

CRITICAL MANAGEMENT ISSUES FOR THE  
URANIUM MILL TAILINGS REMEDIAL ACTION (UMTRA) PROJECT

John G. Themelis, Project Manager  
U.S. Department of Energy, UMTRA Project Office  
Albuquerque, New Mexico

Krish R. Krishnan, Project Manager  
Jacobs Engineering Group Inc., UMTRA Project Office  
Albuquerque, New Mexico

ABSTRACT

The Uranium Mill Tailings Radiation Control Act of 1978 (PL95-604) authorized the Secretary of Energy to enter into cooperative agreements with certain states and Indian Tribes to clean up 24 inactive uranium mill tailings sites and associated vicinity properties. The Uranium Mill Tailings Remedial Action (UMTRA) Project includes three Federal agencies (EPA, DOE, and NRC), eleven states, Indian Tribes, and at least four major contractors.

The UMTRA Project extends over a period of ten years. The standards for the Project require a design life of 1000 years with a minimum performance period of 200 years. This paper discusses the critical management issues in dealing with the UMTRA Project and identifies the development of solutions for many of those issues. The highlights to date are promulgation of EPA standards, continued support from Congress and participating states and Indian Tribes, significant leadership shown at all levels, establishment of credibility with the public, and continued motivation of the team. The challenge for tomorrow is making certain NRC will license the sites and maintaining the high level of coordination exhibited to date to assure Project completion on schedule.

INTRODUCTION

The Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, enacted by the 95th Congress, acknowledges the potential long-term environmental and health risks associated with uranium mill tailings and the need to control tailings for the public good. The law identified the U.S. Department of Energy (DOE, Secretary of Energy), as the agency to implement the law. The U.S. Environmental Protection Agency (EPA) was mandated to develop appropriate standards for the abandoned uranium mill tailings. The Nuclear Regulatory Commission (NRC) and states and Indian tribes were given specific participatory roles. Table I identifies the 24 designated sites and associated vicinity properties. The UMTRA Project includes sites in eleven states and on Indian Tribal lands containing 25 million tons of abandoned uranium mill tailings, and with approximately 8,000 associated vicinity properties.

EARLY ACTIVITIES

Following enactment of PL95-604, the immediate issue facing DOE was identifying the project office for implementation of the UMTRA Project. After significant deliberations, the Albuquerque Operations Office (AL) of the DOE was selected as the field office for implementing the UMTRA Project due to its geographical proximity to the mill sites and the management infrastructure available to support the project. A project office was established at AL under the cognizance of the Assistant Manager for Projects and Energy Programs. To make certain the project moved forward, Sandia National Laboratories was chosen to carry out the National Environmental Policy Act (NEPA) work and certain Research and Technology Development activities to develop technical solutions for mill tailings control and stabilization.

TABLE I

Processing Sites Summary

State	Processing Site	Tailings (10 <sup>6</sup> tons)	No. of Vicinity Properties
Arizona	*Monument Valley	1.100	17
Colorado	*Tuba City	0.800	8
	Durango	1.555	137
	Grand Junction	1.900	6,905
	Gunnison	0.540	14
	Maybell	2.600	--
	Naturita	0.344	60
	New Rifle	2.700	{ 384 }
	Old Rifle	0.350	{ 4 }
	Slick Rock (NC)	0.037	
	Slick Rock (UC)	0.350	
Idaho	Lowman	0.090	17
New Mexico	Ambrosia Lake	2.600	--
	*Shiprock	1.500	17
North Dakota	Belfield	0.050	11
	Bowman	0.071	3
Oregon	Lakeview	0.130	4
Pennsylvania	Canonsburg	0.414	111
South Dakota	Edgemont	N/A	216
Texas	Falls City	2.500	20
Utah	Green River	0.123	29
	*Mexican Hat	2.200	21
Wyoming	Salt Lake	1.880	127
	Spook	0.187	1
	Riverton	0.900	50

\*Processing site on Navajo Tribal lands

Figure 1 identifies the current UMTRA Project organization and interfaces. As identified in the figure, various DOE organizations such as Albuquerque, Idaho, Grand Junction, Oak Ridge, and Headquarters are involved in the project. In addition, checks and balances are provided through the participation of the NRC, U.S. Department of the Interior (DOI), EPA, and the states and Indian Tribes. The involvement of these numerous government agencies created a need for early, effective, and continuous communications in order to make appropriate decisions.

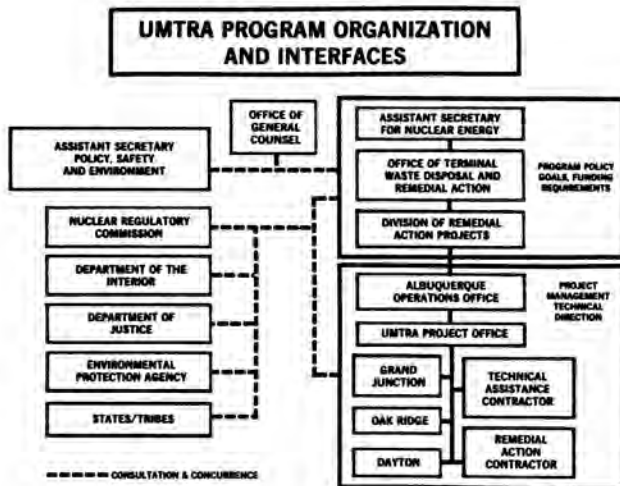


Fig. 1. UMTRA Project Organization and Interfaces

Simultaneously with the organization of the DOE Project Office, the EPA began work on developing appropriate standards for inactive tailings sites. The EPA was required to fully assess the health and environmental impacts of the tailings. It took the EPA approximately five years to promulgate the standards. Figure 2 summarizes the EPA standards for the UMTRA Project mill tailings.

**SUMMARY OF EPA STANDARDS**

**CONTROL OF TAILINGS PILES**

- **LONGEVITY: 200-1000 YEARS**
- **RADON EMISSIONS: 20 pCi/m<sup>2</sup>s; OR 0.5 pCi/l**
- **WATER PROTECTION: NO LIMITS, SITE SPECIFIC JUDGEMENT**

**CLEAN-UP OF LAND**

- **SURFACE: 5 pCi/g ABOVE BACKGROUND AVERAGED OVER 15 cm. SURFACE LAYER**
- **BURIED: 15 pCi/g ABOVE BACKGROUND AVERAGED OVER ANY 15 cm. LAYER BELOW THE 15 cm. SURFACE LAYER**

Fig. 2. Summary of EPA Standards

**PROJECT STRUCTURE**

The DOE Project Office decided to utilize the services of outside contractors to implement the requirements of PL95-604. As the first step, the Project Office identified the need for a Technical Assistance Contractor (TAC) to provide planning; design development; environmental, health, and safety; quality assurance; surveillance and maintenance planning; and miscellaneous technical services. DOE began the selection process in early 1981 and awarded the contract in March, 1982. Jacobs Engineering Group Inc. was selected as the prime contractor with support from Roy F. Weston, Inc., and Sergeant, Hauskins & Beckwith Geotechnical Engineers, Inc. The TAC Albuquerque Project Office was established in June, 1982.

The next major contractor selection was for a Remedial Action Contractor (RAC) to provide detailed design and construction management services for the mill sites and vicinity properties remedial action. Morrison-Knudsen (M-K) was selected as the prime contractor with support from International Engineering Company and Chem Nuclear Systems, Inc. The RAC Albuquerque Project Office was established in August, 1983.

The project structure also includes support from Bendix Field Engineering Corp. (BFEC), supporting activities in Grand Junction and Edgemont; Oak Ridge National Laboratory (ORNL), providing inclusion surveys for vicinity properties; and Mound Facility providing radon characterization support. Figure 3 identifies the current project structure.

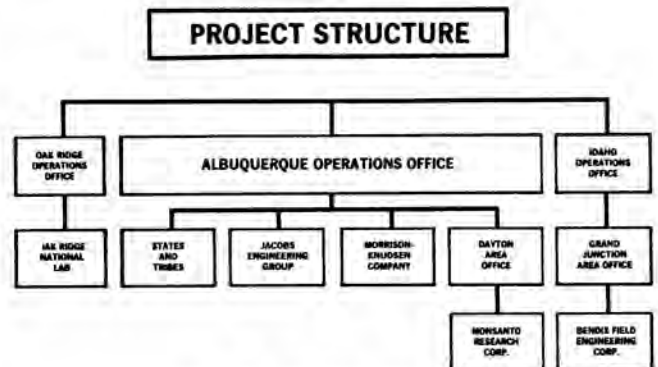


Fig. 3. Project Structure

**FLOW CHART OF ACTIVITIES**

Figure 4 identifies the various steps required to complete the remedial action for processing sites and vicinity properties. The various contractors identified in Fig. 3 participate in completing each of these action items. This requires very effective communication among all team members. At this time approximately 200 DOE and prime contractor personnel are involved in the UMTRA Project.

**PROBLEM DEFINITION**

As is clear by now, there are many participants in the program, namely, EPA, NRC, DOE, eleven different states, the Navajo Nation and various other Indian Tribes (Arapahoe, Hopi, Shoshone, and Plute), and associated publics. Hence, defining the boundaries of the problem and selecting the preferred remedial action requires input, support, and participation from each of these entities.

## UMTRA PROJECT ACTIVITIES FLOW DIAGRAM



Fig. 4. UMTRA Activities Flow Diagram

The first issue faced by the Project was defining the technical problem. Figure 5 provides a simple conceptualization of the problem, namely, radon emanation and radiation exposure, instability of the pile, and seepage of pollutants into the ground water. It was necessary for all participating agencies to come to terms with each of the above issues.

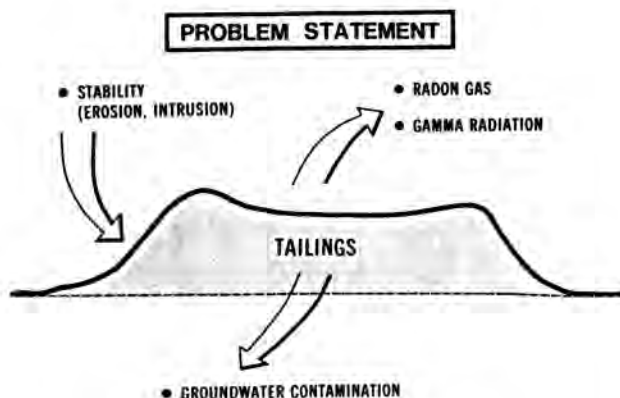


Fig. 5. Problem Statement

In developing the standards, EPA decided that specific surface-water or ground-water standards were not appropriate for the inactive sites. This requires the project to characterize each tailings site from a surface-water and ground-water perspective. The characterization involves extensive field work, which was not initially planned as part of the project, and extensive and close coordination among DOE, NRC, and the states/Indian Tribes to assure that these problems are adequately analyzed and solved. Over the last three years, each of the technical issues has been tackled and resolved in a professional manner satisfactory to all participants.

### REASON FOR SUCCESS

To date, the UMTRA Project has been successful beyond anyone's initial expectation. The EPA standards have been promulgated. Significant support has been provided by Congress, both in terms of funding

and public perception. The participating states and Indian Tribes are contributing significantly to the success of the project. The program has provided leadership at all levels. An excellent team of professionals who are self-starters has been created and this team has maintained its motivation and professionalism. The collocation of participants (DOE, TAC, and RAC) has allowed for good, effective communication. The UMTRA Project has established credibility with the public. Figure 6 highlights the significant items.

### HIGHLIGHTS

- o PASSAGE OF STANDARDS
- o SUPPORT FROM CONGRESS
- o LEADERSHIP AT ALL LEVELS
- o CO-LOCATION OF PARTICIPANTS
- o GOOD PROFESSIONALS. SELF STARTERS
- o THE TEAM APPROACH
- o CONTINUED MOTIVATION
- o ESTABLISHMENT OF CREDIBILITY

Fig. 6. Highlights

The project team established communication with Congress and the public on a regular basis. At each of these meetings, efforts were made to identify progress, listen to the people, and identify and solve critical issues. The DOE, Project Manager, is the leader for the program with effective support from identified state participants. All others (Contractors) functioned in a support role to DOE and the states. Each organization hired professionals with good credentials, ability to work on a team, and self-starting motivation. This, in combination with collocation of participants, helped establish a successful UMTRA Project.

### CRITICAL MANAGEMENT ISSUES

Figure 7 identifies the management issues dealt with on this project. Early on, it was very clear that the Project had to establish a single goal. That goal was identified as moving dirt (e.g., stabilizing the piles) at each of the 24 sites and their associated vicinity properties. Even though some of the participants did not have a direct role in actually moving dirt, they clearly understood the driving force. This helped cut through many management problems. Towards achieving the goal, the team defined the critical path items, namely, data-gathering efforts and the environmental assessment (EA) or environmental impact statement (EIS). Significant attention was devoted to these areas. To help make decisions quickly and effectively, the team created a decision-tree which identified the participants involved in major decisions and the time allotted for them to make the decisions. To help make quick and effective decisions, time was devoted to identifying any hidden agendas of the public or other cognizant agencies. Generally, the Project has been able to take care of the hidden agenda and the project objectives at the same time. In spite of some early hurdles, the team continued to focus on success and future accomplishments. Focusing on success has been very important during the early phases of the Project because of the Project's high visibility.

## CHALLENGES OF TOMORROW

### MANAGEMENT ISSUES

- o IDENTIFY THE GOAL (MOVING DIRT)
- o DEFINE THE PAGING ITEMS
- o CREATE A DECISION TREE
- o IDENTIFY HIDDEN AGENDAS
- o FOCUS ON SUCCESS

Fig. 7. Management Issues

Figure 8 provides a capsule summary of the current status of the UMTRA Project. The Project plans to complete the work in Canonsburg, Pennsylvania, by September, 1985. Work is in progress in Shiprock, New Mexico, and Salt Lake City, Utah. Field data-gathering efforts are in full swing at seven major sites. All participants in the Project plan to keep the pressure on, with an objective of having dirt moving underway at half of the Project sites by the end of 1986.

### WHERE THE PROJECT IS NOW

- o CANONSBURG TO BE COMPLETED '85
- o SHIPROCK AND SALT LAKE CITY IN PROGRESS
- o DATA GATHERING IN PROGRESS ON SEVEN SITES

Fig. 8. Where the Project is Now

The Project has many significant challenges, illustrated in Fig. 9. The NRC must license the Canonsburg site within the next two years. The Project requires significant resources in both technical and support personnel, and adequate funding from Congress and the states. Probably the most significant challenge, if the Project is to be completed on schedule, will be to maintain the high level of effective coordination among the participating agencies that has been established to date.

### CHALLENGES OF TOMORROW

- o LICENSING BY NRC
- o RESOURCES, BOTH PEOPLE AND FUNDING
- o MAINTAIN EFFECTIVE COORDINATION

Fig. 9. Challenges of Tomorrow

### CONCLUSION

The current success of the UMTRA Project is attributed to the following:

- o Clearly defining the goal.
- o Establishing effective communications at all levels.
- o Identifying and selecting high quality, well motivated personnel.
- o Evaluating and understanding public perception issues.
- o Working as one team between DOE, NRC, EPA, and all contractors.

### ACKNOWLEDGEMENT

The Department of Energy's Uranium Mill Tailings Remedial Action Project is headquartered in Albuquerque, New Mexico, and part of the study was supported under DOE Contract No. DE-AC04-82AL14086 to Jacobs Engineering Group Inc.