LMS/MNT/S31921

Monticello, Utah, National Priorities List (NPL) Sites Federal Facility Agreement (FFA) Quarterly Report: July 1–September 30, 2020

November 2020

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

AOA	Area of Attainment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
gpad	gallons per acre per day
gpm	gallons per minute
GRO	Groundwater Remedy Optimization
IC	institutional control
LCRS	Leachate Collection and Removal System
LDS	Leak Detection System
LM	Office of Legacy Management
LMS	Legacy Management Support
LTS&M	long-term surveillance and maintenance
MMTS	Monticello Mill Tailings Site
MNA	monitored natural attenuation
MVP	Monticello Vicinity Properties
OU	Operable Unit
PMP	Performance Monitoring Plan
PRB	permeable reactive barrier
QAPP	Quality Assurance Project Plan
3D	three-dimensional
SMP	Site Management Plan
TSF	Temporary Storage Facility
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
ZVI	zero-valent iron

1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) submits this quarterly report to inform the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality (UDEQ) of the status of the Monticello Vicinity Properties (MVP) and the Monticello Mill Tailings Site (MMTS), collectively called the LM Monticello, Utah, Disposal and Processing Sites, for July through September 2020. The MVP and MMTS are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Quarterly reports are submitted to EPA and UDEQ in February (for October through December), May (January through March), August (April through June), and November (July through September).

LM assesses MVP and MMTS conditions and remedy protectiveness through (1) monthly, quarterly, and annual inspections of site infrastructure and operations as specified under the *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites* (DOE 2018a), also called the Long-Term Surveillance and Maintenance (LTS&M) Plan; (2) semiannual monitoring of groundwater and surface water under the *Record of Decision for the Monticello Mill Tailings (USDOE) Site Operable Unit III, Surface Water and Ground Water, Monticello, Utah* (DOE 2004); and (3) CERCLA Five-Year Reviews.

The primary LTS&M activities at the MVP and MMTS are conducted to (1) provide radiological control at properties where residual soil contamination from mill tailings remains in place (supplemental standards properties), (2) operate and maintain the mill tailings repository, (3) ensure that institutional controls (ICs) restricting the use of land and water remain effective, (4) monitor water quality restoration progress, and (5) operate the Operable Unit (OU) III pump-and-treat groundwater contingency remedy optimization system. This system, implemented in January 2015, focuses on groundwater remediation within a specified region of the alluvial aquifer called the Area of Attainment (AOA).

Annual groundwater reports present comprehensive data evaluation for the groundwater and surface water OU III remedy. LM has utilized the data presented in the most recent annual groundwater report to update the conceptual site model and develop a three-dimensional (3D) numerical fate and transport model to assess remedial time frames.

Project milestones and guiding documents are further described in the *Monticello Site Management Plan* (DOE 2003) (SMP). Section 5.0 of that document is updated annually.

1.1 Quarterly Site Status

A summary of the activities and observations for this quarter is as follows:

- The Groundwater Remedy Optimization (GRO) system operated as planned during the July–September period and pumped approximately 0.67 million gallons of water from the AOA.
- Comments from EPA and UDEQ on the *Quality Assurance Project Plan, Monticello, Utah, Disposal and Processing Sites* (March 2020) (QAPP) were addressed by LM and the Legacy Management Support (LMS) contractor during this quarter.
- Information in the *Groundwater Flow and Fate and Transport Model Quality Assurance Project Plan, Monticello Mill Tailing Site Operable Unit III* (December 2019) (Modeling

QAPP) that was submitted to EPA and UDEQ was rewritten in the format of the Optimized Uniform Federal Policy for Quality Assurance Project Plan Worksheets to meet EPA formatting requirements. The Modeling QAPP was submitted to EPA and UDEQ for final review and concurrence.

- A draft of the *Monticello Mill Tailings Operable Unit III Groundwater Flow and Contaminant Transport Model Report* was completed and submitted to LM for review.
- The LMS contractor drafted a report on its monitored natural attenuation (MNA) project for OU III (the *MNA Demonstration Report*), and was submitted to LM for review.
- Weekly site inspections were performed by site personnel to verify the integrity of the site's systems and to monitor activities that might occur in supplemental standards areas (e.g., city streets and utility corridors). Site personnel worked onsite at least 4 days a week during the quarter.
- Monticello site personnel continued working under Phase 3 of the coronavirus-related Limited Operations return-to-work procedures, which allowed people to work at the site every day except weekends and holidays beginning May 18, 2020.
- Site personnel performed monthly and quarterly site inspections in accordance with the LTS&M Plan.
- The LMS contractor performed the annual site inspection the week of September 14, 2020.
- Semiannual weed spraying occurred the week of September 14, 2020.
- Routine surveillance noted no anomalous conditions for the MVP remedy.
- Routine surveillance noted no violations of MMTS ICs that restrict land and groundwater use.
- Routine surveillance noted no anomalous conditions with the surface features of the disposal cell and Pond 4, the engineered solar evaporation pond.
- The volume of water pumped from the Pond 4 Leachate Collection and Removal System (LCRS) did not exceed the action level this quarter.
- Routine surveillance noted no operational deficiencies for the Temporary Storage Facility (TSF).
- LM, the LMS contractor, and Geosyntec presented fate and transport model findings in the MNA Demonstration Report, as well as initial thoughts on the Performance Monitoring Plan (PMP) and the basis for termination of the GRO system, via WebEx, to EPA and UDEQ on September 21, 2020.
- During the September 21, 2020 meeting LM, EPA, and UDEQ agreed that the semiannual FFA meeting was not necessary and that LM would provide an email with the updates and topics.

2.0 Monticello Vicinity Properties

LTS&M for the MVP consists of providing radiological control at excavations in City of Monticello roadway and utility corridors, in Utah Department of Transportation (UDOT)

rights-of-way within City limits, and at property MS-00176-VL (privately owned supplemental standards property). Surveillance results for this quarter are as follows:

- No anomalous conditions for the MVP remedy were noted.
- LM representatives continued to coordinate with City officials via telecommunications regarding construction and excavation activities by the City, UDOT, and utility companies in roadway and utility corridors. LM follows the normal LTS&M protocol to provide radiological control in the affected roadways.
- Eight excavations occurred in the City streets and utility corridors this quarter. Site personnel radiologically surveyed the removed soils from the excavations, and no radiologically contaminated materials were found.

Neither excessive erosion nor unauthorized excavations were observed at the U.S. Highway 191 embankment at Montezuma Creek (supplemental standards property).

Surveillance of property MS-00176-VL identified no excessive erosion of supplemental standards material or violation of the land-use restriction.

3.0 Monticello Mill Tailings Site

LTS&M activities for the MMTS consist of (1) maintaining the onsite repository and operating the associated LCRS and Leak Detection System (LDS) for the disposal cell and Pond 4, (2) surveillance of properties affected by groundwater- and land-use ICs on the former mill site and peripheral properties, and (3) operation and maintenance of the OU III groundwater remediation system.

3.1 Operable Unit I

OU I consists of the property that contained the former Monticello mill (mill site) and repository. Radioactively contaminated materials were removed from the MVP, the mill site, and peripheral properties (OU II) and encapsulated at the repository as a remedial action that was completed in 1999. LM owns and manages the repository; the City owns the former mill site and manages it as a public park.

3.1.1 Repository

Monthly, quarterly, and annual inspections of the repository ensure that remedy controls remain intact and the waste remains isolated from the environment. Inspection observations and maintenance activities for the quarter are as follows:

- No area of the cover showed settling, slumping, fracturing, seepage, ponding, or significant erosion.
- No anomalous surface feature conditions were observed at the disposal cell or Pond 4. Surveillance checklists for this quarter are attached as Appendix A. No further minor burrowing by voles and small ground squirrels was observed this quarter on the disposal cell and Pond 4 berm.

- The disposal cell LCRS and LDS were operated in accordance with the requirements specified in the LTS&M Plan. Findings for the disposal cell LCRS and LDS this period include the following:
  - Leachate production from the disposal cell was approximately 1050 gallons per week combined for sumps LCRS 1 and LCRS 2. There is no action level for the disposal cell LCRS. See Appendix B for a graphical depiction of leachate production history.
  - The disposal cell LDS continues to receive no water; therefore, the disposal cell LDS action level was not exceeded. See Appendix B for a graphical depiction of leachate production history.
- Operation of the OU III GRO system resulted in increased water collection in the Pond 4 LCRS. LCRS and LDS action levels, approved by EPA and UDEQ, were formally developed in the *Repository and Pond 4 Groundwater Contingency Plan* (see DOE 1998d in the LTS&M Plan) and are also found in Section D5.0 of the LTS&M Plan. The leakage rate established for the Pond 4 LCRS is 851 gallons per acre per day (gpad) (2000 gallons per day) and for the LDS is 20 gpad (47 gallons per day), which is averaged over a 7-day period. These leakage rates are based on the area of the floor of Pond 4, which is 2.35 acres. Currently, the LCRS and LDS monitoring and pumping systems are functioning as designed to recirculate water back into Pond 4.
- Findings for the Pond 4 LCRS and LDS this period are as follows:
  - Water collection at the Pond 4 LCRS continued but did not exceed the action levels this quarter (see Appendix B)
  - Water collection in the Pond 4 LDS remained below the action level (see Appendix B)

3.1.2 Temporary Storage Facility

Routine surveillance of the TSF ensures that maintenance and radiological controls that govern access to and the placement, storage, and transfer of contaminated material in the TSF are current and effective. Surveillance this quarter (see surveillance checklists in Appendix A) revealed that:

- The TSF cover, fencing, radiological controls, and signs have been maintained in accordance with the LTS&M Plan, and the TSF has been inspected and verified as ready to receive contaminated materials.

LM is required to initiate the transfer of TSF materials for permanent disposal at the Grand Junction, Colorado, Disposal Site when the contents reach a volume of approximately 75 cubic yards. Recent TSF activity is summarized as follows:

- The volume of waste stored in the TSF controlled area is approximately 1.5 cubic yards. Currently, the TSF stores no soils or excavation products from City street projects or supplemental standards areas. Present contents consist primarily of used personal protective equipment, one pump, and materials removed from onsite radiological areas during maintenance.

3.1.3 Former Mill Site

LM conducts surveillance of the former mill site (properties MP-00181-VL and MS-00893-VL) to ensure compliance with ICs that were implemented to preserve the OU I remedy for soil and

groundwater. ICs applicable to the former mill site include prohibitions on installing domestic-use wells in the alluvial aquifer, constructing habitable structures, and camping, as well as preserving the properties for day use as a public park.

Surveillance results for this quarter revealed:

- No nonconformance with water- and land-use restrictions.

3.2 Operable Unit II

OU II consists of private and City-owned properties peripheral to the former mill site. LM conducts surveillance of OU II properties to verify compliance with ICs that were implemented to preserve the OU II remedy for soil and groundwater.

Surveillance results for this quarter are summarized below for the different components of OU II.

- **Montezuma Creek Restrictive Easement Area (supplemental standards properties, both City-owned and privately owned):** No evidence of nonconformance with land-use restrictions (no soil removal or construction of habitable structures in supplemental standards areas) was observed.
- **Groundwater-use restrictions (i.e., no installation of domestic-use wells in the alluvial aquifer):** These were applied to several OU II properties under the 2004 covenant by which DOE transferred selected properties to the City. No evidence of nonconformance with this restriction was observed during the quarter.
- **Property MS-00211-VL (City-owned):** No evidence of nonconformance with the land-use restriction on building construction was observed.
- **Pinyon-juniper supplemental standards properties (City-owned):** No evidence of nonconformance with land- and groundwater-use restrictions was observed.
- **Excessive erosion:** No storm events exceeding 2.8 inches of precipitation in a 24-hour period occurred to require surveillance of supplemental standards cleanup properties for excessive erosion.

3.3 Operable Unit III

OU III consists of groundwater and surface water contamination resulting from operation of the former Monticello mill. Routine monitoring of OU III (water quality and water level) is normally performed semiannually in April and October; the next semiannual sampling event is scheduled for the week of October 19, 2020.

The contaminated groundwater is within the alluvial aquifer beneath the valley of Montezuma Creek; some sections of Montezuma Creek are contaminated by the discharge of contaminated groundwater. The alluvial aquifer has no record of past or present use; however, a portion of the aquifer is subject to ICs to restrict use. Montezuma Creek is used for limited irrigation and livestock watering. There are no ICs that restrict surface water use.

The current groundwater remedy includes (1) MNA with ICs and (2) pump-and-treat remediation by evaporation that was implemented as the GRO system in January 2015. Operation and performance of the groundwater remedy are reported annually. Previous remediation efforts have

included (1) treatment by a zero-valent iron (ZVI) in situ permeable reactive barrier (PRB) and (2) pump-and-treat remediation that used ex situ ZVI treatment. The ex situ ZVI treatment system was deactivated in December 2014 and replaced by the GRO system, which is described in greater detail in Section 3.3.2. The PRB remains a component of the GRO system as a groundwater flow barrier.

3.3.1 Groundwater Restricted Area/Institutional Controls

During spring and fall, LM conducts surveillance of properties where groundwater contamination is present to ensure compliance with the groundwater-use restriction (i.e., no installation of domestic-use wells in the alluvial aquifer). The affected OU III properties constitute the Monticello Groundwater Restricted Area, as defined and administered by the Utah Department of Natural Resources Division of Water Rights. Surveillance found:

- No evidence of nonconformance with the groundwater-use restriction since its implementation in May 1999.

3.3.2 OU III Groundwater Contingency Remedy Optimization System

The GRO system includes eight vertical extraction wells strategically placed in the AOA to extract contaminated groundwater and an associated monitoring system. The water from the extraction wells is transmitted in buried pipelines to an aboveground holding tank in the groundwater transfer building; from there it is pumped through a buried water transmission line for about 1 mile to Pond 4 for evaporation.

The associated monitoring system consists of 22 wells installed in the AOA. Sixteen of the 22 wells were installed south of Montezuma Creek in 2014, and 6 wells were installed north of Montezuma Creek in 2017. These 22 wells are currently sampled following the extraction of approximately 1 million gallons from the GRO system as stated in Section 1.5 of the *Remedial Action Completion Report for Operable Unit III Groundwater Contingency Remedy Optimization System, Monticello Mill Tailings Site, Monticello, Utah* (DOE 2016).

3.3.2.1 GRO System Quarterly Performance Summary

The following points summarize the GRO system performance.

- Groundwater extraction during the quarter was approximately 0.67 million gallons, equivalent to an average flow rate of 5.03 gallons per minute (gpm). Assuming the concentration of extracted water throughout the quarter was equal to the uranium concentration of the tank effluent on May 18, 2020 (the most recent sample collected), a total of 3.8 pounds of uranium was removed during this quarter.
- During the quarter, the volume of water stored in Pond 4 decreased by approximately 0.89 million gallons. The GRO system operates by balancing the extraction rate and the Pond 4 evaporation rate while maintaining the Pond 4 storage volume between 5 million and 8 million gallons (the maximum storage volume of Pond 4 is approximately 15.6 million gallons).

- Water-level monitoring during the quarter consisted of:
  - Continuous water-level monitoring in AOA extraction and monitoring wells using pressure transducers and dataloggers (programed to record at 5-minute intervals) connected to the LM System Operation and Analysis at Remote Sites (SOARS) system.
- Cumulatively, the system has removed 22.3 million gallons of contaminated groundwater from the aquifer since system startup in January 2015 (Table 1). Assuming a minimum AOA uranium plume pore volume of 2.4 million gallons and a maximum pore volume of 3.3 million gallons, the GRO system has removed between 8 and 9.3 pore volumes since system startup.
- From January 2015 through May 18, 2020, the GRO system removed approximately 115 pounds of uranium from the AOA aquifer (Table 2). Estimates of cumulative uranium mass removed are only updated at sampling events.

Table 1. GRO System Treatment: Monthly Volumes and Rates for This Quarter and Cumulative Volumes Since January 2015

Calendar Month	Approximate Volume Pumped (million gallons)	Effective Pumping Rate (gpm)	Approximate Cumulative Volume[a] (million gallons)
July 2020	0.18	3.95	21.9
August 2020	0.25	5.70	22.1
September 2020	0.24	5.45	22.3

Notes:
[a] Cumulative volume is based on the volume of groundwater extracted by the GRO system since system startup in January 2015.
[b] Reporting end date is June 30, 2020.

Table 2. Uranium Mass Removal from Groundwater in the AOA

Tank Effluent Sample Date[a]	Effluent Tank Uranium Concentration (µg/L)	Volume Removed Between Tank Samples (million gallons)	Uranium Removed (pounds)[b]	Cumulative Mass Uranium Removed[c] (pounds)
October 14, 2019	520	1.12	5.3	111
May 18, 2020	677	0.83	4.1	115

Notes:
[a] Sampling occurs following the extraction of approximately 1 million gallons.
[b] Uranium removed since last sampling event. Estimate is based on median concentration between sampling dates.
[c] Since GRO system startup in January 2015. Estimates of cumulative mass removed are updated every sampling event.

Abbreviation:
µg/L = micrograms per liter

Monitoring and reporting guidelines for the GRO system are described in the *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah* (DOE 2014). Evaluation of water quality trends and whether remediation goals are being met, in the AOA and sitewide, is

beyond the scope of this Federal Facility Agreement quarterly report but is provided in annual groundwater reports that are submitted to EPA and UDEQ.

3.3.3 OU III Closure Strategy

Several scenarios are being evaluated to develop a closure strategy for OU III, and these are detailed in the *OU III Closure Strategy for the Monticello Mill Tailings Site, Monticello, Utah* (DOE 2018b). These scenarios comprise of MNA and ICs, with remedy transition, decommissioning, and long-term monitoring (Scenario 1); GRO system termination based on asymptotic trends before transitioning to MNA and ICs (Scenario 2); and evaluation of alternative technologies and technical impracticability waiver (Scenario 3). Efforts to determine the best possible closure strategy include hydrogeologic and geochemical characterization along with 3D numerical fate and transport modeling to forecast remedial time frames.

With regard to the OU III closure strategy, the LMS contractor completed the following this quarter:

- Presented the results of the MNA Demonstration Report, the PMP outline, and the basis for GRO system termination to EPA and UDEQ.
- Completed the initial draft of the MNA Demonstration Report.
- A draft of the Monticello Mill Tailings Operable Unit III Groundwater Flow and Contaminant Transport Model Report was completed and submitted to LM for review.

4.0 Schedule of Activities and Deliverables

Table 3 summarizes the completion of recently completed and near-term planned activities and deliverables for the Monticello National Priorities List sites.

Table 3. Monticello Sites Recent and Near-Term Activities and Deliverables

Activity or Deliverable	Schedule
Recent	
Updated Section 5 of the SMP	Submitted to EPA and UDEQ July 22, 2020
Quality Assurance Project Plan, Monticello, Utah, Disposal and Processing Sites (March 2020) path-forward meeting	Meeting held August 6, 2020
Monticello, Utah, National Priorities List Sites Federal Facility Agreement (FFA) Quarterly Report: April 1–June 30, 2020 (DOE 2020)	Submitted to EPA and UDEQ August 13, 2020
Revised Section 5 of the SMP	Submitted to EPA and UDEQ September 10, 2020
Monticello annual site inspection	Held the week of September 14, 2020
Revised Draft Monticello QAPP	Submitted to EPA and UDEQ

Table 3. Recent and Near-Term Activities and Deliverables (continued)

Activity or Deliverable	Schedule
Near-Term	
Revised draft Monticello QAPP	Submitted to EPA and UDEQ October 2020
Modeling QAPP	Scheduled for January 2021
October ground and surface water sampling event	Scheduled for week of October 19, 2020
Monticello Mill Tailings Site Operable Unit III Annual Groundwater Report, May 2019–May 2020 (October 2020) Sampling extended 1 month from April to May due to coronavirus epidemic	Will submit to EPA and UDEQ before October 31, 2020
Monticello, Utah, National Priorities List Sites Federal Facility Agreement (FFA) Quarterly Report: July 1–September 30, 2020	Will submit to EPA and UDEQ before November 15, 2020, deadline
Annual Site Inspection Report	Will submit to EPA and UDEQ by December 31, 2020

5.0 References

DOE (U.S. Department of Energy), 2003. *Monticello Site Management Plan*, GJO-2003-493-TAC, Section 5.0 (this section is continually updated), Office of Legacy Management, October.

DOE (U.S. Department of Energy), 2004. *Record of Decision for the Monticello Mill Tailings (USDOE) Site Operable Unit III, Surface Water and Ground Water, Monticello, Utah*, DOE-LM/GJ629-2004, May.

DOE (U.S. Department of Energy), 2014. *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah*, LMS/MNT/S10629, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2016. *Remedial Action Completion Report for Operable Unit III Groundwater Contingency Remedy Optimization System, Monticello Mill Tailings Site, Monticello, Utah*, LMS/MNT/S13373, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2018a. *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites*, LMS/MNT/S00387, Office of Legacy Management, June.

DOE (U.S. Department of Energy), 2018b. *OU III Closure Strategy for the Monticello Mill Tailings Site, Monticello, Utah*, LMS/MNT/S18146, Office of Legacy Management, May.

DOE (U.S. Department of Energy), 2020. *Monticello, Utah, National Priorities List Sites Federal Facility Agreement (FFA) Quarterly Report: January 1–March 31, 2020*, LMS/MNT/S29501, Office of Legacy Management, May.

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Appendix A

Monthly and Quarterly Surveillance Checklists

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NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 7.15

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	
Signs	☒	☐	
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at the pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: Things appear to be in good condition.

Monticello LM Representative: Gary L. McKinnon Digitally signed by Gary L. McKinnon Date: 2020.07.30 10:19:12 -06'00' Date: 7/30/2020

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Repository Area Surveillance Checklist

☒ Monthly surveillance ☐ Quarterly surveillance: ☐ February ☐ May ☐ August ☐ November

☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads[a]	☒	☐	
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional Quarterly Surveillance Requirements

Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*

Condition of:			
Settlement plate structures	☐	☐	
Manholes[b]	☐	☐	
Sediment ponds	☐	☐	
Evidence of:	☐	☐	
Structural instability	☐	☐	

Additional comments: The repository and site roads appear to be in good condition.

Signature: Gary L. McKinnon Digitally signed by Gary L. McKinnon Date: 2020.07.30 07:15:12 -06'00' Date: 07/30/2020

Monticello LM Representative

[a]Inspections required following a significant storm event
[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for JUL. 2020

NAME: Monticello Office CITY: STATE:
ELEV: 7069 ft LAT: 37° 54' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	64.8	77.3	5:30p	47.1	5:30a	4.5	4.3	0.00	7.4	28.0	4:30p	SSE
2	68.3	81.6	5:30p	50.8	6:30a	2.6	5.8	0.00	7.1	25.0	4:30p	S
3	67.4	78.6	5:30p	58.6	1:00p	0.8	3.2	0.02	6.1	29.0	1:30p	SW
4	69.8	83.0	7:30p	58.5	7:30a	1.1	5.9	0.05	4.0	25.0	2:00p	WSW
5	74.6	88.5	6:00p	59.7	6:00a	0.5	10.2	0.00	5.3	23.0	4:30p	S
6	76.9	89.3	4:00p	63.6	3:30a	0.0	11.9	0.00	8.2	26.0	4:00p	S
7	74.1	86.6	4:30p	61.9	7:00a	0.2	9.4	0.00	9.1	35.0	2:30p	S
8	74.6	85.4	4:00p	60.8	6:00a	0.3	10.0	0.00	7.6	43.0	4:00p	WSW
9	74.6	86.0	4:30p	58.0	6:30a	0.4	10.0	0.00	8.2	27.0	1:30p	WSW
10	76.7	90.3	4:00p	59.8	5:00a	0.4	12.0	0.00	6.7	24.0	12:00p	SSW
11	80.7	93.4	4:00p	62.6	6:00a	0.0	15.7	0.00	6.7	24.0	5:30p	WSW
12	80.4	92.9	4:30p	64.3	5:00a	0.0	15.4	0.00	5.9	36.0	6:00p	WNW
13	79.7	91.3	3:30p	67.9	2:30a	0.0	14.7	0.00	8.9	41.0	6:30p	SSW
14	76.1	88.7	3:00p	61.6	5:00a	0.3	11.4	0.00	8.4	26.0	12:30p	S
15	77.9	89.4	5:00p	65.0	5:30a	0.0	12.9	0.00	7.7	32.0	4:00a	S
16	72.6	84.0	6:00p	64.3	11:00p	0.0	7.6	0.00	8.1	26.0	11:30p	S
17	70.2	83.5	3:00p	61.8	1:30a	0.3	5.6	0.01	7.0	26.0	5:00p	S
18	73.4	86.2	5:30p	60.9	6:30a	0.3	8.7	0.00	8.0	22.0	2:00a	SSE
19	76.1	88.1	4:30p	62.6	4:30a	0.1	11.2	0.00	5.4	21.0	5:00p	S
20	76.9	89.9	3:30p	59.6	7:00a	0.3	12.2	0.00	6.4	27.0	3:30p	WNW
21	75.5	86.7	1:30p	64.4	4:30a	0.0	10.5	0.00	6.3	28.0	10:30p	W
22	66.6	73.7	3:30p	59.5	8:00a	0.8	2.4	0.00	6.8	29.0	4:30a	SSE
23	64.1	79.9	4:00p	56.5	12:00m	3.3	2.4	0.39	5.1	27.0	8:00p	SSW
24	62.7	72.1	4:30p	55.1	6:30a	3.8	1.5	0.02	4.6	18.0	10:00a	SSE
25	65.9	75.1	6:00p	58.1	3:30a	2.2	3.1	0.00	3.3	16.0	1:00p	NNW
26	69.1	82.1	5:30p	55.3	6:00a	2.0	6.2	0.00	4.5	19.0	3:30p	SW
27	68.9	83.2	5:30p	58.5	10:30p	1.0	4.9	0.51	7.2	32.0	6:00p	SSE
28	65.7	78.5	5:30p	55.0	6:00a	2.6	3.3	0.01	4.2	17.0	2:00p	SSW
29	74.0	87.7	5:00p	60.3	6:30a	0.7	9.7	0.00	5.9	22.0	6:00p	WSW
30	76.1	88.2	3:00p	63.6	4:00a	0.1	11.2	0.00	7.2	24.0	3:30p	NNW
31	77.5	90.7	5:30p	63.4	7:00a	0.0	12.5	0.00	6.5	30.0	5:30p	WSW
	72.6	93.4	11	47.1	1	28.6	265.8	1.01	6.6	43.0	8	S

Max >= 90.0: 5
Max <= 32.0: 0
Min <= 32.0: 0
Min <= 0.0: 0
Max Rain: 0.51 ON 07/27/20
Days of Rain: 5 (>.01 in) 2 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 6.44

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	
Signs	☒	☐	
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at the pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: Things appear to be in good condition.

Monticello LM Representative: Gary McKinnon Date: 9/29/2020

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Repository Area Surveillance Checklist

☒ Monthly surveillance ☐ Quarterly surveillance: ☐ February ☐ May ☐ August ☐ November

☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads[a]	☒	☐	
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional Quarterly Surveillance Requirements

Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*

Condition of:			
Settlement plate structures	☐	☐	
Manholes[b]	☐	☐	
Sediment ponds	☐	☐	
Evidence of:	☐	☐	
Structural instability	☐	☐	

Additional comments: Repository and site roads appear to be inm good condition.

Signature: _____ Date: 9/29/2020

Monticello LM Representative

[a]Inspections required following a significant storm event

[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for SEP. 2020

NAME: Monticello Office CITY: STATE:
ELEV: 7069 ft LAT: 37° 54' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	61.4	71.4	4:30p	48.5	5:30a	4.9	1.3	0.00	11.8	36.0	1:00a	NW
2	68.4	81.6	4:00p	54.9	7:00a	2.2	5.6	0.00	8.1	26.0	6:00p	WNW
3	72.0	86.3	4:30p	55.1	7:00a	0.9	8.0	0.00	6.2	20.0	3:00p	NNW
4	74.1	88.8	5:00p	56.7	6:30a	0.7	9.8	0.00	4.9	19.0	3:30p	WSW
5	75.8	90.1	4:30p	59.6	7:00a	0.2	11.0	0.00	6.6	23.0	10:00a	WSW
6	77.2	90.2	4:00p	63.2	6:30a	0.0	12.3	0.00	7.0	30.0	4:30p	WSW
7	74.6	84.7	1:30p	63.8	7:30a	0.0	9.6	0.00	8.6	33.0	3:00p	W
8	47.7	70.6	1:00a	34.0	12:00m	17.6	0.3	0.08	13.7	39.0	8:30a	NW
9	35.0	40.0	11:30p	31.0	3:30a	30.0	0.0	0.45	7.7	20.0	12:30a	NW
10	43.9	51.7	3:30p	38.2	6:00a	21.1	0.0	0.08	2.9	14.0	12:30p	SE
11	50.7	63.9	5:30p	38.3	6:30a	14.3	0.0	0.00	4.0	16.0	12:30p	SE
12	58.2	71.8	5:30p	43.7	6:00a	8.3	1.5	0.00	3.8	14.0	3:30p	WSW
13	63.2	75.7	4:00p	50.3	7:00a	4.7	2.9	0.00	6.1	20.0	12:30p	WSW
14	65.7	78.7	5:00p	54.6	5:30a	2.9	3.6	0.00	6.4	18.0	10:00a	WSW
15	67.0	78.8	4:30p	55.6	7:00a	2.7	4.7	0.00	5.5	19.0	4:30p	WSW
16	66.8	79.9	4:00p	54.9	7:30a	2.9	4.7	0.00	5.2	18.0	2:00p	WSW
17	65.3	78.8	4:00p	52.2	6:30a	3.3	3.6	0.00	7.0	26.0	10:30a	SSE
18	66.2	78.6	4:30p	52.4	2:30a	2.9	4.2	0.00	6.8	21.0	12:30p	SSE
19	65.7	76.1	5:00p	56.4	3:00a	2.1	2.8	0.00	7.8	26.0	2:00p	S
20	65.4	78.0	3:00p	53.2	7:00a	3.2	3.6	0.00	6.4	25.0	5:00p	SSE
21	66.1	77.9	3:30p	55.7	4:00a	2.8	3.9	0.00	4.4	21.0	2:30p	SE
22	61.8	73.0	12:30p	55.5	7:30a	4.0	0.7	0.15	4.2	28.0	1:30a	NW
23	63.0	76.0	3:30p	50.7	5:30a	4.9	3.0	0.00	5.6	19.0	1:30p	W
24	67.8	81.3	5:00p	55.2	7:30a	2.7	5.5	0.00	5.7	28.0	4:00p	WSW
25	68.0	79.6	4:00p	53.5	3:30a	2.2	5.2	0.00	7.3	26.0	2:30p	S
26	65.7	78.5	5:00p	49.1	7:30a	3.3	4.0	0.00	5.7	26.0	3:30p	WSW
27	63.0	69.4	4:00p	52.3	11:30p	3.0	1.0	0.00	11.7	34.0	6:00p	NW
28	52.6	61.2	3:30p	45.0	7:30a	12.4	0.0	0.00	11.7	26.0	2:00p	NW
29	56.7	71.7	4:00p	42.8	6:00a	9.5	1.2	0.00	4.4	14.0	2:30p	WNW
30	62.7	76.9	3:30p	47.2	5:30a	5.5	3.2	0.00	6.1	19.0	4:00p	NNW
	63.1	90.2	6	31.0	9	175.2	117.2	0.76	6.8	39.0	8	NW

Max >= 90.0: 2
Max <= 32.0: 0
Min <= 32.0: 1
Min <= 0.0: 0
Max Rain: 0.45 ON 09/09/20
Days of Rain: 4 (>.01 in) 2 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 6.68

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads	☒	☐	
Signs	☒	☐	One posting (sign) was replaced on fence.
Visible piping	☒	☐	
Visible liner and anchors	☒	☐	
Rescue equipment	☒	☐	Boat remains at the pond.
Evidence of erosion of:			
Top of Pond 4 berm	☒	☐	
Pond 4 sideslopes	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Seepage from Pond 4	☒	☐	
Overtopping of Pond 4	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by wildlife	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional comments: Things appear to be in good condition.

Monticello LM Representative: Gary L. McKinnon Digitally signed by Gary L. McKinnon Date: 2020.08.27 10:41:35 -06'00' Date: 8/27/2020

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Repository Area Surveillance Checklist

☐ Monthly surveillance ☒ Quarterly surveillance: ☐ February ☐ May ☒ August ☐ November

☐ Storm event triggered surveillance due to _____ inches of rainfall over the past 24 hours.

Inspection Item	Acceptable Yes	Acceptable No	Comments and Recommendation
Condition of:			
Fences, gates, and locks	☒	☐	
Roads[a]	☒	☐	
Signs	☒	☐	
Site monuments	☒	☐	
Drainage ditches[a]	☒	☐	
Manholes	☒	☐	
Vegetation	☒	☐	
Evidence of erosion of:			
Top of disposal cell[a]	☒	☐	
Disposal cell sideslopes[a]	☒	☐	
Ditches	☒	☐	
Surrounding area	☒	☐	
Evidence of:			
Vandalism	☒	☐	
Intrusion by livestock	☒	☐	
Burrowing animal damage	☒	☐	
Intrusion by humans	☒	☐	
Accumulation of trash	☒	☐	

Additional Quarterly Surveillance Requirements

Note: *All transects, shown in Figure 3-1, must be walked during this inspection.*

Condition of:			
Settlement plate structures	☒	☐	
Manholes[b]	☒	☐	One posting (sign) was replaced on manehole five.
Sediment ponds	☒	☐	
Evidence of:	☒	☐	
Structural instability	☒	☐	

Additional comments: Things appears to be in good condition.

Signature: Gary L. McKinnon Digitally signed by Gary L. McKinnon Date: 2020.08.27 10:53:49 -06'00' Date: 8/27/2020

Monticello LM Representative

[a]Inspections required following a significant storm event
[b]Open to inspect quarterly

MONTHLY CLIMATOLOGICAL SUMMARY for AUG. 2020

NAME: Monticello Office CITY: STATE:
ELEV: 7069 ft LAT: 37° 54' 00" N LONG: 109° 18' 00" W

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	76.5	89.5	6:30p	61.8	6:30a	0.2	11.7	0.00	6.6	23.0	2:30p	SSE
2	78.1	91.1	5:30p	67.0	6:00a	0.0	13.1	0.00	8.0	27.0	9:30a	S
3	77.0	91.0	3:30p	61.8	6:00a	0.1	12.2	0.00	8.9	26.0	9:00a	SSE
4	76.0	88.3	4:30p	63.4	6:00a	0.1	11.1	0.00	7.4	24.0	12:30p	SSE
5	72.5	84.3	5:30p	58.7	6:00a	0.5	8.1	0.00	7.0	26.0	4:30p	SSE
6	71.4	83.3	6:00p	57.4	6:30a	1.1	7.5	0.00	7.7	27.0	3:30p	SSE
7	70.9	83.0	3:30p	56.2	6:30a	1.3	7.2	0.00	7.4	30.0	1:00p	S
8	72.3	83.9	4:00p	55.8	7:00a	1.0	8.3	0.00	6.9	25.0	3:00p	SSW
9	72.2	85.8	3:30p	57.2	6:00a	0.9	8.1	0.00	5.6	29.0	4:00p	WSW
10	74.8	87.6	4:30p	58.7	2:00a	0.4	10.2	0.00	7.1	31.0	3:00p	WSW
11	73.1	84.4	5:00p	56.2	6:30a	1.0	9.1	0.00	7.2	26.0	4:00p	S
12	75.3	85.6	4:30p	64.0	7:00a	0.0	10.3	0.00	7.8	25.0	12:30p	SW
13	75.8	88.8	5:00p	61.3	7:30a	0.2	11.0	0.00	7.4	25.0	1:30p	S
14	77.2	88.7	4:00p	64.9	4:30a	0.0	12.2	0.00	5.1	27.0	3:30p	WNW
15	77.7	88.5	3:30p	65.4	6:00a	0.0	12.7	0.00	10.5	26.0	3:30p	WNW
16	76.9	90.5	3:30p	61.4	6:00a	0.2	12.1	0.00	5.5	21.0	4:30p	W
17	76.7	90.5	5:30p	62.3	5:30a	0.1	11.8	0.00	6.4	22.0	11:30a	SSE
18	78.5	92.0	4:00p	63.0	6:30a	0.0	13.5	0.00	6.6	19.0	2:30p	SSE
19	77.5	92.6	5:30p	61.7	8:00a	0.1	12.6	0.00	5.4	19.0	3:00p	SE
20	78.8	90.7	5:30p	64.1	5:30a	0.0	13.8	0.00	7.3	26.0	2:30p	SSE
21	77.1	90.4	3:30p	65.2	7:00a	0.0	12.1	0.00	5.7	23.0	5:30p	NNW
22	77.8	92.4	3:30p	64.0	6:00a	0.0	12.8	0.00	4.8	17.0	6:00p	WSW
23	77.1	90.8	3:30p	63.5	4:30a	0.0	12.2	0.00	5.8	16.0	9:30a	SW
24	76.1	89.8	2:30p	65.2	6:00a	0.0	11.1	0.00	5.8	21.0	1:30p	W
25	75.3	86.8	5:30p	60.6	7:00a	0.2	10.5	0.00	6.9	25.0	2:00p	SSW
26	71.4	84.3	6:30p	59.4	6:30a	0.5	6.9	0.00	4.4	20.0	1:00p	SSE
27	73.7	86.6	2:30p	64.5	7:00a	0.0	8.7	0.01	7.1	26.0	12:00m	SSE
28	70.0	81.4	1:00p	61.6	4:00p	0.2	5.2	0.07	4.8	23.0	3:30p	SW
29	67.2	81.4	1:30p	58.0	11:00p	1.1	3.3	0.02	4.4	29.0	4:00p	SSW
30	66.4	79.5	5:30p	54.0	4:00a	2.5	4.0	0.05	5.9	23.0	6:00a	SW
31	69.0	83.0	3:30p	53.3	7:00a	1.9	5.9	0.00	7.9	34.0	12:00m	SSW
	74.5	92.6	19	53.3	31	13.6	309.3	0.15	6.6	34.0	31	SSE

Max >= 90.0: 10
Max <= 32.0: 0
Min <= 32.0: 0
Min <=   0.0: 0
Max Rain: 0.07 ON 08/28/20
Days of Rain: 3 (>.01 in) 0 (>.1 in) 0 (>1 in)
Heat Base: 65.0 Cool Base: 65.0 Method: Integration

NAVARRO

Contractor to the U.S. Department of Energy Office of Legacy Management

Monticello Long-Term Surveillance and Maintenance Temporary Storage Facility (TSF) Record Book Inspection Report

Are these areas acceptable?		
Yes	**No**	
☒	☐	Was the gate locked upon arrival?
☒	☐	Are signs posted in accordance with 10 CFR 835.602[a]?
☒	☐	Are all postings legible?
☒	☐	Are enclosures on the concrete bin and stored drum containers tight?
☒	☐	Are containers in good physical condition (no rust, no holes, no bulges, etc.)?
☒	☐	How much radiologically-contaminated material is in the concrete bin? *Note: the material should be shipped when the volume in storage approaches 75 percent of the storage capacity.*
☒	☐	Is the surface area of the TSF in good physical condition (no erosion, no flood damage, no excessive vegetation growth, etc.)?
☒	☐	Has radiological monitoring been conducted in accordance with 10 CFR 835.405[d]?
☒	☐	Is the security fence in good condition?

Comments:

There is no radiologically contaminated material in the concrete bin.

Colton M. Berube

Digitally signed by Colton M. Berube
Date: 2020.08.26 15:55:16 -06'00'

Signature of Monticello LM Representative

Date of Inspection

Appendix B

Graphs Showing Performance History for Disposal Cell and Pond 4 LCRS and LDS

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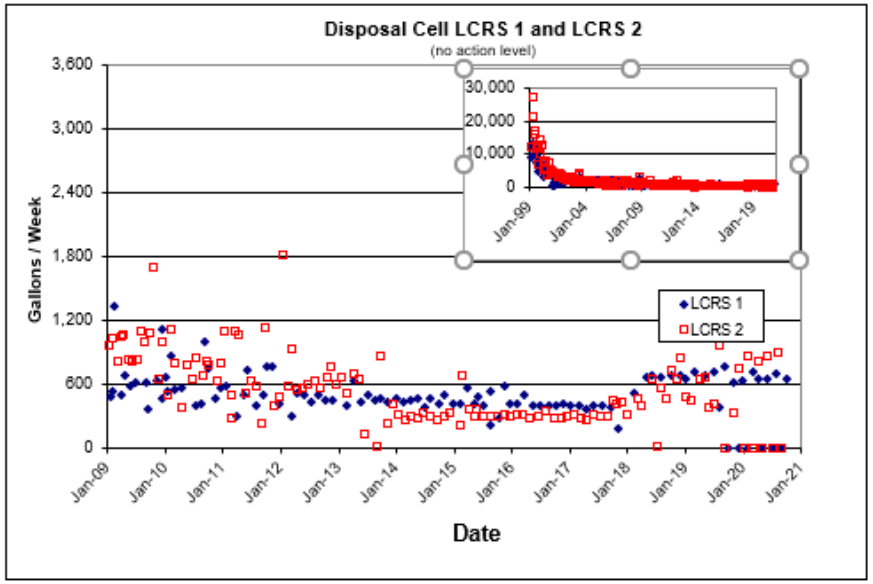
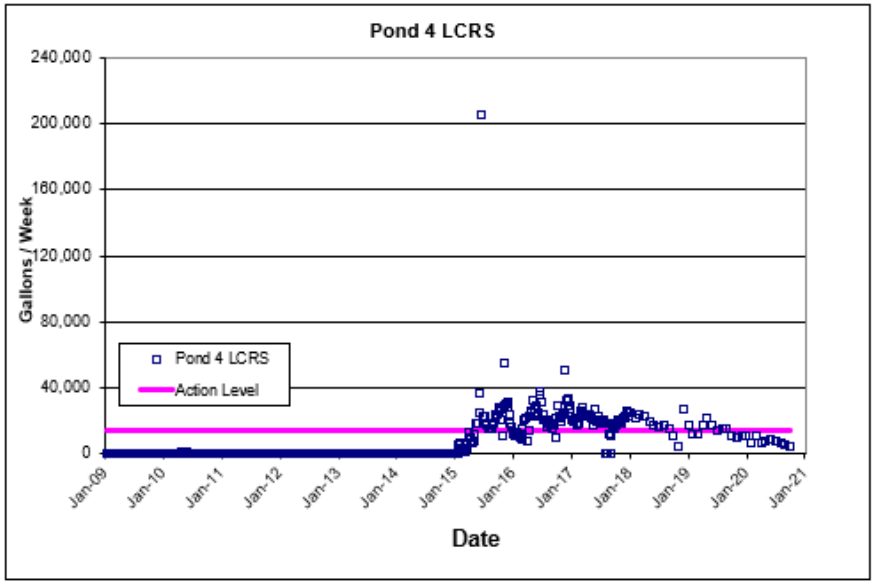
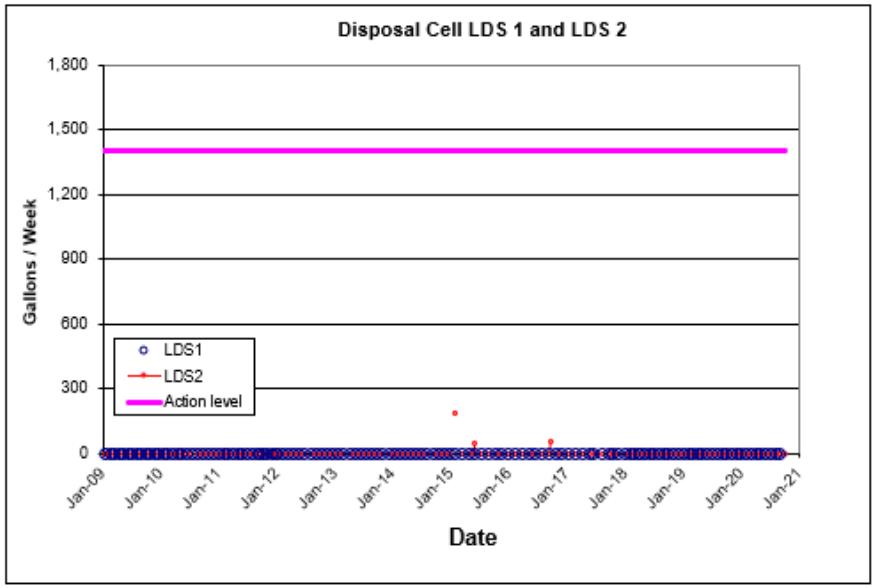
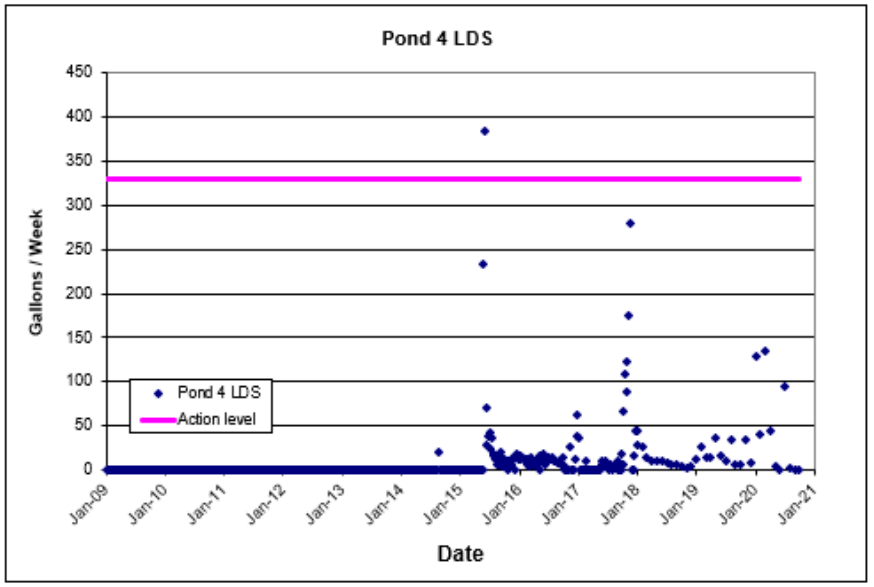
Graphs Showing Performance History for Disposal Cell and Pond 4 LCRS and LDS









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