completed specifically to investigate mortality in relation to exposure to uranium and vanadium during mining and milling activities. Summaries are provided as follows:

- In the first study, researchers completed a mortality study for Karnes County, Texas. Cancer rates in the county before, during, and after uranium operations were compared (Boice et al. 2003). The study also compared nearby counties with similar demographic characteristics. In conclusion, the study found that those cancers which might be increased following high exposures to uranium and its decay products were not elevated. The researchers qualified their conclusions with a statement that the ecological nature of the study design tempered the strength of the conclusions.
- In the second study, researchers evaluated the mortality experiences of 1,484 men employed in seven uranium mills in the Colorado Plateau for at least one year after January 1, 1940 (Pinkerton et al. 2004). The study results stated that mortality from all causes and all cancers was less than expected based on U.S. mortality rates. The study found an excess in mortality from: hematopoietic and lymphatic malignancies (other than leukemia); trachea, bronchus, and lung cancer; non-malignant respiratory disease; and chronic renal disease. For workers hired prior to 1955, mortality from lung cancer and emphysema was higher, presumably because their exposure to uranium, silica, and vanadium was higher. However, mortality did not increase with employment duration. The researchers' conclusion stated that based on the study's limitations (i.e., small cohort size, inability to estimate individual exposure, lack of smoking data), firm conclusions about the relation of increases in mortality and mill exposures were not possible.
- In the third study, researchers compared mortality rates between 1950 and 2000 in Montrose County, Colorado, to those in five similar counties. They concluded that there was no evidence that residents in Montrose County experienced an increased risk of dying of cancer or other diseases because of environmental exposures associated with uranium and vanadium milling and mining activities (Boice et al. 2007).

#### 4.2.4.1.2 Radiation from Uranium Mines

The short-lived decay products of radon-222 gas are the primary radioactive constituents of concern in a uranium mine. These "radon daughters" are also the same elements that can accumulate in a basement, resulting in elevated radiation levels and increased risk of cancer. As provided in the Uranium Leasing Program Final Programmatic EA (DOE 2007), EPA evaluated exposures from radon emissions for individuals located near uranium mines (EPA 1989). For underground uranium mines, radon concentrations for nearby individuals (within 0.33 to 33.00 miles) ranged from 2.0 10-6 to 0.0031 working levels (EPA 1989). Assuming that an individual was continuously exposed, this is equivalent to a probability of a latent cancer fatality of 5.5 × 10-8 to 8.5 × 10-5, or about five chances in 100,000,000 to

eight chances in 100,000. Over 10 years, the probability of a latent cancer fatality would range from 5.5 × 10-7 to 8.5 × 10-4, or about five chances in 10,000,000 to eight chances in 10,000. For perspective, an individual has a lifetime probability of dying of cancer from all sources of about 220,000 in 1,000,000, or a risk of lung cancer of 60,000 in 1,000,000.

At the Daneros Mine, the radon ventilated from the mine would quickly disperse upon reaching exhaust shafts or portals. Because of its remote location (i.e., about 3.5 miles from the nearest potential resident – Fry Canyon Lodge), no impacts to the general public are predicted.

Workers are protected through MSHA regulations, which establish maximum exposure levels of radon and radon-daughter products. Over the period 1985 through 1989, the average occupational radiation dose for uranium miners in the United States was 350 mrem/yr (United Nations Committee on the Effects of Atomic Radiation 2000). This radiation dose is equivalent to a probability of a latent cancer fatality of 2.1 × 10-4, or about two chances in 10,000. Over 10 years, the probability of a latent cancer fatality would be 2.1 × 10-3, or about two chances in 1,000.

Outside the mine during operations, the uranium ore and recycled materials such as scrap metal, batteries, and tires are the only radioactive materials that could leave the site. All scrap metal and other recyclables that are not above ambient levels of radiation would be handled as regular construction waste. Any solid wastes that qualify as low-level wastes for radiation contamination, per NRC guidelines (i.e., not a product or a by-product of ore extraction or production), would be handled in accordance with the Low-Level Radioactive Waste Policy Amendments Act of 1985 at an NRC-approved facility or Utah Division of Radiation Control-approved facility. In the event of an accident resulting in an ore spill, the spilled material and surrounding area would be cleaned up to background levels. Cleanup levels would be verified using a gamma meter or similar instrument.

During the life of mine operations, the public would be protected from radiation exposure by restricting access to the mine site with road closure. For public safety purposes, access on County Road D0029 would be restricted for the duration of mine operations. Safety signs and a gate would be placed on County Road D0029 at the entrance to the mine to restrict access to authorized mine personnel only. Public access would be restored once mining operations are completed in approximately 2016.

After operations are complete the public would have access to the reclaimed waste rock material which would have low levels of residual radioactivity. Based upon residual radiation modeling and a comparative study presented in Appendix I, the 12 inches of topsoil cover added during reclamation, combined with the inert waste rock used to cover the proposed waste rock pile prior to reclamation, would reduce the exposure rate to 0.1 mrem/yr for someone camping atop the reclaimed waste rock pile for 14 days. This would only be 0.1 percent of the NRC guideline of 100 mrem/yr (10 CFR 20.1301). A gamma survey would be conducted on the covered waste rock pile when mining operations are complete to ensure less than 100 mrem/yr exposure for the general public.

Therefore, under the Proposed Action, the impact to public health from radiation exposure is expected to be minimal based on the protective measures described in the MPO (UEC 2008).

**Transportation**

Pursuant to the Transportation Policy for Shipments of Colorado Plateau Uranium Ores to the White Mesa Uranium Mill (Appendix D), trucks would be fitted with tight tarp covers and tailgates to prevent loss of the ore as it travels to the milling site.

The additional trips created by the Daneros Mine would not have any noticeable impact on the Levels of Service (LOS) for State Highways 95 and 191. It is common to assume 10 percent of daily vehicle trips

occur in the peak hour (56 vph for State Highway 95, and 251 vph for State Highway 191). Adding all 16 one-way *daily* Daneros Mine trips to the existing State Highway 95 and State Highway 191 *peak-hour* trips (a conservative approach) yields 72 peak-hour trips on State Highway 95, and 267 peak-hour trips on State Highway 191. Per Exhibit 12-15 of the HCM2000, the additional trips created by the Daneros Mine would not degrade the existing LOS A for State Highway 95 or the existing LOS B on State Highway 191.

From anecdotal evidence and discussions with residents at the intersection of County Road B258 and State Highway 95, County Road B258 typically encounters fewer than five vehicle trips per day in that location. The proposed 16 round trips per day from the Daneros Mine traffic would bring total trips to approximately 20 vehicle trips per day. Per the National Cooperative Highway Research Program's Report #362 *Roadway Widths for Low-Traffic-Volume Roads*, "accident experience does not appear significantly different for unpaved vs. paved surfaces at traffic volume levels of 250 vehicles per day (vpd) or less." Table 1 from this document specifies a total roadway width of 18 feet for a 20 mph design speed and less than 28 percent truck traffic. County Road B258 is typically 28 feet minimum width, with occasional exceptions where the roadway serpentines up a steep grade for approximately 0.75 mile (narrowing down to 20 feet). The existing geometry of this road dictates travel speeds of less than 20 mph, with a commensurate allowable reduction in roadway width to 24 feet (to be widened in washed-out areas as necessary).

Mine traffic would utilize County Road D0029 for approximately 0.5 mile between County Road B258 and the mine site. This road would be closed to the general public during mine operations. Public access would be restored after the seven-year mine operation is complete. San Juan County Road Department has agreed to post a sign approximately 100 yards in from State Highway 95 on County Road B258 to notify the public of increased truck traffic.

Under the Proposed Action, the risk of accidents and impact to public health from transportation is expected to be minimal based on the protective measures incorporated into the Proposed Action.

### *4.2.5 Mitigation Measures for the Proposed Action*

The mitigation measures incorporated into the Proposed Action would effectively minimize impacts. No impacts have been identified that exceed statutory limits for water quality, air quality, or radiation exposure. The measures in the Proposed Action would protect the long term health of the desert bighorn sheep population and prevent impairment of existing water rights. It is expected that these built-in measures would be effective and that no residual impacts would result.

Although impacts are expected to be minor, reasonable measures to further reduce the public's on-site exposure to radiation following mining operations and to further negate potential minor impacts to water quality could be considered. BLM could require stockpiling of the inert waste rock from the two vent shafts. The inert waste rock could then be used to cover the mineralized waste rock material rather than allowing the mineralized rock and inert rock to be mixed. This would increase the thickness of cover over the waste rock which would reduce radiation exposure rates and further protect the waste rock from contact with surface waters. However, based on sampling data and modeling this may not be necessary as the residual levels of radiation would be low (0.1 percent of NRC guideline) and potential impacts to water quality, including acid rock drainage (ARD) are diminutive. The stockpiled cover material would take up limited space and perhaps increase surface disturbance up to 0.25 acre. The location of an additional stockpile area could be limited to the Area of Potential Effect (APE) previously surveyed for cultural and historic properties so that no impacts to cultural resources would occur. The small amount of additional surface disturbance caused by the stockpile would add negligible impacts to soils, vegetation and wildlife.

### *4.2.6 Monitoring and/or Compliance*

The main purposes of NEPA-related monitoring are to: evaluate the quality of the NEPA document; ensure compliance with the NEPA decision; and measure the effectiveness or success of mitigation. There are four key issues: air quality, water quality, wildlife, and human health and safety. Generally, monitoring focuses on these important issues brought forward for detailed analysis. However, other resources are also carefully monitored as necessary.

Monitoring includes inspections for compliance with the terms and conditions of the approved MPO. Pursuant to 43 CFR 3809.600, the BLM MFO would inspect operations, as needed, to ensure compliance with regulations at 43 CFR Subparts 3809 and 3715, including all conditions of approval.

BLM would conduct compliance inspections on a routine basis and would coordinate its monitoring efforts with other agencies as necessary, including the State of Utah Division of Oil, Gas and Mining for compliance with permit terms and reclamation standards, the State of Utah for water and air quality, the UDWR for wildlife, and MSHA for human health and safety.

Sampling data and project specific modeling of the affected environment indicate that impacts of the Proposed Action would be minor. Monitoring required by other agencies such as worker radiation exposure rates and UEC's proposed monitoring programs such as weed control and radon monitoring are incorporated into the Proposed Action. In addition to these monitoring procedures, the BLM could require monitoring of Bullseye Spring, the existing water well, the waste rock dump and the mine haul road to determine the accuracy of the predicted impacts analyzed in the EA. Although monitoring by itself is not mitigation, monitoring could result in additional mitigation if triggered by undesirable monitoring results that exceed preset levels or standards. These mitigation measures, if needed, could include a requirement for additional cover material on the waste rock dump to reduce radiation exposure rates to a pre-established level, measures to neutralize or otherwise mitigate ARD, measures to mitigate or compensate for any impairment of existing water rights, and the removal of uranium-contaminated material from the access road to achieve a specified standard at or near background. Specific monitoring requirements would be prescribed by the BLM as conditions of approval.

## 4.3 Direct/Indirect Impacts Alternative B – No Action

Under the No Action Alternative, the BLM would deny the approval of the MPO, UEC would retain its rights under the mining law, and other uses would continue. Uranium would not be extracted from this location, the associated surface disturbances would not occur, other uses such as livestock grazing would continue, and hunting and off-highway vehicle use in the area would continue.

### *4.3.1 Air Quality*

Under the No Action Alternative, Daneros Mine operations would not be approved or authorized, and there would be no increased emissions of NOx and particulates. Public traffic through the PPA on County Road B258 and County Road D0029 would remain open.

The remnants of past mining activities would remain in the PPA. Soil sampling tests from the waste rock have indicated elevated levels of radium and thorium; any radioactive minerals or other compounds contained within the excavated materials could continue to be exposed as airborne dust in the area.

### *4.3.2 Water Quality*

Under the No Action Alternative, mining operations would not take place. No ancillary facilities requiring water would be built. No well drilling or hauling of water from Fry Spring, or elsewhere, would occur, leaving the local environment as it currently exists. The remnants of past mining activities would remain in the PPA, including the compacted waste rock adjacent to the drainage for Bullseye Canyon. Because soil sampling tests from the waste rock have indicated elevated levels of radium and thorium, any radioactive minerals or other compounds contained within the excavated materials may have already or may continue to leach from the pile after precipitation events. Leaching could lead to transportation into the ephemeral drainage system; however, samples of soils surrounding the waste rock pile suggested only trace, benign background levels of radionuclide compounds. Combined with low precipitation levels received in the region, it is unlikely that hazardous concentrations of these materials would significantly affect local watershed characteristics. However, the No Action Alternative results in continued surface exposure of the historical waste rock dump, posing a greater risk to human health than the Proposed Action, which proposes to reclaim a part (0.41 acre) of the old waste rock dump by covering it with inert waste rock from the Daneros Mine, topsoil, and vegetation.

### *4.3.3 Wildlife*

Under the No Action Alternative, mining operations would not take place. There would be no change from the existing condition and thus no impacts to desert bighorn sheep habitat or sheep population.

### *4.3.4 Human Health and Safety Concerns*

Most of the Daneros Mine PPA is accessible to members of the public. Under the No Action Alternative the public would continue to have access to the mine site. Activities that bring public visitors near the site may include hunting, hiking, and mountain biking. An individual may be exposed to radiation at the existing mine site through three primary pathways: (1) external exposure to gamma radiation; (2) inhalation and ingestion of re-suspended radioactive particulates; and (3) inhalation of radon and radon-daughter products.

Based on the results of residual radioactivity modeling, a camper who resides on the existing waste rock area for a 14-day period would receive a radiation dose of about 0.2 mrem/yr. This dose is well below NRC's 100 mrem/yr guideline (10 CFR 20.1301) for radiation exposure.

## 4.4 Cumulative Impacts Analysis

"Cumulative impacts" are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions, regardless of what agency or person undertakes such other actions.

### *4.4.1 Past and Present Actions*

The proposed Daneros Mine is within the White Canyon mining area, a 650 square-mile area which extends approximately 65 miles from the Colorado River on the southwest to Utah Highway 211 on the northeast. The White Canyon mining area produced nearly 2.3 million tons of ore from 125 properties between 1948 and 1987 (Chenoweth 1996). The Daneros Mine and several old uranium mines occur within the watershed of Red Canyon. The three old uranium mines closest to the Daneros are also located in Bullseye Canyon. These are the Royal Mine and the McCarty–Coleman and Bullseye Declines of the Lark Mine.

The old Fry Canyon Mill and Fry Canyon Mill Site Reclamation Project are located within the White Canyon watershed approximately 3.5 miles northeast.

Since August 2006, the BLM MFO has received nine Notices of Intent for uranium exploration drilling projects in the Red Canyon and White Canyon areas. Proposed surface disturbance totals 15 acres, much of which was due to maintenance work on old roads to access project areas. Proposals ranged from two to 21 drill holes each. Actual operations were short term (a few months).

Mining activity at Denison's Tony M Mine near Hanksville, Utah, has been suspended for an undetermined span of time, although stockpiled ore continues to be hauled to the White Mesa Mill. It is unclear when mining operations will continue and to what degree.

Important large stationary sources of emissions in the region include the Coronado Generating Station near St. Johns, Arizona, and power plants near Shiprock, New Mexico.

### *4.4.2 Reasonably Foreseeable Action Scenario*

With the exception of ore haulage from the Tony M Mine, located approximately 35 miles west of the PPA, there are no other mine operations proposed at this time that would contribute to cumulative impacts.

Several abandoned or decommissioned uranium milling facilities in San Juan County have been listed in the Comprehensive Environmental Response and Liability Act (CERCLA, also known as Superfund)-derived site database, CERCLIS. The EPA CERCLIS is used to track activities at sites considered for cleanup under the CERCLA. Uranium mills contain low-level radioactive wastes and other hazardous substances that can potentially migrate to surrounding soil, groundwater, and/or surface water, and emit radon gas. The listed site nearest to the PPA is at the Fry Canyon Mill (approximately 3.5 miles northeast). In 1987, the Utah Department of Health completed a remedial Preliminary Assessment for the site. At that time it was classified as No Further Response Action Planned (NFRAP). Subsequently, a more comprehensive understanding of the site conditions was obtained from the U.S, Geological Survey demonstration project at the site (BLM 2008c). Although site characterization studies have been completed and BLM has determined that site remediation and/or removal work is necessary, it is speculative to predict when BLM may begin that work under its CERCLA authority.

### *4.4.3 Cumulative Impacts*

BLM recently completed a Reasonable Foreseeable Development (RFD) Scenario for locatable minerals development including related surface disturbance. Impacts were analyzed and documented in the MFO Proposed RMP/FEIS, dated August 2008 (BLM 2008b). BLM projected 360 acres of new surface disturbance from mining over the life of the RMP. This information is found in the FEIS under Summary of Locatable Mineral RFD and Salable Mineral RFD (BLM 2008b:4–113). The Proposed Action is the first operation since the RMP was approved in 2008, and the proposed total surface disturbance is estimated at 4.5 acres, most of which is previously disturbed, and well below the planned-for 360 acres of disturbance.

The nine uranium exploration projects in the Red Canyon and White Canyon areas have caused approximately 15 acres of surface disturbance in the crucial desert bighorn sheep habitat. This is approximately 0.004 percent of the total crucial sheep habitat. Most of the disturbance occurred on existing old roads to project areas. Road maintenance work may have provided or improved vehicle access to certain areas where roads had not been maintained for many years, resulting in temporary disturbance to sheep. However, exploration activity is precluded during the lambing and rutting periods so

disturbances are minor. Areas of new surface disturbance have been or will be reclaimed. Existing roads temporarily opened by maintenance work are generally closed after a short period by natural processes (storm events) that once again make roads impassable for vehicles. Minor short-term impacts to bighorn sheep movement patterns may have been caused by exploration drilling. When combined with the Proposed Action, these minor impacts would not contribute appreciably to cumulative impacts on the crucial desert bighorn sheep habitat or the South San Juan desert bighorn sheep unit population overall.

There are several old underground uranium mines located within the Red Canyon watershed. However, the three old uranium mines closest to the Daneros are also located in Bullseye Canyon. These are the Royal Mine and the McCarty–Coleman and Bullseye Declines of the Lark Mine. The Royal Mine and the Bullseye Decline are comparable in size and configuration and are contemporaneous with the McCarty–Coleman Decline discussed previously in this document. These three mines and others in Red Canyon have not been reclaimed. As is typical of the mines in the area, sites are small (1 acre or less) and consist of an adit with associated pad and waste rock dump. Because the three old mines in Bullseye Canyon are in close proximity (within one-quarter to one-half mile) and because each mine produced ore from the same sandstone-type uranium deposits in the Shinarump Member with similar ore controls, the low-grade mineralized rocks in the mine dumps are expected to be very similar at the three sites.

Soil sampling tests from the waste rock at the McCarty–Coleman Decline indicated elevated levels of radium and thorium. Radioactive minerals or other compounds contained within the old mine dumps may have already or may continue to leach from the piles after precipitation events. Samples of soils surrounding the waste rock pile at the McCarty–Coleman site suggested only trace, benign background levels of radionuclide compounds. Although leaching could lead to transportation into the ephemeral drainage system, the nearest perennial water is approximately 28 miles from the proposed mine operations, and combined with low precipitation levels received in the region, it is unlikely that hazardous concentrations of these materials would significantly affect local watershed characteristics.

Under the Proposed Action, a part of the old McCarty–Coleman waste rock dump would be reclaimed. By placing soil material over the waste rock dump and re-establishing vegetation, precipitation events would be absorbed by the new waste rock material, meaning a portion of the historical waste rock dump would be sheltered from direct exposure. With the revegetated pile in place, less runoff would occur, as the vegetated and topsoiled slopes absorb and stabilize rainwater erosion more effectively than the currently barren waste rock pile. This would result in minor beneficial cumulative impacts by reducing the total amount of radioactive materials or other compounds currently entering the Red Canyon watershed, reducing the total amount of airborne dust from the waste rock dumps, and reducing the public exposure to radiation in Bullseye Canyon.

The Atomic Energy Act does not require controls on uranium mining overburden and neither the NRC nor the DOE regulates the disposal of conventional (open pit and underground) mining wastes (EPA 2008d). Any potential remediation of radioactive wastes at mining sites is driven by federal and state laws such as the Clean Water Act, Safe Drinking Water Act, and the Clean Air Act. Federal intervention on uranium mining has been steady since these and UMTRCA and CERCLA were enacted. However, most small, remote mining operations are not considered a significant danger to human health and are simply left alone (EPA 2008d). Even in its present condition, the PPA is not considered to contribute a considerable risk to human health because of the small size of past operations, remote location, distance from surface water, low economic viability of groundwater for domestic purposes, and the arid climate.

Six ore trucks per day would travel from the Daneros Mine to the White Mesa Mill. This increase of 12 trips per day, when combined with the existing trucks hauling ore from the Tony M Mine, would not have any noticeable impact on the Levels of Service (LOS) for State Highways 95 and 191, and would not

measurably affect traffic flow and patterns. The additional trips created by the Daneros Mine would not degrade the existing LOS A for State Highway 95 or the existing LOS B on State Highway 191.

The Daneros Mine ventilation emissions are considered a minor source. The proposed project includes control measures to mitigate impacts to air quality. These control measures include the use of low sulfur diesel fuel, a dust control plan to achieve 80 percent reduction in dust emissions, and a Tier 3 generator to meet strict new source performance standards for emissions. Emission calculations for the project show that, with these control measures, the proposed project would be a small contributor of criteria pollutants. The proposed project would not result in exceedences of the National Ambient Air Quality Standards and would not degrade the visibility in Class I areas. Screening protocols of the FLAG and guidelines of UDAQ indicate that dispersion modeling is not needed as impacts would be minor.

The Proposed Action would produce a total of 90 tons of NOx emissions per year. This would be a negligible increase in regional emissions when compared to total annual emissions of NOx from primary generators in southeast Utah and northeast Arizona. These primary sources include: motor vehicles; natural wildfires; industrial generators such as agriculture, mining, oil, and gas; and the large stationary sources of emissions at the Coronado Generating Station near St. Johns, Arizona, and power plants near Shiprock, New Mexico. These coal-fired power plants emit $SO_2$, NOx, and fine particulate that, under some atmospheric conditions, impair visibility over a wide area (hundreds of miles). At the Coronado Generating Station near St. Johns, Arizona, the plant's owners recently reached a permit violation settlement with the EPA that will result in new scrubbers being installed. This settlement will reduce combined $SO_2$ and NOx emissions by over 21,000 tons each year. These two actions, occurring over the next five to six years, will improve visibility, reduce ozone smog potential, and protect human health in southeast Utah.

As discussed in Appendix A, total CO2 emissions from the proposed project may contribute negligibly to cumulative rises in global CO2 levels. However, the uranium produced would be used to generate electricity through cleaner nuclear fuel technologies which may offset, or actually may indirectly result in a small beneficial reduction of, CO2 levels globally.

# 5 CONSULTATION AND COORDINATION

## 5.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 4. Appendix A provides the rationale for issues that were considered but not analyzed further. The issues were identified through the public and agency involvement process described in Sections 5.2 and 5.3 below.

## 5.2 Persons, Groups, and Agencies Consulted

As part of the EA scoping process, the public was notified of the Proposed Action by posting on the BLM MFO web page, the BLM Utah State Office Environmental Notifications Bulletin Board, publication in local newspapers, and letters mailed to agencies. The BLM MFO received 11 comment letters during the scoping period. Scoping contacts and comment responses are summarized in Table 9.

**Table 9. Summary of Scoping Contacts and Response Submittal**

| Name | Description | Response |
|---|---|---|
| Sarah Fields, et al. | Program Director<br>Uranium Watch | Letter received |
| Sandy Johnson | Concerned citizen<br>Water rights owner for Fry Canyon | Letter received |
| J. Matthew Snow, Esq. | Lear and Lear attorney for<br>DeVern Dickerson and Dennis Bailey | Letter received |
| Leigh J. Kuwanwisiwma | Director,<br>Hopi Cultural Preservation Office | Letter received |
| Timothy Begay<br>(Recipient) | Program Manager,<br>Navajo Nation Historic Preservation Department<br>Traditional Culture Program | |
| Tony H. Joe, Jr.<br>(Respondent) | Supervisory Anthropologist,<br>Navajo Traditional Culture Program | Letter received |
| Liz Thomas | Staff Attorney,<br>Southern Utah Wilderness Alliance | Letter received |
| Boyd P. Clayton | State Engineer,<br>Utah Division of Water Rights | Letter received |
| Carol Rushin<br>(Recipient) | Acting Regional Administrator,<br>U.S. Environmental Protection Agency | |
| Larry Svoboda<br>(Respondent) | Director, NEPA Program<br>U.S. Environmental Protection Agency | Letter received |
| Harold R. Roberts | Executive Vice President<br>Denison Mines | Letter received |
| Dennis R. Downs | Division Director,<br>Utah Division of Solid and Hazardous Waste | Letter received, followed by personal communication with Ralph Bohn |
| Kelly Shumway | Vice President<br>Utah Energy Corporation | Letter received |
| Dane Finerfrock | Director,<br>Utah Division of Radiation Control | No response submitted |
| Robert Herbert | Ground Water Section Manager,<br>Utah Division of Water Quality | Personal communication |
| Bruce Adams | San Juan County Commissioner | Personal communication with Rick Bailey |
| Will Mahoney | Senior Environmental Scientist,<br>O&G Environmental Consulting | No response submitted |
| Corky Hays | Superintendent,<br>Natural Bridges National Monument | No response submitted |
| Kitty Roberts | Superintendent,<br>Glen Canyon National Recreation Area | No response submitted |

**Table 9. Summary of Scoping Contacts and Response Submittal**

| Name | Description | Response |
|---|---|---|
| Michael Okuniewicz | U.S. Department of Labor,<br>Mine Safety and Health Administration | No response submitted |
| Mike Herkimer | UPDES Section Manager,<br>Utah Division of Water Quality | No response submitted |
| Ivan Pino | Governor,<br>Pueblo of Zia | No response submitted |
| Terry Knight | Tribal Cultural Representative,<br>Ute Mountain Ute Tribe | No response submitted |
| Elaine Atcitty | Councilwoman,<br>White Mesa Ute Council | No response submitted |
| Davis Nieto | Zuni Heritage and Preservation Office,<br>Pueblo of Zuni | No response submitted |
| Damien Garcia | Cultural Preservation Office, Pueblo of Acoma | No response submitted |
| John Antonia Sr. | Governor, Pueblo of Laguna | No response submitted |
| Gilbert Tafoya | Office of Cultural Preservation, Pueblo of Santa Clara | No response submitted |
| Leo Manheimer | Chapter President, Navajo Mountain Navajo Chapter | No response submitted |
| Jerry Tsosie | Chapter President, Mexican Water Navajo Chapter | No response submitted |
| James Black | Chapter President, Oljato Navajo Chapter | No response submitted |
| Russel Gould | Chapter President, Red Mesa Navajo Chapter | No response submitted |
| Bill Todacheenie | Chapter President, Aneth Navajo Chapter | No response submitted |
| Rodger D. Joe | Chapter President, Teec Nos Pos Navajo Chapter | No response submitted |

## Native American Tribes

On October 27, 2008, the BLM sent consultation letters to 15 tribal entities describing the Proposed Action, and presenting the results of the cultural resource inventories conducted within the Area of Potential Effect (APE). A map of the general project location was attached to the letter.

The BLM received response letters from the Hopi Cultural Preservation Office and the Navajo Historic Preservation Department. The responses from the tribes and consultations conducted by the BLM as a follow-up to those letters are described below.

The response letter from the Hopi Cultural Preservation Office (dated November 4, 2008) stated that the Hopi Tribe claims ancestral and cultural affiliation to prehistoric cultural groups in the Monticello area, and that the Hopi Cultural Preservation Office considers the archaeological sites of their ancestors to be Traditional Cultural Properties (TCPs). The letter also stated that they understood that the cultural resource survey of the project area identified no National Register-eligible sites, but that they oppose uranium mining pursuant to the doctrine of discovery and 1892 mining law, and the BLM's application of categorical exclusions for such proposals, particularly near a National Monument. Concerns expressed by the Hopi did not relate to specific sites, TCPs, or sacred areas.

On February 10, 2009, the BLM sent a letter to the Hopi Cultural Preservation Office in response to their letter. In the response letter, the BLM recognized the Hopi Tribe's opposition to uranium mining but

explained the BLM's responsibility to consider the proposal and analyze its effects through an Environmental Assessment (EA). The BLM's letter stated that an EA was being prepared for the proposal and that the BLM would send a copy of the EA to them when one was ready for review. A copy of the EA was sent to the Hopi Cultural Preservation Office on March 16, 2009, requesting further comments on the project. To date, no comment on the EA has been received from the Hopi. The BLM has made a good faith effort to consult further with the Hopi Cultural Preservation Office and to date has not been provided with any further comments or concerns that could be considered or addressed as part of the EA.

The response letter from the Navajo Historic Preservation Department (HPD) (dated January 26, 2009) stated that based on its HPD-TCP Sacred Sites Database, there are many cultural areas and sites within the PPA. The letter further stated "extraction of uranium ore would pose a great threat to this region of cultural significance and would further more damage the cultural entities involved between neighboring tribes of the southwest and that the proposed project is not in the best interest of the Navajo Nation at this time". The letter also included a recommendation that the BLM consult with other tribes in the vicinity of the proposed project area.

The BLM conducted follow-up consultations with Mr. Tony Joe, Jr. of the Navajo HPD by phone, and a copy of the EA was sent to that office on March 16, 2009. The Navajo HPD subsequently concluded, by letter to the BLM dated May 8, 2009, that the proposed undertaking will not impact any Navajo traditional cultural properties and that the HPD, on behalf of the Navajo Nation, had no further concerns about the project.

The BLM concludes that no traditional cultural properties, sacred sites, or other areas of concern to Native American tribes will be impacted by the proposed project. This conclusion is based on 1) the results of the cultural resources inventories and the finding that no historic properties are present or will be effected, and 2) the fact that only two tribes provided comments or raised concerns about the project, and further consultations with those tribes (as described above) failed to produce any additional information about specific TCPs, sacred sites, or other cultural concerns.

**U.S Fish and Wildlife Service**

Consultation with the U.S. Fish and Wildlife Service is not required since there are no known threatened or endangered species and associated habitat within or near the PPA and listed species would not be affected by the Proposed Action.

**State Historic Preservation Officer**

Consultation with the State Historic Preservation Officer (SHPO) was conducted under the Utah Protocol of the BLM's nationwide programmatic agreement. On March 31, 2009, the SHPO concurred with BLM's determination of No Historic Properties Effected for the project.

## 5.3 Summary of Public Participation

Public scoping for this EA started on September 13, 2007, when BLM posted the proposal on its Environmental Notification Bulletin Board (ENBB). BLM again informed the public on November 12, 2008, in local newspapers regarding the proposal and asked for further input. Letters and a copy of the MPO were sent to interested parties, including other agencies, and the MPO was also made available for public review on the MFO website. On March 13, 2009, the BLM posted the EA and notice of a 30-day comment period on the ENBB and made the EA and unsigned FONSI available for review on the MFO website. Certified letters with a copy of the EA were sent to all interested parties, including state, federal,

and tribal entities that commented on the project during the scoping period. On April 1, 2009, the BLM responded to a Freedom of Information Act request from Uranium Watch by providing copies of scoping comments received from local, state, federal, and tribal entities.

The BLM MFO received a total of six comment letters during the EA 30-day comment period. These comments are summarized in Table 10 and Appendix M.

**Table 10. Summary of EA Comments and Response Submittal**

| Name | Description | Response |
|---|---|---|
| Sarah Fields, et al. | Program Director<br>Uranium Watch | Letter received |
| Marc Stilson, P.E. | State of Utah, Division of<br>of Water Rights | Letter received |
| Merwin Shumway | Blanding citizen/<br>Interested public | Letter received |
| Shirwin Shumway | Blanding citizen/<br>Interested public | Letter received |
| City of Blanding | Chris Webb<br>City Manager | Letter received |
| Liz Thomas | Staff Attorney,<br>Southern Utah Wilderness Alliance | Letter received |

## *5.3.1 Comment Analysis*

### Scoping Comments

Pursuant to 43 CFR 3809.411(c), the public and agencies were afforded time to comment on the MPO. BLM placed advertisements in three local papers (Blanding, Moab, and Monticello) and sent letters to various state and federal agencies and tribal entities (see Section 1.7 for full description). As a result of this scoping effort BLM received 11 comment letters, most of which included several different comments. Commenters spoke both in favor of approving the Proposed Action as well as against its approval and expressed concerns regarding many topics. There was a range of comments, but not all were considered resource issues to be addressed in detail in the EA. Comments were made concerning the NEPA process, human health and safety, perceived inadequacy of the MPO, water resources, reclamation, transportation, cultural resources, cumulative impacts, and air quality. This section presents an overview of the issues raised in the comments; Appendix C presents a detailed summary of the comments and BLM's responses to each issue raised during scoping.

### Effects to Air Quality

Two of the comments indicated that air quality effects should be addressed in the EA. These concerns included the following issues:

- Vehicle exhaust emissions
- Dust from waste rock stockpile, vegetation removal activities, and mining operations in general
- Potential impacts to Natural Bridges National Monument airshed

## Effects to Water Quality & Quantity

Many of the comments indicated that effects to water quality and quantity should be addressed in the EA. These concerns included the following issues:

- Potential impacts to water quantity and quantity in general
- Need for appropriate water well permit
- Potential contamination of surface and groundwater from waste rock
- Potential impacts to and protection of ephemeral drainage in Bullseye Canyon from existing stockpile
- Proper appropriation of water rights and approval of proposed water usage
- Establishment of a water monitoring program with regard to existing water rights in project vicinity
- Need to address sources of water for mine operation and dust suppression
- Potential contamination and testing of groundwater used for mine operation and dust suppression
- Potential depletion of groundwater
- Analysis of potential for acid-mine drainage

## Effects to Vegetation & Wildlife

Four of the comments indicated that effects to vegetation and wildlife should be addressed in the EA. These concerns included the following issues:

- Potential for direct impacts to threatened, endangered, and sensitive species
- Potential for habitat loss, fragmentation, and degradation
- Potential impacts to migratory birds
- Potential impacts to bats

## Effects to Human Health & Safety

Several of the comments indicated that effects to human health and safety should be addressed in the EA. These concerns included the following issues:

- Perceived lack of safety information in the MPO
- Existing levels of radionuclides and chemical constituents in the air, soil, and water from historic operations at the mining site
- Safe mining practices, mine integrity, and workforce safety
- Need for an emergency response plan in the MPO
- Need for information regarding safe disposal of radioactive and non-radioactive contaminated material
- Need to address EPA's published materials on TENORM when preparing the EA
- Health hazards for mine and mill workers and area residents associated with potential inhalation of radiation from radon and inhalation of carcinogens from uranium dust
- Potential for contamination of on-site drinking water sources and associated hazard to mine workers

## NEPA Process

Several commenters raised concerns about the NEPA process, scoping, and the adequacy of the MPO, including the following issues:

- Perceived failure of the MPO to provide sufficient information for a FONSI or EA
- Inadequate publicity of scoping
- Perceived need for an EIS to adequately analyze potential environmental effects of Proposed Action
- Consideration of all past, present, and foreseeable future regional uranium mining, including abandoned and un-reclaimed mines, oil and gas activities, and potential tar sand development, as well as the DOE's recent decision to expand its uranium leasing program to include 27,000 acres throughout western Colorado, in the EA
- Consideration in the EA of: the larger regional, national, and international implications of bringing more uranium out of the ground, the associated issues related to the lack of storage/disposal facilities, and the required involvement of the NRC
- Concern that the BLM failed to properly notice the scoping process for the EA on the Utah Environmental Notification Bulletin Board in a timely manner
- Need for BLM to make the amount and adequacy of the bond available to the public
- Need for BLM to consult various state and federal agencies for involvement
- Public scoping efforts meet applicable law, regulation, and policy and an additional 30-day public comment period would cause unnecessary delays

## Economic Effects

A few commenters raised issues regarding the effects of uranium mining and milling on the regional economy. These concerns included the following issues:

- The White Mesa Uranium Mill currently employs approximately 150 people and is the largest non-government employer in San Juan County, Utah
- The Daneros Mine would be one of several contributors to the Mill

## Effects to Recreation & Wilderness Values

Some commenters raised concerns about potential impacts to the scenic and wild character of southeastern Utah as a result of the Proposed Action, which could diminish the recreational value of the area.

## Effects to Other Environmental Resources

A few commenters raised concerns about the potential for other environmental impacts to other resources, including noise and traffic impacts, light pollution, impacts to cultural resources, paleontological resources and soils, and the potential spread of noxious weeds. Concerns regarding proper reclamation and restoration of the mine site were also raised.

These comments were carefully considered and helped drive both issue identification and impact analysis. Not all of the comments presented by the public are actual resource issues to be discussed in detail in this EA. Some comments are outside the scope of this EA, some are addressed through standard operating procedures because they are required by federal law, rule, or regulation, and some are issues that are discussed in detail in this EA. The Interdisciplinary Team Checklist in Appendix A further focused the efforts for this EA.

## 5.3.2 List of Commenters

**Table 11. List of Commenters**

| Commenter | Agency, Individual, Group |
|---|---|
| Boyd Clayton | State of Utah, Division of Water Rights |
| Dennis Downs | State of Utah, Division of Solid and Hazardous Waste |
| Sarah Fields | Uranium Watch |
| Tony H. Joe, Jr. | Navajo Nation |
| Sandy Johnson | Concerned citizen/water rights holder |
| Leigh J. Kuwanwisiwma | Hopi Tribe |
| Harold R. Roberts | Denison Mines |
| Kelly Shumway | Utah Energy Corporation |
| J. Matthew Snow | Lear and Lear Law Offices |
| Larry Svoboda | U.S. Environmental Protection Agency |
| Liz Thomas | Southern Utah Wilderness Alliance |
| Chris Webb | City of Blanding |
| Marc Stilson, P.E. | State of Utah, Division of Water Rights |
| Merwin Shumway | Blanding citizen/interested public |
| Shirwin Shumway | Blanding citizen/interested public |

## 5.3.3 Response to Public Comment

The purpose for scoping and for making the EA available for public review is to involve the public in the NEPA process. The BLM received comments from 15 respondents during the scoping and comment periods. Table 11 shows a list of all commenters. The BLM has responded to scoping comments in Appendix C to help identify issues, analysis requirements, and frame the Alternatives. Brief descriptions of the scoping process and letters can be found in Section 1.7; comments from these letters have been summarized in Appendix C. The BLM received six comment letters during the EA 30-day comment period. Each comment was carefully reviewed and comment responses are summarized in Appendix M. Several changes were made to the EA as a result of public comments. Changes ranged from minor editorial corrections to additional discussion of environmental impacts, none of which affected the scope of analysis. As a result of public comments, the following changes were made to the EA: 1) a discussion of impacts resulting from restricting public access on County Road D0029 was added to Appendix A; 2) information was added to the air quality section, including updated estimates of criteria pollutant emissions from the project; 3) a discussion of impacts associated with the temporary use of water from Fry Spring for dust suppression was added to Chapter 4 under water quality; 4) a discussion of potential impacts to the Bullseye Spring and Well was added to Chapter 4 under water quantity; and 5) Section 2.4 was added to consider an action alternative which would require UEC to clean up the old waste rock dump before commencing new mining activity.

## 5.4 List of Preparers

**Table 12. List of Preparers**

| **Bureau of Land Management, Monticello Field Office** | |
|---|---|
| **Name** | **Position** |
| Ted McDougall | Geologist, Project Leader |
| Brian Quigley | Recreation Planner |
| Paul Curtis | Range Conservationist |
| Tammy Wallace | Wildlife Biologist |
| Jed Carling | Range Conservationist |
| Jeff Brown | Hazmat Specialist |
| Paul Leatherbury | GIS Specialist |
| Maxine Deeter | Realty Specialist |
| Laura Kochanski | Cultural Resource Specialist |
| **SWCA Environmental Consultants** | |
| **Name** | **Position** |
| Alex Wesson | Project Manager |
| Molly Thrash | NEPA Specialist / EA Coordinator |
| Keith Pohs | NEPA Specialist / EA Coordinator |
| Katie Dumm | NEPA Research Assistant |
| Steve O'Brien | Soil Scientist |
| Dave Morrow | Air Quality Specialist |
| John Christensen | Geologist |
| Amanda Christensen | Biologist |
| DeAnne Rietz | Water Quality Specialist |
| Trent Reeder | GIS Specialist |
| Paige Marchus | Technical Editor/Writer |
| Danielle Desruisseaux | Technical Editor/Writer |

# 6 REFERENCES AND ACRONYMS

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## 6.2 List of Acronyms Used in this EA

| ACRONYM | NAME OR TERM |
|---|---|
| BLM | Bureau of Land Management |
| CERCLA | Comprehensive Environmental Response and Liability Act (also known as Superfund) |
| CERCLIS | Comprehensive Environmental Response and Liability Act site database (also known as Superfund site database) |
| CFR | Code of Federal Regulations |
| CWA | Clean Water Act |
| DOE | U.S. Department of Energy |
| EA | Environmental assessment |
| FEIS | Final environmental impact statement |
| EPA | U.S. Environmental Protection Agency |
| FONSI | Finding of No Significant Impact |
| MBTA | Migratory Bird Treaty Act |
| MFO | Monticello Field Office |
| MPO | Mining Plan of Operations |
| MSHA | U.S. Department of Labor Mine Safety and Health Administration |
| NEPA | National Environmental Policy Act |
| MPO | Mining Plan of Operations |
| PPA | Proposed project area |
| PPO | Proposed plan of operations |
| RMP | Resource Management Plan |
| TMDL | Total maximum daily load |
| TENORM | Technically Enhanced Naturally Occurring Radioactive Material |
| UDWR | Utah Division of Wildlife Resources |
| UEC | Utah Energy Corporation |
| UMTRCA | Uranium Mill Tailings Radiation Control Act |
| USDOI | U.S. Department of the Interior |

# APPENDIX A
# Interdisciplinary Team Analysis Record Checklist

# APPENDIX B
# Biological Survey Report

# APPENDIX C
# Scoping Report

# APPENDIX D
# Transportation Policy for
# Shipments of Colorado Plateau Uranium Ores to the White Mesa Uranium Mill

# APPENDIX E
# Storm Water Pollution Prevention Plan

# APPENDIX F
# Soils Report

# APPENDIX G
# Hydrology Report

# APPENDIX H
# Noxious Weed and Invasive Plant Control Plan

# APPENDIX I
# Rationale for Waste Rock Cover Pile Thickness

# APPENDIX J
# Daneros Mine Acid Producing Potential Sampling Program

# APPENDIX K
# Figures

# APPENDIX L
# Air Emission Calculations

# APPENDIX M
# Comment Response