Preliminary Assessment Report
Cove Transfer Station
Cove, Arizona

EPA ID No.: NNN000906016
USACE Contract No.: W91238-05-F-0052
Document Control No.: 12767.063.319

August 2007

Prepared for:
U.S. Environmental Protection Agency
Region 9

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LIST OF ACRONYMS

AUM	Abandoned Uranium Mine
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
EPA	United States Environmental Protection Agency
HRS	Hazard Ranking System
NAMLRP	Navajo Abandoned Mine Land Reclamation Program
NNEPA	Navajo Nation Environmental Protection Agency
NPL	National Priorities List
PA	Preliminary Assessment
pCi/L	pico-curies per liter
SARA	Superfund Amendments and Reauthorization Act
μR/hr	microroentgens per hour

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), Weston Solutions, Inc. (WESTON) has been tasked to conduct a Preliminary Assessment (PA) of the Cove Transfer Station site, located in Cove, Apache County, Arizona. A site location map is presented in Figure 1.

The purpose of the PA is to review existing information on the site and its environs, to assess the threat(s), if any, posed to public health, welfare, or the environment, and to determine if further investigation under CERCLA/SARA is warranted. The scope of the PA includes the review of information available from federal, state, and local agencies and performance of an on-site reconnaissance visit.

Using the sources of existing information, the site is then evaluated using the U.S. Environmental Protection Agency's (EPA's) Hazard Ranking System (HRS) criteria to assess the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which the EPA may conduct remedial response actions. This report summarizes the findings of these preliminary investigative activities.

The Cove Transfer Station site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on July 23, 2003 (EPA ID No.: NNN000906016) (1).

1.1 Apparent Problem

The apparent problem at the Cove Transfer Station site, which contributed to EPA's determination that a PA was necessary, is as follows:

- The site was formerly occupied by a mining operation's field camp and ore transfer station. The ore, which was temporarily stored on site until transfer to an off-site mill, contained elevated concentrations of uranium radionuclides (2, 3).

2.0 SITE DESCRIPTION

2.1 Location

The Cove Transfer Station site is located on an unaddressed property in Cove, Apache County, Arizona. The site is located within the Cove Chapter of the Navajo Nation Native American

Reservation. The geographic coordinates for the site are 36˚ 33’ 39" North latitude and 109˚ 12’ 57" West longitude. The site location is shown in Figure 1.

2.2 Site Description

The Cove Transfer Station site occupies approximately 2.0 acres in a light residential, agricultural, and undeveloped area. As of May 2005, the site was occupied by vacant land. The site was bordered to the north by vacant land, with residential buildings beyond, to the west by Navajo Route 33, with an agricultural field beyond, and to the south and east by vacant land (4).

2.3 Operational History

Historic on-site operations at the Cove Transfer Station site included the stockpiling of uranium-bearing ore, the housing of mining personnel, and the administration of the mining operations in the Lukachukai Mountains (2).

In May 1952, Kerr-McGee Oil Industries, Inc., having acquired property in the Lukachukai Mountains, created their Navajo Uranium Division and began to actively mine the region. In October 1954, the Kerr-McGee field camp was moved from the Mesa No. 1 mine to the Cove Transfer Station site (2).

The Kerr-McGee mining operations field camp included several prefabricated structures that were used for the field administrative offices, to house and service employees during the week, and to maintain fleet vehicles. In addition, ore deposits from the company-run Lukachukai mines were brought down the mountain roads on tandem-drive trucks and stockpiled at the site. The ore was then loaded into larger trucks and shipped approximately 40 miles to the Shiprock Mill. The ore stockpiled at the site primarily came from the Mesa No. 2 mine, which produced approximately 5,000 tons of high-vanadium carnotite-tyuyamunite ore per month and was the most productive mine in the region. It is assumed that the operations at the Cove Transfer Station site ceased no later than 1968 since the final shipments of ore were removed from the Lukachukai Mountains in May 1968 (2, 3).

The EPA, Region 9, began their Abandoned Uranium Mine (AUM) Project in 1994 with the primary objective of determining if the former uranium mining activities that had occurred within the Navajo Nation posed a significant threat to human health. Over the course of this investigation, which lasted through January 2000, aerial radiation surveys were conducted over 1,194 square miles. In addition, over 200 water sources used for human consumption, were identified and analyzed for radiation and related metal concentrations. The aerial radiation survey of the Lukachukai region identified the area of the Cove Transfer Station site as one of elevated radiation levels (5).

A radiological survey was conducted at the Cove Transfer Station site by staff of the Navajo Nation Environmental Protection Agency (NNEPA), a regulatory branch of the Navajo Nation

government, on July 23, 2003. One hundred thirty-four measurements were collected across the site using a hand-held radiation survey meter from 1-meter above ground surface. Approximately 72 percent of these readings were at least two times greater than the established background level of 14 microroentgens per hour (μR/hr). The highest recorded value at the site was 400 μR/hr, which was collected from an unvegetated discolored area at the central portion of the site (Appendix B).

The Navajo Abandoned Mine Land Reclamation Program (NAMLRP) conducted a removal action at the Cove Transfer Station site between July 2003 and July 2004. The NAMLRP staff surveyed the site prior to conducting the removal action to determine areas of elevated radiation. These areas, which totaled between 1 and 2 acres, were then excavated and removed to another unidentified reclamation project, located south of the Cove community. Additional details of this removal action are unknown (6).

NNEPA staff returned to the site on July 9, 2004 to conduct an additional radiological survey following the removal action conducted by the NAMLRP. Radiological readings collected during this survey, which was conducted using the same radiation meter as the previous NNEPA survey, ranged from 15 to 30 μR/hr. Two areas, each less then three square feet, were identified as having elevated levels of radiation (100 and 150 μR/hr). These areas were located at the west side of the property along the highway right-of-way fence line associated with Navajo Route 33 and had not been included in the NAMLRP removal action (6).

2.4 Regulatory Involvement

Information from the following agencies was investigated in the course of conducting the PA: the NNEPA and the NAMLRP. The details of these agencies' involvement with the site are presented below.

2.4.1 U.S. Environmental Protection Agency

The Cove Transfer Station site was not listed in the Resource Conservation and Recovery Act (RCRAInfo) database as of July 26, 2007 (7).

2.4.2 Navajo Nation Environmental Protection Agency

The NNEPA has conducted radiological surveys at the Cove Transfer Station site. Details of these surveys are provided in Section 2.3.

2.4.3 Navajo Abandoned Mine Land Reclamation Program

The NAMLRP conducted a removal action at the Cove Transfer Station site. Details of this action are provided in Section 2.3.

3.0 HAZARD RANKING SYSTEM FACTORS

3.1 Sources of Contamination

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the Cove Transfer Station site include, but may not be limited to:

- Radionuclide materials associated with the former on-site storage of uranium-bearing ore (2).

3.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

The Cove Transfer Station site lies within the Chuska Mountains Subbasin in the northwest portion of the San Juan Hydrologic Basin. The Chuska Mountains Subbasin is generally bound to the west by the Blanding and Black Mesa Hydrologic Basins, to the north by the Carrizo Mountains Subbasin, and to the east and south by the Western San Juan Subbasin. The Chuska Mountain Range, which also includes the Lukachukai Mountains, is generally composed of the horizontally bedded Chuska Sandstone, which unconformably overlies the East Defiance Monocline. The Cove community, including the site vicinity, is underlain by Quaternary-age alluvium, which extends to an unknown depth (2, 8).

The majority of the Navajo Nation, including the Chuska Mountains Subbasin, has three major underlying aquifers and various smaller shallow alluvial aquifers. These aquifers in descending order are the Dakota (D-), Navajo (N-), and Coconino (C-) aquifers. The D-aquifer, which is composed of the Dakota, Cow Springs, and Entrada Sandstones, is primarily used as a domestic water supply in the southwest-central portion of the Navajo Nation. The D-aquifer covers an aerial extent of approximately 3,000 square miles and is interconnected with the N-aquifer in some areas. The N-aquifer, which covers an approximate aerial extent of 6,000 square miles, is

primarily used as a domestic water supply throughout the central and western portions of the Navajo Nation. The primary water-bearing formations of the N-aquifer are the Navajo Sandstone and, when present, the Wingate Sandstone. The C-aquifer covers an aerial extent of approximately 22,000 square miles and is generally used as a domestic water supply in the central, south-central, and far west regions of the Navajo Nation. The primary water bearing formations of the C-aquifer are the Kaibob Limestone, Coconino Sandstone, and the upper sequences of the Supai Formation (9, 10).

The depth to groundwater beneath the site is estimated to be between 500 and 1000 feet below ground surface. Local groundwater supply wells are served by the N- and C-aquifers. The direction of groundwater flow has not been clearly defined, however, based upon regional topography, it is estimated to be in a north to northeasterly direction. Geologic materials in the unsaturated zone between ground surface and the top of the aquifer are unknown, however, the site is underlain by Quaternary-age alluvium, which extends to an unknown depth. The average net precipitation in the area is approximately 9 inches annually (2, 8, 10, 11, 12).

The nearest known drinking water well to the site, Well 309, is a standby well that serves the Cove Day School and is located approximately 0.3 miles west of the site. Well 309 was sampled by the EPA as part of the AUM investigation on May 19, 1999, prior to NAMLRP reclamation activities within the region. Analytical results indicated total uranium concentrations of 83.71 pico-curies per liter (pCi/L), which exceeded the Maximum Contaminant Level of 20 pCi/L (App. C-1, 5, 12, 13, 14).

There are three additionally known drinking water wells within 4 miles of the site. These wells are the Red Point Dug Well, located approximately 1.5 miles north-northwest of the site, the Ellison Wells, located approximately 2 miles northwest of the site, and the Cove Chapter House Well, located approximately 2 miles northeast of the site. These wells, which were also sampled by the EPA as part of the AUM investigation in the spring of 1999, exhibited total uranium concentrations of 7.70, 34.73, and 0.03 pCi/L, respectively. Since groundwater is the most heavily used water source in the Navajo Nation, it is also assumed that there may be additional unidentified private domestic groundwater wells located within the target distance limit. It is unknown what population is served by these wells, however, it is estimated to be less than the total population of Cove Chapter, which was 503 as of 2000. Approximately 60 percent of the total land area of Cove Chapter is within the target distance limit (5, 13, 14, 15).

3.3 Surface Water Pathway

In determining the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumlulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the

HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Stormwater runoff from the Cove Transfer Station site flows west on site, across Navajo Route 33, and into an agricultural field. Runoff that is not infiltrated in the field continues flowing northwest and eventually drains into South Cove Wash, located approximately 0.25 miles from the site. South Cove Wash is an intermittent stream that flows northeast into Cove Wash, which flows northeast out of Cove Chapter until merging with Red Wash, approximately 10 miles from the site in Red Valley Chapter. Red Wash continues flowing northeast until its confluence with the San Juan River, located approximately 30 miles from the site. No known drinking water intakes, fisheries, or sensitive environments are associated with South Cove Wash, Cove Wash, or Red River Wash. However, since approximately 40 percent of the population in the Navajo Nation is without tap water and are known to haul water, sometimes from non-potable sources, long distances to their residences, there is the potential for a small population to be using surface waters downstream of the site as a drinking water source (4, 11, 14).

3.4 Soil Exposure and Air Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

As of May 2005, there were no structures on site. In addition, the site was accessible to the public and its surface was unpaved. There are also no known sensitive environments on site (4, 6).

4.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40CFR 300.415 (b) (2)] authorizes the EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region 9's Emergency Response Office does not appear to be necessary:

- The mining camp operations that formerly occurred at the site are estimated to have ceased operations circa 1968. Details of these operations are provided in Section 2.3 (3).

- A removal action was conducted at the site by the NAMLRP between July 2003 and July 2004. Details of this removal action are provided in Section 2.3 (6).

- The site is located in a rural and sparsely populated area (15).

5.0 SUMMARY

The Cove Transfer Station site is located on an unaddressed property in Cove, Apache County, Arizona. The site is located within the Cove Chapter of the Navajo Nation Native American Reservation. It occupies approximately 2.0 acres in a light residential, agricultural, and undeveloped area. As of May 2005, the site was occupied by vacant land.

Historic on-site operations at the Cove Transfer Station site included the stockpiling of uranium-bearing ore, the housing of mining personnel, and the administration of mining operations in the Lukachukai Mountains. Kerr-McGee Oil Industries, Inc., having acquired property in the Lukachukai Mountains in May 1952, created their Navajo Uranium Division and began to actively mine the region. In October 1954, the Kerr-McGee field camp was moved from the Mesa No. 1 mine to the Cove Transfer Station site. The field camp included several prefabricated structures that were used for the field administrative offices, to house and service employees during the week, and to maintain fleet vehicles. In addition, ore deposits from the mines were stockpiled at the site until the ore was shipped to an off-site mill. It is assumed that on-site operations ceased no later than 1968 since the final shipments of ore were removed from the Lukachukai Mountains in May 1968.

The U.S. Environmental Protection Agency, Region 9, began their Abandoned Uranium Mine Project in 1994 with the primary objective of determining if the former uranium mining activities that had occurred within the Navajo Nation posed a significant threat to human health. The aerial radiation survey of the Lukachukai region identified the area of the Cove Transfer Station site as one of elevated radiation levels. A radiological ground survey was conducted at the site by staff of the Navajo Nation Environmental Protection Agency (NNEPA) in July 2003. Approximately 72 percent of these readings were at least two times greater than the established background level. The Navajo Abandoned Mine Land Reclamation Program (NAMLRP)

conducted a removal action at the site between July 2003 and July 2004. NAMLRP staff surveyed the site prior to conducting the removal action to determine areas of elevated radiation. These areas, which totaled between 1 and 2 acres, were then excavated and removed. NNEPA staff returned to the site in July 2004 to conduct an additional radiological survey. Two areas, each less then three square feet and located adjacent to the highway right-of-way, were identified as having elevated levels of radiation.

The following pertinent Hazard Ranking System factors are associated with the site:

- The depth to groundwater beneath the site is estimated to be between 500 and 1000 feet below ground surface. Geologic materials in the unsaturated zone between ground surface and the top of the aquifer are unknown, however, the site is underlain by Quaternary-age alluvium, which extends to an unknown depth.

- The nearest known drinking water well to the site, Well 309, is a standby well that serves the Cove Day School, and is located approximately 0.3 miles west of the site.

- Surface water flows west on site, across Navajo Route 33, and into an agricultural field. Runoff that is not infiltrated in the field continues flowing northwest into South Cove Wash, then Cove Wash, then Red Wash, and eventually into the San Juan River, located approximately 30 miles northeast of the site. No known drinking water intakes, fisheries, or sensitive environments are associated with surface water bodies within 15 miles downstream of the site.

- As of May 2005, there were no structures on site. In addition, the site was accessible to the public and its surface was unpaved. No known sensitive environments are present on site.

6.0 REFERENCE LIST

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CONTACT LOG

SITE: Cove Transfer Station
EPA ID: NNN000906016

NAME	AFFILIATION	PHONE	DATE	INFORMATION
Irvin Tsosie, Sr.	Navajo Nation – Cove Chapter	(928) 653-5806	09/5/2003	See Contact Report C-1

CONTACT REPORT 1

AGENCY/AFFILIATION: Navajo Nation – Cove Chapter		
DEPARTMENT:		
ADDRESS/CITY: P.O. Box 378, Cove		
COUNTY/STATE/ZIP: Apache, Arizona, 86544		
CONTACT(S)	TITLE	PHONE
Irvin Tsosie, Sr.	Chapter President	(928) 653-5806
PERSON MAKING CONTACT: Eugene Esplain		DATE: 09/25/03
SUBJECT: School Water Sources		
SITE NAME: Cove Transfer Station		EPA ID#: NNN000906016

Staff met with Mr. Tsosie at his job site, Cove Day School, where he is the school custodian. He states that water for the school compound comes from the mountains southeast of the school approximately two miles. The water is convey via an aqueduct and pumped into a storage tank atop a water tower east of the school. The old well, Well 309, is just designated as a stand-by well; it is located alongside a wash approximately a mile northeast of the school.