

12.0 Mexican Hat, Utah, Disposal Site

12.1 Compliance Summary

The Mexican Hat, Utah, Disposal Site, inspected on April 26, 2006, was in good condition. Runoff from storm events continues to transport sediment into the west diversion channel resulting in vegetation growth within the channel; performance of the diversion channel has not been impaired. Repairs were made to the perimeter fence, boundary monument BM-7, and perimeter sign P27. The entrance gate was found damaged, however, vehicles are still able to access the site; therefore, no repairs are planned at this time. Tamarisk plants found on site were cut and treated with herbicide. Trash and tumbleweeds continue to accumulate on the site and along sections of the perimeter fence and may require maintenance in the future. An evaluation of the monitoring program was conducted and presented in the draft report *Resolution of Seep and Ground Water Monitoring at the Mexican Hat, Utah, UMTRCA Title I Disposal Site* (March 2006). Recommendations to discontinue seep water quality monitoring and to continue annual observations of seep flows were conditionally concurred in by the Navajo Nation; NRC approval is pending. Navajo Nation concurrence to decommission the four remaining ground water monitoring wells at the site was received. No cause for a follow-up or contingency inspection was identified.

12.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Mexican Hat, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan [LTSP] for the Mexican Hat Disposal Site, Mexican Hat, Utah* (DOE/AL/62350-207, Rev. 2, U.S. Department of Energy [DOE], Albuquerque Operations Office, June 1997) and in procedures established by DOE to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 12-1.

Table 12-1. License Requirements for the Mexican Hat, Utah, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.1	Section 12.3.1
Follow-up or Contingency Inspections	Section 3.4	Section 12.3.2
Routine Maintenance and Repairs	Section 5.0	Section 12.3.3
Ground Water Monitoring	Section 4.3	Section 12.3.4
Corrective Action	Section 6.0	Section 12.3.5

Institutional Controls—The 119-acre disposal site is held in trust by the United States of America for the Bureau of Indian Affairs; the Navajo Nation retains title to the land. DOE and the Navajo Nation executed a Custodial Access Agreement (CAA) that conveys to the federal government title to the residual radioactive materials stabilized at the repository site and ensures that DOE has perpetual access to the site. UMTRCA authorized DOE to enter into Cooperative Agreement (CA) (DE-FC04-85AL26731) with the Navajo Nation and the U.S. Nuclear Regulatory Commission (NRC) required it prior to bringing the site under the general license. The purpose of the CA was to perform remedial actions at the former processing sites. The site was accepted under the NRC general license (10 CFR 40.27) in 1997. DOE is the licensee and, in accordance with the requirements for UMTRCA Title I sites, is responsible for the custody

and long-term care of the site. Institutional controls at the disposal site, as defined by DOE Policy 454.1, consist of federal control of the property, a site perimeter fence, warning/no trespassing signs placed along the property boundary, and a locked gate at the entrance to the site. Verification of these institutional controls is part of the annual inspection.

12.3 Compliance Review

12.3.1 Annual Inspection and Report

The site, located south of Mexican Hat, Utah, was inspected on April 26, 2006. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 12–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

12.3.1.1 Specific Site Surveillance Features

Access, Fence, Gate, and Signs—The site is accessed via a short unmarked dirt road off U.S. Highway 163 that ends at a graded parking area. An eroded channel is developing on the access road between the parking area and the entrance gate; vehicular access may become difficult in the future. No repairs are necessary at this time.

12A A barbed-wire perimeter fence set inside the property boundary, with a chain-link gate at the site entrance, encloses the site. The center rod to the entrance gate was damaged, causing the west half to be inoperable; however, vehicles can still access the site through the east half of the gate and, therefore, no repairs are planned at this time (PL–1). Damage caused by livestock to the perimeter fence in two locations was repaired: at the north end of the west diversion channel near its outlet and directly north of the east toe drain to the disposal cell.

12B An entrance sign is located at the gate and was in excellent condition. There are 43 perimeter sign locations along the property boundary and each location has a pair of signs: an upper property ownership sign and a lower radioactive materials disposal site warning sign. Some perimeter signs have bullet holes or were dented but were legible. Perimeter sign P27, located on the south property boundary adjacent to the road edge and found damaged by a vehicle during last year's inspection, was repaired and relocated off the edge of the road. Perimeter sign P37 was missing the lower radioactive materials disposal site warning sign. The remaining signs were in excellent condition.

12C **Site Markers and Monuments**—The two site markers, four survey monuments, and 12 boundary monuments were inspected. All site markers were in good condition. Boundary monument BM–7 located in the southwest corner of the property on the side of a dirt road, and found damaged by a vehicle during last year's inspection, was repaired. Boundary monument BM–11, located in an area subject to erosion, remains stable. The markings on survey monument SM–5 are illegible; however, no action is required at this time. All other boundary and survey monuments were in good condition.

Monitor Wells—Three monitor wells (MW–0899, MW–0934, and MW–0935) are located onsite and are in good condition. Because ground water monitoring is not required by the LTSP, NRC approval and Navajo Nation concurrence were received to decommission these wells and is planned in 2007.

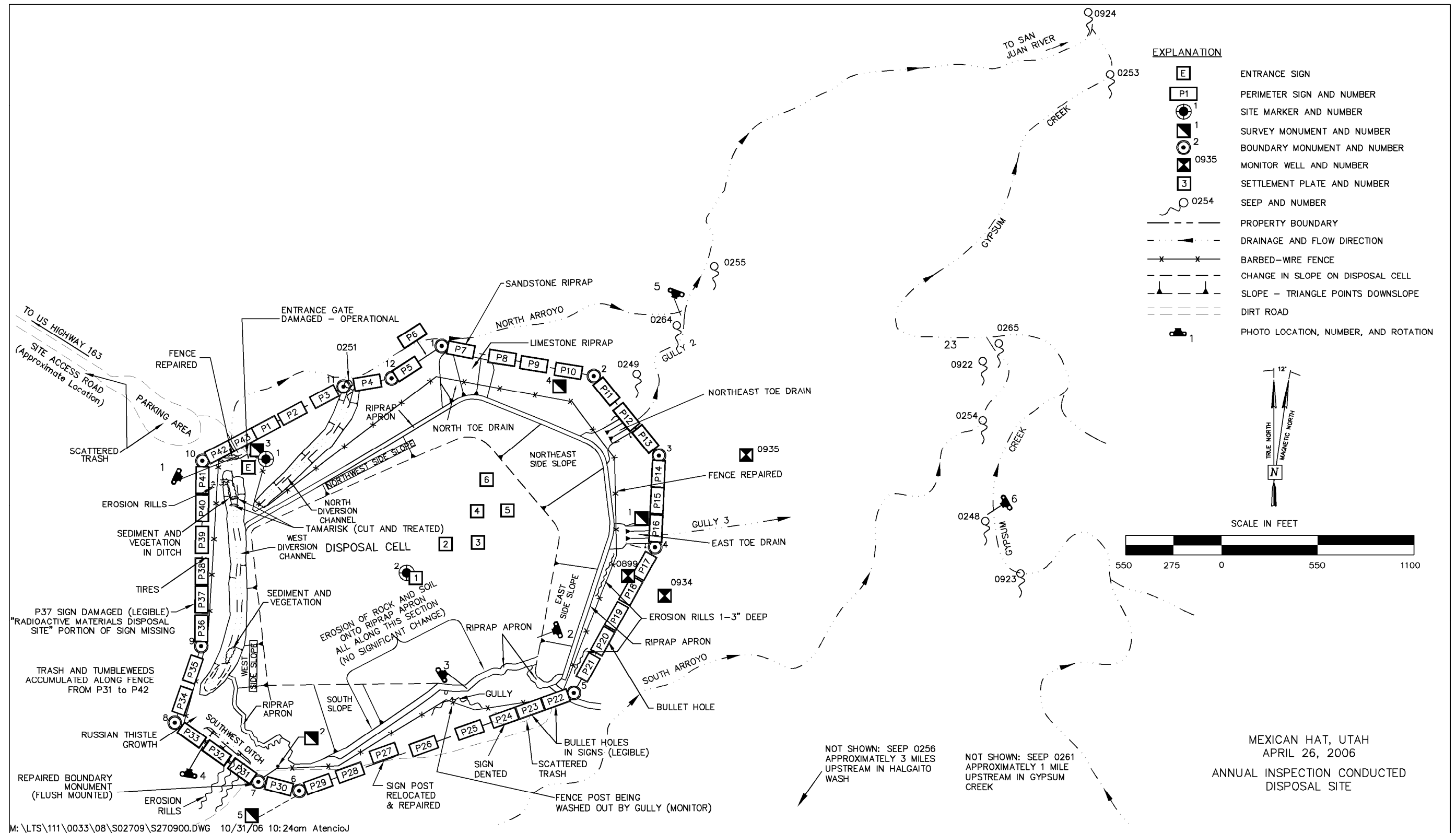


Figure 12-1. 2006 Annual Compliance Drawing for the Mexican Hat, Utah, Disposal Site

12.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as transects: (1) the riprap-covered disposal cell top slope; (2) the riprap-covered side slopes and diversion ditches; (3) the area between the disposal cell and the site boundary; and (4) the outlying area. The area inside each transect was inspected by walking a series of traverses. Within each transect, the inspectors examined specific site surveillance features, drainage structures, vegetation, and other features. Inspectors also looked for evidence of settlement, erosion, or other modifying processes.

Top of Disposal Cell—The top of the riprap-armored disposal cell was in excellent condition (PL-2). There was no evidence of differential settling, cracking, burrowing, or other modifying process that could affect the integrity of the cell. All visible components of the disposal cell and cover were functioning as designed. No vegetation was observed to be growing on top of the disposal cell.

Side Slopes and Diversion Ditches—Inspectors saw no evidence of differential settling, slumping, or other evidence of instability on the side slopes of the disposal cell.

A section along the south apron has been closely monitored since construction because rock and soil have sloughed off the adjacent steep hill slope onto the apron. Based on comparisons with photographs from previous inspections, there was no significant increase in accumulation of the red sandstone and soil along the south apron (PL-3). As observed in past years, there was no evidence of channel erosion in this area, and the sloughed material has not filled the void spaces in the apron riprap beyond the toe of the hill slope. It is anticipated that a minor amount of unstable rock from the hill slope will, over time, continue to fall onto the apron; however, the amount of material that will eventually accumulate on the edge of the apron in this area will have no detrimental impact on the performance of the apron or the disposal cell. However, as a best management practice, inspectors will continue to observe material that has fallen and accumulated on the edge of the apron in this area.

Areas off-site and upgradient continue to erode and transport sediment into the west diversion channel and the southwest ditch. Plant growth, primarily annual weeds, is establishing where the sediment has accumulated in the west diversion channel (PL-4). The sediment accumulation and plant growth have not affected the performance of these storm water diversion structures, and the rate of sedimentation is expected to diminish as the upgradient landscape stabilizes.

12D Tamarisk, a deep-rooted noxious plant, found growing within the outlet of the west diversion channel, was cut and treated with herbicide.

Area Between the Disposal Cell and the Site Boundary—Minor erosional rills and gullies are present upstream of the west diversion channel and southwest ditch, and along the east side slope of the cell. Though some sediment is entering the diversion structures, these erosion features are not a problem and are expected to stabilize. Hill slopes around the disposal cell remain stable with only minor accumulations of loose material at the toe of the slopes.

Scattered trash continues to accumulate in and adjacent to the site. Although most of the trash remains offsite, incremental trash removal will be performed as part of the annual inspections.

Vehicle tracks continue to be observed in the areas between the perimeter fence and the site boundary, indicating occasional trespass onto the disposal site property. Trash accumulations and trespassing will continue to be monitored; currently, they are not affecting the integrity of the site.

Outlying Area—The area surrounding the site was visually inspected for signs of erosion, development, or other disturbance that might affect site integrity or security. Sediment erosion and deposition, trash accumulation, and evidence of off-road vehicle activity continue adjacent to the site. However, the site remains secure and these off-site conditions are not affecting the integrity or the performance of the site.

12.3.2 Follow-Up or Contingency Inspections

DOE will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition, or (2) DOE is notified by a citizen or outside agency that conditions at the site are substantially changed.

No follow-up or contingency inspections were required in 2006.

12.3.3 Routine Maintenance and Repairs

Repairs were made to the perimeter fence, boundary monument BM-7, and perimeter sign P27, and tamarisk plants found on site were cut and treated with herbicide in 2006.

12.3.4 Ground Water Monitoring

Ground water in the uppermost aquifer beneath the site is not affected by the disposal cell or by legacy uranium processing-site activities because of an effective aquitard and an upward hydraulic gradient. Both of these hydrogeologic conditions prevent any downward migration of overlying water into the uppermost aquifer; therefore, monitoring of ground water within this aquifer is not required by the LTSP. However, due to concerns raised by the Navajo Nation, ground water monitoring was performed at the site from November 2000 to August 2002, as a best management practice. This monitoring was performed to demonstrate analytically that no site-related contamination occurred in the uppermost aquifer and that the upward hydraulic gradient continued. The ground water monitoring results from this two-year period confirmed these conditions existed and are presented in the draft report *Resolution of Seep and Ground Water Monitoring at the Mexican Hat, Utah, UMTRCA Title I Disposal Site* (March 2006). This report was submitted to the Navajo Nation in March 2006. In July 2006, the Navajo Nation's concurrence was received to decommission the remaining four monitor wells at the site. Well decommissioning is planned for 2007.

12E

12.3.5 Seep Monitoring

From 1998 through 2005, in accordance with the LTSP and when sufficient flows have allowed, seep water quality monitoring was performed as a best management practice to monitor cell performance due to concerns raised by the Navajo Nation. In 2006, an evaluation of the seep-monitoring program was conducted and presented in the draft report *Resolution of Seep and Ground Water Monitoring at the Mexican Hat, Utah, UMTRCA Title I Disposal Site* (March

2006). Based on the monitoring results, the hydrogeological conditions at the site, the continued low yield (flows) from the seeps, and the absence of any receptors to demonstrate risk, a recommendation was made to discontinue water quality monitoring of the seeps. Annual observations of the seep flow rates will continue with the understanding that if they significantly increase, as compared to historical levels, water quality monitoring would resume. In August 2006, the Navajo Nation conditionally concurred to these recommendations and the draft report was submitted to the NRC; approval is pending.

In accordance with recommendations discussed above, visual monitoring of seep flows was conducted during the annual inspection. The flows of six seeps were observed and documented to be negligible (Table 12-2). All seeps observed are listed in the LTSP, except Seep 0264 (which replaced Seep 0249 in 1995 because of insufficient flow for sampling). Only a minor amount of standing water was found in two of the seeps, 0264 and 0248 (PL-5 and PL-6); the remaining four seeps were either dry or with moist soil. Table 12-2 provides observations and descriptions of seep flows (qualitative). Photographic documentation was also collected.

Table 12-2. Observation and Description of Seeps at the Mexican Hat, Utah, Disposal Site

Seep Location Number	Drainage	Flow Orientation from Disposal Cell	Observations and Descriptions of Seep Flow (Qualitative)
0248	Gypsum Creek	Downgradient	Minimal seep flow (dripping from rock outcrop), very small pool of standing water (~1' diameter, ~1" depth), soils moist in surrounding area against rock outcrop, no flow from immediate area, minimal vegetation – primarily tamarisk (very little other riparian vegetation).
0249	Gully 2	Downgradient	Dry, no flow or standing water, no evidence of seep (i.e.; no moist soils or riparian vegetation were present).
0251	North Arroyo	Downgradient	Dry, no flow or standing water, slightly moist soil in a very small and localized area against rock outcrop, small amount of evaporite present, minimal vegetation – primarily tamarisk (very little other riparian vegetation).
0254	South Arroyo	Downgradient	Dry, no flow or standing water, evaporite present is the only evidence of soil moisture or seep (very little riparian vegetation).
0264	North Arroyo	Downgradient	Most significant flow (still minimal), no flow occurring past the immediate wetted area (~ 15' x 25'), several small pools of standing water (~1' diameter, ~1" depth) occur within the wetted area, riparian vegetation occurs within the wetted area (including tamarisk).
0922	South Arroyo	Downgradient	Small area of moist soil and evaporite present beneath rock outcrop, no flow or standing water, some riparian vegetation (including tamarisk).

Note – Warning signs, that stipulate to not drink the water, remain posted at the seeps.

12.3.6 Corrective Action

Corrective action is taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2006.

12.3.7 Photographs

Table 12-4. Photographs Taken at the Mexican Hat, Utah, Disposal Site

Photograph Location Number	Azimuth	Description
PL-1	115	Entrance gate (showing bent center rod) and sign, site marker; disposal cell in the background.
PL-2	250	View southwest across the cell top from the crest of the east side slope of the cell; south slope of the cell top in the background.
PL-3	60	View northeast along the southeast apron showing insignificant accumulation of detritus.
PL-4	10	Sediment and vegetation in the upper reach of the west diversion channel.
PL-5	200	Seep 0264.
PL-6	240	Seep 0248.



HAT 4/2006. PL-1. Entrance gate (showing bent center rod) and sign, site marker; disposal cell in the background.



HAT4/2006. PL-2. View southwest across the cell top from the crest of the east side slope of the cell; south slope of the cell top in the background.



HAT 4/2006. PL-3. View northeast along the southeast apron showing insignificant accumulation of detritus.



HAT 4/2065. PL-4. Sediment and vegetation in the upper reach of the west diversion channel.



HAT 4/2006. PL-5. Seep 0264.



HAT 4/2006. PL-6. Seep 0248.

End of current section.