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Mr. Rick Shean
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Subject: Submittal of Solid Waste Management Units and Areas of Concern Annual Long-Term Monitoring and Maintenance Report for Calendar Year 2022 at Sandia National Laboratories, New Mexico (SNL/NM), Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Shean:

The Department of Energy, National Nuclear Security Administration, Sandia Field Office, and National Technology & Engineering Solutions of Sandia, LLC submit the Subject document dated March 2023. This report demonstrates the effectiveness of SNL/NM administrative and physical safety controls employed at the Solid Waste Management Units and Areas of Concerns during Calendar Year 2022 per the Resource Conservation and Recovery Act Facility Operating Permit Attachment M, Section M.4.

If you should have any questions, please contact me at (505) 845-6036 or Dr. Adria Bodour of our staff at (505) 845-6930, or adria.bodour@nnsa.doe.gov.

Sincerely,

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**Submittal of Solid Waste Management Units and Areas of Concern
Annual Long-Term Monitoring & Maintenance Report for
Calendar Year 2022, Sandia National Laboratories/New Mexico,
Resource Conservation and Recovery Act Facility Operating Permit**

**Sandia National Laboratories
Albuquerque, New Mexico
EPA ID No. NM5890110518**

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

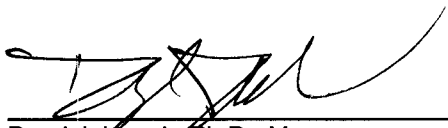
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and



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National Nuclear Security Administration
Sandia Field Office
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Date signed



**Sandia
National
Laboratories**

**SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN
ANNUAL LONG-TERM MONITORING AND MAINTENANCE REPORT
FOR CALENDAR YEAR 2022**

SANDIA NATIONAL LABORATORIES, NEW MEXICO

March 2023



**U.S. DEPARTMENT OF
ENERGY**



**United States Department of Energy
Sandia Field Office**

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

**SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN
ANNUAL LONG-TERM MONITORING AND MAINTENANCE REPORT
FOR CALENDAR YEAR 2022
MARCH 2023**

Facility: Solid Waste Management Units and Areas of Concern

Location: Sandia National Laboratories
Albuquerque, New Mexico

EPA ID No.: NM5890110518

Permit Basis: Resource Conservation and Recovery Act Facility Operating
Permit, effective February 26, 2015

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
CY	calendar year
DOE	U.S. Department of Energy
KAFB	Kirtland Air Force Base
LTMM	Long-Term Monitoring and Maintenance
MWL	Mixed Waste Landfill
NMED	New Mexico Environment Department
Permit	Resource Conservation and Recovery Act Facility Operating Permit
SNL/NM	Sandia National Laboratories, New Mexico
SWMU	Solid Waste Management Unit

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EXECUTIVE SUMMARY

The Solid Waste Management Units and Areas of Concern Annual Long-Term Monitoring and Maintenance Report for Calendar Year 2022 details the measures, including surveillance of site conditions and maintenance of institutional controls, for 24 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at Sandia National Laboratories/New Mexico for which corrective action is complete with controls. These measures address the requirements of the Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories, (Permit) (NMED January 2015, with all approved modifications). Requirements for SWMUs and AOCs are specified in Permit Attachment M, "Long-Term Monitoring and Maintenance Plan for SWMUs and AOCs Granted Corrective Action Complete with Controls." This report does not address measures taken for SWMU 76, Mixed Waste Landfill (MWL), which adheres to the approved MWL Long-Term Monitoring and Maintenance Plan, Section 4.8.1. Site conditions and maintenance of institutional controls for the MWL are covered in a separate annual report that is submitted to the New Mexico Environment Department by June 30 of each year.

Site conditions observed during the calendar year (CY) 2022 Permit-required annual site inspections indicated that maintenance or repair activities were needed at SWMU 4. This SWMU requires the replacement of weathered signs. Maintenance at SWMU 4 will be completed and verified by follow-up inspection within the required time period. Follow-up inspections were performed at SWMUs 45, 46, and 190 to verify that the signs replaced in CY 2021 are in place and in good condition. No other maintenance or repairs were needed.

Based upon the inspections performed and site conditions observed, the administrative and physical institutional controls in place at the SWMUs and AOCs during CY 2022 are providing continued protection of human health and the environment.

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1.0 INTRODUCTION

Sandia National Laboratories (SNL/NM) is a multimission laboratory currently managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's (DOE) National Nuclear Security Administration. SNL/NM is located within the boundaries of Kirtland Air Force Base (KAFB), immediately southeast of the City of Albuquerque in Bernalillo County, New Mexico.

Surveillance of site conditions and maintenance of institutional controls are necessary for continued protection of human health and the environment at 25 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that have undergone corrective action (Figure 1-1) at SNL/NM. These SWMUs/AOCs, together with the surveillance and institutional controls required for each, are specified in Attachment M of the Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories (Permit), (NMED January 2015, with all approved modifications).

This report presents information for 24 of the 25 SWMUs and AOCs at SNL/NM for which corrective action is complete with controls. It does not present the relevant monitoring and maintenance requirements for SWMU 76, Mixed Waste Landfill (MWL). Those requirements are detailed in the approved MWL Long-Term Monitoring and Maintenance (LTMM) Plan, Section 4.8.1 (SNL/NM March 2012), which requires a separate annual report that is submitted to the New Mexico Environment Department (NMED) by June 30 of each year.

1.1 Background

Corrective action and continued management of the SWMUs and AOCs with Corrective Action Complete with Controls status, as approved by the NMED, are conducted in accordance with the requirements of the Permit. Each SWMU and AOC at SNL/NM is listed in one of four tables that comprise Permit Attachment K, "Solid Waste Management Units and Areas of Concern." Figure 1-1 of this Annual LTMM Report shows the locations of the SWMUs and AOCs requiring institutional controls; these are listed in Permit Attachment K, Table K-3 "Solid Waste Management Units and Areas of Concern for which Corrective Action is Complete with Controls." The comprehensive requirements for monitoring and maintenance of long-term institutional controls at the identified SWMUs and AOCs are specified in Permit Attachment M, "Long-Term Monitoring and Maintenance Plan for Solid Waste Management Units and Areas of Concern Granted Corrective Action Complete with Controls," which includes a list of the relevant SWMUs and AOCs. A summary of the associated surveillance and control requirements is included in Permit Attachment M, Table M-1, "Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls."

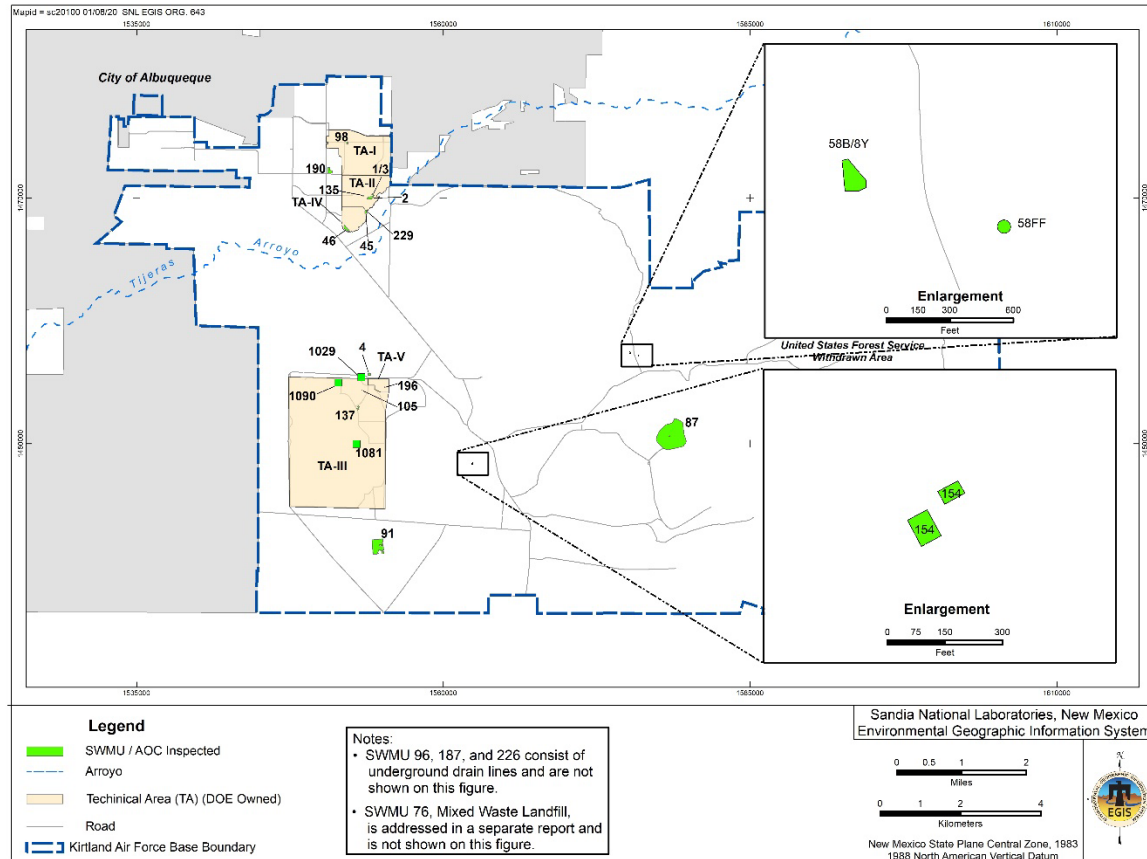


Figure 1-1
 Location of Solid Waste Management Units and Areas of Concern
 for which Corrective Action is Complete with Controls, Sandia National Laboratories, New Mexico

1.2 Purpose and Scope

The purpose of this annual LTMM report is to document maintenance of controls and activities conducted during the calendar year (CY) 2022 reporting period. Table 1-1 lists, and Figure 1-1 shows, the SWMUs and AOCs addressed in this report.

Table 1-1
 List of Solid Waste Management Units and Areas of Concern for which
 Corrective Action is Complete with Controls
 Sandia National Laboratories, New Mexico

SWMU or AOC Number	SWMU or AOC Name
1	Radioactive Waste Landfill
2	Classified Waste Landfill (TA-II)
3	Chemical Disposal Pit
4	LWDS Surface Impoundments
45	Liquid Discharge (Behind TA-IV)
46	Old Acid Waste Line Outfall
58FF	Fire Bricks Feature (Coyote Canyon Blast Area)
58B/8Y	Debris Pile and Pit Area (Coyote Canyon Blast Area)
87	Building 9990 Firing Site
91	Lead Firing Site (Thunder Range)
96	Storm System Drain
98	Building 863 (TCA, Photochemical Releases: Silver Catch Boxes)
105	Mercury Spill (Building 6536)
135	Building 906 Drain System
137	Building 6540/6542 Septic System (TA-III)
154	Bldg. 9960 Septic System and Seepage Pits (Coyote Canyon Test Field)
187	Septic Tank Piping for POTW
190	Steam Plant Tank Farm
196	Building 6597 Cistern (TA-V)
226	Old Acid Waste Line
229	Storm Drain System Outfall (for TA-II)
1029	Building 6584 North Septic System (TA-III)
1081	Building 6650 Septic System (TA-III)
1090	Building 6721 Septic System (TA-III)

Notes:

- AOC = Area of Concern.
- LWDS = Liquid Waste Disposal System.
- POTW = Publicly Owned Treatment Works.
- SWMU = Solid Waste Management Unit.
- TA = Technical Area.
- TCA = 1,1,1-trichloroethane.

1.3 Report Organization

This report is organized as follows:

- Chapter 1 presents background information, purpose and scope, and report organization.
- Chapter 2 provides a summary of controls, surveillance, and maintenance requirements specified in Permit Attachment M.
- Chapter 3 presents the inspection results and maintenance activities performed during the reporting period.
- Chapter 4 presents a general summary and conclusions for the CY 2022 reporting period.
- Chapter 5 lists the references cited in this report.

2.0 CONTROLS AND SURVEILLANCE REQUIREMENTS

Measures to be taken to provide protection of human health and the environment are defined in Permit Attachment M. The measures include surveillance of site conditions and maintenance of institutional controls. The controls are consistent with the risks presented by the site conditions and constituents of concern at each SWMU and AOC. The controls are implemented in an integrated and layered approach to enhance their effectiveness and reliability, and to provide continued protection in the event that one or more controls become temporarily impaired.

The required administrative and physical controls are described in Permit Attachment M, Section M.2 “Institutional Controls,” and are summarized in Section 2.1 and 2.2, respectively. Maintenance requirements are described in Section M.3, “Maintenance of Institutional Controls,” and are covered in Section 2.3 of this report.

2.1 Administrative Controls and Surveillance Requirements

Administrative controls for the SWMUs and AOCs listed in Table 1-1 include information management, awareness, and restrictions on future land use. Information about each SWMU/AOC includes:

- Site location and characteristics;
- Site history and corrective action completed;
- Land use permits or agreements with KAFB;
- Documentation of current site conditions, including information from annual inspections;
- Type of controls;
- Maintenance records;
- Planning information, including restrictions on future activities at the site; and
- Copies of reports previously submitted to NMED.

The information must be maintained and plans for future DOE and SNL/NM activities at or near each SWMU/AOC listed in Permit Table K-3 are to be evaluated during planning stages to identify aspects that are not consistent with the Industrial Land Use designation.

Table 2-1
 Summary of Physical Controls and Surveillance Requirements
 Solid Waste Management Units and Areas of Concern
 Sandia National Laboratories, New Mexico

SWMU or AOC Number	Signs and Postings	Inspection Frequency	Additional Information
1	4 signs on SWMU perimeter, one each in selected corners of the SWMU.	Annual	N/A
2	5 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU.	Annual	N/A
3	Included with SWMU 1.	Annual	Located adjacent to SWMU 1.
4	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU.	Annual	N/A
45	5 signs on SWMU perimeter, one in approximately each corner of the SWMU outside of the TA-IV fence.	Annual	Western half of the SWMU is located within the TA-IV fenced boundary.
46	4 signs along the TA-IV fence line and 7 signs posted along the south and west perimeter of the SWMU.	Annual	N/A
58FF	2 signs on perimeter.	Annual	Feature within SWMU 58.
58B/8Y	4 signs on perimeter.	Annual	Feature within SWMU 58.
87	4 signs, one at the access road and 3 on the perimeter of the SWMU.	Annual	N/A
91	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU.	Annual	N/A
96	Not feasible.	None	SWMU consists of underground storm drains throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.
98	Not feasible.	None	SWMU consists of a subsurface area located under a building. No signs, postings, or inspections are feasible due to SWMU features.

See notes at end of table.

Table 2-1 (Concluded)
 Summary of Physical Controls and Surveillance Requirements
 Solid Waste Management Units and Areas of Concern
 Sandia National Laboratories, New Mexico

SWMU or AOC Number	Signs and Postings	Inspection Frequency	Additional Information
105	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU.	Annual	N/A
135	1 sign.	Annual	N/A
137	4 signs on SWMU perimeter, one each at selected corners of the SWMU.	Annual	N/A
154	4 signs at 2 areas that comprise the SWMU; 2 signs near selected corners of each area.	Annual	N/A
187	Not feasible.	None	SWMU consists of underground sewer lines throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.
190	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU.	Annual	N/A
196	1 sign near the northeast corner of the SWMU.	Annual	N/A
226	Not feasible.	None	SWMU consists of underground drain lines throughout TA-I, -II, and -IV. No signs, postings, or inspections are feasible due to SWMU features.
229	1 sign at the top of the outfall.	Annual	N/A
1029	3 signs on SWMU perimeter.	Annual	N/A
1081	3 signs on SWMU perimeter.	Annual	N/A
1090	1 sign, approximately in the middle of the SWMU.	Annual	N/A

Notes:

- AOC = Area of Concern.
- N/A = Not applicable.
- SWMU = Solid Waste Management Unit.
- TA = Technical Area.

2.2 Physical Controls and Inspection Requirements

Physical controls for the SWMUs and AOCs in Table 2-1 include the following:

- Warning and information signs posted at each SWMU/AOC where feasible,
- Fences that restrict access to some or all portions of each SWMU/AOC,
- Physical features such as subsurface location (e.g., sewer lines), and
- Limiting land use to industrial activities.

Permit Attachment M, Table M-1 “Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls,” lists the specific controls and surveillance requirements. They are further summarized in Table 2-1 of this report.

Annual inspections are to be performed (except as noted in Table 2-1) to verify that physical controls are in place, and to determine whether adverse conditions exist at each SWMU or AOC that would impair the controls or lead to inadvertent exposure to hazardous wastes or hazardous constituents.

2.3 Maintenance Requirements

The physical controls (e.g. signs) for the SWMUs and AOCs are to be maintained and repaired in a timely manner as specified in Permit Attachment M, Table M-2 “Maintenance Schedule.” Maintenance is to occur on the schedule in Table M-2 unless weather or other site-specific conditions result in a delay. Each repair is to be reviewed in a follow-up inspection within 180 days after the completion of sign maintenance activities. The follow-up inspection may be combined with an annual inspection.

Table 2-2 summarizes the response schedule for maintenance issues at the sites.

Table 2-2
 Solid Waste Management Units and Areas of Concern Maintenance Schedule
 Sandia National Laboratories, New Mexico

Maintenance Issue	Response Schedule
Erosion, seepage, or subsidence	Evaluate severity and if necessary develop mitigation plan within 120 days Complete in a timely manner
Newly-occurring or newly-discovered contamination	See Permit Part 8, Corrective Action, Section 8.3.3 Newly Discovered Releases
Signs	Begin to address within 30 days Complete in a timely manner
Activities that are inconsistent with site restrictions	Begin to address within 30 days Complete in a timely manner

See notes at end of table.

Table 2-2 (Concluded)
 Solid Waste Management Units and Areas of Concern Maintenance Schedule
 Sandia National Laboratories, New Mexico

Maintenance Issue	Response Schedule
Awareness measures to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 30 days Implement measures in a timely manner
Access restrictions to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 60 days Implement measures in a timely manner

Notes:

AOC = Area of Concern.

Permit = Resource Conservation and Recovery Act Facility Operating Permit.

SWMU = Solid Waste Management Unit.

2.4 Changes in Requirements During CY 2022

There were no changes in Permit requirements during CY 2022.

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3.0 INSPECTIONS, MAINTENANCE, AND REPAIR ACTIVITIES

This chapter presents a summary of inspection, maintenance, and repair activities conducted during the January 1, 2022 through December 31, 2022 reporting period. SWMUs and AOCs with an “Annual” designation in Table 2-1 were inspected during CY 2022. Table 3-1 summarizes and documents issues noted during inspections, together with maintenance and repair activities.

3.1 Maintenance of Administrative Controls

The information about each SWMU or AOC was maintained during CY 2022 and reviewed as needed during planning activities. Specific activities included:

- Reviewing information from annual inspections to determine whether maintenance or repairs were needed;
- Reviewing approximately 150 plans for future activities at or near the SWMUs and AOCs to verify that the planned activities would not compromise the controls in place; and
- Following each review, notifying the appropriate personnel of the controls at SWMUs and AOCs at or near the planned activities, and the actions needed to avoid compromising the controls.

3.2 Inspection Activities

Personnel inspected each SWMU/AOC (except where not feasible as noted in Table 2-1) in October and November of 2022 (see Table 3-1). During each inspection, personnel walked the SWMU/AOC and recorded observations of the site perimeter and internal site areas. Large SWMUs and AOCs were inspected by following a grid pattern across the site.

Personnel monitored and recorded the following information:

- Condition of site;
- Evidence of erosion, seepage or subsidence;
- Evidence of newly-occurring or newly-visible contamination;
- Condition and location of signs;
- Evidence of activities that were not consistent with the restrictions in place; and
- Evidence of any residential activities adjacent to the given SWMU or AOC that would necessitate additional awareness measures and access restrictions for the site.

Table 3-1
 Summary of Calendar Year 2022 Inspection Results and Maintenance at
 Solid Waste Management Units and Areas of Concern Requiring Controls
 Sandia National Laboratories, New Mexico

SWMU or AOC Number	Inspection Completion Date	Required Maintenance	Maintenance Performed	Maintenance Completion Date	Other Conditions or Events
1	10/07/22	None	N/A	N/A	None observed
2	10/07/22	None	N/A	N/A	None observed
3	10/07/22	None	N/A	N/A	None observed
4	10/21/22	Replace 4 faded signs	Started 11/16/22	TBD	None observed
45	10/07/22	None	N/A	N/A	None observed
46	10/07/22	None	N/A	N/A	None observed
58FF	10/20/22	None	N/A	N/A	None observed
58B/8Y	10/20/22	None	N/A	N/A	None observed
87	10/20/22	None	N/A	N/A	None observed
91	11/22/22	None	N/A	N/A	None observed
105	10/21/22	None	N/A	N/A	None observed
135	10/07/22	None	N/A	N/A	None observed
137	10/21/22	None	N/A	N/A	None observed
154	11/17/22	None	N/A	N/A	None observed
190	11/17/22	None	N/A	N/A	None observed
196	11/29/22	None	N/A	N/A	None observed
229	11/17/22	None	N/A	N/A	None observed
1029	10/21/22	None	N/A	N/A	None observed
1081	11/17/22	None	N/A	N/A	None observed
1090	10/21/22	None	N/A	N/A	None observed

Notes:

Inspections are not required at SWMUs 96, 98, 187, and 226 because these SWMUs consist of underground drain lines or are located under a building. Inspections are not feasible.

- AOC = Area of Concern.
- N/A = Not applicable.
- SWMU = Solid Waste Management Unit.
- TBD = To be determined.

3.3 Inspection Results

Table 3-1 summarizes the results of the 24 annual inspections. Four subsurface sites, SWMUs 96, 98, 187, and 226, are not subject to the requirement for annual inspections, as noted in Table 2-1. Inspection records are maintained at SNL/NM in accordance with the Permit requirements.

Four faded signs were noted during the inspection at SWMU 4. Additional details for replacement of the signs is provided in Section 3.4.

3.4 Maintenance and Repair Activities

Site conditions observed during the CY 2022 Permit-required annual site inspections indicated that maintenance or repair activities were needed at only one site, SWMU 4. This SWMU requires the replacement of four weathered/faded signs. The signs will be replaced and a follow-up inspection will be performed within the time period required in the Permit. No other maintenance or repairs were needed.

3.5 Follow-up Inspections

Follow-up inspections for three SWMUs (45, 46, and 190) that required replacement of weathered signs in CY 2021 were performed concurrently with the CY 2022 annual inspections. Sign replacements at all three sites were verified and the signs were found to be in good condition.

4.0 SUMMARY AND CONCLUSIONS

During CY 2022, inspections and maintenance of long-term controls at SWMUs and AOCs were performed as described and documented in this report. Conditions requiring maintenance or repair activities consist of four Long-Term Stewardship notification signs that require replacement at SWMU 4 (Table 3-1). No conditions requiring maintenance or repair activities were observed at any of the other inspected SWMUs or AOCs during CY 2022.

Personnel associated with approximately 150 planned projects at SNL/NM were notified of controls associated with SWMUs and AOCs so that the controls would not be impacted by the planned activities.

Based upon the inspections performed and site conditions observed, the administrative and physical institutional controls in place at the SWMUs and AOCs are providing continued protection of human health and the environment.

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5.0 REFERENCES

New Mexico Environment Department (NMED), January 2015 with all approved modifications. "Resource Conservation and Recovery Act Facility Operating Permit EPA ID Number NM5890110518 Issued to the U.S. Department of Energy/Sandia Corporation for the Sandia National Laboratories Hazardous and Mixed Waste Treatment and Storage Units and Post-Closure Care of the Corrective Action Management Unit," January 27, 2015.

Sandia National Laboratories, New Mexico (SNL/NM), March 2012. "Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill," Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

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