ATTACHMENT 5

HDP-PO-EM-004
Water Management Plan
14 Pages

Westinghouse Electric Company LLC,
Hematite Decommissioning Project

Docket No. 070-00036

Hematite Decommissioning Project

NUMBER: **HDP-PO-EM-004**

TITLE: **Water Management Plan**

REVISION: **1**

EFFECTIVE DATE: **01/31/2011**

QUALITY-RELATED

REVISION LOG	
Revision Effect. Date	**Change(s)**
0	Rev. 0 is being archived as the record showing the document that was prepared and site approved on 8/11/09. This document awaited anticipated NRC approval of a License Amendment. The NRC did not approve the License amendment as anticipated so Rev. 0 was not implemented for use on site.
1 01/31/11	Revision 0 was never implemented. In the time between the approval date and the current effective date, facility modifications have taken place. This revision 1 reflects the changes in the site evaporation ponds, with the former primary evaporation pond being used as a water collection sump as described in Section 8.2. In addition, the figures have been revised to show current site conditions.

Are Quality Records generated? **NO**.

1.0 PURPOSE

This document serves as the Water Management Plan (WMP) for the Westinghouse Hematite Decommissioning Project (HDP). This plan provides guidance for managing surface water, storm water, and ground water intrusion during the remedial activities associated with the HDP.

HDP will generate water from a variety of sources, potentially containing radioactivity and/or volatile organic compounds (VOCs). The primary goals of water management are to minimize the volume of potentially contaminated water and to maintain the work area in a de-watered condition. Water management practices during decommissioning will ensure liquid discharges meet the effluent standards defined by SNM-33 and the amendments approved by the U.S. Nuclear Regulatory Commission (NRC), and the National Pollution Discharge Elimination System (NPDES) NPDES Permit (MO-0000761) (Reference 5.4).

2.0 POLICY

This WMP provides for minimizing the volume of potentially contaminated water requiring collection, characterization, and treatment. Processed water will be discharged after meeting the requirements of the Radioactive Materials License (SNM-33) (Reference 5.1) and the amendments approved by the NRC, as well as the NPDES Permit (MO-0000761) (Reference 5.4), Applicable or Relevant and Appropriate Requirements (ARAR) waiver MO-ARAR013 (Reference 5.3) issued by the Missouri Department of Natural Resources (MDNR).

3.0 APPLICABILITY

This WMP is to be utilized in conjunction with the Effluent and Environmental Monitoring Plan (EEMP) (Reference 5.2) and is applicable to all personnel working at HDP, including employees, contractors, and subcontractors associated with site decommissioning. The WMP is designed to address contaminated water sources and best management practices (BMPs) described by the State of Missouri General Land Disturbance Permit, to minimize any adverse impact to surface and ground water, and to ensure that potentially contaminated water is appropriately treated and/or evaluated prior to discharge into the environment.

4.0 DEFINITIONS/ACRONYMS

4.1 Definitions

4.1.1 Batch Release – Liquid effluents that are retained for treatment and/or analysis and released as a finite volume.

4.1.2 Composite Sample – A sample volume collected at constant intervals over a specified time period used to represent continuous effluent discharges.

4.1.3 Continuous Effluent Discharge – Effluents that are monitored and released on an uninterrupted basis.

4.1.4 Grab Sample – A single sample or measurement collected over a short time period.

4.1.5 Potentially Impacted Water – Water potentially affected by a secondary material added by human or natural activities which may, in sufficient concentrations, render the primary material or atmosphere unacceptable.

4.1.6 Non-impacted Water – Water that is not potentially affected by a secondary material added by human or natural activities which may, in sufficient concentrations, render the primary material or atmosphere unacceptable.

4.2 Acronyms

ARAR	Applicable or Relevant and Appropriate Requirements
BMP	Best Management Practices
EEMP	Effluent and Environmental Monitoring Plan
FSS	Final Status Survey
gpm	gallons per minute
HDP	Hematite Decommissioning Project
MDNR	Missouri Department of Natural Resources
NPDES	National Pollution Discharge Elimination System
NRC	United States Nuclear Regulatory Commission
RACM	Regulated Asbestos-Containing Material
VOC	Volatile Organic Compounds
WMP	Water Management Plan
WTS	Water Treatment System

5.0 REFERENCES

5.1 SNM-33, NRC Material License No. SNM-33 for Westinghouse-Hematite

5.2 HDP-PO-EM-001, Effluent and Environmental Monitoring Plan

5.3 MO-ARAR013, Missouri Department of Natural Resources

5.4 MO-0000761, National Pollution Discharge Elimination System (NPDES) Permit, Missouri Department of Natural Resources, Water Protection Program, Water Pollution Branch

6.0 RESPONSIBILITIES

6.1 Project Director – has overall responsibility to ensure that activities under this policy are conducted safely and in accordance with Federal, state, and local requirements.

6.2 Department Managers – are responsible for ensuring all site work activities are managed in accordance with this policy.

7.0 OVERVIEW OF MITIGATION MEASURES

The HDP will implement BMPs to minimize erosion and control sedimentation by installing structural features such as silt fence and straw waddle, stabilizing or covering steep slopes, diverting surface water from open excavations, and when practical, minimizing the amount of storm water contacting contaminated soil as discussed in the EEMP (Reference 5.2). Prior to discharge of batch water into the environment, water quality will be evaluated to determine suitability for release. Water determined unsuitable for discharge will be processed to meet the effluent standards. Water that is determined to meet the effluent standards may bypass the Water Treatment System (WTS) prior to discharge in order to reduce the water volume requiring treatment.

8.0 WATER MANAGEMENT REQUIREMENTS

The HDP will generate water from a variety of sources, potentially containing radioactivity and/or VOCs. The primary goals of water management are to minimize the volume of potentially contaminated water and to maintain the work area in a de-watered condition. Water management practices during decommissioning will ensure liquid discharges meet the effluent standards defined by NRC License (Reference 5.1) and the amendments approved by the NRC, the NPDES Permit (MO-0000761) (Reference 5.4), and ARAR waiver MO-ARAR013 (Reference 5.3).

The site arrangement and remedial execution strategy provides adequate facilities for waste segregation, stockpiling, and treatment lay-down areas, while minimizing the impact to ongoing excavation and removal activities. Water management activities within these areas during the remediation activities include:

- Directing infiltrated water from shallow ground water recharge or perched water sources to locations within the excavation that do not impede work activities,
- Collecting precipitation that comes into contact with contaminated materials within open excavations,
- Installing barriers to prevent uncontaminated water or soil from becoming contaminated,
- Diverting surface and precipitation to prevent intrusion into open excavations,
- Collecting water originating from precipitation and the pore volume within stockpiled materials,
- Performing an evaluation, including sampling and laboratory analysis, to determine the suitability for discharge and/or any requirements for water processing.

8.1 BMPs

To manage surface water, berms and diversion dikes will be used to direct water away from the entrances to open excavations to prevent contact with potentially contaminated materials. BMPs will be employed to ensure diverted surface water does not discharge high levels of sediment or cause erosion to off-site locations.

The EEMP (Reference 5.2) describes how BMPs will be administered. The Environmental Health and Safety Manager or their designee will select the most

appropriate BMP for each circumstance, and monitor the effectiveness of the control measure(s). All BMP devices will be utilized in accordance with the manufacturer recommendations.

The BMPs and the ARAR waiver MO-ARAR013 (Reference 5.3) include:

- Creating permanent diversions (land contours),
- Preserving natural vegetation,
- Installing construction entrances (cattle guards),
- Stabilizing exposed soils by compaction,
- Applying chemical stabilizers (soil binders),
- Installing check dams (storm water flow energy control),
- Installing silt fence and filter berms (straw bales),
- Establishing hardy local grasses and/or placing rip-rap to line channels,
- Creating sediment basins and traps,
- Soil roughening,
- Covering surfaces with geotextile,
- Collection of uncontaminated water from excavations for use as a dust suppression source,
- Construction sequencing.

Tarps or coverings may be employed to cover long term stockpiles to prevent run-on water contact and mitigate erosion from precipitation. Areas surrounding stockpiled material will be graded to provide a point of collection, and to prevent run-off to adjacent areas. Water contacting contaminated materials will be collected and evaluated for discharge and/or processed through the WTS.

8.2 Water Collection

Excavation and/or bermed areas will be contoured with low points where ground water or precipitation can collect, including the former Primary Evaporation Pond. Collection Sumps will be installed at these low points for transferring the water to Collection Tanks. To decrease the sediment uptake within the Collection Tanks, the Collection Sumps will be constructed with filter rock and the submersible pumps will have a screen on the inlet. Water may remain in the Collection Tanks for a period of time to allow for entrained sediment to sink to the bottom of the tanks.

Generally, the water will then be transferred to the WTS for processing prior to discharge. Water in the excavation or Collection Tanks may be directly discharged without processing through the WTS based on appropriate sampling, analysis of the sample results, and approval from the Radiation Safety Officer and the Environmental, Health and Safety Manager.

8.3 WTS Installation/Use

A WTS with sufficient capacity to meet the project requirements is planned to be installed. During normal operation, the water will be pumped to influent Settling Tank(s), and then through a series of bag filters, carbon filters, and ion exchange media. The mechanical filtration and ion exchange processes will ensure that potential contaminants are removed from the water for subsequent disposal as

waste materials. Due to the local climate and duration of the project, freeze-protection measures will need to be implemented in conjunction with the installation of the WTS. Freeze protection will include housing vital parts of the WTS indoors, burying hoses/piping supply and discharge lines as practical, heat wrapping piping and water tank de-icers.

Processed water will be temporarily stored in effluent holding tank(s) to allow for sampling and a comparison of the analytical results to the effluent standards. Should contaminants in processed water exceed the effluent standards, the water will be recycled through the system until discharge requirements are met. During effluent discharge, water will be pumped, or allowed to free-flow by gravity to discharge to Outfall #003.

The WTS will have sufficient capacity to temporarily store and process water resulting from precipitation contacting contaminated materials, water entrained with the excavated soil, and ground water infiltration during excavation. Other anticipated sources of water may originate from decontamination activities, such as power washing, or from re-captured water that was used for dust suppression. The WTS is designed for the following flow rates:

Maximum Flow Rate:	100 gpm
Maximum Recirculation Flow:	50 gpm
Normal Flow Rate:	50 gpm
Normal Recirculation Flow:	25 gpm
System Process Effectiveness:	25 gpm

During the early stage of operation, or when processing water with new radiological or chemical characteristics, the processed water will be stored in a tank and tested to determine if the effluent standards have been met. After a period of operational experience that shows consistent reliability in achieving the effluent standards, processed water may be discharged directly following processing. During periods of continuous discharge, a composite sampling device will be used to obtain a representative sample of the liquid effluent. While in this mode of operation, a daily composite sample will be collected for subsequent laboratory analysis.

9.0 SUMMARY OF MAJOR ACTIVITIES

In addition to the general discussion of water management in Section 8.0 for soil remediation work, the following sections describe additional detail on major decommissioning activities.

This document does not authorize any of following work activities, but is intended to provide water management plans for when a work activity is authorized. The following work activities may be subject to regulatory authorization prior to commencement of the work activity. In the event that regulatory authorizations contain provisions that conflict with this document, the regulatory authorization takes precedence over this document.

9.1 Building Demolition

The purpose of the demolition planning and execution process is to safely demolish the buildings and remove the construction and demolition debris while ensuring that the building concrete pads remain in place until they are approved by the NRC for removal. During the demolition phase, special care will be taken to reclaim any accumulated water from precipitation and as a result of dust control or decontamination. Accumulated water will be handled as discussed in Section 8.0.

9.2 Burial Pits

The objective of the Burial Pit water management planning and execution is the safe diversion of water away from the excavation areas, water management of stockpile material, disposition of intrusive water via the WTS, and prevention of off-site migration of contaminated water from the excavations.

9.2.1 Isolation and Controls

Excavation will proceed using methods to reduce potential cross-contamination. Specifically, the work will avoid crossing active or completed excavations, ensure complete removal of burial pit areas or areas that exhibit contamination, and minimize the amount of water in-flow to the excavation. An excavation work area may consist of one or more burial pits. Each excavation work area will:

- Be demarked with a perimeter established in order to set control boundaries. Physical barriers will be employed to isolate each open excavation work area.
- Have a dike or berm installed around it to prevent inflow or outflow. Other management practices such as silt fencing and ditches may also be employed to protect open pits from overflowing or receiving additional water.
- Have a screened pump installed in order to remove any perched water or water from direct precipitation into the pit.

9.2.2 Water Management

Water management tasks will be conducted throughout the duration of the excavation, of final status survey (FSS), of any regulatory confirmation of the FSS, and of restoration work. Each barrier and water management control in place will be checked whenever there is a half-inch precipitation event to ensure controls are operating effectively and as intended.

Precipitation and ground water will be handled as described in Section 8.0 with the exception for areas suspected to have regulated asbestos-containing material (RACM). In those areas, the pumps in the Collection Sumps will also have a 5-micron filter on the inlet. These filters will be disposed of as RACM, as necessary.

9.3 Northeast Creek Water Diversion

A water diversion system consisting of a headwall and flexible pipe or lined trench will be installed to divert surface waters flowing through the Northeast Site Creek. The bypass will be constructed of a diversion headwall installed downstream of where the creek flows under Missouri State Road P. A lined trench, 24-inch high density polyethylene welded line or similar flexible system will be installed to run parallel along the eastern boundary of the facility to rejoin the stream below outfall #006. The natural grade may be enhanced to ensure that a downward slope is maintained for gravity flow of the diverted water. This diversion will remain in place to support planned remedial actions, particularly in the Burial Pit area. This will help reduce recharge to the local ground water in the vicinity of the Burial Pits. In addition to reducing ground water infiltration, hard-piping the diversion will mitigate potential impacts of a possible release from the burial pit excavation to the Northeast Site Creek.

The height of the headwall for water diversion system is planned to be low enough so that water will overflow it before backing up to flood State Road P. This overflow water will follow the creek bed, as modified by berms to keep water from infiltrating the burial pit excavations.

A haul road will be constructed accessing a lay-down area. The haul road will pass over a culvert(s) or similar device which is part of the water diversion system.

9.4 Soil Beneath and Surrounding the Barns, Cistern Burn Pit, and Red Room Roof Burial Area

Remediation of the soil beneath and surrounding the barns, cistern burn pit, and red room roof burial area involves utilizing equipment and methods necessary to screen and segregate clean overburden from waste streams that may require additional treatment or off-site disposal. Appendix A shows the location of this area.

Water management tasks will be conducted throughout the duration of the excavation and FSS, of any regulatory confirmation of the FSS, and of restoration work. Precipitation and ground water will be handled as described in Section 8.0 with the exception for areas suspected to have regulated asbestos-containing material (RACM). In those areas, the pumps in the Collection Sumps will also have a 5-micron filter on the inlet. These filters will be disposed of as RACM, as necessary.

9.5 Storm Drain System and Sanitary Wastewater Lines

Remediation of the storm drain system, which includes exterior building drains for precipitation and associated piping, and sanitary wastewater lines requires further study in order to determine the extent of contamination. Appendix B shows the storm drain system and sanitary lines, including abandoned in-place piping.

Should excavation, as part of remediation be required, all associated piping will be removed as incidental work to the remediation effort. The connecting piping

will not be removed until the access piping has been removed, capped, or diverted to ensure no subsurface discharge. Prior to the removal of the piping, the piping will be located to the extent possible either through as-built drawings, piping locators, or dye tracing. If the piping can not be located through these means, then removal will start at a known point and the excavation will be advanced in the direction of the piping.

9.6 Site Pond

Site Pond remediation involves diverting water from entering the Site Pond, draining it, allowing it to dry for an extended period, and excavating the sediment layer and contaminated soil. This approach minimizes dewatering of sediments, while enhancing the ability to perform in-process screening to the Derived Concentration Guideline Levels. Appendix B shows the location of the Site Pond.

9.6.1 Supernatant Management

Upstream water entering the Site Pond will be diverted to Outfall #001. After the diversion is in place, the supernatant will be drained through Outfall #002. The water will be drained using either a pump or a gravity drain. Pumping would be performed utilizing a submersible pump fitted with a screen. Pond draining of supernatant consists of:

- For the pump/gravity drain, secure the inlet approximately 6 inches above the bottom of the sediment layer.
- Pump/gravity drain the water to Outfall #002. To support the gravity drain, Outfall #002 will likely be relocated and sampled by using a grab method instead of a composite method.
- Once this initial draining is complete, install a large diameter perforated pipe in the sediment to act as a dewatering well point. Secure the perforated pipe to the dam.
- Surround the active screen area of the perforated pipe using stone to pre-filter sediment from entering the pipe inner diameter.
- Lower a pump intake line into the perforated pipe, pumping the remaining supernatant into Collection Tanks for processing through the WTS as described in Section 8.0.

9.6.2 Water Management

Water management tasks will be conducted throughout the duration of upstream water diversion, of draining the supernatant, of the drying period, of excavation and FSS, of any regulatory confirmation of the FSS, and of restoration work. The method of redirecting upstream water will be inspected whenever there is a half-inch precipitation event to ensure that it is functioning correctly.

9.7 Evaporation Ponds

Any Evaporation Pond supernatant will be removed prior to excavation. Appendix B shows the location of the evaporation pond. The supernatant will be

sampled prior to draining. If the sample results are 20 percent of any effluent limits or more, the supernatant will be collected and treated as described in Section 8.0. (Note: Prior to initial operation of the WTS, the Investigation-Derived Waste Treatment System may be used to treat this water.) If the sample results are less than 20 percent of any effluent limits, then the supernatant will be drained via Outfall #001. Pumping would be performed utilizing a submersible pump fitted with a screen.

Water management tasks will be conducted throughout the duration of draining, of excavation and FSS, of any regulatory confirmation of the FSS, and of restoration work.

9.8 Concrete Slabs and Foundations, Concrete and Asphalt Paved Areas, and Associated Soil to be Remediated

Concrete and asphalt slabs, foundations, and soil underneath or supporting these structures that require remediation are shown in Appendix C. Most of these slabs are associated with buildings that will have already been demolished down to the slabs and foundations. The Loading Pad is unique compared to the other areas, as there may be residual sanitary waste from the former leach field underneath the Loading Pad.

Drains within a concrete slab will be plugged or protected from excavation sediment and debris. Using BMPs, these remediation areas will be surrounded with dikes or berms in order to control run-on and run-off water. Precipitation and ground water will be handled as described in Section 8.0. Water management tasks will be conducted throughout the duration of excavation and FSS, of any regulatory confirmation of the FSS, and of restoration work

10.0 FORMS

None

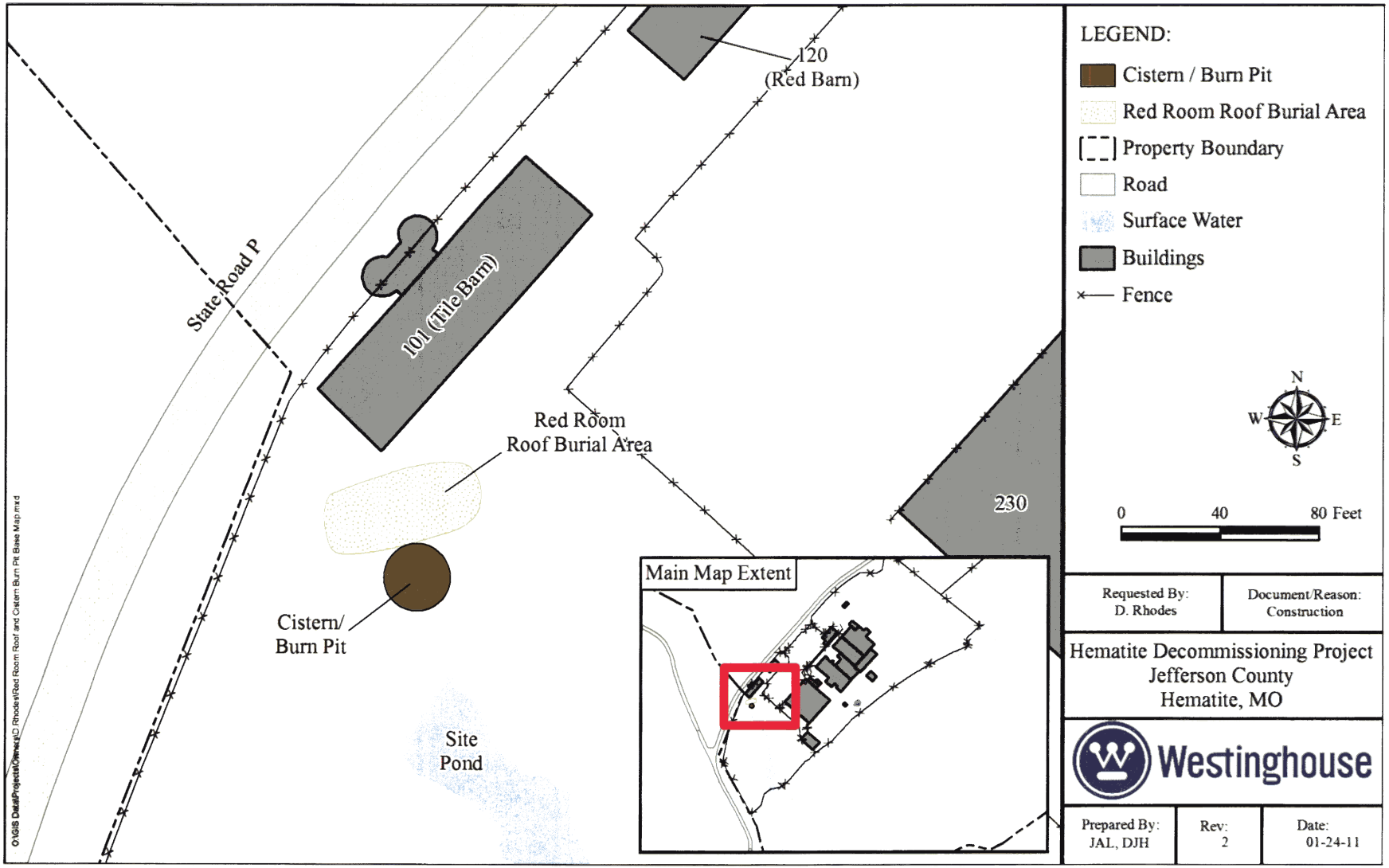
11.0 APPENDICES

Appendix A: Figure of Soil Beneath and Surrounding the Barns, Cistern Burn Pit, and Red Room Roof Burial Area

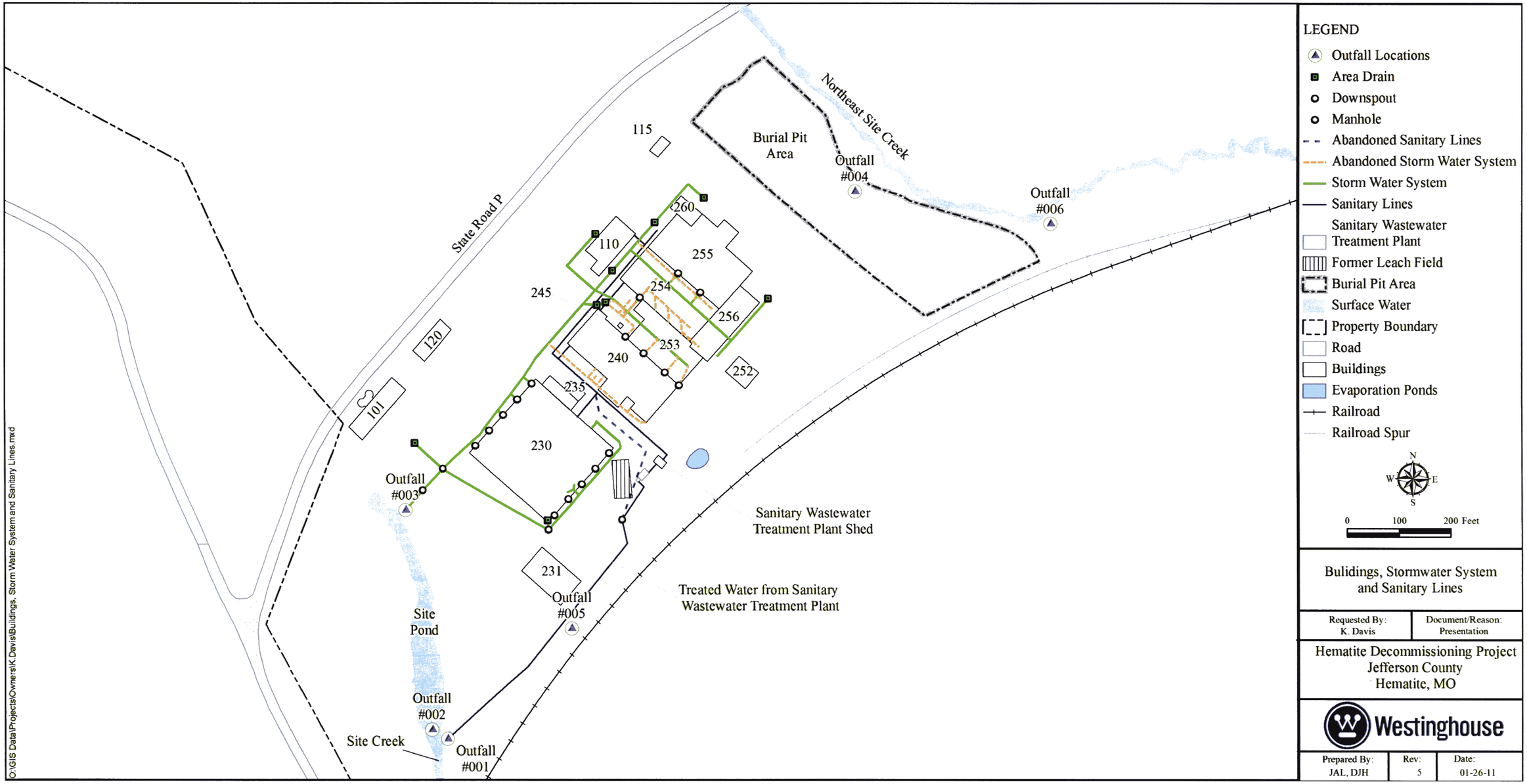
Appendix B: Figure of Sanitary Wastewater Treatment Plant and Storm Drain System for Hematite

Appendix C: Figure of Concrete Slabs and Foundations, Concrete and Asphalt Paved Areas, and Associated Soil to Be Remediated

APPENDIX A
FIGURE OF SOIL BENEATH AND SURROUNDING THE BARNS, CISTERN BURN PIT, AND RED ROOM ROOF BURIAL AREA



APPENDIX B
FIGURE OF SANITARY WASTEWATER TREATMENT PLANT AND STORM DRAIN SYSTEM FOR HEMATITE



APPENDIX C
FIGURE OF CONCRETE SLABS AND FOUNDATIONS, CONCRETE AND ASPHALT PAVED AREAS, AND ASSOCIATED SOIL TO BE REMEDIATED