3003-040428000 1

CH2M HILL
Mound, Inc.
1 Mound Road
P.O. Box 3030
Miamisburg, OH
45343-3030

SM-024/04
March 18, 2004

Ms. Margaret L. Marks, Acting Director
Miamisburg Closure Project
U. S. Department of Energy
500 Capstone Circle
Miamisburg, OH 45342

ATTENTION: Paul Lucas

SUBJECT: Contract No. DE-AC24-03OH20152
MAIN HILL WATER TOWER, BUILDING DATA PACKAGE, PUBLIC REVIEW DRAFT

REFERENCE: Statement of Work Requirement 055 - Regulator Reports

Dear Ms. Marks:

Chuck Friedman from your office has approved the following document to be released for public and Core Team review:

- Main Hill Water Tower, Building Data Package, Public Review Draft

The public review period will be from 19 March 2004 until 18 April 2004, and the site contractor will respond to any comments received and incorporate the responses into the final document. To support DOE's target date for demolition of the tower on 17 or 24 April, CH2M Hill Mound respectfully requests that the Core Team provide comments or concurrence prior to 16 April. If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact Bob Ransbottom at 865-4220.

Sincerely,

K. L. Kehler
SMPP/TFV Project Manager

KLK/VKD

Enclosures

cc: David Seely, USEPA, (1) w/attachments
Brian Nickel, OEPA, (4) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Mary Wojciechowski, Tetra Tech, (1) w/attchs
Frank Schmaltz, DOE/MCP, (1) w/attachments
Lisa Rawls, DOE/MCP, w/o attachments
Randy Tormey, DOE/OH, (1) w/attachments
Dann Bird, MMCIC, (3) w/attachments
Jim Bonfiglio, MESH, (1) w/attachments
Public Reading Room, (4) w/attachments
Kurt Kehler, CH2M Hill, (1) w/attachments
CERCLA Records, CH2M Hill, (1) w/attchs
DCC (1) w/attachments
John Fulton, CH2M Hill, w/o attachments
Bob Ransbottom, CH2M Hill, w/o attachments
Dave Rakel, CH2M Hill, w/o attachments

3003-040428001

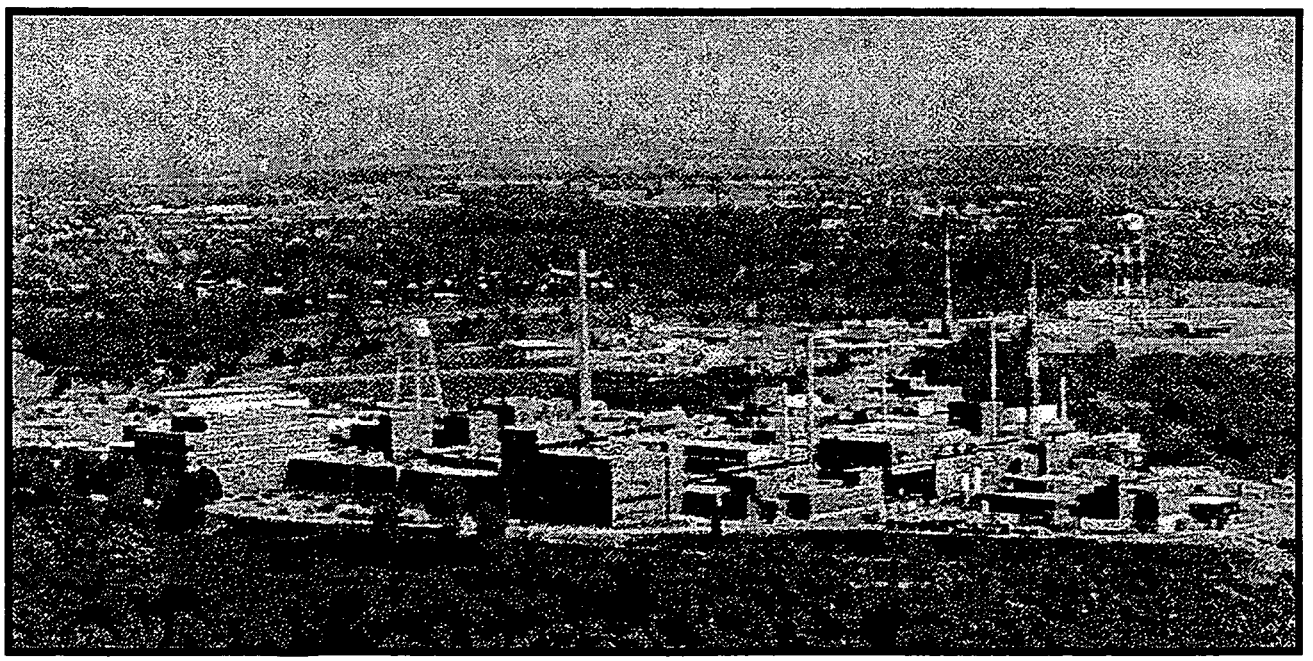
Environmental
Restoration
Program

Miamisburg Closure Project
Building Data Package

Main Hill Water Tower

(Demolition)

Public Review Draft
March 2004



MIAMISBURG CLOSURE PROJECT

BUILDING DATA PACKAGE

The following document is available (March 19, 2004) for public information in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio.

Main Hill Water Tower, Building Data Package

Questions can be referred to Paul Lucas at (937) 847-8350 ext. 314

U.S. Department of Energy
U.S. Environmental Protection Agency
Ohio Environmental Protection Agency

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BDP Main Hill Water Tower

REV	DESCRIPTION	DATE
WORKING DRAFT (to DOE)		**March 2004**
DRAFT (to Core Team)	BDPs for construction demolitions undergo simultaneous review by the Core Team and public.	**N/A**
DRAFT PROPOSED FINAL (incorporates Core Team comments)		**N/A**
PUBLIC REVIEW DRAFT	The public review period will be 19 March through 18 April 2004.	**March 2004**
FINAL		

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Tables

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continued

Appendices

1.0 GENERAL OVERVIEW

1.1 Introduction

The purpose of this Building Data Package (BDP) is to prepare for the demolition of the Main Hill Water Tower and to identify, if possible, any recognized environmental conditions (defined below) that may affect the subject property and structure.

Recognized Environmental Condition: The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a likely release, a past release, or a material threat of a release of any hazardous substances or petroleum into structures, or into the air, ground, groundwater, or surface water near the buildings.

1.2 Scope

This document has been prepared in accordance with the agreements and requirements as specified in the *Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach*. This document is a BDP for the Main Hill Water Tower located at the Department of Energy (DOE) Miamisburg Closure Project (MCP) in Miamisburg, Ohio. The investigation performed to support this BDP models procedures found in *ASTM Standard Practice for Environmental Site Assessments; Phase I Environmental Site Assessment Process* (Designation E 1527-97).

The scope of the investigation included the Main Hill Water Tower, the soil beneath, and a 15-foot wide perimeter border around the structure. The investigation of the Main Hill Water Tower included the following:

A) A structure and perimeter inspection.
B) An examination of historical aerial photographs and maps.
C) A review of federal and state regulatory agency records.
D) Personnel interviews.
E) A review of site records for:

    1) History of spills, releases and chemical inventories
    2) Past sampling data

        - Radiological survey
        - Soil sampling
        - Lead-based paint
        - Asbestos
        - Radon

In addition to the structure investigation conducted by site contractor personnel, documents were reviewed. Information used to compile BDPs includes the following:

- Characterization of Mound's Hazardous, Radioactive, and Mixed Wastes, August 1990
- Operable Unit 9 (OU-9) Site Scoping Report, Volumes 1-12
- Mound Facility Physical Characterization, December 1992
- Active Underground Storage Tank Plan, November 1994
- OU-9 Hydrological Investigation, Bedrock Report, January 1994
- OU-9 Hydrological Investigation, Buried Valley Aquifer Report, March 1994
- Environmental Appraisal Report of the Mound Plant, March 1996
- Title Search
- Lease Information
- EDR Report - Radius Map
- Structure Drawings
- Potential Release Site (PRS) information
- MD-22153, Mound Site Radionuclides By Location, June 1995 Contaminant Surveys
- MLM-3791, Mound Facility Physical Characterization, December 1993

2.0 MAIN HILL WATER TOWER OVERVIEW

The Main Hill Water Tower (Figure 3) is a 100,000-gallon elevated steel water tank and tower. It contains a 50,000-gallon capacity for service water and a 50,000-gallon capacity for fire reserve. The tank dimensions are approximately 28 feet diameter with a 16-foot shell height, and it has a cone roof and an elliptical bottom. The tank is supported by four legs, each approximately 107 feet tall. The overall height of the structure is approximately 133 feet.

The water tower is located on the "Main Hill" of the Mound site (west of Building 28 and east of P [Powerhouse] Building), in the north central portion of the site (Figure 1).

2.1 Past and Current Uses of the Main Hill Water Tower

The tower was originally erected and put in service in 1941 in Weldon Springs, Missouri. Because of the steel shortage following World War II, the tower was dismantled, moved to Ohio, and re-erected on the Main Hill of the Mound site. The top of the tank was replaced in 1990.

It has served the same function as a water storage tank for service water and fire reserve water since it was erected at the Mound site.

Safe Shutdown activities will be conducted prior to the commencement of demolition.

2.3 Summary of Environmental Concerns and Findings –Main Hill Water Tower

Table 1: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Lead-Based Paint	No previous lead surveys or sampling data could be found for the Main Hill Water Tower. On March 15, 2004, Mr. Chris Ahlquist (an Industrial Hygienist with CH2M Hill Mound) collected real-time readings on the lead content of the paint coating on several areas of the water tower's structural steel surface. All areas tested were found to contain lead. Since the structure is scheduled for imminent demolition, areas which are going to be torch cut will be stripped of paint prior to the cutting process in order to alleviate the potential for airborne lead exposure. (Appendix J).	Any disturbances of the affected paint coatings by close worker contact (i.e. sanding, grinding, scraping, etc.), will necessitate the use of appropriate Personal Protective Equipment (PPE) and engineering controls as required under the OSHA Construction Standard for Lead (29 CFR 1926.62). These determinations were made by Mr. Chris Ahlquist who is an Ohio Department of Health Licensed Lead Risk Assessor. Waste Management performed worst-case scenario calculations to determine that structure demolition debris containing lead-based paint meets the waste acceptance criteria at the landfill. Also see Soil Sampling at the end of this table.
Chemicals	The interior surface of the water tower tank is coated with a rust inhibitor (product name NO-OX-ID).	Per Waste Management, the presence of this coating will not effect debris disposition. No further action required.
Ballasts associated with Fluorescent Lamps	N/A	N/A
Air Emissions	N/A	N/A

Table 1: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Asbestos	On January 20, 2004, Mr. Chris Ahlquist performed a survey of all exposed areas of the Main Hill Water Tower in order to identify all asbestos-containing materials prior to demolition of the structure. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist. A paper wrap on the exterior of the pipe riser inside the central column was identified as suspect for containing asbestos. The material was sampled and analyzed for asbestos content and found to not contain asbestos. No other materials suspect for asbestos were identified. (Appendix I)	No further action required.
Drainage Sumps	N/A	N/A
Lead	N/A	N/A
Mercury	N/A	N/A
Radiological	Predemolition surveys are not feasible as the structure is elevated approximately 100 feet above the ground.	Following demolition, radiological surveys will be performed on the debris piles to determine end disposition per Waste Management direction. Results of radiological surveys will be provided in the Closeout Report.
Septic System	N/A	N/A
Wastewater	N/A	N/A
Stains & Corrosion	N/A	N/A
Storage Tanks	Approximately 49 feet south of the water tower is a 50,000 gallon above ground tank used for #2 fuel oil storage. The tank was installed in the mid 1990s and provides standby fuel for the two boilers in P Building. There is a secondary containment concrete barrier around the tank.	Demolition (per Work Plan, Appendix O) will be performed in a manner that ensures the water tower falls to the north, away from the fuel oil tank. The fuel oil tank is believed to have had no environmental impact on the water tower. No further action necessary.
Solid Waste Disposal	N/A	N/A
Migratory Hazards	N/A	N/A
Radon	N/A	N/A
HVAC	N/A	N/A
Energetic Materials	N/A	N/A

Table 1: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Soil Contamination	Appendix L contains graphics showing all soil sample locations within 15 feet of the perimeters of the Main Hill Water Tower, and provides tables for detected compounds (results above laboratory detection limits) and non-detected compounds (results below laboratory detection limits). All results are below applicable screening levels (Core Team approved or the more stringent of either 10^{-6} Risk-Based Guideline Value [RBGV] plus background or Hazard Index = 1).	Historical soil sampling showed no indication of radiological contamination. However, because the tower had lead-based paint and had previously been sand blasted prior to repainting, soil samples will be collected from around the base following demolition to confirm that no lead hazard exists. Soil sampling will be performed per the Work Plan (Appendix O). If contamination is detected, the Core Team will be notified and appropriate actions taken. Analytical results will be provided in the Closeout Report.

N/A: Not applicable

2.4 Radiological Information for the Main Hill Water Tower

Predemolition radiological surveys are not feasible as the structure is elevated 100 feet above the ground. Following demolition, radiological surveys will be performed on the debris piles to determine end disposition per Waste Management direction. Copies of the radiological surveys will be provided in the Main Hill Water Tower Closeout Report.

3.0 SITE DESCRIPTION

3.1 Site/Vicinity Location and Characteristics

The Main Hill Water Tower is located at the DOE MCP site, formerly known as the Mound Plant. The MCP site is situated in the City of Miamisburg, Miami Township, Montgomery County, State of Ohio as shown in Appendix B.

The Mound Plant at one time was situated on approximately 300 acres of land and contained approximately 130 buildings with a total of approximately 1.4 million square feet of floor space (the number of buildings is constantly diminishing as buildings are decommissioned and either sold or demolished). The original 182-acre site, purchased by the Manhattan Engineer District in 1946, consisted of two hills and an intervening valley that runs approximately east and west. The 124-acre tract acquired in 1981 was an undeveloped mixture of fields and woods that undulates and slopes downward to the west, away from the main site. This area was acquired to serve as a buffer and has been used as a staging area and parking area for contractors working onsite.

To the west lie a railroad line and the north south trending Miami-Erie Canal. The northern boundaries of the site abut the residential area of Miamisburg, Ohio. Mound Road marks

the northern half of the eastern perimeter of the facility then veers east, away from the southern half of the eastern boundary. A public golf course (belonging to the City of Miamisburg), the Miamisburg Mound Memorial Park, old agricultural fields, residential lots, and vacant wooded lots border the facility along Mound Road. Benner Road formed the southern property line of the Mound Plant (at the 300-acre stage), with agricultural fields and farms occupying the lands beyond.

3.2 Description of Structures, Roads, and Other Improvements in Proximity to the Main Hill Water Tower

The area under and around the Main Hill Water Tower is covered with grass. The water tower is bordered to the east by Building 28, to the south by a 50,000-gallon above ground fuel oil storage tank, to the west by P Building, and the north by an asphalt roadway and a large dirt area (previously occupied by the recently demolished Buildings W and GW).

3.3 Current and Past Uses of Buildings in Proximity to the Main Hill Water Tower

Current buildings and above ground tank in proximity to the water tower include:

- Building 28 (Ceramic Fabrication Facility), located approximately 54 feet east of the water tower, is a 11,329 square-foot building currently used as a maintenance and machine shop. Building 28 is leased from DOE to MMCIC who leases it to a private enterprise.

- P Building (Powerhouse Building), located approximately 57 feet west of the water tower is a one-story (with mezzanine), 15,143 square-foot building that contains the facilities and equipment necessary to provide the site with centralized process and breathing air, steam and condensate, chilled water supply and return, potable water, and electrical power distribution. It is in the process of being prepared for demolition.

- A 50,000 gallon above ground tank, used for storage of #2 fuel oil, is located approximately 49 feet south of the water tower. It has a concrete secondary containment barrier around it.

Previous buildings in proximity to the water tower include:

- GW Building (Receiving/Inspection), located north/northwest of the water tower, was built in 1968, and demolished in 2003. It was a two-story building with 9,782 square feet of floorspace.

- W Building (Warehouse Building), located north of the water tower, was built in 1948 and demolished in 2003. It was a single-story building with 32,484 square-feet of floorspace.

These buildings are believed to have had no adverse environmental impact on the Main Hill Water Tower.

4.0 RECORDS REVIEW

4.1 General/Historical CERCLA Information

In compliance with permit requirements under Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and the Clean Air Act (CAA), Mound Plant has applied for or has received permits for its surface water discharges, air emissions, and hazardous waste program. The site is currently operating a hazardous waste storage facility under a RCRA Part B permit dated October 18, 1996. The site also maintains a National Pollutant Discharge Elimination System (NPDES) surface water discharge permit with Facility I.D. number OH 0009857. Operations that produce particulate or vaporous emissions are either permitted or registered with RAPCA and the Ohio Environmental Protection Agency (OEPA). The site also submits annual Emergency and Hazardous Chemical Inventory forms to OEPA, pursuant to the Superfund Amendment and Reauthorization Act (SARA), Title III, the Emergency Planning and Community Right-to-Know Act. The March 2002 version of this report did not include the Main Hill Water Tower, as it was not used for chemical storage.

The Mound Plant was identified as a contaminated site on the National Priorities List (NPL) under CERCLA (Superfund) in 1989. The Mound Plant was originally listed due to volatile organic compound (VOC) contamination in the western end of the lower valley area. The cleanup of the site was originally to be accomplished under the CERCLA mandated procedures for regulating Superfund Sites using the operable unit (OU) system to define and characterize cleanup areas. As the cleanup effort went forward, it became apparent that the site did not fit the profile for a cleanup strategy based on the operable units. The DOE, the United States Environmental Protection Agency (USEPA), and OEPA designed a new decision making process for the cleanup of the site.

The new process is known formally as a "removal site evaluation process" and informally as the "Mound 2000 Process." For a more detailed description, refer to the *Work Plan for Environmental Restoration of the DOE Mound Site, the Mound 2000 Approach*. The Mound 2000 Process system divided the site into geographical parcels containing more than 400 PRSs with approximately equal numbers of PRSs concerned with potentially contaminated soil and with potential contamination in or associated primarily with building operations. A PRS is an area where knowledge of historic or current use indicates that the site may have had releases of radioactive and/or hazardous materials. The PRSs were initially identified and documented as part of the Mound site scoping process under the Federal Facility Agreement (FFA). The original list of PRSs can be found in the OU9- Site Scoping Report Volume 12, Site Summary Report, 1994. One of the objectives of the Site Scoping report was to provide a comprehensive summary of PRSs identified through the scoping process. Subsequent to the 1994 Site Scoping Report, additional PRSs have been identified as information became available, bringing the site total to 440 PRSs. The

assignment of a PRS does not necessarily mean that there is a threat to human health or the environment. The tabulation of all PRSs simply provides an explicit means of tracking and evaluating all potential releases onsite, the need for further action, and the identification of the authority responsible for action.

Through the process described above, the specific PRSs in the vicinity of the Main Hill Water Tower are listed in Table 2 along with their binning status. Their locations are shown on Figure 2. All of the six PRSs in the vicinity of the water tower have been determined by the Core Team to require No Further Assessment (NFA). For a PRS to be binned NFA, the Core Team has reviewed the PRS data and agrees that all existing environmental issues associated with that PRS have been resolved and the PRS is protective of human health and the environment. No other PRSs associated with the Main Hill Water Tower have been identified.

4.2 Specific Record Sources for the Main Hill Water Tower

4.2.1 Occurrence Reports

- None

4.2.2 Spills and Releases

- None

4.2.3 Associated PRS Overview

As a result of the investigations and documentation accomplished to comply with the CERCLA cleanup process via the Federal Facilities Agreement (FFA)/DOE Environmental Restoration (ER) Program, DOE and the site contractor tabulated all the PRSs identified under the various regulatory programs in effect at the site. Of these 440 PRSs, six are at or near the Main Hill Water Tower, as identified in Table 2. The PRS locations are shown on Figure 2, and recommendation sheets are provided in Appendix N.

Table 2 - PRSs in Proximity to the Main Hill Water Tower

PRS	CERCLA or Bldg. Related	Binning Status	Comments
113 through 117	CERCLA	NFA*	Powerhouse Soils
126	CERCLA	NFA	Building 28 Solvent Storage Area/Shed

* NFA: No Further Assessment

4.3 Review of Structure Drawings

Structure drawings were reviewed and no significant items were identified. A copy of the original drawing is included in Appendix D.

4.4 Aerial Photographs

Aerial photographs from 1959 (following construction), and 1996 (most recent aerial photo) were reviewed and no significant items were identified. Aerial photographs are presented in Appendix E.

4.5 Interviews

Alan Upshaw (Utilities Manager) and Gary Weidenbach (a site Building Manager) were interviewed regarding possible environmental concerns related to the water tower and its demolition. Both indicated that there were no significant items related to the water tower.

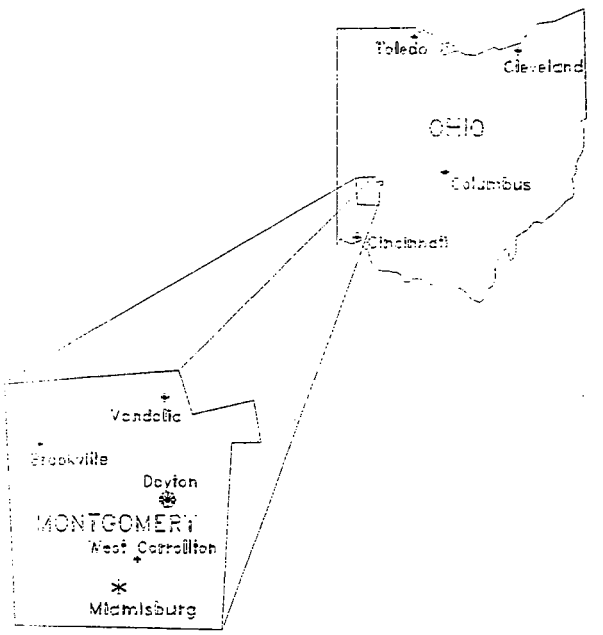
Appendix A

General Listing of Acronyms

ASTM	American Society for Testing and Materials
BDP	Building Data Package
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
cm^2	centimeters squared
CWA	Clean Water Act
DOE	United States Department of Energy
DPM	disintegrations per minute
EPA	United States Environmental Protection Agency
ER	Environmental Restoration (Program)
FFA	Federal Facility Agreement
HAZMAT	hazardous materials
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCP	Miamisburg Closure Project
N/A	not applicable
NPDES	National Pollutant Discharge Elimination System
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PRS	Potential Release Site
RI/FS	Remedial Investigation/Feasibility Study
RAPCA	Regional Air Pollution Control Agency
RCRA	Resource Conservation and Recovery Act
RSDS	Radiological Survey Data Sheet
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

Appendix B

Map of Montgomery County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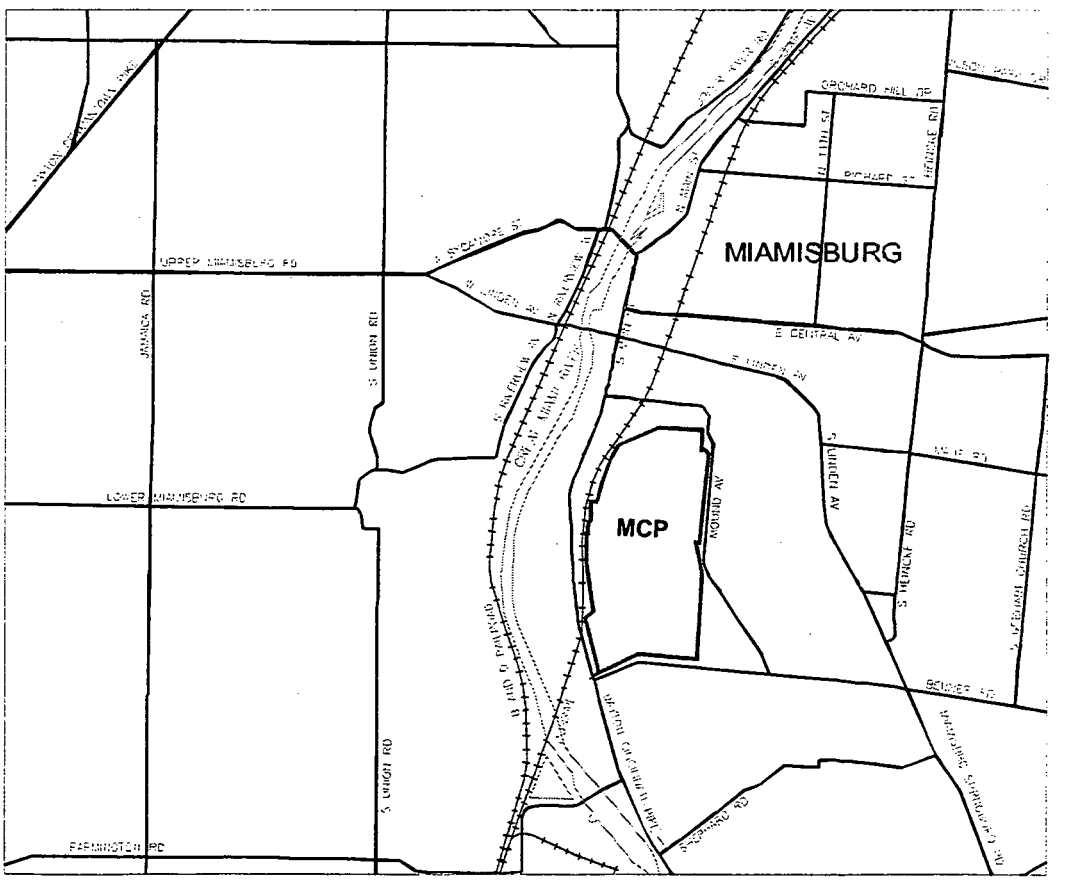
Cleveland
OHIO
Columbus
Cincinnati
Vandalia
Brookville
Dayton
MONTGOMERY
West Carrollton
Miamisburg


MIAMISBURG
MCP
UPPER MIAMISBURG RD
LOWER MIAMISBURG RD
FARMINGTON RD
JAMAICA RD
S UNION RD
E CENTRAL AV
MOUND AV
S PERIMETER RD
BOMBER RD
ORCHARD HILL DR
HERITAGE RD
SPRINGBORO RD

Appendix C

Figures

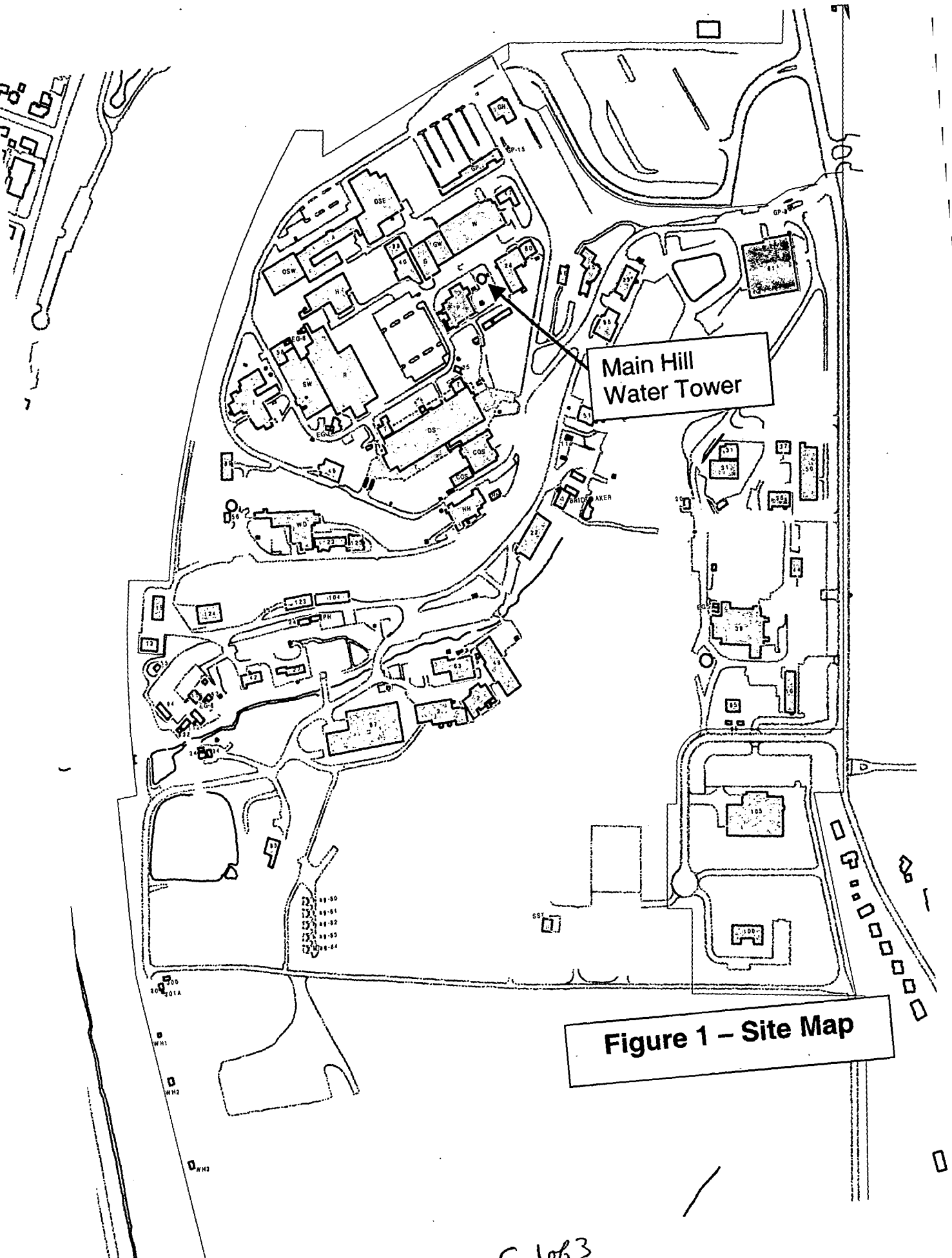
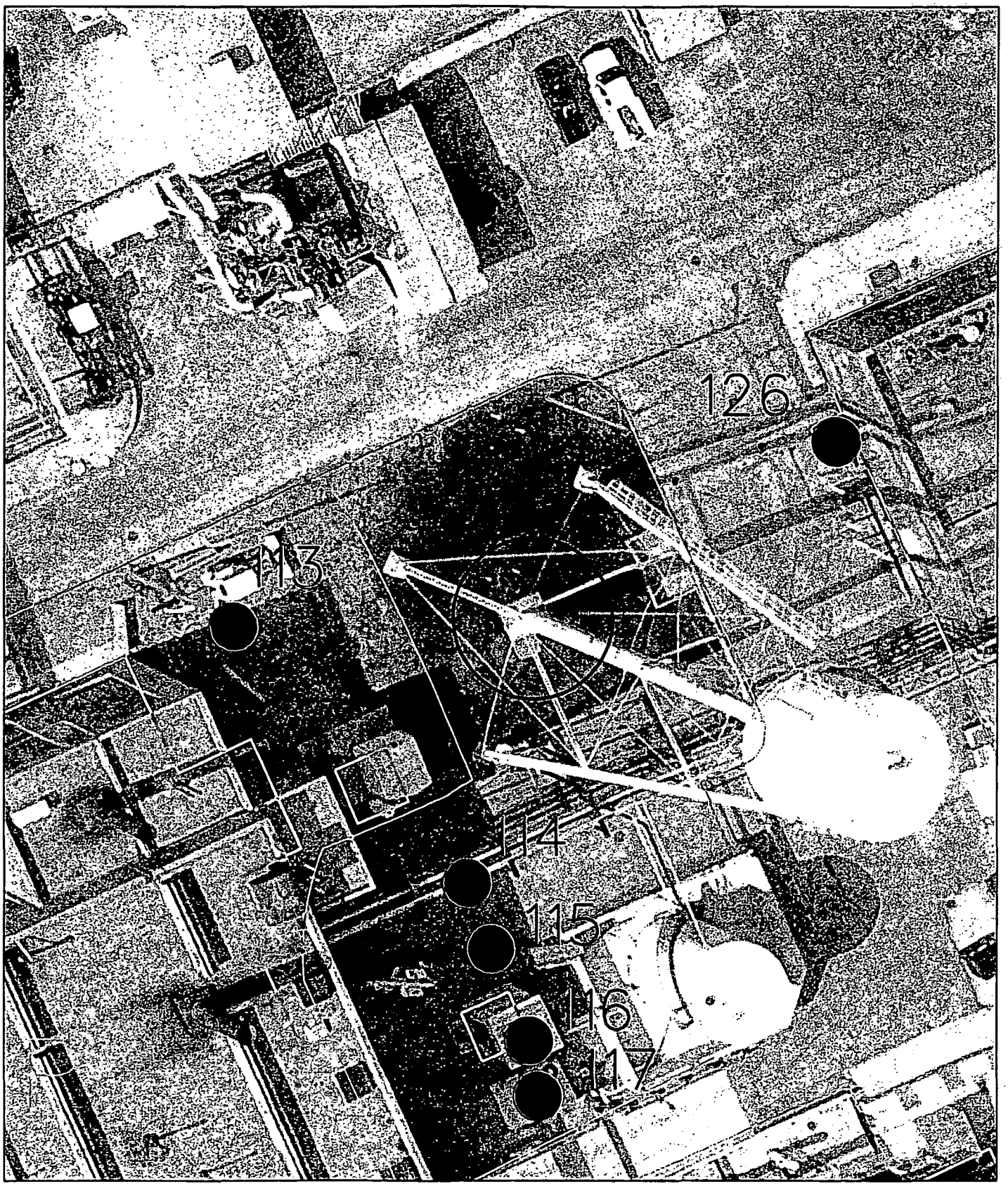


Figure 1 – Site Map

C 1063



PRS Point

PRS Area

PRS Line

GRAPHIC SCALE
10 5 0 10 20FT

MOUND
Environmental Restoration Geographic Information System

Figure 2: Main Hill Water Tower and Vicinity

ISS	DATE	REVISION	BY	CHKR	ENG	LR/EC	APVD	S
	03/11/04		SSP					

SHEET 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ISSUE
SHEET 1 2 3 4 5 6
ISSUE
PART CLASSIFICATION
SECURITY CLASSIFICATION: UNCLASSIFIED
SIZE: D
DRAWING NUMBER: vicinity.dgn
JOB NUMBER
DGN TYPE: STE
PROG: ER-GIS
CADD:
SCALE:
SHEET 1 OF
STATUS: MD-REL-**/**/**
ORIGIN: MSTATION / J

C2063

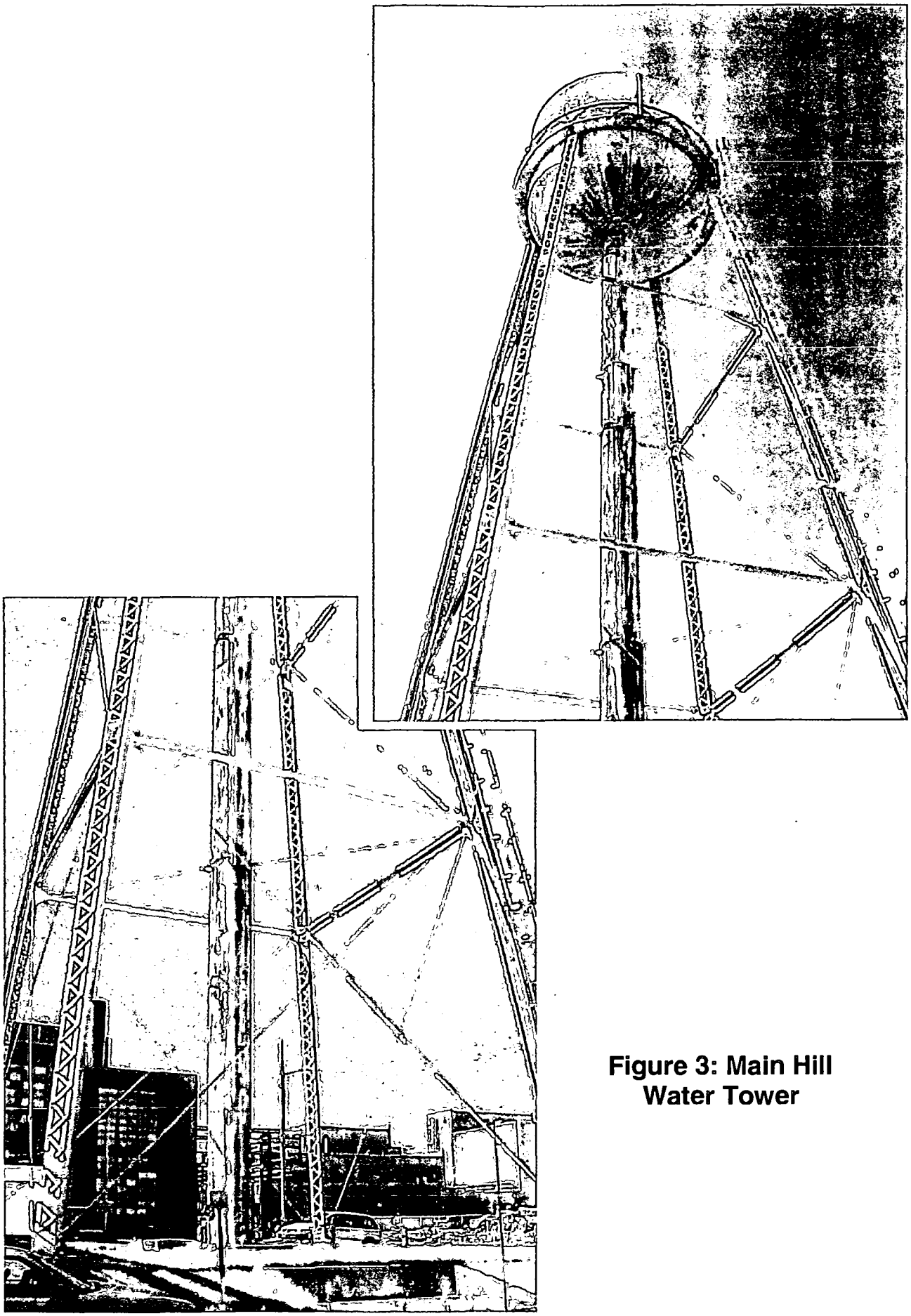
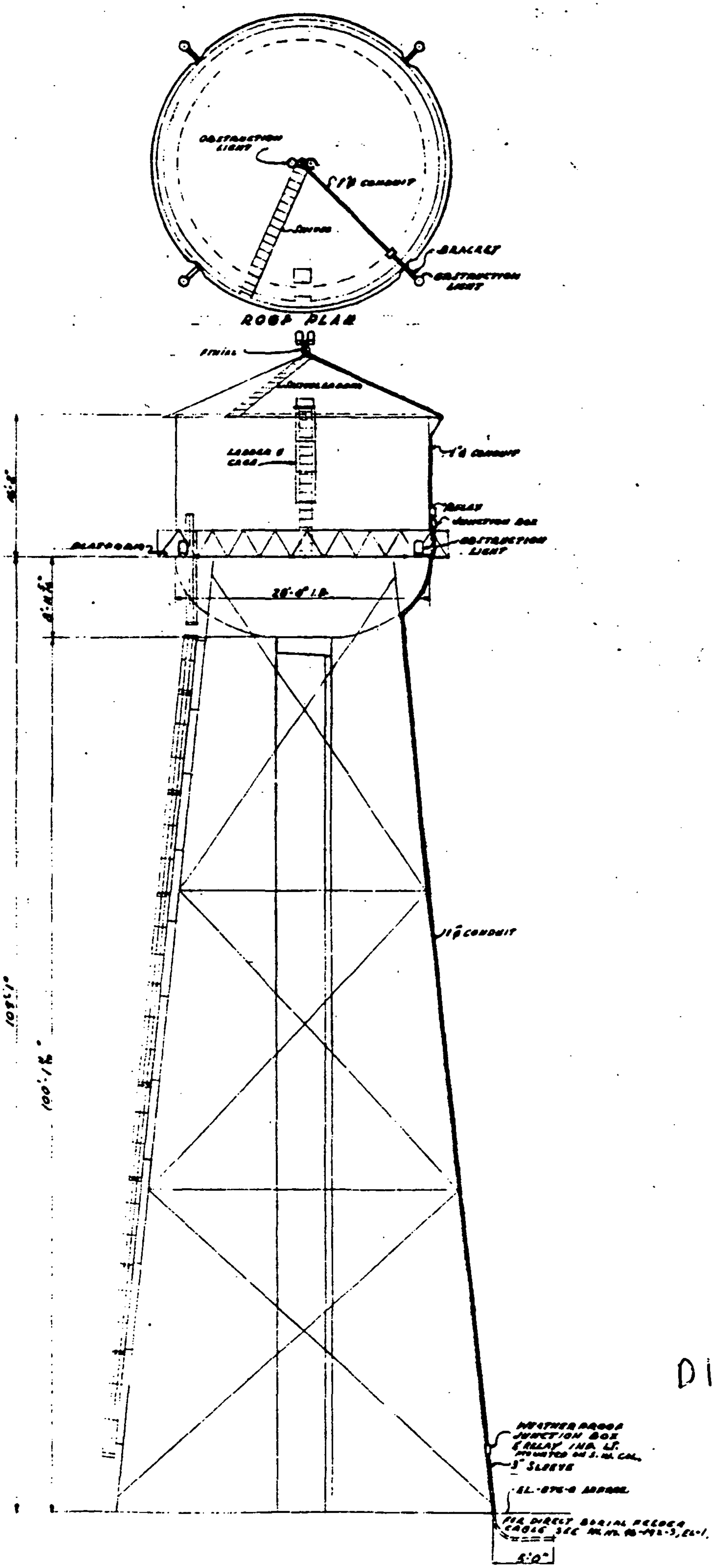


Figure 3: Main Hill Water Tower

C3063

Appendix D

Structure Drawing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BRACKET
OBSTRUCTION LIGHT
ROOF PLAN
FINIAL
LADDER & CAGE
1½" CONDUIT
RELAY
JUNCTION BOX
PLATFORM
OBSTRUCTION LIGHT
1½" CONDUIT
WEATHERPROOF
JUNCTION BOX
3" SLEEVE
5'-0"

D1061

Appendix E

Aerial Photographs

E1082

E2082

Appendix F

Environmental Appraisal Report of the Mound Plant (excerpt)

This appendix is intentionally blank.
The water tower was not included in the Environmental Appraisal;
accordingly, no report excerpt is available.

Appendix G

Radiological Information

This appendix is intentionally blank.
See Section 2.4 for radiological information.

Appendix H

Radon Information

This appendix is intentionally blank.
Radon level is not applicable for open air demolitions.

Appendix I

Asbestos Information

From: Christopher Ahlquist
To: Darnell, Val
Date: 3/15/04 4:36PM
Subject: Main Hill Water Tower

Val -

Lead-Based Paint:

No previous lead surveys or sampling data could be found for the Main Hill Water Tower. On March 15, 2004, Mr. Chris Ahlquist (an Industrial Hygienist with CH2M Hill Mound) collected real-time readings of the lead content of the paint coating several portions of the water tower's structural steel using a Niton Model XL-309 XRF Lead Analyzer; all areas tested were found to contain lead. Since the structure is scheduled for imminent demolition, areas which are going to be torch cut will be stripped of paint prior to the cutting process in order to alleviate the potential for airborne lead exposure.

Any disturbance of the affected paint coatings by close worker contact (i.e. sanding, grinding, scraping, etc.), will necessitate the use of the appropriate Personal Protective Equipment (PPE) and engineering controls as required under the OSHA Construction Standard for Lead (29 CFR 1926.62).

These determinations were made by Mr. Christopher Ahlquist who is an Ohio Department of Health Licensed Lead Risk Assessor.

In addition, Waste Management performed worst-case scenario calculations to determine that structure demolition debris containing lead-based paint meets the waste acceptance criteria at the landfill.

Asbestos

On January 20, 2004, Mr. Chris Ahlquist, an Industrial Hygienist with CH2M Hill Mound, performed a survey of all exposed areas of the Mound Site Main Hill Water Tower in order to identify all asbestos-containing materials prior to demolition of the structure. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist as required by State regulations for individuals assessing asbestos-containing materials. A paper wrap on the exterior of the pipe riser inside the central column was identified as suspect for containing asbestos. This material was sampled and analyzed for asbestos content and found *not* to contain asbestos. No other materials suspect for asbestos were identified.

Let me know if I can be of further assistance,

Chris Ahlquist

CC: Hanson, W. Doug; Hose, Russell; Ransbottom, Robert

Appendix J

Lead Information

From: Christopher Ahlquist
To: Darnell, Val
Date: 3/15/04 4:36PM
Subject: Main Hill Water Tower

Val -

Lead-Based Paint:

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Let me know if I can be of further assistance,

Chris Ahlquist

CC: Hanson, W. Doug; Hose, Russell; Ransbottom, Robert

J 1061

Appendix K

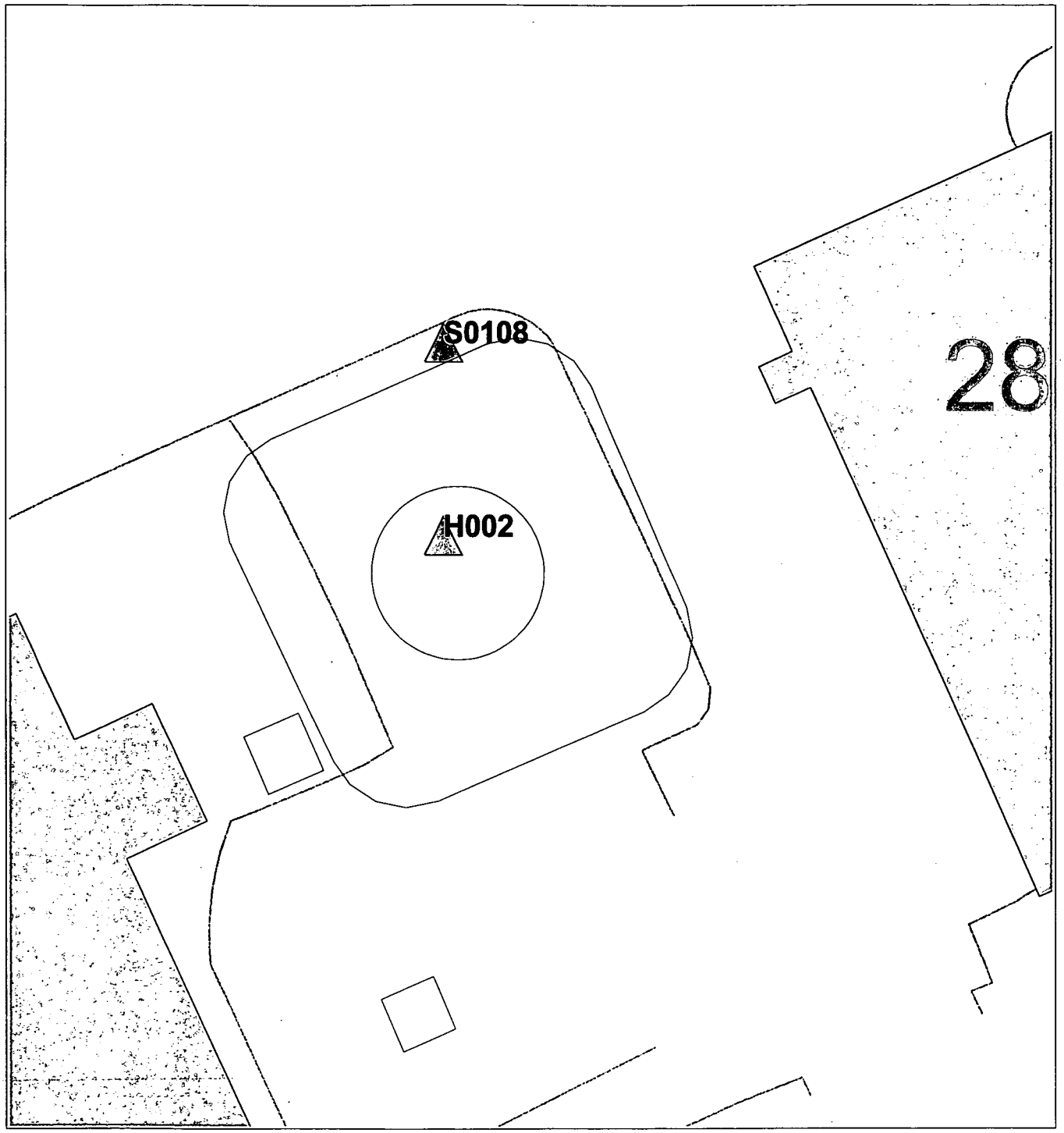
Chemical Information

This appendix is intentionally blank.

Appendix L

Soil Sampling, Vicinity

Sample Locations within 15 feet of Main Hill Water Tower



20 0 20 40 60 80 100 Feet

Sample Detect

N
W E
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03/11/04

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Main Hill Water Tower Detects

Locatio	Sample	Collection_	Value_name	Measured_	Value_	Detection_	Chem	Start_dept	End_depth	CAS_numbe	Lab_	Data	Project_code	Comments
H002	H002	20001031	Cesium-137	0.030000	PCI/G	0.010000	RAD	0.000000	3.000000	10045-97-3			FIREREPAIR	0
H002	H002	20001031	Lead-210	0.310000	PCI/G	0.270000	RAD	0.000000	3.000000	14255-04-0			FIREREPAIR	0
S0108	3061	19831001	Plutonium-238	0.360000	PCI/G	0.010000	RAD	0.000000	0.000000	13981-16-3			RSS	2
H002	H002	20001031	Radium-226	1.000000	PCI/G	0.330000	RAD	0.000000	3.000000	13982-63-3			FIREREPAIR	11
H002	H002	20001031	Thorium-232	0.330000	PCI/G	0.040000	RAD	0.000000	3.000000	7440-29-1			FIREREPAIR	1

Comments — Duplicate entries in the Comment column indicate values for RAD daughters and long lived decay.

- (Blank) No criteria checked
- 0 Value is less than criteria checked in file "Final RBGVs Constr Worker-Site Employee_Rev5.xls"
- 1 Value is greater than 10-6 Risk-Based Guideline Value
- 2 Value is greater than the OU9 Soil Backgroun Value
- 3 Value is greater than the Screening Value (10-6 RBGV + background or as agreed)
- 4 Value is greater than the Cleanup Objective (10-5 RBGV + background or as agreed)
- 5 Value is greater than the MCL
- 6 Value is greater than the Guide Value based on the Hazard Index = 1
- 7 Value is greater than the Hot Spot Criteria (3x10-5 + background or as agreed)
- 8 Value is greater than the Guide Value based on the Hazard Index = 1 + background

Lab and data qualifiers are defined on the pages immediately following the non-detects table in this appendix.
Comparison values for results with comments are provided on the "Comparisons for Soil Analytical Restuls" table at the end of this appendix.

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Main Hill Water Tower Non-Detects

Locatio	Sampl	Collection_d	Value_name	Measured_v	Value_u	Detection_li	Chem_	Start_dept	End_depth	CAS_numb	Lab	Data	Project_code
H002	H002	20001031	Actinium-227	0.130000	PCI/G	0.130000	RAD	0.000000	3.000000	14952-40-0	U		FIREREPAIR
H002	H002	20001031	Americium-241	0.030000	PCI/G	0.030000	RAD	0.000000	3.000000	14596-10-2	U		FIREREPAIR
H002	H002	20001031	Cobalt-60	0.010000	PCI/G	0.010000	RAD	0.000000	3.000000	10198-40-0	U		FIREREPAIR
H002	H002	20001031	Plutonium-238	10.020000	PCI/G	10.020000	RAD	0.000000	3.000000	13981-16-3	U		FIREREPAIR
H002	H002	20001031	Thorium-230	2.710000	PCI/G	2.710000	RAD	0.000000	3.000000	14269-63-7	U		FIREREPAIR
S0108	3061	19831001	Thorium-232	2.000000	PCI/G	2.000000	RAD	0.000000	0.000000	7440-29-1	U		RSS

Lab and data qualifiers are defined on the pages immediately following the non-detects table in this appendix.

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LABORATORY DATA QUALIFIERS (LABQUAL)

The following qualifiers will be applied to the organic analysis results by the laboratory in accordance with CLP SOW direction:

ORGANICS

U	Indicates compound was analyzed for but not detected. The associated sample quantitation limit will be the CRQL, corrected for dilution and for percent moisture.
J	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) assuming a 1:1 response, 2) when the qualitative data indicated the presence of a compound that meets the volatile, semivolatile, and pesticide/Aroclor identification criteria, and the result is less than the CRQL but greater than zero.
N	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where identification is based on a mass spectral library search.
P	Used for pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns.
C	Applies to pesticide results where the identification has been confirmed by GC/MS.
B	Used when the analyte is found in the associated blank as well as in the sample. This flag must be used for a TIC as well as for a positively identified target compound.
E	Identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
D	Identifies all compounds identified in an analysis at a secondary dilution factor.
A	Indicates that a TIC is a suspected aldol-condensation product.

INORGANICS

B	Indicates that the reported value was obtained from a reading that was less than the CRDL but greater than or equal to the Instrument Detection Limit (IDL).
U	Indicates that the analyte was analyzed for but not detected.
E	Indicates the reported value is estimated because of the presence of interferences.
M	Duplicate injection precision was not met.
N	Spiked sample recovery not within control limits.
S	Reported value was determined by the Method of Standard Additions (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbency is less than 50% of spike absorbency.
*	Duplicate analysis not within control limits.
+	Correlation coefficient for the MSA is less than 0.995.

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DATA QUALIFIER CODES (DATAQUAL)

ORGANICS AND INORGANICS

U	The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
J	The associated numerical value is an estimated quantity.
R	The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
N	Presumptive evidence of the presence of the material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
UJ	The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

SUB-QUALIFIER CODES

ORGANICS

D	Duplicates
B	Qualified due to blank
C	Qualified due to calibration
H	Holding time exceeded
K	Qualified due to surrogate recovery
L	Qualified due to Laboratory Control Sample
S	Qualified due to matrix spike recovery
I	Qualified due to internal standard
N	Tentative identification (only for TICs)
P	Pesticide/PCB results have >25 percent difference on two different columns
+	Positive bias (added after subqualifier)
-	Negative bias (added after subqualifier)

INORGANICS

D	Duplicates
B	Qualified due to blank
C	Qualified due to calibration
H	Holding time exceeded
L	Qualified due to Laboratory Control Sample
S	Qualified due to matrix spike recovery
I	Qualified due to interference
+	Positive bias (added after subqualifier)
-	Negative bias (added after subqualifier)
Examples of final qualification might be J-C, UJ-S(+), UJ-BC(-), etc.	

The subqualifiers have been included to clarify any reports you may use. The subqualifiers have been captured when it was included in the electronic data submitted by the contractor. Most of the data in MEIMS does not include them.

The above data was extracted from the OU9 Site Wide Quality Assurance Project Plan, pages 9-16 and Appendix H page 3-1. It was updated from the Methods Compendium.

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Comparisons for Soil Analytical Results

Screening Level (RBGV 10-6 + background, or as agreed)

7440-38-2	Arsenic	1.06E+01	MG/KG
7440-41-7	Beryllium	2.25E+03	MG/KG
7440-43-9	Cadmium	3.00E+03	MG/KG
18540-29-9	Chromium VI	4.50E+02	MG/KG
7440-02-0	Nickel	1.13E+04	MG/KG
55684-94-1	1,2,3,6,7,8-HxCDF	1.99E-04	MG/KG
19408-74-3	1,2,3,7,8,9-HxCDD	4.81E-04	MG/KG
57117-41-6	1,2,3,7,8-PeCDF	3.97E-05	MG/KG
57117-31-4	2,3,4,7,8-PeCDF	3.97E-04	MG/KG
1746-01-6	2,3,7,8-TCDD	1.99E-05	MG/KG
51207-31-9	2,3,7,8-TCDF	1.99E-04	MG/KG
37871-00-4	HpCDD	1.99E-03	MG/KG
38998-75-3	HpCDF	1.99E-03	MG/KG
34465-46-8	HxCDD	1.99E-04	MG/KG
3268-87-9	OCDD	1.99E-02	MG/KG
39001-02-0	OCDF	1.99E-02	MG/KG
36088-22-9	PeCDD	3.97E-05	MG/KG
118-96-7	2,4,6-Trinitrotoluene	9.94E+01	MG/KG
121-82-4	RDX	2.71E+01	MG/KG
72-54-8	4,4'-DDD	1.66E+01	MG/KG
72-55-9	4,4'-DDE	1.31E+01	MG/KG
50-29-3	4,4'-DDT	2.18E+01	MG/KG
309-00-2	Aldrin	1.75E-01	MG/KG
319-84-6	Alpha-BHC	4.73E-01	MG/KG
12674-11-2	Aroclor-1016	1.49E+00	MG/KG
11104-28-2	Aroclor-1221	1.49E+00	MG/KG
11141-16-5	Aroclor-1232	1.49E+00	MG/KG
53469-21-9	Aroclor-1242	1.49E+00	MG/KG
12672-29-6	Aroclor-1248	1.49E+00	MG/KG
11097-69-1	Aroclor-1254	5.95E+01	MG/KG
11096-82-5	Aroclor-1260	1.49E+00	MG/KG
319-85-7	Beta-BHC	1.66E+00	MG/KG
60-57-1	Dieldrin	1.86E-01	MG/KG
58-89-9	Gamma-BHC (Lindane)	2.29E+00	MG/KG
76-44-8	Heptachlor	6.62E-01	MG/KG
1024-57-3	Heptachlor Epoxide	3.28E-01	MG/KG
1336-36-3	Polychlorinated Biphenyls (PCBs)	1.49E+00	MG/KG
8001-35-2	Toxaphene	2.71E+00	MG/KG
122-66-7	1,2-Diphenylhydrazine	3.73E+00	MG/KG
106-46-7	1,4-Dichlorobenzene	1.24E+02	MG/KG
108-60-1	2,2'-oxybis(1-chloropropane)	4.26E+01	MG/KG
88-06-2	2,4,6-Trichlorophenol	2.71E+02	MG/KG
121-14-2	2,4-Dinitrotoluene	4.38E+00	MG/KG
606-20-2	2,6-Dinitrotoluene	4.38E+00	MG/KG
91-94-1	3,3'-Dichlorobenzidine	6.62E+00	MG/KG
99-09-2	3-Nitroaniline	7.84E+01	MG/KG
100-01-6	4-Nitroaniline	7.84E+01	MG/KG
92-87-5	Benzidine	1.30E-02	MG/KG

56-55-3	Benzo(a)anthracene	4.08E+00	MG/KG
50-32-8	Benzo(a)pyrene	4.08E-01	MG/KG
205-99-2	Benzo(b)fluoranthene	4.08E+00	MG/KG
207-08-9	Benzo(k)fluoranthene	4.08E+01	MG/KG
111-44-4	Bis(2-chloroethyl)ether	2.71E+00	MG/KG
117-81-7	Bis(2-ethylhexyl)phthalate	2.13E+02	MG/KG
86-74-8	Carbazole	1.49E+02	MG/KG
218-01-9	Chrysene	4.08E+02	MG/KG
53-70-3	Dibenz(a,h)anthracene	4.08E-01	MG/KG
118-74-1	Hexachlorobenzene	1.86E+00	MG/KG
87-68-3	Hexachlorobutadiene	3.82E+01	MG/KG
67-72-1	Hexachloroethane	2.13E+02	MG/KG
193-39-5	Indeno(1,2,3-cd)pyrene	4.08E+00	MG/KG
78-59-1	Isophorone	3.14E+03	MG/KG
621-64-7	N-Nitroso-di-n-propylamine	4.26E-01	MG/KG
62-75-9	N-Nitrosodimethylamine	5.84E-02	MG/KG
86-30-6	N-Nitrosodiphenylamine	6.08E+02	MG/KG
87-86-5	Pentachlorophenol	2.48E+01	MG/KG
630-20-6	1,1,1,2-Tetrachloroethane	6.95E+00	MG/KG
79-34-5	1,1,2,2-Tetrachloroethane	8.88E-01	MG/KG
79-00-5	1,1,2-Trichloroethane	1.90E+00	MG/KG
75-35-4	1,1-Dichloroethene	1.21E-01	MG/KG
96-18-4	1,2,3-Trichloropropane	4.26E-01	MG/KG
96-12-8	1,2-Dibromo-3-Chloropropane	2.12E+00	MG/KG
107-06-2	1,2-Dichloroethane	7.61E-01	MG/KG
78-87-5	1,2-Dichloropropane	4.38E+01	MG/KG
107-13-1	Acrylonitrile	5.15E-01	MG/KG
71-43-2	Benzene	1.45E+00	MG/KG
100-44-7	Benzyl Chloride	1.75E+01	MG/KG
75-27-4	Bromodichloromethane	4.81E+01	MG/KG
75-25-2	Bromoform	3.77E+02	MG/KG
56-23-5	Carbon Tetrachloride	5.38E-01	MG/KG
67-66-3	Chloroform (Trichloromethane)	5.15E-01	MG/KG
74-87-3	Chloromethane	2.71E+00	MG/KG
124-48-1	Dibromochloromethane	3.55E+01	MG/KG
75-09-2	Dichloromethane (Methylene Chloride)	2.03E+01	MG/KG
106-93-4	Ethylene Dibromide (1,2-Dibromoethane)	3.37E-02	MG/KG
127-18-4	Tetrachloroethene	1.87E+01	MG/KG
79-01-6	Trichloroethene	5.09E+00	MG/KG
75-01-4	Vinyl Chloride	4.14E-01	MG/KG
14952-40-0	Actinium-227	4.48E+00	PCI/G
14952-40-0	Actinium-227+D	5.63E-01	PCI/G
14952-40-0	Actinium-227 long lived decay	5.63E-01	PCI/G
14331-83-0	Actinium-228	1.93E-01	PCI/G
14596-10-2	Americium-241	6.31E+00	PCI/G
14683-10-4	Antimony-124	9.84E-02	PCI/G
14234-35-6	Antimony-125	4.83E-01	PCI/G
14234-35-6	Antimony-125+D	4.83E-01	PCI/G
13981-41-4	Barium-133	6.07E-01	PCI/G
13981-41-4	Barium-133m	4.41E+00	PCI/G
14798-08-4	Barium-140	1.13E+00	PCI/G
13966-02-4	Beryllium-7	4.11E+00	PCI/G

13982-38-2	Bismuth-207	1.75E-01	PCI/G
14331-79-4	Bismuth-210	5.51E+01	PCI/G
14331-79-4	Bismuth-210m	1.00E+00	PCI/G
15229-37-5	Bismuth-211	4.66E+00	PCI/G
14913-49-6	Bismuth-212	9.87E-01	PCI/G
14733-03-0	Bismuth-214	1.17E-01	PCI/G
13967-74-3	Cerium-141	3.80E+00	PCI/G
14762-78-8	Cerium-144	8.87E+00	PCI/G
14762-78-8	Cerium-144+D	3.21E+00	PCI/G
13967-70-9	Cesium-134	1.23E-01	PCI/G
13967-70-9	Cesium-134m	1.74E+01	PCI/G
10045-97-3	Cesium-137	3.81E+01	PCI/G
10045-97-3	Cesium-137 +D	7.62E-01	PCI/G
10045-97-3	Cesium-137 long lived decay	7.62E-01	PCI/G
14392-02-0	Chromium-51	6.89E+00	PCI/G
13981-50-5	Cobalt-57	2.46E+00	PCI/G
13981-38-9	Cobalt-58	1.95E-01	PCI/G
13981-38-9	Cobalt-58m	4.78E+03	PCI/G
10198-40-0	Cobalt-60	7.06E-02	PCI/G
10198-40-0	Cobalt-60m	4.71E+01	PCI/G
13981-15-2	Curium-244	9.20E+00	PCI/G
14683-23-9	Europium-152	1.65E-01	PCI/G
14683-23-9	Europium-152m	6.57E-01	PCI/G
15585-10-1	Europium-154	1.50E-01	PCI/G
14391-16-3	Europium-155	6.98E+00	PCI/G
14596-12-4	Iron-59	1.50E-01	PCI/G
13981-28-7	Lanthanum-140	7.61E-02	PCI/G
14255-04-0	Lead-210	2.10E+00	PCI/G
14255-04-0	Lead-210+D	1.80E+00	PCI/G
14255-04-0	Lead-210 long lived decay	1.82E+00	PCI/G
15092-94-1	Lead-212	1.66E+00	PCI/G
15067-28-4	Lead-214	8.92E-01	PCI/G
13966-31-9	Manganese-54	2.25E-01	PCI/G
13982-78-0	Mercury-203	9.47E-01	PCI/G
13994-20-2	Neptunium-237	7.01E+00	PCI/G
13994-20-2	Neptunium-237+D	1.04E+00	PCI/G
13967-76-5	Niobium-95	2.48E-01	PCI/G
13967-76-5	Niobium-95m	3.73E+00	PCI/G
13981-16-3	Plutonium-238	5.50E+01	PCI/G
PU-238/239	Plutonium-238/239	6.21E+00	PCI/G
15117-48-3	Plutonium-239	6.21E+00	PCI/G
PU-239/240	Plutonium-239/240	6.21E+00	PCI/G
14119-32-5	Plutonium-241	5.06E+02	PCI/G
13982-10-0	Plutonium-242	6.33E+00	PCI/G
13981-52-7	Polonium-210	2.09E+00	PCI/G
13966-00-2	Potassium-40	3.81E+01	PCI/G
14331-85-2	Protactinium-231	2.83E+00	PCI/G
14331-85-2	Protactinium-231+D	4.00E+00	PCI/G
14331-85-2	Protactinium-231 long lived decay	1.28E+00	PCI/G
13981-14-1	Protactinium-233	1.01E-01	PCI/G
15100-28-4	Protactinium-234	1.27E+01	PCI/G
15100-28-4	Protactinium-234m	1.20E+00	PCI/G

15623-45-7	Radium-223	3.24E+00	PCI/G
13233-32-4	Radium-224	5.91E+00	PCI/G
13981-53-8	Radium-225	2.17E+00	PCI/G
13982-63-3	Radium-226	2.10E+00	PCI/G
13982-63-3	Radium-226+D	2.09E+00	PCI/G
13982-63-3	Radium-226 long lived decay	2.73E+00	PCI/G
15262-20-1	Radium-228	1.47E+00	PCI/G
15262-20-1	Radium-228+D	1.47E+00	PCI/G
15262-20-1	Radium-228 long lived decay	1.83E+00	PCI/G
13968-53-1	Ruthenium-103	1.40E+01	PCI/G
13967-48-1	Ruthenium-106	8.77E-01	PCI/G
13967-48-1	Ruthenium-106+D	9.09E-02	PCI/G
13967-63-0	Scandium-46	1.22E-01	PCI/G
14391-65-2	Silver-108m	1.14E+02	PCI/G
14378-38-2	Silver-109m	8.50E-02	PCI/G
13966-32-0	Sodium-22	3.98E-01	PCI/G
13967-73-2	Strontium-85	1.07E+00	PCI/G
13967-73-2	Strontium-85m	3.55E+01	PCI/G
14158-27-1	Strontium-89	1.80E+01	PCI/G
10098-97-2	Strontium-90	1.01E+01	PCI/G
10098-97-2	Strontium-90+D	7.70E-01	PCI/G
14133-76-7	Technetium-99	2.14E+02	PCI/G
14913-50-9	Thallium-208	4.98E-02	PCI/G
15623-47-9	Thorium-227	2.09E+00	PCI/G
14274-82-9	Thorium-228	7.08E+00	PCI/G
14274-82-9	Thorium-228+D	1.61E+00	PCI/G
14274-82-9	Thorium-228 long lived decay	1.61E+00	PCI/G
15594-54-4	Thorium-229	1.89E+00	PCI/G
15594-54-4	Thorium-229+D	5.06E-01	PCI/G
15594-54-4	Thorium-229 long lived decay	5.06E-01	PCI/G
14269-63-7	Thorium-230	1.01E+01	PCI/G
14269-63-7	Thorium-230+D	2.00E+00	PCI/G
14269-63-7	Thorium-230 long lived decay	1.99E+00	PCI/G
7440-29-1	Thorium-232	8.60E+00	PCI/G
7440-29-1	Thorium-232+D	1.47E+00	PCI/G
15065-10-8	Thorium-234	1.76E+01	PCI/G
13966-06-8	Tin-113	3.56E+01	PCI/G
15832-50-5	Tin-126	6.91E+00	PCI/G
10028-17-8	Tritium	7.58E+03	PCI/G
14158-29-3	Uranium-232	2.90E+00	PCI/G
13968-55-3	Uranium-233	1.03E+01	PCI/G
13968-55-3	Uranium-233+D	4.80E-01	PCI/G
13968-55-3	Uranium-233 long lived decay	4.82E-01	PCI/G
U-233/234	Uranium-233/234	4.82E-01	PCI/G
13966-29-5	Uranium-234	1.16E+01	PCI/G
13966-29-5	Uranium-234+D	1.20E+00	PCI/G
15117-96-1	Uranium-235	1.67E+00	PCI/G
15117-96-1	Uranium-235+D	1.60E+00	PCI/G
15117-96-1	Uranium-235 long lived decay	4.20E-01	PCI/G
U-235/236	Uranium-235/236	3.10E-01	PCI/G
7440-61-1	Uranium-238	1.28E+01	PCI/G
7440-61-1	Uranium-238+D	5.31E+00	PCI/G

7440-61-1	Uranium-238 long lived decay	1.29E+00	PCI/G
13982-39-3	Zinc-65	3.11E-01	PCI/G
13967-71-0	Zirconium-95	2.57E-01	PCI/G

Appendix M

Occurrence Reports

This appendix is intentionally blank.
There were no occurrence reports related to the water tower.

Appendix N

PRS Information

MOUND PLANT
PRS 113/114/115/116/117
FORMER TANK SITE - POWERHOUSE FUEL OIL STORAGE TANKS AND SOIL CONTAMINATION

RECOMMENDATION:

Potential Release Sites (PRSs) 113, 114, 115, 116, and 117 were identified to address fuel oil and toluene contamination in the soil located on the east side of the powerhouse.

PRSs 114-117 are the four underground fuel oil tanks that were removed. Removal of the tanks and contaminated soils was initiated in 1995 and completed in 1996. The treatment of the soils is ongoing in accordance with the Action Memorandum for the Fuel Oil Storage Removal Action (FOSRA). The On-Scene Coordinator (OSC) Report for the FOSRA will document residual levels and the requirements for this removal per the Ohio Bureau of Underground Tank Regulations (BUSTR).

PRS 113 refers to a single toluene soil gas detection prior to the removal activities. Toluene was identified at a concentration of 447 parts per billion (ppb), which is below the 414,800 ppb calculated acceptable soil gas concentration.

Therefore, since these PRSs are part of an active removal action, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath 3/19/97
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 3/18/97
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 3/18/97
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 5/8/97 to 6/16/97

☐ No comments were received during the comment period.

☒ Comment responses can be found on page 1, 2 of this package.

MOUND PLANT
PRS 126/127
SOLVENT STORAGE SITE - OUTSIDE AREA NEXT TO BUILDING 28

RECOMMENDATION:

Potential Release Sites (PRSs) 126 and 127 refer to the temporary storage locations for waste solvents generated by the Building 28/60 operations. The solvents were used in cleaning operations during the manufacture of weapon components. There are no historical records of any spill or leak of solvents from either of the waste solvent storage areas.

Volatile organic compounds (VOCs) were detected in the surrounding soil gas samples collected in 1993. All the VOC concentrations were below the calculated acceptable soil gas criteria. Samples analyzed for plutonium and thorium were below their respective radiological guideline criteria, 25 pCi/g for plutonium-238 (Mound ALARA) and 15 pCi/g for subsurface thorium (40 CFR 192.41). Therefore, PRSs 126/127 requires NO FURTHER ASSESSMENT.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 10/3/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 10/3/96 (date)

OEPA: Brian K. Nickel, Project Manager — 10/3/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 10/12/96 to 11/13/96

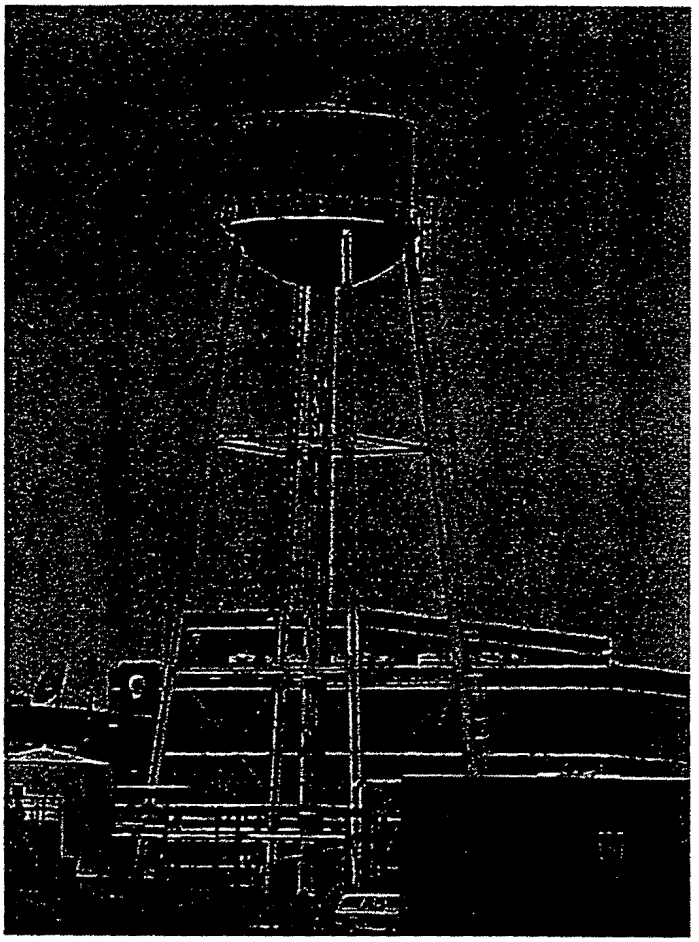
☒ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

Appendix O

Work Plan (Draft)

Engineered Drop Plan
For
CH2M Hill Mound, Inc
Main Hill Water Tower Demolition
Solicitation No. DKB19383
Contract No. 2004-00147



Mail Hill Water Tower

Engineered Tank Drop Design
by

Envirocon Inc.
101 International Way
Missoula, MT 59808

ENVIROCON

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Table of Contents

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1) Physical Description of Water Tower

The Main Hill Water Tower was designed to hold approximately 100,000 gallons of water. The dimensions are approximately 28' diameter with a 16' shell height. The tank is supported by 4 legs approximately 107' tall. The tank has a cone roof and elliptical bottom. The overall height is approximately 133'. Physical dimensions were obtained from site inspection and an elevation drawing provided by WGI. The calculated weight of the water tower is approximately 140,000 pounds.

The water tower legs were fabricated using 2-15" Channels with the flanges facing in opposite directions. The flanges are connected by steel flat bars riveted to the channel flanges, creating a box shaped column. The flat bars are attached to the flanges at a 45° angle to the channel web, attached the full length of the leg.

2) Description of Design Concept

In this design Envirocon has engineered a safe modification of the structure's legs, creating three hinge points whereby the 2 legs on the fall side of the water tower can be buckled under controlled conditions to make the water tower fall. The hinge points will be the column's failure points when a load is applied to the column legs.

Given the 100,000 gallon capacity of the water tower, and the calculated weight of the tank, the structure was originally designed to support approximately 1,000,000 pounds with the tank full of water. The tank will be dropped empty on a day where wind gusts are expected to be less than 25 mph. The weight of the tank at the time of the drop will be less than $1/7^{th}$ the original design capacity of the support structure, consequently the water tower is one of the safest and most predictable structures to drop using this method.

3) Preparation of Structure

The 4 legs of the water tower will be cut in two similar pairs, the front pair (fall side) and the rear pair.

The pair of legs on the fall side of the water tower will be modified to create 3 hinge points in each leg below the 1^{st} horizontal brace. The hinges are made by cutting thru one of the two channels and the lattice at specified elevations in three positions on the legs. A pull cable will be attached to the channel just below the center hinge point using a shackle. A hole will be cut in the channel web near the flange to facilitate placement of the shackle around one flange of the channel. The shackle will be situated around the point where two flat bars are riveted to the channel flange, allowing the shackle to be placed in the bottom of the "V" created by two flat bars.

The pair of legs on the backside will be cut 50% from the back to create the pivot point for the tower to rotate on as it falls. (See Drawing for each specific cut)

Figure 1 Plot Plan

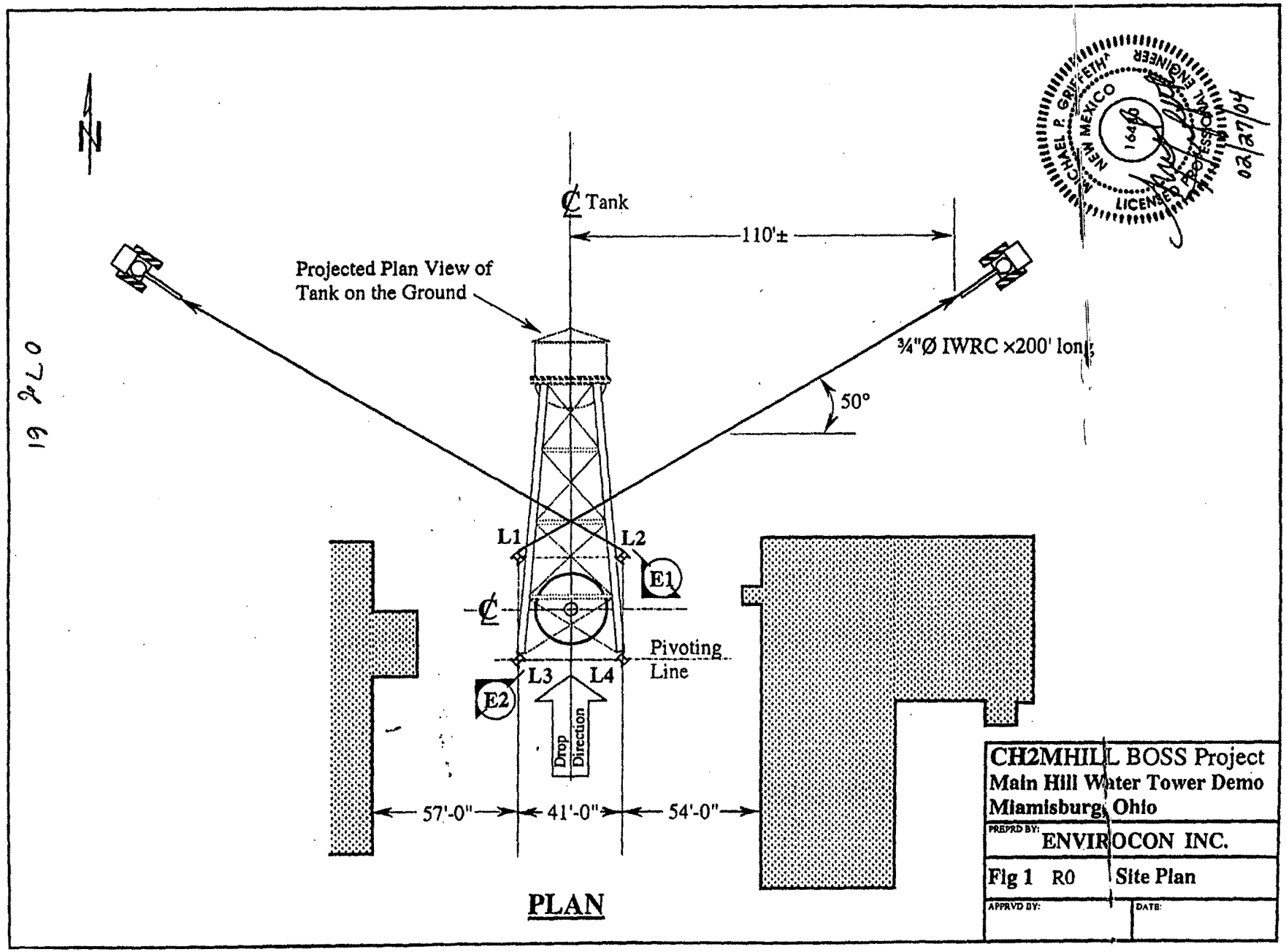
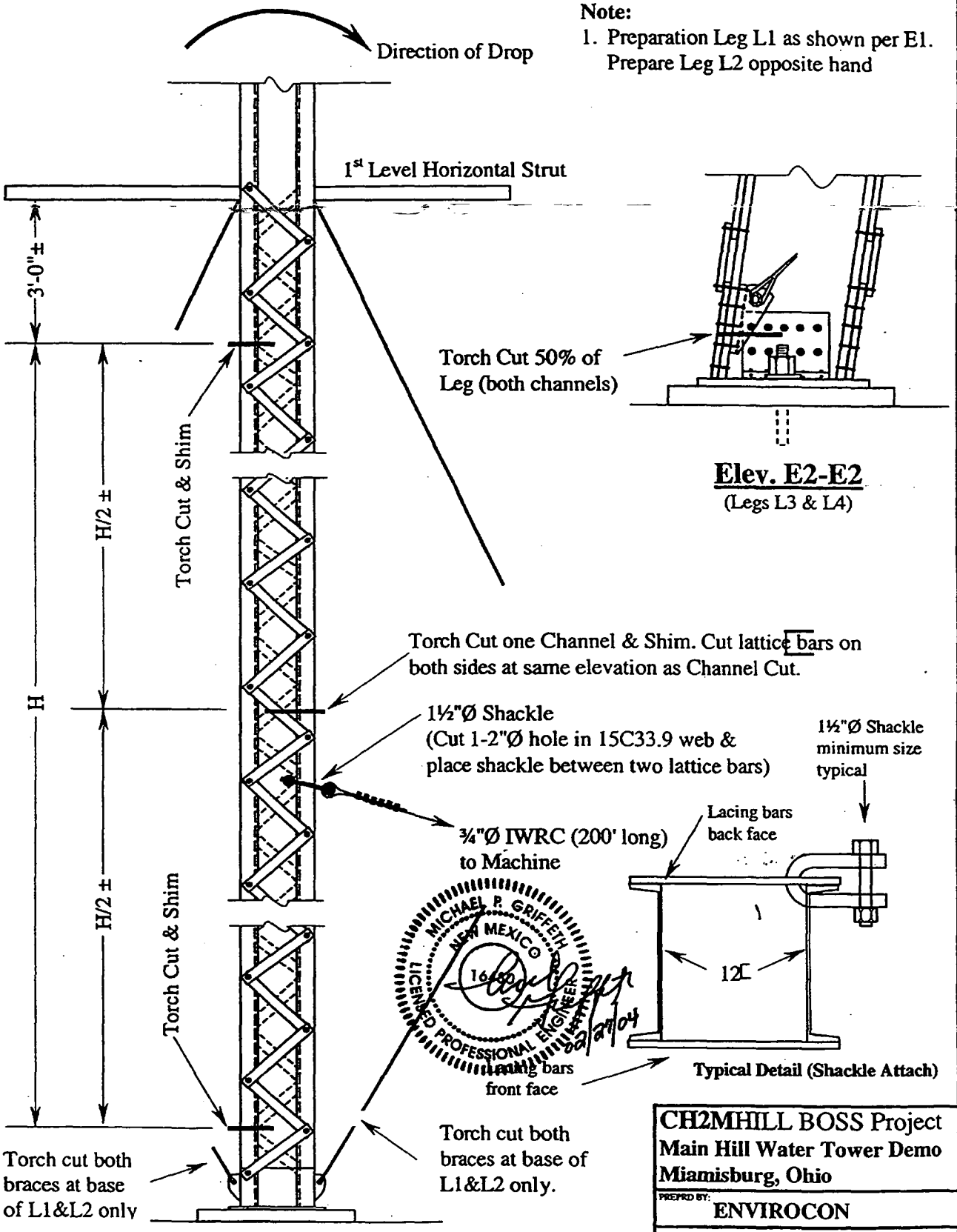

℄ Tank
110'±
Projected Plan View of
Tank on the Ground
¾"Ø IWRC ×200' long
50°
L1
L2
E1
℄
Pivoting
Line
L3
L4
E2
Drop
Direction
57'-0"
41'-0"
54'-0"
PLAN
CH2MHILL BOSS Project
Main Hill Water Tower Demo
Miamisburg, Ohio
PREPRD BY:
ENVIROCON INC.
Fig 1 R0
Site Plan
APPRVD BY:
DATE:
MICHAEL P. GRIFFETH
NEW MEXICO
16446
PROFESSIONAL ENGINEER
LICENSED
02/27/04

Figure 2 Leg Preparation Details

Note:
1. Preparation Leg L1 as shown per E1. Prepare Leg L2 opposite hand



Elev. E1-E1
(Projected View)
L1 & L2

Elev. E2-E2
(Legs L3 & L4)

Typical Detail (Shackle Attach)

MICHAEL P. GRIFFETH NEW MEXICO 16680 LICENSED PROFESSIONAL ENGINEER 2/27/04

CH2MHILL BOSS Project Main Hill Water Tower Demo Miamisburg, Ohio	
PREPD BY: ENVIROCON	
Fig 2 R0 Legs Preparation	
APPR'D BY:	DATE:

09 of 61

Figure 3 Step by Step Instructions

Step by Step Guideline for Controlled Drop of Main Hill Water Tower at Miamisburg, Ohio

Demolition work shall be carried out in the sequence described below. Any changes shall be subjected to prior approval of Envirocon Inc. Health & Safety Requirements are outside the scope of this Guideline. Site Supervisor shall ensure that applicable requirements in the latest OSHA Standards shall be followed.

Pre-drop Preparation (Work may be done one day ahead of the pre-determined drop day)

1. Clear and secure a drop zone 100'± (wide)×200'± (long) measured from the back legs of the tower towards north. Protect underground services, if required.
2. Cut and remove a 20'± section of the center vertical riser to expose interior pipes. Cut and remove 30'± bottom section of the cat-ladder along one leg.
3. Lay the two 200' long ¾"Ø IWRC on the ground per Fig 1. Each 200' long pull cable can be made of 2×100' IWRC linked by 1-1"Ø shackle.
4. Check with local Weather Authority that the forecasted average wind gust speed on the planned drop day at 100'± level will be less than 25 mph.

Drop Preparation (Work shall be done only on the drop day)

5. Check with the local Weather Authority that the forecasted average wind gust speed on the planned drop time at 100'± level will be less than 25 mph. Postpone the drop if the average wind gust speed is expected to exceed 25 mph at the drop time.
6. Place two Excavators (30,000 lbs± operating weight) at the north end of the two pull cables per Fig 1. Secure cable end to the excavator bucket.
7. Cut and remove a 15'± section of all vertical pipes in the riser. Always make a horizontal bottom cut first to check for adequacy of top support. If the cut gap closes (indicating bad corrosion in top support), pin or tie the pipe that drops to adjacent pipe. No worker shall re-enter the tower base after Step 7.
8. Install the pull cables at the mid-height of the two front legs per Fig 2. Do not put any tension in the cables. Leave the cables lying on the ground.
9. Prepare the two front legs per Fig 2. Prepare one leg at a time. Cut both bracing (two) connected to the first front leg near the bottom connection.
10. Workers shall walk around the south side of the water tower to the opposite side to prepare the second front leg, **never** in front or under the tower.
11. For each front leg always cut top hinge first, mid-hinge second and bottom hinge last. At each hinge location, cut 50%± of one 15C33.9 and stop. Drive in a 4"×12"×¼" shim by a hand hammer. Continue cut through the channel and drive in the rest of the shim pl. into cut gap. Cut the lattice bars at same elevation.
12. Cut both bracing (two) connected to the second front leg near the bottom connection. Worker shall walk around the tower to prepare the backlegs.
13. Prepare the back legs per Elev. E2-E2, Fig 2. Cut through both 15C33.9 50%± including gusset plates.
14. All workers shall leave the vicinity of the tower to a safe place (south of the Tower.)
15. Back up the Excavators simultaneously until the pull cables break the two front legs to drop the water tower.

Supporting Engineering Data

a) Total Weight of Steel (Standard Double Ellipsoidal Tank on 4 legs) = 138,130 lbs

b) Total Water Weight during Operation (100,000 gallons capacity) = 835,000 lbs

c) Total Design Weight (original design) = 973,130 lbs round up = 1,000,000 lbs

d) Approx. comp. stress in ea. channel of ea. leg during operation (no horizontal force) = 12,500 psi Steel Area = 9.90 in^2 (for 15C33.9)

e) Approx. comp. stress in ea. channel of ea. leg during Drop ≈ 4,500 psi = (138130×¼)/9.9 +[138130×5%×100'/(41'×2)]/9.9

Note: Assume a horizontal force = 5%g (including wind & seismic) applied at 100' level (See attached note)

f) Approx. Force Required to Break One Leg (3 plastic hinges at 12'± center in 15C33.9) ≈ 4,000 lbs (See attached note)

g) Minimum Tensile Capacity for Pulling Hardware = 10,200 lbs (¾"Ø IWRC with a SF = 5.0)

h) Minimum Static Pull Force from an Excavator ≈ 15,000 lbs for a 30,000 lbs machine

General Safety Rules

* Always work under the tank first and work outside the tank projected area second, such as from Step 7 to Step 8.
* Always prepare the front legs (on a man-lift) along side of the structure, never under or in front of the structure.
* Always prepare (in each front leg) top hinge first, mid-hinge second and bottom hinge last on the ground.
* Always walk around the structure via the south side of the structure from one side to another.
* Always prepare the back two legs last. Workers shall leave the Tower vicinity to a safe area south of the Tower.
* Always use a Site Supervisor and torch men with previous drop experiences to do the job.
* No un-authorized person shall enter the secured area until the Tower is on the ground.

CH2MHILL BOSS Project Main Hill Water Tower Demo Miamisburg, Ohio	
PREPRD BY: ENVIROCON INC.	
Fig 3 R0 Demo Guidelines	
APPRVD BY:	DATE

Load calculations

February 26, 2004

Background of the Assumption

(1) If a new structure were to be designed to withstand an earthquake event, often the Design Requirements or the local Building Code may stipulate that the structure is to withstand a DBE or a SDE or both in different loading combinations depending on the functionality and a number of other factors.
Without performing a detailed dynamic analysis of the structure, a horizontal force in the range of 8%g and 3%g are often used for DBE and SDE application respectively. For a new structure with a service life expectancy of 30-40 years, this assumption is considered reasonable.
"Controlled Drop" demolition process normally takes 3-4 hours to drop a four-leg water tower such as Main Hill Water Tower. The choice of 5%g is not intended to introduce a new structural design concept but rather to demonstrate that even with such a high horizontal force the increase in compressive stress in the front leg is ≈ 850 psi.

---

(2) For a simple beam subjected to a point load at the mid-span, the elastic bending moment can be calculated at PL/4 where L is the span length. For a fixed end simple beam with the same load, the maximum moments at the mid-span and the supports is PL/8 at which stage the material will start to yield.

Sy for 15C33.9 is 3.2 in^3 and for simplicity and conservatism use Shape Factor = 1.25

Mp = fy x Zy = PL/8 where

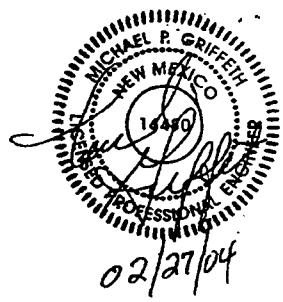
Mp is plastic moment
fy = 36,000 psi (assume ASTM A36 steel)
Zy = Sy x 1.25 = 3.2 x 1.25 = 4 in^3
P = the force required to form 3 plastic hinges
L = 24'± span length

P = (36,000 x 4 x 8) / (24 x 12) = 4,000 lbs
The actual force required to buckle the front leg is much less than 4,000 lbs for the following reasons.

a) A torque is applied because the position of the shackle attached to the leg
b) A dynamic force is applied due to machine pulling

---

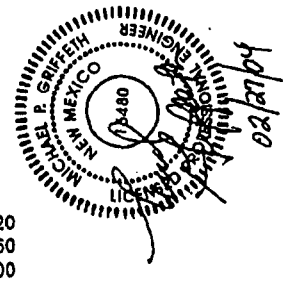
(3) In any official Rigging Manual, a ¾"Ø IWRC (Independent Wire Rope Core) Cable is listed to have a Safe Working Load (SWL) 10,200 lbs under 6x19 Classification Round Strand Group, Grade 110/120 Improved Plow, Steel Core.
SWL is defined as Breaking Load /5.0. Or the SWL has a safety factor of 5.0



02/27/04

Tank Weight Calculation

Main Hill Water Tower
Miamisburg Ohio



02/20/04

19 & 510

Mound Water Tank 28' OD, Approximately 100,000 Gallons

		#/Ft	Weight	Center of Mass	W x COM
Cone Roof 31' OD	810 Sq. Ft.	12	9,720	126.41	1,218,985.20
Shell 28' OD x 16.166'	1422 Sq. Ft.	14	19,908	117.13	2,331,724.50
Bottom 28' OD Elliptical	1100 Sq. Ft.	15	16,500	104.50	1,724,250.00
Ladder	125	13	1,625	54.00	87,750.00
8 Riser Pipe Rods 5/8" x 21'-7"	173 Ln. Ft	1.04	180	53.00	9,535.76
Cross Bracing 1-1/8" x 61' x 8 each	408 Ln. Ft	3.38	1,379	20.00	27,580.80
Cross Bracing 1-1/16" x 44' x 8 each	352 Ln. Ft	3.01	1,060	54.00	57,214.08
Cross Bracing 1-1/16" x 39' x 8 each	312 Ln. Ft	3.01	939	89.80	84,332.98
Deck around Tank	176 Sq. Ft.	20	3,520	109.00	383,680.00
Horizontal Brace 2-8" Channels x 34.4' x 4 Bays	275 Ln. Ft	11.5	3,163	36.00	113,850.00
Horizontal Brace 2-8" Channels x 27.7' x 4 Bays	222 Ln. Ft	11.5	2,553	69.86	178,352.58
Legs					
8 ea 15" x 33.9# Channel x 107'ea\	856 Ln. Ft	33.9	29,018	53.50	1,552,484.40
Lacing 2-7/16"x 5/16"x20" Bar 12" oc x 2 sides	1426 Ln. Ft	3.44	4,905	53.50	262,441.04
Riser Pipe 48" x 100' x 1/2" thick	100 Ln. Ft	256.8	25,680	50.00	1,283,000.00
Water Lines in Riser 12" & 8" Cast Iron	100 Ln. Ft	80	8,000	50.00	400,000.00
Misc Internal Piping, Ladders & Gussets	Plug		10,000	115.00	1,150,000.00
	Total Estimated Weight		138,130	=y	10,865,181.34 =x
	Center of Mass =x / y		79	**Feet**	

Weight Estimate by Envirocon Inc. Chris Schilleci

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WORK PACKAGE / PRELIMINARY HAZARD ANALYSIS

☐ Office Master Copy (Original Approval Signatures) ☐ Field Working Copy (Original Field Sign -Offs) ☐ Review Copy [Note: Mark this section in color] ☐ Other Copy

Note: The Project Engineer is responsible for completing Sections 1 through 10.

1. WORK PACKAGE TITLE: Main Hill Water Tower Demolition

2. WORK PACKAGE NUMBER. BOSS-39197-00

3. WORK PACKAGE SCOPE:
Prepare the Main Hill Water Tower for demo after it has been drained and disconnected by the Utilities Group. Preparation includes partially torch cutting and shimming structural members to allow the tower to be dropped. After the tower has been prepared, it will be pulled over using cables attached to heavy duty equipment, then cut-up and disposed. Remove piers to 3 feet below grade. Collect soil samples. Do site restoration including grading, erosion control, seeding and mulching.

4. WORK LOCATION:

Building #: _Main Hill Water Tower

Room #:

Other:

5. WORK PACKAGE PHASES:

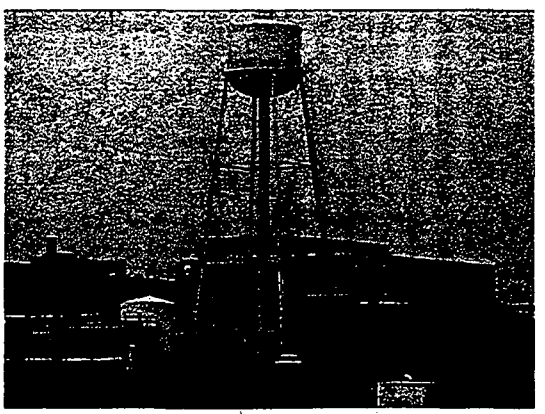
1. Prepare water tower for demolition
2. Pull water tower over
3. Cut-up water tower and dispose
4. Remove in-ground structures
5. Soil Sampling
6. Site Restoration

Note: Insert the Work Package phases for the job. A phase is a separately definable portion or evolution of the project.

6. SPECIAL MATERIALS AND EQUIPMENT:

1. 400 ft. – ¾" dia. IWRC wire rope
2. shims
3. 2- 1- ½" dia. Shackles
4. Tracked excavator with shear, grapple, hoe ram, concrete cracker/pulverizer, or bucket attachment.
5. Rubber tired and tracked front-end loaders.
6. Fog Cannon
7. Transport equipment for debris as required.
8. Aerial lift/manlift

Note: Insert any materials that require long lead procurement or special order. Don't list common items such as PPE.



NOTE: All field changes to the work package must be documented in the Job Status Log

7.0 DETAILED WORK STEPS:

7.1 Site Information for Main Hill Water Tower

The Main Hill Water Tower is an elevated steel water tank and tower. With a capacities of 50,000 gallon domestic service and 50,000 gallon fire reserve. The water column is 125 ft. to water line when full. Due to a shortage of steel after the war, this tank was obtained from surplus from the Weldon Springs Ordnance Plant, Weldon Springs, Mo. in 1948. Maxon Construction Company (a subcontractor to Giffell's and Vallet, who was a subcontractor to Monsanto Chemical Company subcontractor) had a contract with "Ohio Erection Company", of the Cincinnati, OH area to dismantle a water tower at Weldon Springs Missouri, and to re-erect the tower at the Mound site.
Around 1990, the top of the tower was replaced due to corrosion.

7.2 National Historic Preservation Act (NHPA)

The Main Hill Water Tower is not listed as a historic structure with the Ohio Historic Preservation Office (OHOP); therfore, no mitigative documentation package is required.
IMPORTANT: However, if any items or artifacts are discovered as this project progresses, the Cultural Resource Representative will be notified at x 3691. If necessary, work will be suspended until which time the items or artifacts have been recovered.

7.3 Hazard Identification

Elevated work, torch cutting on lead based paint, rigging, and controlled demolition are hazards that will be encountered. All work will be conducted per requirements of MD-10286, the Mound Safety and Industrial Hygiene Manual . The preparation and demo will strictly follow the directions given in the Engineered Tank Drop Plan, by Envirocon, Inc., stamped Feb. 27, 2004.
Silica dust will be encountered during pier removal, so misting will be required.

7.4 Permits

A Hot Work Permit will be required to perform the required torch cutting.
An Excavation Permit will be required to remove in-ground structures.

7.5 Waste/Staging Areas

The water tower debris is expected to be free-releasable. After the water tower is dropped, it will be cut-up and staged into debris piles in the area of the former W Building. Debris pile surveys will be performed to verify that the debris may be free-released. If it may be free-released it is expected that the debris will be sent to a metal recycler. If it doesn't meet free-release requirements, it will be taken to the rail spur and disposed as low level waste.

7.6 Pre-Job Briefing

A pre-job briefing will be conducted prior to beginning any work. All personnel involved in the task will be present for the briefing. A pre-job briefing sheet will be used to record decisions made during these meetings and retained with the work package. Signatures of all involved will denote concurrence with the plans and conditions set forth in the meeting. Instruction in the work package will be discussed as well as job safety requirements, Radiation Work Permit requirements, plus any past problems and lessons learned.

7.7 Lockout/Tagout

Any remaining energy sources or adjacent overhead lines will be Locked-out/Tagged-out as appropriate prior to the commencement of work.

7.8 NESHAPS

The offsite estimated effective dose equivalent (EDE) for the demolition of the Main Hill Water Tower was calculated to not exceed 0.1 mrem/year. Therefore USEPA approval is not required for this project.

7.9 Utilities

All electrical services and utilities associated with the Main Hill Water Tower will be terminated prior to commencement of demolition.

IMPORTANT

Remove or relocated the light pole to the north of the water tower that is in the drop zone for the tower. (See Power and Light Poles map in the Drawing Section.)

7.10 Site Access Control

Access to the work zone boundary will be controlled by fencing and/or barricade tape as directed by the Project Foreman. Proper signage will be placed at all access points to the work zone.

The roadways adjacent to the water tower will be closed during preparation and dropping of the tower. The debris will extend across the roadway, which runs to the north of the water tower and power house. The roadway will remain closed until the debris is removed. Adjacent buildings 28 and P, will be evacuated during preparation and dropping of the water tower.

The work zone may not be entered by anyone not directly involved with the demolition unless they have contacted the Project Construction Manager or Project Foreman in advance.

7.11 Installation Of Fugitive Emissions Control

The goal of fugitive emission controls is to eliminate visible dust, especially during demolition of buildings that are believed to contain radiological contamination. Best available technology (BAT) determination for the demolition of Main Hill Water Tower is reasonably available control measures (RACM). Reasonably available control measures (RACM) will be employed to maintain fugitive particulate emissions as low as reasonably achievable. Visual particulate emissions shall not exceed 20% opacity as a three-minute average for building demolition. Mitigating controls to be employed include, but are not limited to:

- Use of dust suppression equipment including fog cannons and water misting nozzles operated by trained personnel. The goal of dust suppression equipment/personnel will be to provide adequate amounts of water to control fugitive particulate emissions while not over saturating the area and creating run-off problems.
- Controlled water misting of the building demolition area and common waste zone by misters installed on equipment, portable towers or operated by trained personnel.

The intent will be to add enough water to control fugitive emissions without over-saturating the area and creating undesirable run-off. Periodic inspections will be made by the Job Superintendent or designee to assure fugitive emissions controls are achieving the desired effect and meeting acceptable standards. Should it be determined that best available technology (BAT) requires alternate dust suppression methods, other dust control methods will be utilized.

See Table 1 below for proposed fugitive dust control methods.

7.12 Sediment/Storm Water Control

In order to prevent excess debris, soils, silt or other deleterious materials from entering surface streams or the storm sewer system, a retention barrier will be erected where appropriate. This barrier will consist of straw bales or equivalent and industry standard "silt fence". The barrier will be placed around the perimeter fence. Also, cover field grates with covers/sheeting for silt protection of sewer gratings. Coordinate and evaluate effectiveness of controls by periodic inspections throughout demolition activities with Environmental Compliance PoC. If the fence is not functioning properly, take steps to re-enforce or alter the configuration until satisfactory results are achieved.

Note: Insert the activities to be performed during the job. Describe the specific methods of accomplishing these activities and appropriate level of detail based on the complexity, hazard, and skill of the craft. Activities listed must be grouped under the Work Package phases listed in item 5.

Table 1 Airborne Contaminant Protection Methods

Dust Generating Activities	Administrative and Engineering Dust Control Measures
Building Demolition	• Applying dust control materials such as water and surfactants
Hauling Material and Equipment	• Reducing vehicle speeds (<20 mph) • When transporting materials that may become airborne, such as soils, wet the material or cover the truck beds • Keeping soil levels in vehicles below the vehicle sides • Wetting roads used for transport • Wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas
Vehicle and Equipment Traffic	• Reducing vehicle speeds (<20 mph) • Covering truck beds when transporting materials • Wetting roads used for transport • Minimizing unnecessary traffic on roadways, parking areas, and areas around field activities
Excavation	• Applying dust control materials water and surfactants • Covering storage piles with a tarpaulin, plastic, etc. • Keeping soil levels in vehicles below the vehicle sides • Minimizing the material drop height during excavation and loading operations • Compacting soils in work areas and in stockpiles at the end of each workday • Changing excavation and transportation method(s) when feasible • Applying vegetative cover or asphalt to project work area at completion of project • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks
Trenching	• Applying dust control materials water and surfactants • Covering storage piles with a tarpaulin, plastic, etc. • Keeping soil levels in vehicles below the vehicle sides

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Table 1 Airborne Contaminant Protection Methods (continued)

Dust Generating Activities	Administrative and Engineering Dust Control Measures
Trenching (Continued)	• Minimizing the material drop height during excavation and loading operations • Compacting soils in work areas and in stockpiles at the end of each workday • Changing excavation and transportation method(s) when feasible • Applying vegetative cover or asphalt to project work area at completion of project • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks
Material Loading and Unloading	• Minimizing the material drop height during excavation and loading operations • Reducing vehicle speeds (<20 mph) • Covering truck beds when transporting materials • Keeping soil levels in vehicles below the vehicle sides • Wetting roads used for transport • Wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas
Storage Piles	• Compacting soils in work areas and in stockpiles at the end of each workday • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks • Covering storage piles with a tarpaulin, plastic, etc. • Applying vegetative cover to storage pile areas at completion of project
Wind Erosion from Work Sites	• Compacting soils in work areas and in stockpiles at the end of each workday • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks • Covering storage piles with a tarpaulin, plastic, etc. • Applying vegetative cover or asphalt to project work area at completion of project

0219 61

7.11 Temporary Utilities
The only temporary utility that may be required is water. If domestic water is utilized, ensure backflow prevention is present. Coordinate with site Safety and Health and Environmental Compliance PoCs. Water will be used to control dust emissions. Coordinate with Utilities Group/Utilities Package for services needed.

7.12 Misting Requirements
Position hoses to wet the expected impact zone of the water tower.

7.13 Temporary Facilities
This project will use the existing BOSS project trailer complex located in the existing Mound "C" parking lot.

7.14 Temporary Communications
Temporary communications are required (cell phone, radios) as equipment for hearing plant announcements and emergency notifications will have been removed during safe shutdown activities. At the job site, plant announcements and emergency notifications can be heard on the Plant radio channel.

8.0 Preliminary Activities and Verifications

8.1 The paint on the water tower was tested by Industrial Hygiene and was determined to be lead-containing. Therefore, strip lead-based paint using solvents or mechanical means to at least 6 inches on each side of where cuts are to be made. Follow directions of Industrial Hygiene for PPE. Follow MSDS sheet recommendations if using a solvent.

8.2 Verify all Mechanical and Electrical Utility Isolation Activities for Main Hill Water Tower have been completed per work packages FTS-38564 and FTS-38563, respectively.

verified by _____ date: _____
Allen Upshaw or designee/email

8.3 Appropriate waste containers are staged and ready for use.

verified by _____ date: _____
Bill Wahler or designee/email

8.4 Work zone barricade fence has been installed, access control has been instituted and area is properly posted.

verified by _____ date: _____
Bill Wahler or designee/email

8.5 Adequate provisions have been made to protect surrounding utilities and structures.

verified by _____ date: _____
Bill Wahler or designee/email

HOLD POINT: Pre-Impairment Walkdown conducted and Impairment Permit per MD-10286, Section E2, obtained.

verified by _____ date _____
Bill Wahler or designee/email

8.6 The Pre-Job Briefing Record must be completed and signed.

Verified by _____ date: _____
Mike Stromberg or designee/email

8.7 The Job Specific Hazards Analysis (JSHA) must be reviewed and the pre-job hazards analysis walk-down of area is complete.

Verified by _____ date: _____
Mike Stromberg or designee/email

8.8 Notify Gary Weidenbach, X3241 (608-8207), Bldg. Mgr., of demolition schedule, potential traffic pattern delays, and building access/egress coordination.

Verified by _____ date: _____
Mike Stromberg or designee/email

8.9 Verify that all materials are in place at least one day prior to start of demolition.

Verified by _____ date: _____
Mike Stromberg or designee/email

9.0 BUILDING DEMOLITION SEQUENCE OF WORK

9.1 Structural Demolition

Notification of Demolition and Renovation form must be filed with the Regional Air Pollution Control Agency (RAPCA) at least **10 business days before planned demolition of the Main Hill Water Tower.**

HOLD POINT: RAPCA notification verification

Environmental Compliance PoC_____ Date to Proceed with Demo_____

HOLD POINT: NESHAP requirements completed and approved.

Environmental Compliance PoC_____ Date _____

HOLD POINT: Regulatory requirements met.

Verified by _____ date: _____
Robert Ransbottom or designee/email

HOLD POINT: 'COLD & DARK' Review Team Walk-down Completed & Project Manager Authorizes Work to Start:

Project Manager:_____ Date and Time:_____

Review Team: Program Manager, Construction Manager/Foreman, and Project Engineer, at minimum.

IMPORTANT NOTE: All workers have Stop Work Authority. Situations where stop work authority is to be exercised are:
To stop unsafe work.
To stop unauthorized work, i.e., work outside the scope of this workpackage.

HOLD POINT: Roadway has been blocked and adjacent structures have been evacuated.

Bill Wahler or designee/email:_____ Date and Time:_____

CAUTION HAZARD: Vehicle traffic hazard. Control traffic flow as necessary. Project Engineering will coordinate the posting of notice on GroupWise/Mound News, several days in advance and during ongoing demolition work, that traffic routes around the demolition area may be interrupted or diverted. Notify the following organizations/personnel that traffic patterns may be disrupted: Gary Morris (X4015 or 608-8242) Security (Ron Parr, X3958 or 608-8291), Fire Dept. (Tom Beal, X4897 or 608-8295), Transportation (Brady Barnhart, X4047 or 608-8284), the Building Manager (Bill Tonne, X4354 or 673-4300), and Gary Weidenbach (X3241 or 608-8207).

WARNING HAZARD: Dust Control – Utilize misting & fogging during demolition & road wetting during waste hauling. The goal is no visible dust emissions. Periodically evaluate control methods to determine their effectiveness and to ensure drains are protected..

CAUTION HAZARD: Contact with overhead power lines with heavy-duty equipment. If any part of heavy-duty equipment has the potential to come within 10' of street lighting circuit, perform LOTO to de-energize electrical power source. This circuit must be re-energized each evening when demolition is complete for that day.

CAUTION HAZARD: Struck by flying debris. Establish construction boundary. Wear hard hat, safety glasses, safety shoes, (Level D PPE) and reflective vest inside construction area.

CAUTION HAZARD: Struck by moving equipment.

- Maintain the following distances from operating equipment:
- Shear – 75 feet
- Hoe Ram – 50 feet
- Other heavy duty equipment – 30 feet
- Bobcat – 15 feet

WARNING NOISE HAZARD: Wear hearing protection while running heavy-duty equipment. Follow the requirements of MD-10286 D9.

CAUTION HAZARD: Heat/Cold Stress. Follow the requirements of MD-10286 D13/D16

CAUTION HAZARD: A Hot Work Permit will be required if a torch is used for cutting. Coordinate with site Safety and Health for PPE/work controls before torch-cutting due to possible toxic/hazardous fumes (i.e., lead paint/galvanized/stainless steel). Obtain and follow Hot Work permit per MD-10286 O2.

WARNING

Before proceeeding with torch cutting to weaken the tower in preparation for dropping it, check with weather authorities to verify that expected wind gusts will not exceed 25 mph. If they are expected to exceed 25 mph, postpone the demolition until they are below 25 mph.

9.2 Obtain and follow a Hot Work Permit for the required torch cutting
9.3 Turn on water hoses and wet down the expected impact zone.
9.4 Use a manlift and required tie-offs to access elevated work areas.

IMPORTANT

9.5 Follow in detail and step-by-step the attached Engineered Drop Plan by Envirocon. Have all materials in place at least the day before the planned demolition.

10.0 Debris Sizing

10.1 Heavy duty equipment will be used to cut-apart the tower after it has been dropped. Work to clear the roadway to allow the resumption of normal traffic.
10.2 Stage the debris in piles to allow rad surveys by the assigned RCT
10.3 When given the go-ahead of the RCT, load the debris into trucks for transport to the Metal Recycler or sanitary landfill as deemed appropriate by the Waste Management PoC.

NOTE: To date: No significant rad contamination has been found on roofs of buildings downwind of the R, SW and T Buildings, therefore it is assumed that the water tower debris will not be contaminated. However: if rad contamination is found on the debris, it will be disposed as LLW as approriate and a VSAP will be developed to verify that the soil in the impact zone was not contaminated.

11.0 Removal of In-ground Structures

11.1 Obtain and follow and excavation permit

11.2 After debris has beeen removed from the roadway, using heavy duty equipment remove piers and associated in-ground structures down to 3 feet below grade.

12.0 Soil Sampling

12.1 Because the water tower has a history of lead-based paint that was removed by sand blasting, four biased samples will be collected, one each from the midway point between each set of piers. Soil samples will be analyzed for lead.

12.2 If rad contamination is found on the tower debris after demolition, a VSAP will be developed to sample soil in the impact area.

13.0 Site Restoration

13.1 After removal of in ground structures, perform any required soil sampling.

13.2 After appropriate sample results have been obtained, grade the site to match the surrounding terrain, seed, and mulch.

13.3 After site restoration is complete, remove silt fabric sewer grates, silt fences, and any utility protects that were installed.

Work Package /Preliminary Hazard Analysis (Continued)

8.COMMENTS:

Note: Comments, to identify activities/hazards that are common to multiple phases of the project (example: Wear leather gloves when handling cut pipe). Identification of these items will facilitate the addressing the items once in the pre-job briefing.

9. REVIEW SIGNATURES:

Written by: _____ Date: ___/___/___ Phone:

Superintendent: _____ Date: ___/___/___ Phone:

Foreman: _____ Date: ___/___/___ Phone:

Project Eng. Mgr: _____ Date: ___/___/___ Phone:

Industrial Safety & Hygiene: _____ Date: ___/___/___ Phone:

Rad. Controls: _____ Date: ___/___/___ Phone:

ES&C: _____ Date: ___/___/___ Phone:

Waste Mgmt: _____ Date: ___/___/___ Phone:

Bldg. Mgmt: _____ Date: ___/___/___ Phone:

Classification: : _____ Date: ___/___/___ Phone:

Other: _____ Date: ___/___/___ Phone:

Note: Project Manager has the authority to N/A signatures if review is not applicable.

10. USQ SCREEN / DETERMINATION REQUIRED? ☐YES ☐NO

Brief Explaination _____

_____

_____

USQ Trained Person: _____ Date: ___/___/___ Phone:

11. AUTHORIZATION SIGNATURE:

Project Manager: _____ Date: ___/___/___ Phone:

12. WORK PACKAGE CLOSURE:

Job Supervisor: _____ Date: ___/___/___ Phone:

Project Manager: _____ Date: ___/___/___ Phone:

RETURN PHA TO IS&H AT JOB COMPLETION.

APPROVAL CONTINUATION SHEET

Reviews:

Name	Signature	Date	Department

Reference Drawings	Rev.	Reference Procedures	Rev.

02706 61

Appendix A

PHA/JSHA

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities

SECTION A, INDUSTRIAL SAFETY - TO BE COMPLETED BY THE INDUSTRIAL SAFETY AND HEALTH REPRESENTATIVE
Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.), Including any notations for future Hazard Analyses. Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards, that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Access/Blockage:			
Blockage of exits or means of egress		Yes	Acces to Buildings P and 28 blocked. [EGRESS]
Blockages/obstructions (Identify)		Yes	Roadway adjacent to Main Hill Water tower blocked
Confined space entry (**permit**)		No	[CONFINE]
Emergency alarms or evacuation plans required		Yes	Signal that water tower is being dropped [EMERG]
Obstruction of fire protection equipment (pull boxes, hydrants, fire department connections, control panels, fire extinguishers, etc.)		Yes	Acess to adjacent fire hydrants will be blocked during demolition
Traffic control/flagman		Yes	Adjacent roadways will be blocked and flaggers may be required. [TRAFIC]
Flammable/Explosive:			
Burning, welding, hot-work (Fire Watch) (**permit**)		Yes	Torch cutting required [BURN]
Chemical compatibility of corrosives/flammables		No	
Explosive/flammable atmosphere		No	
Explosives		No	
Fire protection system/equipment outage		No	[FIRE/EFIRE]
Fire Hazards Analysis/Fire Engineer Approval		No	[FHA/ADJA]
Flammable liquids/gases		No	[FLAM]
Powder-actuated tools (**permit**)		No	
Special Fire Protection Equipment Required		No	[FIREQU]
Chemicals:			
Chemical process safety		No	
Compressed gas cylinders		Yes	Gasses for torch cutting
Emergency eyewash/shower available		No	[EWASH]
Elevated/Aerial Work:			
Crane operations, overhead or mobile		No	
Critical lifts (heavy or high value loads)			[CLIFT]
Elevated work/fall protection		Yes	For torch cutting and installation of cables [ELEV]
Forklifts, aerial lifts or material handling equipment		Yes	Use of manlift for torch cutting and installation of cables
Hoisting and rigging		Yes	Cables used to pull tower over. [HOIST]
Overhead utilities (Identify)		Yes	Adjacent wires [UITL]

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

SECTION A, INDUSTRIAL SAFETY - TO BE COMPLETED BY THE SAFETY AND HEALTH REPRESENTATIVE
Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.), Including any notations for future Job Safety and Health Analysis(JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
***Lockout/tagout, outages, disconnects* (permit)**			[LOTO/ISO]
• Electrical	Yes		As required on adjacent cables
• Mechanical (steam, hydraulic, pneumatic, gravity)	No		
• Interlocks	No		[ILOCK]
• Chemical	No		
• Radiological	No		
Outages of the plant public announcement (PA) system or the emergency notification system	N/a		[OUTAGE]
Building Systems Alarms - Ensure systems are not functional by contacting: Fire Department Security Facilities Services.	N/a		-Fire Alarm Pull Boxes -Fire Suppression Water Flow Alarms -Smoke Detector Alarms -Security Systems -DDC signals
Alarm Disable/Disconnect	No		
Structure Related:			
Modification to Fire Wall/Door	No		[FIREWAL]
Penetrations into walls, floors, etc. **(permit)**	No		[PENETR]
Plastic sheeting or wood framing/enclosures	No		
Structural Modification	Yes		Tower demo [STRUCT]
Work impacting adjacent normally occupied areas	Yes		Buildings P and 28 and adjacent roadways. [ADJAC/BMAPP/SIGNS/NOTIF]
Temporary Requirements:			
Temporary heating facilities		No	
Temporary/portable buildings or structures		No	[FACIL]
Temporary service hook-ups (Identify)		No	
Public utilities (Identify)		No	[WATER]
Lighting/illumination/adequacy		No	[MLITE]
Miscellaneous:			
Machine guards		No	
Off-shift work		Yes	Friday prep work. Saturdademo
Repetitive work		No	[ERGO]
Other (Specify)		No	
Work in attics, ceilings, chases, or crawlspaces		No	
Work Requiring Scaffolding **(inspection required)**		No	[SCAFF]
Electrical:			
Electrical hazards		No	[LIVEL]

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

SECTION A, INDUSTRIAL SAFETY - TO BE COMPLETED BY THE SAFETY AND HEALTH REPRESENTATIVE

Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Job Safety and Health Analysis(JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Grounding of electrical equipment		No	
Soils/Excavation:			
Underground utilities (Identify)		Yes	[UITL]
Trenching/Shoring (**permit**)		No	[DIG]
Hazards due to condition of facility or terrain (Identify)		No	
Any soil disturbance		Yes	[DIG] (Note: Check for URMAs) Remove in-ground structures

SECTION B, INDUSTRIAL HYGIENE - TO BE COMPLETED BY INDUSTRIAL HYGIENE REPRESENTATIVE

Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Job Safety and Health Analysis (JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Asbestos/Fibers:			
Asbestos		No	[ASBEST]
Removal of ceiling tiles*		No	
Insulation/man-made mineral fibers (☐ MSDS available)*		No	
Hazardous Materials:			
Beryllium		No	
Cadmium		No	
Chlorofluorcarbon (CFC)		No	[CFC]
Coal, tar or asphalt products		No	
Lead		Yes	Lead based paint
Mercury		No	
Polychlorinated biphenyls (PCBs)		No	
Carcinogens (☐ MSDS available)*		No	[CARC]
Chemical/Corrosives:			
Chemicals/solvents (☐ MSDS available)*		No	[CHEM/MSDS]
Corrosives/acids/caustics (☐ MSDS available)*		No	

***NOTE:** Requires a description of the materials involved which present a hazard. Identify the physical location of the MSDS.

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

FOR Work Packages

SECTION B, INDUSTRIAL HYGIENE - TO BE COMPLETED BY INDUSTRIAL HYGIENE REPRESENTATIVE
Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Job Safety and Health Analysis (JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item	Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Ventilation/Air:			
Abrasive blast (☐ MSDS available)*		No	
Coating/painting (☐ MSDS available)*		No	
Dusty operations		No	[POWDER]
Foam in Place Operations		No	
Spraying/generation of mists*		No	
Ventilation or Air Monitoring requirements		No	[VENTIL/IH]
Miscellaneous:			
High Pressure systems		No	[HIPRES]
Lasers		No	
Noise in excess of 85 dBA		No	[NOISE]
Blood-borne pathogens*		No	
Temperature extremes (heat or cold stress)		No	[CRYRO/COLD/HEAT]
Welding, brazing, or thermal cutting operations (**permit**)		Yes	Torch cutting lead based paint [BURN]
Hazardous Waste Operations (HAZWOPER)*		No	
Other (specify)		No	-

***NOTE:** Requires a description of the materials involved which present a hazard. Identify the physical location of the MSDS.

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

FOR Work Packages

SECTION C, RADIOLOGICAL PROTECTION - TO BE COMPLETED BY RADIOLOGICAL CONTROLS REPRESENTATIVE
Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. RWP, ALARA Plan, etc.). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person. (Use Section F if additional space is needed.)

Item		Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Location:	Controlled Areas (Specify)	No		
	Other (Specify)	No		
Activities:	Digging/Soil Removal (permit)	Yes		[DIG]
	• URMA			
	Welding, burning, grinding, hammering, chipping, or scraping of contaminated materials	No		
	Decontamination	No		
	Other (Specify)	No		
Sources:	X-Ray equipment, sealed, or unsealed sources	No		
Controls:	Radiological Work Permit	No		[RWP/RWP=JS/RWP=N/R/RPGEN]
	ALARA Plan	No		[ALARA]
	Other	No		

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

SECTION D, ENVIRONMENTAL COMPLIANCE- TO BE COMPLETED BY ENVIRONMENTAL COMPLIANCE REPRESENTATIVE
Identify engineering/administrative controls as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard. Additionally, identify any activities which are DOE or EPA prescribed protective requirements. (Use Section F if additional space is needed.)

		Exist	Work Package Phase	Comments, Controls, Methods of Compliance
Conditions:	Fugitive Dust (**refer to Table 1 below**)	Yes		OPA 980014 Section 2.11 Water misting
	Storm Water Runoff	No		
	Erosion Control	Yes		Seeding and mulching after grading
	NESHAPS Calculation	Yes		
	National Historic Preservation	No		
	• Artifacts found			•
	Safe Drinking Water Act	No		
	• Potable water			
	• Backflow preventers for misting	Yes		
	Emergency Spill Response Materials (Confirm process lines are drained)	No		Spill kits
	Locate Monitoring Wells	Yes		
Notifications:	RAPCA Notification for Asbestos	No		
	RAPCA Notification for Demolition	Yes		
	Emergency Spill Response Notification	No		911 or 865-4040
	Other	No		

APPENDIX A

Preliminary Hazard Analysis (PHA)For Work Package Activities (Continued)

SECTION E, WASTE MANAGEMENT- TO BE COMPLETED BY WASTE MANAGEMENT REPRESENTATIVE *Include any required and/or other special actions to be taken because of the particular hazard. Additionally, identify any activities which are required by DOE, Nevada Test Site, Envirocare or other waste site.* (Use Section F if additional space is needed.)

	Quantity Expected	Work Package Phase	Radiological Characterization	Packaging Requirements	Mode of Disposal
Types:					
Sanitary Landfill Waste: • Concrete • Steel & Copper Piping • Metal Roofing • PVC • Electrical Wiring • Fiberglass Insulation • Wood					
Recycled Metals	69 tons	2	Free-release	truck	Truck to metal recycler
Hazardous Waste: • RCRA Hazardous Waste • Asbestos • Other					
Mixed Waste					
Low Level Radiological Waste: • Building Debris • Below grade					
Transuranic (TRU) Waste					
NOTE: 1. Sealed pressure vessels will need to be at <1.5 atmosphere if present. 2. Any items not previously evaluated are to be set aside for evaluation by Waste Management prior to disposal.					
Other:					
Material sent off-site Fill out MD-200180 Attachment 1 (see below)					
Material sent to concrete crusher Fill out MD-200180 Attachments 1 & 2 (see below)					

SECTION F - OTHER CONDITIONS, CONCERNS, OR SUPPLEMENTAL INFORMATION FROM SECTIONS A THROUGH C INCLUDING APPLICABLE LESSONS LEARNED:

Rev. 4L-A
08/25/03

Table 1 Airborne Contaminant Protection Methods

Dust Generating Activities	Administrative and Engineering Dust Control Measures
Building Demolition	• Applying dust control materials such as water and surfactants
Hauling Material and Equipment	• Reducing vehicle speeds (<20 mph) • When transporting materials that may become airborne, such as soils, wet the materials or cover the truck beds. • Keeping soil levels in vehicles below the vehicle sides • Wetting roads used for transport • Wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas
Vehicle and Equipment Traffic	• Reducing vehicle speeds (<20 mph) • Covering truck beds when transporting materials • Wetting roads used for transport • Minimizing unnecessary traffic on roadways, parking areas, and areas around field activities
Excavation	• Applying dust control materials water and surfactants • Covering storage piles with a tarpaulin, plastic, etc. • Keeping soil levels in vehicles below the vehicle sides • Minimizing the material drop height during excavation and loading operations • Compacting soils in work areas and in stockpiles at the end of each workday • Changing excavation and transportation method(s) when feasible • Applying vegetative cover or asphalt to project work area at completion of project • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks
Trenching	• Applying dust control materials water and surfactants • Covering storage piles with a tarpaulin, plastic, etc. • Keeping soil levels in vehicles below the vehicle sides

Table 1 Airborne Contaminant Protection Methods (continued)

Dust Generating Activities	Administrative and Engineering Dust Control Measures
Trenching (Continued)	• Minimizing the material drop height during excavation and loading operations • Compacting soils in work areas and in stockpiles at the end of each workday • Changing excavation and transportation method(s) when feasible • Applying vegetative cover or asphalt to project work area at completion of project • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks
Material Loading and Unloading	• Reducing vehicle speeds (<20 mph) • Covering truck beds when transporting materials • Keeping soil levels in vehicles below the vehicle sides • Wetting roads used for transport • Wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas
Storage Piles	• Compacting soils in work areas and in stockpiles at the end of each workday • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks • Covering storage piles with a tarpaulin, plastic, etc. • Applying vegetative cover to storage pile areas at completion of project
Wind Erosion from Work Sites	• Compacting soils in work areas and in stockpiles at the end of each workday • Sealing off work areas, stockpiles, etc., before the workday and during lunch breaks • Covering storage piles with a tarpaulin, plastic, etc. • Applying vegetative cover or asphalt to project work area at completion of project

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Project/Activity:

Name:

JSHA CRITERIA CHECKLIST	YES	NO	N/A
1. Work performed with an unprotected 6 ft. or greater fall hazard, excluding portable ladders. See Item 14 of this checklist for further requirements.			
2. Roof work requiring the use of fall protection (within 6 ft of an unprotected edge) or special fall protection procedures.			
3. Potential hazardous chemical exposure above action levels or permissible exposure limits (PELs), or ACGIH Threshold Limit Values (TLVs).			
4. Work activity in an immediately dangerous to life or health (IDLH) breathing hazard environment.			
5. Fire or explosion hazards. Are fire hazards beyond a Hot Work Permit? (Reference O2, MD-10286)			
6. Work within close proximity of live electrical greater than 50 volts, conductors, and/or work that requires multiple locks, multiple hazard sources, or complicated lockout/tagout circumstances. (Reference MD-10444, *Lockout/Tagout Procedure Manual*, for multiple energy lockout/tagout.)			
7. Any maintenance or repair of equipment under pressure where the pressure cannot be shut off and de-energized.			
8. Work with high or extreme exposure to ionizing or non-ionizing radiation (reference MD-80036, Op 10002), noise, or heat or cold stress (reference D9, D13 & D16, MD-10286).			
9. Determined by an appropriate core team, building manager, member of general or executive management, or the IS&H manager to require a JSHA.			
10. Any onsite construction or service project directed to have JSHAs based on this procedure and/or instruction from project personnel or IS&H staff.			
11. Near-miss event with the potential for loss of life or limb or disabling injury/illness if repeated.			
12. Excessive trama/motion/vibration work situations or manual lifting involving heavy, large, and/or awkward-to-handle objects (reference MD-10407, *Ergonomics Program.*			
13. Unguarded, unmarked close clearance, pinch point, exposed moving machinery parts.			
14. Known potential falling object hazards (e.g., employees working above other employees, potential for dropping tools, falling equipment or material) or working in areas with the potential for flying objects (flying chips, sandblasting, etc.), exposure to sharp or protruding objects (e.g., working inside plenums, air mover ducts, etc.).			

MANDATORY JSHA REQUIRED TO ADDRESS ANY/ALL (YES) RESPONSES

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JOB SAFETY AND HEALTH ANALYSIS FORM

JSHA MASTER DOCUMENT CONTROL NO:
BOSS – 39197

SIGNATURES

DATE: 03/15/04	**_X_ NEW** **___ REV**	**BUILDING:** Main Hill Water Tower	**JOB:** Demolition of Main Hill Water Tower
DEPARTMENT/COMPANY: **BOSS Project/CH2M Hill Mound, Inc.**			**SECTION:** N/A
OCCUPATIONS: Heavy Duty Operators, Demolition Tech's, Demolition Crafts, & Electricians. Supported by Project Personnel e.g.. Supervision, Engineering, RAD Control, Ind. Hygiene, and Safety			

ORIGINATOR: Steve Davis
REVIEW/REV: Safety IH
REVIEW/REV: Foreman
REVIEW/REV: Bldg Mgr
APPROVED: Project Manager

REQUIRED PERSONAL PROTECTIVE EQUIPMENT:	**MSDS(s)/CHEMICALS ASSOCIATED WITH THE JOB:**
Hard Hat, Safety Glasses with side shields, safety shoes, safety vest	None

BASIC JOB STEPS	**POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS**	**SAFE JOB PROCEDURES**
Break the job down into basic steps that tell what is done first, what is done next, and so on. Record the job steps in their normal order of occurrence. Describe what is done, not the details of how it is done. Usually, three or four words are sufficient to describe each job step. For example, the job of "replacing a light bulb" may break down into basic steps as follows: 1. Bring and set up ladder 2. Ascend ladder 3. Remove light globe & bulb 4. Replace light bulb 5. Replace light globe 6. Descend ladder 7. Remove and store ladder	Ask yourself for each job what accidents/illnesses could occur to the employee doing the job. Record potential accidents/illnesses by combining one of the abbreviations below with the agent of contact. For example, "struck by a crane hook" is recorded "SB-crane hook." Number each potential accident. SB - Struck by CB - Contacted by SA - Struck against CW - Contact with CI - Caught in CO - Caught on 1B - Caught between F - Fall SO - Strain-overexertion* E - Exposure (occ. illness) *Show ergonomic stresses as SO (repetitive trauma, single event strain, or awkward position)	For each potential accident/illness, ask yourself exactly what the employee should do or not do to avoid the accident/illness. Describe specific precautions in detail. Give each precaution the same number given in the potential accident (center column) to which it applies. Avoid generalities such as "Be alert," "Be careful," and "Take caution." Use simple do or don't statements; e.g., "Lock out main power switch," "Stand clear of lift before signaling," or "Check wrench grip before exerting full force." If necessary, explain how, as well as what, to do. Amount of detail is a matter of judgment. Describe ergonomic solutions (job redesign, new tools, worker lift assistance, etc.)
General Safety Note	A wide variety of incidents occur on a regular basis that potentially could result in injury or illness	-Be cognizant of your own safe work practices as well as those of your co-workers -Review any related safety procedures of which you are unsure -Utilize STOP WORK Authority as necessary
Pre-job meeting with involved personnel to discuss the work plan and safety requirements. This meeting is conducted daily.	N/A	-This project engages in Enhanced Work Planning (EWP), an ISM process that evaluates and improves the approach by which work is identified, planned, approved, controlled, and executed.
1. Site Preparation & Mobilization	Standard construction hazards.	-Demolition preparation is defined by 29CFR1926.850; workers, unfamiliar with construction standards must notify the project supervision and/or project health and safety personnel.
1a. Site Access Control	Struck by equipment, debris	-Once the work area is defined, only authorized personnel are permitted in the construction perimeter. -Unescorted, non-project and non-emergency personnel must have acceptance of the BOSS Project Manager for entry.
1b. Emergency egress/access	Blocked access	-Buildings P and 28 will be evacuated and access will be blocked to those buildings the day of demolition. - Roadways adjacent to the Main Hill Water Tower will be blocked the day of demolition; the roadway north of the water tower will be blocked until it can be cleared of debris.

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JOB SAFETY AND HEALTH ANALYSIS FORM
(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
2a. Work from elevated surfaces (manlift, bucket truck, etc.).	Fall hazard	Wear proper PPE, restraints, harness, and other fall protection, as required per MD10286, Op M8. Use workers, properly trained and instructed in the hazards of working from elevated surfaces.
2b. Torch cut rebar or to weaken structural members	Burns, fire	-Obtain and follow Hot Work permit per MD-10286 O2. Wear proper PPE, have fire extinguishers in the construction zone.
	Lead-based paint	-Strip lead-based to at least 6" on either side of areas to be torch cut. Follow IH and MSDS directions for using solvents or mechanical means for stripping.
	Premature failure	- Follow engineered, stamped drop plan.
2c. Operation of heavy equipment near electric overhead lines	Shock Hazard	-All utilities to the building including electrical have been disconnected prior to demo by project electricians at a point away from the building. -Identify sources outside the building that may require LOTO to prevent incidental contact by Heavy Duty Equipment, such as street lighting circuit.
2d. Water tower demolition	Vehicle Traffic Hazard	-Control traffic with flagmen as necessary
	Fugitive dust	-Use water mister to reduce opportunity for fugitive dust.
	Premature failure	- Follow engineered, stamped drop plan.
	Struck by falling tower	-Sound warning that tank drop is imminent.
2d. Demolish water tower debris and iremove n-ground structures using excavator-mounted shear, hoe ram, grapple, loader, and bobcat.	Struck by flying debris	-Establish construction boundary.
	Struck by moving equipment	-Wear hard hat, safety glasses, safety shoes, and reflective vest inside construction area. Make eye contact with operator when working around equipment. Use hand signals to communicate intent. -Maintain the following distances from operating equipment: Shear – 75 feet; Hoe Ram – 50 feet Other heavy duty equipment – 30 feet Bobcat – 15 feet -Make sure equipment is in safe working order. Use spotter if vision is obstructed.
	Noise Hazard	-Wear hearing protection while running heavy-duty equipment. Follow the requirements of MD-10286 D9

19 20210

JOB SAFETY AND HEALTH ANALYSIS FORM

(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
2e. Working in excessive heat/cold	Heat Stress/Cold Stress	-Follow the requirements of MD-10286 D13/D16 and discuss in daily pre-job briefings.
3. Site Remediation & Demobilization	**General Safety Note** A wide variety of incidents occur on a regular basis that potentially could result in injury or illness	-Be cognizant of your own safe work practices as well as those of your co-workers. -Review any related safety procedures of which you are unsure. -Utilize STOP WORK Authority as necessary.
3a. Rough grading	Equipment/ personnel mixture.	-Stay clear of operating heavy equipment.
3b. General conditions during demolition/demobilization	Slip – Trip – Fall Lifting /twisting strain.	-Uneven walking and/or working surfaces –use extra caution. -Follow accepted practices.
3c. Demobilize Construction Equipment Remove dust control water distribution system Remove temporary power Remove fencing	Equipment/ personnel mixture. Cuts and abrasions. Lifting /twisting strains. Radiological contamination of equipment if required by in-process surveys	-Be cognizant of your own safe work practices as well as those of your co-workers. -Review any related safety procedures of which you are unsure. -Utilize STOP WORK Authority as necessary. -Coordinate in-process Rad Surveys with Rad Techs.

19 2e30

JOB SAFETY AND HEALTH ANALYSIS FORM

(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
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3c. Demobilize Construction Equipment Remove dust control water distribution system Remove temporary power Remove fencing	Equipment/ personnel mixture. Cuts and abrasions. Lifting /twisting strains. Radiological contamination of equipment if required by in-process surveys	-Be cognizant of your own safe work practices as well as those of your co-workers. -Review any related safety procedures of which you are unsure. -Utilize STOP WORK Authority as necessary. -Coordinate in-process Rad Surveys with Rad Techs.

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SIGN-OFF SHEET

I have read and understand the attached Job Specific Work Plan and JSHA:

Signature	Date	Department

WORK PLAN REVISION SHEET

1. WORK PACKAGE TITLE: H Safe Shutdown

2. WORK PACKAGE NUMBER.

[Note: Mark this section in color]

☐ Office Master Copy (Original Approval Signatures) ☐ Field Working Copy (Original Field Sign -Offs) ☐ Review Copy ☐ Other Copy

Revision Description: (attach page revisions to form)
Add JSA 03-083 to allow connection of Temporary Power units.

Reviewed by:	Name	Signature	Date
Project Engineering:			
Project Superintendent/Foreman:			
Radiological Operations:			
Industrial Safety & Hygiene:			
Waste Management:			
Environmental Safeguards & Compliance:			
Building Manager:			
Other:			

Approved by:

CH2M Hill Project Manager

Name **Signature**

Date

REVISION LOG

1. WORK PACKAGE TITLE:			
2. WORK PACKAGE NUMBER.			
Revision	**Reason**	**By**	**Date**

Appendix B

JOB STATUS LOG

JOB STATUS LOG

1. WORK PACKAGE TITLE:
2. WORK PACKAGE NUMBER.

DATE	TIME	WORK PKG. SECTION	% Complete	BY	STATUS

19 Jo 270

Appendix C

DRAWINGS/SKETCHES

- Drop Zone Map
- Vistamaps of Surrounding Area
- Photos