

**Monticello, Utah, National  
Priorities List Sites  
Federal Facility Agreement  
(FFA) Quarterly Report:  
October 1–December 31, 2015**

**January 2016**



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
FFA	Federal Facility Agreement
gpm	gallons per minute
ICs	institutional controls
LCRS	Leachate Collection and Removal System
LDS	Leak Detection System
LM	Office of Legacy Management
LTS&M	long-term surveillance and maintenance
LTS&M Plan	<i>Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites</i>
µg/L	micrograms per liter
MMTS	Monticello Mill Tailings Site
MVP	Monticello Vicinity Properties
NPL	National Priorities List
OU	Operable Unit
PRB	permeable reactive barrier
TSF	Temporary Storage Facility
UDEQ	Utah Department of Environmental Quality
UDOH	Utah Department of Health
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 Utah Department of Environmental Quality (UDEQ) of the status of the Monticello Vicinity Properties (MVP) and the Monticello Mill Tailings Site (MMTS) (the LM Monticello, Utah, Disposal and Processing Sites) for the period of October through December 2015. 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 January (for October through December), April (January through March), July (April through June), and October (July through September).

LM assesses MVP and MMTS conditions and remedy protectiveness through (1) inspections (monthly, quarterly, and annually) of site infrastructure and operations as specified under the *Long-Term Surveillance and Maintenance Plan for the Monticello NPL Sites* (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 and Ground Water, Monticello, Utah*, May 2004, and (3) CERCLA five-year reviews.

The primary long-term surveillance and maintenance (LTS&M) functions at the MVP and MMTS are 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 waste repository, (3) ensure that institutional controls restricting use of land and water remain effective, (4) monitor water-quality restoration progress, and (5) operate the pump-and-treat groundwater contingency remedy optimization system implemented under the *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah*, May 2014.

Project milestones and guiding documents are further described in the *Monticello Site Management Plan* (updated annually). Annual groundwater reports present comprehensive data evaluation for the groundwater and surface water (Operable Unit [OU] III) remedy.

### 1.1 Quarterly Site Status

- An unplanned shutdown of the groundwater contingency remedy optimization system occurred on December 1, 2015, due to a failed check valve in the groundwater transfer building. Redesign and repairs are expected to be completed in February 2016; until that time, the treatment system will not be operated.
- The 2015 annual site inspection was conducted in September 2015. In general, the site is well maintained and in good condition. No maintenance items or need for a follow-up inspection were identified. LM submitted the 2015 annual inspection report to EPA and UDEQ in December 2015.
- LM submitted the *Monticello Mill Tailings Site Operable Unit III Annual Groundwater Report May 2014 Through April 2015* to EPA and UDEQ in October 2015. The report focuses on water quality restoration progress.
- Routine surveillance noted no anomalous conditions for the MVP remedy.

- Routine surveillance noted no violations of MMTS institutional controls (ICs) regarding land- and groundwater-use restrictions.
- Routine surveillance noted no anomalous operating conditions for the disposal cell Leachate Collection and Removal Systems (LCRS) and Leak Detection Systems (LDS). These recovery systems are operating as intended.
- Water collection at the Pond 4 LCRS slightly exceeded the action level during the quarter. EPA and UDEQ were previously notified of this condition. The LCRS pumping system is operating as intended to circulate water back to the pond. No anomalous operating conditions were noted for the Pond 4 LDS.
- Routine surveillance noted no anomalous conditions for the surface features of the disposal cell and Pond 4.
- Routine surveillance noted no operating deficiencies for the temporary storage facility (TSF).

## **2.0 Monticello Vicinity Properties**

LTS&M for the MVP consists of providing radiological control at excavations in Monticello roadway and utility corridors, in Utah Department of Transportation (UDOT) rights-of-way, and at property MS-00176-VL (privately owned supplemental standards property). Surveillance results for this quarter are:

- LM representatives continued to coordinate with City of Monticello officials in daily planning meetings regarding construction and excavation activities by the City, UDOT, and utility companies in roadway and utility corridors. LM has followed and will continue to follow normal LTS&M protocol to provide radiological control in the affected roadways.
- There were no planned or unplanned excavations in City of Monticello street or utility corridors where radiologically contaminated material was encountered that exceeded LTS&M threshold criteria.
- Neither excessive erosion nor unauthorized excavations were observed at the 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 disposal cell and operating the associated leachate collection and leak detection systems for the repository 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 of the former Monticello mill (mill site) and the waste disposal facility (repository). Solid wastes were removed from the MVP, 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 of Monticello 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 that the waste remains isolated from the environment. Inspection observations and maintenance activities for the quarter are:

- No anomalous conditions were observed at the repository with respect to the surveillance items included in the LTS&M repository area surveillance checklists for the disposal cell and Pond 4 (attached for this quarter in Appendix A).
- Leachate production from the disposal cell was about 730 gallons per week combined for LCRS sumps LCRS 1 and LCRS 2. This collection rate is typical over the past several years. See Appendix B for a graphical depiction of leachate production history.
- The disposal cell LDS continues to receive no water.
- Operation of the OU III groundwater contingency remedy optimization system has resulted in increased water collection in the Pond 4 LCRS and LDS. Water collection at the Pond 4 LCRS slightly exceeded the action level during the quarter. The action level at the Pond 4 LDS did not exceed the action level. The LCRS and LDS monitoring and pumping systems are functional. See Appendix B for a graphical depiction of Pond 4 LCRS and LDS water management history.
- LM has previously notified EPA and UDEQ of the Pond 4 action level exceedances and will review the action levels for relevance to current site conditions.

### 3.1.2 Temporary Storage Facility

Routine surveillance of the TSF ensures that maintenance and radiological controls that govern access to, and placement, storage, and transfer of, contaminated material in the TSF are current and effective. No anomalous conditions were observed for the TSF (see the surveillance checklist attached for this quarter in Appendix A).

No material was placed in the TSF during the quarter. The inventory of contaminated material in the TSF remains at approximately 25 cubic yards. Approximately 4 cubic yards of the contaminated material derives from street and utility excavations from previous quarters. Radiologically contaminated material from supplemental standards properties has not been placed in the TSF since 2011. Approximately 21 cubic yards of the material in the TSF derives from maintenance and repairs to Pond 4 in August 2013.

LM initiates the transfer of TSF materials for permanent disposal at the LM Grand Junction, Colorado, Disposal Site when the contents reach 75 cubic yards. TSF materials were last transferred to the Grand Junction disposal site in June 2010.

The planned transfer of material from the TSF to the Grand Junction Disposal Site for this quarter was delayed due to inclement weather; these tasks are anticipated to be conducted in spring 2016. (**Note:** The volume of material currently stored in the TSF is less than the volume required for transfer, but the TSF contents will be combined with the spent ex situ treatment cell materials when those materials are transferred to the Grand Junction disposal cell. See discussed in Section 3.3.3.)

### 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. The ICs applicable to the former mill site are no installation of domestic-use wells in the alluvial aquifer, no construction of habitable structures, no camping, and preserving the properties as a public park for day-use recreation.

Surveillance results for this quarter are:

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

## 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:

- 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 (no installation of domestic-use wells in the alluvial aquifer) were applied to several OU II properties under the 2004 covenant by which DOE transferred selected properties to the City of Monticello. 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.
- No storm events exceeding 2.8 inches of rain in a 24-hour period occurred to require nonroutine surveillance of supplemental standards cleanup properties. Appendix C provides climatological data for the quarter. (**Note:** Submittal of climatological data will be discontinued in future FFA Quarterly Reports.)

### **3.3 Operable Unit III**

OU III consists of groundwater and surface water contamination resulting from operation of the former Monticello mill. 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. Montezuma Creek is used for limited irrigation and livestock watering.

The groundwater remedy includes (1) monitored natural attenuation with ICs, and (2) pump-and-treat by evaporation that was implemented as the groundwater contingency remedy optimization system in January 2015. Previous remediation efforts included (1) treatment by a zero-valent iron (ZVI) in situ permeable reactive barrier (PRB), and (2) pump-and-treat remediation using ex situ ZVI treatment.

#### **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 (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 State of Utah Division of Water Rights. Surveillance results are:

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

#### **3.3.2 Permeable Reactive Barrier**

The PRB was installed in 1999 as a technology demonstration project. The PRB is now considered a hydraulic barrier to groundwater flow because of internal mineral accumulation. It now serves as the downgradient boundary of the Area of Attainment (AOA) for the groundwater contingency remedy optimization system (Section 3.3.4). Decommissioning the PRB is dependent on remediation progress in the AOA and its need as a hydraulic flow barrier.

#### **3.3.3 Ex Situ Remediation System**

An ex situ pump-and-treat groundwater remediation system was installed in May 2005 as a technology demonstration project. This system is located at the PRB approximately 600 feet east of the former mill site on private property. The system operated using a single extraction well and two aboveground ZVI-based treatment vessels.

Operation of this system was suspended in December 2014. During 9.5 years of operation, the system extracted approximately 33 million gallons of contaminated groundwater and 77 pounds of uranium from the aquifer. The OU III groundwater remedy optimization system (Section 3.3.4) replaced the ex situ treatment system as the active component of the groundwater contingency remedy.

Removal of the spent ex situ treatment cell media is planned for spring 2016 concurrent with the transfer of TSF material to the Grand Junction Disposal Site. The decommissioning/closure strategy for the ex situ system is not yet determined.

### 3.3.4 OU III Groundwater Contingency Remedy Optimization System

The OU III groundwater contingency remedy optimization system began full operation in February 2015 in the AOA described in *Final Groundwater Contingency Remedy Optimization Remedial Design/Remedial Action Work Plan for the Monticello Mill Tailings Site Operable Unit III, Monticello, Utah*, May 2014.

Eight vertical extraction wells are strategically placed in the AOA to extract contaminated groundwater. The water is transmitted in buried pipelines to an aboveground holding tank in the groundwater transfer building; from there it is pumped through a buried pipeline for about 1 mile to Pond 4 for evaporation. The associated monitoring system consists of the 16 monitoring wells that were installed in the AOA.

Consumptive use (evaporation of the extracted groundwater in Pond 4) is allowed under a fixed-time water right appropriation (number 09-2347) and a temporary water right appropriation (number 09-2422) that LM obtained from the Utah Department of Natural Resources, Division of Water Rights.

#### 3.3.4.1 Quarterly Performance Summary

- The system ran continuously during October and November 2015 except for brief planned shutdowns for system monitoring. Groundwater was extracted at a net rate of approximately 17 gallons per minute (gpm) for October and November 2015.
- Table 1 shows treatment volumes and rates for the quarter and cumulatively.
- An unplanned shutdown occurred on December 1, 2015, due to a failed check valve in the groundwater transfer building. The check valve prevents backflow of water in the Pond 4 transmission line. Redesign and repairs are expected to be completed in February 2016; until that time, the treatment system will not be operated.
- Construction warranty work to repair flow meters in the groundwater transfer building was completed during this quarter.
- Water-quality monitoring consisted of:
  - Monthly analysis of the transfer tank effluent to Pond 4 occurred in October and November 2015 (the system did not operate during December 2015).
  - Analysis of individual extraction well effluent to the transfer tank in October and November 2015 (the system did not operate during December 2015). This monitoring is not required but is performed for operational purposes.
  - Analysis of groundwater samples collected at AOA monitoring wells on October 5 and 6, 2015, and November 9 and 10, 2015, coinciding with approximately 5 million and 6 million gallons of water extracted, respectively, since system start-up in January 2015.
  - As documented in the latest annual groundwater report (October 2015), concentrations of uranium in the AOA have decreased by about 200 micrograms per liter ( $\mu\text{g/L}$ ) at many monitoring well locations from baseline concentrations of about 700 to 1,000  $\mu\text{g/L}$ .

- Table 2 provides the estimated mass of uranium removed from groundwater in the AOA.
- Analytical results of tank effluent samples show that uranium concentrations in the extracted groundwater have declined steadily. When the system becomes operational, pumping rates will be adjusted to maximize the removal rate of uranium.
- Groundwater extraction is planned to be conducted cyclically, whereby the aquifer is dewatered to the extent possible and then allowed to recharge when the pumps are not active. To date, water level drawdowns in the AOA have not warranted a planned shutdown to allow for aquifer recovery.

Table 1. OU III Remedy Optimization Treatment Volumes and Rates: Calendar Month and Cumulative

Calendar Month	Approximate Volume Pumped <sup>a</sup> (gallons)	Effective Pumping Rate <sup>b</sup> (gpm)	Approximate Cumulative Volume (million gallons)
October 2015	757,470	17	6.0
November 2015	718,720	16.6	6.7
December 2015 <sup>c</sup>	0.0 <sup>c</sup>	0.0 <sup>c</sup>	6.7

**Notes:**

<sup>a</sup> Total pumped from all eight extraction wells.

<sup>b</sup> Includes system downtime during month.

<sup>c</sup> Treatment system inoperable since December 1, 2015.

Table 2. Uranium Mass Removal from Groundwater in the AOA

Tank Effluent Sample Date	Uranium Concentration (µg/L)	Volume Removed Between Tank Samples (gallons)	Uranium Removed (pounds) <sup>a</sup>	Cumulative Mass Uranium Removed (pounds)
September 24, 2015	519	–	–	33.4
October 22, 2015	539	588,771	2.6	36.0
November 19, 2015	439	689,520	2.8	38.8
December 2015 <sup>b</sup>	–	–	0.0	38.8

**Notes:**

<sup>a</sup> Based on median concentration between sampling dates.

<sup>b</sup> Treatment system inoperable since December 1, 2015; no sample collected in December 2015.

Monitoring and reporting guidelines 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*, May 2014. Analysis of water quality trending toward meeting remediation goals in the AOA is beyond the scope of the FFA quarterly report but is documented in annual groundwater reports.

## 4.0 Schedule of Activities and Deliverables

Table 3 summarizes the completion of recent and planned near-term activities and deliverables for the Monticello National Priorities List (NPL) sites.

Table 3. Recent and Near-Term Activities and Deliverables

Activity/Deliverable	Schedule
<b>Recent</b>	
LM submittal of OU III Annual Groundwater Report May 2014 Through April 2015.	Submitted to EPA and UDEQ in October 2015.
LM submittal of 2015 Annual Inspection Report (penalty milestone).	Submitted to EPA and UDEQ by December 31, 2015.
LM submittal of draft <i>Remedial Action Completion Report for OU III Groundwater Contingency Remedy Optimization System</i> to EPA and UDEQ for review.	Submitted to EPA and UDEQ in October 2015.
LM performed semiannual OU III groundwater and surface water monitoring.	October 12–14, 2015.
LM performed water-quality monitoring at 16 AOA monitoring wells in October and November 2015, coinciding with a cumulative volume of approximately 5 million and 6 million gallons, respectively, extracted since system start-up in January 2015.	Completed October 5–6, and November 9–10, 2015.
LM submitted uranium analytical results from the Seep 6 soil sampling (conducted in September 2015) to the Utah Department of Health (UDOH), EPA, and UDEQ.	December 18, 2015.
<b>Near-Term</b>	
Perform water-quality monitoring at 16 AOA monitoring wells when approximately 7 million gallons have been pumped since system start-up in January 2015.	February 2016; pending time frame of system restart.
LM to conduct a health consultation conference call with UDOH on the Seep 6 soil data.	Teleconference to be scheduled following UDOH review of analytical results.
LM submittal of final Remedial Action Completion Report for OU III Groundwater Contingency Remedy Optimization System to EPA and UDEQ.	February 2016.
Semiannual FFA meetings between LM, EPA, and UDEQ; generally held in March and September.	Teleconference to be tentatively scheduled for March 2016.
ZVI removal from ex situ treatment cells and waste removal from TSF for haul and disposal at LM Grand Junction, Colorado, Disposal Site.	Rescheduled for April 2016. Bad weather conditions forced cancelation of November 2015 activity.
LM submittal of FFA quarterly report: January–March 2016.	Submit to EPA and UDEQ in April 2016.
Perform semiannual OU III groundwater and surface water monitoring.	Week of April 18, 2016 (tentative schedule).
LM submittal of 2015 Water Use Reports for water right appropriation number 09-2347 and temporary water right appropriation number 09-2422 to Utah Department of Natural Resources, Division of Water Rights.	February–March 2016.

## **Appendix A**

### **Monthly and Quarterly Surveillance Checklists**

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## Repository Area Surveillance Checklist

- Monthly surveillance   
  Quarterly surveillance:   
  February   
  May   
  August   
  November  
 Storm event triggered surveillance due to   N/A   inches of rainfall over the past 24 hours.

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
<b>Condition of:</b>			
Fences, gates, and locks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	One strand of wire needs repaired on the south boundary fence. The fence is still solid. Just needs the one wire repaired.
Roads <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Signs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Site monuments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Drainage ditches <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Manholes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of erosion of:</b>			
Top of disposal cell <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Disposal cell sideslopes <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ditches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surrounding area	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Vandalism	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by livestock	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Burrowing animal damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by humans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Accumulation of trash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Additional Quarterly Surveillance Requirements**

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

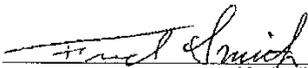
**Condition of:**

Settlement plate structures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Manholes <sup>b</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sediment ponds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Evidence of:**

Structural instability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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**Additional comments:** The site looks good. We have had some winter storms and it is getting cold out. The ground is beginning to freeze.

Signature:  Date: 12-1-2015  
Monticello LM Representative

<sup>a</sup>Inspections required following a significant storm event

<sup>b</sup>Open to inspect quarterly

## Repository Area Surveillance Checklist

- Monthly surveillance   
  Quarterly surveillance:   
  February   
  May   
  August   
  November  
 Storm event triggered surveillance due to N/A inches of rainfall over the past 24 hours.

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
<b>Condition of:</b>			
Fences, gates, and locks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The Monticello team including management and site staff has determined to leave the gates open to the repository to allow access for wildlife to feed. These open gates do not constitute a security concern.
Roads <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site roads are snow packed and drifted. Site personnel are using the tracked side X side to access Pond 4 and the GWTB.
Signs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Site monuments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Drainage ditches <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Manholes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of erosion of:</b>			
Top of disposal cell <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Disposal cell sideslopes <sup>a</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ditches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surrounding area	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Vandalism	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by livestock	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Burrowing animal damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by humans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Accumulation of trash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Additional Quarterly Surveillance Requirements**

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

**Condition of:**

Settlement plate structures	<input type="checkbox"/>	<input type="checkbox"/>	
Manholes <sup>b</sup>	<input type="checkbox"/>	<input type="checkbox"/>	
Sediment ponds	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Structural Instability	<input type="checkbox"/>	<input type="checkbox"/>	

**Additional comments:** The annual inspection occurred this month. The site passed inspection.

Signature:  Monticello LM Representative      Date: 12-31-15

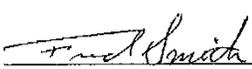
## Monthly Pond 4 Surveillance Checklist

Level of water in Pond 4 ~ 5.6 feet

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
<b>Condition of:</b>			
Fences, gates, and locks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Signs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible piping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible liner and anchors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rescue equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ring bouy rope as been ordered and a rescue boat has been delivered to the site.
<b>Evidence of erosion of:</b>			
Top of Pond 4 berm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pond 4 sideslopes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ditches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surrounding area	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Seepage from Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Overtopping of Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Vandalism	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by wildlife	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by humans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Accumulation of trash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Additional comments:**

An assessment of Pond 4 was completed by H&S and the items identified as issues have been corrected or are in the process of being corrected (e.g., the 90-feet of ring buoy rope).

Monticello LM Representative:  Date: 10-30-15

**Monthly Pond 4 Surveillance Checklist**

Level of water in Pond 4 ~ 6.5 feet

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
<b>Condition of:</b>			
Fences, gates, and locks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Signs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible piping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible liner and anchors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rescue equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ring bouy rope has been attached to the ring buoys.
<b>Evidence of erosion of:</b>			
Top of Pond 4 berm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pond 4 sideslopes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ditches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surrounding area	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Seepage from Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Overtopping of Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Vandalism	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by wildlife	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by humans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Accumulation of trash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Additional comments:**

Pond 4 looks good and is running well. The heat trace has been turned on for the LDS and LCR.

Monticello LM Representative: *Frank Smith* Date: 12-1-2015

**Monthly Pond 4 Surveillance Checklist**

Level of water in Pond 4 ~ 6.4 feet

Inspection Item	Acceptable		Comments and Recommendation
	Yes	No	
<b>Condition of:</b>			
Fences, gates, and locks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Signs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible piping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Visible liner and anchors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rescue equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The skiff is located in the site's shed due to frozen Pond 4 conditions. The skiff would be useless with the ice.
<b>Evidence of erosion of:</b>			
Top of Pond 4 berm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pond 4 sideslopes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Ditches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surrounding area	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Seepage from Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Overtopping of Pond 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Evidence of:</b>			
Vandalism	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by wildlife	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Intrusion by humans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Accumulation of trash	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**Additional comments:** The Groundwater Contingency Remedy Optimization system has not operated since 12/01/15 due to a broken check valve.

Snow has accumulated on the HDPE covered embankments inside Pond 4.

Monticello LM Representative: *Frank Smith* Date: 12-31-15

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

**Acceptable?**

Yes No

- Was the gate locked upon arrival?
- Are signs posted in accordance with Section 3.4.4?
- Are all posting 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 Section 3.4.5?
- Is the security fence in good condition?

Comments: Approximately 3-cubic yards of material is stored in the TSF. However, a separate RMA has been established in the Controlled Area to accommodate 7 super sacks of materials that were removed from Pond 4 and other areas. Together this adds up to approximately 22-cubic yards of materials in the area. We were not able to perform the removal of these materials this fall due to the weather. The removal will take place in the spring of 2016.



Signature of Monticello LM Representative

11-30-2015

Date of Inspection

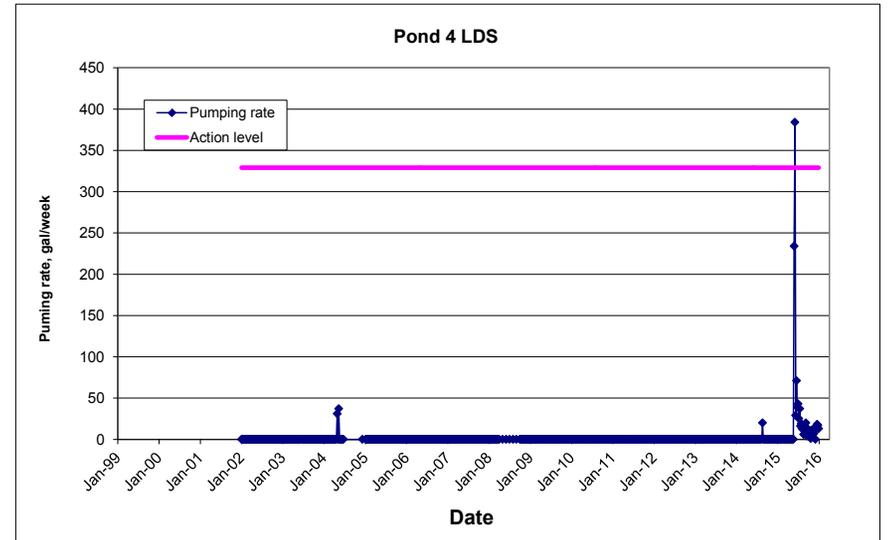
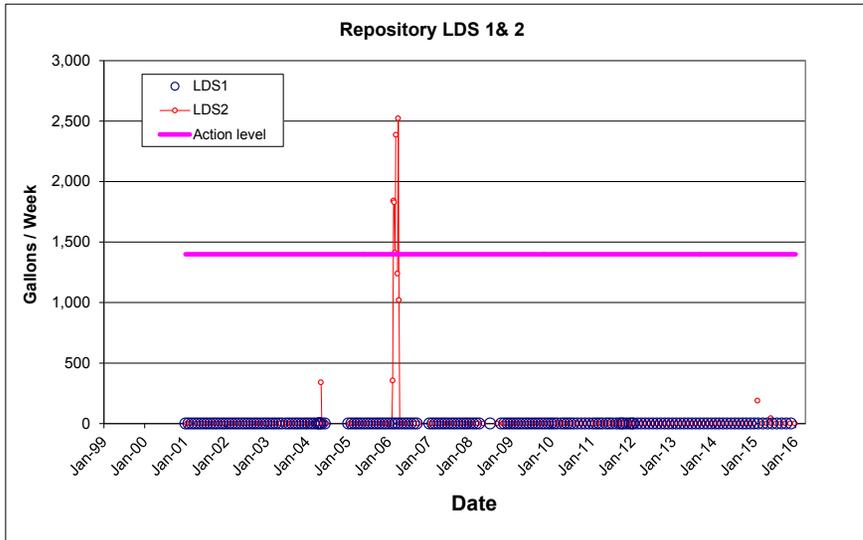
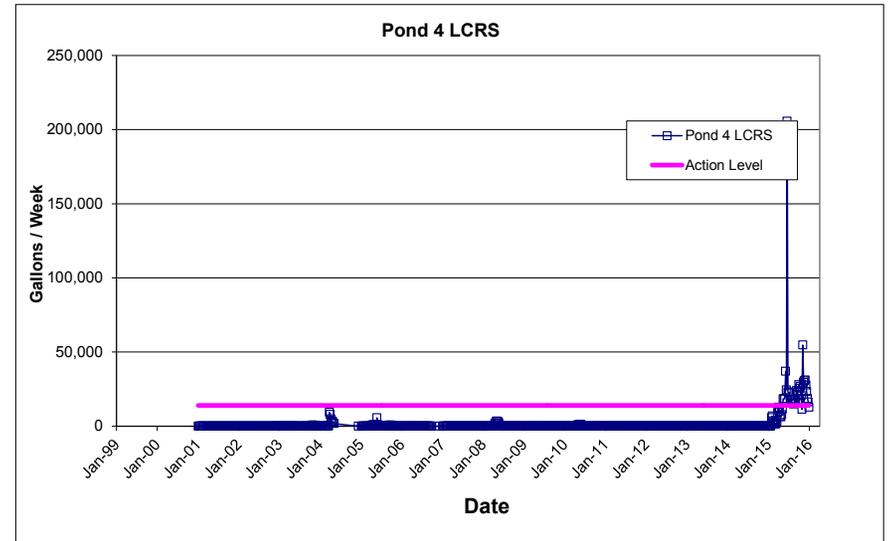
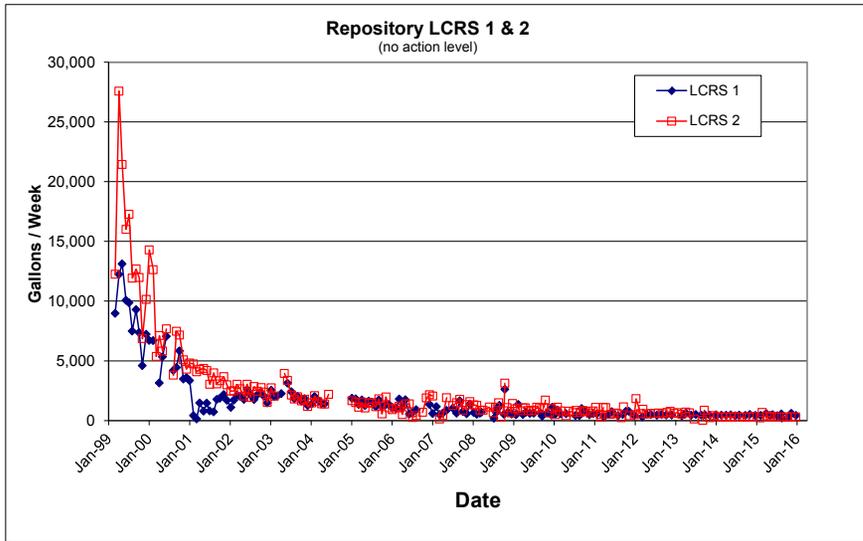
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## **Appendix B**

### **Graphs Showing Performance History for Repository and Pond 4 Leachate Collection and Removal Systems and Leak Detection Systems**

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### Graphs Showing Performance History for Repository and Pond 4 Leachate Collection and Recovery System (LCRS) and Leak Detection System (LDS)



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## **Appendix C**

### **Monthly Climatological Summaries for the Quarter**

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MONTHLY CLIMATOLOGICAL SUMMARY for OCT. 2015

NAME: Monticello Office CITY: STATE:  
 ELEV: 0 ft LAT: LONG:

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	67.8	78.5	4:30p	56.9	7:30a	1.8	4.6	0.00	7.8	28.0	2:30p	SSW
2	61.9	70.5	3:30p	49.6	12:00m	4.0	0.9	0.00	10.0	38.0	1:00p	SSW
3	55.3	66.1	4:30p	43.9	6:00a	9.8	0.1	0.00	5.2	22.0	12:30p	NW
4	54.9	66.3	3:30p	41.9	6:00a	10.1	0.1	0.25	5.9	27.0	11:30a	S
5	49.3	52.2	2:00a	46.0	11:00p	15.7	0.0	1.42	1.6	22.0	3:00a	SSW
6	49.8	58.0	5:00p	45.3	6:30a	15.2	0.0	0.03	2.5	18.0	10:30a	S
7	52.8	63.0	4:00p	45.0	12:30a	12.2	0.0	0.00	3.5	18.0	11:00p	NNW
8	58.3	66.6	4:00p	50.2	6:30a	6.8	0.1	0.00	10.0	24.0	4:30p	NNW
9	58.0	67.7	3:30p	47.0	7:30a	7.3	0.3	0.00	5.7	22.0	1:00p	S
10	58.6	69.6	3:30p	47.9	6:00a	7.0	0.6	0.00	5.4	20.0	1:30p	SSE
11	58.6	71.1	3:30p	46.0	7:30a	7.4	1.0	0.00	3.9	23.0	5:00p	NNW
12	61.9	72.9	4:30p	52.9	2:00a	4.8	1.7	0.00	9.2	20.0	3:00a	NNW
13	61.2	73.3	3:30p	50.6	7:30a	5.8	2.0	0.00	6.1	20.0	2:00p	NW
14	61.7	73.7	4:00p	49.0	4:30a	5.6	2.3	0.00	6.0	21.0	4:30p	WNW
15	61.6	73.0	3:30p	49.3	7:30a	5.3	1.9	0.00	4.0	16.0	4:00p	NW
16	57.2	65.6	3:00p	48.0	4:30a	7.8	0.0	0.00	7.5	26.0	12:30p	SSW
17	53.8	59.9	1:00p	46.9	5:00a	11.2	0.0	0.00	6.5	22.0	1:30p	SSW
18	52.4	57.9	4:00p	48.3	6:00a	12.6	0.0	0.06	6.1	19.0	2:00a	S
19	51.5	60.2	4:00p	47.4	9:00p	13.5	0.0	0.19	4.6	24.0	2:30a	SSW
20	47.6	58.0	3:00p	42.6	8:00a	17.4	0.0	0.42	1.7	21.0	5:30p	SSE
21	46.0	53.9	5:30p	41.1	3:00a	19.0	0.0	0.07	1.1	18.0	12:30p	SSE
22	44.5	49.7	5:30p	39.9	11:30p	20.5	0.0	0.43	0.6	11.0	2:30p	N
23	46.4	54.3	3:30p	41.1	1:00a	18.6	0.0	0.00	6.4	23.0	9:30a	NNW
24	46.4	57.3	4:00p	38.4	4:00a	18.6	0.0	0.00	3.9	14.0	2:30p	SSE
25	48.5	55.5	1:30p	39.2	4:30a	16.5	0.0	0.00	3.8	18.0	1:30p	S
26	47.1	56.9	5:00p	40.9	11:30p	17.9	0.0	0.14	2.2	20.0	7:30a	SW
27	46.0	58.1	3:30p	36.2	7:00a	19.0	0.0	0.00	4.0	23.0	6:00p	NNW
28	42.4	52.6	3:30p	34.2	7:30a	22.6	0.0	0.00	2.6	14.0	3:30p	NNE
29	44.1	50.7	10:30a	36.9	11:30p	20.9	0.0	0.04	7.4	20.0	10:00a	SSW
30	40.1	46.2	3:30p	34.3	1:30a	24.9	0.0	0.09	15.1	37.0	3:30p	NNW
31	44.9	54.5	4:00p	36.9	5:30a	20.1	0.0	0.00	10.1	28.0	3:30a	NNW
	52.6	78.5	1	34.2	28	399.9	15.6	3.14	5.5	38.0	2	NNW

Max >= 90.0: 0

Max <= 32.0: 0

Min <= 32.0: 0

Min <= 0.0: 0

Max Rain: 1.42 ON 10/05/15

Days of Rain: 11 (>.01 in) 6 (>.1 in) 1 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for NOV. 2015

NAME: Monticello Office CITY: STATE:  
 ELEV: 0 ft LAT: LONG:

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

DAY	MEAN		TIME	LOW	TIME	HEAT	COOL	RAIN	AVG		TIME	DOM
	TEMP	HIGH				DEG	DEG		WIND	DIR		
1	49.0	62.8	3:30p	36.8	3:30a	16.0	0.0	0.00	5.1	22.0	2:30p	SSE
2	49.0	58.2	4:00p	41.8	2:30a	16.0	0.0	0.00	10.0	29.0	1:00p	SSW
3	46.2	55.6	3:30p	35.0	11:00p	18.8	0.0	0.31	10.4	33.0	1:00p	SSW
4	33.6	37.2	12:30a	30.5	10:00p	31.4	0.0	0.32	7.6	23.0	4:30a	S
5	31.8	38.1	2:30p	25.0	5:00a	33.2	0.0	0.17	4.7	18.0	11:00a	WSW
6	31.9	39.5	3:00p	24.4	7:00a	33.1	0.0	0.00	8.0	22.0	12:30p	NNW
7	34.1	45.0	3:30p	26.2	7:00a	30.9	0.0	0.00	4.1	17.0	1:00p	NNW
8	36.6	46.7	3:30p	27.9	2:30a	28.4	0.0	0.00	3.4	17.0	12:30p	S
9	42.1	50.0	3:00p	34.9	12:30a	22.9	0.0	0.00	11.5	33.0	12:30p	SSW
10	35.3	44.9	1:30p	27.7	9:00p	29.7	0.0	0.05	9.8	32.0	1:30p	SSW
11	28.5	35.2	2:30p	23.5	10:00p	36.5	0.0	0.01	11.2	40.0	8:30a	NNW
12	31.5	44.2	3:00p	-90.0	5:30a	33.5	0.0	0.00	2.0	12.0	4:00p	NW
13	35.6	47.8	1:00p	-90.0	5:00a	29.4	0.0	0.00	3.7	11.0	1:30a	NNE
14	37.7	50.8	3:00p	26.8	5:00a	27.3	0.0	0.00	3.4	19.0	11:00a	NW
15	37.4	45.8	1:00p	27.1	7:00a	27.6	0.0	0.01	8.0	37.0	9:00p	SSW
16	30.6	36.7	2:30a	26.3	6:00p	34.4	0.0	0.28	8.7	48.0	12:00m	NNW
17	29.4	32.9	4:30p	25.9	3:00a	35.6	0.0	0.01	21.4	51.0	2:00a	NNW
18	34.7	44.3	2:00p	25.9	1:30a	30.3	0.0	0.02	5.7	28.0	2:00p	N
19	36.6	45.1	2:00p	25.5	5:00a	28.4	0.0	0.00	4.1	19.0	2:30p	WNW
20	38.3	48.7	11:30a	30.4	12:00m	26.7	0.0	0.00	9.1	30.0	1:00p	NNW
21	30.6	40.9	2:00p	21.3	7:00a	34.4	0.0	0.00	6.5	20.0	3:30a	NNE
22	34.3	47.7	12:30p	24.2	7:00a	30.7	0.0	0.00	3.0	11.0	12:30p	NNE
23	36.3	47.0	1:30p	25.3	5:00a	28.7	0.0	0.00	5.4	22.0	12:00p	WNW
24	38.6	46.0	3:30p	29.6	7:00a	26.4	0.0	0.00	9.7	26.0	11:00a	S
25	40.9	48.9	4:30p	34.1	3:00a	24.1	0.0	0.00	13.8	39.0	12:00p	S
26	32.4	40.3	2:30p	23.9	10:30p	32.6	0.0	0.00	6.5	28.0	12:30a	SSW
27	27.0	40.4	3:00p	17.7	10:00p	38.0	0.0	0.00	4.6	21.0	1:30p	NNW
28	25.9	33.6	3:30p	17.7	7:30a	39.1	0.0	0.00	5.2	19.0	10:30a	SSW
29	24.8	33.0	1:00p	16.7	12:00m	40.2	0.0	0.00	4.6	23.0	10:00p	SSW
30	19.7	31.0	3:00p	7.7	8:00a	45.3	0.0	0.00	4.0	20.0	3:30a	SE
-----												
	34.7	62.8	1	-90.0	12	909.6	0.0	1.18	7.2	51.0	17	S

Max >= 90.0: 0  
 Max <= 32.0: 1  
 Min <= 32.0: 25  
 Min <= 0.0: 2  
 Max Rain: 0.32 ON 11/04/15  
 Days of Rain: 6 (>.01 in) 4 (>.1 in) 0 (>1 in)  
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for DEC. 2015

NAME: Monticello Office CITY: STATE:  
 ELEV: 0 ft LAT: LONG:

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	24.0	34.4	2:30p	14.1	5:30a	41.0	0.0	0.00	6.3	25.0	1:30p	N
2	29.1	44.3	1:30p	18.1	5:30a	35.9	0.0	0.00	2.0	13.0	1:00p	E
3	33.2	46.7	2:30p	22.0	5:00a	31.8	0.0	0.00	2.5	11.0	1:30p	ESE
4	38.1	44.4	2:30p	27.4	12:30a	26.9	0.0	0.00	7.7	25.0	12:00p	SSW
5	32.1	39.1	12:30a	25.7	6:00a	32.9	0.0	0.00	7.3	25.0	10:00a	NNW
6	30.7	40.0	3:30p	22.5	5:00a	34.3	0.0	0.00	6.6	27.0	12:00p	S
7	33.2	43.1	2:00p	25.2	12:30a	31.8	0.0	0.00	2.3	16.0	5:30p	WNW
8	40.0	51.7	1:00p	29.8	7:00a	25.0	0.0	0.00	3.9	19.0	2:00p	NNE
9	39.0	50.2	2:30p	30.5	11:00p	26.0	0.0	0.00	5.9	28.0	4:00p	S
10	40.2	46.3	4:00p	30.1	4:00a	24.8	0.0	0.00	11.1	34.0	12:30p	SW
11	36.3	42.8	12:30a	28.0	9:30p	28.7	0.0	0.00	6.6	23.0	2:00p	SW
12	26.9	30.4	12:30a	25.0	8:30p	38.1	0.0	0.00	13.5	43.0	9:30p	NNW
13	29.3	39.9	4:00p	21.0	6:00a	35.7	0.0	0.00	10.5	37.0	12:30a	SE
14	24.2	27.4	1:30p	17.5	12:00m	40.8	0.0	0.00	8.3	32.0	3:00p	S
15	19.3	23.4	3:00p	15.0	7:00a	45.7	0.0	0.00	8.4	31.0	11:30a	NNW
16	17.3	24.0	2:30p	11.7	10:00p	47.7	0.0	0.00	5.1	24.0	9:30a	NNE
17	19.0	25.3	2:30p	13.2	9:30p	46.0	0.0	0.00	5.4	28.0	5:00a	SE
18	22.8	31.8	3:00p	12.7	1:30a	42.2	0.0	0.00	4.0	15.0	12:00m	SSE
19	35.3	41.2	2:00p	26.9	12:30a	29.7	0.0	0.00	10.5	30.0	5:30p	SSW
20	32.3	38.2	12:30p	25.2	12:00m	32.7	0.0	0.00	7.4	24.0	1:30p	SSW
21	26.7	31.6	9:00p	17.1	8:00a	38.3	0.0	0.00	8.4	30.0	2:00p	S
22	30.7	37.9	5:00p	27.9	7:00p	34.3	0.0	0.01	12.1	33.0	11:00p	S
23	24.7	38.0	1:30p	10.7	12:00m	40.3	0.0	0.00	7.6	40.0	3:00p	SE
24	16.1	23.7	9:30p	7.8	2:00a	48.9	0.0	0.00	5.3	23.0	10:30a	WNW
25	21.7	25.4	2:30p	17.0	11:00p	43.3	0.0	0.03	7.6	31.0	12:30p	NNW
26	13.9	19.0	12:00m	9.3	8:00p	51.1	0.0	0.00	21.8	42.0	1:00p	NNW
27	14.8	24.5	3:00p	5.4	12:00m	50.2	0.0	0.00	7.9	30.0	2:00a	NNW
28	14.9	23.7	2:30p	5.0	12:30a	50.1	0.0	0.00	3.5	26.0	1:30p	S
29	18.6	24.6	12:30p	9.6	10:00p	46.4	0.0	0.00	2.0	11.0	4:30a	SW
30	19.2	24.5	1:30p	13.4	12:30a	45.8	0.0	0.01	2.6	13.0	3:00a	S
31	18.3	21.1	2:00a	16.8	6:30a	24.3	0.0	0.00	7.1	20.0	9:30a	N
-----												
	26.5	51.7	8	5.0	28	1170.7	0.0	0.05	7.1	43.0	12	NNW

Max >= 90.0: 0  
 Max <= 32.0: 15  
 Min <= 32.0: 31  
 Min <= 0.0: 0  
 Max Rain: 0.03 ON 12/25/15  
 Days of Rain: 1 (>.01 in) 0 (>.1 in) 0 (>1 in)  
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

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