3006-0605030003

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

CH2MHILL

ER/WM-119/05
March 29, 2005

Ms. Margaret L. Marks, Director
Miamisburg Closure Project
U. S. Department of Energy
1075 Mound Road
Miamisburg, OH 45342

ATTENTION: Paul Lucas

SUBJECT: Contract No. DE-AC24-03OH20152
Statement of Work Requirement 055 - Regulator Reports
BUILDING 22, BUILDING DATA PACKAGE, FINAL

Dear Ms. Marks:

Attached is the following Final document for your records:

- Building 22, Building Data Package, Final

If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact me at 937-865-4203.

Sincerely,

David A. Rakel
CERCLA Lead

DAR/ms

Enclosures

cc: Tim Fischer, USEPA, (1) w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Mary Wojciechowski, Tetra Tech, (1) w/attach
Frank Schmaltz, DOE/MCP, (1) w/attachments
Lisa Rawls, MCP, w/o attachments
Randy Tormey, DOE/OH, (1) w/attachments
Git Desai, DOE/HQ, (1) w/attachments
Chris Watson, CH2M Hill, (1) w/attachs
CERCLA Records, CH2M Hill, (1) w/attachs
Frank Bullock, MMCIC (3) w/attachments
Public Reading Room (4) w/attachments
ER Records, CH2M Hill, (1) w/attachs
DCC (1) w/attachments
Admin Record (2) w/attachments
John Lehew, CH2M Hill, w/o attachments
Dave Rakel, CH2M Hill, w/o attachments
Val Darnell, CH2M Hill, w/o attachments
Bo Wier, CH2M Hill, w/o attachments
MOAT Coordinator
file

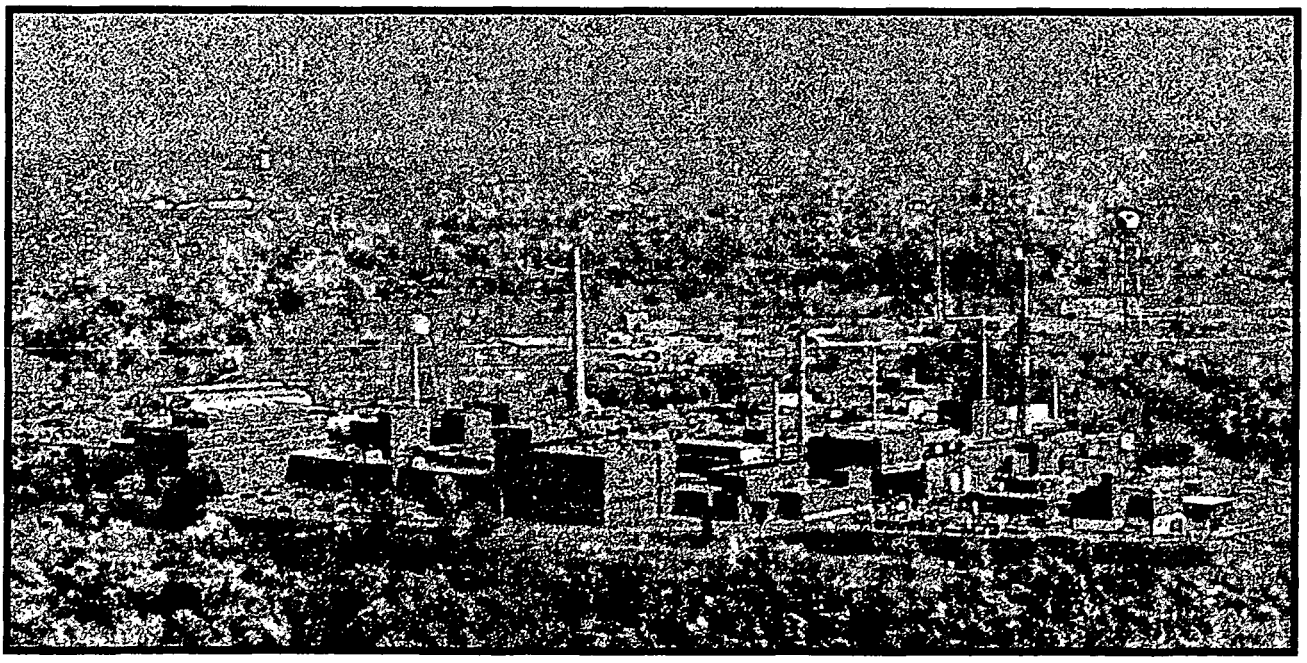
3006-0605030003

Environmental
Restoration
Program

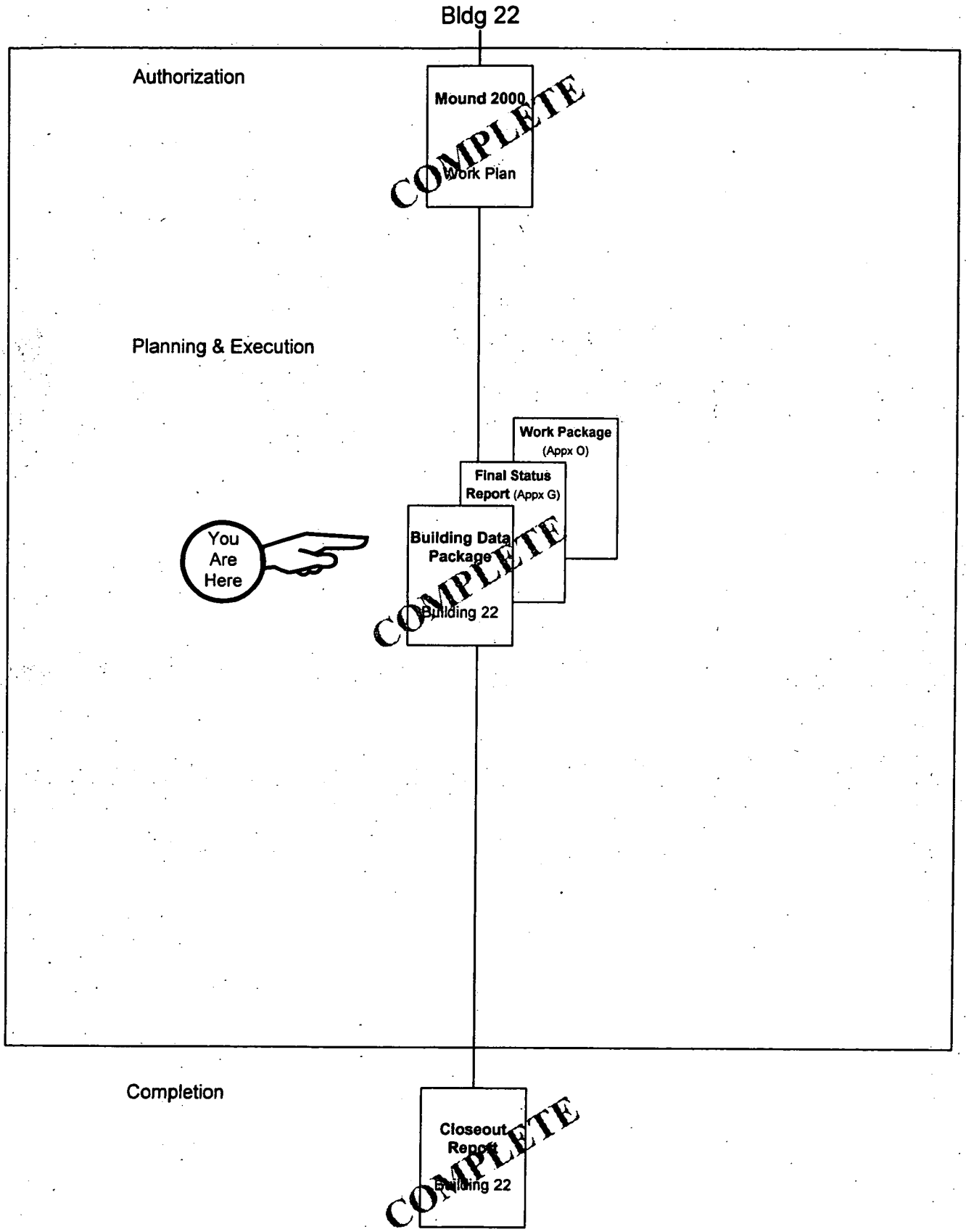
Miamisburg Closure Project
Building Data Package

Building 22
(Demolition)

Final
March 2005



Building 22



21Mar05vkd

This page intentionally left blank.

The Mound Core Team
500 Capstone Circle
Miamisburg, OH 45342

January 2005

Mr. Frank Bullock, PE
Director of Operations
Miamisburg Mound Community Improvement Corporation
720 Mound Road
COS Bldg. 4221
Miamisburg, Ohio 45342-6714

Dear Mr. Bullock:

The Core Team, consisting of the U.S. Department of Energy Miamisburg Closure Project (DOE-MCP), U.S. Environmental Protection Agency (USEPA), and the Ohio Environmental Protection Agency (OEPA), appreciates your comments on the Building 22 Building Data Package. Attached is our response.

Should the responses to comments require additional detail, please contact Paul Lucas at (937) 847-8350, x314 and we will gladly arrange a meeting or telephone conference.

Sincerely,

DOE/MCP: Paul Lucas — 1/4/05
Paul Lucas, Remedial Project Manager — date

USEPA: Timothy J. Fischer — 1/4/05
Timothy J. Fischer, Remedial Project Manager — date

OEPA: Brian K. Nickel — 1/4/05
Brian K. Nickel, Project Manager — date

Response to MMCIC/ EHS Technology Group, LLC Comments on the Building 22 Building Data Pacakge
Public Review Draft
October 2004

Comment 1.

Substantive Comments: EHS concurs with the planned demolition for Building 22. We understand that one area of soil contamination was found within 15 feet of the building (Thorium-232 at a level of 2.3 pCi/g). While this level of thorium in one borehole is not necessarily significant, we are concerned that residual contamination may be located under the footprint of the building. This contamination could be the result of activities inside the building (although this is unlikely due to the recent timeframe that radioactive materials were stored in the building (1995 to present). However, this building is in close proximity to PRS 66, which has widespread contamination. Confirmation that contamination from PRS 66 has not migrated beneath the building would be part of a prudent verification sampling program and we recommend that the contaminates of concern (COCs) for PRS 66 also be included in the sampling protocol of the VSAP for this building.

Coordination between CH2M Hill, the DOE and MMCIC to ensure the building area is left in a condition consistent with the Mound Reuse Plan.

If EHS's understandings are correct, no specific response to the above comment is necessary, and we understand that these comments will be included in the OSC report.

Response 1.

Thank you for your review and input to the document. There is no VSAP associated with this building. This is consistent with the building demolition process in the Mound 2000 Work Plan (Figure 4.4). The concern you point out about contamination from PRS 66 will be addressed by the verification sampling for that removal action. The specific sample result you mentioned is not associated with radioactive material in Building 22 because that sample was collected and analyzed in 1988, prior to the mid 1990s when the building began being used to store radioactive material.

MMCIC is encouraged to coordinate with DOE and the clean-up contractor regarding demolition activities. The demolition Work Plan specifies any site restoration activities following structure removal. The Core Team understands MMCIC's request and encourages MMCIC to meet with DOE to obtain an agreeable end state.

Public comments are included in the final version of the document to which they pertain; accordingly, these comments will not be included in an OSC Report as your comment indicated, but are included in the Final version of the Building 22 Building Data Package.

MIAMISBURG CLOSURE PROJECT

BUILDING DATA PACKAGE

The following document is available (October 7, 2004) for public information in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio.

BDP Building 22:
Waste Staging Facility

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

This page intentionally left blank.

BDP Building 22

REV	DESCRIPTION	DATE
WORKING DRAFT (to DOE)		**September 2004**
DRAFT (to Core Team)	BDPs for construction demolitions undergo simultaneous review by the Core Team and public.	**N/A**
PUBLIC REVIEW DRAFT	Public review period from October 7, 2004 through November 6, 2004.	**October 2004**
DRAFT PROPOSED FINAL (incorporates Core Team comments)	Incorporates changes from OEPA, USEPA, and MMCIC.	**December 2004**
FINAL	The Core Team response to MMCIC comments is provided at the front of this document.	**March 2005**

This page intentionally left blank.

TABLE OF CONTENTS

Section Page

1.0 General Overview 1
- 1.1 Introduction 1
- 1.2 Scope 1

2.0 Building 22 Overview 2
- 2.1 Past Uses of Building 22 3
- 2.2 Current Uses of Building 22 4
- 2.3 Summary of Environmental Concerns and Findings – Building 22 4
- 2.4 Radiological Information for Building 22 6

3.0 Site Description 8
- 3.1 Site/Vicinity Location and Characteristics 8
- 3.2 Description of Structures, Roads, and Other Improvements in Proximity to Building 22 8
- 3.3 Current and Past Uses of Buildings in Proximity to Building 22 8

4.0 Records Review 9
- 4.1 General/Historical CERCLA Information 9
- 4.2 Specific Record Sources for Building 22 10
  - 4.2.1 Occurrence Reports 10
  - 4.2.2 Spills and Releases 11
  - 4.2.3 Associated PRS Overview 11
- 4.3 Review of Building Prints 12
- 4.4 Aerial Photographs 12
- 4.5 Interviews 12

Tables

Table 1: Functions and Processes in Building 22 4

Table 2: Summary of Environmental Concerns and Findings 4

Table 3: Maximum Results Exceeding Screening Levels (pCi/g) 6

Table 4: Radiological Summary 7

Table 5: PRSs in Proximity to Building 22 12

Appendices

Appendix A General Listing of Acronyms
Appendix B Map of Montgomery County
Appendix C Figures
Appendix D Floor Plans
Appendix E Aerial Photographs
Appendix F Environmental Appraisal Report of the Mound Plant (Excerpt)
Appendix G Radiological Information
Appendix H Radon Information
Appendix I Asbestos Information
Appendix J Lead Information
Appendix K Chemical Information
Appendix L Soil Sampling, Vicinity
Appendix M Occurrence Reports
Appendix N PRS Information
Appendix O Work Plan (Final)

1.0 GENERAL OVERVIEW

1.1 Introduction

The purpose of this Building Data Package (BDP) is to prepare for the demolition of Building 22 (Waste Staging Facility) and to identify, if possible, any recognized environmental conditions (defined below) that may affect the subject property and building.

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 building.

1.2 Scope

This document has been prepared in accordance with the agreements and requirements as specified in the *Work Plan for Environmental Restoration (ER) of the DOE Mound Site, The Mound 2000 Approach*. This document is a BDP for Building 22 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 *American Society of Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments; Phase I Environmental Site Assessment Process* (Designation E 1527-00).

The scope of the investigation included Building 22, the soil beneath, and a 15-foot wide perimeter border around the building. The investigation of Building 22 included the following:

A) A building 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 building 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
- Building Prints
- 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 BUILDING 22 OVERVIEW

Building 22 is situated in the central portion of the site (Figure 1) and is located on the south side of the plant site main roadway leading to the Test Fire area. The building includes approximately 9,090 square feet of floor space.

Building 22 was originally constructed as a 5,400-square-foot (approximately) storage facility in 1965. In 1968, a renovation added approximately 3,600 square feet of additional storage area to bring the total building area to 9,090 square feet. The building was originally used for office space and storage of items awaiting lot sale and/or reuse. In 1995, Environmental Safety & Health (ES&H) enhancements were made to the building to accommodate solid radioactive low level waste (LLW) storage activities. The ES&H modifications included office area renovations, insulating the interior wall and roof surfaces of the storage area, installation of electric heating units in the storage area, a diked-perimeter sprinkler water capture system that encompassed the entire storage area, and a three foot by three foot by two foot deep sump pit along the west wall of the storage area (Room 1, Appendix D). A reference is made in the Building 22 section of the *Environmental Appraisal Report of the Mound Plant (Appendix F of this BDP, page 2 of 47)*, to a 1,100 gallon in-ground sump. Jeffrey Phillabaum, one of the former Assistant Building Managers, indicated during an interview that the 1,100 gallon volume included the volumes of both the sump pit and diked floor area. The building is not contaminated with either radiological or energetic materials.

The building structure is noncombustible with a Type II (000) construction classification per NFPA 220, *Types of Building Construction*. The exterior walls and roof are constructed of seamed metal panels; the structural beams, girders, trusses and arches are steel; and the floor is an 8-inch reinforced concrete slab.

In its current configuration, the building is approximately 150 feet long by 60 feet wide, 24 feet high at the roof peak and 14 feet high at the roof edges. The building has a lightning protection system that includes air terminal type strike termination devices along the peak of the gable style roof, grounding conductors are connected to the structural steel trusses, and ground rod terminations into the concrete foundation.

The building is divided into two areas: a storage area on the southwest end that is approximately 8,000 square feet, and an office area on the northeast end that is approximately 1,000 square feet. The office area consists of two office rooms, a storage room, a janitor's closest, a restroom, and a "L" shaped corridor with a dead-end length of approximately 30 feet. The office area has painted gypsum board walls, vinyl floor tile, and an acoustic tile drop ceiling (floor plan provided in Appendix D).

Building 22 Fire System Valve Building

A 5-1/3 feet by 6-3/4 feet by 8 feet tall building is located on the north side of Building 22, approximately 19 feet from the west end of Building 22 to the centerline of the Fire System Valve Building. The walls of the building are constructed of masonry block. The roof is constructed of a concrete slab coated with tar and gravel. The building houses the control valve and piping for the Building 22 dry fire sprinkler system.

Utilities

The Building 22 office area is climate controlled via a heat pump located on the south side of the building. The storage area is heated (no air conditioning) with 480-volt electric heaters suspended from the roof supports. Electric service to Building 22 is 480 volts. The building has potable water, a dry fire sprinkler system, and sanitary services. Storm drains, installed as part of the original construction, were removed in 1995 as part of the building ES&H modifications, when the building was reconfigured for solid radioactive LLW waste storage activities.

2.1 Past Uses of Building 22

Building 22 was originally constructed and used primarily as warehouse storage. In 1968, a renovation added approximately 3,600 square feet of additional area to bring the total building area to 9,090 square feet, with approximately one-third of the building used as office space and two-thirds as warehouse storage space. Items stored would typically be those awaiting lot sale, equipment and instrumentation supporting the Heat Sources program (such as empty shipping containers), and electrical equipment and supplies supporting the plant electrical trades. In 1995, the building was modified to accommodate solid radioactive LLW waste storage activities. The building is not contaminated with either radiological or energetic materials and no hazardous wastes were generated in the storage area. Table 1 provides a list of building uses since its 1965 construction.

Table 1: Functions and Processes In Building 22

Period	Function or Process
1960s to mid 1990s	Warehouse storage and office space
mid 1990s to 2004	Storage of containers of radioactive LLW waste

2.2 Current Uses of Building 22

Building 22 is currently inactive and in the process of Safe Shutdown. All required equipment will be removed from the Building (in accordance with 41 CFR 101-200), and any remaining equipment will be left in place and demolished/disposed of with the building.

2.3 Summary of Environmental Concerns and Findings – Building 22

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Lead-Based Paint	No previous lead surveys or sampling data could be found for Building 22. During July of 2004, a walk-through survey of all accessible areas of Building 22 was performed in order to identify any existing or potential lead paint hazards. The paint coatings present were observed to be intact and no potential hazards observed. Since the building is scheduled for imminent demolition, painted surfaces will be tested for lead content as planned work indicates the need for such testing in order to avoid worker exposure to lead. (Appendix J).	No paint analysis would be necessary to protect occupant or worker health unless any coatings were to be disturbed by close worker contact (sanding, grinding, scraping, torch cutting, etc.). If these types of activities are planned, the affected paint coatings will be tested to verify the absence of lead. Waste Management performed worst-case scenario calculations to determine that building demolition debris containing lead-based paint meets the waste acceptance criteria at the landfill.
Chemicals	Appendix K provides a list of chemicals reportedly used or stored in Building 22.	All chemicals will be removed prior to demolition, and dispositioned by Waste Management.
Ballasts associated with Fluorescent Lamps	Fluorescent lamps were used in the building. Ballasts may contain polychlorinated biphenyls (PCBs).	Ballasts that may contain PCBs will be removed prior to demolition, and disposed of by Waste Management.
Air Emissions	There were no processes that created air emissions in Building 22.	N/A

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
Asbestos	During July of 2004, a comprehensive walk-through survey of all areas of Building 22 was performed in order to identify all asbestos-containing materials (ACMs) prior to demolition of the facilities (Appendix I). A cementitious wall panel (transite) was previously labeled as asbestos containing and is the only asbestos-containing material observed to be located within or on the building. The wall panel will require removal prior to building demolition.	The cementitious wall panel (transite) will be removed in accordance with NESHAP requirements prior to commencement of demolition activities, and disposed of per Waste Management direction. All work will be performed in accordance with current state and federal regulations.
Drainage Sumps	There is one sump pit located along the west wall of the storage area (Room 1). There is a 5" dike along the perimeter wall of the storage area. This diked area (and sump pit) is constructed as a wastewater collection system, which would collect fire sprinkler system water or wash-down water in the event of a fire or explosion. The water would be collected in the diked area and sump pit (the diked floor area and sump pit are both included in the 1,100 gallon sump volume) where it would be tested for radioactive contamination prior to either being discharged into the sanitary sewer system or processed for disposal.	Radiological evaluation of the sump was performed and no activity above background was detected. Survey results are documented in the Final Status Report (Appendix G, page G7 of 96, and G96A of 96 through G96E of 96).
Lead	N/A	N/A
Mercury	Switches were used in the building.	Switches that may contain mercury will be removed prior to demolition, and disposed of by Waste Management.
Radiological	Building 22 meets radiological surface release criteria established by DOE Order 5400.5 and no further radiological surveys are required.	See Section 2.4 for a summary of the results, and Appendix G for the complete Final Status Report.
Septic System	N/A	N/A
Wastewater	Handled by site wastewater facility.	N/A
Stains & Corrosion	N/A	N/A
Storage Tanks	There are no above ground or underground storage tanks within 15-feet of the Building 22 perimeter.	N/A
Solid Waste Disposal	N/A	N/A
Migratory Hazards	N/A	N/A
Radon	Radon level is not applicable for open air demolitions.	N/A

Table 2: Summary of Environmental Concerns and Findings

Description	Comment	Resolution
HVAC	HVAC refrigerant will be drained and disposed of during Safe Shutdown.	No further action required.
Energetic Materials	No processes in or functions of Building 22 are associated with energetic materials.	N/A
Soil Contamination	Appendix L contains a graphic showing all soil sample locations within 15 feet of the perimeter of Building 22, and provides tables for detected compounds (results above laboratory detection limits) and non-detected compounds (results below laboratory detection limits). One sample, at 3-ft. depth at Borehole SCR417, showed elevated Thorium 232 results as shown in Table 3. All other soil results within the 15-ft. perimeter of the building are less than the screening criteria (Core Team approved or the more stringent of either 10^{-6} Risk-Based Guideline Value [RBGV] plus background or Hazard Index = 1).	The borehole location for the elevated level of Thorium 232, SCR417, is not within a PRS boundary. The sample location is adjacent to the roadway on the north side of Building 22. There is no visible borehole in the concrete or asphalt however the digitized coordinate location of the borehole is known (Easting: 1465494.0, Northing: 598412.61, Elevation: 771.849). The location of this borehole will be marked to prevent it from being disturbed during demolition activities; therefore, potential soil contamination at the sample location will not affect worker safety during demolition activities. There is no VSAP associated with this building. Verification sampling to confirm that contamination from PRS 66 has not migrated beneath the building will be addressed by the verification sampling for the PRS 66 removal action.

N/A: Not applicable

Table 3: Maximum Results Exceeding Screening Levels (pCi/g)

Analyte	Maximum Result	Background	RBGV (10^{-6})	Screening Level
Thorium-232	2.3*	1.4	0.07	1.47

RBGV: most stringent of construction and office worker scenarios per Risk-Based Guideline Values, March 1997, Final, as performed using April 2001 Health Effects Assessment Summary Table (HEAST) slope factors.

* Result exceeds Cleanup Objective (2.1 pCi/g) but is below Hot Spot Criteria (3.5 pCi/g).

2.4 Radiological Information for Building 22

A radiological assessment of Building 22 was performed by reviewing its operational history and by performing radiological surveys. Building 22 was constructed in 1965 for use as warehouse storage. In 1968, a renovation added approximately 3,600 square feet of additional area to the building footprint. The primary building function remained warehouse

storage. The building was modified in 1995 to support solid radioactive LLW waste storage activities. Building 22 is scheduled for demolition in accordance with MCP goals.

There is one recorded occurrence involving radioactive contamination, in which tritium contamination was found on two storage drums that had been received from SW Building. The record states that the contaminated drum was overpacked and there was no residual contamination found on building surfaces as a result of the incident.

Surveys were performed throughout the building in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The fixed point, scanning, judgmental (biased), and smear surveys found no residual activity above the Derived Concentration Guideline Level for the wide area average ($DCGL_w$). Smear samples taken in floor drains and sediment smear samples from the ventilation system found no activity above background levels.

The review team concluded that the building meets radiological surface release criteria established by DOE Order 5400.5 and no further radiological surveys are required. Subsurface material (under-slab, footers, etc) and associated soil is not evaluated in this survey, but will be assessed separately when surfaces are accessible.

Supporting documentation for the information summarized in Table 4 is contained in the Final Status Report (FSR) (Appendix G).

Table 4: Radiological Summary

TYPE	RSDS#	LOCATION	SURVEY RESULTS (dpm/100 cm^2)	SURFACE CONTAMINATION GUIDELINES (dpm/100 cm^2) (Note 1)
Highest Alpha Smearable Activity	04-TF-0221	Floor	7.3	20
Highest Group 1 Alpha Fixed Activity	04-TF-0233	Wall	62	100
Highest Group 3 Alpha Fixed Activity	04-TF-0275	Roof	189	5,000
Highest Beta Smearable Activity	04-TF-0221	Floor	6.41	1,000
Highest Beta Fixed Activity	04-TF-0221	Floor	3,102	5,000
Highest Tritium Smearable Activity	04-TF-0253	Attic	119.3	10,000

Note 1: DOE Order 5400.5 (DCGLw)

3.0 SITE DESCRIPTION

3.1 Site/Vicinity Location and Characteristics

Building 22 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 Engineering 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 Building 22

Building 22 is bordered by a parking lot to the west, a ravine to the south, an asphalt roadway to the north, and a vacant area to the east where the Brickmaker was formerly located (Figure 3).

3.3 Current and Past Uses of Buildings in Proximity to Building 22

There are no buildings or structures currently in proximity of Building 22

Previous buildings in proximity (Figure 1) to Building 22 include:

- The Brickmaker (erected in 1992) was a cluster of temporary structures located approximately 60 feet to the east of Building 22. The cluster included three steel-framed Rubb®-Brand buildings/tents, a singlewide office trailer, and a lined in-ground sump pit to receive water from the process. The three tents had footprints that measured approximately 39 x 60 feet, 15 x 40 feet, and 25 x 60 feet. The brickmaker was constructed to house equipment used to compress and de-water low-level radioactively contaminated soils into extruded bricks, and place the bricks in LLW boxes for offsite disposal. The trailer and wooden decking were removed in

1997, transferred to the Spoils Area, and later demolished. In 1999, the brickmaker equipment was radiologically surveyed and cleared for free release. The brickmaker tents and equipment were subsequently sold at auction and removed from the site in July 2002. The structure demolition and sump removal activities were completed in September 2002. The demolition was considered a standard industrial demolition.

- Hydrolysis House (HH) structures were located approximately 170 feet to the northwest of Building 22. Built in 1948, the HH structures included 15,276-square-foot of floor space. As one of Mound's original polonium-process related buildings, it provided for the treatment of polonium processing effluents received from T Building, and had housed a number of radiological and non-radiological programs. Processing activities in HH Building ceased in 1996. Demolition activities were completed in 2004. The structures were demolished as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Action (RA) in accordance with the HH Building Action Memorandum/Engineering Evaluation/Cost Analysis (EE/CA), August 2002, Final. The project will be closed via an OSC Report.

- Buildings WH-7and WH-9 (Warehouses 7 and 9) were both constructed in 1947 and demolished in the early 1950s. The warehouses were adjacent to each other in the (Test Fire) valley area, approximately 165 feet to the southwest of the Building 22. The storage volume of WH-7 and WH-9 were 53,760 cubic feet and 21,760 cubic feet respectively. These warehouses were used for the storage of construction materials that came onsite by rail. WH-7 was also used for the storage of repacked drums of radioactively contaminated liquid wastes. The building's removal was considered a standard industrial demolition.

These buildings are believed to have had no adverse environmental impact on Building 22.

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 had operated a hazardous waste storage facility under a RCRA Part B permit dated October 18, 1996. The site currently 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 indicated that no reportable chemicals were stored in Building 22.

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. 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 Building 22 (Section 4.2.3) are listed in Table 5 along with their binning status. Their locations are shown on Figure 2. Of the eight PRSs in the vicinity of Building 22, two are Removal Actions, one is Unbinned (UB), and five have been determined by the Core Team to require No Further Assessment (NFA). For a PRS to be binned NFA or as a completed RA, 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 Building 22 have been identified.

4.2 Specific Record Sources for Building 22

4.2.1 Occurrence Reports

A search of the occurrence reporting system revealed five reports, all of which were minor and without environmental impact.

- *Building 22 dry sprinkler system activation (January 1992).* Water began leaking from a cracked condensate trap. Cause was traced to an unplugged heat tape wrap on the condensate trap and a non-functioning

pressure switch. A small amount of water was released and cleaned up. The pressure switch and condensate trap were replaced. (Appendix M);

- *Tritium contaminated drums in Building 22 (September 2001).* Two drums transferred from SW Bldg., containing tritium contaminated wastes, were found to have elevated levels for removable tritium contamination during receipt checks of the transferred drums. Subsequent surveys indicated one of the drums as the source of contamination. The evidence suggests that the representative swipe surveys for release of the drums missed localized contamination on one of the drums. This resulted in cross-contamination of the second drum. Surveys were also taken on the Building 22 dock and in the storage area to determine if storage skids or other equipment were contaminated from exposure to the contaminated drums. No contamination was found on building surfaces and there was no spread of contamination to the environment. (Appendix M);

- *Exceedance of Building 22 radiological limits (June 1998).* The combined curie limit for isotopes other than tritium and Pu-238 slightly exceeded the building's category 3 threshold limit. The Inventory Control Database had been incorrectly programmed, and thus no 'flag' was raised that the inventory had been exceeded. The error was noted during a review of the Basis for Interim Operations guidelines for the building;

- *New benchmark Environ. Corp. wooden box characterization data & BD-22 Authorization Basis (May 1999);*

- *480 VAC electrical line contacted while unloading construction equipment from truck resulting in power outage to BD 22 (January 2003).*

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 ER Program, DOE and the site contractor tabulated all the PRSs identified under the various regulatory programs in effect at the site. Eight PRSs are at or near Building 22, as identified in Table 5. The PRS locations are shown on Figure 2 of Appendix C, and recommendation sheets are provided in Appendix N.

Table 5: PRSs in Proximity to Building 22

PRS	CERCLA or Bldg. Related	Binning Status	Comments
32	CERCLA	NFA	Underground Sanitary Sewer Line G12
67	CERCLA	RA	Plant Drainage Ditch
75	CERCLA	RA	Railroad Siding
90	CERCLA	NFA	Site Survey Project Potential Hot Spot Location S0425
286	Building	UB	Area 16, SM Building Sanitary Sewage Septic Tank Leach Field
300	CERCLA	NFA	Area 19, Underground Waste Transfer Line
367	CERCLA	NFA	Elevated Soil Gas Location
397	CERCLA	NFA	Elevated Soil Gas Location

Note: PRSs 286 has not yet been binned by the Core Team.

4.3 Review of Building Prints

Building prints were reviewed and no significant items were identified. Floor plans are included in Appendix D.

4.4 Aerial Photographs

Aerial photographs from 1959 (prior to construction of Building 22), 1965 (following construction of Building 22), and 1996 (most recent aerial photo) were reviewed and no significant items were identified. Aerial photographs are presented in Appendix E.

4.5 Interviews

Past Building Manager, L. T. Lamsa, was interviewed via a building manager questionnaire (Appendix F). A former Assistant Building Manager, Jeffrey Phillabaum, and the current Building Manager, Gary Weidenbach, were also interviewed regarding past facility operations and current conditions. No significant items in the building were identified based on the questionnaire or interviews.

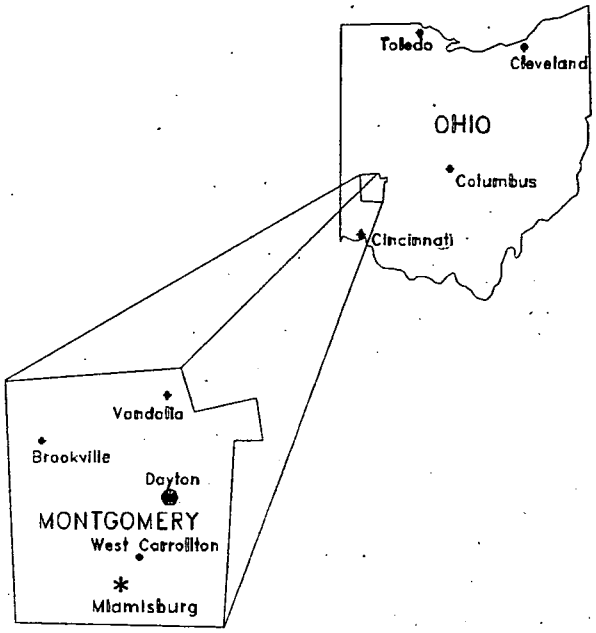
Appendix A

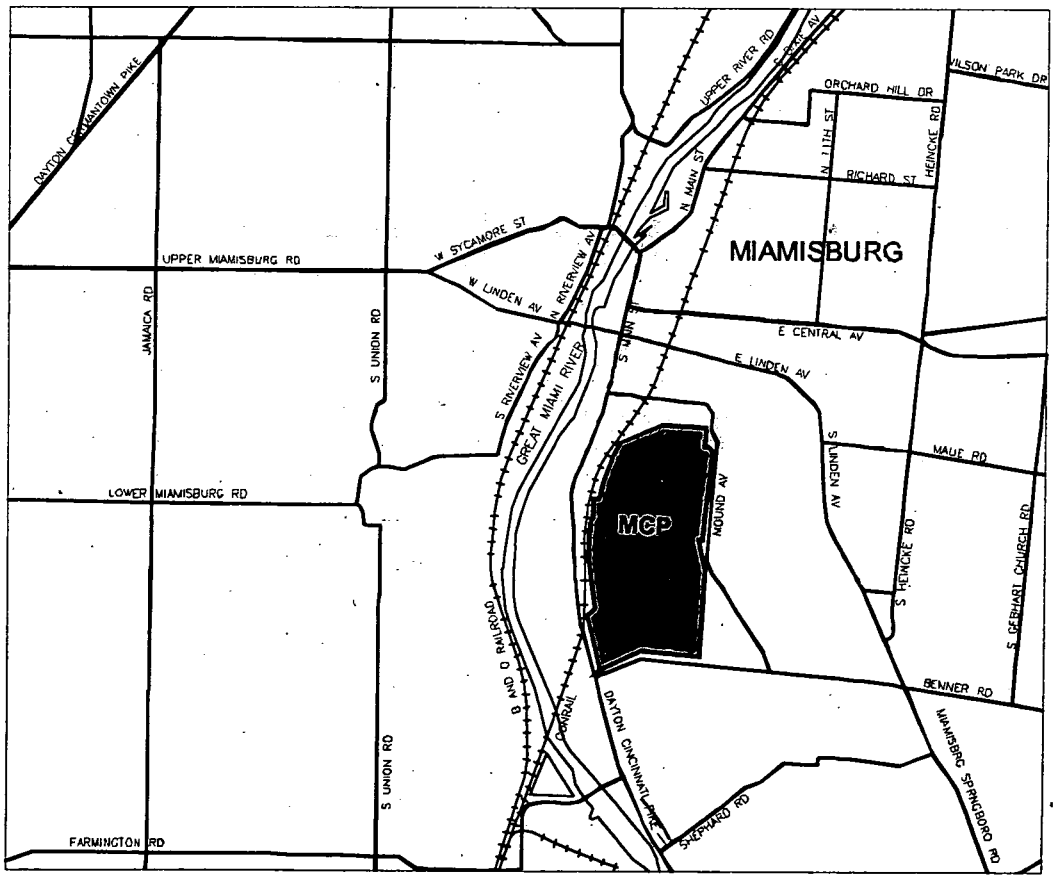
General Listing of Acronyms

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


Toledo
Cleveland
OHIO
Columbus
Cincinnati
Vandalia
Brookville
Dayton
MONTGOMERY
West Carrollton
Miamisburg


DAYTON CORNTOWN PIKE
UPPER MIAMISBURG RD
W SYCAMORE ST
W LINDEN AV
N RIVERVIEW AV
S RIVERVIEW AV
GREAT MIAMI RIVER
JAMAICA RD
S UNION RD
LOWER MIAMISBURG RD
FARMINGTON RD
UPPER RIVER RD
S MAIN ST
N MAIN ST
ORCHARD HILL DR
WILSON PARK DR
N 11TH ST
RICHARD ST
HEINCKE RD
MIAMISBURG
E CENTRAL AV
E LINDEN AV
S LINDEN AV
MAUE RD
MCP
MOUND AV
S HEINCKE RD
S GERHART CHURCH RD
BENNER RD
B AND O RAILROAD
CONRAIL
DAYTON CINCINNATI PIKE
SHEPHARD RD
MIAMISBURG SPRINGBORO RD

B 1 of 1

Appendix C

Figures

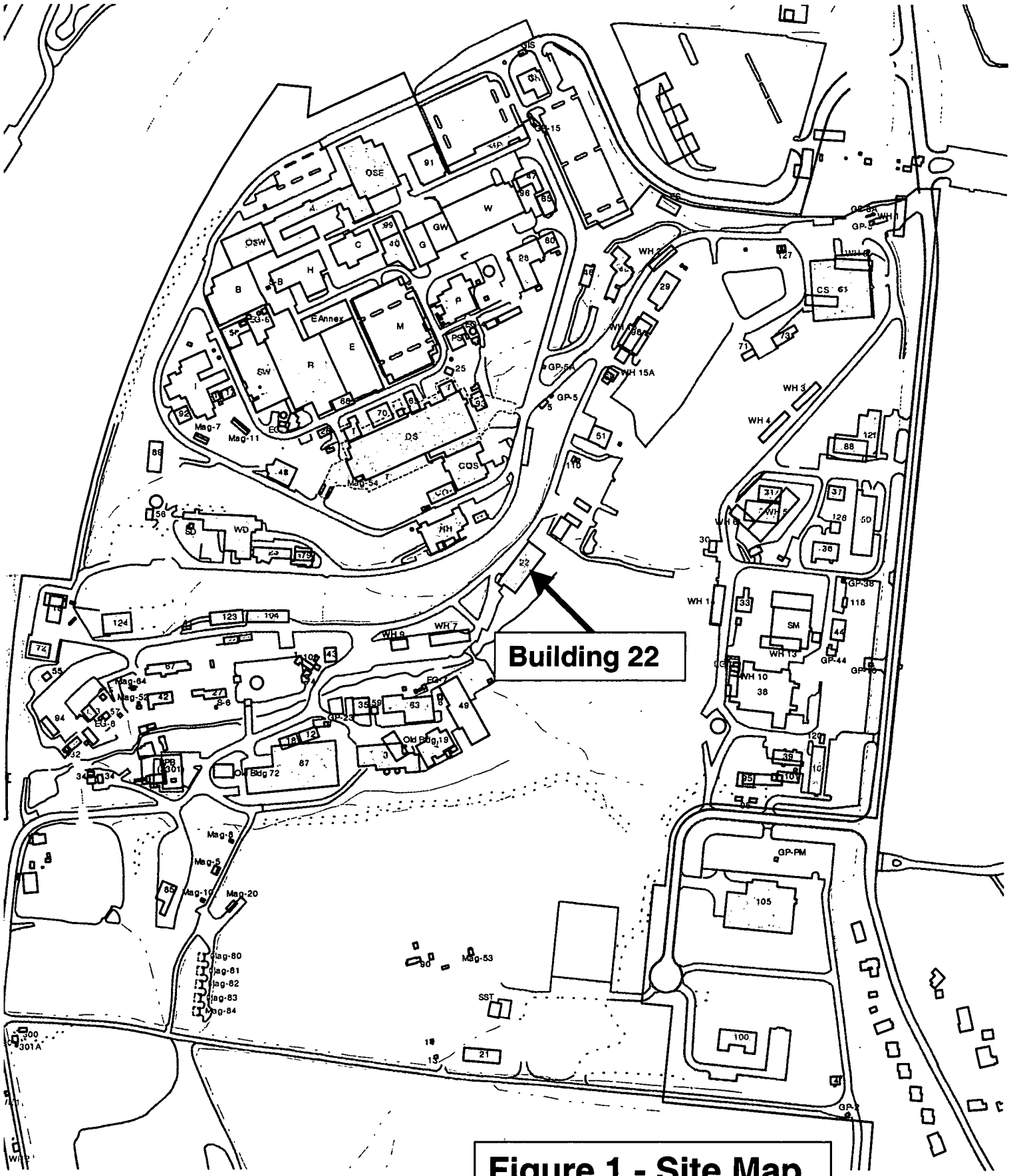
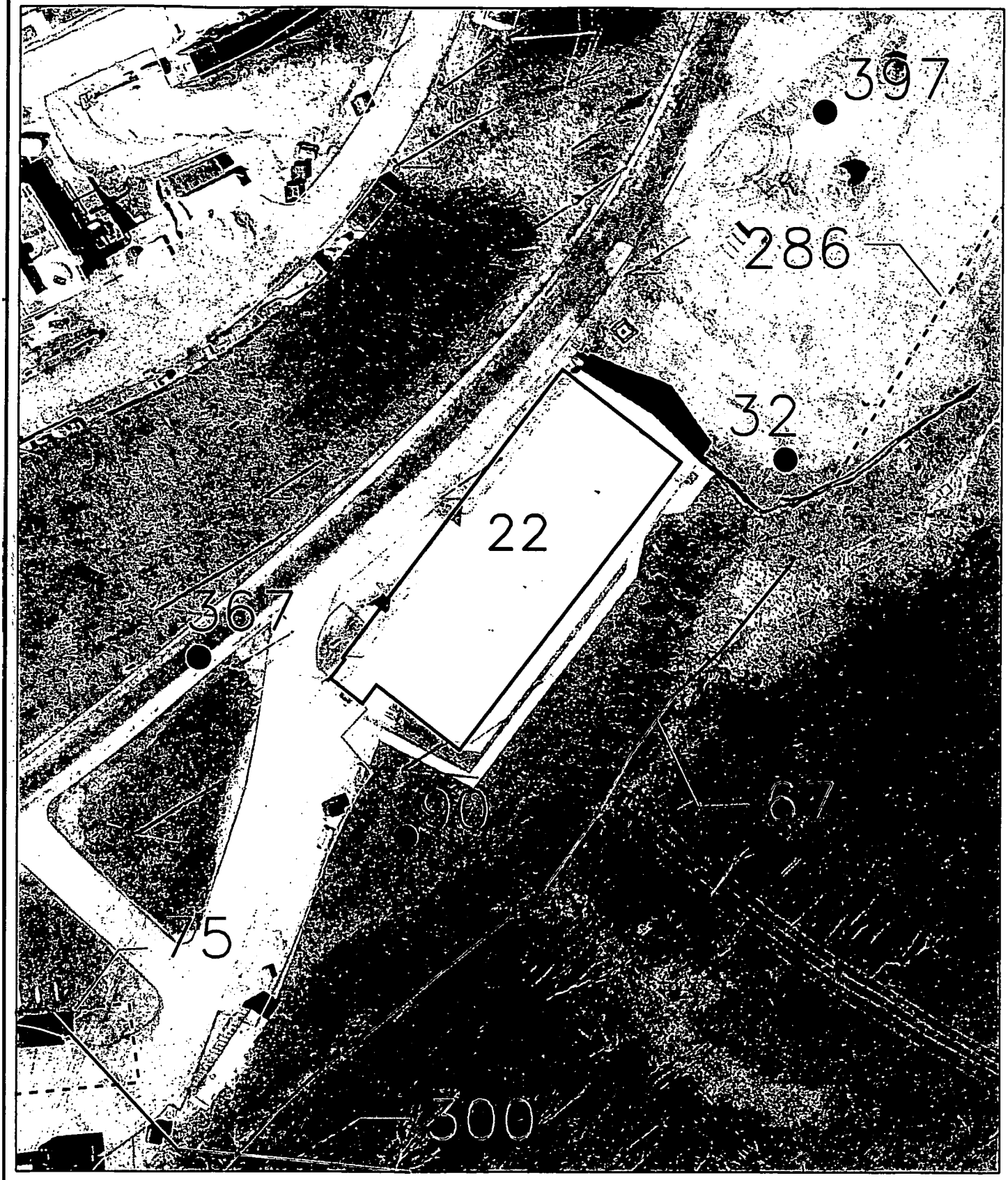


Figure 1 - Site Map



PRS Point

PRS Area

PRS Line

20 10 0 20 40FT
GRAPHIC SCALE

MOUND

Environmental Restoration Geographic Information System

	06/28/04		SSF						
ES	DATE	REVISION	BY	CHKR	CKD	LPREZ	APVD	B	

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

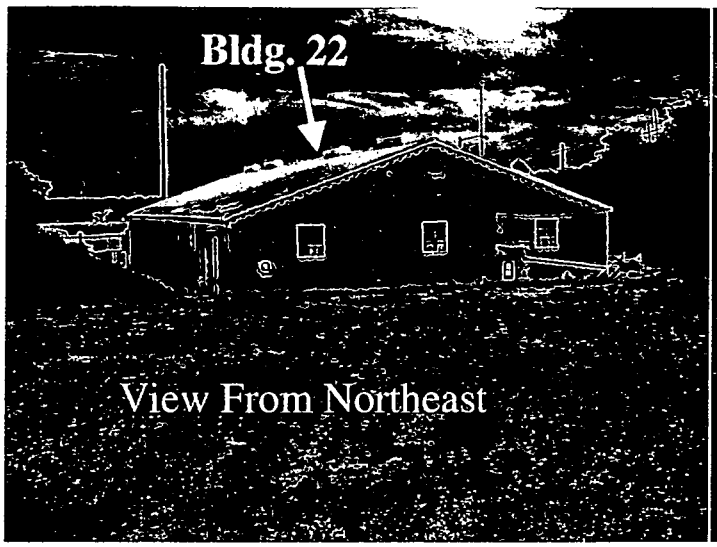
DOCUMENT CLASSIFICATION UNCLASSIFIED

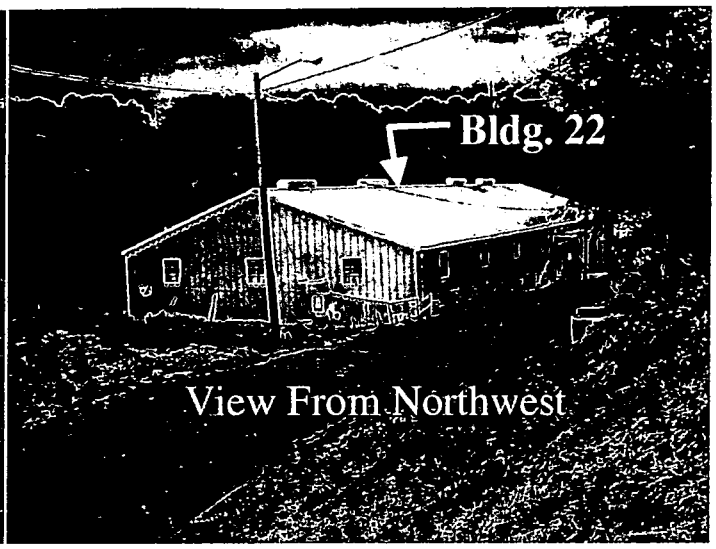
Figure 2
Building 22
and Vicinity

SIZE | DRAWING NUMBER vicinity.dgn | JOB NUMBER

DGN TYPE STE | PRNG ER-GIS | CADD | SCALE | SHEET 1 OF

STATUS MD-REL-99/99/99 | ORIGIN MSTATION / J





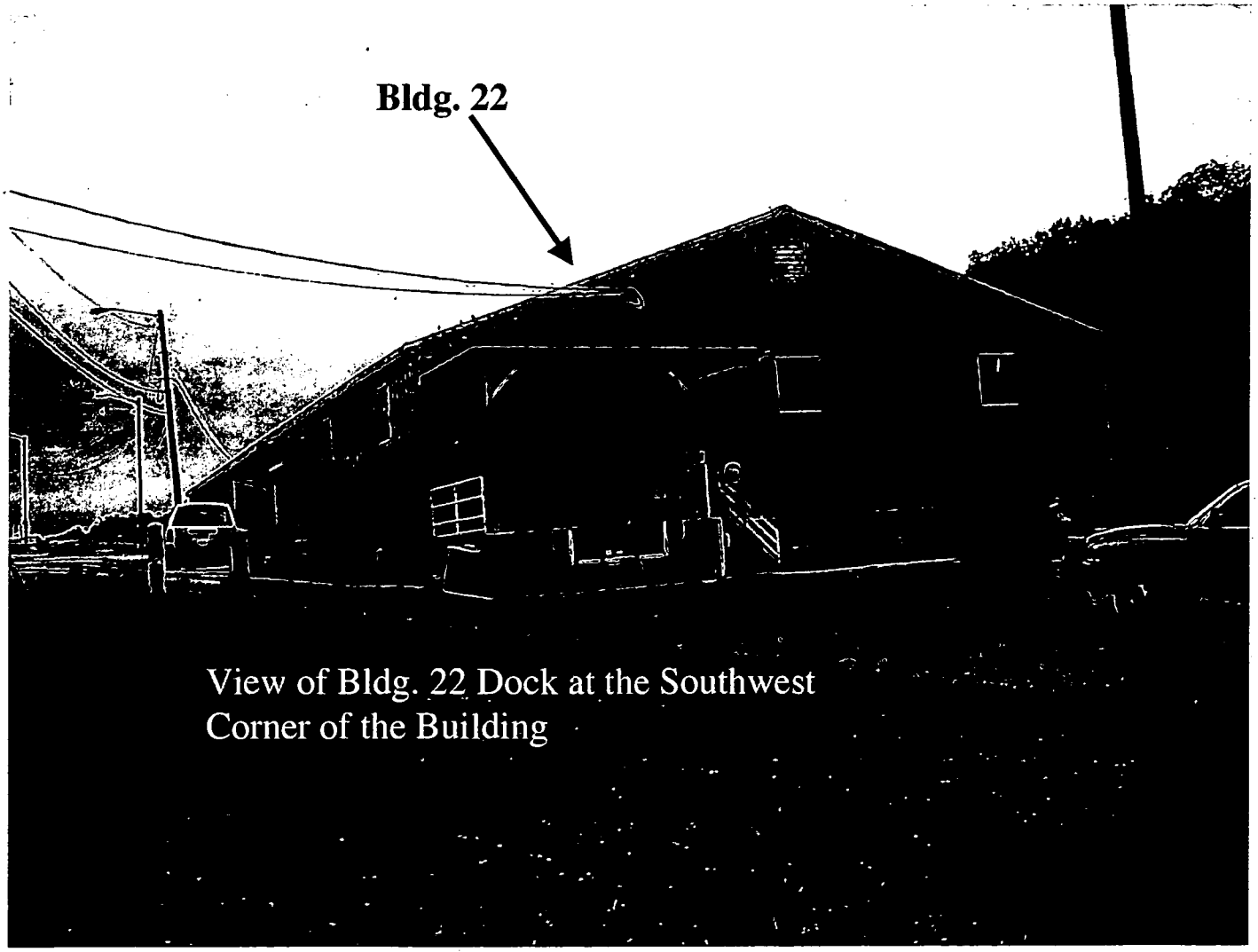
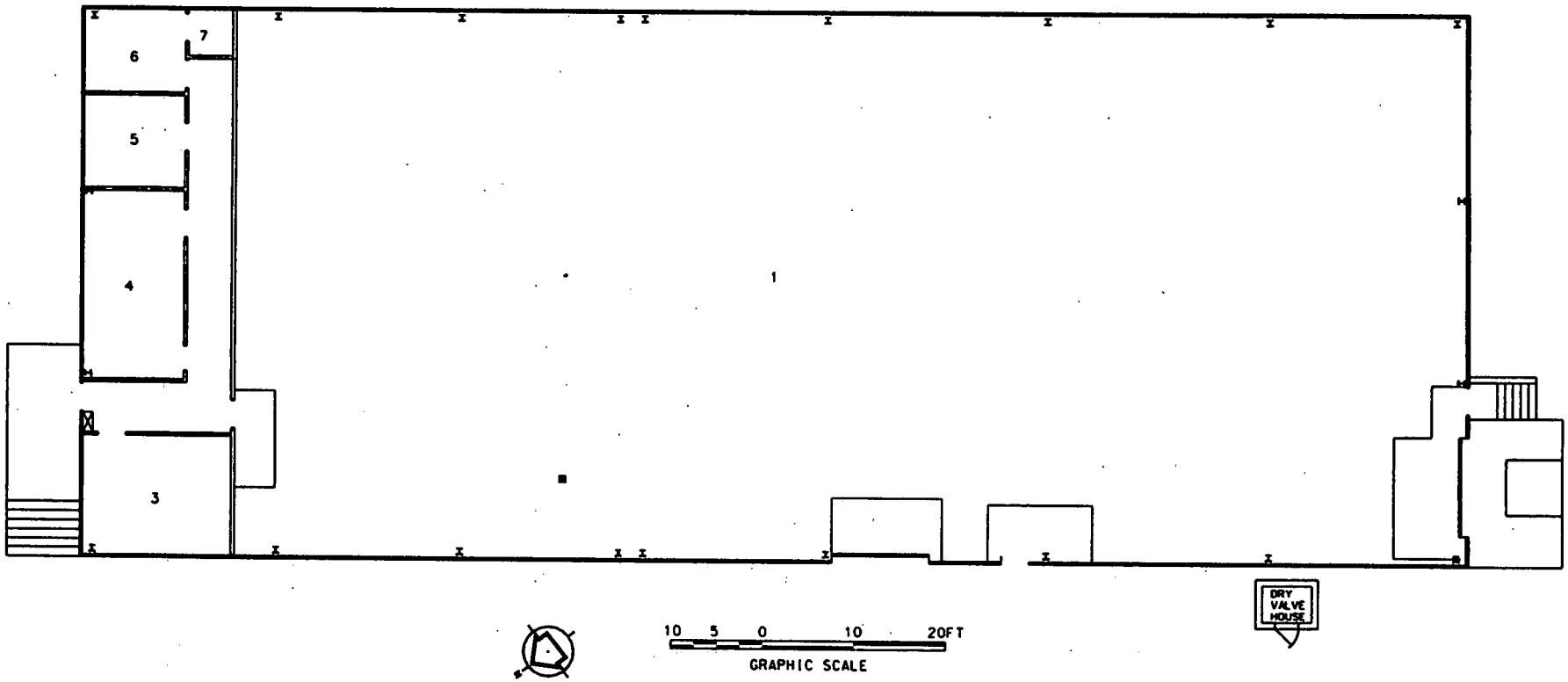


FIGURE 3 – BLDG. 22
EXTERIOR PHOTOS

Appendix D

Floor Plans



ISS	DATE	REVISION	BY	CHKR	ENG	UPDCC	APVD	ISS
	07/15/04		SSF					

MOUND

Environmental Restoration Geographic Information System

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																					

PARTY CLASSIFICATION

DRAWING CLASSIFICATION: UNCLASSIFIED

SIZE | DRAWING NUMBER | JOB NUMBER

DWG TYPE: STE | PRNG: ER-GIS | CAGEC | SCALE: 1" | SHEET 1 OF

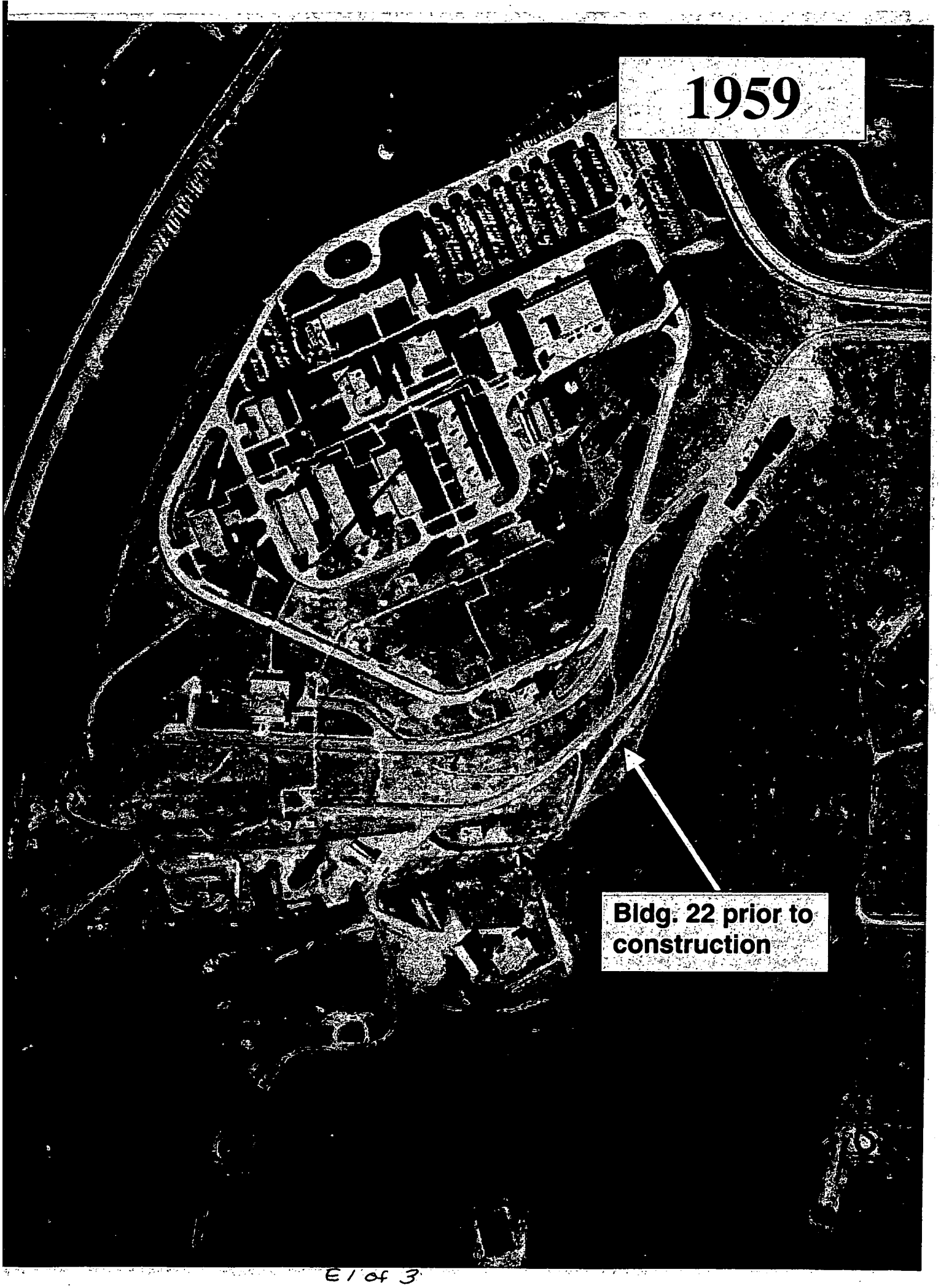
STATUS: MD-REL-[illegible] | ORIGIN: MSTATION / J

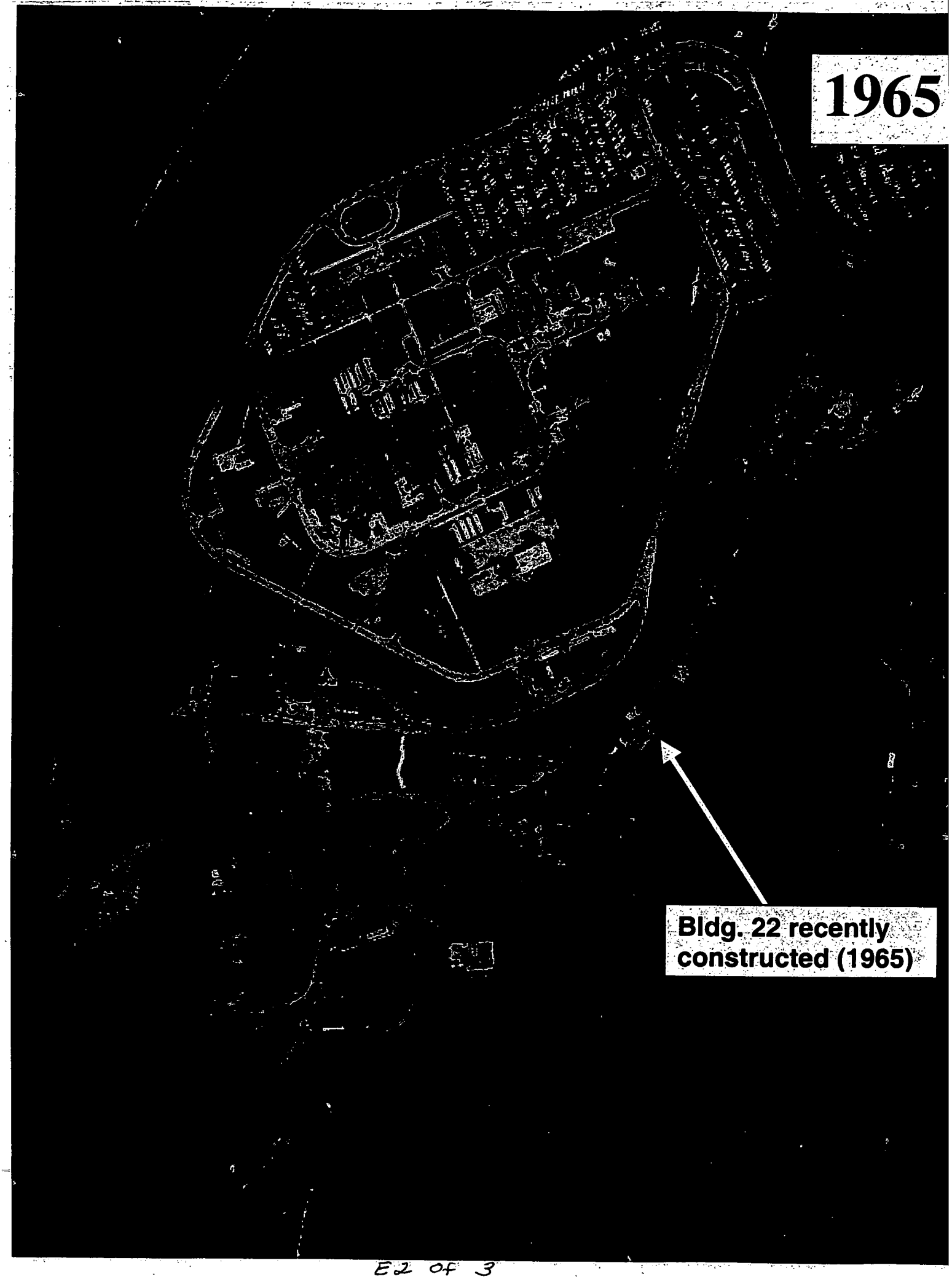
Building 22
1st Floor

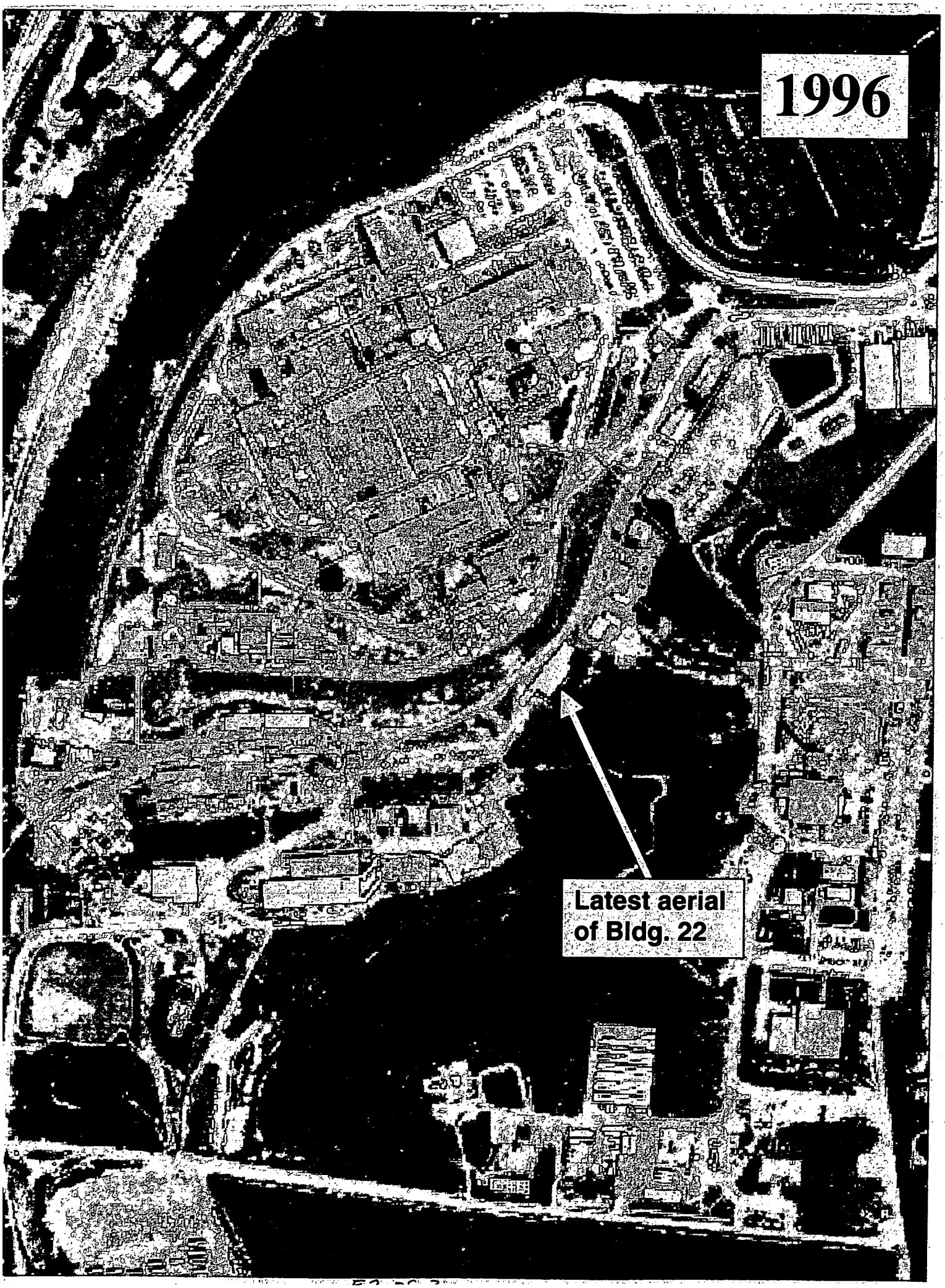
1 of 1

Appendix E

Aerial Photographs


1959
Bldg. 22 prior to construction


1965
Bldg. 22 recently constructed (1965)


1996
Latest aerial of Bldg. 22

Appendix F

Environmental Appraisal Report of the Mound Plant (excerpt)

The Environmental Appraisal Report was prepared in 1996 and documents the observed conditions at the time of the inspection. Information provided in the Building Data Package text supercedes information provided in this appendix.

Based on a review by subject matter experts, hand-written corrections have been made to the report provided in this appendix. Only the text portion of the report is provided herein.

9.45 BUILDING 22

9.45.1 Scope of Building 22 Report

In late 1995 and the early months of 1996, EG&G MAT performed a review of environmental conditions at the Mound Plant. The purpose was to develop a performance baseline, and to identify areas for improvement on a building and a sitewide basis. EG&G MAT did not perform a "due diligence" or Phase I Environmental Site Assessment as specified by ASTM 1527 or ASTM 1528. The scope of the appraisal effort and a discussion of the appraisal methodology are detailed in Sections 2.0 and 5.0, found in Volume 1 of this report.

The appraisal team performed a walk-through of Building 22 on January 23, 1996. The Environmental Appraisal Checklist (EAC) was used to record findings. The EAC is found in Attachment 1 (Section 9.45.6.1). The appraisers were accompanied by the building manager, who is also the process owner. Other information was supplied by the building manager and recorded on the Building Manager's Questionnaire (BMQ), included as Attachment 2 (Section 9.45.6.2).

9.45.2 Description of Building

Building 22 is 9,090-square-foot one-story structure. It has a steel frame with a metal roof. The building is bordered by a parking lot to the west, the brick-maker to the east, a ravine to the south, and a plant road to the north. The location is shown in Attachment 3 (Section 9.45.6.3). An office area, approximately one-tenth of the total floor space and located on the east side has heating and air conditioning. The low level waste (LLW) storage area located on the west side does not have ~~heating or~~ (SBD) air conditioning. Floor plans are presented in Attachment 4 (Section 9.45.6.2).* The building is serviced ~~by central steam for heat,~~ ~~chilled~~ potable (SBD) water, and electrical service (*Mound Facility Physical Characterization*, 12-1-93). The building is served by a dry (SBD) fire sprinkler system.

Building 22 was constructed in ~~1966~~ 1965 (SBD). In the summer of 1995, the building was modified to accommodate solid radioactive LLW waste storage activities. Prior to modification in 1995, the building was used for office space and storage of items awaiting lot sale and/or reuse. The building is not contaminated with either radiological or energetic materials (*Mound Facility Physical Characterization*, 12-1-93).

9.45.3 Summary of Findings

Building 22 is designed to house an LLW storage area on the west side of the building and offices on the east side of the building. The building is currently awaiting approvals prior to initiating storage of solid LLW. The appraisal team did not review design specifications for conformance to Department of Energy (DOE) Order 5280 or state or federal regulations.

The building was originally built as a storage and office facility. The west side of the building is a storage area for solid LLW. The east side houses offices and utility services. The building

A heatpump with resistance heating provides the heating and air conditioning for the office area. The storage area is heated with 480 VAC electric heaters.

is well-maintained, but several issues of environmental concern were identified during the walk-through and review of reference materials.

9.45.4 Observations

9.45.4.1 Air Emissions

The building is currently empty, awaiting approvals prior to initiating storage of LLW. At this time, there are no processes that create air emission sources included in the LLW storage process. There are no fuel-burning units in the building. There is no evidence of fugitive dust, as none of the processes would be expected to generate it. No air emission permit applications have been submitted to the Regional Air Pollution Control Agency (RAPCA) for activities in the building. The requirement for permits once the building is in use was not evaluated by the appraisal team.

9.45.4.2 Wastewater Emissions

The Mound Facility has three wastewater collection systems: a sanitary wastewater system; a storm water system; and a radioactively contaminated process wastewater system. Sanitary wastewater is treated at an onsite tertiary treatment plant and subsequently discharged by hard pipe to the Great Miami River. Storm water and any non-process wastewater, single pass cooling water, and softener backwash may be discharged directly to the Great Miami River, via the Miami-Erie Canal,* or may be diverted to a 3.1-million-gallon holding pond for settling prior to discharge. Radioactively contaminated wastewater is treated in Building WD by physical-chemical treatment. If appropriate, wastewater may be discharged by hard pipe to the Great Miami River. If concentrations of radioactive contaminants cannot be reduced to acceptable levels, wastewater is solidified and shipped to the Nevada Test Site or Envirocare for disposal. All outfalls are permitted under an active NPDES permit. Routine monitoring activities are in place. Based on NPDES monitoring report data reviewed, it appears that the facility is in compliance with qualitative and quantitative conditions of the permit.

*Subsequently, MCP effluent was rerouted around the canal via a covered pipe to the Mound Overflow Creek.

9.45.4.2.1 Sanitary Wastewater

The building has sanitary services. According to a diagram of underground lines, presented as Attachment 5 (Section 9.45.6.5), the building is serviced by a sanitary line. Confirmation of drainage of sanitary waste into sanitary conveyance lines was not within the scope of this effort, therefore, neither dye tests nor smoke tests were conducted.

Sanitary effluent is conveyed to the onsite tertiary wastewater treatment facility, and subsequently discharged to the Great Miami River. There is no monitoring of building effluent. Based on operations data, supplied by the process owner, effluent from Building 22 does not deviate from that expected by the sanitary treatment plant manager.

Wastewater from the storage area, i.e., the area of potential radioactive contamination, drains into a 1,100*-gallon, in-ground sump. However, the floor of the building slopes away from the sump. From visual observation, it appears that all water in the building may not flow into the sump.

*The entire floor of the storage area (Room 1) is constructed as a containment area and the 1,100 gallon volume is comprised of both the floor containment area and the sump pit (~18 cu.ft.) SBD

Water in the sump is tested to measure levels of contamination and subsequently released to the sanitary treatment plant or transported by tank truck to be treated in Building WD. To date all wastewater has been discharged into the sanitary wastewater system.

The in-ground sump was installed approximately one year ago. It is a steel tank within a secondary concrete containment pit. The sump has never overflowed. According to the building manager and the process manager, integrity has not been tested. There is no procedure or plan in place to measure the level, or otherwise verify that the sump's contents do not leak.

The appraisal team did not review design specifications or assumptions to determine if sizing of the sump was adequate to contain water generated in the building. Overflow of the sump drains into the site's main drainage ditch. The ditch is unlined.

9.45.4.2.2 Storm Wastewater

The building is serviced by storm drains according to Attachment 5 (Section 9.45.6.5). There are no internal connections to the storm collection system; roof downspouts are the only connection. Exterior grates and drains were not tested to confirm that they connect to the storm drainage system. Inspection showed no sign of odors, colored discharges, or scarring which would indicate that any materials other than storm water has entered the storm drainage system.

9.45.4.2.3 Chemicals

Minimal chemicals are stored and used in Building 22.* See Chemicals, Table 2. A list of chemicals found in Building 22 is included in the Attachment 2 (Section 9.45.6.2), the BMQ. The information was gathered as part of the chemical inventory which is conducted annually. The inventory information dates to 1994, as 1995 data were not yet available when the appraisal was conducted. Confirmation of the 1994 inventory by the appraisal team was not attempted, as a new inventory was in progress. However, storage, handling and disposal of chemicals listed in the BMQ, Attachment 2 (Section 9.45.6.2), were reviewed to assure conformance to regulations related to 40 CFR 122, 40 CFR 261-265, 268, and 29 CFR 1910. Chemical storage and handling procedures are in place for proper disposal of chemicals.

None of the chemicals listed in the BMQ were Clean Water Act (CWA) priority pollutants. There is no evidence that chemicals enter the storm or sanitary drains. There have been no reported spills from Building 22.

9.45.4.3 Potable and Service Water

Potable water is supplied to the building. Backflow prevention devices are installed at all visible points of potential cross connection. The fountains which supply drinking water have not been tested for lead.* According to Environmental Protection Agency (EPA) protocol, annual sampling criteria do not require testing of each fountain.

* Waste Management determined that building demolition debris containing drinking fountains with the potential for lead-solder joints meet the wasteacceptance criteria at Stoney Hollow Landfill. (SBD)

9.45.4.4 Chemical Storage and Hazardous Materials

Janitorial supplies used in Building 22 are stored in the janitor's closet (Room 7) . These chemicals are stored in the building in accordance with applicable standards. Material Safety Data Sheets (MSDS's) were not readily available in the building.

The building is equipped with appropriate emergency response equipment such as a eyewash, safety shower, and fire extinguisher. There is an Emergency Evacuation Plan, and signs were posted in work areas.

There are no aboveground storage tanks in or around the building and no underground storage tanks are associated with this building. There is one sump* located in the building. There are no separators, or catch basins, in or around the building. See Drainage Sumps, Table 2.

The building was tested and ~~does not contain~~ contains minimal asbestos-containing building material (MD-10391, *Asbestos Program Manual*, 9-14-95). See Asbestos, Table 2.

There are no capacitors or transformers containing polychlorinated biphenyls (PCB's) located in the building (1995 PCB Annual Document Log). See PCBs, Table 2

9.45.4.5 Solid, Hazardous and Chemical Wastes

Solid wastes generated are primarily paper. There is paper and aluminum can recycling to minimize solid waste. Solid wastes are removed by janitorial personnel to a site collection point, then shipped offsite to a local landfill by a contractor. Aluminum cans, glass and cardboard are removed by janitorial personnel to specific collection points, then sent offsite to be recycled by a contractor. White paper is collected, compacted and sent offsite for recycling by a contractor. Scrap metal is collected at a specific site, then sent offsite to be recycled by a another contractor. Lead acid batteries are recycled by a contractor. These service contracts are maintained by Waste Management. Classified paper is collected and taken to the Montgomery County South Incinerator by Security. There is no evidence that hazardous materials or wastes are mixed with solid waste streams.

The LLW waste storage process does not routinely generate hazardous, radioactive, or explosive waste. One condition could potentially generate radioactive wastewater. That condition would be if the fire sprinklers went off.

In the storage area, a separate wastewater collection system exists which would collect fire sprinkler system or wash-down water in the event of fire or explosion. The water would be collected in a 1,100-gallon sump* where it is tested for radioactive contamination prior to discharge into the sanitary sewer system. In the event a hazardous or radioactive waste is ever detected, procedures are in place for transporting the waste for treatment, containment, characterization, and disposal.

* The entire floor of the storage area (Room 1) is constructed as a containment area and the 1100 gallon volume is comprised of both the floor containment area and the sump pit (~18 ft³).

Radioactive waste goes to one of three locations: (1) Nevada Test Site; (2) Envirocare; or (3) storage onsite awaiting characterization.

9.45.4.6 Waste Minimization and Pollution Prevention

At Mound there is an active program to minimize waste streams in accordance with state and federal requirements and Executive Order 12856. Programs for waste minimization include aluminum can and paper recycling. Process procedures have been reviewed for preventing or minimizing pollution. Building 22 will not generate waste except for minimal office trash.

9.45.5 Findings and Recommendations

Photographs were taken to document the environmental appraisal. They are included as Attachment 6 (Section 9.45.6.6). The environmental appraisal of Building 22 indicates that the following action items, in order of priority, should be planned and scheduled for accomplishment thus assuring the best management and operating practices are in place.

22-1 Confirm that design assumptions and specifications have been reviewed to assure that sizing of the sump is adequate to contain liquids generated by spills, fire emergencies, and other accidents or occurrences in the building.

22-2 Review disposition of sump overflow. Current plans which call for overflow to the site's main drainage must be evaluated for conformance to 40 CFR 122 and DOE Order 5280.

22-3 Investigate corrective action to remedy the slope of the floor, so that the sump can be utilized effectively.

22-4 Initiate program for routine inspections and preventive maintenance of sump.

22-5 In accordance with 29 CFR 1910.1200, MSDS's should be prominently displayed, clearly labeled, and readily available. A visitor to the area should be able to walk into the room and find them immediately.

This page intentionally left blank.

ENVIRONMENTAL APPRAISAL CHECKLIST

Building Name 22

Appraisers:

Name _____ Discipline

Name _____ Discipline

Name _____ Discipline

Name _____ Discipline

Building Manager: LARRY T. LAMSA

Process Manager: LARRY T. LAMSA

Date: 1/23/96

ENVIRONMENTAL APPRAISAL CHECKLIST

Table of Contents

Checklist	Page
Clean Water Act	1
Clean Air Act	2
Hazardous Materials	4
Safe Drinking Water Act	7
RCRA Hazardous Waste	8
TSCA and NESHAP Requirements for Asbestos	13
TSCA—PCB	14
Low-level and Transuranic Waste	17
Waste Minimization/Pollution Prevention Activities	22

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

Clean Water Act (CWA) Screening Checklist

Question	Response	Comments
Does the outside drain spouting of the building discharge directly to a storm sewer/sanitary system?	(Y) / N	If the answer to any of these questions is yes, proceed with the following checklist.
Are there sinks, toilets and floor drains in the building?	(Y) / N	
Are chemicals being used in the building?	(Y) / N	
Is there a process which discharges to the storm or sanitary system?	Y / (N)	

CWA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 122 Appendix D Table V	If chemicals are used/stored in the building, are they on the attached list? Are they properly contained?	(Y) / N Y / N	
	Is the building in operation? What are the processes and where do they discharge to?	(Y) N _____ _____	OFFICE SPACE ACTIVE LLW STORAGE TO BEGIN IN FEBUARY
	Do the floor drains, sinks & toilets appear to be draining properly?	(Y) N	
OAC 3745-33	Do the floor drains and sinks drain to a sanitary or storm sewer?	Sanitary Storm	STORM & SANITARY SEWERS
	Is there a sump/pit in the building? If so, what does it contain? How often is it pumped out? Does water collect in sump? Does sump have secondary containment?	(Y) N _____ _____ Y / (N) Y / (N)	DESIGNED TO HOLD 2-3 HOURS OF WATER FROM FIRE SPRINKLERS – SUMP NOT SLOPED ADEQUATELY
	Are there any manholes, catch basins, drains, or fill pipes in or around the building? If so, are there any unusual appearances, colors, and/or odors? Describe in comment section. Can chemicals flow into the drain?	(Y) / N Y / N Y / N	 N/A N/A

F9 of 47

9.45-11

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore Date: 1/23/96

Clean Water Act (CWA) Screening Checklist

Question	Response	Comments
Does the outside drain spouting of the building discharge directly to a storm sewer/sanitary system?	(Y) N	If the answer to any of these questions is yes, proceed with the following checklist
Are there sinks, toilets and floor drains in the building?	(Y) N	
Are chemicals being used in the building?	(Y) N	
Is there a process which discharges to the storm or sanitary system?	Y (N)	

CWA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 122 Appendix D Table V	If chemicals are used/stored in the building, are they on the attached list? Are they properly contained?	(Y) / N Y / N	
	Is the building in operation? What are the processes and where do they discharge to?	(Y) N _____ _____	OFFICE SPACE ACTIVE LLW STORAGE TO BEGIN IN FEBUARY
	Do the floor drains, sinks & toilets appear to be draining properly?	(Y) N	
OAC 3745-33	Do the floor drains and sinks drain to a sanitary or storm sewer?	Sanitary Storm	STORM & SANITARY SEWERS
	Is there a sump/pit in the building? If so, what does it contain? How often is it pumped out? Does water collect in sump? Does sump have secondary containment?	(Y) N _____ _____ Y (N) Y (N)	DESIGNED TO HOLD 2-3 HOURS OF WATER FROM FIRE SPRINKLERS – SUMP NOT SLOPED ADEQUATELY
	Are there any manholes, catch basins, drains, or fill pipes in or around the building? If so, are there any unusual appearances, colors, and/or odors? Describe in comment section. Can chemicals flow into the drain?	(Y) / N Y / N Y / N	N/A N/A

F9 of 47

9.45-11

9.45-12

F10 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

Clean Air Act (CAA) Screening Checklist

Regulatory Guideline	Question	Response	Comments
	Are there any rooms that have air emissions sources that vent to the outside of the building, e.g., fumehoods, equipment? If so, note the rooms.	Y / N	
OAC 3745-35	Using the air emissions inventory reference for this building, are there any sources in the building that are not documented?	Y / N	N/A
	Is there evidence of fugitive dust emissions inside or outside of the building	Y / N	N/A

CAA Checklist

Regulatory Guideline	Question	Response	Comments
	Are there existing air permits or applications applicable to the building?	Y / N	N/A
OAC 3745-31,35	If yes, are the terms and conditions of the permit or the information included on the application (see air emissions database) being followed? Note any differences and update the air emissions database.	Y / N	N/A
OAC 3745-31	Are there any sources that are not included in the air emissions database? If so, note the room, hood number, active or not, POC, and applicable air emission database information on Table B.	Y / N	N/A
OAC 3745-31-03	Are there sources which are lab equipment of lab fumeheads used exclusively for chemical or physical analyses and bench scale lab equipment? These sources do not require a permit. However, the air emissions database should be updated.	Y / N	N/A
	Has there been any release of air contaminants from this building?	Y / N	N/A

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

CAA Checklist – N/A

Comments: Note the number of sources/hoods per room, the number that are active, and the POC on the reference document.

TABLE A

Process Source	Room Number	Hood Number	In Database	Active	Chemicals Used	Quantity Used	Quantity to Waste Management	Hours/Yr. Operation	Air Emissions
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					
			Y / N	Y / N					

Source: _____

F11 of 47

9.45-13

9.45-14

F12 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

Hazardous Materials (HM) Screening Checklist

Question	Response	Comments
Are any chemicals used or stored in this building, now or in the past?	(Y)/N	If the answer is yes, proceed with the following checklist.

(JANITORIAL SUPPLIES ONLY)

HM Checklist

Regulatory Guideline	Question	Response	Comments
29 CFR 1910.1200(b,f)	All containers of hazardous chemicals shall be labeled as to the identity of the chemical and the appropriate hazard warnings.	(Y)/N	3 "PAINT" CANS - NOT MARKED
29 CFR 1910.1200(g)	MSDS shall be available to the employees in close proximity to the work area.	(Y)/N	
29 CFR 1910.22, 1910.106, 1910.176	All places of employment, passageways, storerooms and service areas shall be kept clean and orderly and in a sanitary manner. Aisles shall be unobstructed. Drums and containers are not leaking and are tightly sealed.	(Y)/N	
29 CFR 1910.106	Storage cabinets for flammable materials are constantly kept closed, are fire resistant and are labeled "FLAMMABLE - Keep Fire Away". Containers inside should be labeled and closed. No spills inside cabinet.	Y / N	N/A
29 CFR 1910.106(d)(7)	Incompatible chemicals are not stored together.	Y / N	N/A
29 CFR 1910.106(d)(4)	Inside Flammable/combustible storage rooms must meet the following: 4 in. raised sill or trench that drains to a safe area, liquid tight wall/floor joints, self-closing doors, gravity or mechanical exhaust providing 6 room changes/hr., exhaust switch located outside room, at least one 3 ft. aisle; no cracks in secondary containment.	Y / N	N/A

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

HM Checklist – N/A

Regulatory Guideline	Question	Response	Comments
29 CFR 1910.106(d)(7)	All flammable/combustible storage locations have at least one 12-B portable fire extinguisher located outside and within 10 ft. of a door opening into any room for storage. No smoking signs are posted.	Y / N	
29 CFR 1910.151	Eyewashes/showers shall be provided within the work area. Ensure unit is operational.	Y / N	
CGA P-1 3.3 & 3.3.10	All gas cylinders (full or empty) shall carry a legible label or marking identifying the contents.	Y / N	
CGA P-1 3.5.3	Full and empty containers should be stored separately with the storage layout planned so that containers comprising of old stock can be removed first with a minimum handling of other containers.	Y / N	
CGA P-1 3.5.8	All compressed gas containers in service or in storage shall be stored standing upright and the container shall be secured.	Y / N	
CGA P-1 4.2.2	Oxygen cylinders shall be separated from flammable gas containers or combustible materials a minimum of 20 ft. or a noncombustible barrier 5 ft. high.	Y / N	
29 CFR 1910.104(2)(10)	Oxygen stored as a liquid shall be on a noncombustible surface. Asphalt is considered combustible. Wood and long dry grass shall be cut back 15 ft. from the container.	Y / N	
29 CFR 1910.104	Bulk oxygen storage shall be permanently placarded "OXYGEN - NO SMOKING - NO OPEN FLAMES".	Y / N	
	Is there a sign posted in each work area regarding emergency egress and emergency response action?	Y / N	
	Is there an emergency response plan available?	Y / N	

F13 of 47

9.45-15

9.45-16

F14 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

HM Checklist - N/A

Regulatory Guideline	Question	Response	Comments
	Is there a process area?	Y / N	
	Does it have proper containment?	Y / N	
	Is there a liquid bulk transfer area?	Y / N	
	Is there proper containment?	Y / N	
	Is there an above ground storage tank? If so, complete Table B.	Y / N	

Above Ground Storage Tanks Inventory

TABLE B—Above Ground Storage Tanks Inventory

Building	Capacity (Gal.)	Contents	Estimated Volume	In Service	Containment	Visual Stains/ Contamination	If Empty, Flushed
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N
				Y / N	Y / N	Y / N	Y / N

Source: _____

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

Safe Drinking Water Act (SDWA) Screening Checklist

Does this facility have potable water?	(Y) / N	If yes, conduct the following survey.

SDWA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745 95-02 (A)	Do actual or potential cross-connections exist between potable (light green) and service water (dark green)?	Y / N	
OAC 3745 95-04 (B)(C)	Are backflow prevention devices installed where cross connections (hoses connected to faucets, hot water tank vented directly to a drain) exist?	Y / N	
	Are sources of service water (janitorial and laboratory faucets, or outdoor spigots) posted as non-potable water sources?	Y / N	NOT POSTED, BUILDING MANAGER BELIEVES THE WATER TO BE DRINKING WATER
	Does the facility contain any water coolers or fountains that are not lead free? Complete Table C.	(Y) / N	

TABLE C—Water Fountain Survey

Building	Location	Model #	Comments / Date of Analysis for Lead
22	2	PLF8WMQ100	EPCO-OASIS S/N #95131 157 583

Source: _____

F15 of 47

9.45-17

9.45-18

F16 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

RCRA Screening Checklist

Does this facility generate waste or use chemicals?	(Y) N	If yes, conduct the following survey.

JANITORIAL SUPPLIES ONLY

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745 52-11	Has any material generated been characterized RCRA hazardous? Was charactarization by analysis or by process knowledge? Are lab results or documentation of process knowledge readily available? Note any uncharacterized material in comment section. Is it waste? If yes, proceed with next section.	Y / N analysis / process Y / N Y / N	
OAC 3745 52-11	Are any of the materials noted RCRA hazardous waste? If no, note and stop here. If yes, note the location of the management unit, and the method of management, and proceed with the appropriate section below.	Y / N	

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
I. HAZARDOUS WASTE STORED IN CONTAINERS			
	Is there an area in the building that could qualify as a Satellite Accumulation Area?	Y / N	
	Is it treated as such?	Y / N	
OAC 3475-52-34 (C)	Has any of the RCRA hazardous waste in this building been managed in Satellite Accumulation Areas? If no, proceed to the next section. If yes, answer the following.	Y / N	
	Are the containers marked with the words hazardous waste, or other words denoting the hazard?	Y / N	
	Are the containers in good condition?	Y / N	
	Are the waste compatible with the containers?	Y / N	
	Are containers managing ignitable hazardous waste stored at least 50 feet from the plant site boundary?	Y / N	
	Are containers kept closed and locked except during filling?	Y / N	
	Are containers moved within 3 days of being filled?	Y / N	

F17 of 47

9.45-19

9.45-20

F18 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745-52-11 (A)	If a Satellite accumulation area has been abandoned and/or if waste left in place, and the containers may be subject to the 90-day-storage exclusion. If this exclusion does not apply, go to the next section. If the containers have been in storage under this exclusion, answer the following:		
	Are the containers in good condition?	Y / N	
	Are the waste compatible with the containers?	Y / N	
	Are the containers kept closed except during filling?	Y / N	
	Are the containers managed in such a way, that they are not ruptured, or leaks caused?	Y / N	
	Is the area inspected at least once weekly?	Y / N	
	Is the inspection recorded? Where is the log? Is it properly completed, dated, and signed?	Y / N Y / N	
	Are containers managing ignitable hazardous waste stored at least 50 feet from the facility boundary?	Y / N	
	Are incompatible wastes managed in such a way that they will not react with another incompatible waste?	Y / N	
OAC 3745-52-34(B)	Has any of the waste (except in Building 23, Building 72 and the Burn Area) been managed in excess of 90-days?	Y / N	
	If no go to next section.		
	If yes, note.		
	For Building 23, Building 72 & Burn Area use special checklist.		

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore Date: 1/23/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
II. HAZARDOUS WASTE STORED IN TANKS			
OAC 3745-52-32 (B)	Has any chemical waste stored in a tank, piece of process equipment or ancillary equipment been in storage in excess of 90-days?	Y / N	
	If the answer was no, then proceed with the following:	Y / N	
	Has the tank or piece of equipment had an integrity assessment?	Y / N	
	Is there a sump?	Y / N	
	Is it dry?	Y / N	
	Does the tank or equipment have secondary containment?	Y / N	
	Does the tank or equipment have leak detection device(s)?	Y / N	
	Has spill control prevention been enacted?	Y / N	
	Has any hazardous waste stored in a tank, piece of process equipment or ancillary equipment been in storage in excess of 90-days?	Y / N	
	If the answer was no, then proceed with the following:		
	Has the tank or piece of equipment had an integrity assessment?	Y / N	
	Does the tank or equipment have secondary containment?	Y / N	
	Does the tank or equipment have leak detection device(s)?	Y / N	
	Has spill control prevention been enacted?	Y / N	
	Is there a closure plan?	Y / N	
	If yes, then note.		
OAC 3745-67	Has any of the waste been managed in a surface impoundment? If yes, then note. Go to the next section.	Y / N	

F19 of 47

9.45-21

9.45-22

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

RCRA Checklist

Regulatory Guideline	Question	Response	Comments
OAC 3745-68	Has any of the waste been managed in a Landfill? If yes, then note. Go to the next section.	Y / N	
OAC 3745-68	Has any of the waste been managed in an Incinerator (other than Burn area units)? If yes, then note. Go to the next section.	Y / N	
OAC 3745-68	Has any of the waste been managed in a Thermal treatment Unit (other than Burn area units)? If yes, then note. Go to the next section	Y / N	
OAC 3745-69	Has any of the waste been managed in a Miscellaneous Treatment Unit (other than Burn area units)? If yes, then not. Go to the next section.	Y / N	
OAC 3745-56	Has any of the waste been managed in a Waste Pile? If yes, then note. Go to the next section.	Y / N	

General Comments:

F20 of 47

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore Date: 1/23/96

Asbestos Screening Checklist

Does this facility contain ACBM?	Y (N)	If yes, conduct the following survey:

Asbestos Checklist

Note: Routinely, the asbestos standard for ACBM in schools has been applied to facilities for purpose of cleanup. In addition to AEHERA, there are additional standards in the NESHAPS that may be of importance.

Regulatory Guideline	Question	Response	Comments
ADAPTED FROM TSCA ACBM IN SCHOOLS:			
	Has this building been characterized either through process knowledge, by analyses, or by inspection to determine if it contains asbestos? If no for this building or area note this conclusion in the comment section.	Y / N	
	Is there any evidence of friable asbestos?	Y / N	
	Is the asbestos removal properly managed? (See questions listed below)	Y / N	If there is no asbestos removal, do not complete the following section.
NESHAPS FOR ASBESTOS FOR ANY ONGOING ASBESTOS REMOVAL:			
40 CFR 61.156	There are no discharges of visible emissions to the outside air from collection, processing, packaging, transporting, or deposition of ACBM during the removal.	Y / N	
40 CFR 61.152(b) (1)	ACBM is treated with water in accordance with 40 CFR 152(b)?	Y / N	
40 CFR 61.154	Is friable asbestos adequately wetted during stripping? Or, has an adequate ventilation and collection system been installed?	Y / N	
40 CFR 61.152	Is wetting continued until the waste friable asbestos is collected for disposal?	Y / N	

F 21 of 47

9.45-23

9.45-24

F22 of 47

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore Date: 1/23/96

Toxic Substances and Control Act (TSCA) PCB's Screening Checklist

Does this facility potentially contain any PCB's or PCB contaminated equipment?	Y / N	If yes, are transformers labeled (Blue or Yellow stickers)? If yes, conduct the following survey.

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761	Has any waste generated in, or from, this building been characterized either through process knowledge or by analyses to determine if it contains PCB's ? If the answer is no, note . If the answer is yes, proceed with next section.	Y / N	
	Based on an inspection, are any of the materials or equipment potentially PCB contaminated? If no, note and stop here. If yes, note the location of the management unit, and the method of management, and proceed.	Y / N	
40 CFR 761.65 (c) (5)	Are PCB articles or containers stored in this building checked for leaks at least once every 30 days?	Y / N	
	If yes, are auditable records maintained.	Y / N	
40 CFR.30 (a) (1) (ix)	Are any PCB transformers in use, or stored for possible reuse, that contain PCB's at concentrations of 500 ppm or greater?	Y / N	
	Are they visually inspected quarterly? If yes, are auditable records maintained?	Y / N	

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761.30 (a) 1,viii	Are all combustible materials (i.e., paints, solvents, plastics, paper, sawn wood, etc.) cleared from areas containing PCB transformers to a distance of five meters?	Y / N	
40 CFR 761.65 (b) (8)	Are all PCB articles and containers labeled with the date they were placed in storage?	Y / N	
	Are labeled PCB articles and containers stored so that the labels can be referenced?	Y / N	
40 CFR 761.65 (a)	Are all PCB's and PCB contaminated items at concentrations above 50 PPM, that are stored for disposal, stored no longer than one year from the date they were placed in storage?	Y / N	
40 CFR 761.62 (b) (1) (i)	Do all PCB storage areas have an adequate roof and walls to prevent rainwater from reaching the stored items?	Y / N	
40 CFR 761.62 (b) (1) (iv)	Are storage are floors curbed and constructed of continuous smooth and impervious materials?	Y / N	
40 CFR 761.62 (b) (1) (i)	Are the curbs at least 6 inches high?	Y / N	
40 CFR 761.62 (b) (1) (iii)	No drains are allowed in storage areas. Are there drains in the storage areas?	Y / N	

F 23 of 47

9.45-25

9.45-26

F24 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

TSCA Checklist

Regulatory Guideline	Question	Response	Comments
40 CFR 761.65 (c) (2)	Only non-leaking and undamaged large high voltage PCB's capacitators and PCB-containing electrical equipment are allowed to be stored outside of PCB storage areas, on pallets if stored outside, with containment for 10 percent of the volume of the equipment. Do all PCB's stored in this configuration conform with this requirement?	Y / N	
40 CFR 761.45 and .65	Are all PCB storage areas marked with a large PCB mark as described in 40 CFR 761.45 (a)?	Y / N	
40 CFR 761.65 (c) (5)	Have all leaking PCB articles and containers been transferred to non-leaking containers?	Y / N	
40 CFR 761.65 (c) (6)	Do all PCB storage containers for the storage of liquid and non-liquid PCB's comply with DOT shipping container specifications?	Y / N	

GENERAL COMMENTS:

Building Name: 22 Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore Date: 1/23/96

Low-Level Waste and Transuranic Waste Screening Checklist

Does this facility contain radioactive waste ?	Y / N	If yes, conduct the following survey.

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
Low-Level Waste			
DOE Order 5820.2A Chapter III	Can any waste generated in, or from, this building be characterized either through process knowledge or by analyses to determine if it is LLW ? If the answer is no, note. If the answer is yes, proceed with next section.	Y / N	N/A - ONLY STORAGE.
DOE Order 5820.2A Chapter III.	Are any of the materials noted by inspection LLW? If no, The audit would stop here, because there are no LLW. If yes, note the location of the management unit, and the method of management, and proceed with the section below.	Y / N	
DOE Order 5820.2A Chapter III, 3.a.	Have the storage configurations in use in this area been taken into account for keeping external exposures to the general public below 25 mrem/yr?	Y / N	
	Is the waste stored in a configuration that protects ground-water resources?	Y / N	
DOE Order 5820.2A Chapter III, 3.b.	Has monitoring been conducted in this area in accordance with DOE Order 5820.2A in order to evaluate the area against the performance standard?	Y / N	
	Based on field data, does the monitoring conducted in this area conform to the performance standard?	Y / N	

F25 of 47

9.45-27

9.45-28

F26 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A Chapter III, 3.d.	Based on field data, is the characterization of the materials in this area sufficient to assure proper segregation to assure proper segregation, treatment, storage, and disposal?	Y / N	
	Based on field data does the characterization as documented at the time of generation of the waste ensure that the actual physical and chemical characteristics, and major radionuclide content of this material are recorded and known at all stages of the waste management process?	Y / N	
	Do characterization data include the following:		
	Physical and chemical characteristics of the waste?	Y / N	
	Volume of the waste (including solidification and absorbent material)?	Y / N	
	Weight of the waste (including solidification and absorbent material)?	Y / N	
	Major radionuclides and their concentrations?	Y / N	
	Packaging date, package weight, external volume?	Y / N	
	How were the concentration of radionuclides determined? Direct methods?	_____	
	How were the concentrations of radionuclides determined? Indirect methods?	_____	
DOE Order 5820.2A Chapter III, 3.h	Is the storage configuration in long term storage sufficient to meet the performance standard?	Y / N	
	Are records maintained at the facility enabling this waste to be traced from its origin?	Y / N	

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
TRU WASTE			
	Can any waste generated in, or from this building be characterized either through process knowledge or by analyses to determine if it is TRU waste? If no, note and stop. If yes, proceed with the next section.	Y / N	
	Are any of the materials noted as being TRU waste during an inspection? If no, note and stop. If the answer is yes, note the location of the management unit, and the method of management and proceed with the appropriate section below.	Y / N	
DOE Order 5820.2A, Chapter II, 3.a	Was this material evaluated as soon as possible in the generating process, to determine if it is TRU (>100nCi/g), if it is recoverable, or if it is waste? (Note if the activity level is less than 100nCi/g, the waste is not TRU, and can be managed as LLW.)	Y / N	
	Did the determination of TRU radionuclide concentration include the mass of the container, including shielding? These should be included in calculating the specific activity of the waste.	Y / N	

F27 of 47

9.45-29

9.45-30

F28 of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A, Chapter II, 3.b	Has the TRU waste been assayed or otherwise evaluated to determine its radioactive content prior to storage?	Y / N	
	Has the TRU waste been characterized or otherwise evaluated to determine if hazardous waste is present?	Y / N	
	Has classified TRU waste been treated to destroy the classified characteristics?	Y / N	
DOE Order 5820.2A, Chapter II 3.d	Has all newly generated TRU waste been packaged in non-combustible packaging that meets DOT requirements?	Y / N	
	Have all Type A TRU waste packages been equipped with a method to prevent pressure buildup?	Y / N	
	Have all TRU packages been marked, labeled and sealed in accordance with 40 CFR 261 Subpart C and 49 CFR 172 Subparts D, E and 49 CFR 173 Subpart I?	Y / N	

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

Low-Level Waste and Transuranic Waste Checklist

Regulatory Guideline	Question	Response	Comments
DOE Order 5820.2A, Chapter II 3.e	Has the TRU waste been segregated in manner that will not permit commingling of TRU waste with LLW or high-level waste?	Y / N	
	Has the TRU waste been protected from unauthorized access?	Y / N	
	Has the TRU waste been monitored periodically to ensure that it is not releasing its radioactive and/or hazardous constituents?	Y / N	
	Has this TRU waste storage area been designed, constructed, maintained, and operated to minimize the possibility of fire, explosion, or accidental release of its radioactive and/or hazardous constituents?	Y / N	
	Does the facility have a contingency plan designed to minimize the adverse impacts of fire, explosion, or accidental release of its radioactive and/or hazardous constituents?	Y / N	

GENERAL COMMENTS:

F29 of 47

9.45-31

9.45-32

F30. of 47

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore

Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Screening Checklist

Does this facility generate waste or use chemicals?	Y / N	If yes, conduct the following survey.

Waste Minimiaztion/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Based on available information and a walk through, are there any apparent opportunities to curtail the consumption of raw materials (including but not limited to paper, chemicals, electricity, and etc.). If yes, list candidate areas in the comment section.	Y / N	
	Are there solvent wastes?	Y / N	
	Is vehicle maintenance performed?	Y / N	
	Are oils used ?	Y / N	
	Are these corrosive wastes?	Y / N	
	Are there sludges?	Y / N	
	Are there halogenated organic (nonsolvent) wastes?	Y / N	
	Are metals recovered from wastewater?	Y / N	
	Is waste sludge generated?	Y / N	
	Are any waste minimization practices used that reduce the generation of sludge?	Y / N	
	Ion exchange process?	Y / N	
	Lead in gasoline lowered to reduce tank sludge toxicity?	Y / N	
	Storage tank agitators installed?	Y / N	
	Corrosive resistant materials used?	Y / N	
	Prevention of crude oil oxidation ?	Y / N	
	Drying?	Y / N	

Environmental Appraisal Checklist

Building Name: 22

Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore

Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
HALOGENATED ORGANIC (NONSOLVENT) WASTES			
	Are halogenated organic wastes used as fuel in cement kilns?	Y / N	
	Are baghouse filters used to collect pesticides and pesticide intermediates?	Y / N	
	Are solid wastes generated from the collection of baghouse dust?	Y / N	
	Wet instead of dry grinding used?	Y / N	
	The output spray dried?	Y / N	
	Has baghouse emptying and recycling of baghouse fines been scheduled?	Y / N	
	Have operations been evaluated to improve procedures such as handling, storage and spill prevention for increased efficiency?	Y / N	
METAL WASTES			
	Are any technologies for the recovering of metals from waste rinsewater used?	Y / N	
	Evaporation of waste rinsewater?	Y / N	
	Reverse osmosis?	Y / N	
	Ion exchange?	Y / N	
	Electrolysis?	Y / N	
	Agglomeration?	Y / N	
CORROSIVE WASTES			
	Are acidic or basic cleaning solutions used as treatment for pH adjustment chemicals?	Y / N	

F31 of 47

9.45-33

9.45-34

F32 of 47

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are ion exchange resins used to remove heavy metals and cyanides from acid and base solutions?	Y / N	
	Is crystallization used to remove corrosives from solution by cooling?	Y / N	
	Is the process of evaporation of liquid wastes by heating used to leave behind a more concentrated solution?	Y / N	
CYANIDE AND REACTIVE WASTES			
	Has non-cyanide or low concentration of cyanide process replaced zinc cyanide bath ?	Y / N	
	Are any of these processes used to recycle cyanide wastes?	Y / N	
	Refrigeration/crystallization?	Y / N	
	Evaporation?	Y / N	
	Ion exchange?	Y / N	
	Membrane separation which includes reverse osmosis or electrodialysis?	Y / N	
VEHICLE MAINTENANCE			
	How are auto parts cleaned?	Y / N	
	Solvent sink?	Y / N	
	Solvent dunk bucket?	Y / N	
	Solvent dip tank?	Y / N	
	Are parts cleaning solvents used for anything else besides cleaning parts?	Y / N	
	Are spills reduced by locating sinks or dunk buckets near auto service bays?	Y / N	

Building Name: 22 Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are cleaned parts drained on the sink to minimize solvent spills?	Y / N	
	Are drip tanks used to capture losses?	Y / N	
	Is a solvent sink used for mineral solvents rather than a dunk bucket or dip tank?	Y / N	
	Does a waste hauler collect solvent waste for recycling or treatment?	Y / N	
OILS			
	What kind of oils are used?		
	Hydraulic oil?	Y / N	
	Transformer oil?	Y / N	
	Metal working fluids?	Y / N	
	Spent lubricating oils?	Y / N	
	Can the process be modified or changed to use water-based fluids?	Y / N	
	Are these good housekeeping and operation practices used to minimize oil waste production?		
	Use oils not contaminated with other liquids?	Y / N	
	Oil spills prevented?	Y / N	
	Drip pans installed?	Y / N	
	Oil soaked rags laundered?	Y / N	
	Rags and absorbants used to their limit?	Y / N	

F33 of 47

9.45-35

Environmental Appraisal Checklist

Building Name: 22 Appraisers: Terry Glander, Mary-Louis Hoagland, John Puckett, Mary Sizemore Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	Are these treatment techniques used to promote separation of oil/water wastes?		
	Reclaiming process to remove water and solvents by heat?	Y / N	
	Gravity setting?	Y / N	
	Screening?	Y / N	
	Centrifugation?	Y / N	
	Filtration?	Y / N	
SOLVENT WASTES			
	Has there been an attempt to reduce volume or toxicity by:		
	Eliminating solvents?	Y / N	
	Reducing the use of solvents?	Y / N	
	Reducing the loss of solvents?	Y / N	
	Increasing recyclability?	Y / N	
	Are solvents segregated?	Y / N	
	Are waste solvents free from water and garbage?	Y / N	
	Are recycled solvent containers labeled as such?	Y / N	
	Are containers kept closed?	Y / N	
	Free and sheltered from the elements?	Y / N	
	Are solvent tanks kept as free from contaminations as possible so that the waste can be recycled?	Y / N	
	Is a method used to minimize the use of new materials such as a countercurrent process?	Y / N	

Building Name: 22 Appraisers: Terry Glander, John Puckett, Mary-Louis Hoagland, Mary Sizemore Date: 1/23/96

Waste Minimization/Pollution Prevention Activities Checklist

Regulatory Guideline	Question	Response	Comments
	If there is a recycling program, what technique is used?	Y / N	
	Distillation?	Y / N	
	Solids removal?	Y / N	
	Dispersion breaking?	Y / N	
	Dissolved and emulsified organics recovery?	Y / N	
	Are any of these housekeeping procedures used to minimize the production of solvent wastes?		
	Separators cleaned and checked?	Y / N	
	Parts not allowed to enter the degreaser while wet?	Y / N	
	Sludge from the bottom of the tank not allowed to accumulate?	Y / N	
	Lids kept on tanks?	Y / N	
	Freeboard space on tanks increased?	Y / N	
	Are better operating practices used to reduce waste?	Y / N	
	How long is solvent waste stored and where?	_____	

F35 of 47

9.45-37

This page intentionally left blank.

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: 4182 Date: 12-07-95
Alternate: DOUG HANAMAN Phone: 4524

1. What are the access requirements (training, clearance, etc.)?

NONE

2. What protective equipment is required to enter the building?

NONE

3. Are there any restricted areas? Yes (No)
Where are they?

4. Provide a physical description of the building.

Building is a 9,090-ft² facility of steel frame construction with a metal roof. Office area (approximately one-third) has heating and air conditioning. Building is not contaminated with radioactive or energetic materials.

Source: Mound Facility Physical Characterization, 12-1-93

5. Provide a drawing of the building.

Attached.

6. What is the current building use?

Building is used for storage (~~two-thirds~~ 9/10) and office space (~~one-third~~ 1/10). Building ~~is projected to be~~ HAS BEEN remodeled for use as a solid low-level waste facility.

Source: Mound Building, 5-9-95

7. What is the history of building use other than that described in #6?

Source: Mound Buildings, 5-9-95

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

8. What are ongoing operations or processes? What are the raw materials and waste streams from each process? Who is the best contact for each process?

Process(es) Housed: Short-term storage

How Wastes Are Generated:

Two-thirds of the building is for storage. Items awaiting sale and empty shipping cartons for such things as heat sources or instrumentation are stored for short times (less than 90 days). In this area supplies for the plant electricians are stored for longer periods. No hazardous wastes are generated in the storage area.

In the east one-third of Building 22 there are offices and a work area where a process system is being built for another DOE site. Sometimes the stainless steel pipe in the process system needs to be cleaned before welding. Isopropyl alcohol is the cleaning agent. The steel may be wiped clean (in which case the alcohol evaporates), or it can be cleaned in an ultrasonic bath. Alcohol from the bath is put in waste cans which are picked up by Waste Management.

Contact:
Phone #

Source: Characterization of Mound's Hazardous, Radioactive, and Mixed Wastes, (8-15-90).

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

9. In the last six months, have any modifications been made to the building or to processes in the building? Yes No

SEE ITEM 6

10. Does the building have air emission sources? No

Process Source	Room Number	Hood Number	Active	Chemicals Used	Quantity Used	Quantity to Waste Management	Lbs./Yr. Operation	Air Emissions
			Y / N					
			Y / N					
			Y / N					
			Y / N					
			Y / N					

Source: Mound Air Emissions Database 11/30/95

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

11. Describe air pollution control equipment used to reduce emissions for each source. None Listed

Process Source	Emissions	Control Equipment	Functioning
			Y / N
			Y /N
			Y / N
			Y / N
			Y / N

Source: Air Permits 2/4/95

12. For existing permits are emissions monitored? At what frequency? Where are the records maintained?

Process Source	Permit	Log	Permit & Conditions & Frequency of Monitoring
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	

Source: Air Permits 2/4/95

13. Does the building have domestic water service? Yes No
Is there bottled water? Yes No

14. Does the building discharge to the storm sewer? Yes No
Where?

15. Does the building discharge to the sanitary sewer? Yes No
Where? EAST END

16. Has an asbestos survey been conducted? Yes
What are the results? No

Source: Technical Manual MD-10391, Issue 3 Asbestos Program Manual 9/6/95

9.45-44

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

17. Does the building contain transformers or capacitors? No

Source: PCB ANNUAL DOCUMENT LOG

18. Has the building been identified as containing PCBs? No

Source: PCB ANNUAL DOCUMENT LOG

19. What chemicals are used or stored inside or outside of the building? Include compressed gasses not in large tanks.

Chemical Name	State	Amount (MAX)
NONE		

Source: Chemical Inventory 1994

9.45-45

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

20. Has there been a reported spill, leak, or other release of any chemical? Yes (No)
What, how much, and what clean-up measures were followed?

Chemical	Amount	Clean-up Measures

Source: _____

21. Where do waste chemicals go?

~~NOT APPLICABLE~~. WASTE MANAGEMENT'S HAZ WASTE PICK UP IF APPLICABLE

22. What janitorial supplies are stored inside or outside of the building?

- NON-ACID DISINFECTANT BATHROOM CLEANER
- FLOOR SEALER AND CONDITIONER
- FLOOR FINISH
- ODOR BANE
- FINISH STRIPPER

23. Where do excess janitorial supplies go?

EITHER BACK TO JANITORS OR WASTE MANAGEMENT'S WASTE PICK-UP.

Source: LARRY LAMSA

24. Are pesticides or herbicides stored or used in or around the building? Yes (No)

Chemical	Amount	Chemical	Amount

Source: _____

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

25. Does the building contain active or inactive above ground storage tanks? Yes No
For each tank, list the content, quantity, last inspection, registration number.

NONE

26. Is there a sump or pit or underground tank in or around the building?
Yes No Unknown
Is it double-walled? What does it contain? How many days per year is it filled?
Is there an emergency overflow tank? Has ther been previous overlfows?

Double-Walled	Contents	Days/Year in Use	Overflow Tank	Previous Overflow
Y / N	WATER	1 DAY / YR	Y / N	Y / N

Source: LARRY LAMSA

27. Does the building generate, store, or dispose of hazardous waste? Yes No

Materials	Amount
Calci-Solve	6.6
Isopropanol	30.3
Oil Waste, Alcatel Vacuum Pump Oil	2.1
Oil Waste, Duo Seal Pump Oil	7.3
Oil Waste, Vacuum Pump Oil	4.9
Rinse Water	432.8
Rinse Water	198.2

Source: Characterization of Mounds Hazardous, Radioactive, and Mixed Wastes 08/15/90

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

28. Does the building have abandoned process equipment such as tanks, piping, containers, etc.? Yes No

29. Is waste material stored in or around the building for more than 90 days?
Yes No ASSUMPTION: LOW-LEVEL R
WASTE ≠ WASTE MAT'L.

30. Has the building been identified as a 90 day waste accumulation area?
Yes No

31. Has any area in the building been identified as a satellite accumulation area? Yes No

32. Is mixed waste generated, stored, or disposed of from the building? Yes No
Where are logs found?

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: _____

9.45-48

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

33. Is TRU radioactive waste generated, stored, or disposed of from the building?
Yes (No)
Where are logs found?

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: _____

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

34. Is low-level radioactive waste generated, stored, or disposed of from the building? Yes (No)
Where are logs found? LARRY LAMSA, BLDG 22, Room 3

NOT PRESENTLY BUT IN NEAR FUTURE

Process	Waste	Stored	Disposed	Logs
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

Source: LARRY LAMSA

35. Identify all administrative orders, temporary or permanent injunctions, civil administrative penalties, or criminal activities issued against the building.

NONE

9.45-50

Building Manager's Questionnaire

Building Name: 22 Building Manager: L.T. Lamsa Phone: _____ Date: 12-07-95
Alternate: _____ Phone: _____

36. Is there a waste minimization program in the building? Yes (No)
Discuss your ideas about how to minimize waste.

BLDG 22 WILL NO [illegible] WASTE EXCEPT FOR MINIMAL [illegible] TRASH

37. Has a pollution prevention program been developed for the building? Yes (No)

Appendix G

Radiological Information

Final Status Report
For
Building 22

Prepared by: Robert Coblentz / RW Coblentz **Date:** September 20, 2004

Reviewed by: Galen Tomlinson / [illegible] **Date:** 9-21-04

Approved by: A. Stephen Collas / [illegible] **Date:** 9/21/04

This page intentionally left blank.

1.0 Historical Overview

Building 22, based upon construction drawings, was built in 1965, under the name "Storage Warehouse", and apparently continued to be utilized as a storage warehouse until the summer of 1995, when it was modified to accommodate solid radioactive LLW waste storage activities. The original building size was 5,400 square feet, with a subsequent addition in 1968, increasing the total size to 9,000 square feet. The building consists of a bermed open warehouse space of approximately 8,000 square feet, and an office area of approximately 1,000 square feet.

The building exterior walls and roof are constructed of seamed metal panels, with steel structural beams, girders, trusses, and arches. The floor is bermed 8 inch thick reinforced concrete with a 3ft X 3ft X 2ft collection pit at the west end of the building. The office area consists of two office rooms, a storage room, a janitor's closet, a restroom, and a "L" shaped corridor. The office area has painted gypsum board walls, vinyl floor tile, an acoustical drop tile ceiling, and is climate controlled.

One document ("A 1996 Waste Generation and an Environmental Perspective—Building 22") makes mention of a 1,100 gallon, in-ground sump, consisting of a steel tank within a secondary concrete containment pit. This consists of the entire bermed floor of the storage area (Room 1), which is constructed as a containment area, with the 1,100 gallon volume being comprised of both the floor containment area and the 3ft X 3ft X 2ft collection pit.

There is one recorded occurrence involving radioactive contamination, in which tritium contamination was found on two drums. The record states that the drums were over-packed. No contamination was found on building surfaces. Additionally, building routine radiological surveys have detected no radiological contamination above DOE Order 5400.5, Table 1 limits.

Since there is a potential for residual contamination to be present, Building 22 is designated as impacted.

A complete history of Building 22 can be found in Reference 1.

2.0 Survey Objectives

The objective of this survey plan was to determine whether or not the residual radioactivity of the surfaces of building materials associated with Building 22 satisfy the site release criteria. This was accomplished by measuring the fixed and removable contamination on building surfaces and performing isotopic analysis on any sediment found in building drains or ventilation systems. The survey data is compared to the release criteria of DOE Order 5400.5 using methods defined in Reference 2. The specific survey objectives are outlined on the Survey Plan Form (see Enclosures).

Table 1 lists the permissible surface contamination guideline values as stated in DOE Order 5400.5. These limits are the Derived Concentration Guidelines (DCGL's) for building and structure release.

Table 1

Allowable Total Residual Surface Contamination (dpm/100cm^2)*				
Radionuclides*		**Average***	**Maximum***	**Removable***
Group 1	Transuranics, I-125, I129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	**100**	**300**	**20**
Group 2	Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	**1,000**	**3,000**	**200**
Group 3	U-Natural, U-235, U-238 and associated decay products, alpha emitters	**5,000**	**15,000**	**1,000**
Group 4	Beta-gamma emitters (Radionuclides with decay modes other than alpha emission or spontaneous fission) except for Sr-90 and others noted above	**5,000**	**15,000**	**1,000**
Tritium		**N/A**	**N/A**	**10,000**

* Note: Refer to DOE Order 5400.5, Radiation Protection of the Public and the Environment, for specific information on surface contamination guidelines and additional notes.

The average activity levels shown in Table 1 assumes that the residual contamination is uniformly distributed across the survey unit and is the $DCGL_w$ for this survey. The maximum activity shown in Table 1 represents the Elevated Measurement Comparison ($DCGL_{emc}$) for small (<100cm^2) areas of activity that may be observed in the survey unit while scanning. It is assumed that Pu-238 is the potential contaminant of concern and the Group 1 limits are appropriate for alpha measurements. Group 4 limits are used for beta measurements.

2.1 Survey Design

The characterization survey was designed to evaluate the building internal and external surfaces. Area classification was based on operating history. Testing and radioactive storage areas are Class 2 areas. Administrative and support areas are Class 3. The building was divided into survey units as follows:

Building 22 Survey Units

Survey Unit	Room	Class	Area (Sq.Ft.)	Scan %
1	Room 1 Floor	2	7,700	50
2	Waste area walls to 12'	3	4,512	10
3	2, 3, 4, 5, 6, 7 floors	3	1,020	10
4	2, 3, 4, 5, 6, 7 walls	3	2,423	10
5	Room 1 ceiling	Judgmental	8,292	Judgmental
6	2, 3, 4, 5, 6, 7 ceilings	Judgmental	1,020	Judgmental
7	Office area attic	Judgmental	N/A	Judgmental
8	Exterior Walls	Judgmental	5,749	Judgmental
9	Roof	Judgmental	8,720	Judgmental

Since the variability is expected to be small within the survey unit, the Type I error chosen is $\alpha = 0.05$ and the Type II error is $\beta = 0.05$. The number of data points is determined by calculating the relative shift (Δ/σ) from the DCGL value, the lower bound of the gray region (LBGR), and the standard deviation (σ) of the contaminant in the survey unit (Δ/σ = DCGL-LBGR/σ). For this survey plan, the LBGR is set at 50% of the $DCGL_w$. The standard deviation was estimated to be 17dpm/100cm^2 based on survey data from similar building surfaces and the relative shift was calculated as 2.95. The required number of data points (n = 14) was obtained from Table 5.5, Reference 2.

In the Class 2 survey units, the starting point was randomly selected and data points were placed within the survey unit using the triangular grid method. The spacing of data points in each survey unit was determined by:

$$L = \sqrt{\frac{A}{0.866n}}$$

Where: A = Survey unit area
n = # of data points
L = Distance in feet between data points

Survey data points were randomly placed in the Class 3 survey units. A reference coordinate grid system was used to locate the data points. The location of each data point is determined by multiplying the north-south (X) and the east-west (Y) dimensions of the survey unit by a randomly generated number for each dimension. A computer spreadsheet program was used to determine random coordinates. The data points were then located on a scaled drawing and transferred to the survey unit.

Professional judgment (biased) surveys were performed in overhead and attic spaces to supplement the statistical survey data, but are not combined with the statistical data. Judgmental survey data is compared directly to the release criteria.

Sediment smear samples and water samples were collected from floor drains. A sediment sample and smear samples were taken from the drain trough outside the north rollup door. Sediment smears were taken from the room 1 collection pit. Direct alpha and beta readings were taken at each sediment sample location.

Loose surface contamination was measured by smearing an area of 100cm^2 at each data point. Smears were counted for gross alpha/beta activity. Removable tritium contamination was measured on interior surfaces by liquid scintillation counting of coin smears.

Replicate surveys were performed in accordance with Reference 3.

The instruments selected for this survey were the Ludlum 2350-1 data logger with a 43-68 hand-held gas flow proportional (GFP) detector for alpha/beta fixed point measurements and a 43-37 GFP large area floor probe for alpha scan measurements. For safety reasons, a Ludlum 2360 with an L 43-93 scintillation probe was used for alpha/beta roof measurements in accordance with Reference 4. Laboratory instruments used were appropriate for the analysis requested. Instrument calibration and source check data is documented in accordance with Mound procedures.

2.2 Survey Data

The gross alpha and beta fixed point measurements from each survey unit were averaged and compared to the $DCGL_w$. All measurements inside the building and on exterior walls were below the $DCGL_w$ The maximum data point alpha measurement, excluding the roof, was 62 dpm/100cm^2. The maximum data point beta measurement, excluding the roof, was 2484 dpm/100cm^2. Roof and ceiling surveys were performed via 14 coupon cutouts one square meter in size, due to personnel safety concerns. All roof data points were above the alpha $DCGL_w$, with the max being 189 dpm/100cm^2. Acid etches were performed on two roof data points (one north side and one south side) to identify radionuclides. The predominant radionuclide detected on the roof coupons was Polonium-210. The measured 2350-1 result was therefore compared to the 5400.5, Group 3 contamination limit of 5000 dpm/100cm^2. A graphical representation of the average and maximum total activity for each survey unit is shown in Attachment 1. A retrospective power curve (Attachment 2) demonstrates that the survey design had sufficient power (probability) to meet the DQO's for this survey plan. The average alpha measurement is 18.67 dpm/100 cm^2 ±2.17 dpm/100 cm^2 and the standard deviation (σ) is 11.7. The relative shift (Δ/σ) = 4.24. The retrospective number of data points (n) per Equation 5-2, Reference 2 is 14. All measurements were below the $DCGL_w$, therefore the statistical test is not required.

The following table shows the maximum and average Fixed Point survey results.

Fixed Point Survey Results

Building 22	Smearable dpm/100cm^2			Fixed dpm/100cm^2	
	α	β	H^3	α	β
Average	0.35	1.57	5.86	18.67	1727
Standard Deviation	.927	1.71	19.5	11.7	626
Maximum	7.3	6.41	119	62	3102
Confidence Interval	± 0.17	± 0.32	± 3.86	± 2.17	± 116

Note: Roof data was excluded due to Polonium-210 anomalies

Fifty percent of the Class 2 survey units and ten percent of the Class 3 survey units were scanned for alpha activity in accordance with the survey plan. No areas of elevated measurement were observed.

Judgmental surveys were performed on ceilings, via 14 coupon cutouts one meter squared. The highest observed activity was 34 dpm/100cm^2 alpha and 1530 dpm/100cm^2 beta (RSDS# 04-TF-0275). The average activity was 22.5 (±4.94) dpm/100cm^2 alpha and 1350 (±99.9) dpm/100cm^2 beta.

Judgmental surveys were performed on roof areas, via coupon cutouts one square meter in size. The highest observed activity was 189 dpm/100cm^2 alpha and 2272 dpm/100cm^2 beta (RSDS# 04-TF-0275). The average activity was 160 (±8.85) dpm/100cm^2 alpha and 1985 (±89.5) dpm/100cm^2 beta (RSDS# 04-TF-0275). Acid etch sampling was performed on 2 of the 14 data points. Isotopic analysis showed the predominant radionuclide to be Polonium-210. The roof readings were therefore compared to the DOE Order 5400.5, Table 1, Group 3 limit of 5000 dpm/100cm^2.

2.3 Sediment Sample Data

Sediment smear samples were obtained at thirteen (13) locations of the ventilation system. Smear samples were analyzed for gross alpha, beta and tritium activity in accordance with the survey plan. No elevated activity was detected on any sample. Direct alpha and beta measurements were taken at each sample location. No activity above background was detected.(See RSDS # 04-TF-0197 & 04-TF-0201).

3 floor drains, 1 collection pit, and 1 drain trough were surveyed and sampled. Samples showed no activity above background. Smears and direct measurements were less than 5400.5, Table 1 limits. (See RSDS# 04-TF-0251, 04-TF-0267, and 04-TF-0308)

The metal loading-dock-platform was removed for surveys, and to gain access to sediments below the platform. One elevated alpha direct reading was detected on the top of the metal platform. The measured reading was 104 dpm/100cm^2, alpha. Acid etch sampling was performed at this location. No activity above background was detected in the acid etch sample or on the item surface following etching.

2.4 Quality Control

Quality control measurements were taken to assess the precision of the measurement system in accordance with Reference 3. Sixteen data points were selected at random from the sample group of 56 non-judgmental data points. Replicate measurements were taken at these locations using the same instruments and performed in the same manner as the original survey. The acceptance criterion for fixed-point measurements is that the variance in the measurements of the original sample population is within a factor of two of the variance in the replicate samples (at 95% confidence level). The results of the replicate surveys are shown in the following table:

Replicate Analysis Results

Location #	Alpha (dpm/100cm^2)			Beta (dpm/100cm^2)		
	Initial	2σ	Replicate	Initial	2σ	Replicate
SU1-3	15	7.75	8	2577	101.5	2845
SU1-6	19	8.72	12	2700	103.9	2649
SU1-9	0	0	8	2742	104.7	2876
SU2-2	10	6.32	10	1295	71.97	1125
SU2-7	10	6.32	28	988	62.86	937
SU2-12	35	11.83	10	954	61.77	1074
SU2-13	21	9.17	31	1099	66.3	1270
SU3-3	12	6.93	15	2237	94.59	2319
SU3-6	12	6.93	0	2247	94.81	2195
SU3-11	4	4.00	4	2061	90.8	1783
SU3-12	12	6.93	15	2144	92.61	2309
SU3-13	27	10.39	4	2484	99.7	2247
SU4-5	4	4.00	8	1087	65.9	1371
SU4-10	12	6.93	0	1238	70.4	1299
SU4-12	24	9.80	15	1127	67.14	1412
SU4-14	16	8.00	8	1175	68.56	1567
Variance (S^2)	82		74	473962		432609
Ratio			2			2
Agreement			YES			YES

G 7 of 96

Replicate analyses were not performed on smears or sediment samples. Quality control procedures, blanks, and spikes are a part of the laboratory quality control program at Mound. Participation in the DOE/EML inter-laboratory quality assurance program provides acceptable assurance of nuclide identification reliability and ensures a high quality of sample results. Since a relatively small number of samples were taken for this survey, additional replicate analysis was not required for this survey.

Field instrumentation is source checked each day prior to use and again at the completion of survey activities for that day. A known source is placed in a source holder to ensure a reproducible geometry is achieved. Acceptance criteria is ± 20% of the initial source response following calibration. Results are documented in accordance with Mound Radiological Control procedures. Laboratory instrumentation is source checked and documented in accordance with Mound Laboratory procedures.

2.5 Conclusion

The objective of this survey plan was to determine whether or not the residual radioactivity of the surfaces of building materials associated with Building 22 satisfy the site release criteria established by DOE Order 5400.5. This is accomplished by comparing the survey data to the release criteria in accordance with the MARSSIM (Reference 2).

All of the DQO's for this survey plan have been met and no further surveys of building surfaces are required. Subsurface material (under-slab piping, footers, etc) and associated soil is not evaluated in this survey, but will be assessed separately when surfaces are accessible in accordance with Mound procedures.

Building 22 meets the surface release criteria established by DOE Order 5400.5. The average and maximum residual contamination in each survey unit is less than the $DCGL_w$ and the survey is accepted as the Final Status Survey in accordance with the Survey Plan. The following table shows the maximum fixed and removable activity on the inside and outside building surfaces.

Building 22 Survey Results

TYPE	RSDS#	LOCATION	SURVEY RESULTS (dpm/100 cm²)	SURFACE CONTAMINATION GUIDELINES (dpm/100 cm²) (Note 1)
Highest Alpha Smearable Activity	04-TF-0221	Floor	7.3	20
Highest Group 1 Alpha Fixed Activity	04-TF-0233	Wall	62	100
Highest Group 3 Alpha Fixed Activity	04-TF-0275	Roof	189	5000
Highest Beta Smearable Activity	04-TF-0221	Floor	6.41	1000
Highest Beta Fixed Activity	04-TF-0221	Floor	3102	5000
Highest Tritium Smearable Activity	04-TF-0253	Attic	119.3	10,000
Note 1: DOE Order 5400.5 (DCGLw)				

3.0 Attachments and Enclosures

Attachment 1 – Average Total Alpha and Beta Graph

Attachment 2 – Retrospective Power Curve

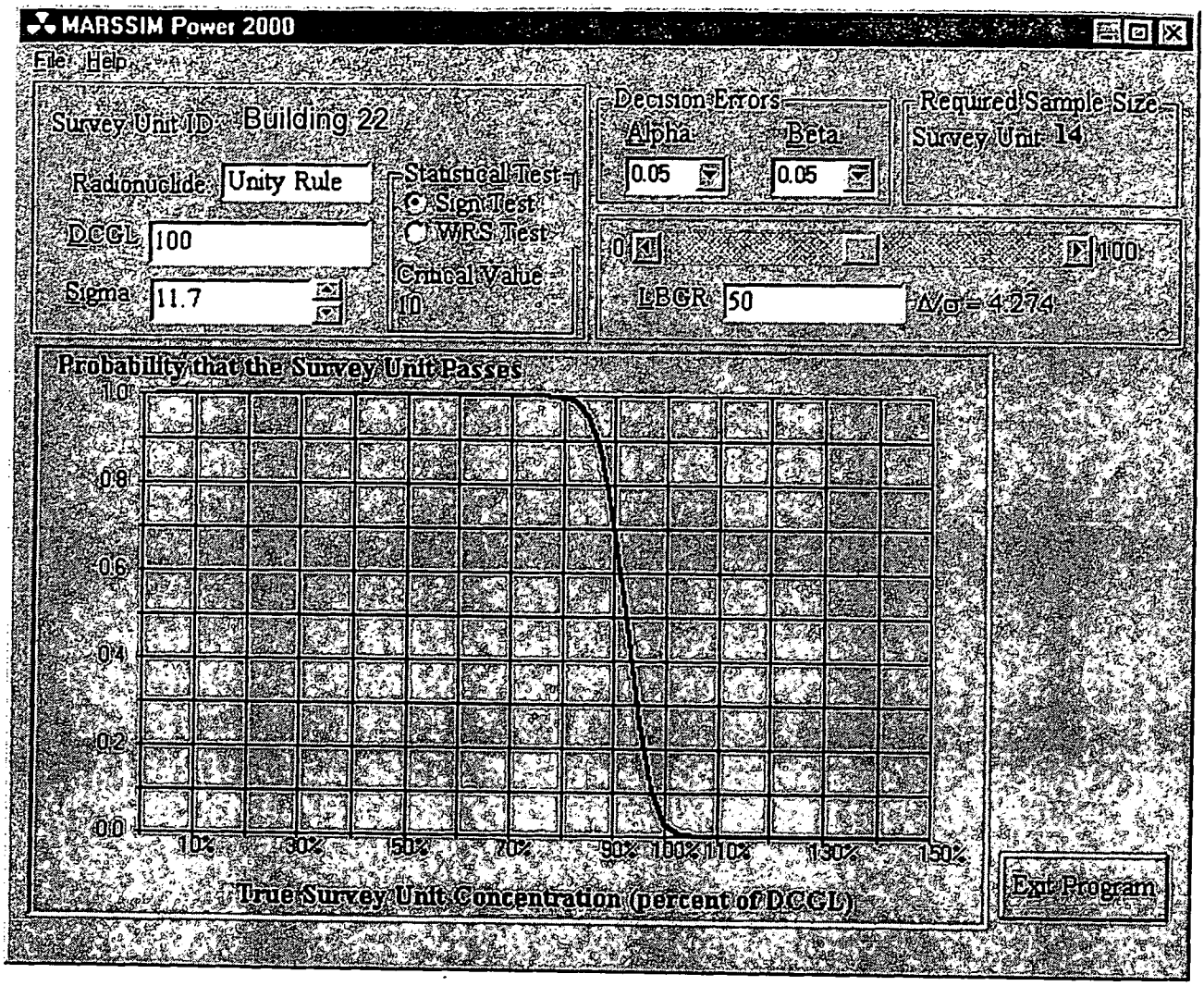
Enclosure 1 – Sample Data Analysis Worksheets

Enclosure 2 – SPF 22-01

4.0 References

1. CH2MHILL Mound, Inc., EC&AS Department, White Paper: Building 50 Structural History and Process History Summary Background Document, January 2003
2. NUREG 1575, Rev 1, Aug 2000, *Multi-Agency Radiation Survey and Site Investigation Manual*, (MARSSIM)
3. MARSSIM Implementing Procedures, *Field Quality Control for Building Contamination Surveys*, MD-80046, Op. 402
4. MD80036, Op. No. 30031,*Operation of the Ludlum 2360 Scaler/Ratemeter with Ludlum 43-93 Alpha/Beta Scintillator,* Section 6.3

Retrospective Power Curve



Building 22 Survey Data Collection Sheet

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU1-01	0221	0	0	4.38	4	2298
SU1-02	0221	3.7	4.43	0.35	8	2865
SU1-03	0221	1.5	0	0	15	2577
SU1-04	0221	0	6.05	0	8	2639
SU1-05	0221	0	0.4	0.52	19	2824
SU1-06	0221	0	3.81	0	19	2700
SU1-07	0221	0	0	0	4	2350
SU1-08	0221	0	0	0	15	2639
SU1-09	0221	0	6.41	3.84	0	2742
SU1-10	0221	0	3.02	0	12	2670
SU1-11	0221	1.45	0	0	0	3102
SU1-12	0221	1.49	0	2.49	12	2824
SU1-13	0221	1.64	0	0	12	2659
SU1-14	0221	0	2.32	7.83	4	2700

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU2-01	0263	2.16	0	8.43	14	903
SU2-02	0263	1.09	0	7.83	10	1295
SU2-03	0263	0	0.12	8.4	17	1056
SU2-04	0263	0	3.42	10.15	0	1193
SU2-05	0263	1.57	0	2.71	21	1125
SU2-06	0263	1.28	1.86	4.75	17	1167
SU2-07	0263	0	4.03	6.47	10	988
SU2-08	0263	0	1.46	6.58	17	835
SU2-09	0263	0	0.74	0	3	1150
SU2-10	0263	1.06	1.28	1.75	14	988
SU2-11	0263	0	1.2	6.98	7	1125
SU2-12	0263	0	0.27	5.58	35	954
SU2-13	0263	0	3.63	8.59	21	1099
SU2-14	0263	0	3.42	2.8	21	1022

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU3-01	0221	0	1.35	6.9	8	2195
SU3-02	0221	0	2.5	0	12	2226
SU3-03	0221	0	0	0	12	2237
SU3-04	0221	0	0	0	15	2340
SU3-05	0221	0	0	0.91	12	2247
SU3-06	0221	0	3.69	0.59	12	2247
SU3-07	0221	0	1.47	0	8	2165
SU3-08	0221	1.25	0	0	15	2061
SU3-09	0221	1.45	1.02	0	12	2092
SU3-10	0221	1.48	3.7	0.35	12	2165
SU3-11	0221	0	1.55	0	4	2061
SU3-12	0221	0	0	3.3	12	2144
SU3-13	0221	7.3	0.75	1.09	27	2484
SU3-14	0221	0	1.32	0	12	2206

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU4-01	0225	0	0.3	3.02	16	1016
SU4-02	0225	0	0	0	16	1127
SU4-03	0225	0	0.15	0	16	1230
SU4-04	0225	0	1.32	0	12	1206
SU4-05	0225	0	0	0	4	1087
SU4-06	0225	0	0	0	12	1048
SU4-07	0225	0	2.09	0	16	1262
SU4-08	0225	0	0	0	12	1095
SU4-09	0225	1.7	2.55	0	4	1413
SU4-10	0225	0	3.02	0	12	1238
SU4-11	0225	0	1.16	2.34	4	1151
SU4-12	0225	1.49	2.54	0	24	1127
SU4-13	0225	0	2.25	0	20	1238
SU4-14	0225	0	0.4	2.29	16	1175

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU5 -01J	0275	0	0	2.63	11	1141
SU5 -02J	0275	0	0.54	0	26	1359
SU5 -03J	0275	0	0.48	0	30	1378
SU5 -04J	0275	0	0	0	19	1255
SU5 -05J	0275	1.69	0.77	2.71	26	1378
SU5 -06J	0275	0	1.11	0	19	1283
SU5 -07J	0275	0	1.32	1.68	30	1312
SU5 -08J	0275	0	1.56	0	34	1530
SU5 -09J	0275	0	0	2.58	26	1397
SU5 -10J	0275	0	0	0	4	1388
SU5 -11J	0275	0	0	0	30	1331
SU5 -12J	0275	0	0	0	15	1245
SU5 -13J	0275	0.74	2.99	0	34	1445
SU5 -14J	0275	0	2.5	2.63	11	1464

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β

SU6 -01	0225	0	0	0	12	1841
SU6 -02	0225	0	0	0	24	2746
SU6 -03	0225	0	1.55	0	28	2508
SU6 -04	0225	0	1.12	0	20	2698
SU6 -05	0225	0	4.95	0	32	2833
SU6 -06	0225	0	3.69	0	12	2794
SU6 -07	0225	0	3.89	0	28	2508
SU6 -08	0225	0	0.29	0	8	2524
SU6 -09	0225	0	0	0	0	1579
SU6 -10	0225	0	1.42	0	4	2690
SU6 -11	0225	0	0.23	0	32	2659
SU6 -12	0225	0	1.78	0	24	2571
SU6 -13	0225	0	3.56	0	20	2746
SU6 -14	0225	1.49	2.54	0	32	2595

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU7 -01J	0253	0	4.04	108.17	17	1074
SU7 -02J	0253	0	0	26.93	38	1474
SU7 -03J	0253	0	4.95	105.66	14	1193
SU7 -04J	0253	0	1.32	30.62	24	1227
SU7 -05J	0253	0	5.06	19.73	35	1287
SU7 -06J	0253	0	2.63	1.23	24	1372
SU7 -07J	0253	0	4.5	5.21	17	1235
SU7 -08J	0253	0	0.29	119.3	21	1491
SU7 -09J	0253	0	6.41	1.25	24	1329
SU7 -10J	0253	0	1.78	2.18	7	1568
SU7 -11J	0253	1.45	2.22	15.18	24	1491
SU7 -12J	0253	0	0.34	0	48	1380
SU7 -13J	0253	0	5.91	5.12	28	1687
SU7 -14J	0253	0	0	0	14	1576

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU8-01J	0233	0	2.79		27	1361
SU8-02J	0233	1.66	0		19	1536
SU8-03J	0233	0	0		42	1464
SU8-04J	0233	0	0.14		27	1464
SU8-05J	0233	0	0		27	1278
SU8-06J	0233	0	2.63		27	1567
SU8-07J	0233	0	0		62	1849
SU8-08J	0233	0	0.29		27	1433
SU8-09J	0233	0	1.47		62	1247
SU8-10J	0233	0	0		42	1515
SU8-11J	0233	0	2.36		19	1350
SU8-12J	0233	0	2.67		23	1402
SU8-13J	0233	0	2.25		23	1340
SU8-14J	0233	0	4		42	1515

		Smearable			Fixed	
Location	RSDS 04-TF-	α	β	H^3	α	β
SU9-01J	0275	0	0	0	140	1825
SU9-02J	0275	0	0.83	0	178	1806
SU9-03J	0275	0	0	0	147	2110
SU9-04J	0275	1.73	4.13	0	136	2158
SU9-05J	0275	0	1.7	0	178	2272
SU9-06J	0275	1.4	2.21	0.78	136	1749
SU9-07J	0275	0	0	0	151	1777
SU9-08J	0275	1.49	2.07	0	159	1977
SU9-09J	0275	0	0	0	151	1910
SU9-10J	0275	0	0	0	174	2253
SU9-11J	0275	0	4.5	0	189	2034
SU9-12J	0275	0	0	0	170	1987
SU9-13J	0275	0	0	0	163	1882
SU9-14J	0275	0	0	0	166	2053

Survey Unit 1

	Smearable			Fixed	
	α	β	H^3	α	β
Number	14	14	14	14	14
Avg	0.6985714	1.88857143	1.385	9.428571	2684.929
SD	1.1135588	2.42678279	2.3987489	6.417695	201.422
Max	3.7	6.41	7.83	19	3102
+/-	0.5833178	1.27122657	1.2565415	3.361794	105.5113

Survey Unit 2

Number	14	14	14	14	14
Avg	0.5114286	1.53071429	5.7871429	14.78571	1064.286
SD	0.7554302	1.50158616	2.9960652	8.789667	124.1943
Max	2.16	4.03	10.15	35	1295
+/-	0.3957185	0.78657893	1.5694349	4.604309	65.05694

Survey Unit 3

Number	14	14	14	14	14
Avg	0.82	1.23928571	0.9385714	12.35714	2205
SD	1.9558944	1.29453564	1.9345835	5.093089	111.7421
Max	7.3	3.7	6.9	27	2484
+/-	1.0245602	0.67811924	1.0133968	2.667923	58.53412

Survey Unit 4

Number	14	14	14	14	14
Avg	0.2278571	1.12714286	0.5464286	13.14286	1172.357
SD	0.5806651	1.14620731	1.097547	5.959571	102.5735
Max	1.7	3.02	3.02	24	1413
+/-	0.304171	0.60042011	0.5749303	3.121814	53.73129

Survey Unit 5

Number	14	14	14	14	14
Avg	0.1735714	0.805	0.8735714	22.5	1350.429
SD	0.4789348	0.98608589	1.2395074	9.436019	99.90204
Max	1.69	2.99	2.71	34	1530
+/-	0.2508814	0.51654338	0.6492937	4.942889	52.33189

Survey Unit 6

Number	14	14	14	14	14
Avg	0.1064286	1.78714286	0	19.71429	2520.857
SD	0.3982193	1.67883398	0	10.60903	362.6976
Max	1.49	4.95	0	32	2833
+/-	0.2086	0.87942702	0	5.662117	189.9926

Survey Unit 7

Number	14	14	14	14	14
Avg	0.1035714	2.81785714	31.47	23.92857	1384.571
SD	0.3875288	2.29523312	44.355143	10.75936	172.2135
Max	1.45	6.41	119.3	48	1687
+/-	0.203	1.20231683	23.234645	5.636095	90.21096

Survey Unit 8

Number	14	14	0	14	14
Avg	0.1185714	1.32857143	#DIV/0!	33.5	1437.214
SD	0.4436537	1.41462611	#DIV/0!	14.39418	114.5716
Max	1.86	4	0	62	1649
+/-	0.2324	0.74102647	#DIV/0!	7.540131	60.01625

Survey Unit 9

Number	14	14	14	14	14
Avg	0.33	1.08857143	0.0557143	159.8571	1985.214
SD	0.6591603	1.59742513	0.2084838	16.90178	170.8968
Max	1.73	4.5	0.76	189	2272
+/-	0.3452893	0.83678245	0.1092	8.853896	89.52122

Graph Data Alpha

	Survey Unit 1	Survey Unit 2	Survey Unit 3	Survey Unit 4	Survey Unit 5	Survey Unit 6	Survey Unit 7	Survey Unit 8	Survey Unit 9
AVG	9.4285714	14.78571	12.36	13.14	22.50	19.71	23.93	33.50	159.86
MAX	19	35	27	24	34	32	48	62	189

Graph Data Beta

	Survey Unit 1	Survey Unit 2	Survey Unit 3	Survey Unit 4	Survey Unit 5	Survey Unit 6	Survey Unit 7	Survey Unit 8	Survey Unit 9
AVG	2684.93	1064.29	2205.00	1172.36	1350.43	2520.86	1384.57	1437.21	1985.21
MAX	3102	1295	2484	1413	1530	2833	1687	1649	2272

NUREG 1507 Table 5.1 (GFP)
Background Count Rates for Various Materials (NCPM)

	Alpha	Beta
Brick	6	567.2
Ceramic Block	15	792
Ceramic Tile	12.6	647
Concrete Block	2.6	344
Drywall	2.6	325
Floor Tile	4	308
Linoleum	2.6	346
Carbon Steel	2.4	322.6

Replicate Fixed Point QC

		alpha (dpm/100cm2)			beta (dpm/100cm2)		
	Location #	initial	2s	replicate	initial	2s	replicate
1	SU1-3	15	7.75	8	2577	101.53	2845
2	SU1-6	19	8.72	12	2700	103.92	2649

3	SU1-9	0	0.00	8	2742	104.73	2876
4	SU2-2	10	6.32	10	1295	71.97	1125
5	SU2-7	10	6.32	28	988	62.86	937
6	SU2-12	35	11.83	10	954	61.77	1074
7	SU2-13	21	9.17	31	1099	66.30	1270
8	SU3-3	12	6.93	15	2237	94.59	2319
9	SU3-6	12	6.93	0	2247	94.81	2195
10	SU3-11	4	4.00	4	2061	90.80	1783
11	SU3-12	12	6.93	15	2144	92.61	2309
12	SU3-13	27	10.39	4	2484	99.68	2247
13	SU4-5	4	4.00	8	1087	65.94	1371
14	SU4-10	12	6.93	0	1238	70.37	1299
15	SU4-12	24	9.80	15	1127	67.14	1412
16	SU4-14	16	8.00	8	1175	68.56	1567
	Variance (S2) =	82		74	473962		432609
	Ratio			2			2
	Agreement			YES			YES

QC Measurements

	Location	RSDS#	α	β
1	SU1-3	04-TF-0266	8	2845
2	SU1-6	04-TF-0266	12	2849
3	SU1-9	04-TF-0266	8	2876
4	SU2-2	04-TF-0266	10	1125
5	SU2-7	04-TF-0266	28	937
6	SU2-12	04-TF-0266	10	1074
7	SU2-13	04-TF-0266	31	1270
8	SU3-3	04-TF-0266	15	2319
9	SU3-6	04-TF-0266	0	2195
10	SU3-11	04-TF-0266	4	1783
11	SU3-12	04-TF-0266	15	2309
12	SU3-13	04-TF-0266	4	2247
13	SU4-5	04-TF-0266	8	1371
14	SU4-10	04-TF-0266	0	1299
15	SU4-12	04-TF-0266	15	1412
16	SU4-14	04-TF-0266	8	1567

SU#	Number
1	3
1	6
1	9
2	2
2	7
2	12
2	13
3	3
3	6
3	11
3	12
3	13
4	5
4	10
4	12
4	13

Instrument Data

	Inst	SN	CDD	RSDS 04-TF-	α Bkg (cpm)	β Bkg (cpm)	
1	L2350	5855/5884	6/9/2005	0221	0.6	195	✓
2	L2350	5857/5859	9/9/2004	0263	1.2	148	✓
3	L2350	5855/5884	6/9/2005	0221	0.6	195	✓
4	L2350	5855/5884	6/9/2005	0225	2.2	183	✓
5	L2350	5854/5861	7/20/2005	0275	1.6	125	✓
6	L2350	5855/5884	6/9/2005	0225	2.2	183	✓
7	L2350	5857/5859	9/9/2004	0253	2.4	139	✓
8	L2350	5855/5884	6/9/2005	0233	1	181	✓
9	L2350	5854/5861	7/20/2005	0275	1.6	125	✓

Acid Etch Sample Results (Dock Plate)

Isotope	dpm/sample	Uncertainty	LDL
Pu238	2.57	0.33	0.34
Pu239/240	<LDL	<LDL	0.21
Th232	0.09	0.05	0.08
Th230	0.26	0.1	0.21
Th228	0.31	0.1	0.06
Th227	<LDL	<LDL	0.31
U238	0.36	0.09	0.06
U235	<LDL	<LDL	0.31
U233/234	0.36	0.09	0.06

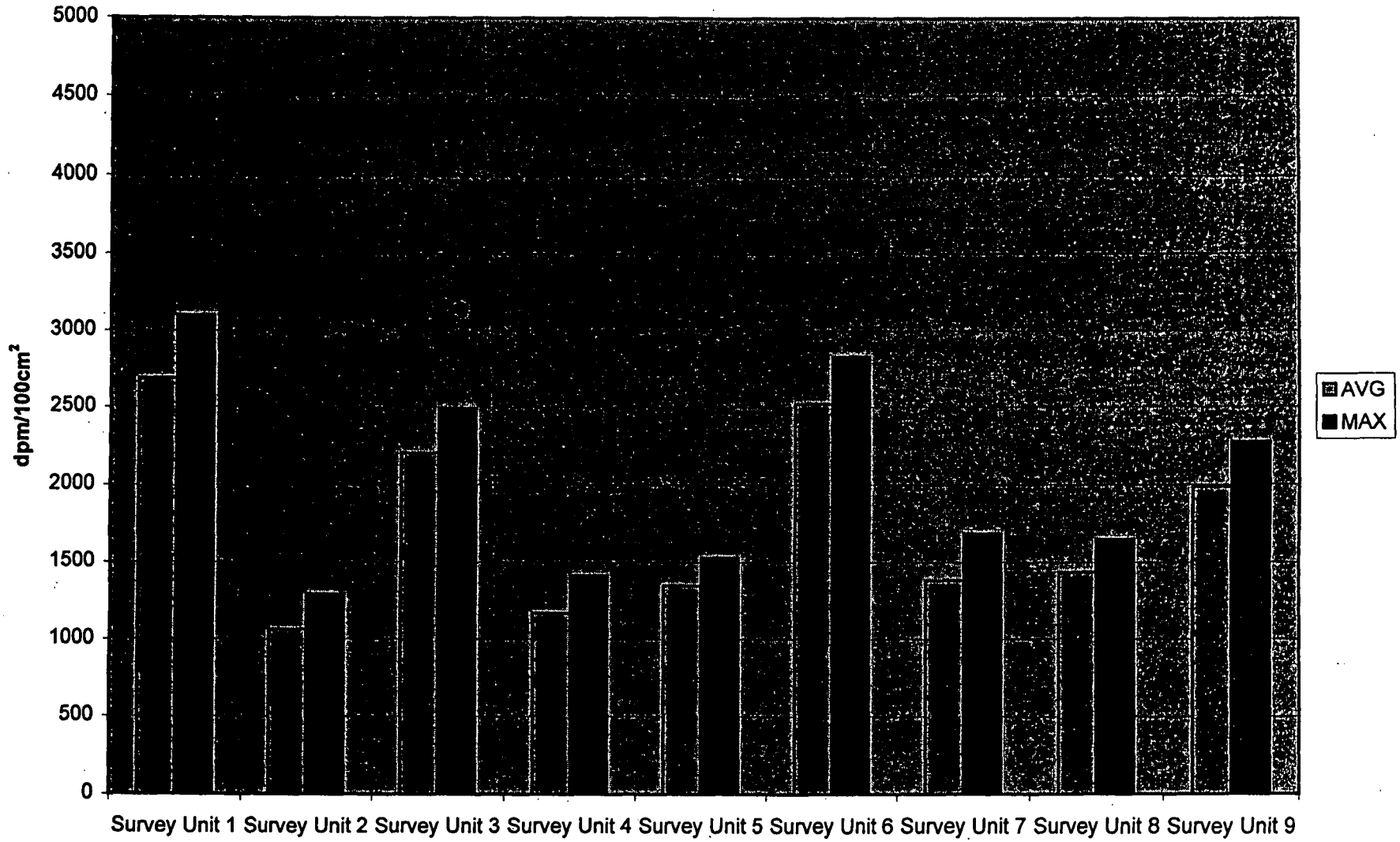
Acid Etch Sample Results (Roof Coupon)

Isotope	dpm/sample	Uncertainty	LDL
Pu238	<LDL	<LDL	0.79
Pu239/240	<LDL	<LDL	0.22
Th232	<LDL	<LDL	0.09
Th230	0.37	0.11	0.09
Th228	<LDL	<LDL	0.32
Th227	0.13	0.07	0.09
U238	1.29	0.27	0.13
U235	<LDL	<LDL	0.13
U233/234	0.36	0.09	0.06
Po210	77.9	5.36	0.45

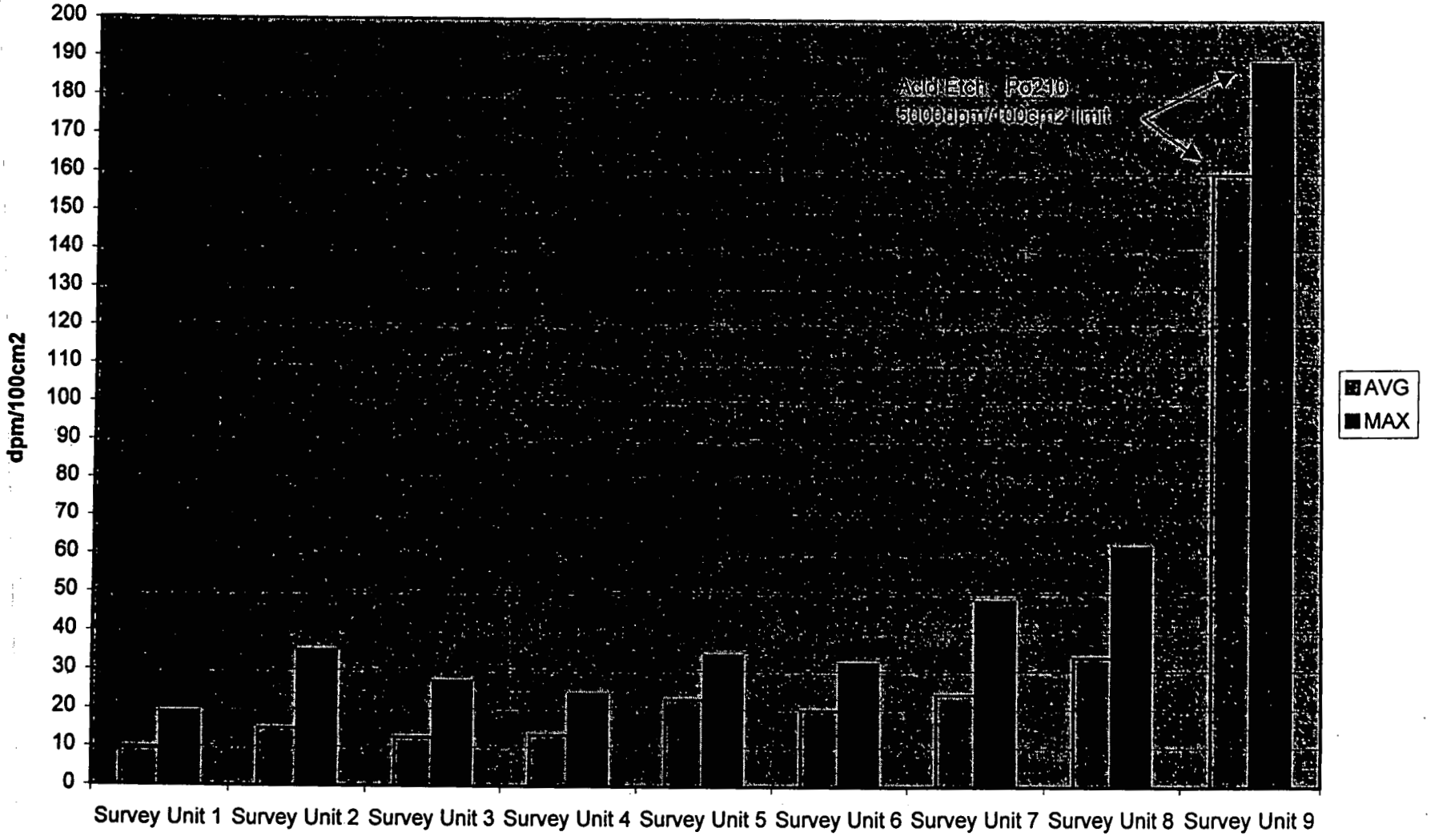
Acid Etch Sample Results (Roof Coupon)

Isotope	dpm/sample	Uncertainty	LDL
Pu238	0.74	0.24	0.6
Pu239/240	<LDL	<LDL	0.11
Th232	0.1	0.06	0.09
Th230	0.45	0.13	0.09
Th228	<LDL	<LDL	0.33
Th227	0.28	0.1	0.09
U238	<LDL	<LDL	0.57
U235	0.77	0.2	0.12
U233/234	0.36	0.09	0.06
Po210	97.81	6.64	0.13

Building 22 Average and Maximum Total Beta Activity



Building 22 Average & Maximum Total Alpha



SURVEY PLAN FORM

SPF NUMBER	22-01	DATE OF REQUEST	July 8, 2004
TYPE OF SP	☐ FSS ☒ CHARACTERIZATION ☐ REFERENCE ☐ OTHER:		
AREA/LOCATION	Building 22		
PURPOSE	The purpose of this SPF is to characterize Building 22 to support decisions on final disposition.		
SURVEY UNIT	(See Attachment 1)	SURVEY UNIT	N/A
SURVEY UNIT	N/A	SURVEY UNIT	N/A
SURVEY UNIT	N/A	SURVEY UNIT	N/A
SURVEY UNIT	N/A	SURVEY UNIT	N/A

SAMPLE TYPE

☐ SURFACE SOIL SAMPLE:

☐ SUB-SURFACE SOIL SAMPLE:

☒ SEDIMENT SAMPLE: See specific sediment sampling instructions on page 2.

☐ Rubbelized Material:

☐ OTHER:

SURVEY TYPE

SURFACE SCAN	☐ BETA ☐ GAMMA ☒ ALPHA	INST. TYPE	L-2350	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Scan surface at a rate of 1" per second at a distance of not more than ¼" from surface
		PROBE TYPE	43-37 Floor Probe or 43-68 Hand Probe		
STATIC MEASUREMENT	☒ BETA ☐ GAMMA ☒ ALPHA	INST. TYPE	L-2350	COUNT TIME & DETECTOR DISTANCE FROM SURFACE	Perform 2 minute counts at specified locations not more than ¼" from surface
		PROBE TYPE	43-68 Hand Probe		
SURFACE SCAN	☒ BETA ☐ GAMMA ☒ ALPHA	INST. TYPE	L-2360	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	To be used I.A.W. MD 80036, Op 30030 & 30031 for attic and exterior areas, due to accessibility and safety concerns.
		PROBE TYPE	43-89; 43-93		
STATIC MEASUREMENT	☒ BETA ☐ GAMMA ☒ ALPHA	INST. TYPE	L-2360	COUNT TIME & DETECTOR DISTANCE FROM SURFACE	To be used I.A.W. MD 80036, Op 30030 & 30031 for attic and exterior areas, due to accessibility and safety concerns.
		PROBE TYPE	43-89; 43-93		

OTHER SURVEY TYPES OR COMMENTS:

All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.

Rad Con shall document all discrepancies from the above sampling and surveying instructions on the Radiological Survey Data Sheet (RSDS).

Perform sediment sampling and surface scan surveys prior to performing static measurements.

Ensure the surfaces of interest in the survey unit are dry and free of loose debris or other material that may obscure alpha measurement.

SPF NUMBER	22-01	DATE OF REQUEST	July 8, 2004

SPECIFIC SAMPLING / SURVEY INSTRUCTIONS

Safety Considerations

1. Obtain assistance from the responsible building custodian for access to upper walls, ceilings, roof, etc. Exercise extreme caution when performing surveys from ladders or scaffolds. Follow appropriate site safety procedures when accessing areas requiring fall protection measures.
2. Ensure ventilation units are de-energized prior to attempting to collect a sample. Obtain approval and assistance from the responsible building custodian to dismantle any equipment for sample collection.

Sediment Samples

1. Collect approximately 250ml of debris/water from each accessible ventilation unit opening, floor drain, sump and any other area where debris has accumulated.
2. If insufficient material is present at these sample locations, obtain a representative smear of the location.
3. Document sample information and description of material on Attachment 1.
4. Label sample container with sample number, date and time of collection, and location in accordance with Mound procedures.
5. Perform a static alpha and beta measurement at each sediment sample location.
6. Show sample location and static measurement results on the RSDS map.
7. Submit sediment/water samples to laboratory for gamma spectroscopy analysis. Submit smears for gross alpha and beta analysis.
8. Additional intrusive samples may be collected in areas of elevated activity as determined by the MARSSIM Engineer.

Surface Scan Measurements using a Ludlum 2350 with 43-37 alpha Floor probe

1. Set the Ludlum 2350-1 datalogger to alarm at 75dpm/100cm^2 in the ratemeter mode.
2. Scan at least 50% of the surface in Class 2 Survey Units using a serpentine method with rows spaced one probe width apart.
3. Scan at least 10% of the surface in Class 3 Survey Units using the professional judgment of the surveyor.
4. Perform a 30 second integrated count at every location where an alarm is obtained. In addition, obtain a 30 second integrated count at any point where an audible or visual indication of elevated activity is observed at twice the background rate.
5. Record the location of the area scanned on the RSDS map and document the results of any integrated counts.

Surface Scan Measurements using a Ludlum 2350 with 43-68 alpha Hand probe

1. Scan at least 10% of the surface in Class 3 Survey Units using the professional judgment of the surveyor.
2. Using the audible output of instrument, stop and pause for approximately ten (10) seconds if one pop (click) is heard. If one pop (click) is heard during pause, perform an integrated count for two (2) minutes. Otherwise, if no pop heard during pause, continue scan.
3. Record the location of the area scanned on the RSDS map and document the results of any integrated counts.

Data Point Location

1. Locate the data points in each survey unit using the coordinates shown in Attachment 3.
2. Mark each data point with tape or other non-permanent marking.
3. Document locations on the appropriate RSDS Map.

Continued Next Page

Specific Survey and Sampling Instructions (continued)

Static Measurements Using L 2350 with 43-68 (alpha/beta) probe

1. Perform an integrated alpha and beta measurement at each data point in each Survey Unit.
2. Perform at least 14 integrated alpha and beta measurements on ceilings, crawl spaces, and horizontal structural surfaces where, in the judgement of the surveyor, a potential exists for residual contamination.
3. Record location, material type, and results on RSDS map in accordance with Mound Rad Con procedures.
4. Document gross activity for each location (No "<" values). Record instrument background at survey location.

Loose Surface Contamination

1. Obtain a smear of 100cm^2 at each survey point identified above.
2. Count each smear for alpha, beta, and H^3. H^3 analysis is not required for building external surfaces.
3. Record location and results on RSDS map in accordance with Mound Rad Con procedures.

Quality Control

1. QC measurements will be performed by re-surveying 16 data points. Data points selected for resurvey should include the highest and lowest readings in the data set.
2. Sediment samples or smears with measured activity above the MDA may be resubmitted for replicate analysis. Ensure alpha and beta smear results are obtained before performing H^3 analysis.
3. Record location, material, and results on RSDS in accordance with Mound Rad Con procedures.

APPROVAL SIGNATURES			
MARISSM Engineer	R. Coblentz	DATE	July 8, 2004
Technical Reviewer	R. Case	DATE	7/13/04
Rad Con Manager	ASCollas	DATE	7/13/04
SP CLOSE-OUT SIGNATURES			
MARISSM Engineer	R. Coblentz	DATE	9-21-04
Technical Reviewer	G. Tomlinson	DATE	9-21-04
Rad Con Manager	ASCollas	DATE	9/21/04
COMMENTS			

SPF 22 –01
Attachment 1
Building 22 Survey Units

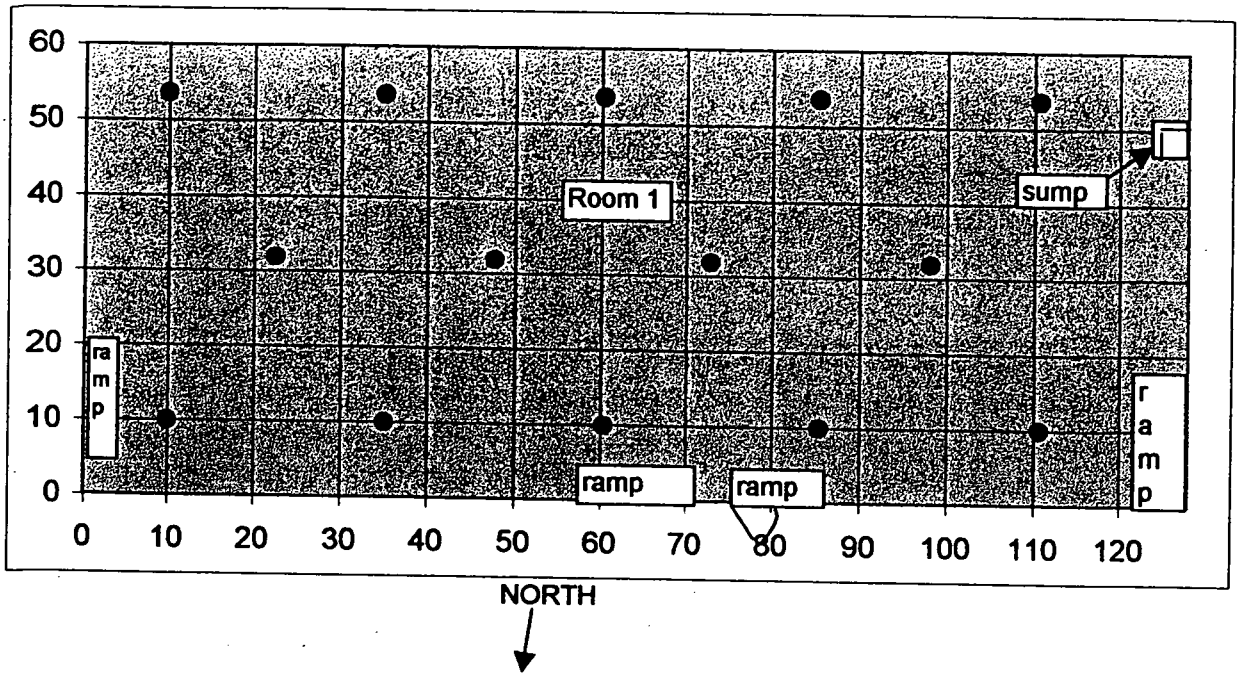
Survey Unit	Room	Class	Area (Sq.Ft.)	Scan %	Floor	Walls
1	1	2	7,700	50	X	
2	1 (12 feet height)	3	4,512	10		X
3	2, 3, 4, 5, 6, 7	3	1,020	10	X	
4	2, 3, 4, 5, 6, 7	3	2,423	10		X
5	1 ceiling	J	8,292	J		
6	2, 3, 4, 5, 6, 7 ceiling	J	1,020	J		
7	2, 3, 4, 5, 6, 7 attic	J	N/A	J		
8	Exterior walls	J	5,749	J		X
9	Roof	J	8,292	J		

Sample Data Collection Sheet
Attachment 2

Sample Number	Sample Date	Sample Time	Sample Volume /Weight	Sample Description	Sampled By	Chain of Custody Relinquished to Lab			
						Date	Time	Initials	Rec'd By
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									
22-01-									

G 21 of 96

BUILDING 22 SURVEY UNIT 1



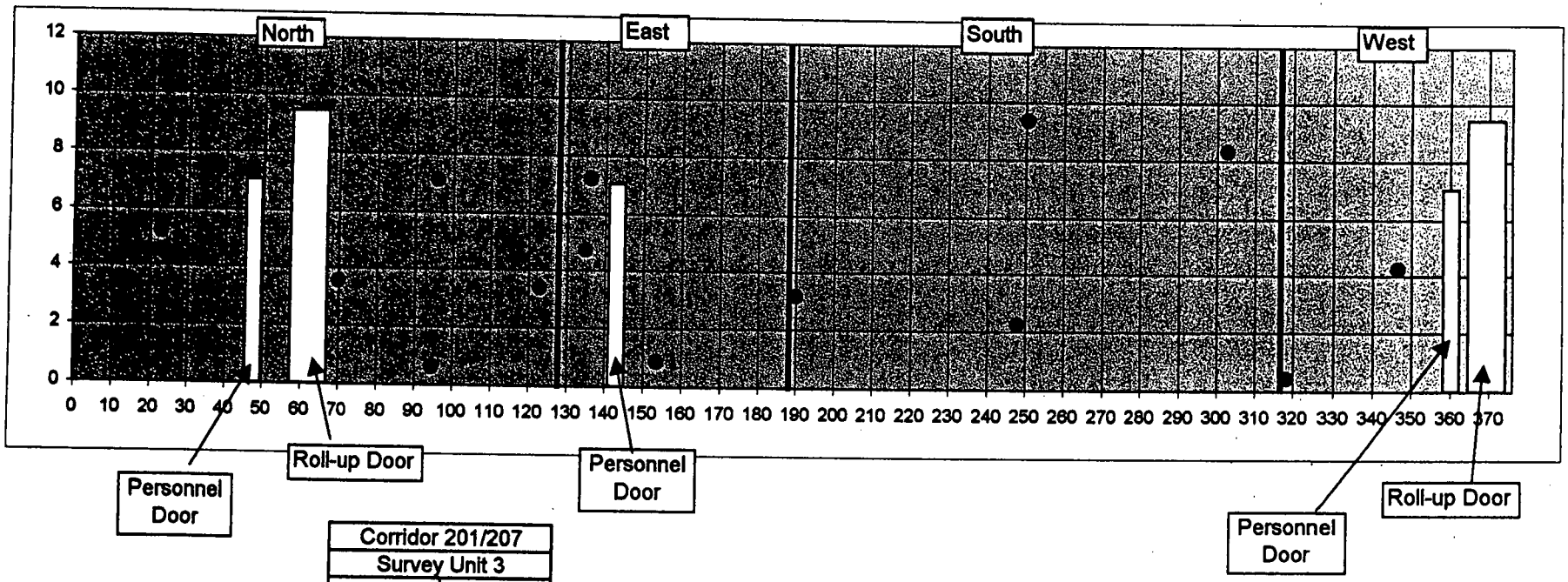
	Room 1	
	SU 1	
	X	Y
	128	60
1	10.0	10.0
2	35.2	10.0
3	60.3	10.0
4	85.5	10.0
5	110.7	10.0
6	22.6	31.8
7	47.8	31.8
8	72.9	31.8
9	98.1	31.8
10	110.7	53.6
11	10.0	53.6
12	35.2	53.6
13	60.3	53.6
14	85.5	53.6

Area	L	L'
7680	25.16852	21.79594

Start	X	Y
Rand X:Y	10	10

Not to scale

Building 22 Survey Unit 2



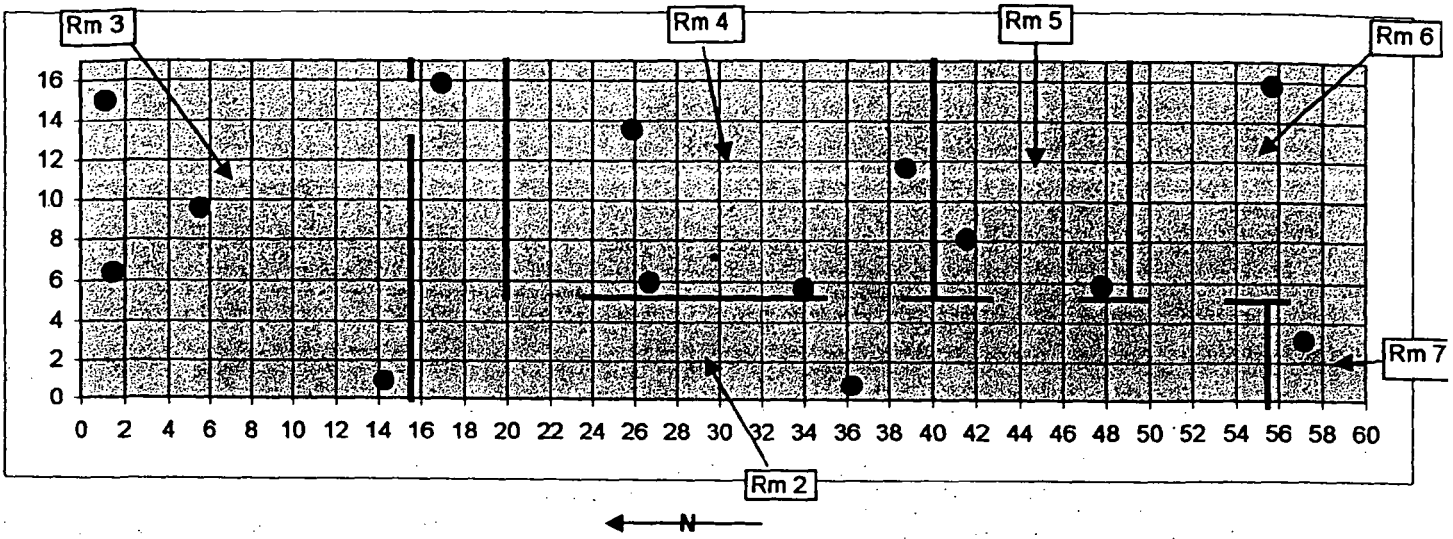
	Corridor 201/207	
	Survey Unit 3	
	X	Y
	376.0	12.0
1	22.7	5.2
2	250.5	9.4
3	189.9	3.2
4	153.5	0.9
5	247.8	2.3
6	136.1	7.2
7	94.5	0.6
8	70.0	3.6
9	134.8	4.7
10	122.8	3.4
11	346.4	4.3
12	302.7	8.3
13	318.1	0.4
14	95.8	7.1

Area	L	L'
4512	16.14026	13.97747

Not to scale

G22 of 96

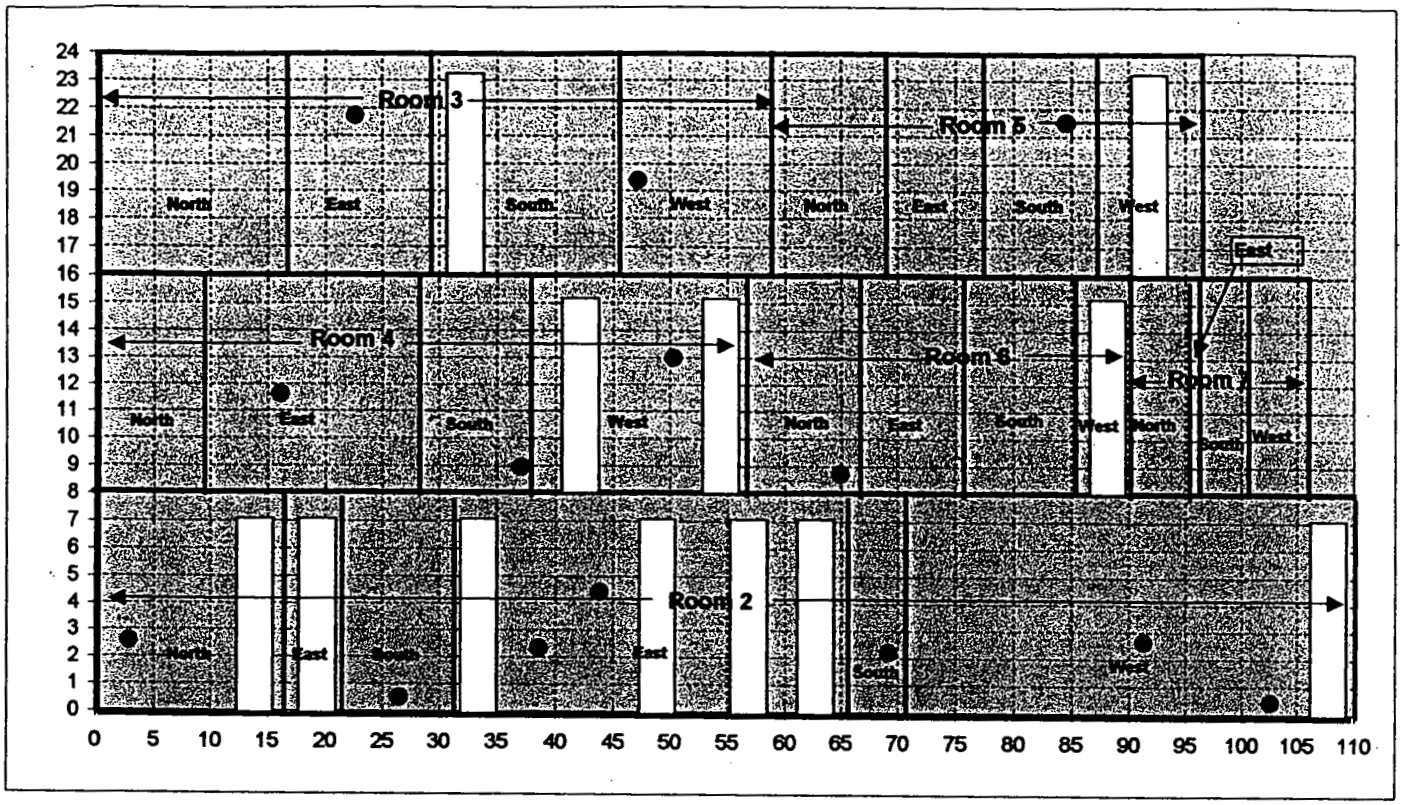
Building 22 Survey Unit 3



	Rooms 2, 3, 4, 5, 6, 7	
	Survey Unit 3	
	X (feet)	Y (feet)
	60.0	17.0
1	55.7	15.8
2	34.0	5.7
3	5.5	9.6
4	26.7	6.0
5	38.8	11.6
6	36.2	0.7
7	17.0	15.8
8	14.3	0.9
9	57.2	3.1
10	41.6	8.1
11	47.8	5.8
12	1.5	6.4
13	25.9	13.5
14	1.2	15.0

Area	L	L'
1020	9.172276	7.943191

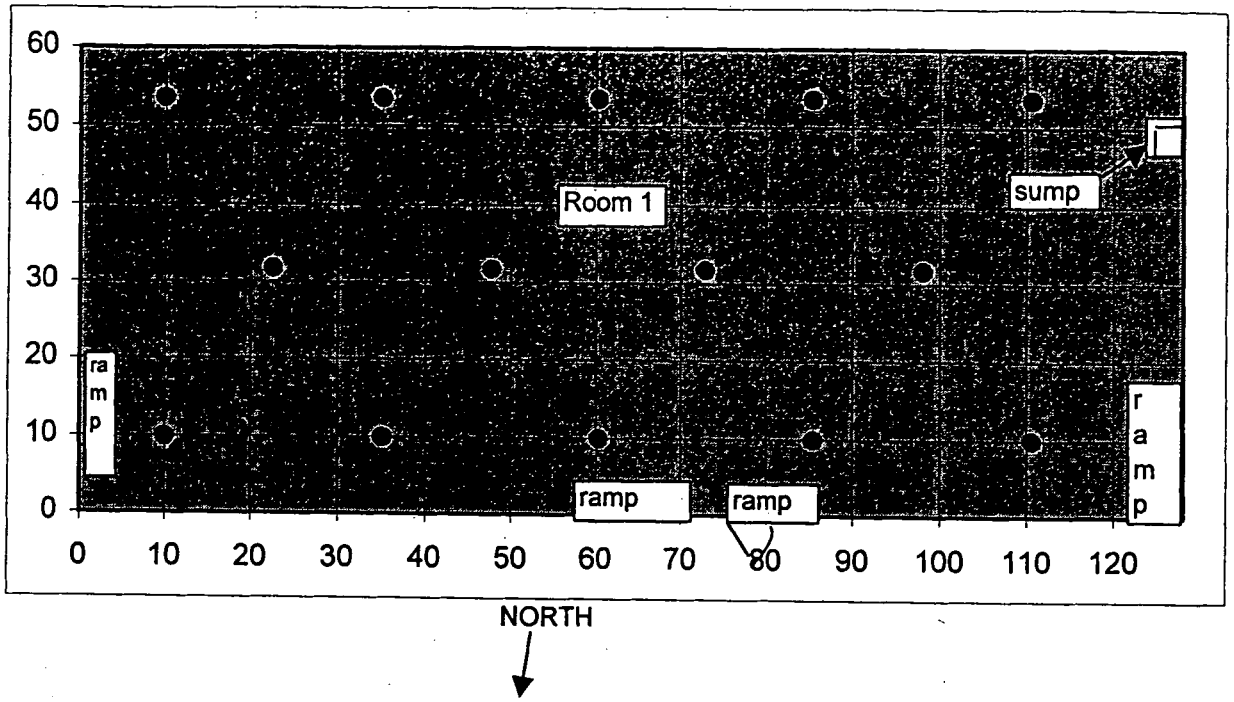
Building 22 Survey Unit 4



	Rm 2, 3, 4, 5, 6, 7 Survey Unit 4		
	X (feet)	Y (feet)	
	110	24	Room 2 Corridor
1	2.8	2.6	
2	26.5	0.5	
3	38.6	2.3	
4	43.9	4.4	
5	69.2	2.2	
6	91.3	2.6	
7	102.7	0.4	
8	16.2	3.6	Rooms 4 & 6
9	37.0	0.9	
10	50.3	5.0	
11	65.0	0.7	
12	22.7	5.7	Rooms 3 & 5
13	47.2	3.4	
14	84.6	5.5	

NOTE: Walls were plotted in the following order: North, East, South, West. The "L" shaped Corridor 2 was plotted in similar order going clockwise looking down, but following the "L" shape completely.

BUILDING 22 SURVEY UNIT 1

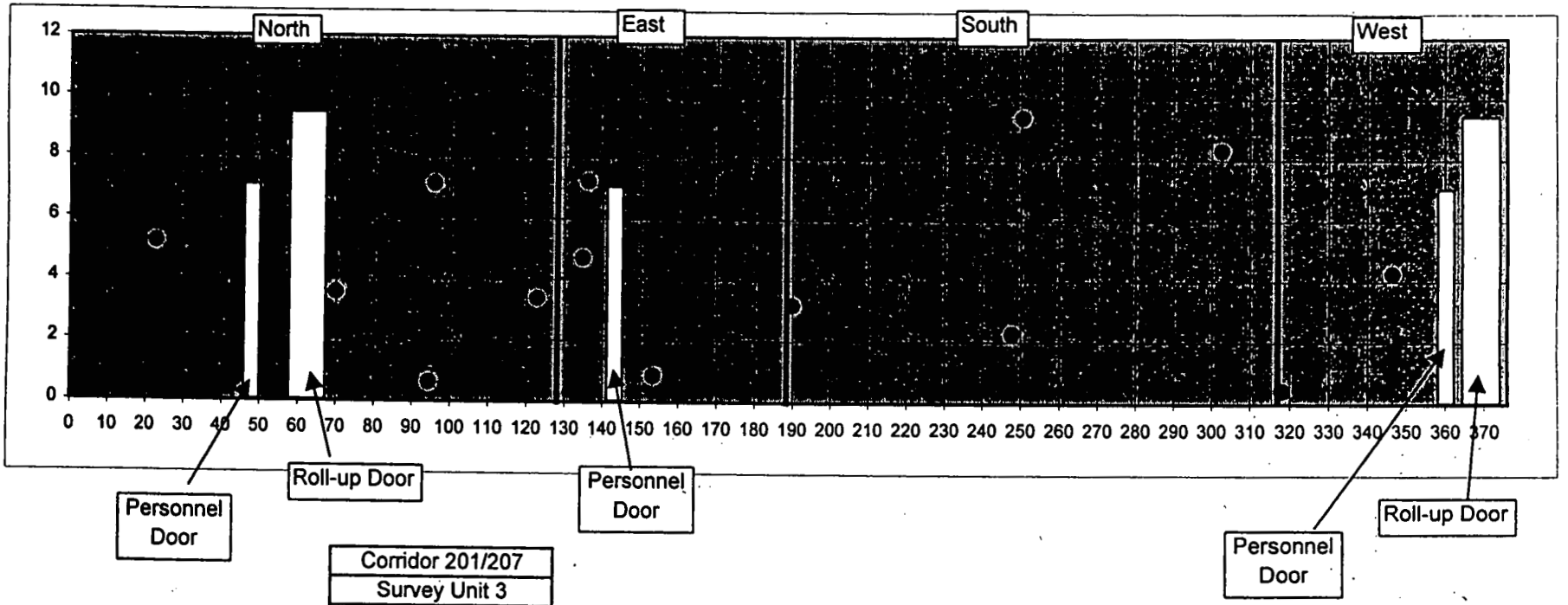


	Room 1	
	SU 1	
	X	Y
	128	60
1	10.0	10.0
2	35.2	10.0
3	60.3	10.0
4	85.5	10.0
5	110.7	10.0
6	22.6	31.8
7	47.8	31.8
8	72.9	31.8
9	98.1	31.8
10	110.7	53.6
11	10.0	53.6
12	35.2	53.6
13	60.3	53.6
14	85.5	53.6

Area	L	L'
7680	25.16852	21.79594

Start	X	Y
Rand X:Y	10	10

Building 22 Survey Unit 2

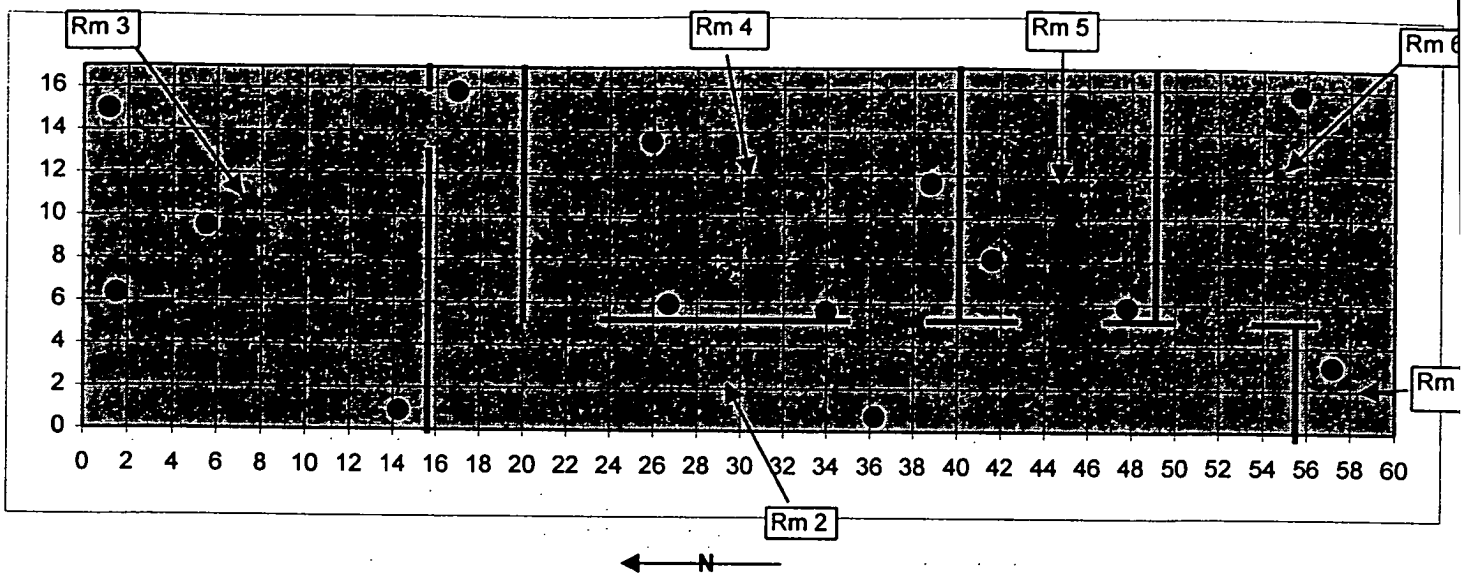


	Corridor 201/207	
	Survey Unit 3	
	X	Y
	376.0	12.0
1	22.7	5.2
2	250.5	9.4
3	189.9	3.2
4	153.5	0.9
5	247.8	2.3
6	136.1	7.2
7	94.5	0.6
8	70.0	3.6
9	134.8	4.7
10	122.8	3.4
11	346.4	4.3
12	302.7	8.3
13	318.1	0.4
14	95.8	7.1

Area	L	L'
4512	16.14026	13.97747

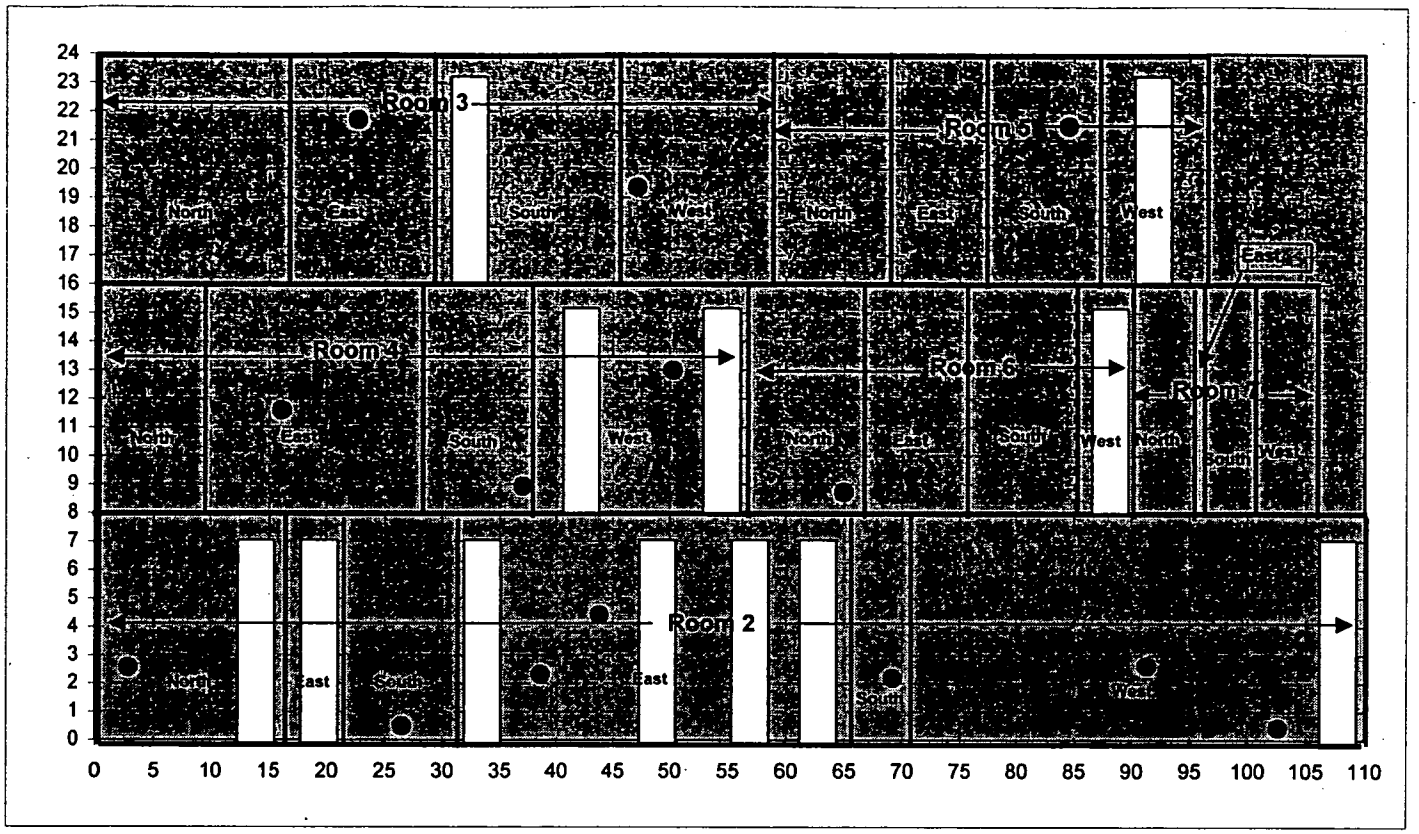
Not to scale

Building 22 Survey Unit 3



	Rooms 2, 3, 4, 5, 6, 7				
	Survey Unit 3				
	X (feet)	Y (feet)	Area	L	L'
	60.0	17.0	1020	9.172276	7.943191
1	55.7	15.8			
2	34.0	5.7			
3	5.5	9.6			
4	26.7	6.0			
5	38.8	11.6			
6	36.2	0.7			
7	17.0	15.8			
8	14.3	0.9			
9	57.2	3.1			
10	41.6	8.1			
11	47.8	5.8			
12	1.5	6.4			
13	25.9	13.5			
14	1.2	15.0			

Building 22 Survey Unit 4



	Rm 2, 3, 4, 5, 6, 7		
	Survey Unit 4		
	X (feet)	Y (feet)	
	110	24	Room 2 Corridor
1	2.8	2.6	
2	26.5	0.5	
3	38.6	2.3	
4	43.9	4.4	
5	69.2	2.2	
6	91.3	2.6	
7	102.7	0.4	
8	16.2	3.6	Rooms 4 & 6
9	37.0	0.9	
10	50.3	5.0	
11	65.0	0.7	
12	22.7	5.7	Rooms 3 & 5
13	47.2	3.4	
14	84.6	5.5	

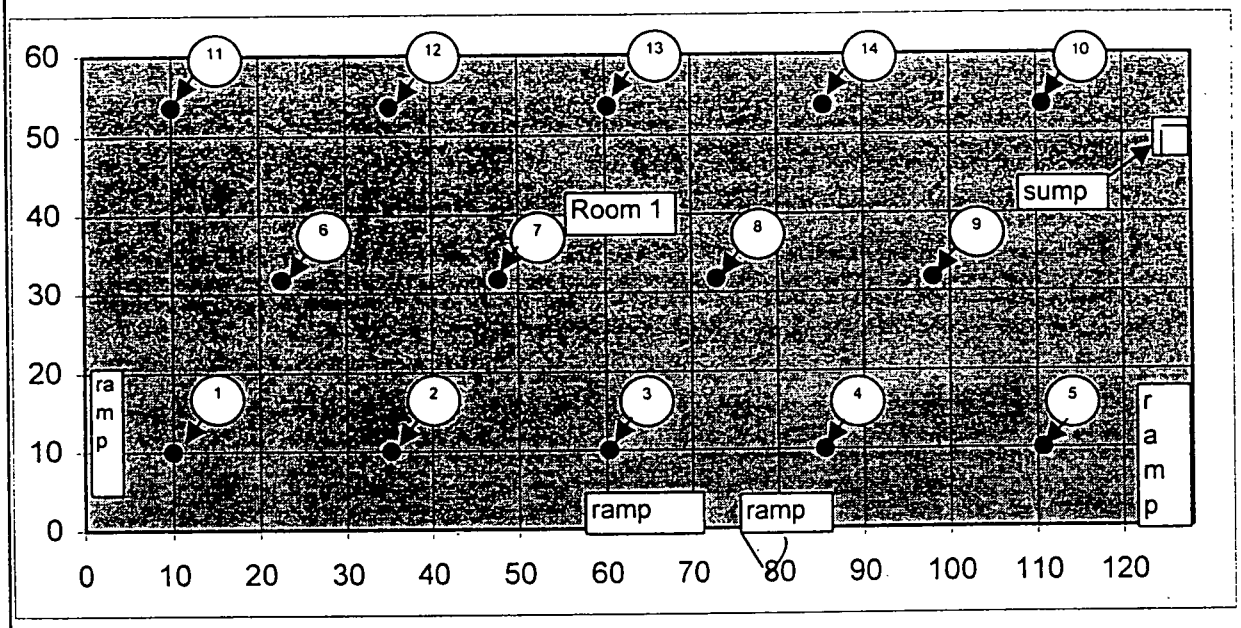
NOTE: Walls were plotted in the following order: North, East, South, West. The "L" shaped Corridor 2 was plotted in similar order going clockwise looking down, but following the "L" shape completely.

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Building 22/ Room 1	SURVEY NO. 04-TF-0221
PURPOSE: MARSSIM Survey Plan 22-1 Unit 1	RWP NO. N/A
	DATE: 7/20/04
	TIME: 16:00

MAP / DRAWING



Room 1
SU 1

	X	Y
1	10.0	10.0
2	35.2	10.0
3	60.3	10.0
4	85.5	10.0
5	110.7	10.0
6	22.6	31.8
7	47.8	31.8

Room 1
SU 1

	X	Y
8	72.9	31.8
9	98.1	31.8
10	110.7	53.6
11	10.0	53.6
12	35.2	53.6
13	60.3	53.6
14	85.5	53.6

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- —·—·—·· = radiological boundary

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5707-5718	8/19/04
2350	5855-5864	6/9/05

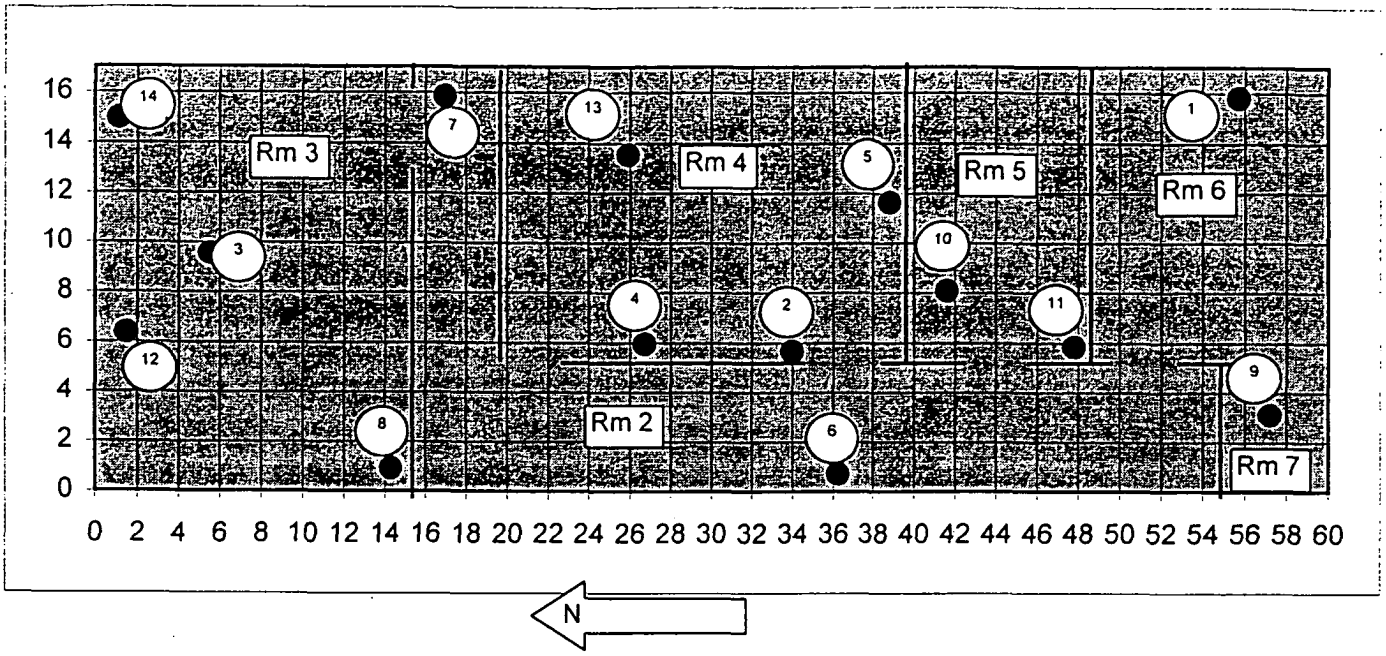
[redacted]

HP# 6178 7224	Date: 7-22-04
HP#	Date:
ATTACHED	
HP# 7707	Date: 7-29-04

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22/ Room's 2-7	04-TF-0221
PURPOSE: MARSSIM Survey Plan 22-1 Unit 3	RWP NO. N/A
	DATE: 7/20/04
	TIME: 16:00

MAP / DRAWING



Room 2-7 SU 3			Room 2-7 SU 3		
	X	Y		X	Y
1	55.7	15.8	8	14.3	0.9
2	34.0	5.7	9	57.2	3.1
3	5.5	9.6	10	41.6	8.1
4	26.7	6.0	11	47.8	5.8
5	38.8	11.6	12	1.5	6.4
6	36.2	0.7	13	25.9	13.5
7	17.0	15.8	14	1.2	15.0

Room 2-7 SU 4			Room 2-7 SU 4		
	X	Y		X	Y
1	2.8	2.6	8	16.2	3.6
2	26.5	0.5	9	37.0	0.9
3	38.6	2.3	10	50.3	5.0
4	43.9	4.4	11	65.0	0.7
5	69.2	2.2	12	22.7	5.7
6	91.3	2.6	13	47.2	3.4
7	102.7	0.4	14	84.6	5.5

Next Page

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · · = radiological boundary

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5707-5718	8/19/04
2350	5855-5864	6/9/05
	N/A	

Completed by: (Signature)	HP#	Date:
Completed by: (Printed Name)		
Counted by: (Signature)	HP#	Date:
Counted by: (Printed Name) SEE PAGE 1		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

Survey No. 04-TF-0221

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
1	see attached	see attached	see attached	unit 1-1
2				2
3				3
4				4
5				5
6				6
7				7
8				8
9				9
10				10
11				11
12				12
13				13
14				14
15				UNIT 3-1
16				2
17				3
18				4
19				5
20				6
21				7
22				8
23				9
24				10
25				11
26				12
27				13
28				14
NFE				

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
N/A				

COMMENTS: 2360 used to Field Check Smears

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

22 Building Characterization Survey Unit 1 and 3

RSDS# 04-TF-0221 RCT: AC RCT: DGH

Alpha	43-68 BKG:	0	EFF:	0.206	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.154	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5855	6178	5864	1		7/20/04	8:16	3	300	5
ALPHA	SRC CHECK	5855	6178	5864	1		7/20/04	8:22	1859	60	14324
ALPHA	SRC CHECK	5855	6178	5864	1		7/20/04	8:24	1958	60	15087
ALPHA	SRC CHECK	5855	6178	5864	1		7/20/04	8:25	2022	60	15580
ALPHA	SRC CHECK	5855	6178	5864	1		7/20/04	8:27	1936	60	14918
ALPHA	U-1 01	5855	6178	5864	1	1	7/20/04	9:38	1	120	4
ALPHA	U-1 02	5855	6178	5864	1	2	7/20/04	9:44	2	120	8
ALPHA	U-1 03	5855	6178	5864	1	3	7/20/04	9:49	4	120	15
ALPHA	U-1 04	5855	6178	5864	1	4	7/20/04	9:54	2	120	8
ALPHA	U-1 05	5855	6178	5864	1	5	7/20/04	9:59	5	120	19
ALPHA	U-1 06	5855	6178	5864	1	6	7/20/04	10:04	5	120	19
ALPHA	U-1 07	5855	6178	5864	1	7	7/20/04	10:08	1	120	4
ALPHA	U-1 08	5855	6178	5864	1	8	7/20/04	10:12	4	120	15
ALPHA	U-1 09	5855	6178	5864	1	9	7/20/04	10:17	0	120	0
ALPHA	U-1 10	5855	6178	5864	1	10	7/20/04	10:21	3	120	12
ALPHA	U-1 11	5855	6178	5864	1	11	7/20/04	10:26	0	120	0
ALPHA	U-1 12	5855	6178	5864	1	12	7/20/04	10:30	3	120	12
ALPHA	U-1 13	5855	6178	5864	1	13	7/20/04	10:34	3	120	12
ALPHA	U-1 14	5855	6178	5864	1	14	7/20/04	10:39	1	120	4
ALPHA	U-3 01	5855	6178	5864	1	15	7/20/04	12:28	2	120	8
ALPHA	U-3 02	5855	6178	5864	1	16	7/20/04	12:33	3	120	12
ALPHA	U-3 03	5855	6178	5864	1	17	7/20/04	12:38	3	120	12
ALPHA	U-3 04	5855	6178	5864	1	18	7/20/04	12:42	4	120	15
ALPHA	U-3 05	5855	6178	5864	1	19	7/20/04	12:46	3	120	12
ALPHA	U-3 06	5855	6178	5864	1	20	7/20/04	12:50	3	120	12
ALPHA	U-3 07	5855	6178	5864	1	21	7/20/04	12:55	2	120	8
ALPHA	U-3 08	5855	6178	5864	1	22	7/20/04	13:01	4	120	15
ALPHA	U-3 09	5855	6178	5864	1	23	7/20/04	13:06	3	120	12
ALPHA	U-3 10	5855	6178	5864	1	24	7/20/04	13:10	3	120	12
ALPHA	U-3 11	5855	6178	5864	1	25	7/20/04	13:14	1	120	4
ALPHA	U-3 12	5855	6178	5864	1	26	7/20/04	13:18	3	120	12
ALPHA	U-3 13	5855	6178	5864	1	27	7/20/04	13:23	7	120	27
ALPHA	U-3 14	5855	6178	5864	1	28	7/20/04	13:27	3	120	12
BETA	SRC BKG	5855	6178	5864	2		7/20/04	8:35	974	300	2008
BETA	SRC CHECK	5855	6178	5864	2		7/20/04	8:47	2717	60	28005
BETA	SRC CHECK	5855	6178	5864	2		7/20/04	8:48	2634	60	27149
BETA	SRC CHECK	5855	6178	5864	2		7/20/04	8:50	2681	60	27633
BETA	SRC CHECK	5855	6178	5864	2		7/20/04	8:53	2849	60	29365

22 Building Characterization Survey Unit 1 and 3

RSDS# 04-TF-0221 RCT: AK RCT: DGA

Alpha	43-68 BKG:	0	EFF:	0.206	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :	1
Beta	43-68 BKG:	0	EFF:	0.154	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :	2
Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # :	3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2	
BETA	U-1 01	5855	6178	5864	2	1	7/20/04	9:39	223	60	2298	
BETA	U-1 02	5855	6178	5864	2	2	7/20/04	9:45	278	60	2865	
BETA	U-1 03	5855	6178	5864	2	3	7/20/04	9:50	250	60	2577	
BETA	U-1 04	5855	6178	5864	2	4	7/20/04	9:55	256	60	2639	
BETA	U-1 05	5855	6178	5864	2	5	7/20/04	10:00	274	60	2824	
BETA	U-1 06	5855	6178	5864	2	6	7/20/04	10:05	262	60	2700	
BETA	U-1 07	5855	6178	5864	2	7	7/20/04	10:09	228	60	2350	
BETA	U-1 08	5855	6178	5864	2	8	7/20/04	10:13	256	60	2639	
BETA	U-1 09	5855	6178	5864	2	9	7/20/04	10:18	266	60	2742	
BETA	U-1 10	5855	6178	5864	2	10	7/20/04	10:22	259	60	2670	
BETA	U-1 11	5855	6178	5864	2	11	7/20/04	10:27	301	60	3102	
BETA	U-1 12	5855	6178	5864	2	12	7/20/04	10:31	274	60	2824	
BETA	U-1 13	5855	6178	5864	2	13	7/20/04	10:36	258	60	2659	
BETA	U-1 14	5855	6178	5864	2	14	7/20/04	10:40	262	60	2700	
BETA	U-3 01	5855	6178	5864	2	15	7/20/04	12:30	213	60	2195	
BETA	U-3 02	5855	6178	5864	2	16	7/20/04	12:34	216	60	2226	
BETA	U-3 03	5855	6178	5864	2	17	7/20/04	12:39	217	60	2237	
BETA	U-3 04	5855	6178	5864	2	18	7/20/04	12:43	227	60	2340	
BETA	U-3 05	5855	6178	5864	2	19	7/20/04	12:47	218	60	2247	
BETA	U-3 06	5855	6178	5864	2	20	7/20/04	12:51	218	60	2247	
BETA	U-3 07	5855	6178	5864	2	21	7/20/04	12:56	210	60	2165	
BETA	U-3 08	5855	6178	5864	2	22	7/20/04	13:03	200	60	2061	
BETA	U-3 09	5855	6178	5864	2	23	7/20/04	13:07	203	60	2092	
BETA	U-3 10	5855	6178	5864	2	24	7/20/04	13:11	210	60	2165	
BETA	U-3 11	5855	6178	5864	2	25	7/20/04	13:15	200	60	2061	
BETA	U-3 12	5855	6178	5864	2	26	7/20/04	13:20	208	60	2144	
BETA	U-3 13	5855	6178	5864	2	27	7/20/04	13:24	241	60	2484	
BETA	U-3 14	5855	6178	5864	2	28	7/20/04	13:28	214	60	2206	

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR009
Batch Ended: 7/20/04 14:34

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: RENFRO 04-TF-0221 [28] JC

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.00		0.00	1.25	
A2	2	3.70	2.95		4.43	2.94	
A3	3	1.50	1.96		0.00	1.70	
A4	4	0.00	2.03		6.05	3.14	
B1	5	0.00	2.01		0.40	2.33	
B2	6	0.00	2.05		3.81	2.63	
B3	7	0.00	1.81		0.00	1.21	
B4	8	0.00	1.87		0.00	1.60	
C1	9	0.00	2.13		6.41	3.50	
C2	10	0.00	2.08		3.02	2.77	
C3	11	1.45	1.95		0.00	1.69	
C4	12	1.49	1.90		0.00	1.65	
A1	13	1.64	2.00		0.00	1.25	
A2	14	0.00	2.09		2.32	2.40	
A3	15	0.00	1.97		1.35	2.08	
A4	16	0.00	2.00		2.50	2.37	
B1	17	0.00	2.00		0.00	2.02	
B2	18	0.00	2.00		0.00	1.17	
B3	19	0.00	1.81		0.00	1.21	
B4	20	0.00	1.92		3.69	2.78	
C1	21	0.00	2.08		1.47	2.47	
C2	22	1.25	2.05		0.00	1.75	
C3	23	1.45	1.96		1.02	2.07	
C4	24	1.48	1.94		3.70	2.86	
A1	25	0.00	2.02		1.55	2.16	
A2	26	0.00	2.06		0.00	1.20	
A3	27	7.30	3.90		0.75	2.08	
A4	28	0.00	1.99		1.32	2.05	

DJH DJH

35
G34 of 96

6 of 7

: 2.00
Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
ground Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
ion A:	0.5	- 18.6	0	0.0	7.82
ion B:	2.0	- 18.6	0	0.0	7.53
ion C:	40.0	- 2000	0	0.0	11.10

ch Indicator: tSIE/AEC
Ext Std Terminator: Count
F-0221 RENFRO (28) AG
inescence Correction On
ncidence Time(ns): 18
ay Before Burst(ns): Normal
tocol Data Filename: C:\DATA\PROT4.dat
nt Data Filename: C:\DATA\SDATA4.DAT
ctrum Data Drive & Path: C:\DATA

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2SIGMA	CPMC
-1	10.00	7.82	7.53	8	B	580.88		0.000	11.10
0	2.00	839.80	770.87	1		643.80	1483.11	106.397	0.00
1	2.00	2.22	1.24	5		521.88	4.36	9.498	0.90
2	2.00	0.18	0.05	6		565.48	0.35	8.302	0.00
3	2.00	0.00	0.00	20		516.04	0.00	0.000	2.40
4	2.00	0.00	0.00	13		579.78	0.00	0.000	0.00
5	2.00	0.25	0.00	6		463.96	0.52	9.245	2.33
6	2.00	0.00	0.00	7		551.70	0.00	0.000	3.40
7	2.00	0.00	0.00	20		466.22	0.00	0.000	0.00
8	2.00	0.00	0.00	8		572.26	0.00	0.000	1.90
9	2.00	1.62	1.25	5		380.70	3.84	11.186	4.40
10	2.00	0.00	0.00	6		409.21	0.00	0.000	0.00
11	2.00	0.00	0.00	14		311.18	0.00	0.000	0.90
12	2.00	1.13	0.96	15		427.64	2.49	11.065	0.00
13	2.00	0.00	0.00	14		384.81	0.00	0.000	0.00
14	2.00	3.18	3.13	5		363.48	7.83	12.393	0.40
15	2.00	3.68	2.52	4		573.88	6.90	9.623	1.40
16	2.00	0.00	0.00	14		449.69	0.00	0.000	0.00
17	2.00	0.00	0.00	14		546.62	0.00	0.000	0.84
18	2.00	0.00	0.00	0		383.60	0.00	0.000	0.00
19	2.00	0.44	0.00	6		475.36	0.91	9.196	0.00
20	2.00	0.32	0.61	6		587.42	0.59	8.204	0.00
21	2.00	0.00	0.00	14		499.96	0.00	0.000	0.00
22	2.00	0.00	0.00	11		477.67	0.00	0.000	0.00
23	2.00	0.00	0.00	10		442.46	0.00	0.000	0.00
24	2.00	0.18	0.47	6		536.39	0.35	8.518	0.00
25	2.00	0.00	0.00	0		440.08	0.00	0.000	0.00
26	2.00	1.68	1.20	5		522.82	3.30	9.268	0.50
27	2.00	0.57	0.01	6		542.44	1.09	8.639	1.49
28	2.00	0.00	0.00	8		594.76	0.00	0.000	0.00

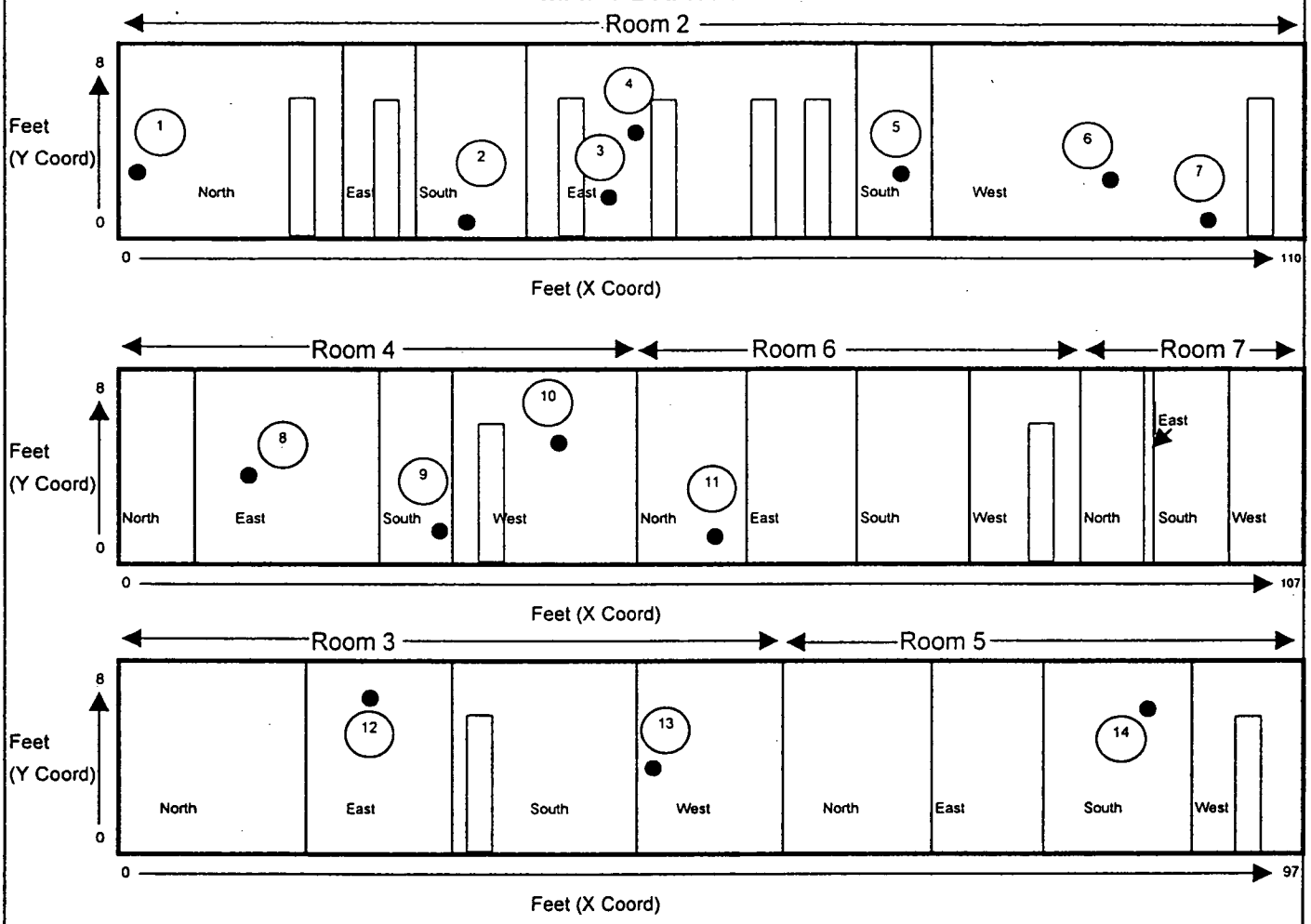
DGH

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22/ Room's 2-7	04-Tf-0225
PURPOSE:	RWP NO.
MARSSIM Survey Plan 22-1 Unit 4	N/A
	DATE: 7/21/04
	TIME: 16:00

MAP / DRAWING



LEGEND:

- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · — = radiological boundary
- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5707-5718	8/19/04
2350	5585-5864	6/9/05
	N	
	A	

[redacted]

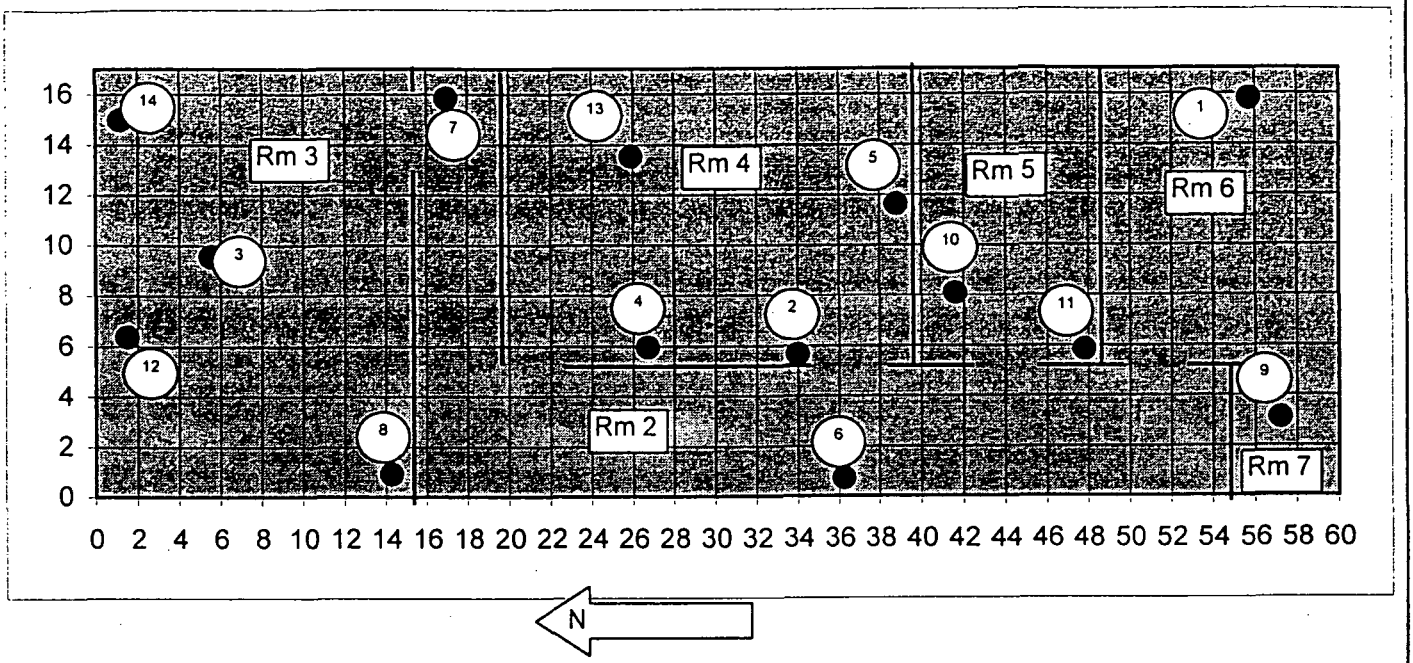
HP#	Date:
6178	7-22-04
[redacted]	
HP#	Date:
CHED	
HP#	Date:
7707	7-23-04
[redacted]	

G37 of 76

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Building 22/ Room's 2-7	SURVEY NO. 04-TF-0225
PURPOSE: MARSSIM Survey Plan 22-1 Unit 6 (Ceiling)	RWP NO. N/A
	DATE: 7/21/04
	TIME: 16:00

MAP / DRAWING



Room 2-7 SU 6			Room 2-7 SU 6		
	X	Y		X	Y
1	55.7	15.8	8	14.3	0.9
2	34.0	5.7	9	57.2	3.1
3	5.5	9.6	10	41.6	8.1
4	26.7	6.0	11	47.8	5.8
5	38.8	11.6	12	1.5	6.4
6	36.2	0.7	13	25.9	13.5
7	17.0	15.8	14	1.2	15.0

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · — = radiological boundary

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5707-5718	8/19/04
2350	5855-5864	6/9/05
	N	
	A	

Completed by: (Signature)	HP#	Date:
Completed by: (Printed Name)		
Counted by: (Signature) SEE	HP#	Date:
Counted by: (Printed Name) PAGE 1		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

Survey No.
04-TF-0225

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See attached		N/a	unit 4
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				unit 6
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
		N		
		A		

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
		N	A	

COMMENTS:
Used 2360 to field check smears prior to sending them to count lab

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

22-Building Characterization Survey Unit 4 and 6

RSDS# 04-TF-0225 RCT: NJH RCT: N/A

Alpha	43-68 BKG:	0	EFF:	0.2	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector #: 1
Beta	43-68 BKG:	0	EFF:	0.2	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector #: 2
Scan	43-37 BKG:	0	EFF:	0.2	PROBE AREA:	584	cm²	Surface Eff:		0.5	Detector #: 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5855	6178	5864	1		7/21/04	8:12	11	300	17
ALPHA	SRC CHECK	5855	6178	5864	1		7/21/04	8:18	1852	60	14698
ALPHA	SRC CHECK	5855	6178	5864	1		7/21/04	8:19	2032	60	16127
ALPHA	SRC CHECK	5855	6178	5864	1		7/21/04	8:21	2026	60	16079
ALPHA	SRC CHECK	5855	6178	5864	1		7/21/04	8:22	1990	60	15794
ALPHA	U-4 01	5855	6178	5864	1	1	7/21/04	9:12	4	120	16
ALPHA	U-4 02	5855	6178	5864	1	12	7/21/04	9:16	4	120	16
ALPHA	U-4 03	5855	6178	5864	1	14	7/21/04	9:20	4	120	16
ALPHA	U-4 04	5855	6178	5864	1	16	7/21/04	9:24	3	120	12
ALPHA	U-4 05	5855	6178	5864	1	18	7/21/04	9:44	1	120	4
ALPHA	U-4 06	5855	6178	5864	1	20	7/21/04	9:48	3	120	12
ALPHA	U-4 07	5855	6178	5864	1	22	7/21/04	9:52	4	120	16
ALPHA	U-4 08	5855	6178	5864	1	24	7/21/04	9:56	3	120	12
ALPHA	U-4 09	5855	6178	5864	1	26	7/21/04	10:02	1	120	4
ALPHA	U-4 10	5855	6178	5864	1	28	7/21/04	10:06	3	120	12
ALPHA	U-4 11	5855	6178	5864	1	30	7/21/04	10:11	1	120	4
ALPHA	U-4 12	5855	6178	5864	1	32	7/21/04	10:18	6	120	24
ALPHA	U-4 13	5855	6178	5864	1	34	7/21/04	10:22	5	120	20
ALPHA	U-4 14	5855	6178	5864	1	36	7/21/04	10:27	4	120	16
ALPHA	U-6 01	5855	6178	5864	1	38	7/21/04	12:11	3	120	12
ALPHA	U-6 02	5855	6178	5864	1	40	7/21/04	12:15	6	120	24
ALPHA	U-6 03	5855	6178	5864	1	42	7/21/04	12:19	7	120	28
ALPHA	U-6 04	5855	6178	5864	1	44	7/21/04	12:23	5	120	20
ALPHA	U-6 05	5855	6178	5864	1	46	7/21/04	12:27	8	120	32
ALPHA	U-6 06	5855	6178	5864	1	48	7/21/04	12:31	3	120	12
ALPHA	U-6 07	5855	6178	5864	1	50	7/21/04	12:35	7	120	28
ALPHA	U-6 08	5855	6178	5864	1	52	7/21/04	12:39	2	120	8
ALPHA	U-6 09	5855	6178	5864	1	54	7/21/04	12:43	0	120	0
ALPHA	U-6 10	5855	6178	5864	1	56	7/21/04	12:47	1	120	4
ALPHA	U-6 11	5855	6178	5864	1	58	7/21/04	12:51	8	120	32
ALPHA	U-6 12	5855	6178	5864	1	60	7/21/04	12:55	6	120	24
ALPHA	U-6 13	5855	6178	5864	1	62	7/21/04	12:59	5	120	20
ALPHA	U-6 14	5855	6178	5864	1	64	7/21/04	13:04	8	120	32
BETA	SRC BKG	5855	6178	5864	2	0	7/21/04	7:57	913	300	1449
BETA	SRC CHECK	5855	6178	5864	2	1	7/21/04	8:02	2633	60	20897
BETA	SRC CHECK	5855	6178	5864	2	2	7/21/04	8:03	2645	60	20992
BETA	SRC CHECK	5855	6178	5864	2	3	7/21/04	8:05	2514	60	19952
BETA	SRC CHECK	5855	6178	5864	2	4	7/21/04	8:06	2839	60	22532
BETA	U-4 01	5855	6178	5864	2	11	7/21/04	9:13	128	60	1016
BETA	U-4 02	5855	6178	5864	2	13	7/21/04	9:17	142	60	1127

22-Building Characterization Survey Unit 4 and 6

RSDS# 04-TF-0225 RCT: DJH RCT: N/A

Alpha	43-68 BKG:	0	EFF:	0.2	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.2	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.2	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
BETA	U-4 03	5855	6178	5864	2	15	7/21/04	9:21	155	60	1230
BETA	U-4 04	5855	6178	5864	2	17	7/21/04	9:25	152	60	1206
BETA	U-4 05	5855	6178	5864	2	19	7/21/04	9:45	137	60	1087
BETA	U-4 06	5855	6178	5864	2	21	7/21/04	9:49	132	60	1048
BETA	U-4 07	5855	6178	5864	2	23	7/21/04	9:53	159	60	1262
BETA	U-4 08	5855	6178	5864	2	25	7/21/04	9:59	138	60	1095
BETA	U-4 09	5855	6178	5864	2	27	7/21/04	10:03	178	60	1413
BETA	U-4 10	5855	6178	5864	2	29	7/21/04	10:08	156	60	1238
BETA	U-4 11	5855	6178	5864	2	31	7/21/04	10:12	145	60	1151
BETA	U-4 12	5855	6178	5864	2	33	7/21/04	10:20	142	60	1127
BETA	U-4 13	5855	6178	5864	2	35	7/21/04	10:24	156	60	1238
BETA	U-4 14	5855	6178	5864	2	37	7/21/04	10:28	148	60	1175
BETA	U-6 01	5855	6178	5864	2	39	7/21/04	12:12	232	60	1841
BETA	U-6 02	5855	6178	5864	2	41	7/21/04	12:16	346	60	2746
BETA	U-6 03	5855	6178	5864	2	43	7/21/04	12:20	316	60	2508
BETA	U-6 04	5855	6178	5864	2	45	7/21/04	12:24	340	60	2698
BETA	U-6 05	5855	6178	5864	2	47	7/21/04	12:28	357	60	2833
BETA	U-6 06	5855	6178	5864	2	49	7/21/04	12:32	352	60	2794
BETA	U-6 07	5855	6178	5864	2	51	7/21/04	12:36	316	60	2508
BETA	U-6 08	5855	6178	5864	2	53	7/21/04	12:40	318	60	2524
BETA	U-6 09	5855	6178	5864	2	55	7/21/04	12:44	199	60	1579
BETA	U-6 10	5855	6178	5864	2	57	7/21/04	12:48	339	60	2690
BETA	U-6 11	5855	6178	5864	2	59	7/21/04	12:52	335	60	2659
BETA	U-6 12	5855	6178	5864	2	61	7/21/04	12:57	324	60	2571
BETA	U-6 13	5855	6178	5864	2	63	7/21/04	13:01	346	60	2746
BETA	U-6 14	5855	6178	5864	2	65	7/21/04	13:05	327	60	2595

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR014
Batch Ended: 7/21/04 15:30

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: RENFRO 04-TF-0225 [28] JC

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.01		0.30	1.76	
A2	2	0.00	2.06		0.00	1.20	
A3	3	0.00	1.96		0.15	1.70	
A4	4	0.00	1.99		1.32	2.05	
B1	5	0.00	1.97		0.00	1.17	
B2	6	0.00	2.00		0.00	1.17	
B3	7	0.00	1.85		2.09	2.41	
B4	8	0.00	1.86		0.00	1.14	
C1	9	1.70	2.09		2.55	2.76	
C2	10	0.00	2.08		3.02	2.77	
C3	11	0.00	1.96		1.16	2.07	
C4	12	1.49	1.93		2.54	2.61	
D1	13	0.00	2.15		2.25	2.45	
D2	14	0.00	2.42		0.40	1.70	
D3	15	0.00	1.91		0.00	1.18	
D4	16	0.00	2.05		0.00	1.12	
A1	17	0.00	2.02		1.55	2.16	
A2	18	0.00	2.08		1.12	2.08	
A3	19	0.00	2.00		4.95	2.95	
A4	20	0.00	2.01		3.69	2.65	
B1	21	0.00	2.05		3.89	3.08	
B2	22	0.00	2.01		0.29	1.66	
B3	23	0.00	1.83		0.00	1.70	
B4	24	0.00	1.90		1.42	2.27	
C1	25	0.00	2.07		0.23	2.14	
C2	26	0.00	2.07		1.78	2.48	
C3	27	0.00	1.98		3.56	2.68	
C4	28	1.49	1.93		2.54	2.61	

DGH DGH

6 of 7
~~Page 1 of 1~~
DGH 7-22-04

J. Collins

21 Jul 2004 16:25 TRI-CARB - 1.09
Protocol #: 5 PW H3 #407906 User : 2138

DJH 7-22-04

Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	9.24
Region B:	2.0 -	18.6	0	0.0	8.14
Region C:	40.0 -	2000	0	0.0	10.81

Quench ~~Indicator: tSIE/AEC~~
Ext Std Terminator: Count
04-TF-0225 RENFRO (28) AG
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT5.dat
Count Data Filename: C:\DATA\SDATA5.DAT
Spectrum Data Drive & Path: C:\DATA

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2SIGMA	CPMC
-1	10.00	9.24	8.14	2	B	585.10		0.000	10.81
0	2.00	828.34	756.23	0		622.68	1525.18	109.522	1.69
1	2.00	1.62	2.43	0		604.73	3.02	9.422	0.00
2	2.00	0.00	0.36	0		572.36	0.00	0.000	0.00
3	2.00	0.00	0.00	0		587.20	0.00	0.000	1.69
4	2.00	0.00	0.00	0		596.02	0.00	0.000	0.00
5	2.00	0.00	0.00	0		517.30	0.00	0.000	0.00
6	2.00	0.00	0.00	0		596.76	0.00	0.000	0.00
7	2.00	0.00	0.00	0		569.13	0.00	0.000	1.69
8	2.00	0.00	0.00	0		604.63	0.00	0.000	0.00
9	2.00	0.00	0.00	0		592.55	0.00	0.000	0.00
10	2.00	0.00	0.13	0		613.11	0.00	0.000	0.00
11	2.00	1.26	1.06	0		614.19	2.34	9.215	0.00
12	2.00	0.00	0.52	0		607.60	0.00	0.000	0.00
13	2.00	0.00	0.00	0		616.67	0.00	0.000	0.10
14	2.00	1.26	2.01	0		639.41	2.29	9.042	0.00
15	2.00	0.00	0.00	0		621.35	0.00	0.000	0.00
16	2.00	0.00	0.24	0		605.96	0.00	0.000	0.00
17	2.00	0.00	0.00	0		563.17	0.00	0.000	0.00
18	2.00	0.00	0.00	0		574.38	0.00	0.000	0.00
19	2.00	0.00	0.00	0		528.36	0.00	0.000	1.19
20	2.00	0.00	0.00	0		622.54	0.00	0.000	0.00
21	2.00	0.00	0.00	0		626.61	0.00	0.000	1.69
22	2.00	0.00	0.00	0		541.25	0.00	0.000	0.00
23	2.00	0.00	0.36	0		563.82	0.00	0.000	0.00
24	2.00	0.00	0.00	0		577.57	0.00	0.000	0.00
25	2.00	0.00	0.00	0		591.23	0.00	0.000	0.00
26	2.00	0.00	0.00	0		519.98	0.00	0.000	0.00
27	2.00	0.00	0.00	0		620.14	0.00	0.000	0.00
28	2.00	0.00	0.00	0		585.79	0.00	0.000	0.00

DJH

J. Collins

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
22	04-TF-0226
PURPOSE:	RWP NO.
	N/A
MARSSIM Survey plan 22-01 Unit 1 and 3 Floor Sacn	DATE: 7/21/04
	TIME: 16:00

MAP / DRAWING

See attached

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · · = radiological boundary

(#) - mrem/hr neutron

(#) - swipe number

[#] [redacted] (#) or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5857/5675	9/9/04
2350	5855/5850	6/9/05
	N	
	A	

[redacted]	# 6178 1244/1224	Date: 7-28-04
[redacted]		
Counted by: (Printed Name) N	A	
Review [redacted]	HP# 7707	Date: 7-28-04
Review [redacted]		

ML-9620 (2-98)

22 Building Characterization Survey Unit 1 Floor Scan

RSDS# 04-TF-0226 RCT: VE RCT: DJH

Alpha	43-68 BKG:	0	EFF:	0.229	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.186	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.194	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
SCAN	SRC BKG	5857	7224	5675	3		7/21/04	8:04	24	300	8
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:07	1773	60	3130
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:09	1865	60	3292
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:10	1994	60	3520
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:12	1684	60	2973
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:14	1720	60	3036
SCAN	SRC CHECK	5857	7224	5675	3		7/21/04	8:15	1634	60	2884
SCAN	U-1 01	5857	7224	5675	3	1	7/21/04	13:07	1	30	4
SCAN	U-1 02	5857	7224	5675	3	2	7/21/04	14:25	1	30	4
SCAN	U-1 03	5857	7224	5675	3	3	7/21/04	14:29	0	30	0
SCAN	U-1 04	5857	7224	5675	3	4	7/21/04	14:36	3	30	11
SCAN	U-1 05	5857	7224	5675	3	5	7/21/04	14:50	1	30	4

Scanned for alpha only - RMC

22-Building Characterization Survey Unit 1 Floor Scan

RSDS# 04-TF-0226 RCT: AE RCT: DJH

Alpha	43-68 BKG:	0	EFF:	0.2297	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.1863	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.1948	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
SCAN	SRC BKG	5857	6178	5675	3		7/26/04	9:25	15	300	5
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:28	1883	60	3310
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:30	1958	60	3442
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:32	1988	60	3495
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:33	1903	60	3346
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:35	1843	60	3240
SCAN	SRC CHECK	5857	6178	5675	3		7/26/04	9:36	1885	60	3314
SCAN	U-1 06	5857	6178	5675	3	1	7/26/04	9:54	1	30	4
SCAN	U-1 07	5857	6178	5675	3	2	7/26/04	9:57	2	30	7
SCAN	U-1 08	5857	6178	5675	3	3	7/26/04	9:59	2	30	7
SCAN	U-1 09	5857	6178	5675	3	4	7/26/04	10:21	2	30	7
SCAN	U-1 10	5857	6178	5675	3	5	7/26/04	12:56	4	30	14
SCAN	U-1 11	5857	6178	5675	3	6	7/26/04	13:13	0	30	0
SCAN	U-1 12	5857	6178	5675	3	7	7/26/04	13:25	1	30	4

Scanned for alpha only - AMC

22-Building Characterization Survey Unit Unit 1 and 3

RSDS# 04-TF-0226 RCT: M.C RCT: DJH

Alpha	43-68 BKG:	0	EFF:	0.206	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.154	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
SCAN	SRC BKG	5855	7244	5850	3		7/26/04	9:40	34	300	11
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:43	2075	60	3230
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:48	2251	60	3504
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:50	2300	60	3580
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:51	2152	60	3350
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:53	2213	60	3445
SCAN	SRC CHECK	5855	7244	5850	3		7/26/04	9:55	2084	60	3244
SCAN	U-3 01	5855	7244	5850	3	1	7/26/04	10:15	3	30	9
SCAN	U-3 02	5855	7244	5850	3	2	7/26/04	10:24	9	30	28
SCAN	U-3 03	5855	7244	5850	3	3	7/26/04	10:26	6	30	19
SCAN	U-3 04	5855	7244	5850	3	4	7/26/04	10:29	11	30	34
SCAN	U-3 05	5855	7244	5850	3	5	7/26/04	10:36	6	30	19
SCAN	U-3 06	5855	7244	5850	3	6	7/26/04	10:42	7	30	22
SCAN	U-1 013	5855	7244	5850	3	7	7/26/04	12:40	3	30	9
SCAN	U-1 014	5855	7244	5850	3	8	7/26/04	12:43	6	30	19
SCAN	U-1 015	5855	7244	5850	3	9	7/26/04	12:45	9	30	28
SCAN	U-1 016	5855	7244	5850	3	10	7/26/04	12:55	9	30	28
SCAN	U-1 017	5855	7244	5850	3	11	7/26/04	13:05	4	30	12
SCAN	U-1 018	5855	7244	5850	3	12	7/26/04	13:07	9	30	28
SCAN	U-1 019	5855	7244	5850	3	13	7/26/04	13:12	9	30	28
SCAN	U-1 020	5855	7244	5850	3	14	7/26/04	13:21	4	30	12
SCAN	U-1 021	5855	7244	5850	3	15	7/26/04	13:26	12	30	37
SCAN	U-1 022	5855	7244	5850	3	16	7/26/04	13:29	8	30	25
SCAN	U-1 023	5855	7244	5850	3	17	7/26/04	13:37	7	30	22

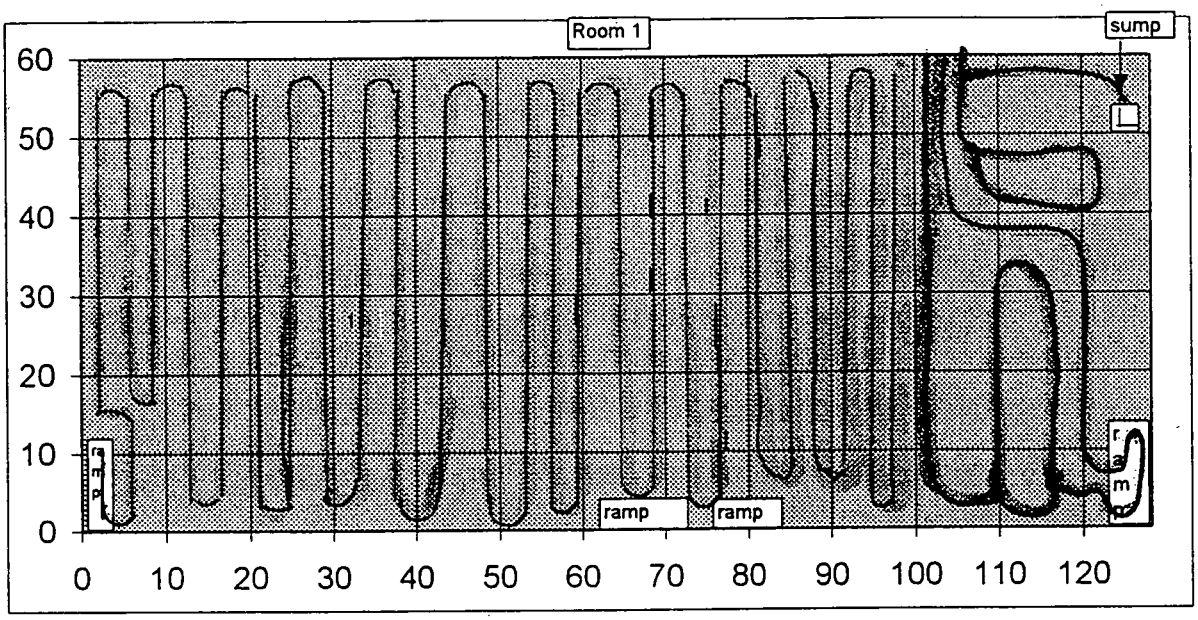
Scanned for alpha only - RMC

RSDS#: ~~04-R~~ 04-TF-0226

PAGE 5 of 6

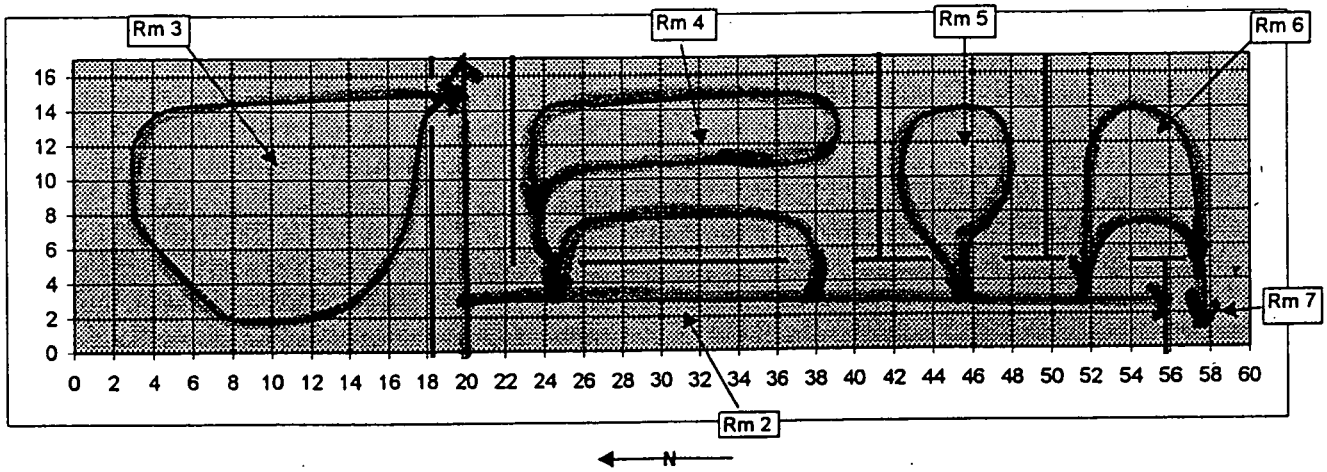
DQH

BUILDING 22 SURVEY UNIT 1 (Floor)



3

Building 22 Survey Unit 3 (Floors)



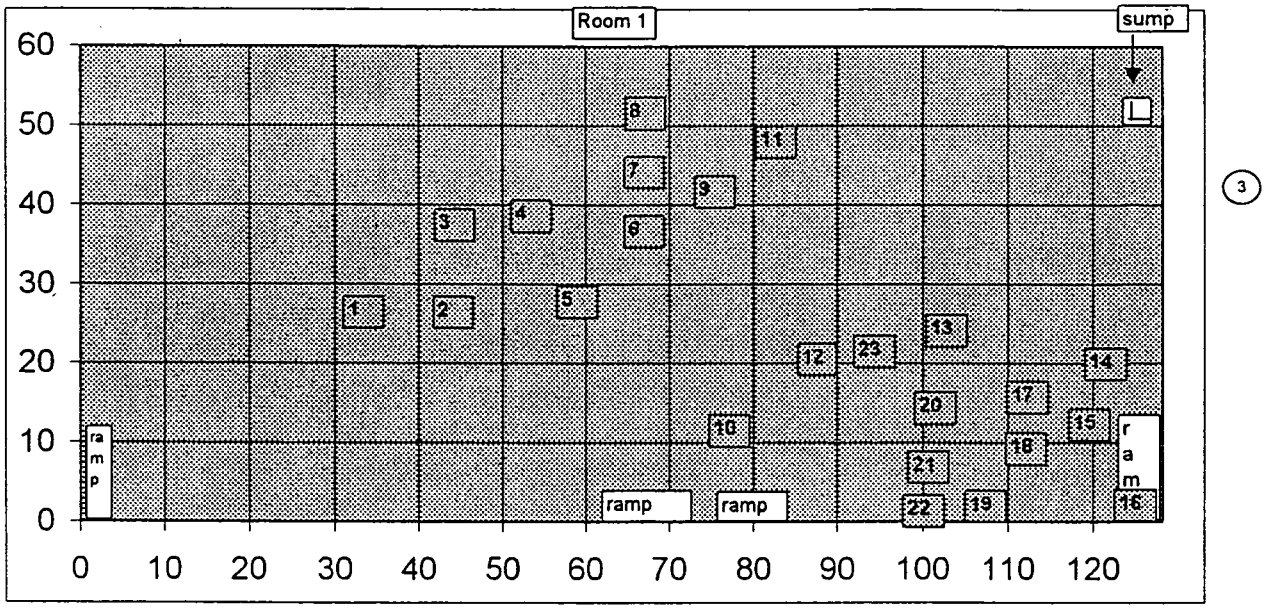
[redacted] = Route scanned

RSDS#: 04-TF-0226

PAGE 6 of 6

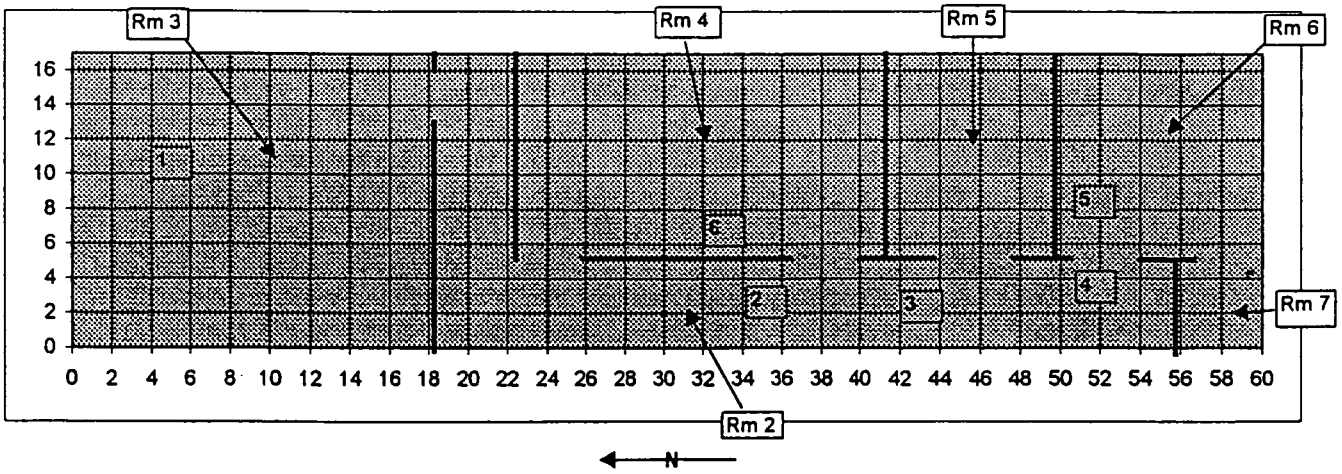
Dgt

BUILDING 22 SURVEY UNIT 1 (Floor)



3

Building 22 Survey Unit 3 (Floors)



RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22 Building	SURVEY NO. C4-TF-0233
PURPOSE: Building 22 Unit 8 outside Survey	RWP NO. N/A
	DATE: 7.28.04
	TIME: 13:00

MAP / DRAWING

see attached for location/ identification of smears

Background 1α 170B

LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
—·—·· = radiological boundary
(#) = mrem/hr neutron
(#) = swipe number
[#] = air sample number
(#/α) or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5707-5718	8.19.04
~~NFE~~		

[redacted]

# 7224 7244	Date: 7.29.04
HP#	Date:
HP# 7707	Date: 7-29-04

Survey No. 04-TF-0233

RADIOLOGICAL SURVEY DATA SHEET

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See attached	See attached	See attached	Front of Build
2	↓	↓	↓	↓
3				
4				
5				↓
6				Side
7				↓
8				Back of Build
9				↓
10				
11				
12				↓
13				Dock Side of Build
14	↓	↓	↓	↓
NFE				

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
N/A				

COMMENTS: 2360 - used to field check smears

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

ML-9620A (4-98)

G-51 of 96

22 Building Characterization Survey Unit 8

RSDS# 04-Tf-0233 RCT: J.M.C RCT: SR

Alpha	43-68 BKG:	0	EFF:	0.206	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector #: 1
Beta	43-68 BKG:	0	EFF:	0.154	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector #: 2
Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm²	Surface Eff:		0.5	Detector #: 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5855	7244	5864	1		7/28/04	8:27	5	300	8
ALPHA	SRC CHECK	5855	7244	5864	1		7/28/04	8:29	1861	60	14340
ALPHA	SRC CHECK	5855	7244	5864	1		7/28/04	8:31	2004	60	15442
ALPHA	SRC CHECK	5855	7244	5864	1		7/28/04	8:32	1992	60	15349
ALPHA	SRC CHECK	5855	7244	5864	1		7/28/04	8:33	2050	60	15796
ALPHA	U-8 01	5855	7244	5864	1	1	7/28/04	9:09	7	120	27
ALPHA	U-8 02	5855	7244	5864	1	2	7/28/04	9:15	5	120	19
ALPHA	U-8 03	5855	7244	5864	1	3	7/28/04	9:20	11	120	42
ALPHA	U-8 04	5855	7244	5864	1	4	7/28/04	9:26	7	120	27
ALPHA	U-8 05	5855	7244	5864	1	5	7/28/04	9:30	7	120	27
ALPHA	U-8 06	5855	7244	5864	1	6	7/28/04	9:35	7	120	27
ALPHA	U-8 07	5855	7244	5864	1	7	7/28/04	9:39	16	120	62
ALPHA	U-8 08	5855	7244	5864	1	8	7/28/04	9:45	7	120	27
ALPHA	U-8 09	5855	7244	5864	1	9	7/28/04	9:49	16	120	62
ALPHA	U-8 10	5855	7244	5864	1	10	7/28/04	9:53	11	120	42
ALPHA	U-8 11	5855	7244	5864	1	11	7/28/04	9:58	5	120	19
ALPHA	U-8 12	5855	7244	5864	1	12	7/28/04	10:03	6	120	23
ALPHA	U-8 13	5855	7244	5864	1	13	7/28/04	10:08	6	120	23
ALPHA	U-8 14	5855	7244	5864	1	14	7/28/04	10:13	11	120	42
BETA	SRC BKG	5855	7244	5864	2		7/28/04	8:39	907	300	1870
BETA	SRC CHECK	5855	7244	5864	2		7/28/04	8:42	2677	60	27592
BETA	SRC CHECK	5855	7244	5864	2		7/28/04	8:43	2664	60	27458
BETA	SRC CHECK	5855	7244	5864	2		7/28/04	8:45	2962	60	30530
BETA	SRC CHECK	5855	7244	5864	2		7/28/04	8:47	2860	60	29478
BETA	U-8 01	5855	7244	5864	2	1	7/28/04	9:10	132	60	1361
BETA	U-8 02	5855	7244	5864	2	2	7/28/04	9:16	149	60	1536
BETA	U-8 03	5855	7244	5864	2	3	7/28/04	9:22	142	60	1464
BETA	U-8 04	5855	7244	5864	2	4	7/28/04	9:27	142	60	1464
BETA	U-8 05	5855	7244	5864	2	5	7/28/04	9:32	124	60	1278
BETA	U-8 06	5855	7244	5864	2	6	7/28/04	9:36	152	60	1567
BETA	U-8 07	5855	7244	5864	2	7	7/28/04	9:40	160	60	1649
BETA	U-8 08	5855	7244	5864	2	8	7/28/04	9:46	139	60	1433
BETA	U-8 09	5855	7244	5864	2	9	7/28/04	9:50	121	60	1247
BETA	U-8 10	5855	7244	5864	2	10	7/28/04	9:55	147	60	1515
BETA	U-8 11	5855	7244	5864	2	11	7/28/04	10:00	131	60	1350
BETA	U-8 12	5855	7244	5864	2	12	7/28/04	10:04	136	60	1402
BETA	U-8 13	5855	7244	5864	2	13	7/28/04	10:09	130	60	1340
BETA	U-8 14	5855	7244	5864	2	14	7/28/04	10:14	147	60	1515

G-51A of 96

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR005
Batch Ended: 7/28/04 14:00

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: COLLINS 04-TF-0233 [14] JC

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.03		2.79	2.49	
A2	2	1.66	2.07		0.00	1.70	
A3	3	0.00	1.95		0.00	1.20	
A4	4	0.00	1.98		0.14	1.67	
B1	5	0.00	1.97		0.00	1.17	
B2	6	0.00	2.03		2.63	2.35	
B3	7	0.00	1.81		0.00	1.21	
B4	8	0.00	1.89		0.29	1.96	
C1	9	0.00	2.08		1.47	2.47	
C2	10	0.00	2.05		0.00	1.75	
C3	11	0.00	1.97		2.36	2.40	
C4	12	0.00	1.93		2.67	2.61	
D1	13	0.00	2.15		2.25	2.45	
D2	14	0.00	2.51		4.00	2.69	

SR SR

52 of 96

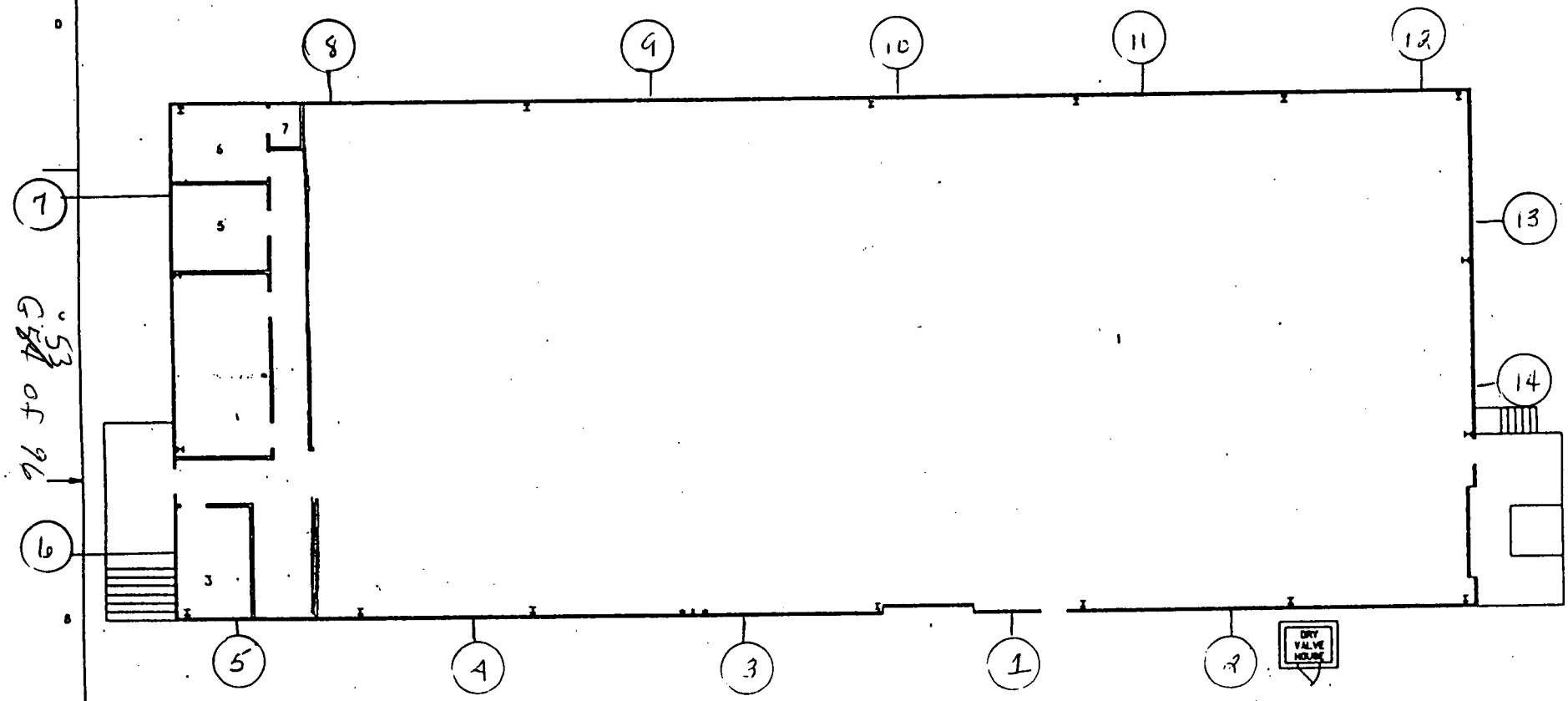
 7.29.04 SR

4675

J. Collins

INI	DATE	REVISION	BY	CHKR	DWG	UPDT	APVD	R
8	12/12/91	ASBUILT ISSUE	DCB				DVD	

Unit 8 J4-TF-0233



76 to 83 G.S.

UNCLASSIFIED & NON-SENSITIVE
Reviewed by Mound Declassification Office. Reviewer Initials: CDM

0 3' 6' 10' 20'

BLDG #22
FIRST FLOOR
BLDG CODE:3022

SHEET	1	2	3	4	5	6
ISSUE	8					

TITLE (U) TITLE CLASSIFICATION
BLDG #22
FLOOR PLANS

PART CLASSIFICATION

DRAWING CLASSIFICATION: UNCLASSIFIED

SIZE: C | DRAWING NUMBER: FSC911234 | JOB NUMBER: 12335

DWG TYPE: SFP | PROJECT: BLDG #22 | CODE: 14865 | SCALE AS NOTED | SHEET 1 OF 1

STATUS: MO-REL-12/12/91 | ORIGIN: MO-BRJ-V3.8

DESIGN DM | PROJ MGR | SPEC | DWG SUPV | LP & DC | PROJ REV | DWG MGR | APVD | DATE

APPROVALS: | DATE:
SAFETY COMMITTEE REVIEWED:
___NONE ___SNSDOC ___TEDOC ___DVDOC
TECH. REP. ___
GL. MGR. ___
SNSDOC ___
TEDOC ___
DVDOC ___

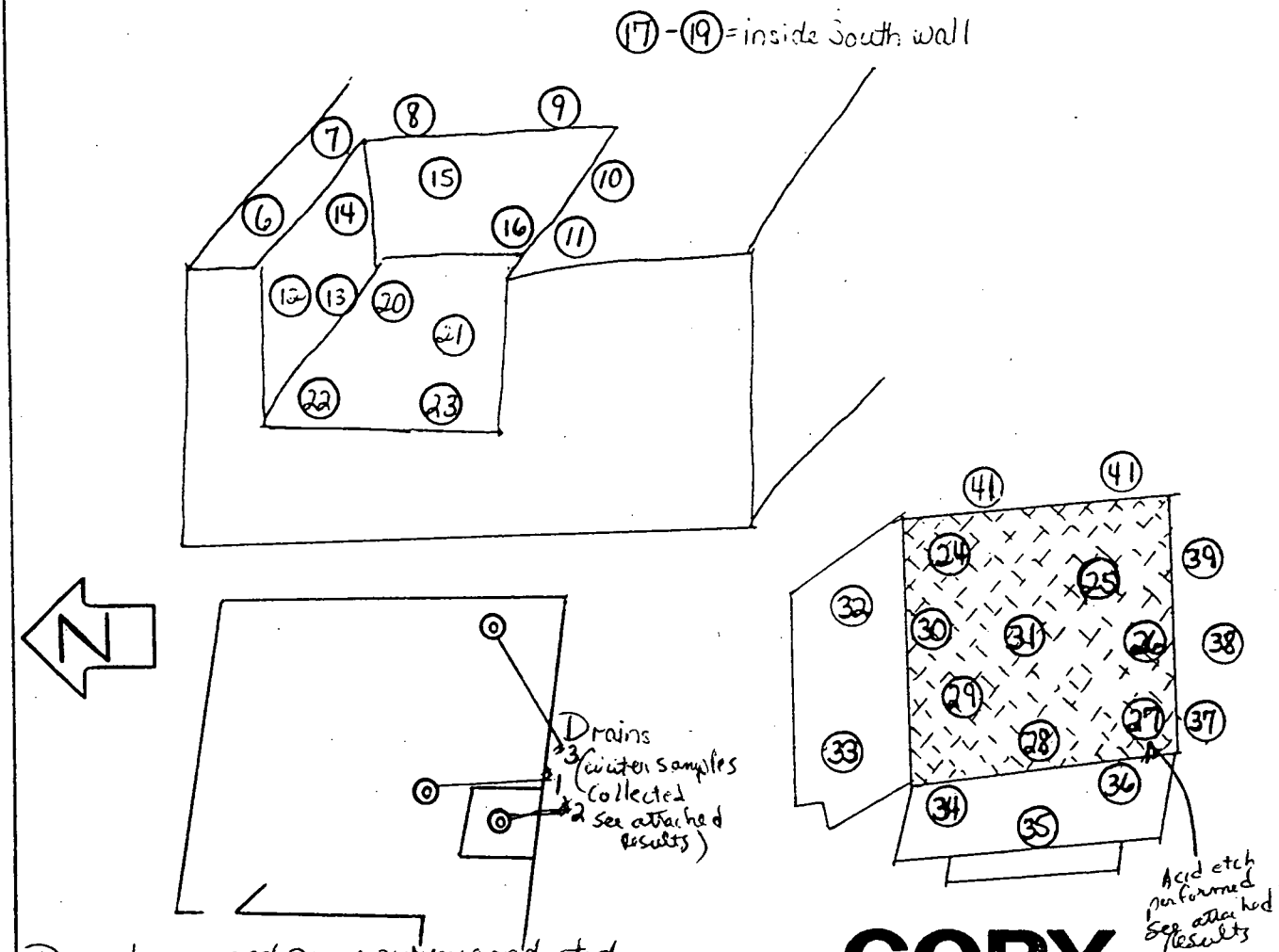
page 5 of 5

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22 - rm. 6 (floor) / outside - West Dock	SURVEY NO. 04 - TF - 0251
PURPOSE: MARSSIM characterization survey in accordance with survey plan 22-01	RWP NO. N/A
	DATE: 7/12/04
	TIME: 1100

MAP / DRAWING



Direct scan and pause survey conducted
See Attached for results on dock
No clicks in required time for drains - Integrated not required.

COPY

LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
— · — · — = radiological boundary
= mrem/hr neutron
= air sample number
= swipe number
#/α or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date			
2360-89	5775/5720	9-23-04	[redacted]	HP# 7244	Date: ~~8/16/04~~ 8/30/04
				HP#	Date:
	N A			HP# 7707	Date: 9-1-04

ML-9620 (2-98) Computer Generated

Survey No. 04-TF-0251

RADIOLOGICAL SURVEY DATA SHEET

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See Attached			top drain cover #1
2				bottom ↓ #1
3				top drain cover #2
4				bottom ↓ #2
5				drain #3
6				west dock
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				diamond plate
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
36	See Attached			diamond plate
37				
38				
39				
40				
41				

NEW

COMMENTS: All smears field checked with 2360 prior to submitting to count lab.

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

ML-9620A (4-98)

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR009
Batch Ended: 8/12/04 15:59

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: 04-TF-0251 COLLINS (41) AG

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.01		0.30	1.76	
A2	2	0.00	2.08		1.12	2.08	
A3	3	0.00	1.95		0.00	1.20	
A4	4	0.00	1.99		1.32	2.05	
B1	5	0.00	2.05		3.89	3.08	
B2	6	0.00	2.01		0.29	1.66	
B3	7	0.00	1.88		5.70	3.19	
B4	8	0.00	1.91		2.55	2.54	
C1	9	0.00	2.09		2.70	2.76	
C2	10	1.25	2.05		0.00	1.75	
C3	11	0.00	1.96		1.16	2.07	
C4	12	0.00	1.91		0.34	2.02	
D1	13	0.00	2.14		1.03	2.12	
D2	14	0.00	2.39		0.00	1.20	
D3	15	0.00	1.91		0.00	1.18	
D4	16	0.00	2.05		0.00	1.12	
A1	17	0.00	2.00		0.00	1.25	
A2	18	0.00	2.13		5.91	3.18	
A3	19	0.00	1.96		0.15	1.70	
A4	20	0.00	2.00		2.50	2.37	
B1	21	0.00	2.01		0.40	2.33	
B2	22	0.00	2.02		1.46	2.03	
B3	23	1.41	1.84		0.74	2.08	
B4	24	0.00	1.90		1.42	2.27	
C1	25	1.70	2.04		0.00	1.24	
C2	26	0.00	2.07		1.78	2.48	
C3	27	0.00	1.96		1.16	2.07	
C4	28	0.00	1.90		0.00	1.65	
D1	29	0.00	2.15		2.25	2.45	
D2	30	0.00	2.42		0.40	1.70	
D3	31	1.35	1.94		1.83	2.35	
D4	32	1.12	2.08		2.09	2.24	
A1	33	0.00	2.04		4.04	2.79	
A2	34	0.00	2.09		2.32	2.40	

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR009
Batch Ended: 8/12/04 15:59

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: 04-TF-0251 COLLINS (41) AG

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A3	35	1.49	1.98		2.40	2.41	
A4	36	1.58	2.01		3.55	2.65	
B1	37	0.00	2.04		2.73	2.85	
B2	38	0.00	2.01		0.29	1.66	
B3	39	0.00	1.81		0.00	1.21	
B4	40	0.00	1.90		1.42	2.27	
C1	41	0.00	2.06		0.00	1.75	

12 Aug 2004 17:39 ALPHA/BETA - 1.09 ~~Page #1~~
Protocol #: 3 PW 3 403727 User : 2138

Time: 2.00
Data Mode: DPM Nuclide: SM6LS02 Quench Set: SM6LS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	7.28
Region B:	2.0 -	18.6	0	0.0	6.63
Region C:	40.0 -	2000	0	0.0	11.79

~~Quench Indicator: tSIE~~/AEC
Ext Std Terminator: Count
04-TF-0251 COLLINS (41) AG
~~Coincidence Time(ns): 18~~
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT3.dat
Count Data Filename: C:\DATA\SDATA3.DAT

S#	TIME	CPMA	CPMB	CPMC	tSIE	LUM	FLAG	DPM1	2SIGMA
-1	10.00	7.28	6.63	11.79	587.38	8	B		0.00
0	2.00	781.17	749.35	0.71	637.64	0		1475.30	131.52
1	2.00	5.64	6.01	0.00	604.60	0		11.02	10.50
2	2.00	0.28	0.00	0.00	642.47	0		0.54	7.98
3	2.00	0.00	0.00	0.00	642.38	0		0.00	0.00
4	2.00	0.00	0.00	0.00	596.13	0		0.00	0.00
5	2.00	0.00	0.16	0.00	596.76	0		0.00	0.00
6	2.00	0.00	0.00	0.00	620.36	8		0.00	0.00
7	2.00	1.13	1.55	0.00	573.97	0		2.28	8.96
8	2.00	1.22	1.53	0.00	638.15	0		2.30	8.42
9	2.00	0.00	0.37	0.00	592.78	0		0.00	0.00
10	2.00	0.22	0.87	0.00	588.75	0		0.43	8.40
11	2.00	1.72	1.84	2.21	596.15	0		3.38	9.01
12	2.00	2.22	2.34	0.00	593.69	0		4.38	9.25
13	2.00	0.00	0.00	0.00	555.62	0		0.00	0.00
14	2.00	0.00	0.10	0.00	593.68	0		0.00	0.00
15	2.00	0.00	0.00	0.00	557.01	0		0.00	0.00
16	2.00	0.00	0.00	1.21	591.26	0		0.00	0.00
17	2.00	0.00	0.00	0.00	551.60	0		0.00	0.00
18	2.00	0.00	0.00	0.00	502.14	0		0.00	0.00
19	2.00	0.00	0.00	0.00	571.82	0		0.00	0.00
20	2.00	0.00	0.00	0.71	415.73	0		0.00	0.00
21	2.00	0.00	0.00	0.00	496.96	0		0.00	0.00
22	2.00	1.22	1.87	0.00	580.67	0		2.44	8.93
23	2.00	0.00	0.00	0.00	577.04	0		0.00	0.00
24	2.00	0.00	0.37	0.71	542.95	0		0.00	0.00
25	2.00	0.00	0.00	0.00	512.22	0		0.00	0.00
26	2.00	2.72	3.37	0.00	585.06	0		5.41	9.54
27	2.00	2.72	2.69	0.00	545.80	0		5.65	9.95
28	2.00	1.53	2.18	0.00	597.80	0		3.01	8.91
29	2.00	0.00	0.00	0.00	594.34	0		0.00	0.00
30	2.00	0.72	1.09	0.00	603.44	0		1.40	8.50
31	2.00	0.00	0.00	0.71	551.95	0		0.00	0.00
32	2.00	0.72	1.07	0.00	614.95	0		1.39	8.40
33	2.00	1.64	2.29	0.00	574.41	0		3.30	7.18
34	2.00	1.33	1.44	0.00	597.49	0		2.62	8.83
35	2.00	0.00	0.00	0.00	578.59	0		0.00	0.00
36	2.00	0.00	0.00	0.00	628.97	0		0.00	0.00

04-TF-0251

12 Aug 2004 19:37 ALPHA/BETA - 1.09 ~~Page #2~~
Protocol #: 3 FW 3 403727 User : 21

S#	TIME	CPMA	CPMB	CPMC	tSIE	LUM FLAG	DPMJ	2SIGMA
37	2.00	0.64	1.29	0.00	604.10	0	1.24	8.46
38	2.00	1.29	1.94	0.21	611.10	0	2.50	8.69
39	2.00	0.00	0.00	0.00	566.68	0	0.00	0.00
40	2.00	0.00	0.06	0.00	574.44	0	0.00	0.00
41	2.00	0.00	0.00	0.00	565.63	0	0.00	0.00

J. Collins

Survey No.
04-TF-0251

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Ludlum 2360 Integrated Measurement Results							
		Alpha			Beta		
		BKGD	3	cpm	BKGD	271	cpm
		DL	2.2	Net cpm	DL	20	Net cpm
No.	Item/Location Description	Gross (cpm)	CF	Results (dpm/100cm2 or Sample)	Gross (cpm)	CF	Results (dpm/100cm2 or Sample)
24	top	9	8	48	199	4	<DL
25	top	8	8	40	179	4	<DL
26	top	7	8	32	219	4	<DL
27	top	16	8	104	221	4	<DL
29	top	12	8	72	200	4	<DL
30	top	6	8	24	231	4	<DL
34	front	7	8	32	144	4	<DL

BWXT of Ohio, Inc.

ANALYTICAL SERVICES REQUEST FOR ANALYSIS

DATE SUBMITTED:	SAMPLE TYPE:	COLLECTED BY:	NUMBER OF SAMPLES
7/13/04	H_2O	[illegible]	3

PROJECT/FUNCTION:	PRIMARY CONTACT/PHONE NO.:	MAIL STOP:
BOS	[illegible]	

CHARGE NUMBER:	DATE(S) COLLECTED:	RSDS# (if applicable):	ATTACHMENTS (list):
EE022F	7/13/04	04-TF-[illegible]	

ANALYSES REQUESTED (check):

- [x] ^3H
- [ ] Characterize/Approve for Sanitary or Storm Discharge. Estimate of Total Volume for Release_____ Approved_____
- [x] Gross Alpha
- [ ] Air Filter – Isotopic Analysis
- [ ] Characterization per MD-80036, Operation #10015
- [ ] Isotopic Analysis: Pu____ U_____ Th____ Am____ Other_____
- [ ] Other _____

ADDITIONAL INFORMATION:

NOTE: Attach additional information (e.g. RSDS, screening results, collection data, and gamma spec. results) if applicable

LAB IDENTIFICATION	SAMPLE LOCATION	SAMPLE NUMBER	RESULTS ^3H uCi/ML	RESULTS Gross Alpha DPM/L
0404730	[illegible]	1	<0.005	<2.00
0404731	↓	2	<0.005	<2.00
0404732	↓	3	<0.005	<2.00

COMMENTS:

ANALYZED BY: [signature] DATE: 8-16-04

ML-5222 (1-01)

Laboratory ID#: 0404818
Project/function: Bldg. 22
Submitted: Aug 18, 2004
Submitted by: L. Hopkins
Point of Contact: L. Hopkins
RSDS#: ~~N/A~~ 8/30/04 04-TF-0251
Date: Aug 25, 2004

acid etch of metal dock platform - Survey Location # 27

Lab ID	0404818		
Sample Location	Bldg 22 #1		
Isotope	**pCi/Sample**	**Uncertainty +/-**	**LDL**
Pu-238	2.57	0.33	0.34
Pu-239/240	<LDL	<LDL	0.21
Th-227	<LDL	<LDL	0.31
Th-228	0.31	0.10	0.08
Th-230	0.26	0.10	0.21
Th-232	0.09	0.05	0.08
U-233/234	0.36	0.09	0.06
U-235	<LDL	<LDL	0.16
U-238	0.36	0.09	0.06
Po-210	<LDL	<LDL	1.82

[redacted]

1585 — HP #
8.25.04 — Date

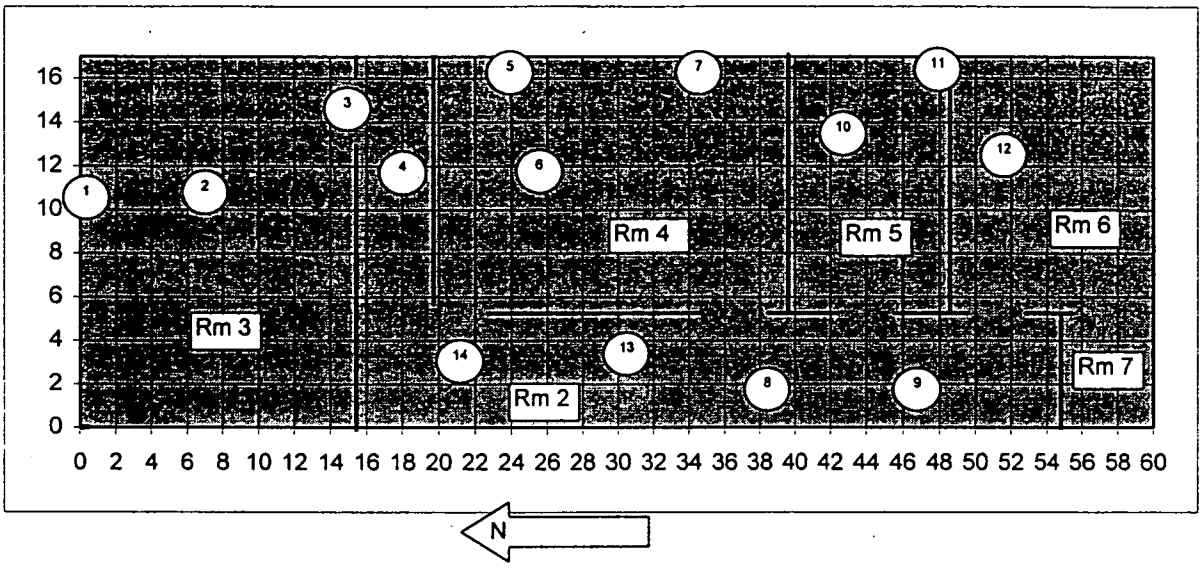
1585 — HP #
8.25.04 — Date

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22/ Room's 2-7	04-TF-0253
PURPOSE:	RWP NO.
MARSSIM Survey Plan 22-1 Unit 7 (Overhead, Judgmental)	N/A
	DATE: 5/12/04
	TIME: 15:30

MAP / DRAWING



LEGEND:

- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · · = radiological boundary
- # - mrem/hr neutron
- # - swipe number
- # [redacted] or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
Lud 2350/43-68	5857/5859	9/9/04
	N A	

Comp[redacted]	7836 / 5478	5/12/04
[redacted]		
[redacted]	HP#	Date:
Count[redacted]		
Revie[redacted]	HP# 7707	Date: 8/23/04
Revie[redacted]		

ML-9620 (2-98)

Survey No.
04-TF-0253

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See Attached			wall ledge
2				top of duct
3				door ledge
4				light fixture
5				u- channel
6				top of duct
7				I- beam
8				top of duct
9				top of duct
10				horizontal duct
11				wall ledge
12				drop ceiling
13				square duct
14				drop ceiling
		N	A	

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
		N	A	

COMMENTS: N/A

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR002
Batch Ended: 8/16/04 9:32

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: OEFFNER 04-TF-0253 [14] JC

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.04		4.04	2.79	
A2	2	0.00	2.06		0.00	1.20	
A3	3	0.00	2.00		4.95	2.95	
A4	4	0.00	1.99		1.32	2.05	
B1	5	0.00	2.06		5.06	3.30	
B2	6	0.00	2.03		2.63	2.35	
B3	7	0.00	1.87		4.50	2.95	
B4	8	0.00	1.89		0.29	1.96	
C1	9	0.00	2.13		6.41	3.50	
C2	10	0.00	2.07		1.78	2.48	
C3	11	1.45	1.97		2.22	2.40	
C4	12	0.00	1.91		0.34	2.02	
D1	13	0.00	2.18		5.91	3.24	
D2	14	0.00	2.39		0.00	1.20	

~~Page 1 of 1~~ 8/17/04

65
Page 65 of 96

3 of 5
~~Page 1~~
8/17/04

16 Aug 2004 09:55 ALPHA/BETA - 1.09 Page #1 ~~105~~ 170
Protocol #: 5 410462 User : 2138

Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	7.88
Region B:	2.0 -	18.6	0	0.0	7.46
Region C:	40.0 -	2000	0	0.0	11.36

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
04-TF-0253 OEFFNER (14) AG
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT2.DAT
Count Data Filename: C:\DATA\SDATA5.DAT
Spectrum Data Drive & Path: C:\DATA

S#	TIME	CPMA	LUM	FLAG	tSIE	DPM1	2Sigma	CPMC
-1	10.00	7.88	1	B	605.43		0.00	11.36
0	2.00	740.12	0		645.12	1367.77	102.84	0.64
1	2.00	56.12	1		596.40	108.17	22.83	66.79
2	2.00	13.12	0		527.49	26.93	13.87	0.00
3	2.00	53.06	0		560.12	105.66	22.98	46.05
4	2.00	16.12	0		613.23	30.62	13.68	16.64
5	2.00	9.44	0		508.57	19.73	12.89	17.45
6	2.00	0.62	0		572.54	1.23	8.84	0.00
7	2.00	2.62	0		562.34	5.21	9.77	0.00
8	2.00	58.31	0		530.73	119.30	24.67	16.14
9	2.00	0.62	0		551.52	1.25	9.01	0.00
10	2.00	1.12	0		591.12	2.18	8.91	2.98
11	2.00	8.12	0		632.10	15.18	11.11	1.49
12	2.00	0.00	0		512.71	0.00	0.00	0.00
13	2.00	2.62	0		583.50	5.12	9.58	2.14
14	2.00	0.00	0		542.85	0.00	0.00	0.00

NO

AP

22-Building Characterization Survey Unit 7

RSDS# 04-TF-0253 *RCT:* LAO *RCT:* JT

Alpha	43-68 BKG:	0	EFF:	0.2297	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.1863	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.2	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRCBKG	5857	7836	5859	1		8/12/04	10:25	12	300	17
ALPHA	SRCCHECK	5857	7836	5859	1		8/12/04	10:28	2059	60	14228
ALPHA	SRCCHECK	5857	7836	5859	1		8/12/04	10:29	2179	60	15058
ALPHA	SRCCHECK	5857	7836	5859	1		8/12/04	10:30	1963	60	13565
ALPHA	SRCCHECK	5857	7836	5859	1		8/12/04	10:32	2129	60	14712
ALPHA	SU701J	5857	7836	5859	1	1	8/12/04	13:30	5	120	17
ALPHA	SU702J	5857	7836	5859	1	2	8/12/04	13:34	11	120	38
ALPHA	SU703J	5857	7836	5859	1	3	8/12/04	13:39	4	120	14
ALPHA	SU704J	5857	7836	5859	1	4	8/12/04	13:45	7	120	24
ALPHA	SU705J	5857	7836	5859	1	5	8/12/04	13:52	10	120	35
ALPHA	SU706J	5857	7836	5859	1	6	8/12/04	13:56	7	120	24
ALPHA	SU707J	5857	7836	5859	1	7	8/12/04	14:01	5	120	17
ALPHA	SU708J	5857	7836	5859	1	8	8/12/04	14:10	6	120	21
ALPHA	SU709J	5857	7836	5859	1	9	8/12/04	14:19	7	120	24
ALPHA	SU710J	5857	7836	5859	1	10	8/12/04	14:26	2	120	7
ALPHA	SU711J	5857	7836	5859	1	11	8/12/04	14:31	7	120	24
ALPHA	SU712J	5857	7836	5859	1	12	8/12/04	14:35	14	120	48
ALPHA	SU713J	5857	7836	5859	1	13	8/12/04	14:42	8	120	28
ALPHA	SU714J	5857	7836	5859	1	14	8/12/04	14:48	4	120	14
BETA	SRCBKG	5857	7836	5859	2		8/12/04	10:39	697	300	1188
BETA	SRCCHECK	5857	7836	5859	2		8/12/04	10:43	2509	60	21377
BETA	SRCCHECK	5857	7836	5859	2		8/12/04	10:44	2503	60	21326
BETA	SRCCHECK	5857	7836	5859	2		8/12/04	10:45	2477	60	21104
BETA	SRCCHECK	5857	7836	5859	2		8/12/04	10:47	2524	60	21505
BETA	SU701J	5857	7836	5859	2	1	8/12/04	13:31	126	60	1074
BETA	SU702J	5857	7836	5859	2	2	8/12/04	13:35	173	60	1474
BETA	SU703J	5857	7836	5859	2	3	8/12/04	13:40	140	60	1193
BETA	SU704J	5857	7836	5859	2	4	8/12/04	13:46	144	60	1227
BETA	SU705J	5857	7836	5859	2	5	8/12/04	13:53	151	60	1287
BETA	SU706J	5857	7836	5859	2	6	8/12/04	13:57	161	60	1372
BETA	SU707J	5857	7836	5859	2	7	8/12/04	14:02	145	60	1235
BETA	SU708J	5857	7836	5859	2	8	8/12/04	14:11	175	60	1491
BETA	SU709J	5857	7836	5859	2	9	8/12/04	14:20	156	60	1329
BETA	SU710J	5857	7836	5859	2	10	8/12/04	14:27	184	60	1568
BETA	SU711J	5857	7836	5859	2	11	8/12/04	14:32	175	60	1491
BETA	SU712J	5857	7836	5859	2	12	8/12/04	14:36	162	60	1380
BETA	SU713J	5857	7836	5859	2	13	8/12/04	14:43	198	60	1687
BETA	SU714J	5857	7836	5859	2	14	8/12/04	14:49	185	60	1576

This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22 - room 1 - walls	SURVEY NO. 04-TF-0263
PURPOSE: MARSSIM Survey Unit 2	RWP NO. N/A
	DATE: 8/26/04
	TIME: 1630

MAP / DRAWING

See Attached

COPY

LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
—·—·— = radiological boundary

△# = mrem/hr neutron
= air sample number
(#) = swipe number
(#/α) or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date			
M2350-1	5857/5859	9-9-04	[redacted]	HP# 7244/7224	Date: 8/31/04
Ludlum 2360	5831/5804	~~9-13-05~~		HP#	Date:
	A	9/8/04 4-13-05		HP# 7707	Date: 9-1-04
	N				

ML-9620 (2-98) Computer Generated

Survey No. 04-TF-0263

RADIOLOGICAL SURVEY DATA SHEET

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See Attached			walls
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
		NFE		

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
		NFE		

COMMENTS: All smears field checked with 2360 prior to submitting to count lab.
NFE = No Further Entries

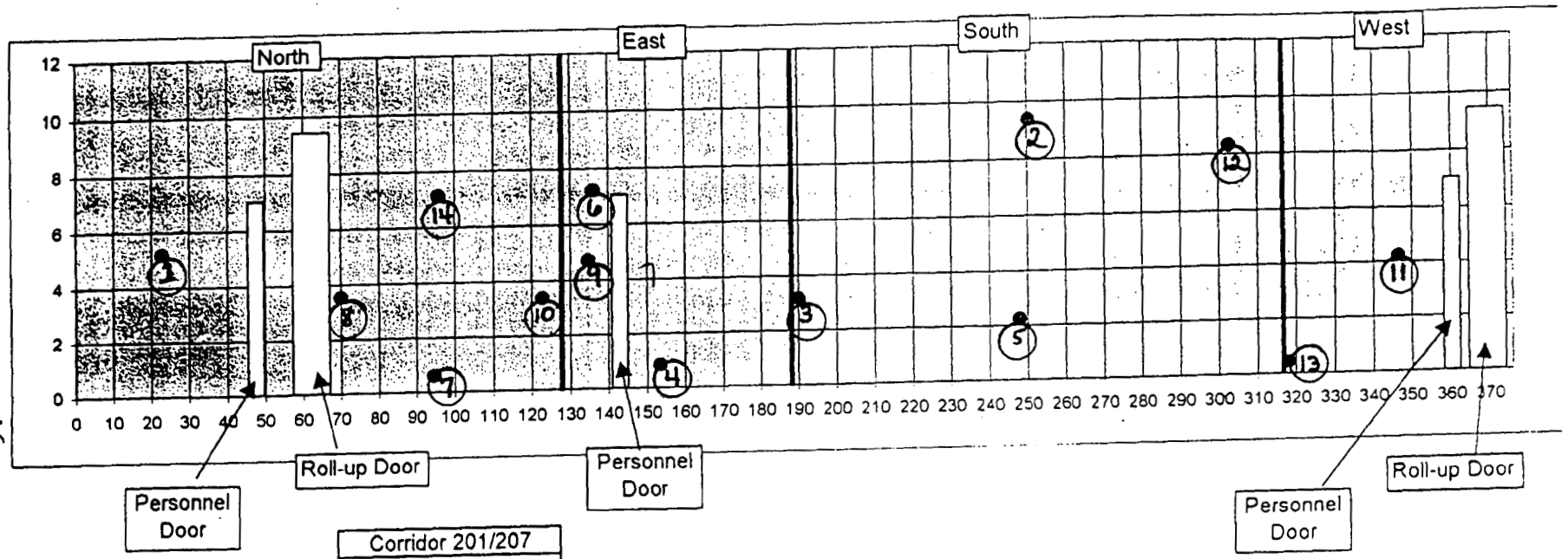
NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

ML-9620A (4-98)

G 68A 0696

04-TF-0263

Building 22 Survey Unit 2



	Corridor 201/207 Survey Unit 3	
	X	Y
	376.0	12.0
1	22.7	5.2
2	250.5	9.4
3	189.9	3.2
4	153.5	0.9
5	247.8	2.3
6	136.1	7.2
7	94.5	0.6
8	70.0	3.6
9	134.8	4.7
10	122.8	3.4
11	346.4	4.3
12	302.7	8.3
13	318.1	0.4
14	95.8	7.1

Area	L	L'
4512	16.14026	13.97747

Not to scale

G-77 of 96

Doc. 3 of 6

22-Building Characterization Survey Unit 2

RSDS# 04-TF-0263 RCT: J.M.C RCT: S.R

Alpha	43-68 BKG:	0	EFF:	0.2297	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.1863	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.1948	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5857	7244	5859	1		8/26/04	9:21	6	300	8
ALPHA	SRC CHECK	5857	7244	5859	1		8/26/04	9:36	1997	60	13800
ALPHA	SRC CHECK	5857	7244	5859	1		8/26/04	9:37	2079	60	14367
ALPHA	SRC CHECK	5857	7244	5859	1		8/26/04	9:38	2082	60	14387
ALPHA	SRC CHECK	5857	7244	5859	1		8/26/04	9:40	1834	60	12674
ALPHA	U-2 01	5857	7244	5859	1	1	8/26/04	13:46	4	120	14
ALPHA	U-2 02	5857	7244	5859	1	2	8/26/04	13:51	3	120	10
ALPHA	U-2 03	5857	7244	5859	1	3	8/26/04	13:55	5	120	17
ALPHA	U-2 04	5857	7244	5859	1	4	8/26/04	14:00	0	120	0
ALPHA	U-2 05	5857	7244	5859	1	5	8/26/04	14:05	6	120	21
ALPHA	U-2 06	5857	7244	5859	1	6	8/26/04	14:10	5	120	17
ALPHA	U-2 07	5857	7244	5859	1	7	8/26/04	14:15	3	120	10
ALPHA	U-2 08	5857	7244	5859	1	8	8/26/04	14:21	5	120	17
ALPHA	U-2 09	5857	7244	5859	1	9	8/26/04	14:25	1	120	3
ALPHA	U-2 10	5857	7244	5859	1	10	8/26/04	14:29	4	120	14
ALPHA	U-2 11	5857	7244	5859	1	11	8/26/04	14:34	2	120	7
ALPHA	U-2 12	5857	7244	5859	1	12	8/26/04	14:38	10	120	35
ALPHA	U-2 13	5857	7244	5859	1	13	8/26/04	14:42	6	120	21
ALPHA	U-2 14	5857	7244	5859	1	14	8/26/04	14:47	6	120	21
BETA	SRC BKG	5857	7244	5859	2		8/26/04	9:33	741	300	1263
BETA	SRC CHECK	5857	7244	5859	2		8/26/04	9:48	2753	60	23456
BETA	SRC CHECK	5857	7244	5859	2		8/26/04	9:49	2804	60	23890
BETA	SRC CHECK	5857	7244	5859	2		8/26/04	9:53	2768	60	23584
BETA	SRC CHECK	5857	7244	5859	2		8/26/04	9:54	2715	60	23132
BETA	U-2 01	5857	7244	5859	2	1	8/26/04	13:47	106	60	903
BETA	U-2 02	5857	7244	5859	2	2	8/26/04	13:52	152	60	1295
BETA	U-2 03	5857	7244	5859	2	3	8/26/04	13:57	124	60	1056
BETA	U-2 04	5857	7244	5859	2	4	8/26/04	14:01	140	60	1193
BETA	U-2 05	5857	7244	5859	2	5	8/26/04	14:06	132	60	1125
BETA	U-2 06	5857	7244	5859	2	6	8/26/04	14:11	137	60	1167
BETA	U-2 07	5857	7244	5859	2	7	8/26/04	14:16	116	60	988
BETA	U-2 08	5857	7244	5859	2	8	8/26/04	14:22	98	60	835
BETA	U-2 09	5857	7244	5859	2	9	8/26/04	14:26	135	60	1150
BETA	U-2 10	5857	7244	5859	2	10	8/26/04	14:31	116	60	988
BETA	U-2 11	5857	7244	5859	2	11	8/26/04	14:35	132	60	1125
BETA	U-2 12	5857	7244	5859	2	12	8/26/04	14:39	112	60	954
BETA	U-2 13	5857	7244	5859	2	13	8/26/04	14:43	129	60	1099
BETA	U-2 14	5857	7244	5859	2	14	8/26/04	14:48	120	60	1022

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Green
Data file name: SMEAR002
Batch Ended: 8/26/04 15:38
Cal. Due Date: 5/1/05
Serial Number: 26966-3

Batch ID: 04-TF-0263 COLLINS (14) AG

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	σ	flags	DPM	σ	flags
A1	1	2.16	2.23		0.00	1.97	
A2	2	1.09	2.07		0.00	1.25	
A3	3	0.00	2.33		0.12	1.90	
A4	4	0.00	2.19		3.42	2.47	
B1	5	1.57	1.92		0.00	1.84	
B2	6	1.28	1.93		1.86	1.99	
B3	7	0.00	2.29		4.03	3.05	
B4	8	0.00	2.01		1.46	2.16	
C1	9	0.00	2.18		0.74	2.27	
C2	10	1.06	2.05		1.28	2.08	
C3	11	0.00	2.22		1.20	1.85	
C4	12	0.00	2.13		0.27	2.87	
D1	13	0.00	2.28		3.63	2.66	
D3	14	0.00	2.34		3.42	2.65	

gc. gc

71 of 96

AP

29 Aug 2004 20:26 ALPHA/BETA - 1.09 8/31/04 ~~Page #1~~
Protocol #: 4 PW H3 #403727 User : 21

Time: 2.00
Data Mode: DPM Nuclide: SM6LS02 Quench Set: SM6LS02
Background Subtract: 1st Vial

	LL	UL	LCR	2SZ	BKG
Region A:	0.5 -	18.6	0	0.0	6.10
Region B:	2.0 -	18.6	0	0.0	5.95
Region C:	40.0 -	2000	0	0.0	12.40

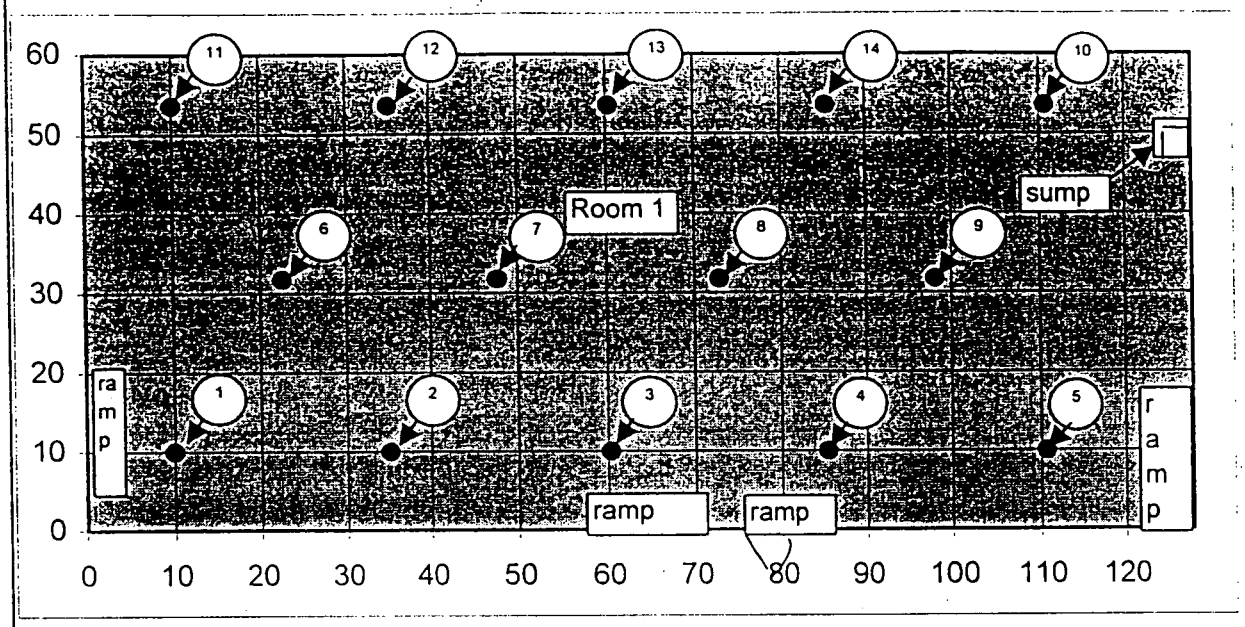
Quench Indicator: tSIE/AEC
~~Ext Std~~ Terminator: Count
04-TF-0263 COLLINS (14) AG
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT4.dat
Count Data Filename: C:\DATA\SDATA4.DAT

S#	TIME	CPMA	CPMB	CPMC	tSIE	LUM	FLAG	DPM1	2SIGMA
-1	10.00	6.10	5.95	12.40	584.81	3	B		0.00
0	2.00	800.33	764.95	1.10	630.62	0		1522.11	135.12
1	2.00	4.40	4.55	0.00	622.87	0		8.43	9.30
2	2.00	3.90	3.08	0.00	578.25	0		7.83	9.52
3	2.00	4.40	4.55	0.00	626.22	0		8.40	9.27
4	2.00	4.90	4.37	0.00	547.97	0		10.15	10.27
5	2.00	1.40	0.95	0.60	613.39	0		2.71	8.08
6	2.00	2.40	2.29	0.00	592.06	0		4.75	8.73
7	2.00	3.40	3.55	2.10	629.97	0		6.47	8.82
8	2.00	3.40	3.55	0.00	613.82	0		6.58	8.97
9	2.00	0.00	0.00	0.00	619.93	0		0.00	0.00
10	2.00	0.90	0.00	0.00	607.87	0		1.75	7.89
11	2.00	3.64	3.48	0.00	623.41	0		6.98	8.98
12	2.00	2.87	2.73	0.00	606.93	0		5.58	8.80
13	2.00	4.42	4.28	0.00	610.40	0		8.59	9.43
14	2.00	1.40	1.55	0.00	581.19	0		2.80	8.36

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22/ Room 1	04-TF-0266
PURPOSE	RWP NO.
Final Status Survey QC 22-1 Unit 1	N/A
	DATE: 8/30/04
	TIME: 16:00

MAP / DRAWING



Room 1 SU 1	X	Y	Room 1 SU 1	X	Y
1	10.0	10.0	8	72.9	31.8
2	35.2	10.0	9	98.1	31.8
3	60.3	10.0	10	110.7	53.6
4	85.5	10.0	11	10.0	53.6
5	110.7	10.0	12	35.2	53.6
6	22.6	31.8	13	60.3	53.6
7	47.8	31.8	14	85.5	53.6

Readings were taken at Highlighted points

COPY

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- —·—·—·· = radiological boundary

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5855/5864	6/9/05
-	N	
	A	

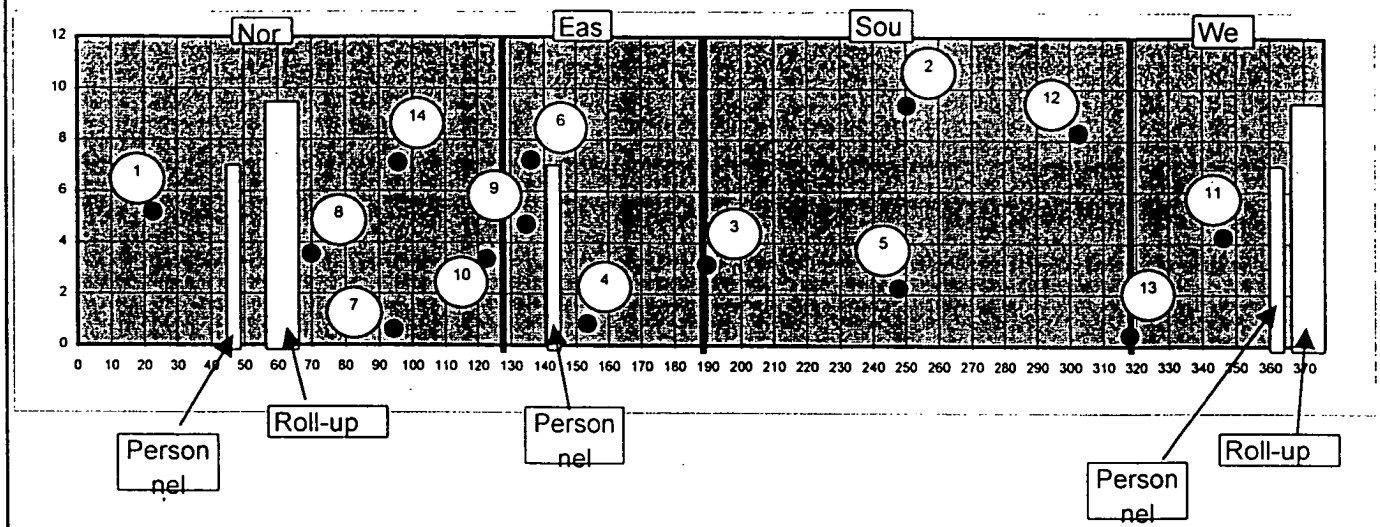
[redacted]

HP#	Date:
5478/7244/7224	8/31/04
[redacted]	
HP# 6478	Date:
~~[redacted]~~	9-1-04
HP# 7707	Date: 9-1-04
[redacted]	

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Building 22/ Room 1	SURVEY NO. 04-TF-0266
PURPOSE: Final Status Survey QC 22-1 Unit 2	RWP NO. N/A
	DATE: 8-30-04
	TIME: 16:00

MAP / DRAWING



Room 1 SU 2	X	Y	Room 1 SU 2	X	Y
1	22.7	5.2	8	70.0	3.6
2	250.5	9.4	9	134.8	4.7
3	189.9	3.2	10	122.8	3.4
4	153.5	0.9	11	346.4	4.3
5	247.8	2.3	12	302.7	8.3
6	136.1	7.2	13	318.1	0.4
7	94.5	0.6	14	95.8	7.1

Readings were taken at Highlighted Points

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · = radiological boundary

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

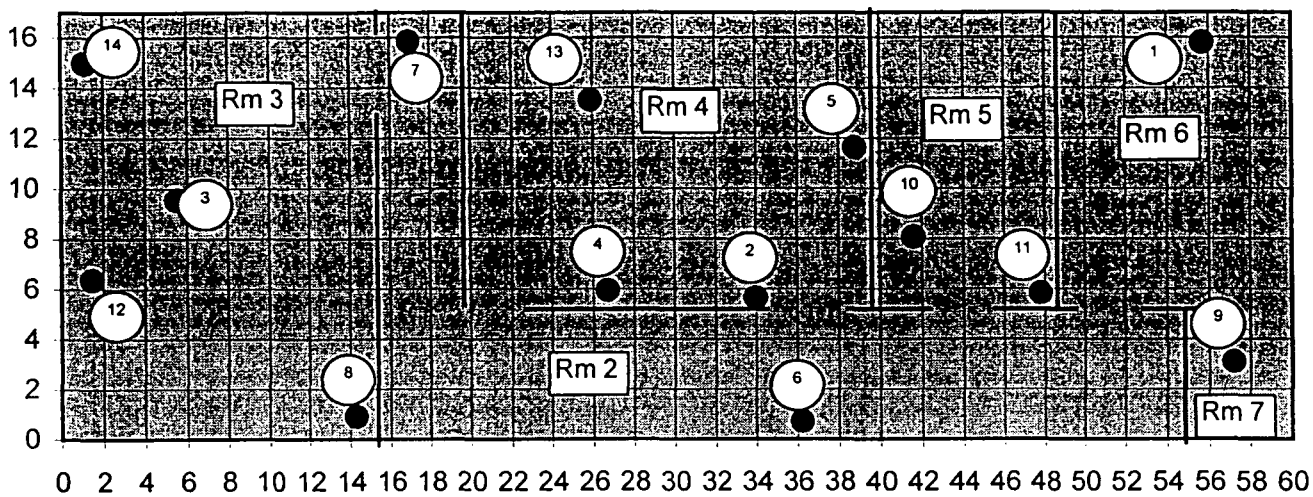
Instrument	Serial Number	Cal. Due Date
2350-1	5857/5859	9-9-04
	N/A	

Completed by: (Signature)	HP#	Date:
Completed by: (Printed Name)		
Counted by: (Signature) See Page #1	HP#	Date:
Counted by: (Printed Name)		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22/ Room's 2-7	04 - TF - 0266
PURPOSE:	RWP NO.
Final Status Survey QC 22-1 Unit 3	N/A
	DATE: 8 · 30 · 04
	TIME: 16 : 00

MAP / DRAWING



N

Room 2-7 SU 3			Room 2-7 SU 3		
	X	Y		X	Y
1	55.7	15.8	8	14.3	0.9
2	34.0	5.7	9	57.2	3.1
3	5.5	9.6	10	41.6	8.1
4	26.7	6.0	11	47.8	5.8
5	38.8	11.6	12	1.5	6.4
6	36.2	0.7	13	25.9	13.5
7	17.0	15.8	14	1.2	15.0

Room 2-7 SU 4			Room 2-7 SU 4		
	X	Y		X	Y
1	2.8	2.6	8	16.2	3.6
2	26.5	0.5	9	37.0	0.9
3	38.6	2.3	10	50.3	5.0
4	43.9	4.4	11	65.0	0.7
5	69.2	2.2	12	22.7	5.7
6	91.3	2.6	13	47.2	3.4
7	102.7	0.4	14	84.6	5.5

Next Page

LEGEND:
- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- —·—·—·- = radiological boundary

Readings were taken at Highlighted Points

- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

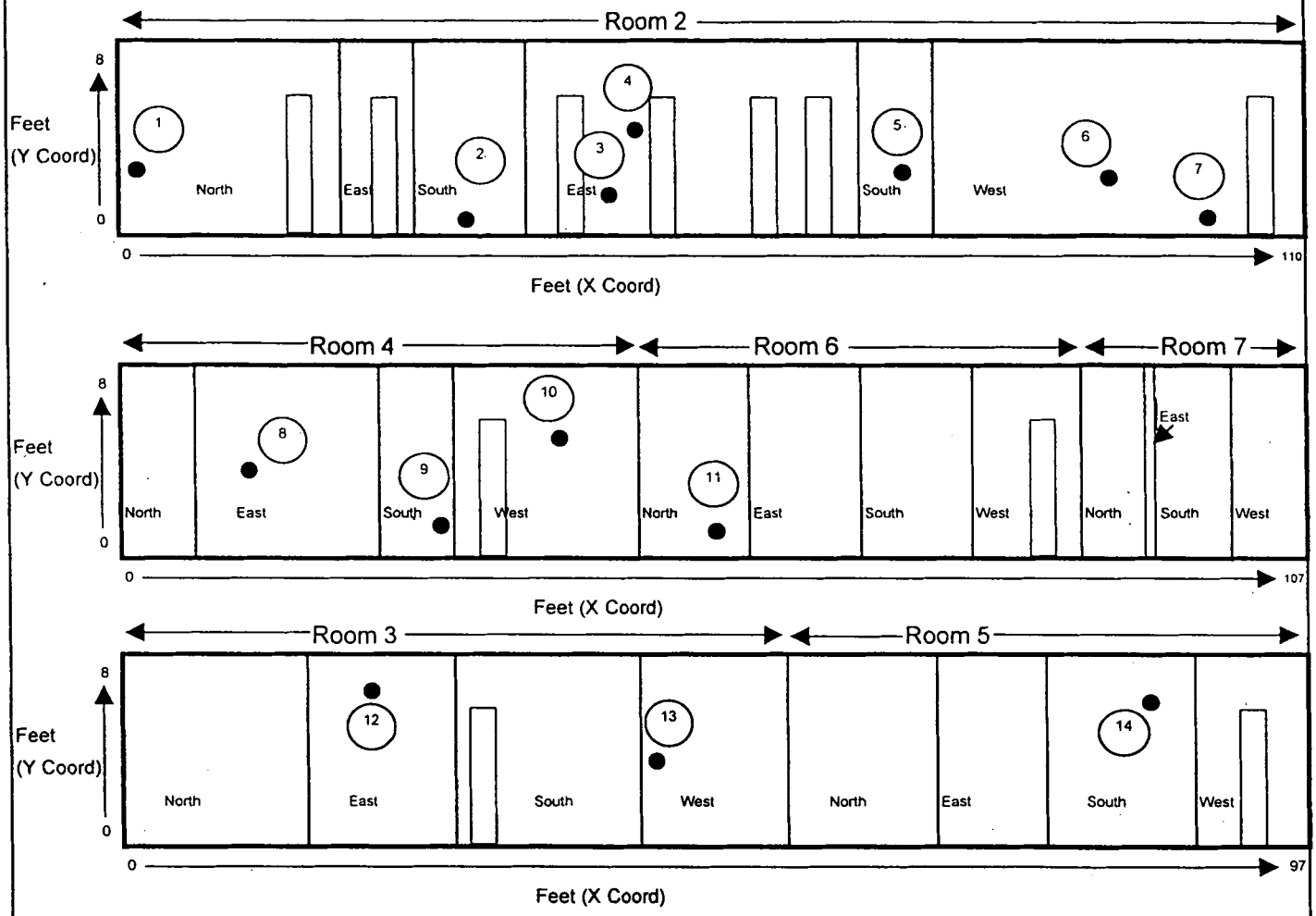
Instrument	Serial Number	Cal. Due Date
2350-1	5855/5864	6·9·05
NA		

Completed by: (Signature)	HP#	Date:
Completed by: (Printed Name) See Page 1		
Counted by: (Signature)	HP#	Date:
Counted by: (Printed Name)		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Building 22/ Room's 2-7	SURVEY NO. 04-TF-0266
PURPOSE: Final Status Survey QC 22-1 Unit 4	RWP NO. N/A
	DATE: 8-30-04
	TIME: 16:00

MAP / DRAWING



LEGEND:

- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · — = radiological boundary
- △ # - mrem/hr neutron
- ◯ # - swipe number
- ▭ # - air sample number
- ◯ #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5855/5864	6/9/05
	N	
	A	

Completed by: (Signature)	HP#	Date:
Completed by: (Printed Name)		
Counted by: (Signature) See Page #1	HP#	Date:
Counted by: (Printed Name)		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

22-Bldg. Final Status Survey Units 1, 3 & 4

RSDS#04-TF-0266 RCT: JMC RCT: DR

Alpha	43-68 BKG:	0	EFF:	0.206	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.154	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5855	7244	5864	1		8/30/04	10:35	6	300	9
ALPHA	SRC CHECK	5855	7244	5864	1		8/30/04	10:37	1915	60	14756
ALPHA	SRC CHECK	5855	7244	5864	1		8/30/04	10:39	1855	60	14293
ALPHA	SRC CHECK	5855	7244	5864	1		8/30/04	10:40	2059	60	15865
ALPHA	SRC CHECK	5855	7244	5864	1		8/30/04	10:42	1925	60	14833
ALPHA	U-1 06Q	5855	7244	5864	1	1	8/30/04	13:35	3	120	12
ALPHA	U-1 09Q	5855	7244	5864	1	2	8/30/04	13:40	2	120	8
ALPHA	U-1 03Q	5855	7244	5864	1	3	8/30/04	13:49	2	120	8
ALPHA	U-3 13Q	5855	7244	5864	1	4	8/30/04	14:15	1	120	4
ALPHA	U-3 11Q	5855	7244	5864	1	5	8/30/04	14:19	1	120	4
ALPHA	U-3 06Q	5855	7244	5864	1	6	8/30/04	14:23	0	120	0
ALPHA	U-3 12Q	5855	7244	5864	1	7	8/30/04	14:27	4	120	15
ALPHA	U-3 03Q	5855	7244	5864	1	8	8/30/04	14:31	4	120	15
ALPHA	U-4 12Q	5855	7244	5864	1	9	8/30/04	14:38	4	120	15
ALPHA	U-4 05Q	5855	7244	5864	1	10	8/30/04	14:43	2	120	8
ALPHA	U-4 14Q	5855	7244	5864	1	11	8/30/04	14:47	2	120	8
ALPHA	U-4 10Q	5855	7244	5864	1	12	8/30/04	14:51	0	120	0
BETA	SRC BKG	5855	7244	5864	2		8/30/04	10:50	974	300	2008
BETA	SRC CHECK	5855	7244	5864	2		8/30/04	10:54	2764	60	28489
BETA	SRC CHECK	5855	7244	5864	2		8/30/04	10:55	2664	60	27458
BETA	SRC CHECK	5855	7244	5864	2		8/30/04	10:57	2562	60	26407
BETA	SRC CHECK	5855	7244	5864	2		8/30/04	10:59	2823	60	29097
BETA	U-1 06Q	5855	7244	5864	2	1	8/30/04	13:36	257	60	2649
BETA	U-1 09Q	5855	7244	5864	2	2	8/30/04	13:41	279	60	2876
BETA	U-1 03Q	5855	7244	5864	2	3	8/30/04	13:50	276	60	2845
BETA	U-3 13Q	5855	7244	5864	2	4	8/30/04	14:16	218	60	2247
BETA	U-3 11Q	5855	7244	5864	2	5	8/30/04	14:20	173	60	1783
BETA	U-3 06Q	5855	7244	5864	2	6	8/30/04	14:24	213	60	2195
BETA	U-3 12Q	5855	7244	5864	2	7	8/30/04	14:28	224	60	2309
BETA	U-3 03Q	5855	7244	5864	2	8	8/30/04	14:32	225	60	2319
BETA	U-4 12Q	5855	7244	5864	2	9	8/30/04	14:39	137	60	1412
BETA	U-4 05Q	5855	7244	5864	2	10	8/30/04	14:44	133	60	1371
BETA	U-4 14Q	5855	7244	5864	2	11	8/30/04	14:48	152	60	1567
BETA	U-4 10Q	5855	7244	5864	2	12	8/30/04	14:52	126	60	1299

Highlighted rows are the highest and lowest readings each survey unit.

22-Building QC Replicates [redacted] Survey Unit 2

5478

RSDS# 04-TF-0266 RCT: _____ RCT: JR

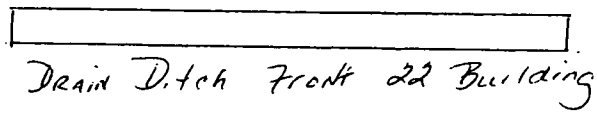
Alpha	43-68 BKG:	0	EFF:	0.2297	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :
Beta	43-68 BKG:	0	EFF:	0.1863	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :
Scan	43-37 BKG:	0	EFF:	0.1948	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # :
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5857	7836	5859	1		8/30/04	10:43	8	300	11
ALPHA	SRCCHECK	5857	7836	5859	1		8/30/04	10:50	2074	60	14332
ALPHA	SRCCHECK	5857	7836	5859	1		8/30/04	10:53	2097	60	14491
ALPHA	SRCCHECK	5857	7836	5859	1		8/30/04	10:55	1905	60	13164
ALPHA	SRCCHECK	5857	7836	5859	1		8/30/04	10:56	1970	60	13613
ALPHA	U-2 02Q	5857	7836	5859	1	1	8/30/04	13:34	3	120	10
ALPHA	U-2 12Q	5857	7836	5859	1	2	8/30/04	13:38	3	120	10
ALPHA	U-2 13Q	5857	7836	5859	1	3	8/30/04	13:43	9	120	31
ALPHA	U-2 07Q	5857	7836	5859	1	4	8/30/04	13:48	8	120	28
BETA	SRC BKG	5857	7836	5859	2		8/30/04	11:07	648	300	1104
BETA	SRCCHECK	5857	7836	5859	2		8/30/04	11:10	2527	60	21530
BETA	SRCCHECK	5857	7836	5859	2		8/30/04	11:11	2465	60	21002
BETA	SRCCHECK	5857	7836	5859	2		8/30/04	11:13	2444	60	20823
BETA	SRCCHECK	5857	7836	5859	2		8/30/04	11:14	2297	60	19571
BETA	U-2 02Q	5857	7836	5859	2	1	8/30/04	13:35	132	60	1125
BETA	U-2 12Q	5857	7836	5859	2	2	8/30/04	13:40	126	60	1074
BETA	U-2 13Q	5857	7836	5859	2	3	8/30/04	13:44	149	60	1270
BETA	U-2 07Q	5857	7836	5859	2	4	8/30/04	13:49	110	60	937

Highlighted rows are the highest and lowest readings each survey unit.

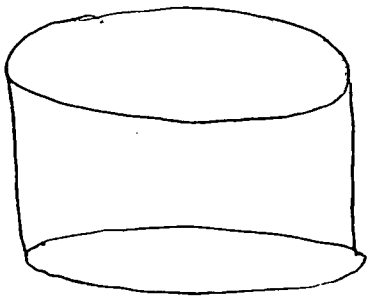
RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22 - Drain	SURVEY NO. 04-TF-0267
PURPOSE: Characterization of Drain in Front of Building 22	RWP NO. N/A
	DATE: 8·31·04
	TIME: 10:30

MAP / DRAWING



Drain Ditch Front 22 Building



Container

See Attached for Location identification of Smears

Direct Scan and Pause Survey
No Clicks in Required Time
Intergrated Not Required.

Background 2 α 198 β⁻
D.L. 1.8 α 20 β⁻

LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
— · — · · = radiological boundary
△# = mrem/hr neutron
= air sample number
(#) = swipe number
#/α or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5749·5799	10·8·04
3030	5826	10·20·04
3030	5816	7·12·05
	N A	

[redacted]

HP# 7224/7244	Date: 9/2/04
HP# 7224	Date: 8/31/04
HP# 7707	Date: 9-14-04

ML-9620 (2-98) Computer Generated

Survey No. 4-TF-0267

RADIOLOGICAL SURVEY DATA SHEET

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	0	0	NOT Required	Inside Drain
2	21	0		Container
NFE				

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
N/A				

COMMENTS: 2360 used to Field Check Smears
NFE = No Further Entries

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

ML-9620A (4-98)

SOIL ANALYSIS REPORT

Field Sample ID:
Lab Sample ID: GL02498
File ID: 6SC00447.s0
Priority: Yes

Description\Location
Building 22 Front Drain
Long Count

Collector: 7244
Date Received: 8/31/04
Date Collected: 8/31/04

Radionuclide		Activity (pCi/g)	MDA
Co-60	*	0	0.02
Cs-137	*	0	0.02
Pb-210		1.1	0.43
Ra-226	*	0.15	0.51
Ac-227 (D)	*	0.11	0.22
Th-230	*	1.37	4.83
Th-232 (D)		0.23	0.04
Pu-238	*	0	14.96
Am-241	*	0	0.06

Other Nuclides

Radionuclide	Activity (pCi/g)	MDA

Σ_{DOT} 0.02 nCi/g

Instrument type: High Purity Germanium

Σ_{DOT} 2nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is Assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation

Comments:

Date: 9/1/04 Counted By: 5288 Analyzed By: 5288 Initials [redacted]

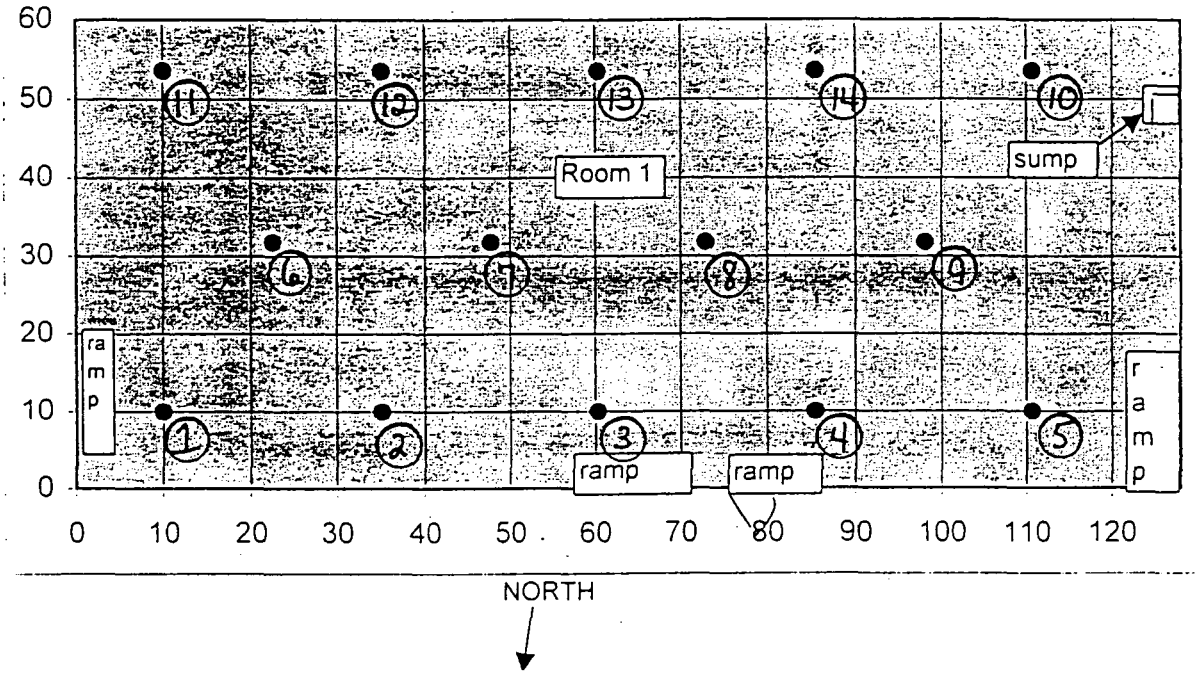
This page intentionally left blank.

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22-Rm. 1	SURVEY NO 04-TF-0275
PURPOSE: MARSSIM Survey Unit 5 & 9 (ceiling and roof)	RWP NO. N/A
	DATE: 9-8-04
	TIME: 1630

MAP / DRAWING

BUILDING 22 SURVEY UNIT 5 & 9



LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
— · — · - = radiological boundary
△# = mrem/hr neutron
= air sample number
(#) = swipe number
(#/α) or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date	HP#	Date
Ludlum 2350-1	5854/5861	7-20-05	7204	9-14-04
Ludlum 2360-89	5708/5731	8-17-05		
–	A		HP#	Date:
–	N		7707	09-14-04

[redacted]

ML-9620 (2-98) Computer Generated

Survey No. 04-TF-0275

8/20/01

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See Attached			Unit 5 (ceiling)
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				Unit 9 (roof)
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
	NFE			

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
	NFE			

COMMENTS: NFE = No Further Entries
All smears field checked with 2360 prior to submitting to count lab.

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

Bldg. 22 Final Status Survey Units 5 & 9 (ceiling/roof)

RSDS# 04-TF-0275 RCT: J.M.C RCT: _____

Alpha	43-68 BKG:	0	EFF:	0.21	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.167	PROBE AREA:	126	cm²	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.226	PROBE AREA:	584	cm²	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5854	7244	5861	1		9/8/04	8:53	8	300	12
ALPHA	SRC CHECK	5854	7244	5861	1		9/8/04	9:21	1945	60	14701
ALPHA	SRC CHECK	5854	7244	5861	1		9/8/04	9:23	1962	60	14830
ALPHA	SRC CHECK	5854	7244	5861	1		9/8/04	9:25	2049	60	15488
ALPHA	SRC CHECK	5854	7244	5861	1		9/8/04	9:26	1992	60	15057
ALPHA	U-5J 01	5854	7244	5861	1	1	9/8/04	10:24	3	120	11
ALPHA	U-5J 02	5854	7244	5861	1	2	9/8/04	12:40	7	120	26
ALPHA	U-5J 03	5854	7244	5861	1	3	9/8/04	12:45	8	120	30
ALPHA	U-5J 04	5854	7244	5861	1	4	9/8/04	12:49	5	120	19
ALPHA	U-5J 05	5854	7244	5861	1	5	9/8/04	12:53	7	120	26
ALPHA	U-5J 06	5854	7244	5861	1	6	9/8/04	12:57	5	120	19
ALPHA	U-5J 07	5854	7244	5861	1	7	9/8/04	13:00	8	120	30
ALPHA	U-5J 08	5854	7244	5861	1	8	9/8/04	13:04	9	120	34
ALPHA	U-5J 09	5854	7244	5861	1	9	9/8/04	13:08	7	120	26
ALPHA	U-5J 10	5854	7244	5861	1	10	9/8/04	13:11	1	120	4
ALPHA	U-5J 11	5854	7244	5861	1	11	9/8/04	13:15	8	120	30
ALPHA	U-5J 12	5854	7244	5861	1	12	9/8/04	13:19	4	120	15
ALPHA	U-5J 13	5854	7244	5861	1	13	9/8/04	13:23	9	120	34
ALPHA	U-5J 14	5854	7244	5861	1	14	9/8/04	13:26	3	120	11
ALPHA	U-9J 01	5854	7244	5861	1	15	9/8/04	13:34	37	120	140
ALPHA	U-9J 02	5854	7244	5861	1	16	9/8/04	13:38	47	120	178
ALPHA	U-9J 03	5854	7244	5861	1	17	9/8/04	13:42	39	120	147
ALPHA	U-9J 04	5854	7244	5861	1	18	9/8/04	13:46	36	120	136
ALPHA	U-9J 05	5854	7244	5861	1	19	9/8/04	13:50	47	120	178
ALPHA	U-9J 06	5854	7244	5861	1	20	9/8/04	13:54	36	120	136
ALPHA	U-9J 07	5854	7244	5861	1	21	9/8/04	14:00	40	120	151
ALPHA	U-9J 08	5854	7244	5861	1	22	9/8/04	14:04	42	120	159
ALPHA	U-9J 09	5854	7244	5861	1	23	9/8/04	14:08	40	120	151
ALPHA	U-9J 10	5854	7244	5861	1	24	9/8/04	14:12	46	120	174
ALPHA	U-9J 11	5854	7244	5861	1	25	9/8/04	14:17	50	120	189
ALPHA	U-9J 12	5854	7244	5861	1	26	9/8/04	14:21	45	120	170
ALPHA	U-9J 13	5854	7244	5861	1	27	9/8/04	14:24	43	120	163
ALPHA	U-9J 14	5854	7244	5861	1	28	9/8/04	14:28	44	120	166
BETA	SRC BKG	5854	7244	5861	2		9/8/04	9:32	626	300	1190
BETA	SRC CHECK	5854	7244	5861	2		9/8/04	9:34	2398	60	22793
BETA	SRC CHECK	5854	7244	5861	2		9/8/04	9:37	2443	60	23220
BETA	SRC CHECK	5854	7244	5861	2		9/8/04	9:38	2587	60	24589
BETA	SRC CHECK	5854	7244	5861	2		9/8/04	9:40	2475	60	23524

Bldg. 22 Final Status Survey Units 5 & 9 (ceiling/roof)

RSDS# 04-TF-0275 RCT: J.M.C RCT: _____

Alpha	43-68 BKG:	0	EFF:	0.21	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :
Beta	43-68 BKG:	0	EFF:	0.167	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # :
Scan	43-37 BKG:	0	EFF:	0.226	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # :
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm²
BETA	U-5J 01	5854	7244	5861	2	1	9/8/04	10:25	120	60	1141
BETA	U-5J 02	5854	7244	5861	2	2	9/8/04	12:42	143	60	1359
BETA	U-5J 03	5854	7244	5861	2	3	9/8/04	12:46	145	60	1378
BETA	U-5J 04	5854	7244	5861	2	4	9/8/04	12:50	132	60	1255
BETA	U-5J 05	5854	7244	5861	2	5	9/8/04	12:54	145	60	1378
BETA	U-5J 06	5854	7244	5861	2	6	9/8/04	12:58	135	60	1283
BETA	U-5J 07	5854	7244	5861	2	7	9/8/04	13:01	138	60	1312
BETA	U-5J 08	5854	7244	5861	2	8	9/8/04	13:05	161	60	1530
BETA	U-5J 09	5854	7244	5861	2	9	9/8/04	13:09	147	60	1397
BETA	U-5J 10	5854	7244	5861	2	10	9/8/04	13:12	146	60	1388
BETA	U-5J 11	5854	7244	5861	2	11	9/8/04	13:16	140	60	1331
BETA	U-5J 12	5854	7244	5861	2	12	9/8/04	13:20	131	60	1245
BETA	U-5J 13	5854	7244	5861	2	13	9/8/04	13:24	152	60	1445
BETA	U-5J 14	5854	7244	5861	2	14	9/8/04	13:27	154	60	1464
BETA	U-9J 01	5854	7244	5861	2	15	9/8/04	13:36	192	60	1825
BETA	U-9J 02	5854	7244	5861	2	16	9/8/04	13:39	190	60	1806
BETA	U-9J 03	5854	7244	5861	2	17	9/8/04	13:43	222	60	2110
BETA	U-9J 04	5854	7244	5861	2	18	9/8/04	13:47	227	60	2158
BETA	U-9J 05	5854	7244	5861	2	19	9/8/04	13:51	239	60	2272
BETA	U-9J 06	5854	7244	5861	2	20	9/8/04	13:55	184	60	1749
BETA	U-9J 07	5854	7244	5861	2	21	9/8/04	14:01	187	60	1777
BETA	U-9J 08	5854	7244	5861	2	22	9/8/04	14:05	208	60	1977
BETA	U-9J 09	5854	7244	5861	2	23	9/8/04	14:09	201	60	1910
BETA	U-9J 10	5854	7244	5861	2	24	9/8/04	14:13	237	60	2253
BETA	U-9J 11	5854	7244	5861	2	25	9/8/04	14:18	214	60	2034
BETA	U-9J 12	5854	7244	5861	2	26	9/8/04	14:22	209	60	1987
BETA	U-9J 13	5854	7244	5861	2	27	9/8/04	14:25	198	60	1882
BETA	U-9J 14	5854	7244	5861	2	28	9/8/04	14:29	216	60	2053

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR002
Batch Ended: 9/9/04 8:21

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: 04-TF-0275 COLLINS A/B (28) AG

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.17		0.00	1.83	
A2	2	0.00	2.21		0.54	1.81	
A3	3	0.00	2.18		0.48	1.76	
A4	4	0.00	2.04		0.00	1.78	
B1	5	1.69	1.97		0.77	2.28	
B2	6	0.00	2.09		1.11	2.39	
B3	7	0.00	1.96		1.32	2.50	
B4	8	0.00	1.92		1.56	2.30	
C1	9	0.00	2.34		0.00	1.97	
C2	10	0.00	2.18		0.00	2.37	
C3	11	0.00	2.10		0.00	1.90	
C4	12	0.00	2.07		0.00	2.23	
D1	13	0.74	2.23		2.99	3.23	
D2	14	0.00	2.27		2.50	2.52	
D3	15	0.00	1.95		0.00	2.04	
D4	16	0.00	2.16		0.63	2.39	
A1	17	0.00	2.16		0.00	1.33	
A2	18	1.73	2.26		4.13	2.83	
A3	19	0.00	2.20		1.70	2.15	
A4	20	1.40	2.07		2.21	2.48	
B1	21	0.00	1.94		0.00	1.98	
B2	22	1.49	2.11		2.07	2.66	
B3	23	0.00	1.92		0.00	1.32	
B4	24	0.00	1.87		0.00	1.20	
C1	25	0.00	2.42		4.50	3.58	
C2	26	0.00	2.18		0.00	2.37	
C3	27	0.00	2.08		0.00	1.39	
C4	28	0.00	2.05		0.00	1.35	

gc gc

gc 9/14/04

gc 9/14/04

All

Time: 2.00
Data Mode: DPM Nuclide: SM6LS02 Quench Set: SM6LS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5	18.6	0	0.0	8.10
Region B:	2.0	18.6	0	0.0	7.17
Region C:	40.0	2000	0	0.0	11.37

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
04-TF-0275 COLLINS (28) AG
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: c:\data\PROT5.DAT
Count Data Filename: c:\data\SDATA5.DAT
Spectrum Data Drive & Path: c:\data

S#	TIME	CPMA	DPM1	2Sigma	CPMB	CPMC	tSIE	FLAG
-1	10.00	8.10		0.00	7.17	11.37	563.17	B
0	2.00	702.03	1315.90	122.49	648.91	0.00	613.44	
1	2.00	1.40	2.63	8.86	1.75	0.00	610.60	
2	2.00	0.00	0.00	0.00	0.00	0.00	611.57	
3	2.00	0.00	0.00	0.00	0.00	0.00	590.65	
4	2.00	0.00	0.00	0.00	0.00	0.00	537.15	
5	2.00	1.40	2.71	9.14	1.41	0.00	575.65	
6	2.00	0.00	0.00	0.00	0.00	0.00	615.87	
7	2.00	0.90	1.68	8.60	1.52	0.00	619.05	
8	2.00	0.00	0.00	0.00	0.00	1.13	609.92	
9	2.00	1.40	2.58	8.69	1.66	0.00	633.53	
10	2.00	0.00	0.00	0.00	0.00	0.13	640.20	
11	2.00	0.00	0.00	0.00	0.00	0.00	618.02	
12	2.00	0.00	0.00	0.00	0.00	0.00	614.81	
13	2.00	0.00	0.00	0.00	0.37	0.00	630.96	
14	2.00	1.40	2.63	8.88	2.04	0.00	608.86	
15	2.00	0.00	0.00	0.00	0.34	0.00	571.08	
16	2.00	0.00	0.00	0.00	0.00	0.00	507.24	
17	2.00	0.00	0.00	0.00	0.00	0.00	538.18	
18	2.00	0.00	0.00	0.00	0.00	0.00	560.26	
19	2.00	0.00	0.00	0.00	0.00	0.00	588.24	
20	2.00	0.40	0.78	8.75	0.16	2.63	572.22	
21	2.00	0.00	0.00	0.00	0.00	0.00	569.38	
22	2.00	0.00	0.00	0.00	0.00	0.00	587.10	
23	2.00	0.00	0.00	0.00	0.00	0.00	544.80	
24	2.00	0.00	0.00	0.00	0.00	0.00	611.66	
25	2.00	0.00	0.00	0.00	0.00	0.00	553.32	
26	2.00	0.00	0.00	0.00	0.00	0.00	573.01	
27	2.00	0.00	0.00	0.00	0.00	0.00	565.14	
28	2.00	0.00	0.00	0.00	0.00	0.00	588.26	

J.C.

J. Collins

Laboratory ID#: 0405248 - 0405249
Project/function: Bldg. 22
Submitted: Sep 13, 2004
Submitted by: B. Coblentz
Point of Contact: B. Coblentz
RSDS#: N/A
Date: Sep 20, 2004

Lab ID 0405248
Sample Location Bldg 22 #4

Isotope	pCi/g	Uncertainty +/-	LDL
Pu-238	<LDL	<LDL	0.79
Pu-239/240	<LDL	<LDL	0.22
Th-227	0.13	0.07	0.09
Th-228	<LDL	<LDL	0.32
Th-230	0.37	0.11	0.09
Th-232	<LDL	<LDL	0.09
U-233/234	1.24	0.26	0.13
U-235	<LDL	<LDL	0.13
U-238	1.29	0.27	0.13
Po-210	77.90	5.36	0.45

Lab ID 0405249
Sample Location Bldg 22 #12

Isotope	pCi/g	Uncertainty +/-	LDL
Pu-238	0.74	0.24	0.60
Pu-239/240	<LDL	<LDL	0.11
Th-227	0.28	0.10	0.09
Th-228	<LDL	<LDL	0.33
Th-230	0.45	0.13	0.09
Th-232	0.10	0.06	0.09
U-233/234	0.82	0.20	0.12
U-235	0.77	0.20	0.12
U-238	<LDL	<LDL	0.57
Po-210	97.81	6.64	0.13

LCH

[redacted]

HP # 2857 Date 9/20/04

HP # Date

BWXT of Ohio, Inc.

ANALYTICAL SERVICES REQUEST FOR ANALYSIS

DATE SUBMITTED:	SAMPLE TYPE:	COLLECTED BY:	NUMBER OF SAMPLES
9-13-04	metal	B. Coblentz	2

PROJECT/FUNCTION:	PRIMARY CONTACT/PHONE NO.:	MAIL STOP:
BOSS		

CHARGE NUMBER:	DATE(S) COLLECTED:	RSDS# (if applicable):	ATTACHMENTS (list):
EA554A			

ANALYSES REQUESTED (check):

- ☐ ^3H
- ☐ Characterize/Approve for Sanitary or Storm Discharge. Estimate of Total Volume for Release_____ Approved_____
- ☐ Gross Alpha
- ☐ Air Filter – Isotopic Analysis
- ☐ Characterization per MD-80036, Operation #10015
- ☑ Isotopic Analysis: Pu____ U____ Th____ Am____ Other____
- ☐ Other _____

ADDITIONAL INFORMATION:

NOTE: Attach additional information (e.g. RSDS, screening results, collection data, and gamma spec. results) if applicable

LAB IDENTIFICATION	SAMPLE LOCATION	SAMPLE NUMBER	RESULTS
0405248	Bldg. 22	4	
0405249	Bldg. 22	12	

COMMENTS:

ANALYZED BY	DATE:
L. C. Hopkins	8-15-04

ML-5222 (1-01)

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) 22 - Rm. 1 ceiling	SURVEY NO. 04-TF-0276
PURPOSE: MARSSIM final status survey Unit 5 ceiling scan	RWP NO. N/A
	DATE: 9-9-04
	TIME: 1630

MAP / DRAWING

Ceiling coupons x 14

100% SCAN ON 14 total Coupons

NO ALARM ACKNlage

Intergrated Counts ON Coupons 2, 9, 12, 14

LEGEND:
= mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
K = factor of 1000
— · — · — = radiological boundary
= mrem/hr neutron
= air sample number
= swipe number
#/α or /β = direct contamination measurement in dpm/100 cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5854/5861	7-20-05
	N A	

[redacted]

HP# 7244	Date 9/16/04
HP# 7244	Date 9-9-04
HP# 7707	Date: 9-20-04

ML-9620 (2-98) Computer Generated

22-Building Final Status Survey Unit 5 (ceiling scan)

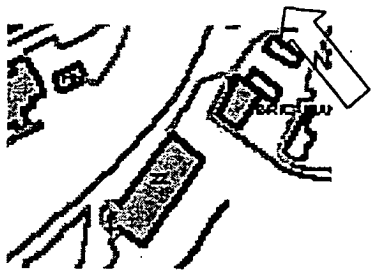
RSDS# 04TF-0276 *RCT:* J.M.C. *RCT:* N/A

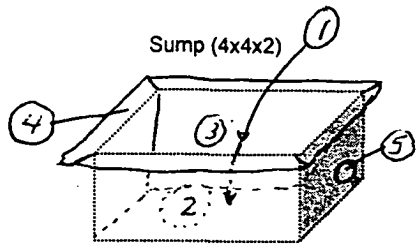
Alpha	**43-68 BKG:**	**0**	**EFF:**	**0.21**	**PROBE AREA:**	**126**	**cm^2**	**Surface Eff:**		**0.5**	**Detector # :**
Beta	**43-68 BKG:**	**0**	**EFF:**	**0.167**	**PROBE AREA:**	**126**	**cm^2**	**Surface Eff:**		**0.5**	**Detector # :**
Scan	**43-37 BKG:**	**0**	**EFF:**	**0.226**	**PROBE AREA:**	**584**	**cm^2**	**Surface Eff:**		**0.5**	**Detector # :**
TYPE	**LOCATION**	**2350#**	**RCT ID**	**PROBE**	**DET #**	**ITEM #**	**DATE**	**TIME**	**CNTS**	**CT TIME**	**dpm/100cm**
ALPHA	SRC BKG	5854	7244	5861	1		9/9/04	10:09	16	300	24
ALPHA	SRC CHECK	5854	7244	5861	1		9/9/04	10:12	1969	60	14883
ALPHA	SRC CHECK	5854	7244	5861	1		9/9/04	10:13	2020	60	15268
ALPHA	SRC CHECK	5854	7244	5861	1		9/9/04	10:15	2111	60	15956
ALPHA	SRC CHECK	5854	7244	5861	1		9/9/04	10:16	2106	60	15918
ALPHA	U-5 01	5854	7244	5861	1	1	9/9/04	12:54	5	120	19
ALPHA	U-5 02	5854	7244	5861	1	2	9/9/04	13:45	3	120	11
ALPHA	U-5 03	5854	7244	5861	1	3	9/9/04	14:15	6	120	23
ALPHA	U-5 04	5854	7244	5861	1	4	9/9/04	14:29	4	120	15
BETA	SRC BKG	5854	7244	5861	2		9/9/04	10:22	610	300	1160
BETA	SRC CHECK	5854	7244	5861	2		9/9/04	10:23	2170	60	20625
BETA	SRC CHECK	5854	7244	5861	2		9/9/04	10:25	2462	60	23401
BETA	SRC CHECK	5854	7244	5861	2		9/9/04	10:26	2424	60	23040
BETA	SRC CHECK	5854	7244	5861	2		9/9/04	10:27	2615	60	24855
BETA	U-5 01	5854	7244	5861	2	1	9/9/04	12:55	139	60	1321
BETA	U-5 02	5854	7244	5861	2	2	9/9/04	13:46	154	60	1464
BETA	U-5 03	5854	7244	5861	2	3	9/9/04	14:16	142	60	1350
BETA	U-5 04	5854	7244	5861	2	4	9/9/04	14:30	150	60	1426

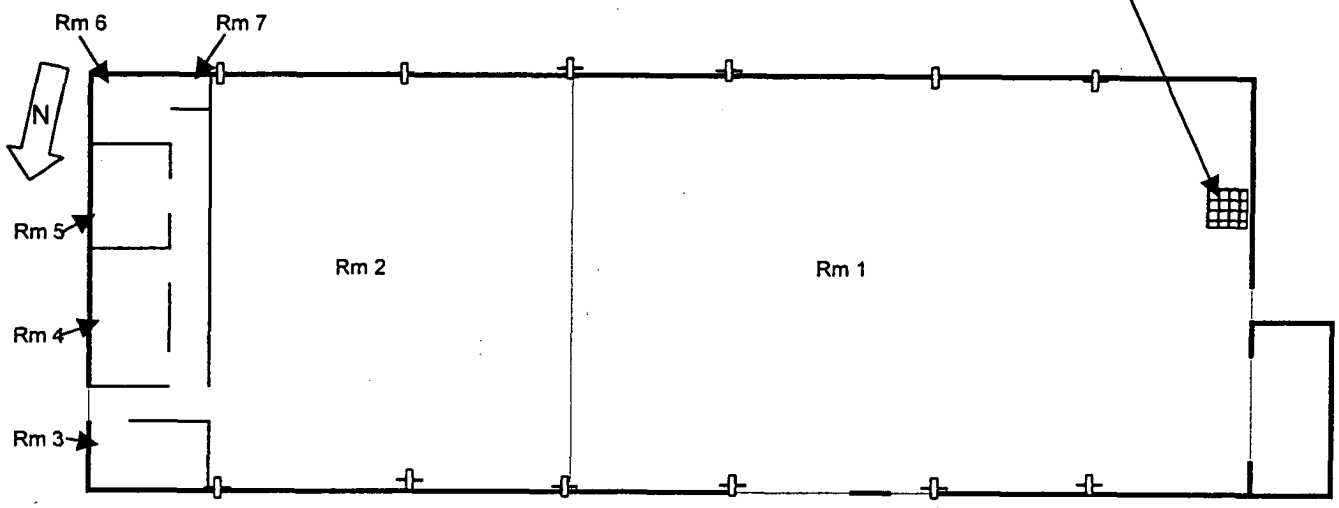
RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	SURVEY NO.
Building 22	04-TF-0308
PURPOSE:	RWP NO.
Characterization Survey	N/A
	DATE: 09/30/04
	TIME: 11:30

MAP / DRAWING







5 smears taken ~ see attached for location/identification

LEGEND:

- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+η+γ) extremity on contact
- K = factor of 1000
- — · — · — · · = radiological boundary
- # - mrem/hr neutron
- # - swipe number
- # - air sample number
- #/α or /β - direct contamination measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360-89	5752-5732	10-23-04

[redacted]

HP#	Date
7224/7244	9/30/04
[redacted]	
HP#	9/30/04
ched	
HP# 7707	Date: 09-30-04
[redacted]	

Survey No.
04-TF-0308

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
1	← SEE ATTACHED		→	FLOOR
2	↓	↓	↓	SIDE
3				SIDE
4				LEDGE
5	▼	▼	▼	DRAIN
NFE				

Removable Contamination				
Swipes (dpm/100cm^2)				
Sample #	β/γ	Alpha	Tritium	Comments
		N/A		

COMMENTS: 236C used to Field Check Swipes taken

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

G 96B of 96

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Aqua
Data file name: SMEAR017
Batch Ended: 9/30/04 11:50

Crosstalk correction performed.

Recalibration Date: 03/18/05
Serial Number: 26966-1

Batch ID: COBLENTZ 04-TF-0308 [5] JC

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
A1	1	0.00	2.19		0.96	2.23	
A2	2	0.00	2.24		3.04	2.54	
A3	3	0.00	2.22		2.92	2.47	
A4	4	0.00	2.03		0.00	1.29	
B1	5	0.00	1.94		0.00	1.98	

AR AR

99% C.L.

J. Cordino

30 Sep 2004 11:59 ALPHA/BETA - 1.09 Page #1 4-3
Protocol #: 1 Pw H3 #403728 User : 2324

Time: 2.00
Data Mode: DPM Nuclide: SMGLO2 Quench Set: SMGLO2
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	8.80
Region B:	2.0 -	18.6	0	0.0	8.60
Region C:	40.0 -	2000	0	0.0	11.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
COBLENTZ 04-TF-0308 1-5 JC
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: c:\data\prot1.dat
Count Data Filename: c:\data\SDATA1.DAT
Spectrum Data Drive & Path: c:\data

S#	TIME	CPMA	LUM	FLAG	tSIE	DPM1	2Sigma	CPMC
-1	10.00	8.80	9	B	567.48		0.00	11.00
0	2.00	698.57	0		627.78	1307.61	105.68	1.00
1	2.00	2.88	0		530.42	5.89	10.67	0.00
2	2.00	3.70	0		605.38	7.06	10.26	0.00
3	2.00	0.00	0		604.14	0.00	0.00	0.00
4	2.00	0.00	0		549.69	0.00	0.00	0.33
5	2.00	0.00	0		572.75	0.00	0.00	0.00

AR

95
G 96 D of 96

J. Corkran

22-Building Pit Characterization Survey

RSDS# 04-TF-0308 RCT: JMC RCT: AR

Alpha	43-68 BKG:	0	EFF:	0.2297	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 1
Beta	43-68 BKG:	0	EFF:	0.1863	PROBE AREA:	126	cm^2	Surface Eff:		0.5	Detector # : 2
Scan	43-37 BKG:	0	EFF:	0.1948	PROBE AREA:	584	cm^2	Surface Eff:		0.5	Detector # : 3
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	SRC BKG	5857	7244	5859	1		9/30/04	10:54	3	300	4
ALPHA	SRC CHECK	5857	7244	5859	1		9/30/04	11:02	2059	60	14228
ALPHA	SRC CHECK	5857	7244	5859	1		9/30/04	11:04	2045	60	14132
ALPHA	SRC CHECK	5857	7244	5859	1		9/30/04	11:05	2003	60	13841
ALPHA	SRC CHECK	5857	7244	5859	1		9/30/04	11:06	2027	60	14007
ALPHA	BLD22 PIT	5857	7244	5859	1	1	9/30/04	11:42	4	120	14
ALPHA	BLD22 PIT	5857	7244	5859	1	2	9/30/04	11:46	1	120	3
ALPHA	BLD22 PIT	5857	7244	5859	1	3	9/30/04	11:50	2	120	7
ALPHA	BLD22 PIT	5857	7244	5859	1	4	9/30/04	11:53	3	120	10
ALPHA	BLD22 PIT	5857	7244	5859	1	5	9/30/04	11:57	5	120	17
BETA	SRC BKG	5857	7244	5859	2		9/30/04	11:12	948	300	1615
BETA	SRC CHECK	5857	7244	5859	2		9/30/04	11:14	2848	60	24265
BETA	SRC CHECK	5857	7244	5859	2		9/30/04	11:15	2940	60	25049
BETA	SRC CHECK	5857	7244	5859	2		9/30/04	11:16	2745	60	23388
BETA	SRC CHECK	5857	7244	5859	2		9/30/04	11:17	2735	60	23303
BETA	BLD22 PIT	5857	7244	5859	2	1	9/30/04	11:43	207	60	1764
BETA	BLD22 PIT	5857	7244	5859	2	2	9/30/04	11:47	223	60	1900
BETA	BLD22 PIT	5857	7244	5859	2	3	9/30/04	11:51	193	60	1644
BETA	BLD22 PIT	5857	7244	5859	2	4	9/30/04	11:54	173	60	1474
BETA	BLD22 PIT	5857	7244	5859	2	5	9/30/04	11:58	175	60	1491

 G 96 - 096

Appendix H

Radon Information

Radon level is not applicable for open air demolitions.

Appendix I

Asbestos Information

From: Christopher Ahlquist
To: Kramer, Donald
Date: 8/12/04 2:49PM
Subject: Bldg 22 BDP

Don -

For Building 22 asbestos and lead paint concerns, the following is provided for your use:

Asbestos

A previous asbestos survey report for Building 22 was located and reviewed; this report was a summary of surveys conducted by PEI Associates in 1989. Additionally, individual asbestos analysis results of Building 22 materials sampled by Mound Industrial Hygienists were reviewed. Mr. Chris Ahlquist, an Industrial Hygienist with CH2M Hill Mound, performed a walk-through survey of the accessible areas of the building during July of 2004 in order to identify any existing or potential asbestos hazards and collect additional samples of suspect materials for analysis. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist as required by State regulations for individuals assessing asbestos-containing materials. No materials were previously identified as asbestos-containing in the reports reviewed, but a cementitious wall panel (transite) was previously labeled as asbestos-containing. This panel was the only asbestos-containing material located within or on the building.

This material will be removed and packaged by an Ohio Department of Health Licensed Asbestos Abatement Contractor or other properly trained and certified personnel, in the Summer of 2004. The asbestos material will be removed in accordance with NESHAP requirements and placed into an approved waste container for disposal by the Mound Waste Management Group.

Lead

No previous lead surveys or sampling data were found for Building 22. Mr. Chris Ahlquist, an Industrial Hygienist with CH2M Hill Mound, performed a walk-through survey of the accessible areas of the referenced building in July of 2004 in order to identify any existing or potential lead paint hazards. The paint coatings present were observed to be intact and no potential hazards observed. Untested paint should be assumed to contain lead until such time that testing proves otherwise.

Since the building is scheduled for imminent demolition, painted surfaces will be tested for lead content as planned work indicates the need for such testing in order to avoid worker exposure to lead. This restriction will be incorporated into work plans for which disturbance of paint is a possibility.

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

Let me know if I can be of further assistance,

Chris Ahlquist

This page intentionally left blank.

Date: August 5, 2004

From: Christopher Ahlquist
BOSS Project Safety & Health

To: Mark Schmidt
BOSS Project Engineering

Re: Building 22: Asbestos-Containing Materials

During July of 2004, Mr. Christopher Ahlquist, an Industrial Hygienist with CH2M Hill Mound, Inc. (CH2M), completed a survey of Building 22 at the Mound site in Miamisburg, Ohio for purpose of identifying asbestos-containing materials contained therein. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist as required by Ohio Department of Health regulations. During the course of the survey, Mr. Ahlquist reviewed previous survey reports and sampling data of materials found within Building 22 as necessary in order to determine the asbestos content of said materials. A room-by-room inspection of all accessible spaces was then conducted in order to verify the previous data and prepare an inventory of the location and approximate quantities of identified asbestos-containing materials. One (1) distinct type of material, a transite wall panel behind electrical breaker boxes, was found to contain greater than one percent (>1%) asbestos content which defines a material as asbestos-containing by EPA and OSHA regulations.

Sample Method

During CH2M's review of previous surveys it was noted that previous bulk samples were collected utilizing sampling methods and protocol specified in the EPA's Asbestos Hazard Emergency Response Act (AHERA). Each sample was collected and placed in a clean, sealable hard-shell container and labeled with a unique sample identification number. Pertinent information was recorded on a Bulk Sample Data Sheet including sample identification number, date of inspection, name of inspector, building name, a brief description and location of the sample, and the type of material sampled (e.g., preformed-block pipe insulation, aircell-paper pipe insulation, etc.).

Analysis of Samples

The reviewed samples were submitted to accredited laboratories and analyzed for asbestos content by PLM and dispersion staining (Method Reference: 40 CFR Part 763, Volume 47, No. 103, May 27, 1982 pg. 23376). This analytical method, which the EPA currently recommends for the determination of asbestos in bulk samples of suspect materials, can be used for qualitative identification of six morphologically different types of asbestos fibers: chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite asbestos. The method specifies that the asbestos content in a bulk sample shall be

estimated and reported as a finite percentage (rounded to the nearest percentage) within the range of 0 to 100. The result of the bulk sample analysis is reported in a standard written laboratory report. This report includes the client name, the project number, the laboratory identification number, the sample number assigned to the bulk sample upon receipt at the laboratory, and the field number assigned to the bulk sample upon collection at the site. If the bulk sample contains more than one distinct layer of material, each layer is analyzed separately. The composition of the bulk sample is reported in percentages of asbestos (i.e., cellulose, fiberglass, or other) components. The results of the sample analyses can be found on the laboratory reports.

The analyzing laboratories utilized were accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is the agency sponsored by the National Institute of Standards and Technology providing EPA accreditation of laboratories analyzing bulk samples for asbestos content.

Conclusions

One (1) type of material was identified through analysis to be asbestos-containing (>1%) per EPA and OSHA definition. This material was the transite (asbestos cement) panel located behind the electrical breaker boxes on the north wall of Room 1. There was 20 square feet of this material and it is considered Nonfriable Category II in accordance with the EPA's NESHAP regulation. Since the building is scheduled for demolition, this material will have to be removed prior to demolition. Notification of the EPA and the Ohio Department of Health of this removal activity is not required due to the quantity involved. Removal activities must be accomplished by properly trained individuals employing appropriate work methods and engineering controls.

Please call with any questions or concerns.

Respectfully,

Christopher Ahlquist
Industrial Hygienist

TABLE: INVENTORY OF ASBESTOS-CONTAINING MATERIALS
BUILDING 22
AUGUST 5, 2004

Location of ACM	Material Description	Homo-geneous Area No.	Type ACM	Material Quantity (approx.)
Room 1, north wall electrical panel	Transite panel, 1/2" thick	1	Misc.	20 sf

Notes:

sf = square feet
Misc. = miscellaneous material

Appendix J

Lead Information

From: Christopher Ahlquist
To: Kramer, Donald
Date: 8/12/04 2:49PM
Subject: Bldg 22 BDP

Don -

For Building 22 asbestos and lead paint concerns, the following is provided for your use:

Asbestos

A previous asbestos survey report for Building 22 was located and reviewed; this report was a summary of surveys conducted by PEI Associates in 1989. Additionally, individual asbestos analysis results of Building 22 materials sampled by Mound Industrial Hygienists were reviewed. Mr. Chris Ahlquist, an Industrial Hygienist with CH2M Hill Mound, performed a walk-through survey of the accessible areas of the building during July of 2004 in order to identify any existing or potential asbestos hazards and collect additional samples of suspect materials for analysis. Mr. Ahlquist is an Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist as required by State regulations for individuals assessing asbestos-containing materials. No materials were previously identified as asbestos-containing in the reports reviewed, but a cementitious wall panel (transite) was previously labeled as asbestos-containing. This panel was the only asbestos-containing material located within or on the building.

This material will be removed and packaged by an Ohio Department of Health Licensed Asbestos Abatement Contractor or other properly trained and certified personnel, in the Summer of 2004. The asbestos material will be removed in accordance with NESHAP requirements and placed into an approved waste container for disposal by the Mound Waste Management Group.

Lead

No previous lead surveys or sampling data were found for Building 22. Mr. Chris Ahlquist, an Industrial Hygienist with CH2M Hill Mound, performed a walk-through survey of the accessible areas of the referenced building in July of 2004 in order to identify any existing or potential lead paint hazards. The paint coatings present were observed to be intact and no potential hazards observed. Untested paint should be assumed to contain lead until such time that testing proves otherwise.

Since the building is scheduled for imminent demolition, painted surfaces will be tested for lead content as planned work indicates the need for such testing in order to avoid worker exposure to lead. This restriction will be incorporated into work plans for which disturbance of paint is a possibility.

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

Let me know if I can be of further assistance,

Chris Ahlquist

Appendix K

Chemical Information

A list of chemicals known to have been in Building 22 is provided.

Chemicals and Products Used or Stored in Building 22

Adhesive, Spray
Calci-Solve
Chlorodifluoromethane
Dichlorodifluoromethane
Ethylene Glycol
Finish Stripper
Floor Finish
Floor Sealer and Conditioner
Isopropyl Alcohol
Non-Acid Disinfectant Bathroom Cleaner
Odor Bane
Oil Waste, Alcatel Vacuum Pump Oil
Oil Waste, Duo-Seal Pump Oil
Oil Waste, Vacuum Pump Oil
Paint, Latex
Rinse Water
Sodium
Window Cleaner

Appendix L

Soil Sampling, Vicinity

Building 22 Detects

Location_ name	Sample_id	Collection_ date	Value_name	Measured_ value	Value_ units	Detection_ limit	Chem_ class	Start_ depth	End_ depth	Lab	Data	Project_code	Media	Comments
SCR420	88042720	19880427	Plutonium-238	30.000000	PCI/G		RAD	4.00	4.00			SCRDATA	Soil	12
SCR420	88042810	19880428	Plutonium-238	26.000000	PCI/G		RAD	3.00	3.00			SCRDATA	Soil	12
SCR417	88042817	19880428	Plutonium-238	25.000000	PCI/G		RAD	3.00	3.00			SCRDATA	Soil	12
S0423	10469	19850801	Plutonium-238	2.400000	PCI/G	0.010000	RAD	0.00	0.00			RSS	Soil	2
S0421	10470	19850801	Plutonium-238	1.680000	PCI/G	0.010000	RAD	0.00	0.00			RSS	Soil	2
S0424	10468	19850801	Plutonium-238	1.230000	PCI/G	0.010000	RAD	0.00	0.00			RSS	Soil	2
S0660	5833	19840701	Plutonium-238	0.360000	PCI/G	0.010000	RAD	0.00	0.00			RSS	Soil	2
SCR417	88042817	19880428	Thorium-232	2.300000	PCI/G		RAD	3.00	3.00			SCRDATA	Soil	1222344

(Blank)	No criteria checked
0	Value is less than criteria checked in file "Final RBGVs Constr Worker-Site Employee_Rev7.xls"
1	Value is greater than 10-6 Risk-Based Guideline Value
2	Value is greater than the OU9 Soil Background 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
9	Value is greater than the Guide Value based on the Hazard Index = .1 + background

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

Building 22 Non-Detects

Location _name	Sample_id	Collection _date	Value_name	Measured _value	Value _units	Detection _limit	Chem _class	Start_	End_	Lab_	Data_	Project_code	Media
SCR420	8804289	19880428	Plutonium-238	18.000000	PCI/G		RAD	2.0	2.0	U		SCRDATA	Soil
SCR417	88042811	19880428	Plutonium-238	22.000000	PCI/G		RAD	4.0	4.0	U		SCRDATA	Soil
SCR420	88042719	19880427	Plutonium-238	23.000000	PCI/G		RAD	5.0	5.0	U		SCRDATA	Soil
SCR420	88042720	19880427	Thorium-232	1.500000	PCI/G		RAD	4.0	4.0	U		SCRDATA	Soil
SCR420	88042719	19880427	Thorium-232	1.600000	PCI/G		RAD	5.0	5.0	U		SCRDATA	Soil
SCR420	88042810	19880428	Thorium-232	1.700000	PCI/G		RAD	3.0	3.0	U		SCRDATA	Soil
SCR417	88042811	19880428	Thorium-232	1.800000	PCI/G		RAD	4.0	4.0	U		SCRDATA	Soil
SCR420	8804289	19880428	Thorium-232	1.900000	PCI/G		RAD	2.0	2.0	U		SCRDATA	Soil
S0421	10470	19850801	Thorium-232	2.000000	PCI/G	2.000	RAD	0.0	0.0	U		RSS	Soil
S0424	10468	19850801	Thorium-232	2.000000	PCI/G	2.000	RAD	0.0	0.0	U		RSS	Soil
S0423	10469	19850801	Thorium-232	2.000000	PCI/G	2.000	RAD	0.0	0.0	U		RSS	Soil
S0660	5833	19840701	Thorium-232	2.000000	PCI/G	2.000	RAD	0.0	0.0	U		RSS	Soil

Lab and data qualifiers are defined on pages 5 and 6 of this appendix

11 of 47

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.

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.

Comparison 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
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	5.42E+01	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	5.25E+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

A search of the occurrence reporting system revealed five reports, all of which were minor and without environmental impact:

- Building 22 Dry Sprinkler System Activation (copy provided)
- Tritium Contaminated Drums in Building 22 (copy provided)
- Exceedance of Building 22 Radiological Limits
- New Benchmark Environ. Corp. Wooden Box Characterization Data & BD-22 Authorization Basis
- 480 VAC Electrical Line Contacted While Unloading Constriction Equipment From Truck Resulting in Power Outage to BD-22

ALO-DA-EGGM-EGGMAT04-1992-0002 FINAL

Occurrence Report
Before 2003 Redesign

Sites and Grounds

(Name of Facility)

Balance-of-Plant

(Facility Function)

Mound Plant EG&G Mound Applied Technologies

(Laboratory, Site, or Organization)

Name: Castleberry, V. E.
Title: Director, Engineering **Telephone No.:** (513) 865-3458

(Facility Manager/Designee)

Name: Heitz, David L.
Title: Fire Protection Supervisor **Telephone No.:** (513) 865-3125

(Originator/Transmitter)

Name: **Date:**

(Authorized Classifier (AC))

1. Occurrence Report Number: ALO-DA-EGGM-EGGMAT04-1992-0002

Building 22 Dry Sprinkler System Activation

N/A

Small water leak. No spread to environment

2. Report Type and Date: FINAL

	Date	Time
Notification:	01/22/1992	11:21 (MTZ)
Initial Update:	02/04/1992	13:30 (MTZ)
Latest Update:	02/04/1992	13:30 (MTZ)
Final:	02/19/1992	05:15 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: EG&G Mound Applied Technologies

6. Secretarial Office: DP - Defense Programs

7. System, Bldg., or Equipment: Building 22

8. UCNI?: No

M1 of 9

9. Plant Area: Lower

10. Date and Time Discovered: 01/21/1992 12:56 (ETZ)

11. Date and Time Categorized: 01/21/1992 13:30 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
01/21/1992	13:45 (ETZ)	George R. Gartrell	DOE/DAO

13. Other Notifications:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

14. Subject or Title of Occurrence:

Building 22 Dry Sprinkler System Activation

---

15. Nature of Occurrence:

01) Facility Condition
C. Safety Status Degradation

---

16. Description of Occurrence:

A low air pressure alarm was received at 12:56 p.m. on January 21 from Building 22. When Fire Department personnel arrived they found air leaking from a cracked condensate trap. At approximately 1:00 p.m., while being observed by a fire fighter, water started to leak from the trap. The water was turned off in less than one minute. During the winter, the condensate trap is on a two week maintenance schedule to drain the condensate. The trap was traced with heat tape. However, the tape was found to be unplugged. The area involved is a storage area, and no damage other than the loss of the trap occurred.

This occurrence report was reviewed by an authorized derivative classifier, (Paul B. Dowd), and contains no classified nor UCNI information.

M 2 of 9

17. Operating Conditions of Facility at Time of Occurrence:

Normal first shift operations. This was the first mild day, (in temperature), after a cold snap.

18. Activity Category:

03 - Normal Operations (other than Activities specifically listed in this Category)

19. Immediate Actions Taken and Results:

The system was immediately shut down and drained. The system was returned to service the same day utilizing a nitrogen cylinder as a source of gas pressure. The pressure switch will be repaired, or replaced, and the system permanently put back in service by the end of the week.

20. Direct Cause:

2) Procedure Problem
A. Defective or Inadequate Procedure

21. Contributing Cause(s):

1) Equipment/Material Problem
A. Defective or Failed Part

7) External Phenomena
A. Weather or Ambient Condition

22. Root Cause:

2) Procedure Problem
A. Defective or Inadequate Procedure

23. Description of Cause:

A number of scenarios could have precipitated the problem. We know that coincident with the leak, the air compressor pressure switch failed and the compressor was running continuously. This would put an unusual amount of moisture in the system. Moisture buildup in the trap may have been due to inadequate draining frequencies. This has been done every two weeks

M3 of 9

in the past and no unusual amount of moisture has been noted. It is unlikely that a definite cause can be identified, however, the corrective actions will prevent a recurrence.

24. Evaluation (by Facility Manager/Designee):

It is unlikely that a definite cause can be identified. Checking the drains on a daily basis in below-freezing weather will resolve all identified possible causes. This includes system leaks, compressor or pressure switch failure, and less than adequate inspection and condensate trap draining frequency.

25. Is Further Evaluation Required?: No

26. Corrective Actions
(* = Date added/revised since final report was approved.)

1.	Establish a procedure to check and drain condensate on a daily basis, based on outside temperatures.	
	Target Completion Date: 01/31/1992	**Completion Date:** 01/22/1992
2.	Stress importance of draining condensate on a regular basis to Fire Department personnel.	
	Target Completion Date: 01/25/1992	**Completion Date:** 01/25/1992
3.	Restore system to permanent service.	
	Target Completion Date: 01/31/1992	**Completion Date:** 01/30/1992

27. Impact on Environment, Safety and Health:

None

28. Programmatic Impact:

None

29. Impact on Codes and Standards:

None.

The NFPA codes require daily draining of condensate until the quantity is nil. After that a reduced frequency is acceptable.

30. Lessons Learned:

M 4 of 9

Increased frequency of checking and draining of condensate will identify other system problems that can lead to failure.

---

31. Similar Occurrence Report Numbers:

None

---

32. User-defined Field #1:

33. User-defined Field #2:

---

34. HQ Keyword(s):

---

35. DOE Facility Representative Input:

---

36. DOE Program Manager Input:

---

37. Approvals:

Approved by: Castleberry, V. E., Facility Manager/Designee
Date: 02/11/1992
Telephone No.: (513) 865-3458

Approved by: Gartrell, George R., Facility Representative/Designee
Date: 02/19/1992
Telephone No.:

Approved by: Hagan, Ralph A., Program Manager/Designee
Date: 02/19/1992
Telephone No.:

M5 of 9

OH-MB-BWO-BWO06-2001-0003 FINAL

Occurrence Report
Before 2003 Redesign

Waste Management Facilities

(Name of Facility)

Nuclear Waste Operations/Disposal

(Facility Function)

Mound Plant Babcock and Wilcox of Ohio, Inc.

(Laboratory, Site, or Organization)

Name: SIENKIEWICZ, CHARLES J
Title: Facility Manager **Telephone No.:** (937) 865-3314

(Facility Manager/Designee)

Name: SIENKIEWICZ, CHARLES J
Title: **Telephone No.:** (937) 865-3314

(Originator/Transmitter)

Name: Finley Morris **Date:** 09/27/2001

(Authorized Classifier (AC))

1. Occurrence Report Number: OH-MB-BWO-BWO06-2001-0003

Tritium Contaminated Drums in Building 22

2. Report Type and Date: FINAL

	Date	Time
Notification:	09/20/2001	13:24 (MTZ)
Initial Update:	09/27/2001	13:20 (MTZ)
Latest Update:	10/29/2001	10:19 (MTZ)
Final:	10/31/2001	08:39 (MTZ)

See Body of Report

3. Occurrence Category: Off-Normal

No spread to Environment

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: BWXT of Ohio, Inc.

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Building 22 Waste Storage Facility

8. UCNI?: No

M6 of 9

9. Plant Area: Test Fire Valley

10. Date and Time Discovered: 09/20/2001 07:00 (ETZ)

11. Date and Time Categorized: 09/20/2001 09:00 (ETZ)

12. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
NA	NA	NA	NA

13. Other Notifications:

Date	Time	Person Notified	Organization
09/20/2001	09:15 (ETZ)	Chris White	DOE/MEMP

14. Subject or Title of Occurrence:

Tritium Contaminated Drums in Building 22

---

15. Nature of Occurrence:

01) Facility Condition
D. Loss of Control of Radioactive Material/Spread of Radioactive Contamination

---

16. Description of Occurrence:

Drums containing tritium contaminated waste were transferred from the Semi-Works (SW) Building to Building 22 on September 19, 2001. Routine surveys in Building 22, in preparation for shipment, completed upon receipt indicated results for removable tritium contamination in excess of levels indicated on the Radioactive Material Transfer tags. A recount of the swipes confirmed elevated readings on the bottoms of two drums in excess of reporting limits. One drum had removeable contamination of approximately 194,000 dpm/100 cm2 and the second drum had removeable contamination of approximately 143,000 dpm/100 cm2. The second drum also showed contamination of approximately 30,000 dpm on the side.

---

17. Operating Conditions of Facility at Time of Occurrence:

Normal operations

---

18. Activity Category:

02 - Maintenance

---

19. Immediate Actions Taken and Results:

The contaminated drums were isolated in a contamination area. Initial swipes were recounted. Additional surveys were performed to determine the extent and level of contamination on the drums received. The drums were checked for off-gassing. The truck used for transport, handling equipment in Building 22 and handling equipment in SW Building was surveyed for tritium contamination. Personnel involved in the transport and handling of the drums were notified and bioassay samples were requested. A critique was held. Additional surveys were requested to verify contamination on the drums. Surveys will be taken to determine if the skids in BD-22 are contaminated and if the dock was contaminated during off loading of the drums. SW floors and dock will be surveyed to verify no spread of contamination.
Results of follow-up surveys:

M7 of 9

SW-148: Maximum wipe ~300 dpm/100 cm2
SW hallway to dock: <10,000 dpm/100 cm2
SW dock: ~30 dpm/100 cm2
SW drum carts: green cart 11,0000 dpm/100 cm2
BD-22 Dock/Building: ~10 dpm/100 cm2
BD-22 Drum Carts: <10,000 dpm/100 cm2
BD-22 boards under drums: 12,980 dpm/100 cm2
Truck 4 Wheeled cart: 34 dpm/100 cm2
Truck cab: <10,000 dpm/100 cm2
Drum 3275: < 10, 000 dpm/100 cm2 (previously 194,000 dpm/100 cm2 on bottom)
Drum 2466: Side 13, 266 dpm/100 cm2; bottom lip 386,160 dpm/100 cm2; bottom 59,973 dpm/100 cm2 (previously ~143,000 dpm/100 cm2)

---

20. Direct Cause:

8) Radiological/Hazardous Material Problem
B. Source Unknown

21. Contributing Cause(s):

8) Radiological/Hazardous Material Problem
B. Source Unknown

22. Root Cause:

8) Radiological/Hazardous Material Problem
B. Source Unknown

---

23. Description of Cause:

Swipe surveys designed to characterize objects for release from a contamination area are assumed to be representative of contamination over the entire object. The evidence suggests that the representative swipe surveys for release of one container missed localized contamination. This resulted in cross contamination of a second container (either by setting on the floor, use of the fork truck to spread contamination from one drum to the other, or the Radiological Control Technician may have transferred contamination via handling to obtain the surveys).

---

24. Evaluation (by Facility Manager/Designee):

Radiological surveys performed to meet DOT shipping requirements (22 dpm/cm2) discovered surface contamination on two drums in excess of internal requirements (10,000 dpm/100 cm2) not identified prior to release from a contamination area. Subsequent surveys identified a single drum as the most probable source. Overpacking the contaminated drum is sufficient to meet DOT requirements. Review and analysis of existing procedures and methodologies for performing radiological surveys for release from contamination areas was determined to be adequate based on past performance.

---

25. Is Further Evaluation Required?: No

---

26. Corrective Actions
(* = Date added/revised since final report was approved.)

1.

Overpack contaminated drum.	
Target Completion Date: 09/24/2001	**Completion Date:** 09/24/2001

2.

Remove contaminated skid from Building 22.	
Target Completion Date: 09/27/2001	**Completion Date:** 09/25/2001

M8 of 9

27. Impact on Environment, Safety and Health:

None.

28. Programmatic Impact:

None.

29. Impact on Codes and Standards:

None.

30. Lessons Learned:

None

31. Similar Occurrence Report Numbers:

OH-MB-BWO-BWO04-1999-0007

32. User-defined Field #1:

33. User-defined Field #2:

34. HQ Keyword(s):

06B--Radiological Issues - Facility/Equipment/Site Contamination

35. DOE Facility Representative Input:

36. DOE Program Manager Input:

37. Approvals:

Approved by: SIENKIEWICZ, CHARLES J, Facility Manager/Designee
Date: 10/29/2001
Telephone No.: (937) 865-3314

Approved by: WHITE, CHRISTOPHER A, Facility Representative/Designee
Date: 10/31/2001
Telephone No.: (937) 865-4396

Approved by: Approval delegated to FR, Program Manager/Designee
Date: 10/31/2001
Telephone No.:

M9 of 9

Appendix N

PRS Information

Recommendation pages are not generated for PRSs that require Further Assessment (FA) or that are unbinned. Accordingly, there is no recommendation page included herein for PRS 286

The Recommendation Sheet for PRS 67 is not complete; the Core Team-approved Fact Sheet for PRS 67 is included herein in its place.

RECOMMENDATION

PRS 31-36, 125, & 270 Package

Potential Release Sites (PRSs) 31-36, 125, and 270 were identified as PRSs as a result of breaks and/or separations in Mound's sanitary sewer lines, identified during a 1982 video survey of the lines. Radionuclides were not considered contaminants of concern. The concern was the potential release of non-radioactive contaminants into the environment from the identified breaks in the lines. A subsequent project repaired these lines by replacing them or by extruding a liner at the point of the breaks. Soil sampling was performed and results for all non-radioactive analytes were below 10^{-5} Risk-Based Guideline Values.

Therefore, the Core Team recommends <u>No Further Assessment</u> for PRSs 31-36, 125, and 270.

11-27-02

Rob Rothman, OSC
U.S. Department of Energy
Miamisburg, Ohio

11/26/02

Tim Fischer, RPM
USEPA
Chicago, Illinois

11/27/02

Brian Nickel
OEPA
Dayton, Ohio

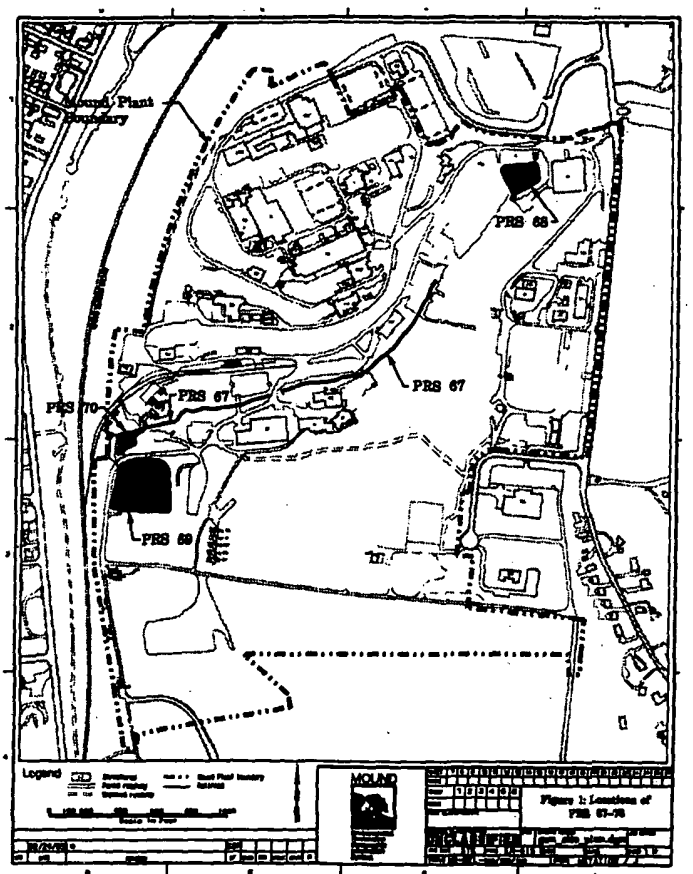
PUBLIC FACT SHEET

PRSs 67, 68, 69, & 70: Site Stormwater Drainage System

This Fact Sheet satisfies the Public Notification requirement set forth in the Contingent Action Memorandum[1].

Background. Potential Release Sites (PRSs) 67 through 70 are the primary components of the site stormwater drainage system as identified in the following table:

PRS	Description
67	Plant Drainage Ditch
68	Asphalt Lined Pond - North
69	Plant Overflow Pond - South
70	Retention Basins and Weir Basin



PRS 67 is an open, unlined channel that constitutes the primary plant drainage ditch (see Figure 1).

PRS 68 is the asphalt lined pond in the northeast corner of the site. The pond was constructed in the 1970s to receive stormwater runoff from the east central portion of the site to support reduction in suspended solids in runoff.

PRS 69 is the overflow pond and outfall pipe located at the south end of the drainage ditch. It is used to retain storm water flows, settle sediment, and support compliance with the National Pollutant Discharge Elimination System (NPDES) discharge standards for suspended solids. The pond is fed by two inlets, one being the PRS 67 drainage ditch and the other being a drainage structure (PRS 418) which was binned No Further Assessment. This PRS addresses only the stormwater sediment within the pond.

PRS 70 is also located at the south end of the drainage ditch (PRS 67) and consists of an open impoundment with earthen sides used to control the flow of water and settle sediment. The bottom is partitioned into three basins by concrete dividers. PRS 70 discharges into the weir basin. This PRS also includes the weir basin that moderates the flow so that the discharge volume can be measured.

Characterization. Several investigations have been conducted at or near the subject PRSs. Water and sediment samples have been collected and analyzed. All contaminants detected in the composited water samples were at concentrations less than applicable guideline values. The sediment sample results indicated exceedances to cleanup objectives (risk criteria), maximum results of which are presented in pCi/g in the table below.

Analyte	PRS	Maximum Result	Cleanup Objective
Plutonium-238	67	535	55
	68	257	55
	69	34	55
	70	749	55
Thorium-228	67	1.23	2.6
	68	9.44	2.6
	69	1.4	2.6
	70	1.27	2.6
Thorium-232	67	1.09	2.1
	68	0.44	2.1
	69	2.70	2.1
	70	1.57	2.1

1: Action Memorandum/Engineering Evaluation/Cost Analysis, Contingent Removal Action for Contaminated Soil, June 2002, Final
2: Standard Work Package for Contingent Removal Actions, November 2001, Final
3: Storm Water Pollution Prevention Plan

The maximum sample result of the only chemical found above cleanup objective is benzo(a)pyrene (8.0 mg/kg vs. 4.1 mg/kg CO). Benzo(a)pyrene is present in urban environments as a result of incomplete combustion in motor vehicles and is a component of asphalt based products. Five sample results were above the cleanup objectives; four were located within the asphalt-lined pond (PRS 68) and one at the discharge pipe from the asphalt-lined pond.

The Core Team originally recommended Further Assessment for these PRSs. Subsequently, the Department of Energy determined that a **Removal Action** (RA) per the Contingent Action Memo[1] is appropriate based on results above COs. RA COCs are Pu-238, Th-232, and isolated instances of benzo(a)pyrene.

The **Work Plan** for Contingent Removal Actions[2], supplemented by the Unique Work Package, includes procedures, instructions, and applicable permits and notifications required to safely conduct the work. Erosion and runon/runoff controls will be managed per the SWP3[3].

The RA will consist of excavation of contaminated soil and sediment in areas indicated by sample results above the cleanup objectives and shipping this soil to an approved disposal facility. Post-excavation sampling will be performed within the excavations per a Core Team-approved **Verification Sampling & Analysis Plan (VSAP).**

Schedule. This Fact Sheet will be in public review for 30 days, ending April 29, 2004. The RA is planned to begin in late summer 2004. As currently planned, removal activities for PRSs 67-70 will not begin until all upgradient contamination has been remediated. However if the removal of upgradient contamination is not completed by the time removal activities begin in PRSs 67-70, additional precautions such as supplemental sediment and silt controls will be put in place on all upgradient projects at the project perimeters to ensure that upgradient contamination does not re-comtaminate these PRSs. Subsequent confirmatory sampling at the appropriate outfalls into the drainage system will occur to ensure cross contamination did not take place. These precautions will be further specified within the Core Team approved Removal Work Plan and Verification Sampling Plan. A summary of the RA & the verification data will be included in the On-Scene Coordinator (OSC) Report. The OSC Report will be placed in the public reading room after the conclusion of the verification sampling and approval by the Core Team.

Expected excavation of approximately 3220 yd^3 (2460 m^3) with possible maximum excavation of 8730 yd^3 (6675 m^3) and verification are expected to cost less than $500,000.

Additional information can be found in the public reading room, or by contacting Danny Punch at 847-8350 extension 301.

1: Action Memorandum/Engineering Evaluation/Cost Analysis, Contingent Removal Action for Contaminated Soil, June 2002, Final
2: Standard Work Package for Contingent Removal Actions, November 2001, Final
3: Storm Water Pollution Prevention Plan

MOUND PLANT
PRS 75
SOIL CONTAMINATION
HISTORICAL RAILROAD SPUR AREA

RECOMMENDATION:

Potential Release Site (PRS) 75 is a soils area in the vicinity of the railway siding. This PRS was created due to its use as a radioactive drum storage, loading, unloading, and repackaging area. Plans call for the rail siding to be considered an active site, instrumental in the shipment of contaminated soils from the Mound plant.

Mutiple soil samples taken from the PRS 75 area have recorded concentrations of thorium-232 and plutonium-238 in excess of guideline criteria. Radium-226 and uranium-238 has also been found in excess of guideline in at least one sample. Plutonium-238 has been reported as high as 573 pCi/g (Mound ALARA guideline criteria is 25 pCi/g). Thorium-232, radium-226, and uranium-238 have been reported as high as 107 pCi/g, 14 pCi/g, and 13.5 pCi/g, respectively (regulatory guideline criteria for thorium-232, radium-226, and uranium-238 is 5 pCi/g).

Therefore, due to soil radiological concentrations which present an unacceptable risk to potential future construction activities at PRS 75, a RESPONSE ACTION is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 11/21/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 11/21/96 (date)

OEPA: Brian K. Nickel, Project Manager — 11/21/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 11/29/96 to 01/01/97

[X] No comments were received during the comment period.

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

MOUND PLANT
PRS 90
SOIL CONTAMINATION - BUILDING 22

RECOMMENDATION:

Potential Release Site (PRS) 90 was based on an isolated thorium-238 reading of 5.74 pCi/g gathered during the 1983 site survey, however no known radioactive or hazardous waste generating processes are known to have occurred at the location of PRS 90. This "hot spot" was subsequently remediated. Soil borings and subsequent soil screening results from March, 1995 verified that thorium contamination was below the D&D clean-up level of 5 pCi/g surface and 15 pCi/g subsurface. The OU5 Operational Area Phase I Investigation further indicates that the area is below the D&D clean-up level of 5 pCi/g surface and 15 pCi/g subsurface, therefore, NO FURTHER ASSESSMENT is recommended for PRS 90.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 3/28/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 3/4/96 (date)

OEPA: Brian K. Nickel, Project Manager — 3/4/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 4/15/96 to 5/15/96.

☒ No comments were received during the comment period.

☐ Comment responses can be found on page_____ of this package.

MOUND PLANT
PRS 176/177/178/300
WASTE TRANSFER SYSTEM LINE, TANKS AND SOIL

RECOMMENDATION:

These Potential Release Sites (PRSs) deal with the transfer of plutonium-238 contaminated waste solutions via the Waste Transfer System (PRS 300) to the Waste Disposal Building (WD) and to two underground storage tanks in Building 41 (PRSs 177 and 178). The PRSs were created as a result of historical knowledge of leaks in the underground Waste Transfer System (WTS).

The WTS was built in 1967 and remained in operation until 1974 when repeated leaks in the WTS lines forced the WTS to be abandoned. In 1974, the soils associated with the WTS leaks (PRS 176) were remediated. In the mid 1980s, the WTS line, the two holding tanks, and Building 43 were removed. Post removal sampling results obtained from the November 1993 *OU6, Area 19 and Area 14 Verification Report* indicated all concentrations of VOCs, SVOCs, pesticides/PCBs and inorganics, in the soil, were below their 10^{-6} Risk Based guideline values. Additionally, the *OU6, Area 19 and Area 14 Verification* sampling showed, within the 95% upper confidence level (UCL), plutonium-238 and thorium soil concentrations were below their respective guideline criteria of 25 pCi/g (Mound ALARA goal for plutonium) and 15 pCi/g (regulatory guideline criteria for subsurface thorium). No other contaminants were detected above guideline criteria.

Therefore, NO FURTHER ASSESSMENT is recommended for PRSs 176, 177, 178, and 300.

CONCURRENCE:

DOE/MB: Arthur W Kleinrath — 11/26/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer — 12/3/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel — 12/12/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 1/9/97 to 2/13/97

■ No comments were received during the comment period.

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

MOUND PLANT
PRS 367
SOIL CONTAMINATION -

RECOMMENDATION:

PRS 367 is a soil potential release site (PRS) located in the western sector of the original Mound plant. This soil location was identified as a PRS due to qualitative hydrocarbon detections found during the PETREX soil gas portion of the ***OU5, Non Area of Concern*** investigation. No radioactive or hazardous waste generating processes or activities are known to have occurred at PRS 367.

In 1996, the Soil Gas Confirmation Sampling effort sampled the locations with the highest ion counts (confirmation sample locations 7, 11, and 18) in the western sector and discovered no contamination above the 10^{-6} risk range. PRS 367 was not sampled as part of the Soil Gas Confirmation Sampling but the PRS had lower ion counts than confirmation sample locations 7, 11, and 18. This implies that PRS 367 has similar or lower health risk than confirmation sample locations 7, 11, and 18.

All radiological samples collected near this PRS indicate that radionuclides are below their applicable 10^{-6} Risk Based Guideline Values, ALARA, regulatory, or background levels. Therefore, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 12/17/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 12/17/96 (date)

OEPA: Brian K. Nickel, Project Manager — 12/18/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 2/27/97 to 4/3/97

☒ No comments were received during the comment period.

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

N7 of 8

MIAMISBURG CLOSURE PROJECT
PRS 397

RECOMMENDATION:

Potential Release Site (PRS) 397 is located south of the former fuel tanks (Figure 1) and was binned Further Assessment (FA) by the Core Team on 3 October 1996. PRS 397 was identified based on a soil sample (Sample ID SEPW) collected as part of the passive soil gas survey in 1994.

Further Assessment was performed and confirmed that the levels of BTEX and PAH are acceptable when compared to the more stringent of the 10^{-6} RBGV or Hazard Index of one values. TPH was not detected in the sample.

Therefore, the Core Team recommends **No Further Assessment** for PRS 397.

A PRS Package with an NFA recommendation signed by the Core Team will be placed in the Public Reading Room for a 30-day review period. Upon closure of the public review comments, if any, the PRS Package will be issued as a final document and made available in the Public Reading Room.

CONCURRENCE:

DOE/MCP: _____ 2/19/03
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 2/19/03
David P. Seely, Remedial Project Manager (date)

OEPA: _____ 2/19/03
Brian K. Nickel, Project Manager (date)

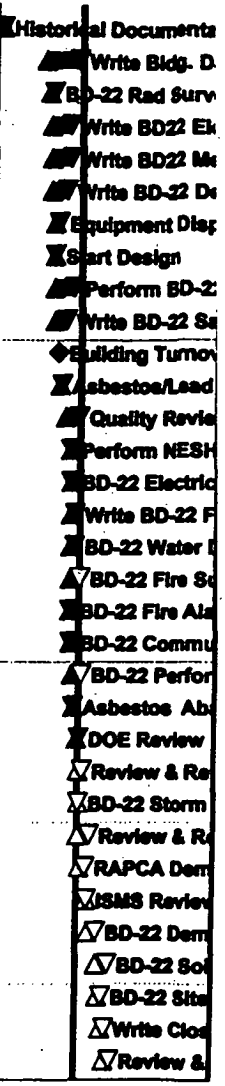
Appendix O

Work Plan (Final)

The drawings listed on the flysheet for Appendix C of the Work Plan are oversized and therefore are not included in the Work Plan in this appendix (Appendix O). However, the oversized drawings are included in field and record copies of the Work Plan.

Copies of the oversized drawings are available upon request.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Status Start	Status Finish	Target 1 Early Start	Target 1 Early Finish	Variance 1 Early Finish	Total Float
Building 22										
BD022150	Historical Documentation	4	0	100	19FEB04A	23FEB04A	19FEB04A	23FEB04A	0	
BD022125	Write Bldg. Data Pkg. BD-22 -	20	0	100	21JUN04A	22SEP04A	21JUL04	17AUG04	-21	
BD022350	BD-22 Rad Survey Plan	6	0	100	06JUL04A	15JUL04A	26JUL04	29JUL04	8	
BD022625	Write BD22 Electrical Disconnect	21	0	100	06JUL04A	02SEP04A	21JUL04	25AUG04	-5	
BD022635	Write BD22 Mechanical	24	0	100	06JUL04A	02SEP04A	21JUL04	25AUG04	-5	
BD022575	Write BD-22 Demolition WP -	14	0	100	12JUL04A	23AUG04A	11FEB04A	13SEP04	12	
BD022100	Equipment Disposition	8	0	100	19JUL04A	02AUG04A	01SEP04	14SEP04	25	
BD022910	Start Design	1	0	100	19JUL04A	19JUL04A	20JUL04	20JUL04	1	
BD022375	Perform BD-22 Rad Surveys	8	0	100	21JUL04A	15SEP04A	01SEP04	21SEP04	3	
BD022900	Write BD-22 Safe Shutdown WP -	15	0	100	22JUL04A	23AUG04A	21JUL04	17AUG04	-3	
BD022095	Building Turnover	0	0	100		02AUG04A		31AUG04*	17	
BD022475	Asbestos/Lead Survey - BD-22	4	0	100	09AUG04A	12AUG04A	11AUG04	10AUG04	-2	
BD022175	Quality Review	4	0	100	23AUG04A	29SEP04A	18AUG04	24AUG04	-21	
BD022450	Perform NESHAP Calculations	1	0	100	06SEP04A	06SEP04A	04OCT04	04OCT04	16	
BD022650	BD-22 Electrical Disconnect	4	0	100	06SEP04A	06SEP04A	22SEP04	28SEP04	13	
BD022400	Write BD-22 Final Status Report	4	0	100	07SEP04A	21SEP04A	27SEP04	30SEP04	6	
BD022775	BD-22 Water Drain and	4	0	100	07SEP04A	16SEP04A	01SEP04	07SEP04	-6	
BD022800	BD-22 Fire Suppression Drain	4	3	25	07SEP04A	08OCT04	18OCT04	21OCT04	9	103
BD022825	BD-22 Fire Alarm Disconnect	2	0	100	07SEP04A	09SEP04A	25OCT04	26OCT04	26	
BD022875	BD-22 Communications	2	0	100	07SEP04A	09SEP04A	27OCT04	28OCT04	28	
BD022800	BD-22 Perform Safe Shutdown	18	6	67	13SEP04A	12OCT04	14SEP04	04OCT04	-5	254
BD022550	Asbestos Abatement After Utility	12	0	100	21SEP04A	21SEP04A	29SEP04	14OCT04	17	
BD022225	DOE Review	5	0	100	30SEP04A	04OCT04A	25AUG04	31AUG04	-24	
BD022300	Review & Revise - Public	14	14	0	04OCT04	17OCT04	01OCT04	14OCT04	-3	440
BD022725	BD-22 Storm	3	3	0	04OCT04	08OCT04	01SEP04	08SEP04	-18	257
BD022250	Review & Revise BDP/WP - Core	30	30	0	07OCT04	05NOV04	01SEP04	30SEP04	-36	151
BD022925	RAPCA Demolition Notification	10	10	0	13OCT04	26OCT04	18AUG04	31AUG04	-40	306
BD022920	ISMS Review	4	4	0	01NOV04	04NOV04	18AUG04	24AUG04	-42	240
BD022950	BD-22 Demolition	16	16	0	08NOV04	02DEC04	27OCT04	23NOV04	-6	86
BD022960	BD-22 Soil Samples	30	30	0	03DEC04	01JAN05	28NOV04	27DEC04	-5	152
BD022975	BD-22 Site Restoration	8	8	0	06DEC04	16DEC04	24NOV04	07DEC04	-6	200
BD022325	Write Closeout Report - BD-22	8	8	0	20DEC04	30DEC04	08DEC04	21DEC04	-6	200
BD022335	Review & Revise - OSC Report	14	14	0	31DEC04	13JAN05	22DEC04	04JAN05	-9	352



Start Date	05FEB04	Early Bar	ERST
Finish Date	17APR06	Progress Bar	CH2MHILL
Data Date	04OCT04	Critical Activity	Integrated Status Schedule
Run Date	08OCT04 14:04		integrated status layout

Sheet 8 of 36

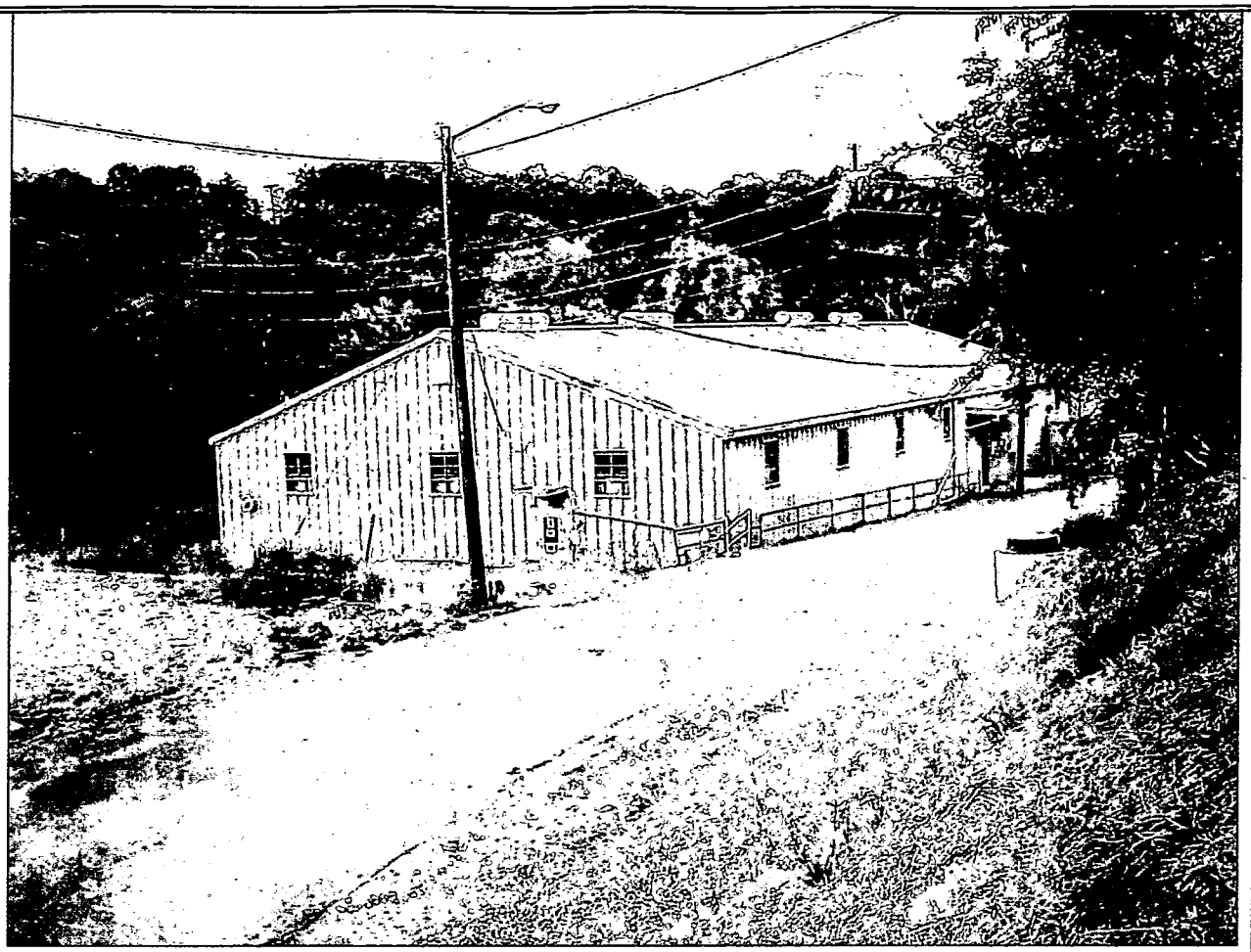
Date	Revision	Checked	Approved

© Primavera Systems, Inc.

O pg A

This page intentionally left blank.

0 pg B



View of Building 22 from east side

7.0 DETAILED WORK STEPS:

7.1 SITE INFORMATION:

Building 22 is a pre-fabricated ARMCO type S-3 with steel-lox metal panel building. Building 22 is a 9000 square foot (150 feet long by 60 feet wide by 24 feet high at the roof peak and 14 foot high at the roof edges) metal building (ref: 302200-01001 thru 302200-05001). The original building (90 feet long x 60 feet wide) was constructed in 1965. A later addition to Building 22 (60 feet long x 60 feet wide) was added to the east side of the original building (ref: 4-7765 thru 4-7770). A 5'4" x 6'9" x 8 ' high concrete block fire system valve building is on the north side of Building 22 (ref: 4-6259, 4-6261). The roof is 2" thick reinforced concrete.

In the summer of 1995, the building was modified and used to accommodate solid radioactive low level waste (LLW) storage activities until July 2004 (ref: 302204-00001 thru 302204-05003). The west side of the building, approximately 8000 square feet, was used as the storage area for solid LLW. The east side, approximately 1000 square feet, housed offices and utility services. Prior to the modifications in 1995, the building was used for office space and storage of items awaiting lot sale and/or reuse.

During the 1995 modifications, the existing slab (existing concrete encased tension rods remained in floor slab) was removed and replaced with a 8" concrete slab on 6" compacted granular base, reinforced with #3 rebar, 18" on center each way, 3" below top of slab. A 3' x 3' x 2' sump was installed in the southwest corner of Building 22 to collect any spills in area (ref: 302204-03001, 302204-03002). The fire system valve building floor slab is 6" thick.

The original north and south wall foundations are set on 3'-6" to 7' deep footers (ref: 302200-03001). The base of the original north and south sidewall footer is reinforced concrete with four #5 reinforcing bars. The original

west wall foundation are set on 3'-6" to 7' deep footers (ref: 302200-03001). The base of the original west wall footer is reinforced concrete with two #5 reinforcing bars. The addition's north and south wall foundations are set on 3'-6" deep footers (ref: 4-7767). The base of the addition's north and south wall footer is reinforced concrete with four #6 reinforcing bars. The addition east wall foundation are on 3'-6" deep footers (ref: 4-7767). The base of the addition east wall footer is reinforced concrete with three #5 reinforcing bars.

The original dock west of Building 22 was replaced with a new 14'x 20' dock during the 1995 modifications to the building (ref: 302204-03001 & 302204-03002).

7.2 NATIONAL HISTORIC PRESERVATION ACT (NHPA)

Building 22 is not listed as a historic structure with the Ohio Historic Preservation Office (OHPO). 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 extension 3691. Work will be temporarily suspended until which time the items or artifacts have been recovered.

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, for example, work outside the scope of this work package.

7.3 SITE PREPARATION & MOBILIZATION

7.3.1 Site Access Control

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

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

7.3.2 Sediment/Storm Water Control

7.3.2.1 Cover field grates with covers/sheeting for silt protection sewer gratings (See maps Appendix C) and install sediment/storm water control silt fences around designated construction area, as needed. Protect Sanitary Sewer and utility access manholes with steel plates, as needed. Reference OPA980099, Storm Water Pollution Prevention Plan (latest issue). Coordinate and evaluate effectiveness of controls periodically throughout demolition activities with Environmental Compliance PoC.

7.3.2.2 Ensure spill kit is in area and available and adequate to prevent any liquid contaminants from entering storm drains or drainage ditch. Employees shall report any observed spills or releases to a Site Supervisor by dialing 608-8293 or 608-8294 or via NEXTEL phone at Site Sup1 or Site Sup2 or AASecurity.

7.3.3 Clear Area and Mark/Protect Utility Equipment

7.3.3.1 The area around the building will be cleared of obstacles as appropriate. Coordinate with site Safety and Health and Environmental Compliance.

7.3.3.2 *Mark (with visible stakes), construct barriers to protect structures/utility equipment, or remove as needed:*

NOTE: THE BOREHOLE LOCATION FOR THE ELEVATED LEVEL OF THORIUM 232, SCR417, IS NOT WITHIN A PRS BOUNDARY. THE SAMPLE LOCATION IS ADJACENT TO THE ROADWAY ON THE NORTH SIDE OF BUILDING 22. THERE IS NO VISIBLE BOREHOLE IN THE CONCRETE OR ASPHALT, HOWEVER THE DIGITZED COORDINATE LOCATION OF THE BOREHOLE IS KNOWN (EASTING: 1465494.0, NORTHING 598412.61, ELEVATION: 771.849). MARK THE LOCATION OF THIS BOREHOLE TO PREVENT IT FROM BEING DISTURBED DURING DEMOLITION ACTIVITIES; THEREFORE, POTENTIAL SOIL

CONTAMINATION AT THE SAMPLE LOCATION WILL NOT AFFECT WORKER SAFETY DURING DEMOLITION ACTIVITIES.

- Fire line Post Indicating Valve (PIV) and Building 22.
- Fire hydrant west of Building 22.
- Borehole SCR417

7.3.4 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.

7.3.5 Temporary Facilities

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

7.3.6 Temporary Communications

Temporary communications are required (cell phone, radios) as equipment for hearing plant announcements and emergency notifications will have been removed during A building's safe shutdown activities. At the job site, plant announcements and emergency notifications will be made via the cell phone..

7.3.7 Staging Areas

The project site is of sufficient size to be used as a staging area for materials needed / generated.

7.3.8 Erosion/Dust Control Measures

Control measures will be instituted to mitigate effects of excess storm water run-on/ run-off and the effects of erosion. The site Storm Water Pollution Prevention Plan, OPA980099 (latest issue) is written to comply with the site National Pollutant Discharge System (NPDES) Permit {OAC 3435-33}. The requirements of OPA 980014 Section 2.11, Fugitive Dust Control will be followed in this work package.

7.3.8.1 Installation of Silt Fence

In order to prevent excess debris, soils, silt or other harmful materials from entering surface streams or the storm sewer system a retention barrier will be erected where appropriate. This barrier will consist of industry standard "silt fence." Where silt fence installation is impractical, straw bales will be used. Periodic inspections will be made by the project Superintendent or designee to ensure the fence is functioning properly. If, in the opinion of the Job Superintentent, the fence is not functioning properly, steps will be taken to re-enforce or alter the configuration until satisfactory results are achieved.

7.3.8.2 Installation of Fugitive Emissions Controls

The goal of fugitive emission controls is no visible dust/emissions. Best available technology (BAT) determination for the demolition of Building 22 is reasonably available control measures (RACM). Reasonably available control measures (RACM) will be employed to maintain fugitive particulate emissions as low as reasonably achievable. Mitigating controls to be employed include, but are not limited to:

- Use of fixatives on internal and external surfaces, removal of loose paint and decontamination prior to demolition.
- Use of fixatives in-situ during work or prior to pauses in work (i.e. weekends and holidays)
- 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 Superintendant or designee to assure fugitive emissions controls are achieving the desired effect and meeting acceptable standards. Reference Table 1, Airborne Contamination Protection Methods, below.

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) • 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
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 • 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

Table 1 Airborne Contaminant Protection Methods (continued)

Dust Generating Activities	Administrative and Engineering Dust Control Measures
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

7.3.9 Permits

The following permits may be applicable to perform this work:

- Penetration Permits
- Hot Work or Burning Permit
- Excavation Permits
- Lock Out Tag Out Permits
- Radiological Work Permits (RWP)
- Certification of equipment
- Sling Inspection

7.3.10 Chemicals/Hazardous Materials

All known sources of chemicals of concern and Asbestos Containing Material will have been removed from the building prior to demolition. A licensed asbestos abatement subcontractor or asbestos worker trained Mound personnel will have abated regulated Asbestos Containing Material in Building 22 prior to the start of demolition.

Material, equipment, and debris (except hazardous material) associated with this project will be evaluated for feasibility to be free-released. When surveys are below release limits, and debris can be protected from being contaminated during demolition, the debris will be free-released. The remainder of the debris will be treated as low-level radioactive waste unless radiological surveys determine waste exceeds 100 nCi/g. Any waste determined to exceed TRU levels will be segregated and packaged accordingly.

Mixed wastes may be encountered during the structure demolition activities. Any hazardous waste material (i.e. ACM, lead and mercury) encountered during demolition will be abated (as practical) and disposed of according to CH2M Hill Waste Management requirements.

Silica/nuisance dust and lead paint may be encountered during demolition. Engineering/administrative controls (such as water misting) will be used to mitigate the potential hazard to workers and the environment. No torch cutting of painted surfaces will be permitted unless MCP Safety and Health has tested affected paints and found them free of lead. MCP Safety and Health may conduct air monitoring as necessary to maintain applicable annual exposure assessments and compliance with occupational exposure standards.

7.3.11 NESHAPS

The offsite estimated effective dose equivalent (EDE) for the demolition of the Building 22 is less than the 0.1 mrem/year threshold. Therefore USEPA approval is not required for this project. This work plan will contain methods/requirements to mitigate any potential dose that would exceed the threshold level.

7.3.12 Material Disposition

Based on a review of the work to be performed, the Waste Generator and Waste Coordinator determine types (sanitary, hazardous, LLW, LLMW, TRU) and estimated amounts of waste prior to generation. An evaluation of the physical, radiological and chemical properties is made to determine a disposal path for each type of waste. The proposed disposal facility, waste profile, and knowledge of the waste generating process will determine the characterization methodology required for each waste type.

Process knowledge will generally be sufficient to characterize sanitary and hazardous waste for disposal. Sampling and analysis for radiological characterization of radioactive waste will be determined based on process knowledge of the source of the waste. Analytical methods employed include surface contamination measurements, air concentration measurements and calorimetry (tritium), alpha spectroscopy and gamma spectroscopy. All characterization determinations are documented and peer reviewed prior to waste shipment. Material Safety Data Sheets (MSDS) are used to supplement process knowledge of chemical properties of the waste. Where process knowledge is not sufficient to provide a RCRA determination, analysis of waste will be accomplished through the Toxicity Characteristic Leaching Procedure (TCLP) performed by an offsite laboratory.

Procedures controlling waste characterization are contained in Mound Technical Manuals MD-10167, *Radioactive Waste Procedures*, Operations 420: *Waste Stream Characterization* and 428: *Waste Radionuclide Identification and Quantification*, and MD-70523, *Management of Hazardous Waste, Trash, and Recyclable Materials*, Operation 001: *Waste Verification Sampling and Analysis*. Additional direction is contained in these manuals in operations specific to the waste type and container being used.

7.4 PRELIMINARY ACTIVITIES AND VERIFICATIONS

IMPORTANT

7.4.1 Verify all Safe Shutdown Activities Building 22 completed per work package BOSS-38211.

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

7.4.2 Verify all Utility Isolation Activities for Building 22 have been completed per work package FTS-38216.

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

7.4.3 Contact Rod Case (673-4518) to ascertain if any area in Building 22 constitutes a Rad hazard. If any area constitutes a Rad hazard, coordinate with Rad Controls for RWP/PPE/work controls and revise Demolition Work Package to address Rad hazard. If there is not any Rad hazard, continue with this work package.

HOLD POINT: Radiological Final Status Survey Report complete verification:

verified by_____ date _____
Rad PoC or email

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

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

7.4.5 The Job Specific Hazards Analysis (JSHA) must be reviewed.

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

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

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

7.5 BUILDING DEMOLITION SEQUENCE OF WORK

WARNING HAZARD: The structural demolition (Section 7.5.1) must be completed prior to the slab and foundation demolition (Section 7.5.2). The structural 1" diameter (#8) tie rods in the floor slab that provides added support to the outside columns (Ref: drawing 302200-03001, 4-7767), must remained in tact until the Building 22 structure has been demolished. Once the building structure has been removed, these tie rods provide no purpose, so they can be safely removed during the slab and foundation removal.

IMPORTANT NOTE: **During demolition activities, when Building 22 is being collapsed, access to roadway north of Building 22 (as conditions warrant) may be restricted.**

7.5.1 Structural Demolition

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: Jeff Lentz 865-4047 or 608-8293, and the Building Manager, Gary Weidenbach, 608-8207.

CAUTION CONTAMINATE SPILL HAZARD: Ensure spill kit is available to prevent any liquid contaminant from entering storm drains or drainage ditch. Employees shall report any observed spills or releases to a Site Supervisor by dialing 608-8293 or 608-8294 or via NEXTEL phone at Site Sup1 or Site Sup2 or AASecurity.

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.

CAUTION HAZARD: Possible 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.

If any part of heavy-duty equipment has the potential to come with 10 feet of the 12,470 volt power lines along the western side of Building 22 and/or the power and light poles around Building 22, follow OHSA 29 CFR 1910.333(c)(3)(iii)(A)(2), installing insulating barriers, if feed can not be shutdown and LOTO'd. (See attached Lessons Learned)

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

Notification of Demolition and Renovation form must be filed with the Regional Air Pollution Control Agency (RAPCA) at least 10 <u>business</u> **days before planned demolition of Building 22.**

HOLD POINT: RAPCA Notification verification

Environmental Compliance PoC_____ Date to Proceed with Demo_____

HOLD POINT: Regulatory requirements met.

Verified by:_____ Date and Time_____
Robert Ransbottom or designee

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

Project Manager:_____ Date and Time:_____

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.

NOTE: The progression of the building demolition and selection/sizing of demolition equipment will ultimately be determined in the field. However, when a decision is made in the field to deviate from the work plan, the deviation will be discussed with and approved by the Job Supervisor and the Job Status Log will be filled out to document the change. Changes will be evaluated for any increased collapse potential.

NOTE:. Based on radiological screening results, Building 22 is not radiological contaminated and will be disposed as non-Rad waste, unless debris pile surveys indicate otherwise.

NOTE: Waste debris created during demolition will be staged as much as possible within the footprint of building. After appropriate surveys, it will then be loaded directly into the appropriate packaging or haulers. **Do not put Rad contaminated debris on an uncontaminated slab. Use Rad contaminated slab for Rad contaminated debris, only.** All waste will be packaged and disposed per CH2M Hill Waste Management requirements.

NOTE: Wind direction must be taken into account when pre-placing personnel operated and/or portable water misting equipment. Place personnel and misting equipment upwind to allow easy water application.

7.5.1.1 Using heavy equipment, working from the north side of Bldg. 22, demolish the above ground structures to cut or dismantle and pull down the joists, roofing materials, wall sections, and support beams.

7.5.1.2 Use the existing slab and/or dock for load out surface for loading debris and placing into appropriate hauling containers or trucks.

7.5.2 Slab and Foundation Demolition

CAUTION HAZARD: Strike underground utilities. Obtain Excavation permit and follow its requirements per MD-10286 O5

CAUTION HAZARD: Possible 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.

If any part of heavy-duty equipment has the potential to come with 10 feet of the 12,470 volt power lines along the western side of Building 22, follow MD-10395, Electrical Safety Manual, if feed can not be shutdown and LOTO'd.

Power and light poles run along the northern and eastern ends of Building 22.

WARNING HAZARD: Dust Control – Utilize misting & fogging during demolition & road wetting during waste hauling. The Goal is no visible dust emissions.

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

CAUTION HAZARD: Struck by flying debris. Establish construction boundary. Wear hard hat, safety glasses, safety shoes, and high visibility clothing (i.e.; highway reflective vests; fluorescent shirts) inside construction area.

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).

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

CAUTION HAZARD: Burns/fire. Utilize Burn Permit , fire protection, and wear appropriate PPE

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

IMPORTANT: Exercise caution when demolishing and removing slab and foundation/footers to not damage underground utilities. Be alert to and reference Underground Utilities Vista Maps in Appendix C for the following utility system lines running near the foundations/slabs of Building 22. Storm sewer lines under the floor slab, associated with Building 22 roof drainage, can be removed. **Excavation permit required for these activities.** Reference the Electrical and Mechanical Utilities Isolation Activities work packages for the post demolition status of these lines.

- Sanitary System Lines on southeast corner of Building 22.
- Storm system line east of Building 22
- Domestic waterline south of Building 22.
- Fire Protection System line north of Building 22

NOTE: The progression of the building demolition and selection/sizing of demolition equipment will ultimately be determined in the field. However, when a decision is made in the field to deviate from the work plan, the deviation will be discussed with and approved by the Job Supervisor and the Job Status Log will be filled out to document the change. Changes will be evaluated for any increased collapse potential.

NOTE: The area bordering east and south of Building 22 is an URMA. Coordinate demolition activities with Environmental Restoration group (James Fontaine 608-8220 and/or Monte Williams 865-4543 or 608-8005) and Environmental Compliance (Ron Paulick 865-4080 or 608-8227).

NOTE: During the concrete demolition, use heavy equipment to assist radiological control personnel to perform radiological screening of ground contact concrete surfaces. Based on radiological screening results, transport to designated disposal area as directed by Waste Management PoC.

7.5.2.1 Using heavy equipment, for Building 22 and the fire system control valve building, break apart the concrete slabs, dock pad, sidewalks, retaining walls, and Building 22 foundation walls/footers to 3 feet below grade, torch cut the rebar if required (Hot Work Permit is required) to support demolition and downsizing. Debris will be removed and surveyed/scanned by Rad. Control technicians. The materials will be sized and placed into appropriate hauling containers or trucks.

NOTE: If soil staining or unusual fumes/odors are noted during slab/foundation excavations, contact IH (Chris Ahlquist r 608-8203) or Safety (Doug Hanson or 608-8008) and Environmental Compliance (Ron Paulick 865-4080 or 608-8227).

7.6 Site Remediation & demobilization

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

CAUTION FALLING HAZARD: Utilize fall protection, barricades, or man-lifts

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

7.6.1 Grading, Seeding, & Mulching

7.6.1.1 Erect any additional erosion control/protection fencing or other materials as needed in compliance with Environmental Compliance group PoC (Ron Paulick, 865-4080 or 608-8227) instructions. Remove

debris/rubble/rock as necessary to provide smooth continuous grade and restore the area by grading and filling with appropriate amount of gravel/soil to grade to drain.

7.6.1.2 Apply appropriate amounts of grass seed and matting, in graded and soil backfilled areas, to maintain erosion control/protection in accordance with Environmental Compliance PoC instructions.

7.6.1.3 Remove any temporary protection/structures used to protect Building 22 utility equipment/stanchions, PIVs, sanitary/storm sewer grates/manholes, and utility access manholes.

7.6.1.4 Remove silt protection covers from field grates and any remaining sediment/storm water control fences, straw bales and sand bags, unless it is beneficial to keep silt/sediment control devices in-place for further demolition/remediation work.

7.6.1.5 Remove sediment and debris that has collected at the storm sewer gratings and along roadways and curbing.

7.6.2 Demobilize Construction Equipment

CAUTION FALLING HAZARD: Utilize fall protection, barricades, or man-lifts

---

Remove dust control water distribution system, temporary power (if used), fencing and any traffic control. Scan equipment for radiological contamination prior to leaving area, as required, dependent upon in-process Rad surveys.

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.

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: 8/14/04	Phone: 608-8284
Superintendent:		Date: 8/24/04	Phone: 608-8202
Foreman:		Date: 8/24/04	Phone: 608-8202
Project Eng. Mgr:		Date: 8/23/04	Phone: 608-8201
Industrial Hygiene:		Date: 8/12/04	Phone: 608-8203
Safety:		Date: 08/23/04	Phone: 608-8008
Rad. Controls:		Date: 8/11/04	Phone: 673-4528
ES&C:		Date: 8/12/04	Phone: 608-8227
Waste Mgmt:		Date: 08/12/04	Phone: 623-8384
Bldg. Mgmt:		Date: 09/01/04	Phone: 608-8207
Classification:	N/A	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

This work will have no affect upon a Nuclear or Radiological Building

USQ Trained Person: Date: 09/01/04 Phone: 608-8207

11. AUTHORIZATION SIGNATURE:

Project Manager: Bo Date: 9/1/04 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.

WORK PLAN REVISION SHEET

1. WORK PACKAGE TITLE: Demolition of Building 22
2. WORK PACKAGE NUMBER: BOSS-38214 - 00.

[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)

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: Demolition of Building 22

2. WORK PACKAGE NUMBER. BOSS-38214 - 00.

Revision	Reason	By	Date

Appendix A

Preliminary Hazards Analysis (PHA)

Job Safety & Health Analysis (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	No	N/A	
Blockages/obstructions (Identify)	YES	3	Coordinate road blockages around Building 22 with points of contact listed in work package
Confined space entry (permit)	No	N/A	
Emergency alarms or evacuation plans required	Yes	All	Cell phones will be used as the main line of communicating alarms to personnel.
Obstruction of fire protection equipment (pull boxes, hydrants, fire department connections, control panels, fire extinguishers, etc.)	Yes	All	Fire hydrant will be protected, but still available for emergency use.
Traffic control/flagman	Yes	All	Provide sufficient flagmen and signage to ensure safe traffic control
Flammable/Explosive:			
Burning, welding, hot-work (Fire Watch) (permit)	Yes	2 & 3	Obtain & follow Hot Work Permit per MD-10286 operation O2, Hot Work Permit Procedures. Paint may contain lead, do not torch cut painted surfaces without verification by IH or Safety PoC.
Chemical compatibility of corrosives/flammables	No	N/A	
Explosive/flammable atmosphere	No	N/A	
Explosives	No	N/A	
Fire protection system/equipment outage	No	N/A	
Fire Hazards Analysis/Fire Engineer Approval	No	N/A	
Flammable liquids/gases	Yes	2 & 3	Acetylene & oxygen – Utilize proper tank restraints. Follow Mound Procedure MD-10286, H1
Powder-actuated tools (permit)	No	N/A	
Special Fire Protection Equipment Required	No	N/A	
Chemicals:			
Chemical process safety	No	N/A	
Compressed gas cylinders	Yes	2 & 3	Follow Mound Procedure MD-10286, operation H1, Use of Compressed Gas Cylinders, Manifolds, and Regulators, when handling oxygen and acetylene gas cylinders.
Emergency eyewash/shower available	No	N/A	
Elevated/Aerial Work:			
Crane operations, overhead or mobile	No	N/A	
Critical lifts (heavy or high value loads)	No	N/A	
Elevated work/fall protection	Yes	All	Follow Mound Procedure MD-10286, operation M8, Fall Protection / Elevated Work Surface.
Forklifts, aerial lifts or material handling equipment	Yes	All	Follow Mound Procedure MD-10286, operation M8, Fall Protection / Elevated Work Surface.
Hoisting and rigging	No	N/A	
Overhead utilities (Identify)	Yes	All	LOTO overhead utilities per MD-10444, Lockout / Tag Out Procedure. If LOTO not feasible, follow MD-10395 electrical safety manual to work within 10 feet any overhead energized.

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)			
• Electrical	Yes	All	Electrical isolation of the facility is accomplished during Utilities Isolation Activities. LOTO overhead utilities per MD-10444, Lockout / Tag Out Procedure as needed. If LOTO not feasible, follow MD-10395 electrical safety manual to work within 10 feet any overhead energized lines
• Mechanical (steam, hydraulic, pneumatic, gravity)	No	N/A	
• Interlocks	No	N/A	
• Chemical	No	N/A	
• Radiological	No	N/A	
Outages of the plant public announcement (PA) system or the emergency notification system	Yes	All	Plant PA system out of service. Use cell phones and air horns for emergency notifications.
Building Systems Alarms - Ensure systems are not functional by contacting: Fire Department Security Facilities Services.	No	N/A	
Alarm Disable/Disconnect	No	N/A	
Structure Related:			
Modification to Fire Wall/Door	No	N/A	
Penetrations into walls, floors, etc. (permit)	No	N/A	
Plastic sheeting or wood framing/enclosures	No	N/A	
Structural Modification	Yes	All	Demolish building per work package.
Work impacting adjacent normally occupied areas	No	N/A	
Temporary Requirements:			
Temporary heating facilities	No	N/A	
Temporary/portable buildings or structures	No	N/A	
Temporary service hook-ups (Identify)	Yes	All	Water hydrant for misting, including backflow prevention, if required or fog cannon & self contained water tanks
Public utilities (Identify)	No	N/A	
Lighting/illumination/adequacy	No	N/A	
Miscellaneous:			
Machine guards	No	N/A	
Off-shift work	Yes	All	As determined by Project Manager
Repetitive work	No	N/A	
Other (Specify)	None	N/A	
Work in attics, ceilings, chases, or crawlspaces	No	N/A	
Work Requiring Scaffolding (Inspection required)	No	N/A	
Electrical:			
Electrical hazards	Yes	All	Electrical isolation of the facility is accomplished during Utilities Isolation Activities. LOTO overhead utilities per MD-10444, Lockout / Tag Out Procedure as needed. If LOTO not feasible, follow MD-10395 electrical safety manual to work within 10 feet any overhead energized lines. Overhead electrical lines run along the roadway on the northern side of building and along the western end of the building.

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	N/A	
Soils/Excavation:			
Underground utilities (Identify)	Yes	3 & 4	Utilize Excavation/Soil Disturbance Permit, MD_10286, O5 before slab demolition
Trenching/Shoring (permit)	No	N/A	
Hazards due to condition of facility or terrain (Identify)	No	N/A	
Any soil disturbance	Yes	3 & 4	(Note: Check for URMAs) Obtain & follow Excavation/Soil Disturbance Permit, MD_10286, O5 before slab demolition. Remediation of this contamination will be conducted by the ER Project.

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	N/A	
Removal of ceiling tiles*	No	N/A	
Insulation/man-made mineral fibers (☐ MSDS available)*	No	N/A	
Hazardous Materials:			
Beryllium	No	N/A	
Cadmium	No	N/A	
Chlorofluorcarbon (CFC)	No	N/A	
Coal, tar or asphalt products	No	N/A	
Lead	Yes	All	Exposure to airborne lead during torch cutting. Contact Industrial Hygiene to verify absence of lead in paint or remove paint prior to torch cutting
Mercury	No	N/A	
Polychlorinated biphenyls (PCBs)	No	N/A	
Carcinogens (☐ MSDS available)*	No	N/A	
Chemical/Corrosives:			
Chemicals/solvents (☐ MSDS available)*	No	N/A	
Corrosives/acids/caustics (☐ MSDS available)*	No	N/A	

***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)

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	N/A	
Coating/painting (☐ MSDS available)*	No	N/A	
Dusty operations	Yes	3 & 4	Utilize dust control measures as appropriate from Table 1 (OPA980014).
Foam in Place Operations	No	N/A	
Spraying/generation of mists*	Yes	3 & 4	Demolition dust control water misting during demolition and road wetting during waste hauling. Control misting water run-off in accordance with OPA 980099, Storm Water Pollution Prevention Plan (latest issue).
Ventilation or Air Monitoring requirements	Yes	3 & 4	Air monitoring for potential silica during demolition activities wil be performed as needed for annual site assessment.
Miscellaneous:			
High Pressure systems	No	N/A	
Lasers	No	N/A	
Noise in excess of 85 dBA	Yes	3	Hearing protection required during noise hazard activities.
Blood-borne pathogens*	No	N/A	
Temperature extremes (heat or cold stress)	Yes	All	Discuss in daily pre-job briefings & monitor per MD-10286 Operations D13/D16
Welding, brazing, or thermal cutting operations (permit)	Yes	2, 3,& 4	Hot Work Permit Required. Paint may contain lead, do not torch cut painted surfaces without verification by IH.
Hazardous Waste Operations (HAZWOPER)*	No	N/A	
Other (specify)	None	N/A	

*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)

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)			
•	Radiologically Fixed Contaminated Areas (FCAs)	No	N/A	
•	One Radiological Contamination Area (CA)	No	N/A	
•	One Radiological Materials Management Area (RMMA)	No	N/A	
	Other (Specify)	None	N/A	
Activities:	Digging/Soil Removal (permit)	Yes	3 & 4	Survey concrete (soil contact side) following slab removal. Excavation permit required for slab/foundation removal and site remediation activities
	• URMA	Yes	All	Demolition Site is located near URMA. Do not disturb URMAs eastern and southern sides of building 22.
	Welding, burning, grinding, hammering, chipping, or scraping of contaminated materials	No	N/A	
	Decontamination	No	N/A	
	- Site Remediation	No	N/A	
	Waste Disposal	No	N/A	
	Other (Specify) – Radiological Survey, Evaluation & Posted	No	N/A	
Sources:	X-Ray equipment, sealed, or unsealed sources	No	N/A	
Controls:	Radiological Work Permit	No	N/A	
	ALARA Plan	No	N/A	
	Other	None	N/A	

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	All	OPA 980014 Section 2.11. Use water misting during demolition & road wetting during waste hauling.
	Storm Water Runoff	Yes	All	Install sediment/storm water protective "slip cover" around storm drain grating & silt fencing. Referenc OPA 980099, Install sand bags/silt fences as needed.
	Erosion Control	Yes	All	Grading, seeding, and mulching
	NESHAPS Calculation	Yes	All	Emission Levels determined to be below requirement. No US EPA approval required for this building.
	National Historic Preservation	No	N/A	Building 22 is not listed as a historic structure with the Ohio Historic Preservation Office (OHPO). No mitigative documentation package is required.
	• Artifacts found	Yes	All	If any items or artifacts are discovered as this project progresses, the Cultural Resource Representative will be notified @ extension 3691. Work will be temporarily suspended until which time the items or artifacts have been recovered.
	Safe Drinking Water Act	No	N/A	All Utilities were isolated with Utility Isolation Work Package
	• Potable water	Yes	All	The potable water system will be used for dust suppression, otherwise the building was disconnected from the potable water system during Utilities Isolation Work Package.
	• Backflow preventers for misting	Yes	All	Install backflow prevention for water misting source as directed by Environmental Compliance PoC
	Emergency Spill Response Materials (Confirm process lines are drained)	Yes	All	Ensure spill kits are available. Employees shall report any observed spills or releases to a Site Supervisor by dialing 608-8293 or 608-8294 or via NEXTEL phone at Site Sup1 or Site Sup2 or AASecurity.
	Locate Monitoring Wells	No	N/A	No monitoring wells within project site boundary
Notifications:	RAPCA Notification for Asbestos	No	N/A	All regulated asbestos material was removed during a previous phase of this project
	RAPCA Notification for Demolition	Yes	3	Required 10 business days before beginning demolition activity
	Emergency Spill Response Notification	Yes	All	Employees shall report any observed spills or releases to a Site Supervisor by dialing 608-8293 or 608-8294 or via NEXTEL phone at Site Sup1 or Site Sup2 or AASecurity.
	Other	None		

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 Cu. Ft.	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	52000	3	No elevated radioactivity levels	Trucks, rolloffs	Trucks to sanitary landfill.
Hazardous Waste: • RCRA Hazardous Waste • Asbestos • Other	None				
Mixed Waste	None				
Low Level Radiological Waste: • Building Debris • Below grade	None				
Transuranic (TRU) Waste	None				
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)	None				
Material sent to concrete crusher Fill out MD-200180 Attachments 1 & 2 (see below)	None				

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

EMERGENCY PREPAREDNESS

- Site Notification Procedures
  Use **911** for all emergency services onsite. This is the first response for any emergency. If using a cell phone, dial **AAA911** (NEXTEL). Any injury, no matter how minor, shall be reported immediately to the Medical Department for evaluation and treatment. The injured employee shall report any injury to the supervisor in charge or designee.

  Employees will be notified of emergency or abnormal conditions by the project two-way radios. Additionally, unique sheltering and evacuation signals are available should site-wide protective actions be necessary.
  Evacuation: Continuous air horn blasts
  Take Shelter: Two air horn blasts – pause – two air horn blasts

- Evacuation Route/Assembly Areas
  Assembly area is North of Building 22 outside the work area boundary fence.

- Take Shelter Area
  Be aware of threatening weather and take shelter when life-threatening storms are imminent.

  The take shelter area is COS Building, Room 120 and common halls on 1st floor.

APPLICABLE LESSONS LEARNED – See Appendix E

JOB SAFETY & HEALTH ANALYSIS

JSHA MASTER DOCUMENT CONTROL NO: BOSS –

DATE: 04/26/04	_X_ NEW ___ REV	BUILDING: 31/31A	JOB: Demolish Building 22 MSR #38214
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, Building/Facility Manager, RAD Control, Ind. Hygiene, and Safety

SIGNATURES

ORIGINATOR:
REVIEW/REV:
REVIEW/REV:
REVIEW/REV:
APPROVED:

{PRIVATE }REQUIRED PERSONAL PROTECTIVE EQUIPMENT:	MSDS(s)/CHEMICALS ASSOCIATED WITH THE JOB:
Hard Hat, Safety Glasses with side shields, safety shoes, safety vest	

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 Project Manager for entry. -Emergency access to the work zone will be maintained to the extent possible.
1b. Clear Area and Mark/Protect Utility Equipment	Running into fire hydrants, manhole covers, or grates over field drains.	-Mark/protect hydrant and other utility equipment with wooden boxes, visible stakes, and/or colored flags. -Cover field grates to protect

JOB SAFETY AND HEALTH ANALYSIS FORM
(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
2 Building Demolition & Debris Disposition	Vehicle Traffic Hazard	-Control traffic with flagmen and signage as necessary
2a. Demolish building using excavator mounted shear, hoe ram, grapple, loader, and bobcat	Struck by flying debris Struck by moving equipment Noise Hazard	-Establish construction boundary. -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. -Install traffic control with sufficient flagmen -Wear hearing protection while running heavy duty equipment Follow the requirements of MD-10286 D9
2b. Torch cut rebar or to weaken structural members	Burns, fire Potential lead paint fume exposure Compressed Gas Cylinders (CGCs)	-Obtain and follow Hot Work permit per MD-10286 O2. Wear proper PPE, have fire extinguishers in the construction zone. -Test for lead paint; do not torch cut lead paint. -Follow Mound Procedure MD-10286, H1
2c. Working in excessive heat/cold	Heat Stress/Cold Stress	-Follow the requirements of MD-10286 D13/D16 and discuss in daily pre-job briefings
2d. Debris Characterization & Disposal	Radiological Contamination	-RCTs to conduct surveys as needed. -Follow any RWP requirements if contamination is found
2e. Slab & Foundation Demolition & Removal	Underground Utility Contact – Electrical/Water Pressure Exposure Radiological Contamination	-Evaluate & Mark area per Excavation/Soil Disturbance Permit, MD_10286, O5 for Underground Utilities. -Follow any RWP requirements if contamination is found. -Have RCTs survey bottom of slab before disposal
3a. Rough grading	Equipment/ personnel mixture	-Stay clear of operating heavy equipment

{PRIVATE }

JOB SAFETY AND HEALTH ANALYSIS FORM
(CONTINUATION SHEET)

BASIC JOB STEPS	POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS	SAFE JOB PROCEDURES
3b. Erosion control installation	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 strain 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

Appendix B

Pre-Job Briefings/Job Status Log

PRE-JOB BRIEFING RECORD

MSR/PROCEDURE (if applicable):	JOB SUPERVISOR:

A. Time, Date and Location of PJB: _____

B. Applicable Procedure Number: _____

C. Job Description: _____

D. Personnel Attending:

HP#	SIGNATURE	HP#	SIGNATURE

BRIEFING CHECK OFF LIST

JOB SUPERVISOR:	**Check When Completed***
1. Scope of work reviewed:	
a. The assignments and responsibilities of each individual were specifically identified.	Done ☐ N/A☐
b. The current facility conditions, tagouts, valve lineups, and work permits relating to this job have been discussed.	Done ☐ N/A☐
c. The precautions, limitations, initial conditions, and prerequisites were adequately reviewed.	Done ☐ N/A☐
d. Potential hazards associated with the job have been discussed (JSHA).	Done ☐ N/A☐
e. Specific work covered by RWP (any limitations).	Done ☐ N/A☐
2. All necessary safety equipment and PPE is available.	Done ☐ N/A☐
3. All required personnel have satisfied initial and continuing training requirements to perform the job including training specified on the RWP.	Done ☐ N/A☐
4. All required personnel have reviewed the applicable documentation listed in B above as it applied to their part of the job.	Done ☐ N/A☐
5. Reliable and adequate communications are available.	Done ☐ N/A☐
6. The required tools and equipment are available.	Done ☐ N/A☐
7. Appropriate lob sheets, material transfer, and data recording forms are available.	Done ☐ N/A☐
8. All required documents available at the PJB are approved and current.	Done ☐ N/A☐

*For items not applicable, write in N/A.

PRE-JOB BRIEFING RECORD (Page 2)

9. Related past problems, unusual events, and occurrences were discussed. Done ☐ N/A☐
10. All personnel understand egress procedures and egress areas. Done ☐ N/A☐
11. RWP requirements:
    a. Radiological conditions of the workplace. This should include a review of the most recent survey of the area. It is important to ensure that the survey is specific to the work area. In cases where a system of unquantified activity will be breached, discuss the "anticipated activity" to be expected after the breech. Done ☐ N/A☐
    b. Dosimetry requirements. Done ☐ N/A☐
    c. Protective clothing and respiratory protection requirements (cite location of doffing instructions). Done ☐ N/A☐
    d. Job coverage requirements (continuous vs. intermittent). Explain that continuous means "within line of sight and field of control of RCT at all times." Done ☐ N/A☐
    e. Stop Work Levels (SWLs) and other applicable limitations. Done ☐ N/A☐
    f. POC's/RCT's must discuss the type of radiological monitoring to be employed at the job site during and subsequent to the work. Personnel assigned to do the work MUST EXPRESS THEIR FULL UNDERSTANDING of the monitoring to be employed and of the alarm signals if applicable. Workers MUST CONCUR in the type and scope of monitoring planned at the job site before work can begin. Done ☐ N/A☐
    g. Dose reduction/contamination control techniques (e.g., use of; shielding, capture velocity, containment devices). Done ☐ N/A☐
    h. Personnel and equipment monitoring requirements (including control point locations). Done ☐ N/A☐
    i. Bioassay requirements. Discuss; isotopes to be encountered, proper use of the bioassay information form, use of nosewipes as appropriate (and disposition of nosewipe results), and bioassay frequency if this will be a long term task. Done ☐ N/A☐
    j. Effective date and expiration date of RWP reviewed. Done ☐ N/A☐
    k. Briefly cover WORKER RESPONSIBILITIES (Article 123 of the DOE RADCON MANUAL) Done ☐ N/A☐
12. Necessary instrumentation is adequately tested and calibrated. Done ☐ N/A☐
13. Key task steps in which radiological conditions may change and where the RCT will perform in-process surveys to assess radiological conditions. Done ☐ N/A☐
14. If an ALARA Job Review was required, then this would be an appropriate time for the review. Done ☐ N/A☐
15. Radiological hold points, if any. Done ☐ N/A☐
16. Discuss any appropriate response actions to emergencies, such as CAM, alarms, criticality alarms, or increasing radiation levels. Done ☐ N/A☐
17. When nonradiological health monitoring (e.g. asbestos) is to be employed at the job site during and subsequent to the work, the personnel assigned to do the work MUST EXPRESS THEIR FULL UNDERSTANDING of the monitoring to be employed and of the alarm signals if applicable. Workers MUST CONCUR in the type and scope of the monitoring planned at the job site before work can begin. Done ☐ N/A☐
18. Communications and coordination with other groups. Done ☐ N/A☐
19. Provisions for waste management and job cleanup. Done ☐ N/A☐
20. Open floor to questions. Done ☐ N/A☐

The above minimum requirements have been met; this PJB has been conducted in sufficient detail to ensure save conduct of the job.

_____

Job Supervisor/Foreman Date

NOTE: Completed pre-job briefing sheet must be retained with the work package or maintained in your record file.

CAUTION: Working on or Near Live, Active Lines/Utilities
Consider Alternative Means of Protection (Blocking, Shielding, etc.)
And Alternative Manual Methods for Removal

PRE-JOB UPDATE RECORD

MSR/PROCEDURE (if applicable):	JOB SUPERVISOR:

A	Time, Date and Location of PJU:
B	Applicable Procedure Number:
C	Job Description:
D	Personnel Attending:

HP#	SIGNATURE	HP#	SIGNATURE

JOB SUPERVISOR – This is a reminder checklist for the update. The supervisor need only discuss and note changes from the previous day's briefing or update. (Use NC for No Change).

1. Any changes/revisions to safety envelope for work:
a. New/added assignments and responsibilities of any individual
b. Changes in facility conditions, tagouts, valve lineups
c. New or changed precautions/hazards
d. Valid RWP or other required work permits still in effect
2. Adequate supply of PPE
3. New Training, any training coming up on expiration
4. New changes to relevant Category "A" or Category "B" procedures
5. Equipment and tools calibrations in effect
6. Relevant lessons learned, critique reports
7. RWP revisions:
a. Changes to radiological conditions of the workplace, particularly with respect to postings
b. Change in scope, especially if it is a reduction in scope or Stop Work Levels
8. Changes to radiological and/or health monitoring
9. Open floor to questions

The above minimum requirements have been met; this PJU has been conducted in sufficient detail to maximize continued safe conduct of the job, and all personnel have been through a previous Pre-Job Brief.

Job Supervisor/Foreman _____ Date _____

NOTE: Completed pre-job update sheet must be retained with the work package or maintained in your record file.
CAUTION: Working on or Near Live, Active Lines/Utilities
Consider Alternative Means of Protection (Blocking, Shielding, etc.)And Alternative Manual Methods for Removal

JOB STATUS LOG

1. WORK PACKAGE TITLE: Demolition of Building 22

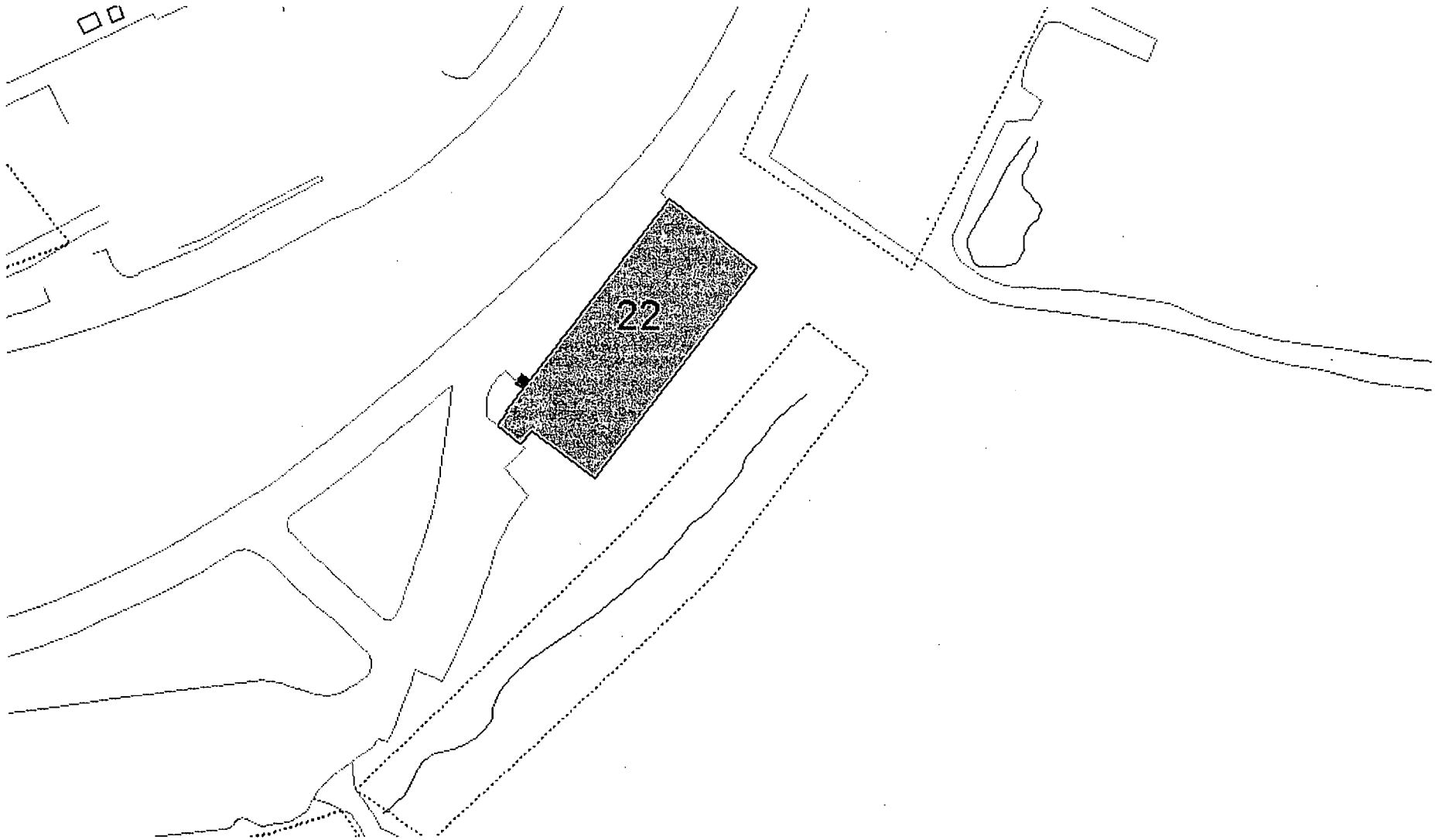
2. WORK PACKAGE NUMBER: BOSS-38214 - 00

DATE	TIME	WORK PKG. SECTION	% Complete	BY	STATUS

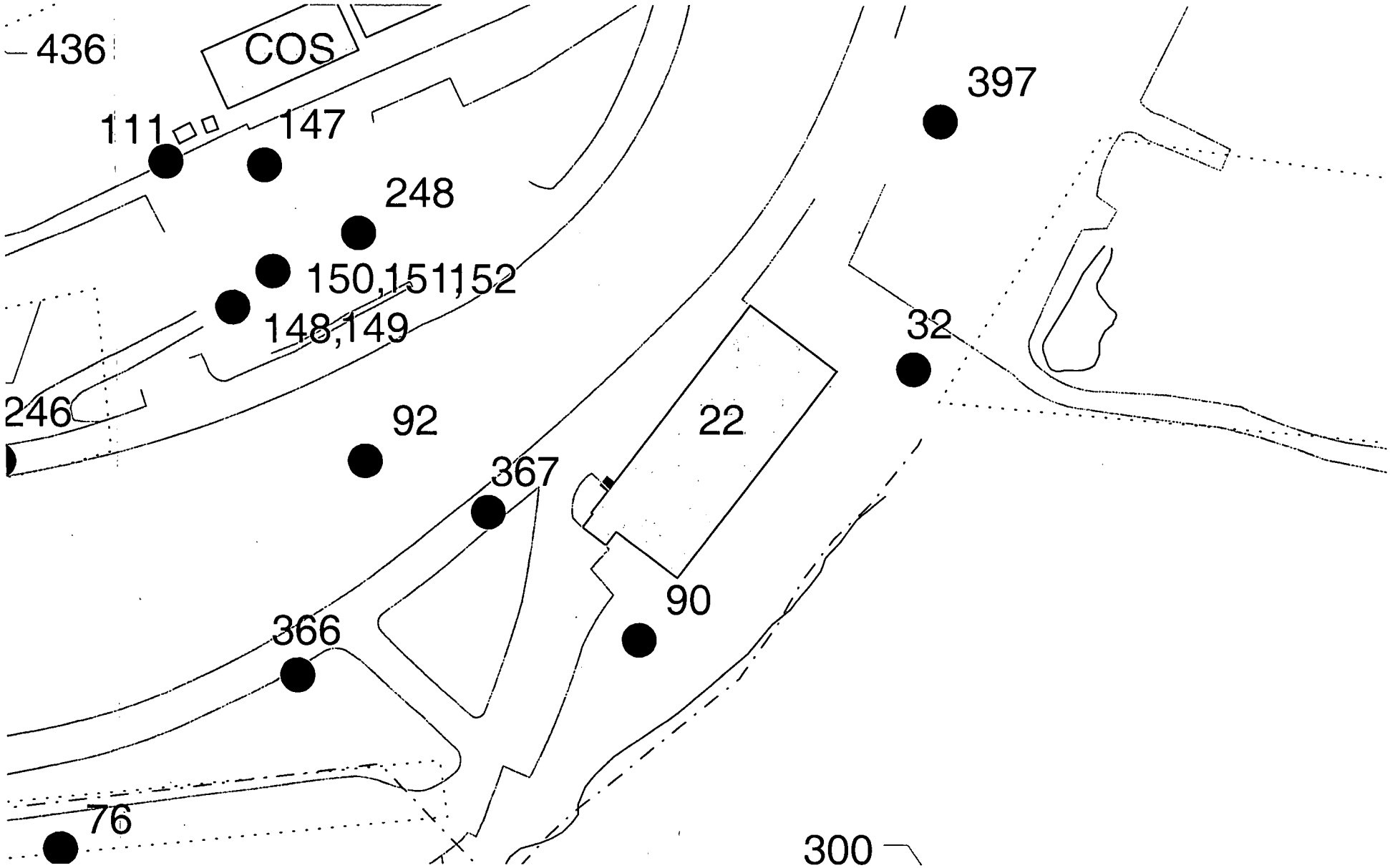
Appendix C

Drawings/Sketches/Photographs

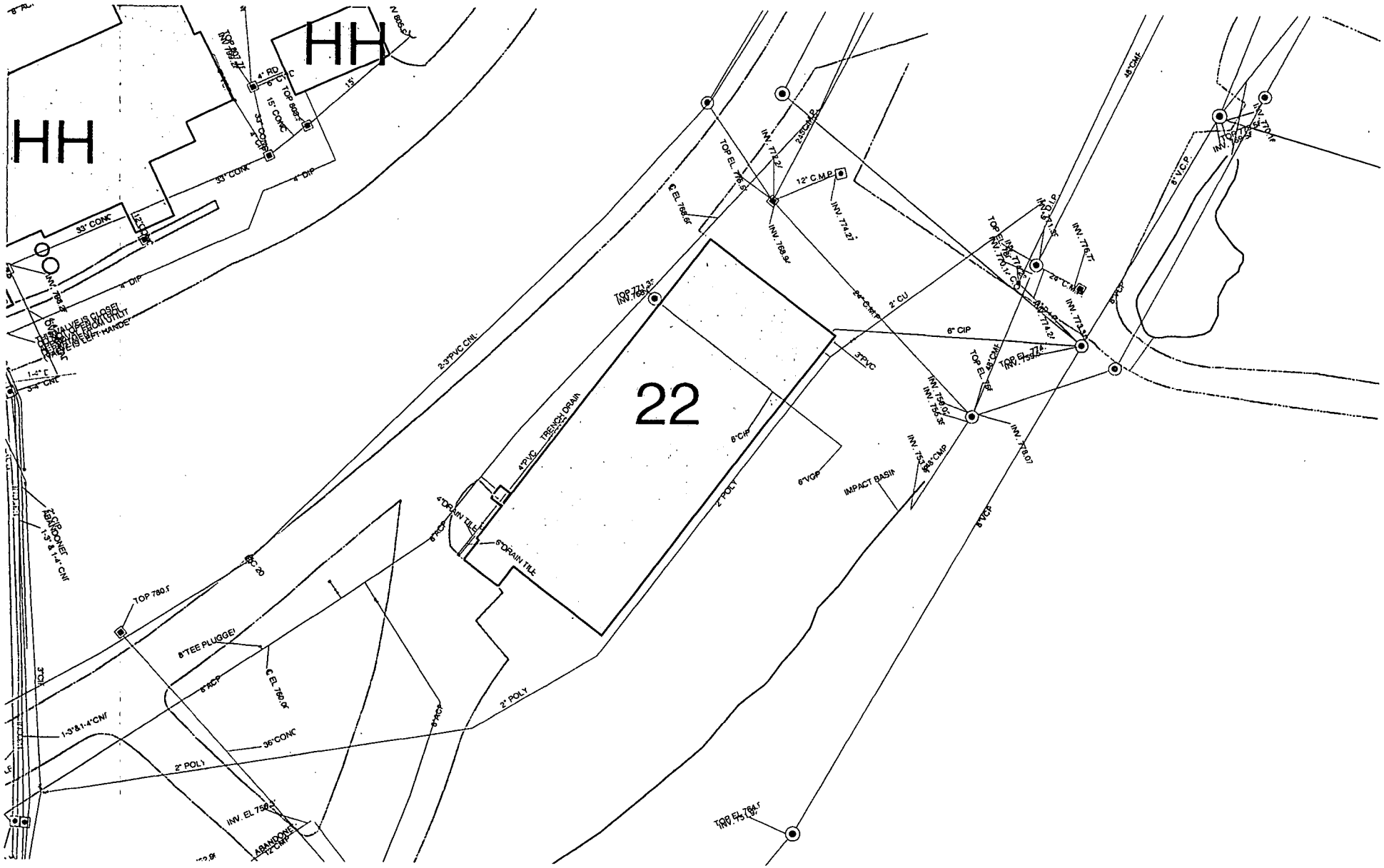
- **Original Building 22 Drawings, 302200-00001 thru 302200-05001 (1965)**
- **East Addition, Building 22 Drawings, 4-7765 thru 4-7770 (1968)**
- **Fire System Valve Building, Building 22 Drawings, 4-6259, 4-6261, 3-5039 (1966)**
- **ES&H Enhancements, Building 22 Drawings302204-00001 thru 302204-05003 (1995)**
- **URMAs locations around BD-22**
- **PRSs locations around BD-22**
- **Overhead and Underground Utilities Plan**
- **Contour**
- **Building 22 Floor Plan**



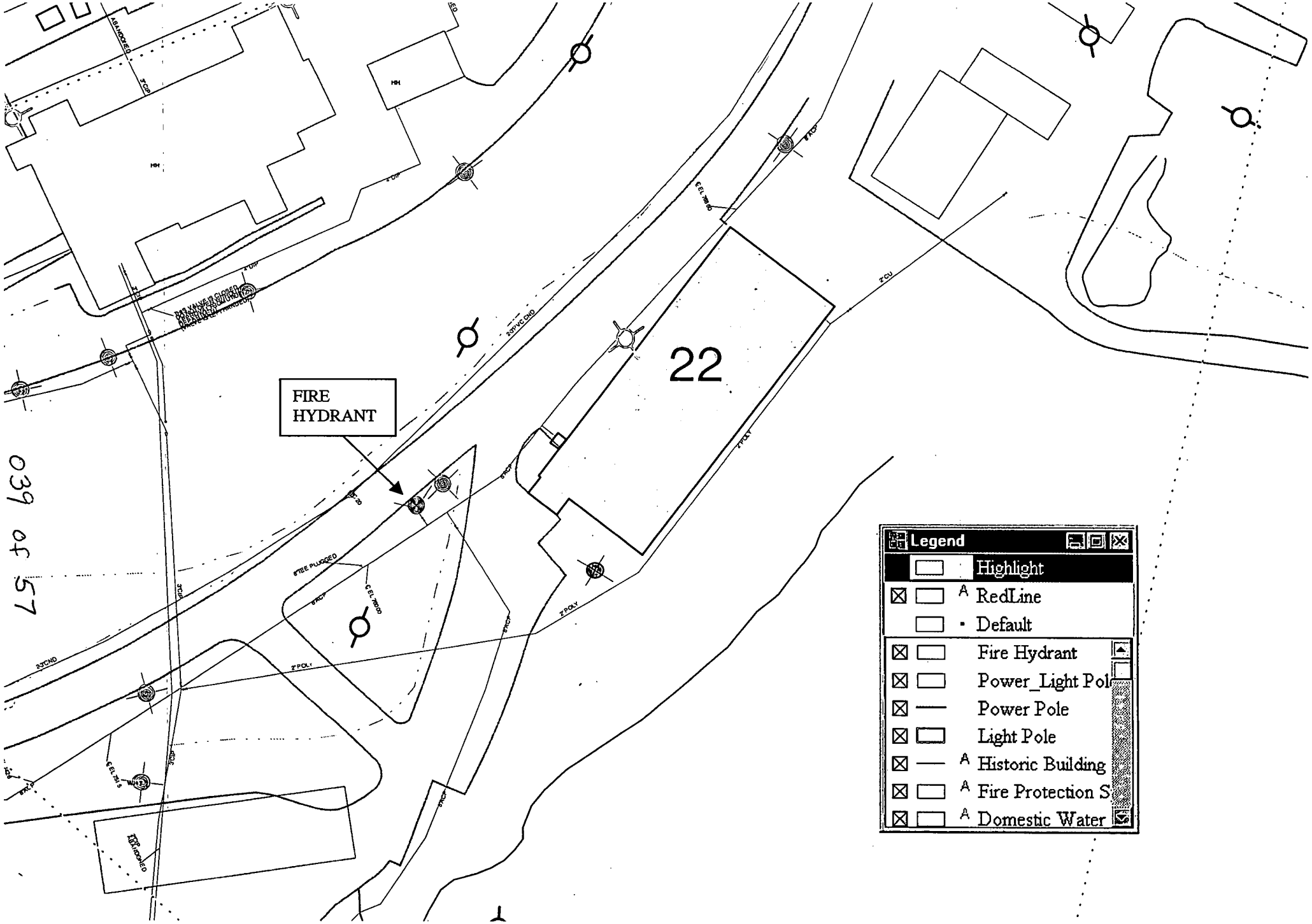
URMAs

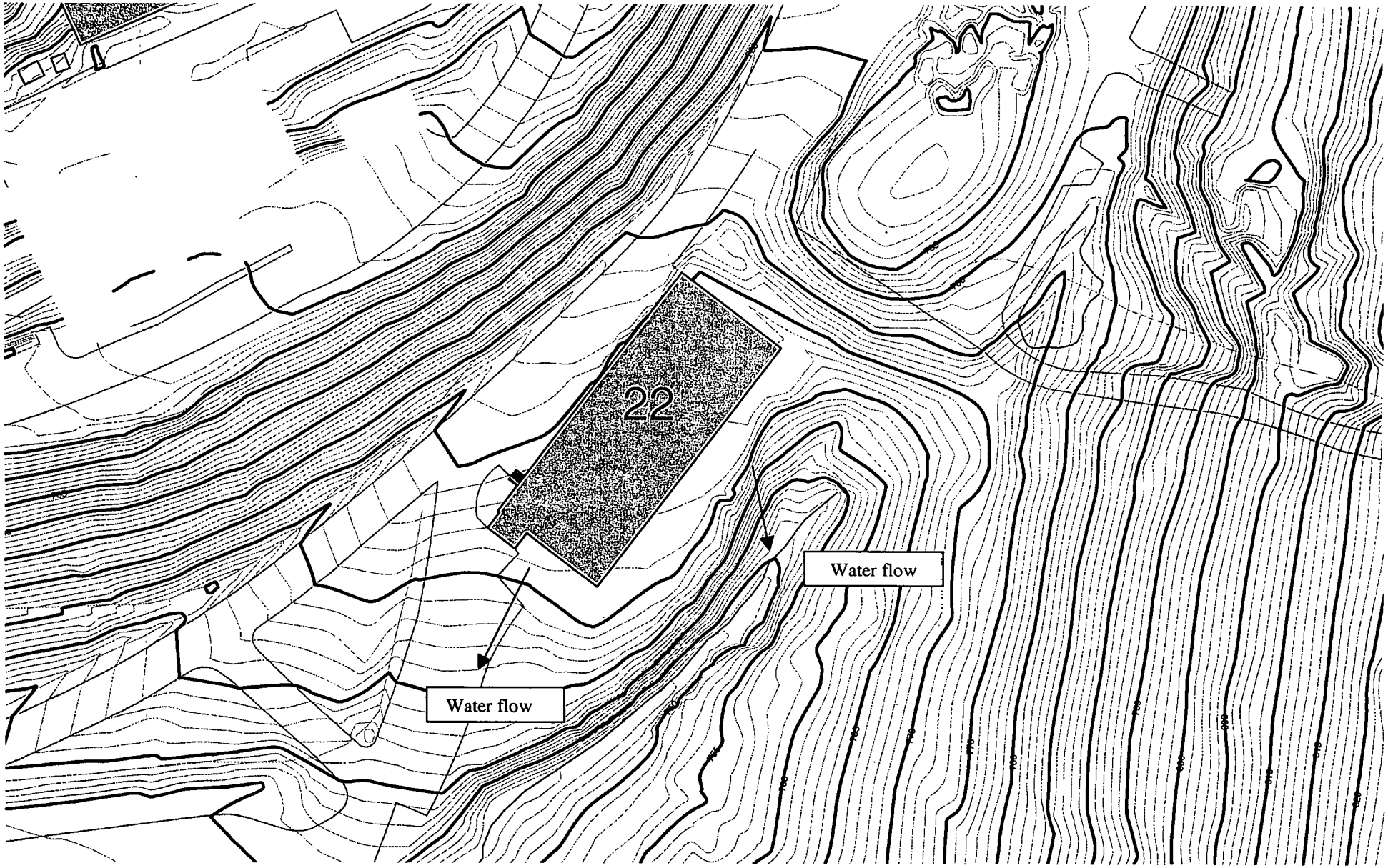


PRSs in Vicinity of BD-22

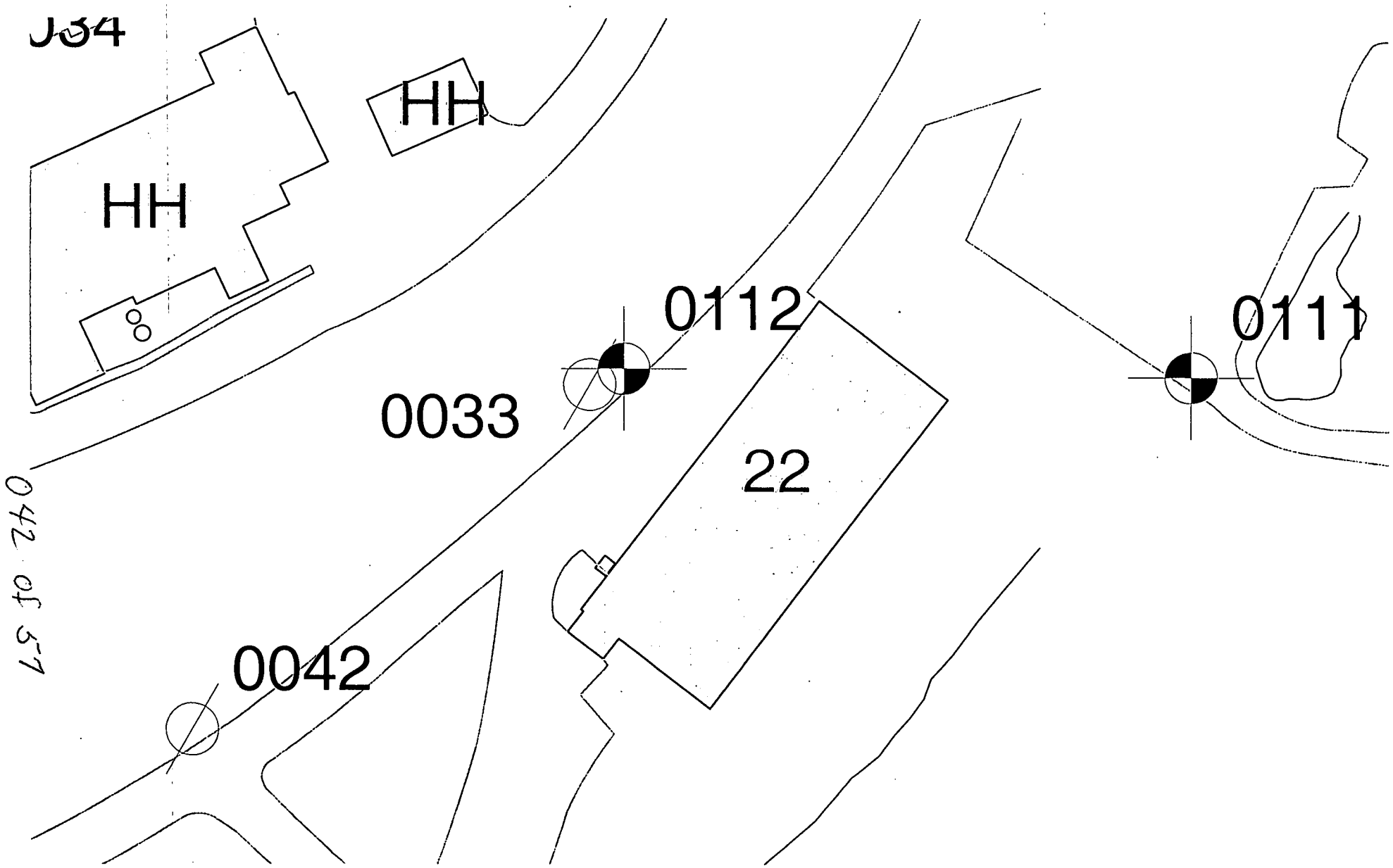


Underground Utilities

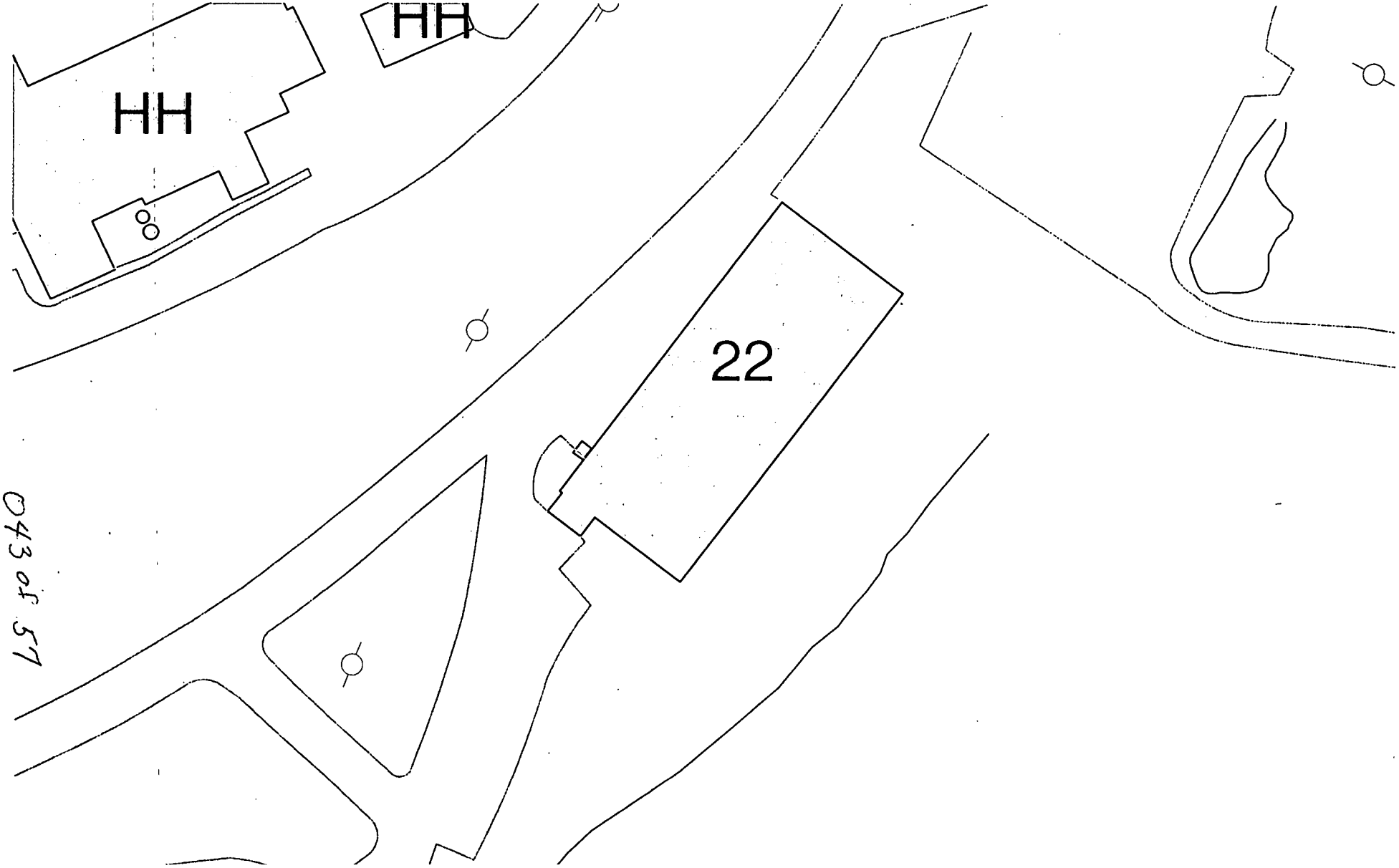

FIRE
HYDRANT
22
Legend
Highlight
RedLine
Default
Fire Hydrant
Power_Light Pol
Power Pole
Light Pole
Historic Building
Fire Protection S
Domestic Water



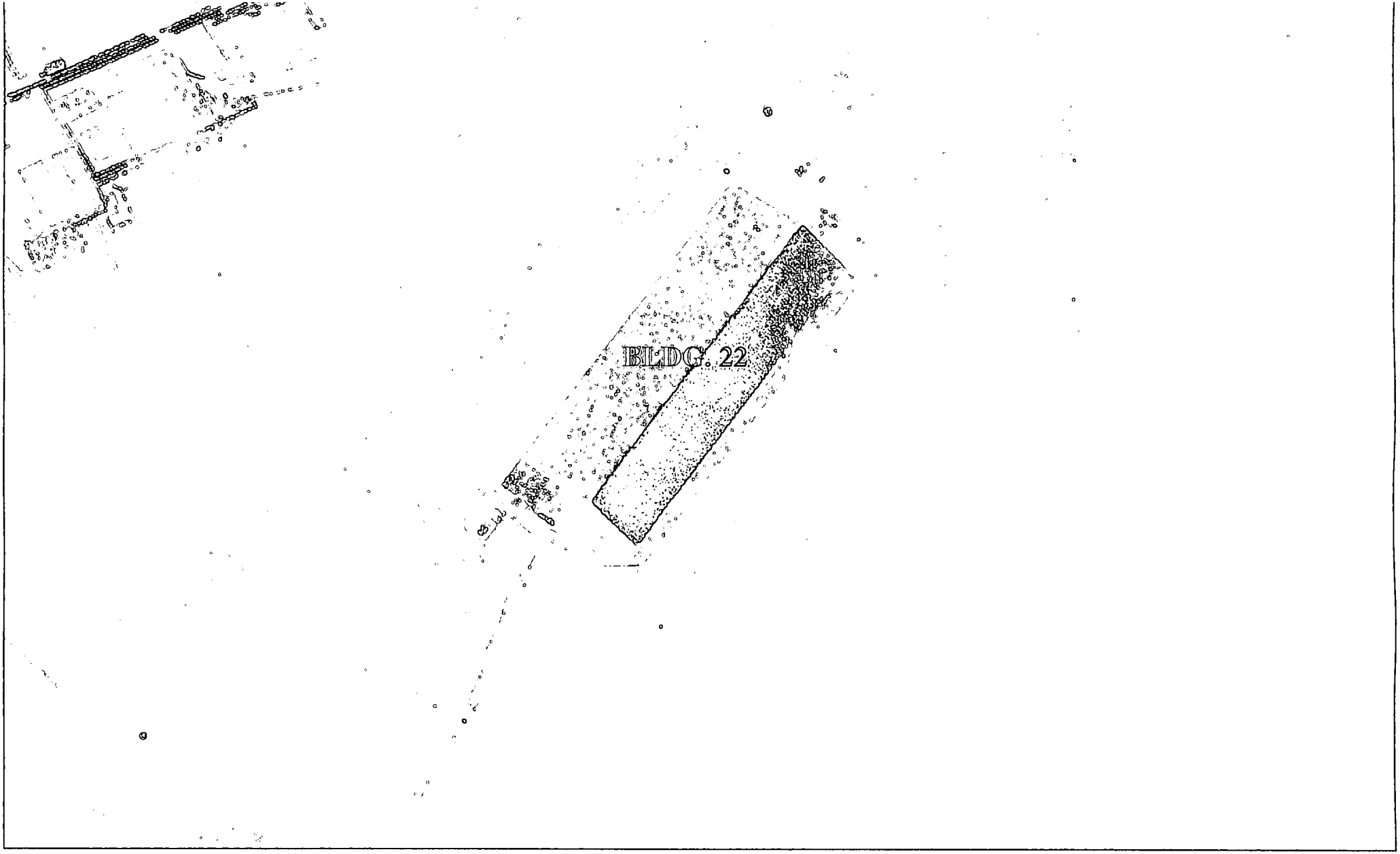
Contour



Monitoring Wells



Power Poles



Aerial Photo

Appendix D

Miscellaneous

- **No USQ required for this Work Package**
- **No RWP required for this Work Package**
- **Solid Waste Debris/Rolloff Release form.**
- **PRSs around BD-22**
- **Work Package Material List**
- **Structural Engineering Survey Letter per 29 CFR 1926.850**

Attachment 1, (Example) Solid Waste Debris/Roll-off Release – ML9901 (10/02)

SOLID WATE ROLL-OFF RELEASE

ROLL-OFF NUMBER: _____ **WASTE GENERATED:** _____

BUILDING/AREA	Buildings with no Rad History		Buildings/Rooms with Rad History	COMMENTS
	ANNUAL SURVEY (DATE/NO.)	ROLL-OFF/ DEBRIS PILE SURVEY (DATE/NO.)	ITEM/AREA PRE-DEMOLITION/TRANSITION SURVEY or MARSSIM METHODOLOGY\ (DATE/NO.)	

The demolition/solid waste being disposed of from the Mound Location identified above meets the standards established by the Mound Guidance for Disposal of Solid Waste in agreement with the Ohio Environmental Protection Agency and the Department of Health Bureau of Radiological Protection. The Mound Guidance for Disposal of Solid Waste establishes standards for the survey of demolition debris and solid waste. The radiological surveys of the demolition debris/solid waste comprising this shipment were conducted in accordance with approved procedures and the use of best available technology as described in the Mound Guidance for Disposal of Solid Waste.

_____ Date_____

Waste Operations Manager or Designated Representative

ML-9901 (10/02).

Attachment 2 – FREE RELEASE SURVEY FOR WASTE DISPOSED OF IN ROLL-OFFS TO LOCAL LANDFILL

I. BUILDINGS WITH NO RAD HISTORY (MARSSIM NON-IMPACTED AREAS)	II BUILDINGS/ROOMS WITH RAD HISTORY (MARSSIM CAT,. 1, 2, & 3)	
ANNUAL SURVEY AND ROLL-OFF/DEBRIS PILE SURVEY	PRE-DEMOLITION/TRANSITION SURVEY OR MARRSIM methodology for unrestricted release of building structure. Equipment/furniture left in the building for D&D or that is part of a clean-out will have a representative survey of horizontal surfaces. OR Item Specific free release requires a survey/ evaluation in accordance with MD-80043, OP 400 or OP 500, as appropriate.	NOTES: Structural materials or specific item identified as contaminated above the limits in MD-80043, OP 400 may be decontaminated and resurveyed to determine if it meets release survey criteria

PRSs in Proximity to Building 22

PRS	CERCLA or Bldg. Related	Binning Status	Comments
32	CERCLA	NFA	**Underground Sanitary Sewer Line G12**
67	CERCLA	FA	**Plant Drainage Ditch**
75	CERCLA	RA	**Railroad Siding**
90	CERCLA	NFA	**Site Survey Project Potential Hot Spot Location S0426**
286	Building	UB	**Area 16, SM Building Sanitary Sewage Septic Tank Leach Field**
300	CERCLA	NFA	**Area 19, Underground Waste Transfer Line**
367	CERCLA	NFA	**Elevated Soil Gas Location**
397	CERCLA	NFA	**Elevated Soil Gas Location**

Note: PRSs 286 has not yet been binned by the Core Team.

WORK PACKAGE MATERIAL LIST

Work Package # Demolition of Building 22 Page ___ of ___

Work Package Description BOSS-38214-00

Item #	Qty.	Units	Material Description	Used For	Suggested Supplier
1		ea	Check spill kits	Spills	

Structural Engineering Survey Letter will go here.

Appendix E

LESSONS LEARNED/ POST-JOB CONFERENCE

EVENTS

1. EXCAVATOR BOOM CONTACTS OVERHEAD 13.8 KILOVOLT POWER LINE

On April 22, 2002, at the Rocky Flats Environmental Technology Site, the boom of an excavator contacted an overhead 13.8 kilovolt high-voltage power line, causing a visible electrical arc and tripping a substation circuit breaker. The excavator was being used to dismantle a building using mechanical shears attached to the boom for breaking up concrete. The line was checked for damage and it was returned to service a short time later. There were no injuries to the operator or equipment damage. (ORPS Report RFO--KHLL-NONPUOPS3-2002-0002)

The equipment operator was moving the excavator to position it out of the work area by extending the boom to assist in turning (see Figure 1). During one of these maneuvers, the boom contacted the power line, which was approximately 23 feet above the ground. A spotter was not used because the excavator was not expected to operate near the overhead lines.

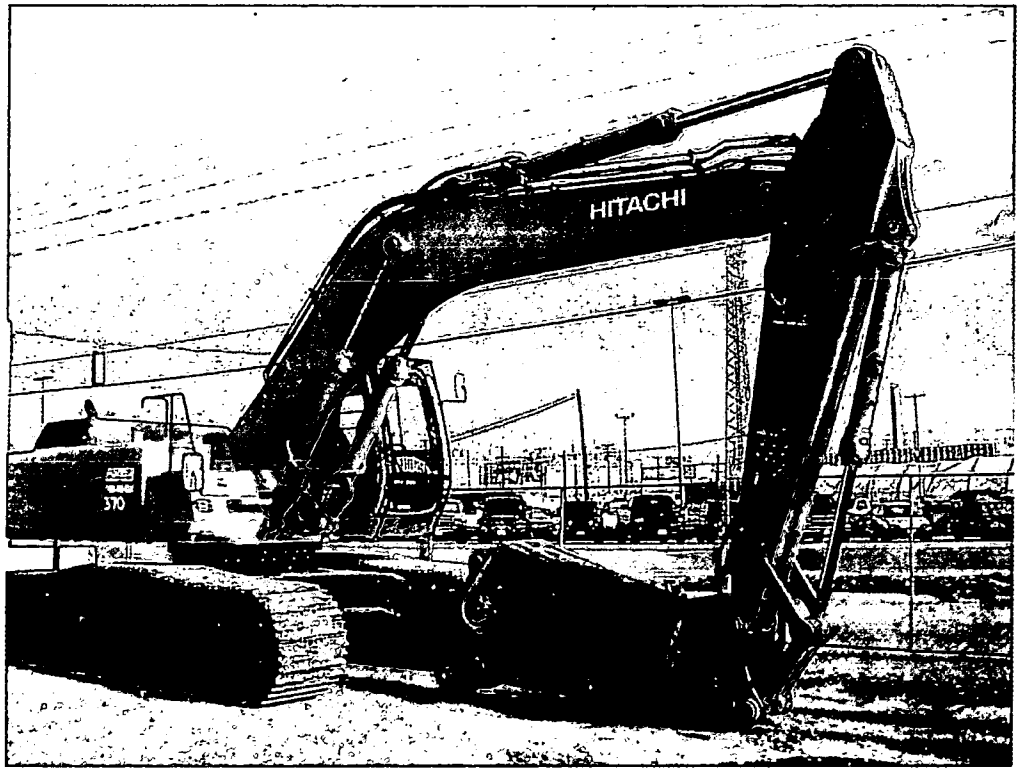


Figure 1. Excavator with boom positioned on the ground

A similar incident was reported in Operating Experience Summary 2000-09, in which a mobile television crew was injured when their transmission antenna contacted an overhead power line. The television crew was extending the antenna mast from their truck to transmit a live broadcast when the mast contacted an overhead power line and caused a small electrical fire and explosion inside their van. A camera operator outside the truck and an operator inside the truck were taken by helicopter to a hospital for treatment of burns.

The Occupational Safety and Health Administration regulation 29 CFR 1910.333(c)(3)(iii)(A), *Vehicular and Mechanical Equipment*, states that any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 feet is maintained.

This event demonstrates the importance of exercising extreme caution when operating excavators, cranes, front-end loaders, forklifts, and other vehicles in the vicinity of power lines. Pre-job briefings, facility procedures, and training programs should emphasize the dangers associated with these types of operations. Many events have occurred because equipment operators were not aware of potential hazards around and above them. The use of a spotter in this circumstance might have prevented this occurrence.

KEYWORDS: *Electric line, excavator, overhead line, electrical safety*

ISM CORE FUNCTIONS: *Develop and Implement Hazard Controls, Perform Work within Controls*

2. INADEQUATE EQUIPMENT GROUNDING RESULTS IN ELECTRICAL SHOCK

On January 29, 2002 at the Savannah River Site, a cafeteria services worker received a shock to his right hand while attempting to turn off an electric kitchen stove. The worker had seen electrical sparks underneath the 208-volt stove and decided to turn the stove control to the "off" position. Investigators later determined that the stove housing was inadequately grounded to prevent a shock. The worker did not require medical attention, but the shock to his right hand resulted in a near-miss occurrence. (ORPS Report SR--WSRC-FSSDGEN-2002-0001; final report filed March 25, 2002)

A critique of the event revealed that the stove was a replacement unit that had been installed in 2000, without upgrading the existing wiring and without verifying that the grounding was adequate after installation was complete. The electrical junction box for the replacement stove was located at the bottom of the unit and the power supply wires, inside a flexible conduit, rested against the sheet metal of the junction box.

The direct cause was a defective or failed part because the insulation on one of the power supply conductors touching the junction box had melted, causing an electrical short. Because of this short and the inadequate grounding of the stove, the worker received a shock. Daily use of the stove had generated high levels of heat for prolonged periods of time. Some of this heat apparently transferred to the junction box through conduction and melted the insulation.

The contributing cause was the electrician's failure to verify that the stove had been properly grounded after he installed it.

The root cause of this event was an inadequate or defective design. Maintenance personnel assumed that installation of the new stove was a direct replacement of the old one. The electrician failed to consider that the existing wiring would need to be upgraded, and used the same flexible conduit and wiring that was used for the old stove.

The following corrective actions have been implemented or are underway:

- Submit a lessons-learned document to the division lessons learned coordinator for review and sitewide distribution on the necessity of conducting a design review before replacing installed industrial-class electrical equipment.
- Ensure that all industrial-class equipment in the facility is properly grounded and that circuit breaker protection is adequately rated.
- Ensure that the new stove is grounded correctly and that it has effective circuit breaker protection.

Transporting Portable Fuel Tanks

(L03-012)

Lessons Learned Statement:

When moving portable fuel tanks, care should be taken to adjust lifting forks to the proper width required by the item being lifted. Setting of the forks into available lifting slots should be verified and spill kits should be readily available at the job site where portable fuel tanks are being used.

Discussion:

Oh March 26, 2003, a Heavy Duty operator attempted to lift a 550 gallon portable diesel fuel day tank, with a John Deere 644G loader equipped with forks. The tank assembly was equipped with two lifting slots; however the operator did not take time to adjust the loader forks to match their spacing. He attempted to pick up the tank by engaging only one lifting slot (a common practice) and placing the other fork under the lower tank support rails. In his haste to complete the job, the operator proceeded to lift the tank without first verifying that the fork had engaged the slot; the fork had missed the intended slot. As the tank was lifted it became unstable, rolled off of the forks, and tipped onto its end. At this point, diesel fuel began to pour out of the vent pipe. After three attempts, the operator was able to right the tank and stop the spill. Immediately, the Fire Department was called and several people in the area began to take measures to contain the spill. Through teamwork by the involved organizations, the spill was prevented from flowing into the adjacent stream. A total of approximately 24 gallons of fuel spilled from the tank onto a paved parking lot.

Analysis:

Failure to take the time necessary to adjust the loader forks and to verify that they were set into the tank lifting slots prior to lifting resulted in the spill of diesel fuel. Contributing to the event was the common practice of transporting the tank with only one fork set in the lifting slot. Additionally, work plans did not consider special precautions though the tank was being manipulated while in close proximity to a body of water.

Recommended Actions:

1. Operators must take the required time to adjust lifting forks to the proper width required by the item being lifted. The practice of moving the portable tanks with only one fork set into the lifting slots should be discontinued. Further, setting of the forks into both lifting slots must be verified prior to beginning the lift.

2. Spill kits should be located at the job site where portable fuel tanks are being used.

3. Work plans should provide special precautions when using or transporting portable fuel tanks near bodies of water.

POST JOB CONFERENCE

1. WORK PACKAGE TITLE: Demolition of Building 22
2. WORK PACKAGE NUMBER. BOSS-38214 - 00.

What went well?

What could be improved?

Other Comments:

Items Requiring Further Action:

POST-JOB CONFERENCE ATTENDEES

NAME	HP	NAME	HP

LESSONS LEARNED INPUT FORM

Title: (This is a brief descriptive title)

Lessons Learned Statement: (This is a brief, two or three sentence, summary of the lesson that was learned)

Discussion: (This is background and detail of what happened)

Analysis: (Discussion of what went wrong, or right and what should be done in the future)

Recommended Actions: (Identify specific corrective actions)

Submitted by: _____ Date: _____

OPTIONAL

Mail to: Lessons Learned Program Manager, or appropriate Project or Functional Manager