

2010 Annual Inspection of the DOE Monticello, Utah, Mill Tailings Site and Monticello Vicinity Properties

December 2010



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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DOE Monticello, Utah, Mill Tailings Site and
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Executive Summary

The annual inspection of the U.S. Department of Energy (DOE) Monticello Mill Tailings Site (MMTS) and Monticello Vicinity Properties (MVP) was conducted on September 13 through 15, 2010. DOE inspects these sites annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, contamination remains in place at some locations where use is restricted and exposure is limited. Annual inspections (1) verify that DOE long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls restricting land and water use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and recommend corrective actions as needed. This report summarizes the results of the 2010 annual inspection.

Repository Findings

The repository is well maintained and well managed. No remedy-related maintenance items were identified. Most site features and support structures are in good condition. The fence along the south border of the site requires repair or replacement, as many sections of broken fence allow livestock from the adjoining property to access the site. Fence repair was completed in November, 2010. Repairs and upgrades to the field office building and surrounding support structures, discussed in the 2009 annual inspection report, have been completed. Vegetation across the site was assessed by a plant ecologist, and is in very good condition, although two small patches of noxious weeds—Russian knapweed (*Acroptilon repens*) near the office building, and spotted knapweed (*Centaurea stoebe*) near the Highway 191 gate—were treated during the annual inspection. The vegetation on the repository cover is ecologically healthy and diverse, and the condition of the vegetation has improved since 2009. No new erosion was identified at the repository site. Minor maintenance items include making various fence repairs and replacing perimeter sign P28 and the “No Hunting” sign at the northeast corner of the site.

City Property Findings

No violation of institutional controls restricting land and water use was evident during the 2010 annual inspection. Drainage and runoff control structures were in good condition. There were no repair or maintenance items to report to the City of Monticello. Construction on Property MP-00181, on the western portion of the former mill site, has been properly monitored. The construction work includes the temporary storage of fill materials from off-site, and it involves no soil excavation below the fill. During the annual inspection, a fire pit was discovered on Property MP-01040, but no evidence of overnight camping was apparent. Bicycle trails were mapped in 2010 to facilitate monitoring. During mapping, a fire pit and lean-to were discovered on Property MP-01077. The area was radiologically scanned and investigated. Radiation levels were not above background, and the lean-to, constructed by a local youth, had not been used for overnight camping. The area will continue to be monitored.

City Streets and Utility Corridor Findings

No unplanned or unmonitored excavations were evident during the 2010 annual inspection. No new erosion of highway shoulders and along the Highway 191 embankment at Montezuma Creek was apparent. On-site representatives confirmed that the extensive construction projects involving City and State infrastructure upgrades were appropriately monitored for radiologic control.

Private Property Findings

No violation of any land or water use restriction was evident during the 2010 annual inspection. In 2010, portions of Properties MG-01033 and MP-00990 changed ownership, but no land use changes are apparent. In 2008, a land use change occurred on Property MP-00990 when water from Montezuma Creek was diverted to a pond for irrigation. DOE evaluated this change and communicated its findings to the U.S. Environmental Protection Agency and the Utah Department of Environmental Quality. No significant risk is associated with the change, and the pond was sampled again in October 2010 to confirm 2009 sample results. No well drilling occurred in 2010 in or near the Groundwater Restricted Area.

Records Findings

No major deficiencies were noted in radiological as-built drawings, site record books, or surveillance checklists. LTS&M documents were available electronically from the field office, the Information Repository and Operable Unit III Administrative Record were present and in good condition, and deed restrictions were verified at the San Juan County Recorder's Office, including those associated with the sale of portions of Properties MG-01033 and MP-00990.

1.0 Introduction

The annual inspection of the U.S. Department of Energy (DOE) Monticello Mill Tailings Site (MMTS) and Monticello Vicinity Properties (MVP) was conducted on September 13 through 15, 2010. DOE inspects these sites annually to ensure that the selected remedies remain protective of human health and the environment. Under those remedies, contamination remains in place at some locations where use is restricted and exposure is limited. Annual inspections (1) verify that DOE long-term surveillance and maintenance (LTS&M) activities implemented throughout the year are effective and appropriate, (2) confirm that the institutional controls restricting land and water use under the MMTS and MVP remedies remain effective, and (3) identify deficiencies and recommend corrective actions as needed. This report summarizes the results of the 2010 annual inspection.

1.1 Monticello Site Background Information

Between the early 1940s and 1960, uranium and vanadium ore was intermittently processed at the mill and ore-buying station in Monticello, Utah. Mill tailings with low-level radioactivity were impounded at the former mill, and over time, some were dispersed to nearby properties by wind and water or used for construction in Monticello. Drainage of liquids from the impounded tailings contaminated groundwater in the underlying shallow alluvial aquifer.

The MVP and MMTS projects were placed on the National Priorities List (NPL) in 1986 and 1989, respectively, to address mill-related contamination. Figure 1 shows the locations of the Monticello NPL sites. DOE, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as implemented through a Federal Facilities Agreement, completed remediation of soil contamination at the MMTS and MVP in August 1999. Radiologically contaminated materials were placed in an engineered disposal cell about 1 mile south of the former mill site. The disposal cell, completed in October 1999, and associated support facilities are known collectively as the repository site (see Figure 2). The repository site includes a temporary storage facility (TSF), where radiologically contaminated materials are stored before eventual disposal off site.

In some locations, radiologically contaminated material was left in place in compliance with supplemental standards, as codified at Title 40 *Code of Federal Regulations* Part 192.21. These locations, referred to as supplemental standards areas (see Figure 3), occur on City and private property, beneath City streets, and in utility corridors. Land use restrictions are applied to these properties and to the former mill site. Restrictions are also applied to properties overlying contaminated groundwater. The former mill site property and several adjacent properties that include supplemental standards areas were transferred to the City of Monticello in 2000 for use as a public park. City and private properties are described in more detail in Section 1.3.

1.2 Long-Term Surveillance and Maintenance

The DOE Office of Legacy Management (LM) administers the long-term stewardship of the Monticello NPL sites to ensure that the selected remedies continue to be protective of human health and the environment. The U.S. Environmental Protection Agency (EPA) Region 8 and the Utah Department of Environmental Quality (UDEQ) provide oversight. Annual inspections are one component of LTS&M at Monticello. Other primary components include routinely

inspecting, operating, and maintaining the on-site permanent disposal cell and leachate management system; routinely inspecting all properties affected by land and water use controls to ensure compliance with the controls; and monitoring and managing radiologically contaminated soil encountered at City and Utah Department of Transportation (UDOT) excavations in Monticello. Additional related activities associated with Operable Unit III remediation include monitoring groundwater and surface water quality and evaluating and reporting on the water quality restoration effort annually. CERCLA 5-year reviews (begun in 1997) are also conducted to monitor and document the protectiveness of the MMTS and MVP remedies.

LTS&M activities, including the annual inspection and reporting, are conducted by on-site and off-site personnel in accordance with the procedures provided in the *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites* (LTS&M Plan).

1.3 Annual Site Inspection Scope

Annual inspections of the MMTS and MVP focus on four general topics: Recordkeeping and Administrative Review, DOE Repository Site, City and Private Properties, and City Streets and Utility Corridors. The Annual Inspection Checklist records the items inspected; Appendix A includes the completed checklist for the 2010 annual inspection. Revised in 2009, the new checklist format was approved by EPA and UDEQ through Federal Facilities Agreement meetings. The checklist supersedes Appendix K of the LTS&M Plan.

Recordkeeping and Administrative Review

Recordkeeping by the on-site contractor staff is reviewed for proper documentation of day-to-day activities and recorded in Section II of the Annual Inspection Checklist. On-site record books, surveillance checklists, and radiological as-built maps are verified. The inspection also confirms that deed annotations applicable to the supplemental standards areas remain accurately filed at the County Courthouse; that the Information Repository and Operable Unit III (OU III) Administrative Record documents are complete and current; that updated copies of relevant LTS&M documents are available to the on-site staff; and that workers accessing the TSF are appropriately trained or escorted. The inspection no longer includes a review of the MMTS and MVP Administrative Record because these files were sent to the Federal Records Center in Denver, Colorado, in 2008.

DOE Repository Site

The repository site is inspected for the integrity of constructed features and support facilities (e.g., signs, buildings, fences, gates) and the integrity of the disposal cell cover, including the health of the plant community, and recorded in Section III of the Annual Inspection Checklist. Areas needing maintenance or repair are noted, as are areas of soil erosion or siltation. The repository site inspection also includes the management and operation of Pond 4 and the disposal cell leachate collection system, and the management and operation of the TSF.

City and Private Properties

City and private properties are inspected annually to confirm that institutional controls, as described in the LTS&M Plan, remain effective, and to document any change in site conditions

that may affect the protectiveness of the remedies. Properties are inspected for evidence of violations of applicable restrictions, and findings are recorded in Sections IV, V, VI, VII, and VIII-C of the Annual Inspection Checklist.

Land and water use restrictions apply to the following City and private properties (see Figure 3 for locations):

- City-owned properties transferred from DOE: MP-00391, MP-01077, MP-01040 (north), MP-01041, MP-01042, MS-00893, and MP-00181. All of these properties are restricted to recreational day use. Overnight camping and the building of habitable structures are prohibited.
- Piñon/Juniper properties supplemental standards areas (a subset of the City-owned properties): MP-00391, MP-01077, and MP-01041. These properties have an added restriction of no soil removal.
- Former mill site (a subset of the City-owned properties): MS-00893 and MP-00181. In addition to other restrictions, damage to wetlands is prohibited in these areas.
- Groundwater Management Area (also known as the Groundwater Restricted Area [GWRA]; includes both City-owned and private properties): MS-00893, MP-00181, MP-01077, MP-00211, MP-00179, MP-00947, MP-01083, MP-00951, MP-01084, MP-00990, MG-01033, MG-01026, MG-01027, MG-01029, and MG-01030. Domestic use of groundwater from the alluvial aquifer is prohibited on these properties. This institutional control is administered by the State Engineer's Office through the well permitting process.
- Montezuma Creek Soil and Sediment Properties (also known as the Montezuma Creek Restrictive Easement Area; privately owned): MP-00951, MP-00990, MP-01084, MG-01026, MG-01027, MG-01029, MG-01030, and MG-01033. Portions of these properties have restrictive easements to prohibit soil removal or the construction of habitable structures.
- Properties MP-00211 (City-owned but not transferred from DOE) and MS-00176 (privately owned). Special zoning ordinances, which require radiological scanning for certain ground-disturbing activities, affect these properties.

Surface components of the OU III groundwater treatment system and inactive monitoring well surface completions, located on private property MP-00179, are also inspected annually. Inspectors also note any evidence of standing water, saturated soil, surface disturbance, or stressed vegetation in the area of the groundwater treatment system.

City Streets and Utility Corridors

During the annual inspection, City streets, utility corridors, and Highway 191 and 491 rights-of-way are inspected for evidence of unmonitored excavations or soil movement. Results are recorded in Sections VIII-A and VIII-B of the Annual Inspection Checklist.

Radiologically contaminated soil remains in some places beneath streets and utility corridors in Monticello, in the Highway 191 embankment over Montezuma Creek, and UDOT rights-of-way along Highways 191 and 491. Supplemental standards have been applied to these areas. Through a cooperative agreement with the City, the on-site staff monitors all excavations in these areas for radiologically contaminated material. The City transports any radiologically contaminated

material to the TSF under direction of the on-site staff. On-site S.M. Stoller Corporation personnel monitor all excavations of Highways 191 and 491. Through a Memorandum of Understanding between UDOT and DOE, UDOT has the option of returning contaminated material to the excavation as backfill or having City workers, under the direction of on-site personnel, haul the material to the TSF.

1.4 2010 Annual Site Inspection Participants and Schedule

Inspection team members and affiliations are listed on page 1 of the Annual Inspection Checklist (Appendix A). L. Sheader and P. Wetherstein conducted the physical site inspection on September 13 through 15, 2010. T. Moon, J. Dayvault, and S. Bourgeois participated in portions of the inspection. M. Stilson, of the Utah Department of Natural Resources Division of Water Rights was contacted in conjunction with the annual inspection.

Monday, September 13, 2010

Inspection team members convened at the Monticello field office to review the job safety analysis by P. Wetherstein. L. Sheader and P. Wetherstein inspected repository features, including Pond 4, the repository cover, cover penetrations, wildlife fence, drain ditches and toe trenches, the field office, and the TSF. Portions of the Administrative Record inspection were also completed. J. Dayvault and S. Bourgeois accompanied the inspectors for portions of the inspection.

Tuesday, September 14, 2010

The repository perimeter fence, perimeter signs, and boundary markers were inspected in the morning. In the afternoon, City-owned properties MP-00211, MP-00181, and MS-00893; privately owned property MS-00176; Montezuma Creek Soil and Sediment Properties; the Groundwater Management Area (except for Property MP-00179, which was inspected on October 11, 2010); City streets and utilities; and UDOT Highways 191 and 491 were inspected. Inspection team members convened at the field office to discuss their findings; J. Dayvault, S. Bourgeois, and others attended the Federal Facility Agreement biannual meeting.

Wednesday, September 15, 2010

P. Wetherstein and L. Sheader inspected the remaining City-owned properties, except for the former haul road (property MP-01077), which L. Sheader inspected on September 8, 2010, during field activities. Small infestations of noxious weeds on the repository site were treated with herbicide. The remainder of the Administrative Record inspection was completed at the San Juan County Recorder's Office. The field inspection concluded at approximately 12:00 p.m.

2.0 Site Inspection Results

2.1 DOE Repository Site and Disposal Cell

The repository site consists of the access area (support buildings and the TSF), the repository perimeter, run-on and runoff drainage controls, Pond 4, the disposal cell cover, and cover penetrations (manholes, settlement monuments, and structures associated with the embedded lysimeter). Results of the repository inspection are summarized below and in Appendix A, Section III.

2.1.1 Access Area

The Monticello field office buildings and associated structures are in very good condition. Repairs and upgrades to the field office building, described in the 2009 annual inspection report, were completed (Photo 1), and a new shed, with a concrete foundation, has been installed. Site access signs displaying contact information are current and visible. Two noxious weed species were identified and flagged by L. Sheader near the access area during field activities on September 8, 2010. Control of noxious weeds on Federal sites is required by law. Although weed treatment is not specified in the LTS&M Plan and is not an annual inspection activity, inspectors with expertise in identifying all stages of weed growth were present, and the weeds were at the appropriate stage for most effective control. Russian knapweed (*Acroptilon repens*) was treated with herbicide along the west fence of the support area. Diffuse knapweed (*Centaurea diffusa*) was also treated near the main access gate. Both infestations were smaller than in 2009. In response to a recommendation following the 2009 inspection, empty 55-gallon drums for storing potential mixed waste were no longer stored outside.

The TSF is a restricted-access, gravel-surfaced area enclosed by an 8-foot-high chainlink fence. The fence is appropriately posted with access control signs, and there is no evidence of vandalism or trespassing. Within the fence, the TSF bin and lay-down area for potential mixed waste are in good working order. At the time of the inspection, the bin contained about 1.5 cubic yards of material (Photo 2).

2.1.2 Repository Perimeter

A conventional barbed-wire stock fence, containing several gates, marks the repository site boundary and discourages human trespass and livestock entry. Forty numbered location-reference signs (E and P1–P39) are fixed to the fence or on separate posts nearby. The site entrance gate is locked at night and at other times when on-site personnel are not present.

Perimeter Fence

The perimeter fence along the south edge of the repository site was replaced in fall 2008, but since then, snow and livestock have damaged it severely. Many sections were broken, allowing livestock to enter the site. Fence repair was completed in November, 2010. Several head of cattle were on site during the annual inspection (Photo 3). Small sections of fence near perimeter signs P14 and P15 are also damaged. Because snow accumulation and livestock activities have repeatedly damaged the southern fence line, installation of a taller, sturdier fence is recommended in lieu of future repairs.

Location-Reference Signs

Most of the perimeter signs are legible and in good condition. As in 2009, the lettering on perimeter sign P28 is illegible and needs to be replaced. One “No Hunting” sign in the northeast corner of the site has broken off the fence and also needs to be replaced. No evidence of fence or sign vandalism (e.g., bullet holes) is present.

Boundary Markers

All six boundary markers were located and are in good condition.

Erosion and Gullies

No new erosion was apparent during the 2010 inspection (Photo 4). Previous inspection reports describe a gully between perimeter signs E and P2, which threatened portions of the fence line along the west boundary of the site. Because sources of water to the gully have been rerouted or repaired by UDOT, no action was taken by DOE to fill the gully or to move the perimeter fence. In 2010, the gully was still present but deposition has continued, slowly filling in washout areas (Photo 5). This process will likely continue to fill the gully over time.

Perimeter Vegetation

Vegetation between the perimeter fence and the wildlife fence (inner fence) is healthy and composed primarily of desirable species. Few weedy species are present. Inspectors found no significant accumulations of tumbleweeds or debris along the perimeter fence line.

Maintenance Item: Repair sections of damaged fence near perimeter signs P14 and P15.

Maintenance Item: Replace perimeter sign P28 and the “No Hunting” sign in the northeast corner of the site.

2.1.3 Repository Run-on and Runoff Controls

Engineered rock-lined drainage controls that collect and direct runoff from the disposal cell are the West Drain Ditch, South Drain Ditch, East Toe Trench, and North Toe Trench. These features prevent the erosion of the disposal cell. Some areas of siltation, the result of natural processes where rock channels are filled in slowly over time, were observed within the ditches and trenches (Photo 6). All ditches and trenches are in good condition and do not contain excessive vegetation.

West Drain Ditch

In 2002, eroded areas in the West Drain Ditch channel immediately north of the inner fence were repaired, and the channel was lined with rock all the way to North Draw. This repaired section is in good condition (Photo 7). Minor erosion was found in a small armored gully during the 2008 annual inspection; this area has not changed and will continue to be monitored (Photo 8).

South Drain Ditch

Erosion rills are present on the South Drain Ditch’s north side in places. These features do not require action other than continued monitoring. Rabbitbrush (*Ericameria nauseosa*) was observed in portions of the South Drain Ditch, but the ditch is mostly free of vegetation (Photo 9).

East Toe Trench and North Toe Trench

Some rock at the surface of the East Toe Trench and North Toe Trench has degraded in the past, but no new degradation was noted. Erosion or bypass of these trenches is not evident. Soils and vegetation have accumulated in the drainage downgradient of the East Toe Trench, but flows are not impeded. Soils and vegetation have also accumulated in the drainage downgradient of the North Toe Trench; some slopes in this area show evidence of minor sheet erosion (Photo 10).

2.1.4 Pond 4

Pond 4 is a lined solar evaporation pond that collects water pumped from the disposal cell's leachate collection and recovery system (LCRS). Pond 4 also collects a small amount of precipitation. Pond 4 is constructed with its own LCRS and leak detection system (LDS). In the past, when Pond 4 was used to store construction water or during times of increased precipitation, the pond's LCRS infrequently collected water. The Pond 4 LDS has never collected water.

Gate, Fence, Entrance, and Perimeter Signs

An 8-foot-high chainlink security fence surrounds Pond 4. Locked chainlink gates are present at the northeast and southwest corners, and a locked vehicle access gate is in the west fence. All gates are in good working condition. Warning signs on the perimeter fence are easily visible and legible. The following warning signs are posted on the perimeter fence: "Danger Do Not Enter," "Controlled Area, Enter at Designated Access Only," "Contaminated Water, Do Not Discharge," and a sign posting contact information, which includes a No Trespassing warning. Within the fence, around the perimeter of the pond, are Contamination Area postings and notices that life jackets are required. There is no evidence of vandalism or trespass. However, inspectors discovered a gap in the fence that could allow human or animal access to the Pond 4 area (Photo 11). This gap requires repair.

Pond Perimeter and Berm

The pond's rope barrier is in place, and warning signs are visible and legible. There is no visible evidence of damage (burrowing, erosion, slumping) to the berm. Vegetation on the slopes of the berm is well established and primarily composed of non-weedy species.

Lifesaving Equipment

Water rescue equipment is stored in a weatherproof metal cabinet on the berm near the northeast corner of Pond 4. The cabinet is highly visible, adequately labeled, and in good condition. The contents of the cabinet (throw buoys, rope, a rope ladder, personal flotation devices) are easily accessible and in good condition. A new cabinet was placed near the entrance gate; an additional rescue station will be installed at this location. This rescue station was installed in November, 2010.

Pond 4 LCRS/LDS Control Cabinet

The LCRS/LDS control cabinet is in good condition. No evidence of insects or rodent damage is present, and the cabinet remains weatherproof. Operation of the Pond 4 LCRS and LDS is reported under Section 2.1.6, "Cover Penetrations."

Liner, Anchors, and Pond Interior

No evidence of holes in the pond liner was observed (Photo 12). Liner anchors, consisting of sand-filled polyethylene pipe installed in 2007, are in good condition. Less than 1 foot of water is standing in the northeast corner of the pond. The pond contains minor silt and vegetation.

Maintenance Item: Repair the gap in the fence section surrounding Pond 4.

2.1.5 Disposal Cell Cover

The repository cover inspection includes the disposal cell cover and other features within the inner wildlife fence, including roads, riprap areas, and site monuments. The wildlife fence is a 6-foot-high wire-mesh fence that contains a vehicle access gate on the west end, a Pond 4 access gate on the east end, and five narrow gate apertures that allow wildlife to pass through.

Roads, Wildlife Fence, Site Monuments, and Raptor Perches

The graveled road surrounding the disposal cell and the road to Pond 4 are generally in good condition, but a small hole in the road bed liner was found between Manholes 2 and 3. This area will be monitored. One gap was discovered in the wildlife fence near Manhole 5 (Photo 13), and several fence posts along the north fence line are leaning (Photo 14). Other sections of the wildlife fence and gates, open at the time of the inspection, are in good condition and show no evidence of vandalism. Both site monuments, one along the access road inside the wildlife fence and one at the apex of the repository, are present and intact. Six raptor perches were installed near the disposal cell cover in 2007. All poles are in good condition, and site personnel occasionally observe raptors using the perches.

Vegetation

Desirable plants are well established on the cover, and no barren areas, eroded areas, or phreatophyte shrubs were identified. Some dead sagebrush (*Artemisia tridentata*) and rabbitbrush plants—killed because of a past vole infestation—are still scattered across the cover. However, a significant number of desirable seedling shrubs have become apparent in 2010. Trace quantities of bindweed (*Convolvulus arvensis*), a Category C noxious weed, were found on the cover.

A Repository Cover Vegetation Index was developed in 2009 for use during annual inspections (pages A-11 and A-12 in Appendix A). This index replaces the previous style of monitoring performed on the site between 2000 and 2008. A vegetation condition score of 3.89 out of 5.00, up from 3.56 in 2009, was assigned to the repository cover vegetation in 2010. An average score is considered to be 3.00. The vegetation condition score is used to detect trends in the health of the vegetation community. Dominant species identified on the cover in 2010 include western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), and sagebrush.

Vegetation on the repository's soil-covered side slopes and outlying areas is in good condition. Plants have also established on portions of the rock riprap armoring (Photo 15), mainly rabbitbrush and yarrow (*Achillea millefolium*), with occasional patches of oak brush (*Quercus gambelii*). Because none of this vegetation overlies tailings or threatens the integrity of the side slopes, it is not of concern.

Burrowing

Burrows of small rodents were identified in several places on the repository cover, but such burrowing is expected and is not excessive. Burrows are small and they probably do not penetrate beneath the biointrusion layer.

Stability

No area of the cover indicated settling, slumping, fracturing, seepage, ponding, or significant erosion. The steep, rock-lined slopes show no evidence of rock movement or degradation, settling, slumping, or erosion.

Maintenance Item: Repair the gap in wildlife fence near Manhole 5 and repair the leaning fence posts along the northern section of the wildlife fence.

2.1.6 Cover Penetrations

Cover penetrations include five manholes, two video ports, nine settlement monuments, and structures associated with a large lysimeter, which measures water flow, embedded in the eastern portion of the disposal cell (see Figure 2).

Manholes and Video Ports

Manholes 1 and 3 enclose equipment for the disposal cell LCRS and LDS. They were not entered during the annual inspection because of safety restrictions, but the exteriors were in good condition. All five manhole covers are secure and operable, appropriate safety warnings and entry procedures are posted, the exterior pump access ports are undamaged, telemetry surface installations are in good condition, and no leakage or drainage is evident. Covers of the inoperable video ports on MH-1 and MH-2 are locked and secure.

Settlement Monuments

Nine settlement monuments, identified by the letters A through I, are on the disposal cell. The outer protective casings (12-inch PVC pipe) and the inner plates are intact and undamaged. Data from elevation surveys of the settlement monuments in 2006 indicated no evidence of settlement. Settlement monument elevations are surveyed every 5 years; the next survey is scheduled for 2011.

Embedded Lysimeter

External features of the embedded lysimeter were inspected, and no drainage or seepage was detected at the outlet or along cover penetrations. Instrumentation installations are in good condition.

Operation of Repository and Pond 4 LCRS and LDS

Monitoring of leachate production is performed automatically via the repository telemetry system. Upgraded in 2007, the telemetry system relays data to the LM Systems Operation and Analysis at Remote Sites (SOARS) system, for off-site viewing, evaluation, and management. The on-site staff routinely summarizes the telemetry data in quarterly reports to DOE, EPA, and UDEQ. Annual inspection of the repository telemetry system is conducted through interviews with the on-site staff and through reviews of the quarterly reports. Currently, less than 1,800 gallons of water per week is pumped from the LCRS and delivered to Pond 4. In 1999, initial leachate production was about 30,000 gallons per week. To date, no water has been collected in the LDS. No water was collected in the Pond 4 LCRS or LDS in 2010. All components of the system are functional.

2.2 City-Owned Properties

City-owned properties MP-00181, MP-00391, MS-00893, MP-01040 (north), MP-01041, MP-01042, and MP-01077 were transferred from DOE to the City of Monticello in 2000. Specific restrictions on these properties are summarized in Section 1.3 (City and Private Properties). Photos 16 through 18 show the former mill site property. Property MP-00211 was always City-owned and is subject only to zoning restrictions on excavation and construction. Results from the 2010 annual inspection are summarized below and in Section IV of Appendix A.

Recreational Use

The City-owned properties transferred from DOE are accessible to the public. In 2007, these properties were annexed by the City of Monticello. Hunting with firearms is not allowed within city limits, but bow hunting was authorized in 2009. Walking and mountain bike trails are used throughout the properties. During the annual inspection, the City was in the process of re-grading the surface of the walking trails. In 2010, DOE mapped the bike trails with GPS to facilitate monitoring.

Construction of Habitable Structures

No overnight camping was evident on any property, nor was the construction of any habitable structures. A fire pit (Photo 19) was discovered on Property MP-01040 during the annual inspection, but no evidence of overnight camping in the area was apparent.

Supplemental Standards Areas on Piñon/Juniper Properties

No evidence of new soil removal by human activity or natural processes was noted on any of the Piñon/Juniper properties supplemental standards areas during the 2010 inspection. The supplemental standards areas are physically delineated by four-strand wire fence. The City of Monticello has breached sections of this fence to accommodate mountain bike trails, and other sections of the fence have degenerated due to age. Radiological scans of the bike trails indicate no concerns, and survey records are available at the field office. DOE will continue to monitor these areas regularly. A small lean-to and fire pit were discovered on Property MP-01077 during GPS mapping of the bike trails. The area was radiologically scanned and investigated. Radiation levels were not above background levels, and the lean-to, constructed by a local youth, had not been used for overnight camping. The area will continue to be monitored.

Soil Movement, Drainage, and Runoff Controls

Construction on Property MP-00181, on the western portion of the former mill site, was underway at the time of the inspection (Photo 20). The on-site representative and records confirmed that all excavations had been properly monitored. The construction work includes the temporary storage of materials from off-site, and it involves no soil excavation below the fill. The materials will be used to resurface bicycle trails constructed on the site by the City.

All riprap-armored structures, dams, check dams, berms, and runoff control drainages (see Figure 4) are intact and functional. No major erosion issues were noted during the 2010 inspection (for example, see Photo 21).

Wetlands

Wetlands on the former mill site were constructed according to EPA-specific criteria, and these wetlands are protected by cooperative agreement. Under this agreement the City will not disturb these areas without prior approval from appropriate State and federal agencies and is not responsible for repairing damage to these areas by natural causes. Montezuma Creek and three constructed marsh wetlands on the City-owned properties are ecologically healthy, and no evidence of damage by human activity or natural causes was observed during the 2010 inspection.

Groundwater Use

No evidence of groundwater use or water-well drilling on City-owned properties with groundwater restrictions was observed during the 2010 inspection or through the year. No applications to drill were filed with the Utah Department of Natural Resources Division of Water Rights for these areas (see Section 2.6 below).

2.3 City Streets and Utility Corridors, and UDOT Rights-of-Way

Results of the 2010 annual inspection of City streets and utility corridors, and UDOT rights-of-way are found in Appendix A, Section VIII. Throughout the 2010 inspection, City streets were observed at random for unmonitored or unplanned excavations. None were identified. On-site personnel were aware of all planned excavations. Excavations to Highway 191 and extensive excavations within the city were underway at the time of the inspection. No new erosion of highway shoulders or along the Highway 191 embankment at Montezuma Creek was evident.

2.4 Private Property MS-00176-VL

Before a habitable structure is constructed on this property, Monticello zoning ordinance requires that a special building permit, based on radiological scanning results, be obtained. There is no evidence of erosion, soil removal, or construction of habitable structures (see Appendix A, Section VIII-C). A portion of this property was sold in 2006. The portion that was sold does not have supplemental standards areas, but the new owner did not remove the land use restriction annotated to the deed.

2.5 Properties in the Montezuma Creek Restrictive Easement Area

There was no evidence of significant erosion or soil removal from the restricted areas of these properties during the 2010 inspection (see Appendix A, Section V). Photo 22 shows a portion of the restricted area in Upper Montezuma Canyon.

In 2006, a new residence was constructed on property MP-00990 outside the supplemental standards area. At that time, on-site personnel helped the landowner delineate the restricted area of this property. Portions of this property, including the residence and portions of Property MG-01033, were sold in 2010 to a new landowner. No land use changes are apparent.

A portion of Property MP-00990 is cultivated in the restricted area in compliance with the land use restriction. In 2008, the landowner changed the land use by diverting water from Montezuma Creek near monitoring well 92-09 to an irrigation pond to apply to cultivated areas. DOE evaluated this land use change and communicated its findings to EPA and UDEQ. No significant

risk is associated with the change, and the pond was sampled again in October 2010 to confirm 2009 sample results.

2.6 Groundwater Restricted Area

In the past year there has been no evidence of well-drilling activity in or near the GWRA (Appendix A, Section VI). On September 13, 2010, M. Stilson of the State Engineer's Office confirmed the lack of well-drilling activity and indicated that there were no applications filed in the past year for water wells in or near the Monticello GWRA.

2.7 Operable Unit III

Permeable Reactive Barrier (PRB) and Auxiliary Treatment System

A groundwater treatment system comprising the PRB and treatment cells is on Property MP-00179 (private property) east of the former mill site. Features of these systems are inspected each year to ensure that the current land use, ranching, is not adversely affected. This area was inspected on October 11, 2010. Visible components of the groundwater treatment system (vaults, telecommunications antenna, electrical panel, fence enclosures) are intact. No evidence of ponded water or saturated soil was present, but vegetation was somewhat stressed near the infiltration gallery (see Appendix A, Section VII-B).

Water Quality Monitoring and Well Inspection

OU III water quality is monitored at an established network of active groundwater monitoring wells and surface water monitoring sites. Active wells are inspected during sampling in April and October of each year, and field personnel noted no deficiencies during routine well inspections in 2010. Inactive wells at the PRB were inspected on October 11, 2010. Surface completions of the inactive wells are generally in good condition (see Appendix A, Section VII-A) and have not changed since 2009.

2.8 Administrative and Records Inspection

The following documents and records, recorded by the on-site staff, were inspected for completeness and accuracy of information (see Appendix A, Section II):

- Radiological as-built drawings.
- Site record books, which include the repository, the TSF, City-owned properties, private property restricted areas, and public roads and utilities.
- Surveillance checklists, which include meteorological monitoring data; TSF access/security logs; and monthly, quarterly, and Pond 4 surveillance checklists. Pond 4 and repository LCRS and LDS monitoring records are maintained electronically.

The following categories of documents and records were inspected to ensure that pertinent information for implementing LTS&M activities is readily available to the on-site staff and the general public:

- LTS&M Plan (including site-specific emergency response information), the *Health and Safety Manual* (LMS/POL/S04321), and the Quality Assurance manual (LMS/POL/S04320). These documents are available electronically.

- Information Repository and OU III Administrative Record.
- LTS&M Training Records (applicable to on-site and unescorted City employees accessing the TSF).

Deed restrictions (verified in the San Juan County Recorder's Office) were inspected to ensure that administrative controls remain in effect with the City and County.

No major deficiencies were noted in any of the above administrative categories. LTS&M documents were available electronically from the field office. The Information Repository and Operable Unit III Administrative Record were present and in good condition. Deed restrictions were verified at the San Juan County Recorder's Office, including those associated with the sale of portions of Properties MG-01033 and MP-00990. Some minor omissions were found on the radiological as-built drawings due to the large volume of entries related to recent excavations (for example, not all specific background readings in the record books were recorded on the as-built drawings). However, all areas from which materials were removed were accurately recorded.

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3.0 Conclusions and Recommendations

The 2010 annual inspection confirmed that DOE LTS&M activities implemented throughout the year remain effective and appropriate, and institutional controls restricting land and water use under the MMTS and MVP remedies remain effective. No corrective actions are necessary.

The following maintenance issues were identified during the 2010 annual inspection and are scheduled to be resolved between April and June 2011, or sooner if possible. Repair of the southern repository fence line was completed in November 2010 and is not included below:

- Repair sections of damaged fence near perimeter signs P14 and P15.
- Replace perimeter sign P28 and the “No Hunting” sign in the northeast corner of the site.
- Repair the gap in the wildlife fence near Manhole 5
- Repair the leaning fence posts along the northern section of the wildlife fence.
- Repair the gap in the fence surrounding Pond 4.

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4.0 Photograph Log and Photographs

Photographs were taken to document findings of the 2010 annual inspection. The location and orientation of the photographs included below are identified in Figures 2, 3, and 4. A Field Photograph Log associated with all photographs taken during the 2010 annual inspection is included as Appendix A, Section IX.



1. Monticello field office trailer showing 2010 improvements.



2. Materials in the Temporary Storage Facility (TSF).



3. Cattle on site along south fence line between perimeter signs P28 and P29.



4. Erosion under north fence line near perimeter sign P16. No new erosion is evident.



5. Erosion under fence line near perimeter sign P2. This area accumulated sediment in 2010.



6. Siltation from previous years in North Toe Drain.



7. Outlet of West Drain Ditch as it meets North Draw.



8. Eroded section near West Drain Ditch. No new erosion is evident.



9. South Drain Ditch, west end, view to the east.



10. Minor sheet wash area on slope where North Toe Drain and East Toe Drain converge.



11. Open section of fence surrounding Pond 4.



12. Pond 4, view from the northeast corner.



13. Gap in wildlife fence near Manhole 5, along east fence line.



14. Leaning fence posts in wildlife fence along north fence line.



15. North Toe Drain and repository slope with vegetation.



16. Western portion of former mill site, including Wetland 1.



17. Central portion of former mill site, including Wetland 2.



18. Eastern portion of former mill site, including Wetland 3.



19. Fire pit found on Property MP-01040. No evidence of camping was identified.



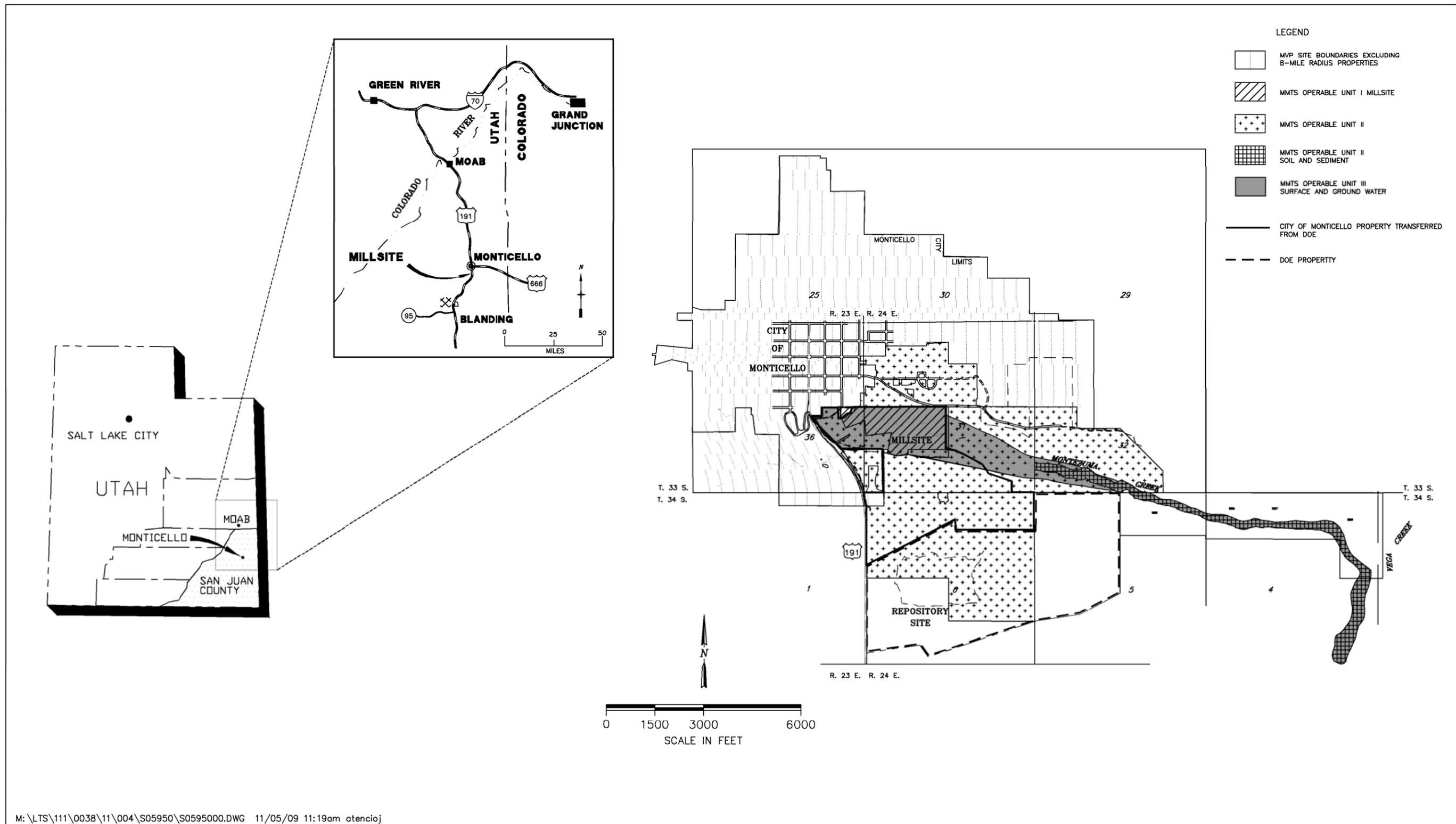
20. Clean fill materials on Property MP-00181.



21. Deer Draw Dam area.



22. Upper Montezuma Canyon.



M:\LTS\111\0038\11\004\S05950\S0595000.DWG 11/05/09 11:19am atencioj

Figure 1. Location and Features of Monticello MMTS and MVP Sites

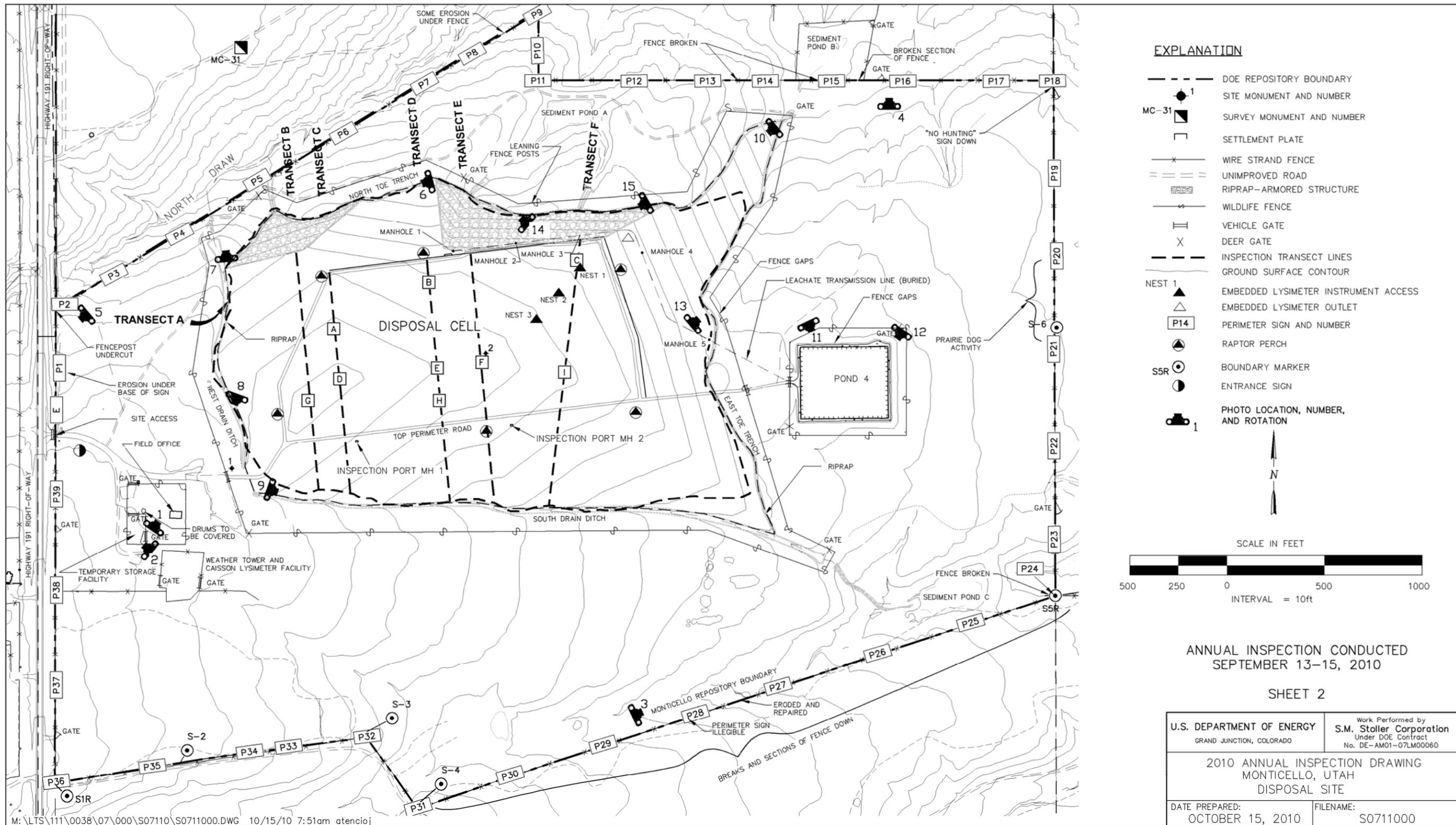


Figure 2. Monticello, Utah, Repository Site

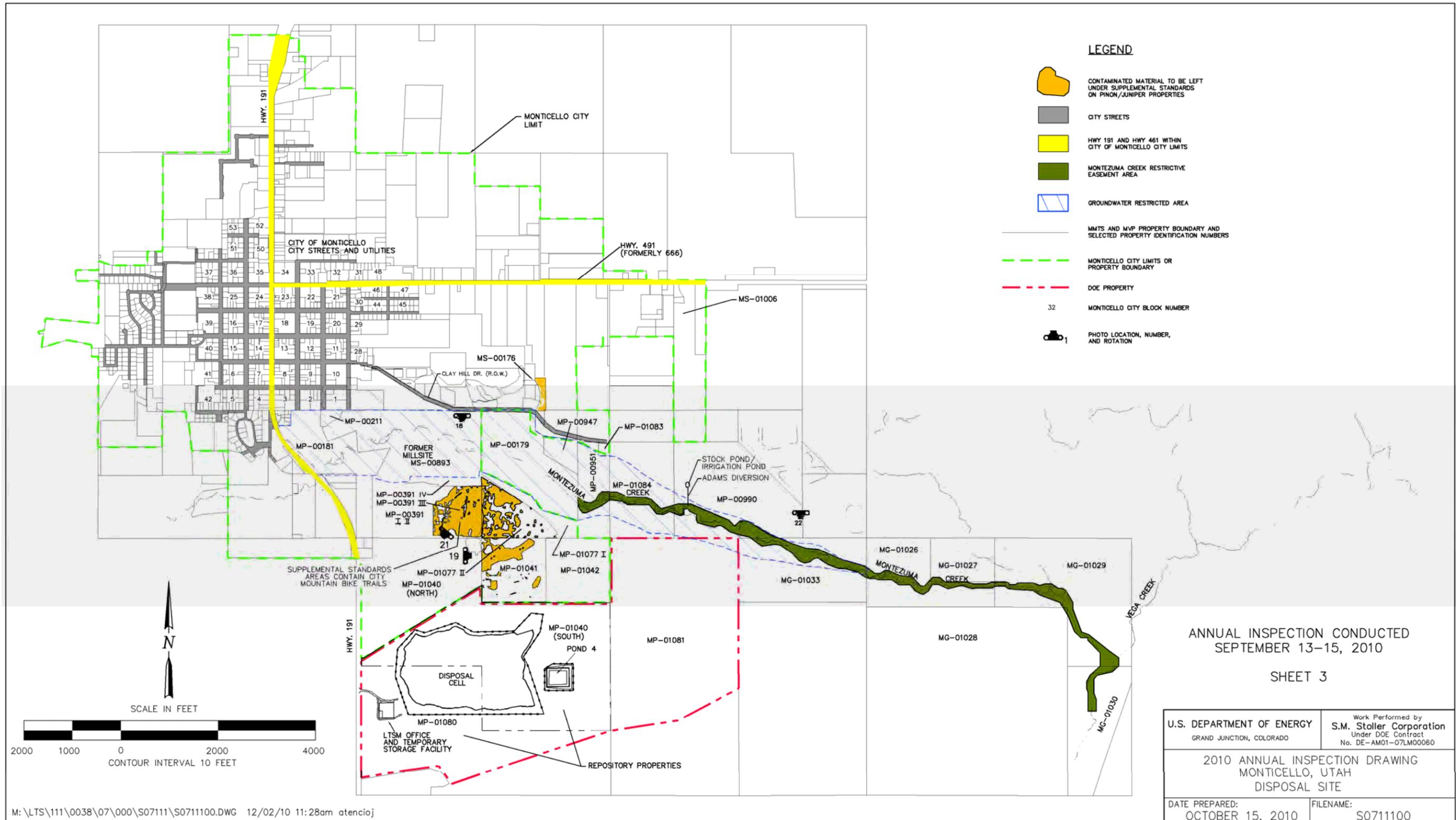


Figure 3. MMTS and MVP Supplemental Standards and Groundwater Restricted Areas

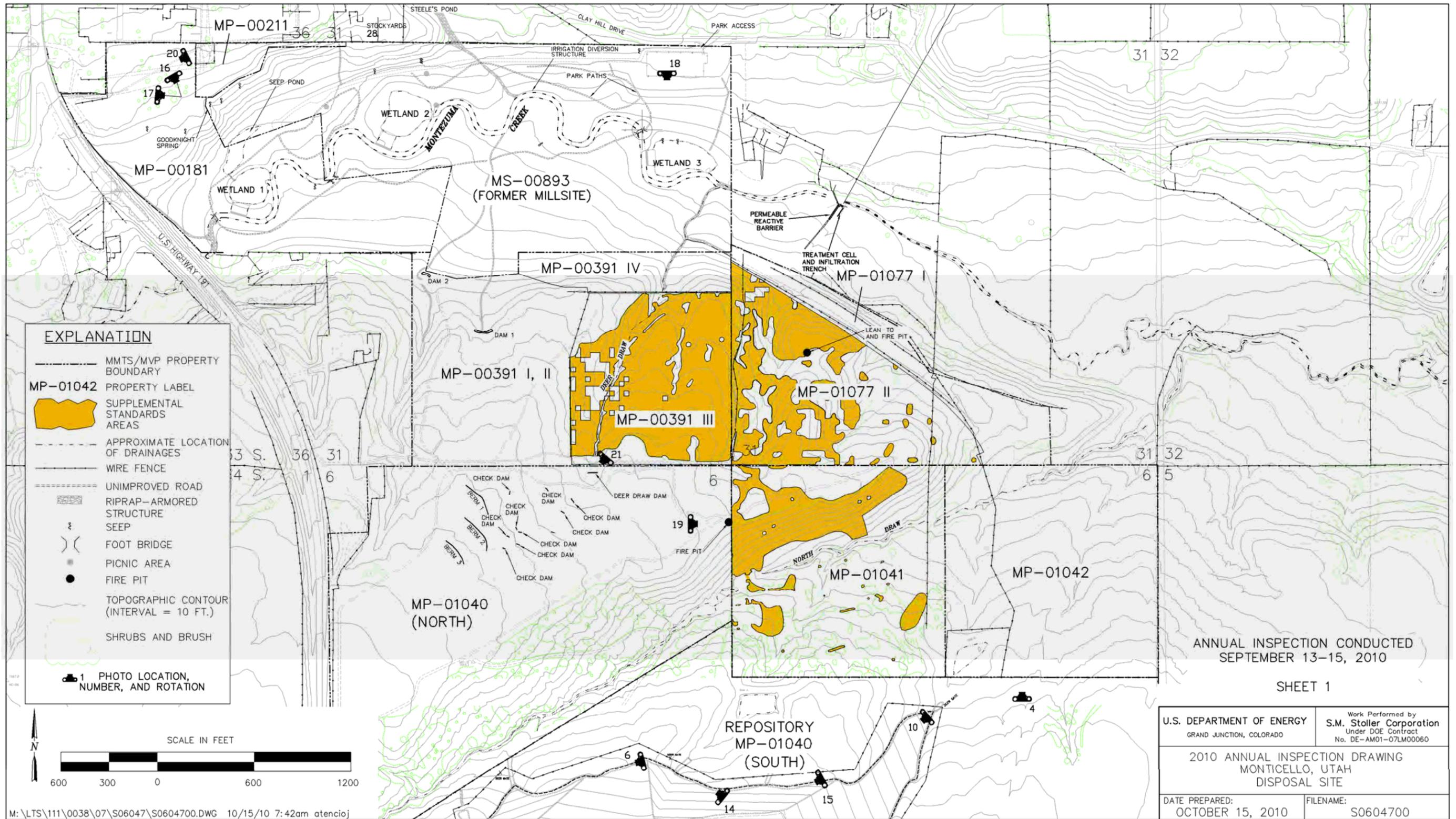


Figure 4. Monticello, Utah, Former Mill Site and Surrounding Area

Appendix A

MMTS & MVP Annual Inspection Checklist

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MMTS: Monticello Mill Tailings (USDOE) Site; Operable Units I, II, and III (UT 3890090035)
MVP: Monticello Radioactively Contaminated Properties (Monticello Vicinity Properties) (UTD 980667208)
 Location: Monticello, Utah: EPA Region 8

Note: Section 6.1 of the Long-Term Surveillance and Maintenance Plan contains detailed inspection procedures. See attached maps for the location of site inspection features identified in this checklist.

Annual Inspection Preparation:

The following tasks were completed in preparation for the current MMTS and MVP annual inspection:

	Y	N
Review annual inspection requirements outlined in Section 6.1 of the LTS&M Plan	X	<input type="checkbox"/>
Schedule site inspection and appoint chief inspector	X	<input type="checkbox"/>
Review previous reports and records as outlined in Section 6.1.2 of LTS&M Plan	X	<input type="checkbox"/>
Notes:		
Review OU III water quality data for contaminant trends and distribution	X	<input type="checkbox"/>
Provide team members with background information, maps, and inspection checklists	X	<input type="checkbox"/>
Notify EPA and UDEQ at least 2 weeks prior to site visit and invite them to participate	X	<input type="checkbox"/>
Notify representatives from other agencies as necessary and invite them to participate	X	<input type="checkbox"/>
Verify names and telephone numbers of parties with access or notification agreements	X	<input type="checkbox"/>
Verify key contact information listed in Section 6.1.2 of the LTS&M Plan	X	<input type="checkbox"/>
Contact State Engineer's Office for water well permit applications in/near GWMA	X	<input type="checkbox"/>
Verify annual contact with UDOT re: planned highway projects for current year	X	<input type="checkbox"/>
Verify regular contact with City of Monticello re: planned or unplanned excavations	X	<input type="checkbox"/>

Date(s) of Annual Inspection: 9/13/10–9/15/10

Inspection Team Members

Name	Affiliation	Phone Number	E-mail
Linda Sheader	S.M. Stoller Corp. (Plant Ecologist and curator of Information Repository records and the OU III Administrative Record)	970-248-6711	Linda.Sheader@lm.doe.gov
Paul Wetherstein	S.M. Stoller Corp. (Environmental Compliance)	970-248-6645	Paul.Wetherstein@lm.doe.gov
Todd Moon	S.M. Stoller Corp. (on-site representative)	435-587-3115	Todd.Moon@lm.doe.gov
Jalena Dayvault	U.S. Department of Energy (Project Manager)	970-248-6016	Jalena.Dayvault@lm.doe.gov
Sandra Bourgeois	U.S. Environmental Protection Agency (Remedial Project Manager)	720-985-5827	Bourgeois.Sandra@epa.gov

Note: attach additional sheets as needed for any of the following sections.

I. Interviews		
Name of Individual Interviewed	Affiliation	Date Interviewed
Todd Moon	On-Site LM Representative	9/15/10
<p>Notes:</p> <p><i>Within the past several weeks, portions of Properties MP-00990 and MG-01033 were parceled out and sold to a new landowner. The new parcel probably contains restricted areas along the creek.</i></p> <p><i>The fire pit and lean-to found on Property MP-01077 during trail mapping were constructed by a local youth and were not used for overnight camping.</i></p> <p><i>On-site personnel are aware of construction activities on the former mill site (Property MP-00181). The site is not currently monitored for radioactive contamination because construction activities only involve the storage and placement of imported fill materials.</i></p> <p><i>The City is in the process of scraping and resurfacing walking paths. This is done every year or so. No soils are being removed.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
	City of Monticello	
<p>Notes:</p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
Mark Stilson	State Engineer	September 13, 2010
<p>Notes:</p> <p><i>P. Wetherstein contacted M. Stilson by phone to verify that no well permits were issued in restricted areas. No well permits were requested or issued in restricted areas in 2010.</i></p>		
Name of Individual Interviewed	Affiliation	Date Interviewed
<p>Notes:</p>		

II. Administrative and Records Inspection

	Readily Available		Current	
	Y	N	Y	N
1. General LTS&M Documents				
Ready access from field office to online manuals (Long-Term Surveillance and Maintenance Plan, Health and Safety Manual, QA Manual)	X	<input type="checkbox"/>	X	<input type="checkbox"/>
2. LTS&M Training Records (ID names in TSF log; verify with Training dept.)				
On-site employees			X	<input type="checkbox"/>
City workers (unescorted workers must have current training)			X	<input type="checkbox"/>
3. Public Records (verify records are present and in order)				
OU III Administrative Record	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Repository (Monticello)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Repository (Grand Junction)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Record Books (Note: Inspection guidelines are listed inside covers of record books; LTS&M Plan Appendix B contains record book management and entry protocol)				
Record book entries/documentation	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Repository Site Record Book	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TSF Record Book (see LTS&M Plan Section 3.4)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City-owned properties (see LTS&M Plan Section 4.4)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Property Restricted Areas (see LTS&M Sec. 4.4)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Roads and Utilities Record Book	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation/recordkeeping requirements met	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Information readily traced to updated drawings	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Rad scan info for eroded/excavated material	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Entries include TSF transfers	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Entries include info on stockpiled material and follow-up scan results	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Hwy 191/491 entries include information on scan				<input type="checkbox"/> N/A
Results and material returned to excavation	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Storm event surveys documented	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Notes for Record Books Inspection:				
Old manuals in office were properly marked as uncontrolled. City workers accessing TSF include C. Baird, M. Robinson and G. Rice. All training current through 6/2012. Record books were inspected for 8/27/2009 – present. Some areas with background scans not recorded on maps for each scan, but all areas with materials removed were found on map with appropriate annotations.				
5. Radiological As-Built Drawings				
Drawing updated annually	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Documentation/recordkeeping requirements met	X	satisfactory	<input type="checkbox"/>	unsatisfactory
Radiological scan information recorded	X	satisfactory	<input type="checkbox"/>	unsatisfactory
6. Surveillance Checklists and Records				
(Note: Repository and Pond 4 LCRS and LDS monitoring records are sent electronically on a regular basis.)				
TSF Access/Security Logs	X	<input type="checkbox"/>	X	<input type="checkbox"/>
Meteorological Monitoring Data, Monthly and Quarterly Repository Surveillance Checklists, and Monthly Pond 4 Surveillance Checklists	X	<input type="checkbox"/>	X	<input type="checkbox"/>
Notes for checklist and records inspection:				
All records complete. Two entry logs were kept for TSF for a period of time; slightly confusing, but complete. Logs were recently consolidated. One log from 9/3 was erroneously dated 9/2, a minor error.				
7. Agreements (Note: verify inclusion in Information Repository)				
DOE/City Cooperative Agreement			X	<input type="checkbox"/>
DOE/UDOT Memorandum of Understanding			X	<input type="checkbox"/>
8. Zoning Restriction—Overlay Zone OL-1				
Restriction is verified as current through City for property MP-00211-VL			X	<input type="checkbox"/>
Restriction is verified as current through City for property MP-00176-VL			X	<input type="checkbox"/>

9. Deed Restrictions (verify at San Juan County Recorder's Office, 117 S. Main)

Properties Transferred from DOE to City of Monticello

IC Annotations in Place

DOE ID	Parcel	Document	Book	Page	Y	N
MP-00181-OT	A33230367201& 33S23E367204	E061691	B788	100-113	X	<input type="checkbox"/>
MP-00391-VL	33S24E316001	E061691	B788	100-113	X	<input type="checkbox"/>
MS-00893-OT	33S24E315400	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01040-VL (N)	34S24E061200	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01041-VL	34S24E060600	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01042-VL	34S24E060000	E061691	B788	100-113	X	<input type="checkbox"/>
MP-01077-VL	33S24E318400	E061691	B788	100-113	X	<input type="checkbox"/>

Note: Correction to quitclaim deed for properties transferred to City recorded as E062130, B789, P450-452.

Montezuma Creek Soil and Sediment Properties

DOE ID	Parcel	Document	Book	Page	Y	N
MP-00990-CS	33S24E324800	E063343	B793	831-852	X	<input type="checkbox"/>
MG-01033-VL	34S24E050000	E063343	B793	831-852	X	<input type="checkbox"/>
MS-01026-VL	34S24E043000	E063343	B793	831-852	X	<input type="checkbox"/>
MS-01027-VL	34S24E042400	E063343	B793	831-852	X	<input type="checkbox"/>
MG-01030-VL	34S24E047200	E063255	B793	526-538	X	<input type="checkbox"/>
MG-01029-VL	34S24E040000	E063219	B793	390-404	X	<input type="checkbox"/>
MP-00951-VL	33S24E317200	E063926	B796	188-202	X	<input type="checkbox"/>
MP-01084-VL	33S24E326000	E063926	B796	188-202	X	<input type="checkbox"/>

Note: Correction to warranty deed recorded as E073394, B830, P611.

Utah Department of Transportation Properties

DOE ID	Parcel	Document	Book	Page	Y	N
MS-00895-OT	A33230367811	E068703	B814	533	X	<input type="checkbox"/>
MS-00892-OT	A33230367202	E068704	B814	534	X	<input type="checkbox"/>
MS-01021-OT	A33230367812	E068705	B814	535-536	X	<input type="checkbox"/>
MS-01020-OT	A33230369001	E068706	B814	537-538	X	<input type="checkbox"/>

Notes for deed restriction inspection:

Add to inspection checklist for 2011: MP-01033-VL, 34S24E0506-01, B921, pages 474-476 and MP-00990-CS, 33S24E328400, B921, pages 474-476. The clerk in the records office assisted in locating these records. Institutional Control annotations were in place.

III. Repository Inspection

A. Access Area

1. Site Access Sign/Emergency Information	X Satisfactory	<input type="checkbox"/> Repairs/Maintenance Needed
2. Field Office	X Satisfactory	<input type="checkbox"/> Repairs/Maintenance Needed
3. Temporary Storage Facility	X Satisfactory	<input type="checkbox"/> Repairs/Maintenance Needed
Bin cover	X Functional	<input type="checkbox"/> Not Functional
Approximate volume of bin contents (cubic yards)	<u>1.5</u>	
Health and safety/rad postings	X Appropriate	<input type="checkbox"/> Inadequate
Drums and secondary containment	X Good condition	<input type="checkbox"/> Unavailable/not good condition
Vandalism/trespassing	X Not evident	<input type="checkbox"/> Evident (locate on map)

Describe access area repairs/maintenance needed:

The field office building was repaired and upgraded. A new shed was completed.

Infestations of Russian knapweed (Acroptilon repens) near the TSF and diffuse knapweed (Centaurea diffusa) near the front gate were treated with herbicide (Roundup and 2,4-D) during the inspection.

B. Repository Perimeter (Note locations of erosion, noxious weeds, vandalism, or excessive vegetation on map)

- 1. **Outer Fencing and Gates** Satisfactory Repairs/Maintenance Needed
- 2. **Signs** (Note condition of 40 numbered reference signs and posts)
Signs damaged but legible, requiring monitoring: P9; P13; P15; P30
Signs requiring replacement: P28
- 3. **South Boundary Markers** All six markers located Marker(s) _____ not located
- 4. **Erosion/Gullyng** Not evident Evident
- 5. **Vegetation** Not excessive Excessive growth
 Noxious weeds absent Noxious weeds present
- 6. **Land use changes on adjoining property** No change Change
- 7. **Vandalism/trespassing** Not evident Evident

Notes for condition of repository perimeter (e.g., repairs needed, erosion areas, vandalism):
No new erosion/gullyng; evidence of erosion/gullyng from previous years still apparent. South perimeter fence repaired in winter 2008/2009. Additional repair needed. Fence is broken in many places, allowing access by cattle. Four cattle observed on site during inspection. Erosion channel along west fence remains, but continues to fill in. Gate on east perimeter fence open at time of inspection. Inspectors closed gate. Prairie dog activity seen near Perimeter Sign P21. No Hunting Sign down at northeast corner.

C. Repository Runoff/Run-On Controls (North and East Toe Drains; South and West Drain Ditches)

- 1. **Settlement** Not evident Evident Minor; no change in 2010
- 2. **Material Degradation** Not evident Evident No changes in 2010
- 3. **Erosion/gullies** Not evident Evident No new gullies in 2010
- 4. **Siltation** Not evident Evident No significant changes in 2010
- 5. **Obstructions** Not evident Evident
- 6. **Excessive Vegetation** Not evident Evident

Notes for condition of repository runoff and run-on controls (Note: locate all areas of concern on map):
Settlement slight in places along the North Toe Drain; some rock has crumbled in toe drains but all areas still stable; gullies above South Drain Ditch have stabilized and are beginning to fill in; portions of North Toe Drain silted in but stable; shrub obstructions do not interfere with channel flow.

D. Pond 4 (Note: locate all areas of concern on map)

- 1. **Perimeter Fence and Access Gate** Satisfactory Unsatisfactory
- 2. **Erosion/Biointrusion of Pond Berm** Not evident Evident
- 3. **Safety Equipment** Pond barrier rope intact Yes No
Personal floatation device posting present and visible Yes No
PFD storage container appropriately marked and in good condition Yes No
PFDs accessible, in good condition, and appropriately sized Yes No
- 4. **Pond 4 LCRS and LDS Electrical Housing/Surface Installations**
Physical condition is: Satisfactory Unsatisfactory
- 5. **Liner—Holes/Cracks/Tears** Not Evident Evident
- 6. **Liner Anchors** Intact Not intact
- 7. **Siltation and Vegetation in Pond 4** Not evident Evident
- 8. **Pond 4 Water Level** Estimated water depth is _____ < 1 ft. Water in NE corner of pond
- 9. **Vandalism** Not evident Evident

Notes for condition of Pond 4 features:
Cabinet, still in packaging, is placed near access gate inside fence. Cabinet will be part of a new PFD station to be installed near entrance gate. A small layer of sediment is present in Pond 4. An area of fence has come loose around Pond 4 allowing for potential access by wildlife.

E. Repository Cover Inspection			
1. Top Perimeter Road and Road to Pond 4	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
2. Interior Wildlife Fence and Wildlife Gates			
Physical condition is:	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Wildlife gates are:	<input checked="" type="checkbox"/> Open	<input type="checkbox"/> Closed	
3. Cover Vegetation	See attached Repository Cover Vegetation Index form; note areas of concern on map		
4. Rip-Rap Armoring			
<input checked="" type="checkbox"/> Slumping/sliding not evident	<input type="checkbox"/> Slumping/sliding evident (locate on map)		
<input checked="" type="checkbox"/> Rock deterioration not evident	<input type="checkbox"/> Rock deterioration evident (locate on map)		
5. Settlement/Desiccation/Erosion/Gullies			
<input checked="" type="checkbox"/> Settlement depressions not evident	<input type="checkbox"/> Settlement depressions evident (locate on map)		
<input checked="" type="checkbox"/> Desiccation cracking not evident	<input type="checkbox"/> Desiccation cracking evident (locate on map)		
<input checked="" type="checkbox"/> Erosion/gullies not evident	<input type="checkbox"/> Erosion/gullies evident (locate on map)		
6. Holes/Burrows/Biointrusion			
<input type="checkbox"/> Holes/burrows/biointrusion not evident	<input checked="" type="checkbox"/> Holes/burrows/biointrusion evident (locate on map)		
7. Seepage/Ponding			
<input checked="" type="checkbox"/> Seepage not evident	<input type="checkbox"/> Seepage evident (locate on map)		
<input checked="" type="checkbox"/> Ponding not evident	<input type="checkbox"/> Ponding evident (locate on map)		
<input checked="" type="checkbox"/> Soft subgrade not evident	<input type="checkbox"/> Soft subgrade evident (locate on map)		
<input checked="" type="checkbox"/> Phreatophytes not present	<input type="checkbox"/> Phreatophytes present (locate on map)		
8. Site Monument at apex of cover	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Repairs/maintenance needed	
Site Monument at boundary gate	<input checked="" type="checkbox"/> Satisfactory	<input type="checkbox"/> Repairs/maintenance needed	
Notes for repository cover inspection:			
Minor areas of burrows from small mammals occur in places on the repository cover, but do not appear to penetrate below the biointrusion layer.			
There is a hole in the road bed liner near Manholes 2 and 3. This area requires monitoring to avoid washout.			
F. Cover Penetrations (Caution: confined space entry requirements in effect for all manholes)			
1. Manholes 1 and 3 (LCRS and LDS access vaults)			
Covers secure and operable	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Exterior pump access ports are undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of leakage into vaults	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Evidence of drainage through cover penetrations	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Telemetry surface installations in good condition	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Vaults are posted as confined-spaces	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
2. Manholes 2, 4, and 5			
Covers secure and operable	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of drainage through cover penetrations	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Manholes are posted as confined-spaces	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Notes for condition of manholes:			
Extra gravel has been placed near Manholes 1 and 3 to facilitate ATV access.			
3. LCR Video Ports (check covers only; ports are inoperable)			
Covers secure and operable	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of drainage through cover penetrations	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
4. Settlement Monuments (A to I) (Note: plates surveyed during 5-year reviews only)			
Surface completions undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Inner plates undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
5. Embedded Lysimeter			
Evidence of seepage at outlet	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Instrumentation installations undamaged	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of drainage along cover penetrations	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Telemetry surface installations in good condition	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	

6. Operation of Repository and Pond 4 LCRS and LDS (interview on-site LM operator)

LCRS and LDS pumps, water level sensors,
and flow meters are fully operational Yes No
 Telemetry system is fully operational Yes No
 Leachate production is below action levels Yes No
 Leachate production rates are stable Yes No
 Water levels do not exceed top of sumps Yes No
 Monitoring data are managed through SOARS Yes No
 Pumping rates (gallons/week): LCRS 1 < 1000 LCRS 2 < 1000 LDS 1 0
 LDS 2 0 Pond 4 LCRS 1 0 Pond 4 LDS 1 0

Notes for cover penetrations inspection and operation of LCRS/LDS:

Information summarized from quarterly report on 10/6/10

IV. City-Owned Properties Inspection

A. City-Owned Properties Transferred from DOE

(MP-00181, MP-00391, MP-00893, MP-01040 (North Portion), MP-01041, MP-01042, and MP-01077)

Property	181		391		893		1040		1041		1042		1077	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Accessible to public	<input checked="" type="checkbox"/>	<input type="checkbox"/>												
Evidence of camping	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Habitable structure(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Gullies/erosion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Runoff/drainage controls intact and in good repair (ditches, riprap structures, dams, check dams, berms)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Land use changes	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Evidence of vandalism	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
Soil removal evident	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water well installation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wetland/creek damage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		n/a		n/a	
Supp. Stds. fence intact	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>	n/a		n/a		<input checked="" type="checkbox"/>	<input type="checkbox"/>	n/a		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Describe any violations of institutional controls and/or repair/maintenance issues (locate on map):

Supplemental standards fence was cut in several places to access mountain bike trails; trails were mapped with GPS in 2010. A fire pit and lean-to were discovered on Property MP-01077 during mapping, but not used overnight; radiological scans are at background. An additional fire pit was discovered on Property MP-01040, but no evidence of overnight camping.

Construction underway on Property MP-00181. Onsite rep verified that no excavations have occurred because work only involves fill materials from offsite.

Siltation of trench on Property MP-01077 reported by downslope landowner in 2009 is in same condition as in 2009.

City is scraping and resurfacing walking paths. Activity does not involve soil removal.

B. City-Owned Property MP-00211

	Yes	No	N/A
Evidence of excavation or construction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If yes, confirm the following with on-site LM representative:			
In accordance with Monticello zoning district Overlay Zone (OL-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Violation has been reported	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiological contamination was encountered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiological contamination was appropriately managed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrective action required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Notes for City-owned property MP-00211 inspection:

V. Montezuma Creek Soil and Sediment Properties

(Note: Refer to Plates 2 and 3 in the LTS&M Plan for boundary of restricted areas on these properties: MP-00951, MP-00990, MP-01084, MG-01026, MG-01027, MG-01029, MG-01030, and MG-01033)

Evidence of habitable structures within the restricted area	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Evidence of soil removal from the restricted area	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Land use/ownership has changed *	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Land owners are aware of use restrictions *	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Violations have reported *	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	× N/A
Corrective action required	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	

Notes for Soil and Sediment Properties inspection:

* confirm with on-site LM representative

VI. Groundwater Management Area

(Note: the boundary of the Groundwater Management Area [GWMA] is shown in Plate 4 of the LTS&M Plan and includes the following properties: MP-00181, MP-00893, MP-00211, MP-00179, MP-00947, MG-00951, MG-01084, MG-00990, and MG-01033)

Evidence of water well installation within the restricted area *	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
No permits for water well installation within the restricted area †	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	
Violations have been reported *	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	× N/A
Land ownership has changed *	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Landowners are aware of water use restriction*	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No	
Corrective action required	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	

Notes for Groundwater Management Area inspection:

* confirm with on-site LM representative

† confirm with State Engineer's Office

VII. OU III Monitoring Wells and Water Treatment Systems

A. Monitoring well surface completions *(Note: active wells are inspected and maintained biannually during sampling events. Inactive wells are inspected during the annual inspection [see attached map for locations])*

	Yes	No
Active wells in working condition (verify with sampling teams)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Outer casing or flush mount vault intact	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wells are locked/flush mount well lids secured	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Notes for inactive monitoring well inspection (note location of any maintenance issues on map):

Two inactive wells have missing bolts, but cannot be replaced because bolts cannot be inserted.

B. Permeable Reactive Barrier (PRB) and Auxiliary Treatment Cells and Infiltration Trench

	Yes	No
Electrical panel, antenna, fence, and vault access in satisfactory condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Evidence of ponded water or saturated soil	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Evidence of surface disturbance	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Evidence of stressed vegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for PRB and treatment cells inspection:

In vicinity of infiltration gallery, vegetation is somewhat stressed.

VIII. MVP Field Inspection

A. City Streets and Utilities

Roads/Utilities under Construction	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiological material is properly controlled and managed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The utility locator service is contacted regularly by the on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for city streets and utilities inspection:

Site personnel identified multiple construction areas related to gas line installation, City utility line work, and a new subdivision. All areas are monitored.

B. UDOT Highways 191 and 491 Rights-of-Way

1. Roads under Construction	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiological material is properly controlled and managed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The local UDOT official is contacted periodically by the on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for UDOT highways inspection:

2. Erosion (*highway shoulders and Highway 191 embankment at Montezuma Creek*)

New erosion evident Previous erosion evident; unchanged No erosion evident

Eroded material scanned for radiological contamination and properly managed

Yes No N/A

Describe erosion noted on UDOT highways:

C. Property MS-00176 (Note: observations and activities for MS-00176-VL are recorded by the on-site LM representative in the Private Properties Restricted Areas Record Book)

Monticello zoning district Overlay Zone (OL-1) requires radiological scanning of the footprint of new habitable structures. Radiologically contaminated material is removed under the direction of the on-site LM representative.

	Y	N
Unmonitored excavations observed during inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Planned excavations are identified by on-site LM representative	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Site conditions indicate ICs properly implemented	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes for Property MS-00176 inspection:

IX. Photo Log (attach additional pages as necessary)

Photo No.	Feature Photographed	Description (include photo location on map)
Note: numbers in parentheses indicate the photo number used in this report		
1 (2)	Temporary Storage Facility	Materials in the Temporary Storage Facility (TSF).
2	Field Office	Monticello field office facilities.
3 (1)	Field Office	Monticello field office trailer showing 2010 improvements.
4 (11)	Pond 4	Open section of fence surrounding Pond 4.
5	Pond 4	View of evaporation pond from west fence.
6	Repository Runoff Controls	East Toe Drain showing woody vegetation.
7 (13)	Interior Wildlife Fence	Gap in wildlife fence near Manhole 5, along east fence line.
8 (10)	Repository Runoff Controls	Minor sheet wash area on slope where North Toe Drain and East Toe Drains converge.
9 (15)	Rip-Rap Armoring	North Toe Drain and repository slope with vegetation.
10 (14)	Interior Wildlife Fence	Leaning fence posts in wildlife fence along north fence line.
11 (6)	Repository Runoff Controls	Siltation from previous years in North Toe Drain.
12 (7)	Repository Runoff Controls	Outlet of West Drain Ditch s it meets North Draw.
13 (8)	Repository Runoff Controls	Eroded section near West Drain Ditch. No new erosion is evident.
14 (9)	Repository Runoff Controls	South Drain Ditch, west end, view to the east.
15	Erosion/Gullyng	Eroded area near perimeter sign P31, showing no new erosion.
16 (3)	Outer Fencing and Gates	Cattle on site along south fence line between perimeter signs P28 and P29.
17 (4)	Erosion/Gullyng	Erosion under north fence line near perimeter sign P16. No new erosion is evident.
18 (5)	Erosion/Gullyng	Erosion under fence line near perimeter sign P2. This area accumulated sediment in 2010.
19	Erosion/Gullyng	Erosion channel along west fence line showing accumulation of sediment in 2010.
20 (20)	City-Owned Properties	Clean fill materials on Property MP-00181.
21	City-Owned Property 211	Property MP-00211 from the western edge, view northeast.
22 (16)	City-Owned Properties	Western portion of former mill site, including Wetland 1.
23 (17)	City-Owned Properties	Central portion of former mill site, including Wetland 2.
24 (18)	City-Owned Properties	Eastern portion of former mill site, including Wetland 3.
25	UDOT Highway 191	Eroded section of Highway 191 berm. No new erosion is evident.
26 (22)	Montezuma Creek properties	Upper Montezuma Canyon.
27 (21)	City-Owned Properties	Deer Draw Dam area.
28 (19)	City-Owned Properties	Fire pit found on Property MP-01040. No evidence of camping was identified.
29 (12)	Pond 4	Pond 4, view from the northeast corner.

Repository Cover Vegetation Index
Monticello, Utah

Date inspected: 9/13/10 Inspected by: L. Sheader & P. Wetherstein

Dominant species present on the repository cover at time of inspection (Note: dominant species make up an estimated 10% or more of the vegetative cover):

Species Name	Growth Form			Life Cycle		Vegetation Type		
	Shrub	Grass	Other	Annual	Perennial	Native	Weedy	Other
<i>Pascopyrum smithii</i>		X			X	X		
<i>Agropyron cristatum</i>		X			X			X
<i>Thinopyrum intermedium</i>		X			X			X
<i>Artemisia tridentata</i>	X				X	X		

Less common species present on repository cover: *Sphaeralcea coccinea*, *Pseudoroegneria spicata*, *Salsola tragus*, *Bromus tectorum*, *Ericameria nauseosa*, *Bromus inermis*, *Lactuca serriola*, a variety of trace forb and grass species

Noxious weed species present (record locations on map or GPS): *Convolvulus arvensis*
(scattered in small populations in places on cover; not mapped)

Additional notes: _____

Vegetation Condition Score (see reverse): 3.89

Notes:

(Has the composition of vegetation changed, including plant diversity? If so, how? Describe any evidence of vegetation disturbance or relevant climate factors. If the vegetation score is less than 3.0, provide explanation and/or recommendation(s).)

The diversity of species has appeared to decrease, but this is likely not the case. A dry mid- to late summer resulted in some species not producing seed heads in 2010, and these species are more difficult to differentiate and identify. Some species (e.g., *Pascopyrum smithii*) produced abundant seed. Weedy grasses (e.g., *Bromus tectorum*) were generally scarce, but non-noxious weedy forbs, particularly *Salsola tragus* were more abundant in places than in previous years. Although vole-killed shrubs were still observed on the cover, a great abundance of seedling and young sagebrush plants were found along with some small rabbitbrush.

Condition of Vegetative Cover (indicate number in each row that best represents current conditions):

Indicator	1	2	3	4	5
Composition of Plant Cover (estimated visually)	Annual weeds dominant; non-weedy perennial species <20% of total cover	Annual weeds abundant and expanding; non-weedy perennial species 20–40% of total cover	Annual weeds present and expanding; non-weedy perennial species 40–60% of total cover	Some weeds present; non-weedy perennial species 60–80% of total cover	No obvious weeds; non-weedy perennial species exceeding 80% of total cover
Total Plant Cover (visual estimate)	Canopy cover less than 30%	Canopy cover 30–50%	Canopy cover 50–70%	Canopy cover 70–90%	Canopy cover over 90%
Bare Soil	Mostly bare soil	Large areas of bare soil	Moderate areas of bare soil	Few areas of bare soil	No obvious areas of bare soil
Diversity of Dominant Species	One species dominant across site	2–3 species dominant across site, one or both of which are weedy; species occur in patches	2–3 species dominant across site, both of which are non-weedy; species evenly distributed with some monoculture patches	More than 3 species dominant across site, at least 2 of which are non-weedy perennials; few patches of monocultures	More than 4 non-weedy perennial species dominant across site; few to no patches of monocultures
Diversity of Trace Species	0–1 non-weedy trace species observed on cover	2 non-weedy trace species observed	3–4 non-weedy trace species observed	5–6 non-weedy trace species observed	7 or more non-weedy trace species observed
Plant Residue	No plant residue on soil surface	1–10% of soil surface covered with plant residue	10–20% of soil surface covered with plant residue	20–30% of soil surface covered with plant residue	30–70% plant residue on soil surface
Standing dead vegetation (visual estimate)	Standing dead >25%	Standing dead 15–25%	Standing dead 5–15%	Standing dead <5%	No obvious standing dead
Erosion	Sheet erosion visible; rills/gullies present OR blowouts or dunes forming	Sheet erosion visible; some small rills present OR soil swept from on site causing burial or abrasion of vegetation	Sheet erosion not obvious; no visible rills or rills stabilized OR soil swept from off site causing burial or abrasion	No obvious sheet erosion; rills not present or fully stabilized OR some soil deposition from off site without burial or abrasion	No visible signs of current or past sheet or wind erosion.
Disturbance	Evidence of mass disturbance to several species of vegetation (fire, animal damage, etc.)	Evidence of some disturbance to several species of vegetation OR major disturbance to one species	Evidence of minor disturbance to one or two species of vegetation; localized to individual patches	Evidence of minor damage to individual plants only; disturbance not sitewide	No evidence of disturbance to any plant species or individual plants
Total each column	0	1	1	5	2

Add up all columns for total condition score:

$$\begin{array}{r}
 \underline{0} \quad (\text{Column 1}) \times 1 = \underline{0} \\
 \underline{1} \quad (\text{Column 2}) \times 2 = \underline{2} \\
 \underline{1} \quad (\text{Column 3}) \times 3 = \underline{3} \\
 \underline{5} \quad (\text{Column 4}) \times 4 = \underline{20} \\
 + \quad \underline{2} \quad (\text{Column 5}) \times 5 = \underline{10} \\
 \hline
 \underline{35} \quad \text{Total}
 \end{array}$$

Divide total by 9 to calculate vegetative cover condition score = 3.89