Critical Decision-0, Mission Need Statement
Moab, Utah, UMTRA Project

Major System Project

August 2005

Prepared by the
U.S. Department of Energy
Grand Junction, Colorado

EXECUTIVE SUMMARY

The purpose of this document is to identify the need to clean up surface contamination and implement a ground water compliance strategy to address contamination that resulted from uranium-ore processing at the Moab Uranium Mill Tailings Site (Moab Site), Grand County, Utah.

In October 2000, Congress and the President approved the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, Public Law 106-398 (the Act). The Act stipulated that the license issued by the U.S. Nuclear Regulatory Commission (NRC) for the materials at the Moab Site be terminated and that the title and responsibility for cleanup be transferred to the Department of Energy (DOE). Title of the site was transferred to DOE on October 25, 2001. Specifically, the DOE Environmental Management (EM) office in Grand Junction, Colorado, now has primary responsibility for the Moab Site.

The Act further designated that the Moab Site undergo remediation in accordance with Title I of the Uranium Tailings Radiation Control Act (UMTRCA) of 1978 (Public Law 95-604). In order to comply with the Act, DOE will need to proceed with site remediation, which includes a broad range of remediation alternatives. There is no provision in the Act for cost sharing by the State of Utah.

The DOE EM office in Grand Junction, Colorado, completed a draft Environmental Impact Statement (EIS) in November 2004. Twelve federal, tribal, state, and local agencies participated as cooperating agencies with DOE in the development and preparation of the draft EIS. DOE is providing a 90-day public review and comment period and comments will be accepted through February 18, 2005.

The Act also stipulated that a draft remediation plan be presented to the National Academy of Sciences (NAS) for review. NAS was directed to provide “technical advice, assistance, and recommendations” for remediation of the Moab Site. Under the Act, the Secretary of Energy is required to consider NAS comments before making a final recommendation on the remedy. DOE has considered NAS findings and recommendations and documented the proposed resolutions in the draft EIS.

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1. STATEMENT OF MISSION NEED

The former uranium-ore processing facility at Moab was owned and operated by the Uranium Reduction Company and later Atlas Minerals Corporation (Atlas) under a license issued by the Nuclear Regulatory Commission (NRC). The mill ceased operations in 1984 and has been dismantled except for one building that is currently used by DOE for vehicle maintenance and could be used as office space in the future during site remediation. During its years of operation, the facility accumulated approximately 8.9 million cubic yards of residual radioactive material (RRM). RRM contamination is intended to be restricted to materials directly related to the milling process and is not intended to include uranium or other naturally occurring radioactive materials not directly related to the milling process. Decommissioning of the mill began in 1988, and an interim cover was placed on the tailings pile between 1989 and 1995. The Atlas Minerals Corporation filed for bankruptcy in 1998 and the Nuclear Regulatory Commission (NRC), responsible for issuing the license, created a trust for site reclamation and closure and named PricewaterhouseCoopers as trustee.

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The DOE EM office in Grand Junction, Colorado, completed a draft Environmental Impact Statement (EIS) in November 2004, for remediation of the Moab Site. Twelve federal, tribal, state, and local agencies participated as cooperating agencies with DOE in the development and preparation of the draft EIS. The public review and comment period ended on February 18, 2005. DOE is on schedule to issue the final EIS in July 2005. The final EIS will identify a preferred alternative, which will support a Record of Decision by fall 2005.

To minimize potential adverse effects to human health and the environment in the short term, former site operators, custodians, and DOE have instituted environmental controls and interim actions at the Moab Site. Controls have included storm water management, dust suppression, pile dewatering activities, and placement of an interim cover on the tailings to prevent movement of contaminated windblown materials from the pile. Interim actions have included restricting site access, monitoring ground water and surface water, and managing and disposing of chemicals to minimize the potential for releases to the environment. An interim action ground water extraction system was implemented in the summer of 2003 to reduce the contaminant mass in ground water discharging to the Colorado River.

1.1 Background

The DOE Moab Project Site is approximately 3 miles northwest of the City of Moab in Grand County, Utah, and includes the former Atlas uranium-ore processing facility. The site is situated on the west bank of the Colorado River at the confluence with Moab Wash. The site encompasses approximately 400 acres, of which approximately 130 acres are covered by the uranium mill tailings pile.

The mill was constructed in 1956 by the Uranium Reduction Company, which operated the mill until 1962 when the property was sold to Atlas. Atlas operated the site until 1984 under a license and regulatory authority provided by the NRC in accordance with Title II of the UMTRCA. When the processing operations ceased in 1984, approximately 7.8 million cubic yards of uranium tailings (of the total 8.9 million cubic yards of RRM) and contaminated soil had been stored in an unlined impoundment located in the northwest portion of the property.

Atlas proposed to reclaim the tailings pile for permanent disposal in its current location. As a result of the Atlas proposal, the NRC developed an *Environmental Impact Statement* that focused primarily on on-site reclamation of the mill tailings. Atlas declared bankruptcy in 1998, in doing so, relinquished its license, and forfeited its reclamation bond. Because NRC could not legally possess a site it regulated, NRC appointed PricewaterhouseCoopers as the trustee of the Moab Mill Reclamation Trust and the licensee for the site. The trustee used the forfeited reclamation bond funds to initiate site reclamation, conduct ground water studies, and perform site maintenance activities.

In October 2000, Congress and the President approved the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, Public Law 106-398 (the Act). The Act stipulated that the license issued by NRC for the materials at the Moab Site be terminated and that the title and responsibility for cleanup be transferred to the DOE. Title to the site was transferred to DOE on October 25, 2001. Specifically, the DOE EM office in Grand Junction, Colorado, now has primary responsibility for the Moab Site.

The Act further designated that the Moab Site undergo remediation in accordance with Title I of the UMTRCA, though certain sections of UMTRCA shall not apply. In accordance with the Act, DOE developed a draft Preliminary Plan for Remediation that evaluated mill tailings remediation, contaminated ground water cleanup alternatives, and submitted the draft plan to the NAS for review. The NAS provided comments to DOE on the draft Preliminary Plan for Remediation in June 2002 regarding DOE's remediation decision-making process and related technical issues. After considering NAS comments on the *Draft Plan for Remediation*, DOE determined no *Final Plan for Remediation* would be published. Instead, responses to NAS comments are incorporated into the draft EIS DOE has prepared.

To fulfill the National Environmental Policy Act (NEPA) requirement of considering the full range of reasonable alternatives and associated environmental effects of significant

federal actions, DOE has initiated the NEPA process with development of an EIS. DOE used applicable information from the NRC EIS.

Under NEPA, DOE actively solicits public participation in its decision that affects the quality of human health and the environment. Twelve federal, state, local, and tribal agencies are assisting DOE as cooperating agencies in the EIS process in identifying reasonable alternatives and significant environmental, social, or economic impacts associated with the proposed actions.

DOE is conducting ongoing site operations and maintenance activities. These activities include maintaining site access controls, environmental monitoring, radiological assessments, dewatering and stabilization of the uranium mill tailings pile, and ground water cleanup efforts to address elevated ammonia levels.

1.2 Regulatory Drivers for the Moab Site Project

In 1978, Congress passed the UMTRCA, 42 U.S.C. §§ 7901 et seq., in response to public concern regarding potential health hazards of long-term exposure to radiation from uranium mill tailings. Title I of UMTRCA requires DOE to establish a remedial action program and authorizes DOE to stabilize, dispose of, and control uranium mill tailings and other contaminated material at 24 uranium-ore processing sites and associated vicinity properties. UMTRCA also directed the U.S. Environmental Protection Agency (EPA) to promulgate cleanup standards, which are now codified at Title 40 *Code of Federal Regulations* Part 192 (40 CFR 192), "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," and assigned the NRC to oversee the cleanup and license the completed disposal cells.

In October 2000, Congress enacted the Floyd D. Spence National Defense Authorization Act for Fiscal Year (FY) 2001 (Public Law 106-398), amending UMTRCA Title I (which expired in 1998 for all other DOE sites) to give DOE responsibility for acquisition and remediation of the Moab Site in accordance with UMTRCA Title I. To support its remediation decision-making, in 1999 NRC completed the *Final Environmental Impact Statement Related to Reclamation of the Uranium Mill Tailings at the Atlas Site, Moab, Utah* (NUREG-1531, March 1999), which proposed stabilizing the tailings impoundment (pile) in place. In accordance with Public Law 106-398, DOE acquired the site in 2001 to facilitate remedial action. DOE's EIS builds upon the analyses and the alternatives evaluated in NRC's EIS and expands the scope of the EIS to include ground water remediation and vicinity properties.

2. ANALYSIS TO SUPPORT MISSION NEED

The top of the tailings pile averages 94 feet (ft) above the Colorado River floodplain (4,076 ft above mean sea level) and is about 750 ft from the Colorado River. The pile was constructed with five terraces and consists of an outer compact embankment of coarse tailings, an inner impoundment of both coarse and fine tailings, and an interim cover of soils taken from the site outside the pile area. Debris from dismantling the mill buildings and associated structures was placed in an area at the south end of the pile and covered with contaminated soils and fill. Radiation surveys indicate that some soils outside the pile also contain radioactive contaminants at concentrations above the EPA standards in 40 CFR 192.

Ground water in the highly saline shallow alluvium at the site was contaminated by ore-processing operations. The Colorado River adjacent to the site has been affected by site-related contamination, mostly due to ground water discharge. The primary contaminant of concern in ground water and surface water is ammonia. Addressing contaminated ground water does not significantly effect the decision to cap in place or relocate.

In addition to the contaminated materials currently at the Moab Site, some tailings may have been removed from the Moab mill site and used as construction or fill material at homes, businesses, public buildings, and vacant lots in and near Moab. As a result, these vicinity properties may have elevated concentrations of radium-226 that exceed the maximum concentration limits in 40 CFR 192. On the basis of preliminary surveys conducted in the 1970s by EPA, 130 potential sites may require remediation. However, using statistical analysis and past experience, DOE believes that a number smaller than 130 would actually need to be remediated. Additional characterization would be necessary to identify the current number and locations of vicinity properties. In accordance with the requirements of UMTRCA, DOE is obligated to remediate those properties where RRM exceed the maximum concentration limits in 40 CFR 192 along with the Moab Site.

3. IMPORTANCE OF NEED AND IMPACT IF NOT APPROVED

3.1 Importance of Need for the Moab, Utah UMTRA Project

Approval of this mission need statement provides the basis for project funding in supporting the need to clean up surface contamination and implement a ground water compliance strategy to address contamination that resulted from past uranium-ore processing at the Moab Site. Approval of this mission need document will:

- protect human health,
- reduce environmental risks associated with Moab Site tailings mill,
- comply with the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, and
- comply with Title I of UMTRCA.

DOE has not yet determined whether on-site or off-site disposal is its preferred alternative. DOE has not yet identified either a preferred location for an off-site disposal cell or a preferred mode of transportation for relocating the tailings if the off-site disposal alternative is selected. However, with the exception of the No Action alternative, the proposed ground water strategy would be applicable to both the on-site and off-site alternatives. DOE intends to consider the results of the analyses provided in the draft EIS, the relative costs among the alternatives, and other factors, such as public and agency comments on the draft EIS (including the views of cooperating agencies) in determining its preferred alternative for the disposal cell location and remediation of vicinity properties. DOE's preferred alternative will be based on these considerations and identified in the final EIS.

3.2 Impact of Not Executing the Moab, Utah UMTRA Project

Under a No Action alternative, DOE would not remediate contaminated materials either on the site or at vicinity properties. The existing tailings pile would not be covered and managed in accordance with standards in 40 CFR 192. No short-term site controls or activities to protect human health and the environment would be continued or implemented. Public access to the site is assumed to be unrestricted. All site activities, including operation and maintenance, would cease. A compliance strategy for contaminated ground water beneath the site would not be developed in accordance with standards in 40 CFR 192. No institutional controls would be implemented to restrict use of ground water, and no long-term stewardship and maintenance would take place. Because no activities would be budgeted or scheduled at the site, no further initial, interim, or remedial action costs would be incurred.

4. CONSTRAINTS AND ASSUMPTIONS

Several areas of continuing controversy have emerged as a result of DOE's discussions and consultations with cooperating and other agencies or as a result of public comments. Some of these issues and controversies derive directly from technical or regulatory uncertainties. Nontechnical issues and controversies have their origins in policies, perspectives, or positions endorsed by specific agencies or members of the public. For example, while DOE has not yet identified a preferred alternative, several cooperating agencies have expressed a preference.

There are also some areas of technical disagreement regarding long-term site risks. These risks are associated with uncertainties in processes potentially occurring over hundreds or thousands of years that are not amenable to short-term resolution. For example, professional differences of opinion with the State of Utah on river migration and transport of contaminants under the Colorado River to the Matheson Wetlands Preserve can be resolved with certainty only through long-term monitoring.

Major Assumptions

- Most impacts associated with the on-site and off-site disposal alternatives would not be permanent or irreversible. The exceptions are unavoidable impacts to human health, cultural resources, land use, and resource consumption.

- Surface remediation for the off-site disposal alternative would cost 2 to 3 times more than for the on-site disposal alternative.

- For ground water remediation, the capital costs and annual operating costs would be identical and the duration of ground water remediation would be very similar (75 to 80 years) under either the on-site or off-site disposal alternative.

- The Klondike Flats and Crescent Junction sites are off-site disposal locations where new disposal cells would need to be constructed. The White Mesa Mill site is an existing off-site facility that could receive RRM with appropriate NRC license modification.

- Among the three off-site disposal locations analyzed, White Mesa Mill would entail unique cultural and environmental justice impacts due to the proximity of the Ute community and the richness of the known and potential cultural resource inventory on or near the White Mesa Mill site and the White Mesa Mill slurry pipeline corridor.

- Transporting the tailings by truck to any of the three potential off-site locations would noticeably increase truck traffic on US-191 for up to 8 years. If the tailings were trucked to White Mesa Mill, the increase in truck traffic through already congested central Moab would represent a severe, ongoing impact.

- The No Action alternative would pose the greatest risk to human health over the long term due to the continuation of current levels of public exposure to radiation at potential vicinity properties and at the Moab Site.

5. APPLICABLE INTERFACES

DOE has entered into agreements with 12 federal, tribal, state, and local agencies to be cooperating agencies in the development of the draft EIS. Several of the cooperating agencies have jurisdiction by law and intend to use the EIS to support their own decision-making. The others have expertise relevant to potential environmental, social, or economic impacts with their geographic regions.

Federal

- Bureau of Land Management
- National Park Service
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Nuclear Regulatory Commission

State

- State of Utah

Tribal

- Ute Mountain Ute Tribe

County

- Grand County
- San Juan County

Local

- City of Blanding
- Community of Bluff

6. RESOURCE REQUIREMENTS, SCHEDULES, AND DEVELOPMENT PLAN

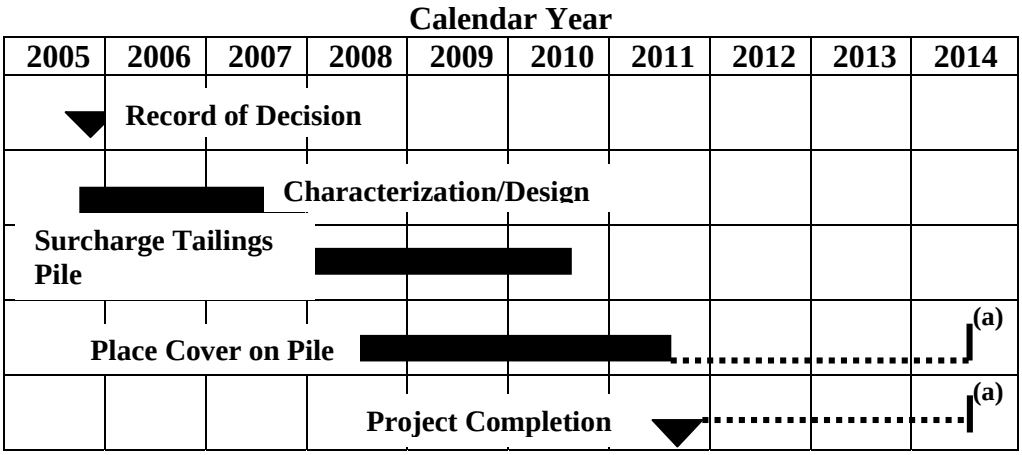
6.1 Project Planning and Schedules

The Moab UMTRA Project will be planned and controlled to meet the requirements of DOE Order 413.3 and DOE Manual 413.3-1. Current cost and schedule estimates are based on feasibility studies and therefore the estimates are preliminary.

In the EIS, DOE proposes two principal alternatives for remediation of contaminated surface materials at the Moab Site and potential vicinity properties: (1) on-site disposal and (2) off-site disposal. In addition, DOE is proposing one action to remediate contaminated ground water under the Moab Site and to protect ground water and surface water quality at the Moab Site and at an off-site disposal cell location if the proposed off-site disposal alternative is implemented.

6.1.1 On-Site Disposal Alternative

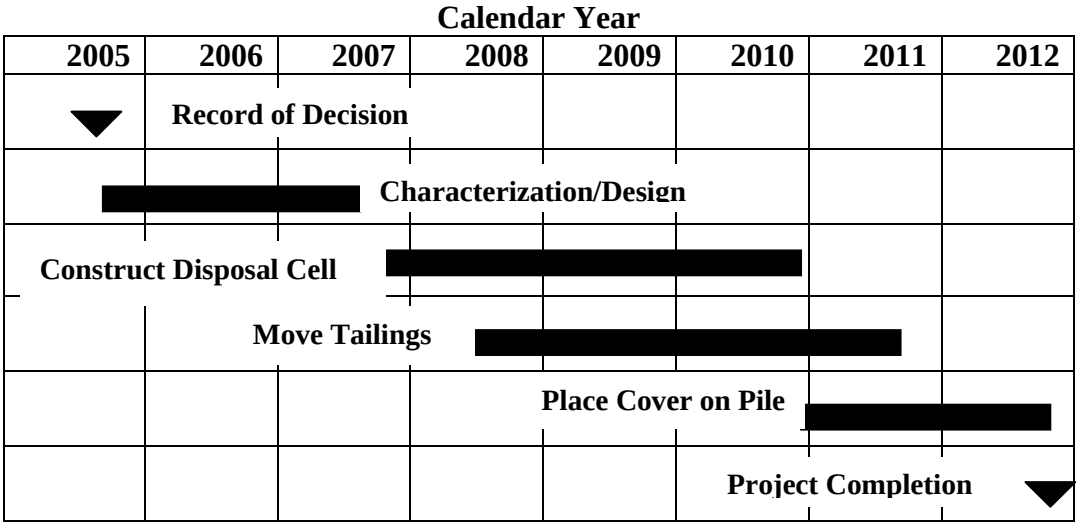
For the schedule, DOE assumed one work shift schedule for site and vicinity property remediation because the controlling factor determining how quickly work could progress would be the rate at which the tailings pile consolidated after excavated site soil and potential vicinity property material were placed on the pile. DOE estimates that all surface remediation activities under the on-site disposal alternative would be completed approximately 6 years from the issuance of the Record of Decision (ROD). However, this schedule is aggressive and is based on the draft EIS. The schedule baseline parameters will be better defined upon completion of the Acquisition Strategy and Risk Management Plan.



Note (a): Uncertainty related to pile consolidation.

6.1.2 Off-Site Disposal Alternative

The off-site disposal alternative would entail excavating and relocating the entire Moab Site tailings pile, other on-site RRM, and all RRM, if any, from vicinity properties to an off-site disposal cell. Assuming that a ROD is issued in 2005 and that a single-shift work schedule is implemented for transportation, remediation work would begin in late 2007 and would be completed in 2012. However, this schedule is aggressive and is based on the draft EIS. The schedule baseline parameters will be better defined upon completion of the Acquisition Strategy and Risk Management Plan.



6.2 Critical Decision Dates

Critical Decision Dates for the Moab Project Site are planned as follows:

Decision	Date Needed
CD-0, Approve Mission Need	2nd Quarter FY05
Record of Decision	4th Quarter FY05 (see note below)
CD-1 Approve Alternative Selection and Cost Range	3rd Quarter FY06
CD-2 Approve Performance Baseline	2nd Quarter FY07
CD-3, Approve Start of Construction	2nd Quarter FY07
CD-4, Project Closeout	4th Quarter FY11 or 4th Quarter FY12

Note: Approval of critical decisions as shown above is key to achieving project success.

6.3 Project Cost Range

Cost ranges were established for each alternative using DOE Manual 413.3-1 Risk Planning Guidelines. The cost ranges were based on the draft EIS estimate and are intended to reflect the current level of project uncertainty. The Moab Site Integrated

Project Team prepared Risk Screening Checklists for each major cost element of the on-site disposal alternative and the off-site alternative including the three possible off-site locations and the three tailings transportation options. For the project risks identified, the probability of the risk occurring and the consequence of the risk were analyzed to determine risk level and documented on Risk Assessment Forms. The key output from the risk analysis was the establishment of appropriate contingency levels based upon the confidence levels of project success. (Note: The estimates assume that ground water remediation and long-term surveillance and monitoring would continue for 80 years under the on-site disposal alternative and for 75 years under the off-site disposal alternative. The cost for these activities is estimated at $906,000 per year.)

6.3.1 On-Site Disposal Cost Range

Lower Range	Upper Range
$226.6 M	$289.3 M
0 to 10% Contingency	25 to 50% Contingency

6.3.2 Off-Site Disposal Cost Ranges

Alternative	Lower Range	Contingency	Upper Range	Contingency
Klondike Flats - Truck	$392.1 M	0 to 10%	$585.9 M	25 to 75%
Klondike Flats - Rail	$453.6 M	0 to 10%	$686.9 M	25 to 75%
Klondike Flats - Pipeline	$457.3 M	0 to 10%	$695.1 M	25 to 75%
Crescent Junction - Truck	$396.8 M	0 to 10%	$596.7 M	25 to 75%
Crescent Junction - Rail	$458.3 M	0 to 10%	$697.6 M	25 to 75%
Crescent Junction - Pipeline	$465.5 M	0 to 10%	$710.6 M	25 to 75%
White Mesa - Truck	$482.2 M	0 to 10%	$735.3 M	25 to 75%
White Mesa - Pipeline	$528.9 M	0 to 10%	$814.3 M	25 to 75%

6.4 Project Funding Profile

6.4.1 On-Site Disposal Alternative

	FY05	**FY06**	**FY07**	**FY08**	**FY09**	**FY10 – FY11**	**Total**
Total Project Cost (ROD Forward)	$1.6 M	$19.7M	$31.6M	$45.8 M	$42.5	$148.1 M*	$289.3 M

(*Includes ground water surveillance and monitoring for 80 years at $906 K per year.)

6.4.2 Off-Site Disposal Alternatives
(Assume Klondike Flats Rail which is in the medium high cost range of alternatives)

	FY05	FY06	FY07	FY08	FY09	FY10 – FY12	Total
Total Project Cost (ROD Forward)	$1.9 M	$26 M	$75.6 M	$102.1 M	$124.3 M	$357 M*	$686.9 M

(*Includes ground water surveillance and monitoring for 75 years at $906 K per year.)

6.5 Measures to Determine Project Success

The Moab Project will be managed in accordance with DOE Order 413.3. The project will measure and control cost and schedule performance using an Earned Value Management System based on the American National Standard Institute/Electronic Industries Alliance Earned Value Management Systems (ANSI/EIA – 748) guidelines. The technical, schedule, and cost baseline parameters will be controlled through formal change control procedures.

The Moab Project will be considered complete with the clean up of all surface contamination to standards in 40CFR192, disposal cell construction (either on- or off-site), and the implementation of a ground water compliance strategy to fulfill ground water standards in 40CFR192.

7. SUMMARY

DOE issued the Final EIS in July 2005. The EIS identified the preferred alternatives to be: (1) off-site disposal of uranium mill tailings at Crescent Junction Site, using rail as the primary mode of transportation; and (2) active remediation of contaminated ground water at the Moab Site. The schedule for DOE's Record of Decision is September 2005.

8. REFRENCES

DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets* (October 13, 2000)

DOE Manual 413.3-1, *Project Management for the Acquisition of Capital Assets* (March 28, 2000)

Draft Environmental Impact Statement, *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah* (November, 2004)

Title I of the Uranium Mill Tailings Radiation Control Act (UMTRCA – 1978)

Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398)

National Environmental Policy Act (NEPA) (40 CFR 1502.25)

Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.)