

ATTACHMENT E
INSPECTION SCHEDULE, PROCESS AND FORMS

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1 **ATTACHMENT E**

2 **INSPECTION SCHEDULE, PROCESS AND FORMS**

3 Introduction

4 This Permit Attachment describes the facility inspections (including container inspections) that
5 are conducted to detect malfunctions, deterioration, operator errors, and discharges that may
6 cause or lead to releases of hazardous waste or hazardous waste constituents to the
7 environment or that could be a threat to human health.

8 E-1 Inspection Schedule

9 Equipment instrumental in preventing, detecting, or responding to environmental or human
10 health hazards, such as monitoring equipment, safety and emergency equipment, security
11 devices, and operating or structural equipment are inspected. The equipment will be inspected
12 for malfunctions, deterioration, potential for operator errors, and discharges which could lead to
13 a release of hazardous waste constituents to the environment or pose a threat to human health.

14 The WIPP facility has developed and will maintain a series of written procedures that include all
15 the detailed inspection procedures and forms necessary to comply with 20.4.1.500 NMAC
16 (incorporating 40 CFR §264.15(b)), during the Disposal Phase. Tables E-1 and E-1a list each
17 item or system requiring inspection under these regulations, the inspection frequency, the
18 organization responsible for the inspection, the applicable inspection procedure, and what to
19 look for during the inspection. 20.4.1.500 NMAC (incorporating 40 CFR §§264.15(b), 264.174,
20 and 264.602) list requirements that are applicable to the WIPP facility. Attachment D, Table D-2,
21 *Emergency Equipment Maintained at the Waste Isolation Pilot Plant*, identifies the emergency
22 equipment and corresponding locations to be inspected in accordance with Table E-1.

23 Operational procedures detailing the inspections required under 20.4.1.500 NMAC
24 (incorporating 40 CFR §§264.15(a) and (b)), are maintained in electronic format on the WIPP
25 computer network, in the Operating Record and, as appropriate, in controlled document
26 locations at the WIPP facility. Frequency of inspections is discussed in detail in Section E-1a(2).
27 Inspections are conducted often enough to identify problems in time to correct them before they
28 pose a threat to human health or the environment and are based on regulatory requirements.
29 The operational procedures assign responsibility for conducting the inspection, the frequency of
30 each inspection, the types of problems to be watched for, what to do if items fail inspection,
31 directions on record keeping, and inspector signature, date, and time. The operational
32 procedures are maintained at the WIPP facility. Tables E-1 and E-1a summarize inspections,
33 frequencies, responsible organizations, and the types of anticipated problems as well as the
34 references for the operational procedures. Inspection records are maintained at the WIPP site
35 for three years. Beginning with the effective date of this Permit, records that are over the three
36 year retention period are either maintained at the WIPP site or transferred to the WIPP Records
37 Archive located in Carlsbad, NM until closure. The records maintained at the WIPP Records
38 Archive are stored in facilities that are temperature and humidity controlled especially for the
39 long term storage of records and readily retrievable and available for inspection.

40 Waste handling equipment and area inspections are typically controlled through established
41 procedures and the results are recorded in logbooks or on data sheets. Operators are trained to

1 consult the logbook to identify the status of any piece of waste handling equipment prior to its
2 use. Once a piece of equipment is identified to be operable, a preoperational inspection is
3 initiated in accordance with the appropriate inspection procedure in Tables E-1, E-1a, or in
4 operational procedures. Inspection results as described below are entered in the applicable
5 logbook.

6 Inspections include identifying malfunctions or deteriorating equipment and structures.
7 Inspection results and data, including deficiencies, discrepancies, or needed repairs are
8 recorded. A negative inspection result does not necessarily lead to a repair. A deficiency, such
9 as low fluid level, may be corrected by the inspector immediately. A discrepancy, such as an
10 increasing trend of a data point, may necessitate additional inspection prior to the next
11 scheduled frequency. The actions taken (corrected, additional inspection, or Action Request
12 (**AR**) for repair submitted) are recorded on the inspection form, the WIPP automated
13 Maintenance Management tracking program (**CHAMPS**) work order sheet, or the equipment
14 logbook, whichever is applicable.

15 Items that are operational with restrictions are operated in accordance with applicable
16 compensatory measures. Items that are not operational are scheduled for repair or replacement
17 in accordance with work authorization procedures. In such cases, compensatory measures may
18 be needed until the equipment is returned to service. These compensatory measures will
19 provide an equivalent level of protection, be documented in WIPP facility files (e.g., equipment
20 logbook), and include an appropriate inspection schedule, when applicable.

21 Normally, the individual inspecting the equipment/system is not qualified to make repairs and
22 consequently, prepares an AR if repairs are needed. The AR is tracked by the CHAMPS system
23 through the work control process. When parts are received and work instructions are completed,
24 the work order can be scheduled. The schedule is discussed daily to ensure facility
25 configuration can support scheduled work items and to allocate and coordinate the resources
26 necessary to complete the items.

27 Work orders are released for work by the responsible organization. When repairs are complete
28 the responsible organization tests the equipment to ensure the repairs corrected the problem,
29 then closes out the work order, to return the equipment to an operational status for normal
30 operations to resume. Implementation of these procedures constitutes compliance with
31 20.4.1.500 NMAC (incorporating 40 CFR §264.15(c)).

32 Requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.15(d)), are met by the
33 inspections for each item or system included in Tables E-1 and E-1a. Beginning with the
34 effective date of this Permit, the results of the inspections are maintained in the operating record
35 for three years and are then transferred to the WIPP Records Archive where they are
36 maintained until closure. The inspection logs or summary records include the date and time of
37 inspection, the name of the inspector, a notation of the observations made, and the date and
38 nature of any repairs or other remedial actions. Major pieces of waste handling equipment are
39 inspected using proceduralized inspections. Current copies of inspection forms are maintained
40 in the Operating Record. Non-administrative changes (i.e., changes that affect the frequency or
41 content of inspections) to inspection forms must be submitted to the NMED in accordance with
42 the appropriate portions of 20 NMAC 4.1.900 (incorporating 40 CFR §270.42). The status of
43 these pieces of equipment is maintained in an equipment logbook that is separate from the
44 checklist. The logbook contains information regarding the condition of the equipment.
45 Equipment operators are required, by the inspection checklist, to consult the logbook as the first

1 activity in the inspection procedure. This logbook is maintained in the operating record. CH
2 transuranic (TRU) mixed waste equipment that is controlled by a logbook includes the waste
3 handling forklifts, all waste handling cranes, the adjustable center of gravity lift fixture, the CH
4 TRU underground transporter, the facility transfer vehicle, the trailer jockey, and the push-pull
5 attachment. RH TRU mixed waste equipment that is controlled by a logbook includes the
6 140/25-ton RH Bay overhead bridge crane, cask transfer cars, 25-ton cask unloading room
7 crane, transfer cell shuttle car, RH Bay cask lifting yoke, facility grapple, 6.2-ton overhead hoist,
8 facility cask rotating device, hot cell overhead powered manipulator, 15-ton hot cell crane,
9 facility cask transfer car, 41-ton forklift, facility cask, and emplacement equipment. Inspections
10 of the Cask Unloading Room, Hot Cell, Transfer Cell, Facility Cask Loading Room, RH Bay and
11 radiation monitoring equipment will be recorded on data sheets. In addition to the inspections
12 listed in Tables E-1 and E-1a, many pieces of equipment are subject to regular preventive
13 maintenance. This includes more in-depth inspections of mechanical systems, load testing of
14 lifting systems, calibration of measurement equipment and other actions as recommended by
15 the equipment manufacturer or as required by DOE Orders. These preventive maintenance
16 activities along with the inspections in Tables E-1 and E-1a make mechanical failure of waste
17 handling equipment unlikely. The WIPP Safety Analysis Report (DOE, 1999) and the WIPP
18 Remote-Handled Waste Preliminary Safety Analysis Report (RH PSAR) (DOE, 2000) contain
19 the results of a systematic analysis of waste handling equipment and the hazards associated
20 with potential mechanical failures. Equipment subject to failures that cannot practically be
21 mitigated is retained for analysis and is the basis for contingency planning. The inspection
22 procedures maintained in the Operating Record for operational and preventive maintenance are
23 implemented to assure the equipment is maintained. An example equipment inspection
24 checklist and a typical logbook form are shown as Figures E-1 and E-2. Actual checklists or
25 forms are maintained within the Operating Record.

26 E-1a General Inspection Requirements

27 Tables E-1, E-1a, and E-2 of this Permit Attachment list the major categories of monitoring
28 equipment, safety and emergency systems, security devices, and operating and structural
29 equipment that are important to the prevention or detection of, or the response to,
30 environmental or human health hazards caused by hazardous waste. These systems may
31 include numerous subsystems. These systems are inspected according to the frequency listed
32 in Tables E-1 and E-1a, a copy of which is maintained at the WIPP facility. The frequency of
33 inspections is based on the nature of the equipment or the hazard and regulatory requirements.
34 When in use, daily inspections are made of areas subject to spills, such as TRU mixed waste
35 loading and unloading areas in the WHB Unit, looking for deterioration in structures, mechanical
36 items, floor coatings, equipment, malfunctions, etc., in accordance with 20.4.1.500 NMAC
37 (incorporating 40 CFR §264.15(b)(4)).

38 As required in 20.4.1.500 NMAC (incorporating 40 CFR §264.33), the WIPP facility inspection
39 procedures for communication and alarm systems, fire-protection equipment, and spill control
40 and decontamination equipment include provisions for testing and maintenance to ensure that
41 the equipment will be operable in an emergency.

42 E-1a(1) Types of Problems

43 The inspections for the systems, equipment, structures, etc., listed in Tables E-1 and E-1a,
44 include the types of problems (e.g., malfunctions, visible cracks in coatings or welds, and

deterioration) to be looked for during the inspection of each item or system, if applicable, and are in compliance with 20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(3)).

E-1a(2) Frequency of Inspections

Tables E-1, E-1a, and E-2 of this Permit Attachment list the inspection frequencies and monitoring schedule for equipment and systems subject to the 20.4.1 NMAC hazardous waste management requirements. The frequency is based on the rate of possible deterioration of the equipment and the probability of an environmental or human health incident if the deterioration or malfunction, or any operator error, goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, are inspected daily when in use, consistent with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(4)).

When RH TRU mixed waste is present in the RH Complex, inspections are conducted visually and/or using closed-circuit video cameras in order to manage worker dose and to minimize occupational radiation exposures to as low as reasonably achievable (**ALARA**). More extensive inspections of these areas are performed at least annually during routine maintenance periods and when RH TRU mixed waste is not present, as identified in Table E-1a.

E-1a(3) Monitoring Systems

There are two monitoring systems used at the WIPP to provide assurance that facility systems are operating correctly, that areas can be used safely, and that there have been no releases of hazardous waste constituents. These systems are shown in Table E-2 and include the geomechanical monitoring system and the central monitoring system (**CMS**). The geomechanical monitoring system is used to assess the condition of mined excavations to assure no unsafe conditions are allowed to develop. The CMS continuously assesses the status of the fixed radiation monitoring equipment, electrical power, fire alarm systems, ventilation system, and other facility systems including water tank levels. In addition, the CMS collects data from the meteorological monitoring system.

E-1b Specific Process Inspection Requirements

20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(4)), requires inspections of specific portions of a facility, rather than the general facility. These include container storage areas and miscellaneous units. Both are addressed below.

E-1b(1) Container Inspection

Containers are used to manage TRU mixed waste at the WIPP facility. These containers are described in Permit Part 3. Off-site waste that will be managed and stored as CH TRU mixed waste will arrive in 55-gallon drums arranged as seven (7)-packs, in Ten Drum Overpacks (**TDOP**), in 85-gallon drums arranged as four (4) packs, in 100-gallon drums arranged as three (3) packs, in standard waste boxes (**SWB**), in standard large box 2s (**SLB2s**) or shielded containers as (3)-packs. The waste containers will be visually inspected to ensure that the waste containers are in good condition and that there are no signs that a release has occurred. This visual inspection shall not include the center drums of 7-packs and waste containers positioned such that visual observation is precluded due to the arrangement of waste assemblies on the facility pallets. If CH TRU mixed waste handling operations should stop for any reason with containers located on the TRUPACT-II Unloading Dock (**TRUDOCK** storage

1 area of the WHB Unit) or in room 108 while still in the Contact-Handled Packages, primary
2 waste container inspections could not be accomplished until the containers of waste are
3 removed from the shipping containers.

4 As described in Permit Attachment A1, Section A1-1d(3), off-site waste that will be managed
5 and stored as RH TRU mixed waste will arrive in containers inside Nuclear Regulatory
6 Commission (**NRC**)-certified casks designed to provide shielding and facilitate safe handling.
7 Canisters, will be loaded singly into an RH-TRU 72-B cask. Drums will be loaded into a CNS 10-
8 160B cask. The cask will be visually inspected upon arrival. Because RH TRU mixed waste is
9 stored in the Parking Area Unit in sealed casks, there are no additional requirements for
10 engineered secondary containment systems. Following removal of the canisters and drums, the
11 interior of the cask will be inspected and surveyed for evidence of contamination that may have
12 occurred during transport.

13 Off-site waste that will be managed and stored as RH TRU mixed waste is managed and stored
14 in the RH Complex of the WHB. The RH Complex includes the following: RH Bay, the Cask
15 Unloading Room, the Hot Cell, the Transfer Cell, and the Facility Cask Loading Room. As RH
16 TRU mixed waste is held in canisters within a canister rack the physical inspection of the drum
17 or canister is not possible. Inspections of RH TRU mixed waste in these areas occurs remotely
18 via closed-circuit cameras a minimum of once weekly when stored waste is present. Because
19 RH TRU mixed waste is in sealed casks, there are no additional requirements for engineered
20 secondary containment systems. However, the floors in the RH Complex (including the RH Bay,
21 Facility Cask Loading Room and Cask Unloading Room) are coated concrete and during normal
22 operations (i.e., when waste is present), the floor of the RH Complex is inspected visually or by
23 using close-circuit cameras on a weekly basis to verify that it is in good condition and free of
24 visible cracks and gaps.

25 Inspections of RH TRU mixed waste containers stored in the Hot Cell and Transfer Cell are
26 conducted using remotely operated cameras. RH TRU mixed waste in the Hot Cell is stored in
27 either drums or canisters. The containers in the Hot Cell are inspected to ensure that they are in
28 acceptable condition. RH TRU mixed waste in the Transfer Cell is stored in the RH-TRU 72-B
29 cask or shielded insert; therefore, inspections in this area focus on the integrity of the cask or
30 shielded insert. RH TRU mixed waste in the Facility Cask Loading Room is stored in the facility
31 cask; therefore, inspections in this area focus on the integrity of the facility cask.

32 Inspections will be conducted in the Parking Area Unit at a frequency not less than once weekly
33 when waste is present. These inspections are applicable to loaded Contact-Handled and
34 Remote-Handled Packages. The perimeter fence located at the lateral limit of the Parking Area
35 Unit, coupled with personnel access restrictions into the WHB Unit, will provide the needed
36 security. The perimeter fence and the southern border of the WHB shall mark the lateral limit of
37 the Parking Area Unit. Radiologically controlled areas can be established temporarily with
38 barricades. More permanent structures can be installed. The western boundary can be
39 established with temporary barricades since this area is within the perimeter fence. Access to
40 radiologically controlled areas will only be permitted to personnel who have completed General
41 Employee Radiological Training (**GERT**), a program defined by the Permittees, or escorted by
42 personnel who have completed GERT. This program ensures that personnel have adequate
43 knowledge to understand radiological posting they may encounter at the WIPP site. The fence
44 of the Radiologically Controlled Area, south from the WHB airlocks, was moved to provide more
45 maneuvering space for the trucks delivering waste. Since TRU mixed waste to be stored in the
46 Parking Area Unit will be in sealed Contact-Handled or Remote-Handled Packages, there will be

1 no additional requirements for engineered secondary containment systems. Inspections of the
2 Contact-Handled and Remote-Handled Packages stored in the Parking Area Unit shall be
3 conducted at a frequency no less than once weekly and will focus on the inventory and integrity
4 of the shipping containers and the spacing between trailers carrying the Contact-Handled or
5 Remote-Handled Packages. This spacing will be maintained at a minimum of four feet.

6 Container inspections will be included as part of the surface TRU mixed waste handling areas
7 (i.e. Parking Area Unit and WHB Unit) inspections described in Tables E-1 and E-1a. These
8 inspections will also include the Derived Waste Storage Areas of the WHB Unit. The Derived
9 Waste Storage Areas will consist of containers of 55 or 85-gallon drums or SWBs for CH TRU
10 mixed waste and 55-gallon drums for RH TRU mixed waste. A Satellite accumulation area
11 (**SAA**) may be required in an area adjacent to the TRUDOCKs for CH TRU mixed waste. A SAA
12 may also be required in the RH Bay and Hot Cell for RH TRU mixed waste. These SAAs will be
13 set up on an as needed basis at or near the point of generation and the derived waste will be
14 discarded into the active derived waste container. All SAAs will be inspected in accordance with
15 20.4.1.300 NMAC (incorporating 40 CFR §262.17).

16 E-1b(2) Miscellaneous Unit Inspection

17 20.4.1.500 NMAC (incorporating 40 CFR §264.602), requires that inspections required in
18 20.4.1.500 NMAC (incorporating 40 CFR §264.15 and §264.33), as well as any additional
19 requirements needed to protect human health and the environment, be met. The requirements
20 of 20.4.1.500 NMAC (incorporating 40 CFR §264.15 and §264.33) are discussed in Section E-1
21 of this Permit Attachment, along with how the WIPP facility complies with those requirements for
22 standard types of inspections. Inspection frequencies for geomechanical monitoring equipment
23 are provided in Table E-1. The monitoring schedule for geomechanical instrumentation is given
24 in Table E-2.

25 References

26 DOE, 1999. "WIPP Safety Analysis Report," DOE/WIPP-95-2065. Rev. 4, U.S. Department of
27 Energy. Washington, D.C.

28 DOE, 2000. "WIPP Remote-Handled Waste Preliminary Safety Analysis" (RH PSAR), U.S.
29 Department of Energy. Washington, D.C.

30

1

FIGURES

2

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TYPICAL EQUIPMENT WEEKLY CHECK LIST		
<input checked="" type="checkbox"/> OK <input checked="" type="checkbox"/> Adjustment Made <input type="checkbox"/> Repairs Required AR Written <input type="checkbox"/> Yes <input type="checkbox"/> No AR # _____ (check or complete appropriate information)		
ITEM INSPECTED	Condition	Comments/Corrective Action
Mechanical Checks: (examples)		
Oil level		
Radiator fluid level		
Automatic transmission fluid level		
Operate all valves/check gauges		
Emergency brake		
Fuel level (> ¾ full)		
Oil pressure (at warm idle)		
Tire Pressure		
Sirens, horn, & back-up alarm		
Deterioration Checks: (examples)		
Fan belts		
Battery (terminals, cables)		
Run generator 5 min.		
Hose, nozzles & valves		
Leaks/Spills Checks: (examples)		
Leaks around pump		
Foam tank level		
Required Equipment: (examples)		
Inspect SCBAs (> 4050 psi)		
Hand tools & equipment		
Trauma Kit		
Inspected by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Print Name Signature Time/Date </div> Inspected by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Print Name Signature Time/Date </div> Reviewed by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Print Name Signature Time/Date </div> Comments: _____ _____ _____		

NOTE: All items that are mandatory for every inspection form are shown in bold.

**Figure E-1
 Typical Inspection Checklist**

HOUR METER READING _____ EQUIPMENT NO. _____			
DEFICIENCIES NOTED: _____			

PRE OPS COMPLETED PER <u> {Procedure Number} </u> SAT _____ PROBLEMS NOTED _____			
CORRECTIVE ACTIONS TAKEN: _____			

OPERATOR SIGNATURE	DATE	TIME	SUPERVISOR SIGNATURE/DATE
_____	_____	_____	_____
NOTE: All items that are mandatory for every inspection form are shown in bold.			

Figure E-2
Typical Logbook Entry

1

TABLES

2

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**Table E-1
Inspection Schedule/Procedures**

System/Equipment Name	Responsible Organization	Inspection^a Frequency	Procedure Number and Inspection Criteria^b
Air Intake Shaft Hoist	Underground Operations	Preoperational ^c	WP 04-HO1004 Inspecting for Deterioration ^b , Safety Equipment, Communication Systems, and Mechanical Operability ^m in accordance with Mine Safety and Health Administration (MSHA) requirements
Ambulance (Surface) and Medical Cart (Underground)	Fire Department	Weekly	WP 12-FP0030 Inspecting for Mechanical Operability ^m , Deterioration ^b , and Required Equipment ⁿ
Adjustable Center of Gravity Lift Fixture	Waste Handling	Preoperational ^c	WP 05-WH1410 Inspecting for Mechanical Operability ^m and Deterioration ^b
Backup Power Supply Diesel Generators	Facility Operations	Monthly	WP 04-ED1301 Inspecting for Mechanical Operability ^m and Leaks/Spills by starting and operating both generators. Results of this inspection are logged in accordance with WP 04-AD3008.
Facility Inspections (Water Diversion Berms)	Facility Engineering	Annually	WP 10-WC3008 Inspecting for Damage, Impediments to water flow, and Deterioration ^b
Central Monitoring Systems (CMS)	Facility Operations	Continuous	Automatic Self-Checking
Contact-Handled (CH) TRU Underground Transporter	Waste Handling	Preoperational ^c	WP 05-WH1603 Inspecting for Leaks/Spills, Mechanical Operability ^m , Deterioration ^b , and area around transporter clear of obstacles
Conveyance Loading Car	Waste Handling	Preoperational ^c	WP 05-WH1406 Inspecting for Mechanical Operability ^m , Deterioration ^b , path clear of obstacles, and guards in the proper place
Facility Transfer Vehicle	Waste Handling	Preoperational ^c	WP 05-WH1204 Inspecting for Mechanical Operability ^m , Deterioration ^b , path clear of obstacles, and guards in the proper place

System/Equipment Name	Responsible Organization	Inspection^a Frequency	Procedure Number and Inspection Criteria^b
Emergency Lighting	Fire Department	Monthly/annually	WP 12-FP0051 Inspecting for Deterioration ^b , and Operability of indicator lights in accordance with NFPA 101
Exhaust Shaft	Underground Operations	Quarterly	PM041099 Inspecting for Deterioration ^b and Leaks/Spills
Eye Wash and Shower Equipment	Equipment Custodian	Weekly	WP 12-IS1832 Inspecting for Deterioration ^b
		Semi-annually	WP 12-IS1832 Inspecting for Deterioration ^b and Fluid Levels—Replace as Required
Fire Detection and Alarm System	Fire Protection Engineering	Semi-annually/annually	WP 12-FP0027 Inspecting for Deterioration ^a and Operability of underground fuel station fire suppression system in accordance with NFPA 17 (semi-annual inspection); Inspecting for Deterioration ^b and Operability of the alarm panel and transmitter, audible/visual alarm devices, detectors, and pull stations in accordance with NFPA 72 (annual inspection)
		Monthly/quarterly/annually	WP 12-FP0028 Inspecting for Deterioration ^b , and Operability of the alarm panel and transmitter, audible/visual alarm devices, detectors, and pull stations in accordance with NFPA 72
Fire Extinguishers ^j	Fire Department	Monthly	WP 12-FP0036 Inspecting for Deterioration ^b , Leaks/Spills, Expiration, seals, fullness, and pressure
Fire Hoses	Fire Department	Annually (minimum)	WP 12-FP0031 Inspecting for Deterioration ^b and Leaks/Spills
Fire Hydrants	Fire Protection Engineering	Semi-annual/annually	WP 12-FP0034 Inspecting for Deterioration ^b and Leaks/Spills

System/Equipment Name	Responsible Organization	Inspection ^a Frequency	Procedure Number and Inspection Criteria ^b
Fire Pumps	Fire Protection Engineering	Weekly Annually (Electric Pump) Annually (Diesel Pump)	WP 12-FP0026 Inspecting for Deterioration ^b , Leaks/Spills, fire water valve position(s), and panel light status WP 12-FP5113 Inspecting for Deterioration ^b , operability, flow, discharge pressure, suction pressure, and pump speed WP 12-FP5114 Inspecting for Deterioration ^b , operability, flow, discharge pressure, suction pressure, and pump speed
Fire Sprinkler Systems	Fire Protection Engineering	Monthly/ quarterly/ annually	WP 12-FP0025, WP 12-FP0063, and WP 12-FP0064 Inspecting for Deterioration ^b , Leaks/Spills, water pressures, and main drain test
Fire and Emergency Response Vehicles (Fire Trucks, Fire Suppression Cart, and Rescue Cart)	Fire Department	Weekly	WP 12-FP0033 Inspecting for Mechanical Operability ^m , Deterioration ^b , Leaks/Spills, and Required Equipment ⁿ
Forklifts Used for Waste Handling (Electric and Diesel forklifts, Push-Pull Attachment)	Waste Handling	Preoperational ^c	WP 05-WH1201, WP 05-WH1207, WP 05-WH1401, WP 05-WH1402, WP 05-WH1403, and WP 05-WH1412 Inspecting for Leaks/Spills, Mechanical Operability ^m , Deterioration ^b , and On board fire suppression system
Automatic on-board fire suppression systems	Fire Protection Engineering	Monthly/Semi-annually	WP 12-FP0085 WP 12-FP0060 Inspecting for Mechanical Operability ^m and Deterioration ^b
Hazardous Material Response Equipment	Fire Department	Quarterly	WP 12-FP0033 Inspecting for Deterioration ^b , and Required Equipment ⁿ
Head Lamps	Facility Personnel	Daily ⁱ	Head lamps are operated daily and are repaired or replaced upon failure
Miners First Aid Station	Fire Department	Quarterly	WP 12-FP0035 Inspecting for Required Equipment ⁿ

System/Equipment Name	Responsible Organization	Inspection^a Frequency	Procedure Number and Inspection Criteria^h
Mobile Phones	Facility Personnel	Daily ⁱ	Mobile Phones are operated daily and are repaired or replaced upon failure
Mine Pager Phones (between surface and underground)	Facility Operations	Monthly/Annually ^o	WP 04-PC3017 WP 04-PC3018 Testing of Mine Pager Phones at essential locations
MSHA Air Quality Monitor	Maintenance/ Underground Operations	Daily ^l	WP 12-IH1828 Inspecting for Air Quality Monitoring Equipment Functional Check
Perimeter Fence, Gates, Signs	Security	Daily	WP 17-SS1023 Inspecting for Deterioration ^b and Posted Warnings
Mine Rescue Self-Contained Breathing Apparatus (SCBA)	Mine Rescue Team	30 days	WP 12-ER3007 Inspection for Deterioration ^b and Pressure ^g
Fire Department SCBA	Fire Department	Weekly/monthly	WP 12-FP0029 Inspecting for Deterioration ^b and Pressure
Site Notification System; Underground Evacuation Alarm System	Facility Operations	Monthly/Annually	WP 04-PC3017 WP 04-PC3018 Testing of PA and Underground Alarms
Radio Equipment	Facility Personnel	Daily ⁱ	Radios are operated daily and are repaired or replaced upon failure
Salt Handling Shaft Hoist	Underground Operations	Preoperational ^c	WP 04-HO1002 Inspecting for Deterioration ^b , Safety Equipment, Communication Systems, and Mechanical Operability ^m in accordance with MSHA requirements
Self-Rescuers and Self-Contained Self-Rescuers	Underground Operations	Quarterly	WP 04-AU1026 Inspecting for Deterioration ^b and Functionality in accordance with MSHA requirements
Surface TRU Mixed Waste Handling Area ^k	Waste Handling	Preoperational ^c or Weekly ^e	WP 05-WH1101 Inspecting for Deterioration ^b , Leaks/Spills, Required Aisle Space, Posted Warnings, Communication Systems, Container Condition, and Floor coating integrity

System/Equipment Name	Responsible Organization	Inspection^a Frequency	Procedure Number and Inspection Criteria^b
TRU Mixed Waste Decontamination Equipment	Waste Handling	Annually	WP 05-WH1101 Inspecting for Required Equipment ⁿ
Underground Openings— Roof Bolts and Travelways	Underground Operations	Weekly	WP 04-AU1007 Inspecting for Deterioration ^b of Accessible Areas
Underground— Geomechanical Instrumentation System (GIS)	Geotechnical Engineering	Monthly	WP 07-EU1301 Inspecting for Deterioration ^b
Underground TRU Mixed Waste Disposal Area	Waste Handling	Preoperational ^c	WP 05-WH1810 Inspecting for Deterioration ^b , Leaks/Spills, mine pager phones, equipment, unobstructed access, signs, debris, and ventilation
Uninterruptible Power Supply (Central UPS)	Facility Operations	Daily	WP 04-ED1542 Inspecting for Mechanical Operability ^m and Deterioration ^b with no malfunction alarms. Results of this inspection are logged in accordance with WP 04-AD3008.
TDOP Uender	Waste Handling	Preoperational ^c	WP 05-WH1010 Inspecting for Mechanical Operability ^m and Deterioration ^b
Waste Handling Cranes	Waste Handling	Preoperational ^c	WP 05-WH1407 Inspecting for Mechanical Operability ^m , Deterioration ^b , and Leaks/Spills
Waste Hoist	Underground Operations	Preoperational ^c	WP 04-HO1003 Inspecting for Deterioration ^b , Safety Equipment, Communication Systems, and Mechanical Operability ^m , Leaks/Spills, in accordance with MSHA requirements
Water Tanks	Facility Operations	Daily	WP 04-AD3008 Inspecting for Deterioration ^b , valve lineup, and water levels. Results of this inspection are logged in accordance with WP 04-AD3008.
Push-Pull Attachment	Waste Handling	Preoperational ^c	WP 05-WH1401 Inspecting for Damage and Deterioration ^b

System/Equipment Name	Responsible Organization	Inspection^a Frequency	Procedure Number and Inspection Criteria^b
Trailer Jockey	Waste Handling	Preoperational ^c	WP 05-WH1405 Inspecting for Leaks/Spills, Mechanical Operability ^m and Deterioration ^b
Closure Bulkheads	Underground Operations	Semi-annually	PM000011 PM000015 Integrity and Deterioration ^b of Accessible Areas
Bolting Robot	Waste Handling	Preoperational ^c	WP 05-WH1203 Mechanical Operability ^m
Yard Transfer Vehicle	Waste Handling	Preoperational ^c	WP 05-WH1205 Mechanical Operability ^m , Deterioration ^b , Path clear of obstacles and Guards in proper place
Payload Transfer Station	Waste Handling	Preoperational ^c	WP 05-WH1208 Mechanical Operability ^m , Deterioration ^b , and Guards in proper place
Monorail Hoist	Waste Handling	Preoperational ^c	WP 05-WH1202 Mechanical Operability ^m , Deterioration ^b , and Leaks/Spills
Bolting Station	Waste Handling	Preoperational ^c	WP 05-WH1203 Mechanical Operability ^m , Deterioration ^b , and Guards in proper place

Table E-1 (Continued)
Inspection Schedule/Procedures Notes

- ^a Inspection may be accomplished as part of or in addition to regularly scheduled preventive maintenance inspections for each item or system. Certain structural systems of the WHB, Waste Hoist and Station A are also subject to inspection following severe natural events including earthquakes, tornados, and severe storms. Structural systems include columns, beams, girders, anchor bolts and concrete walls.
- ^b Deterioration includes: obvious visible cracks, erosion, salt build-up, damage, corrosion, loose or missing parts, malfunctions, and structural deterioration.
- ^c "Preoperational" signifies that inspections are required prior to the first use during a calendar day. For calendar days in which the equipment is not in use, no inspections are required. For an area this includes: area is clean and free of obstructions (for emergency equipment); adequate aisle space; emergency and communications equipment is readily available, properly located and sign-posted, visible, and operational. For equipment, this includes: checking fluid levels, pressures, valve and switch positions, battery charge levels, pressures, general cleanliness, and that all functional components and emergency equipment is present and operational.
- ^e These weekly inspections apply to container storage areas when containers of waste are present for a week or more.
- ^g Inspections are performed per manufacturer's maintenance instructions.
- ^h Inspections and PM's are not required for equipment that is out of service. However, if compensatory measures have been established to ensure an equivalent level of protection during the period that the equipment is out of service (e.g., required equipment/supplies from an out-of-service emergency vehicle have been temporarily relocated), appropriate inspections will be scheduled, conducted, and documented in the Operating Record, in accordance with Attachment E, Section E-1.
- ⁱ Head Lamps, Mobile Phones, and Radios are not routinely "inspected." They are typically used in day-to-day operations. They are used until they fail, at which time they are replaced and repaired.
- ^j Fire extinguisher inspections are performed in accordance with NFPA 10.
- ^k Surface CH TRU mixed waste handling areas include the Parking Area Unit, the WHB unit, and unloading areas.
- ^l No log forms are used for daily readings. However, readings that are out of tolerance are reported to the CMR and logged by CMR operator. Inspection includes daily functional checks of portable equipment.
- ^m Mechanical Operability means that the equipment has been checked and is operating in accordance with site safety requirements (e.g., proper fluid levels and tire pressure; functioning lights, alarms, sirens, and power/battery units; and belts, cables, nuts/bolts, and gears in good condition), as appropriate.
- ⁿ Required Equipment means that the equipment identified in Table D-2 is available and usable (i.e., not expired/depleted and works as designed).
- ^o Mine pager phones in non-essential locations are not routinely "inspected". Many are used in day-to-day operations. They are used until they fail, at which time they are repaired. Mine pager phones are used routinely by Underground Operations.

Table E-1a
RH TRU Mixed Waste Inspection Schedule/Procedures

System/ Equipment Name	Responsible Organization ^J	Inspection ^a Frequency	Procedure Number (Latest Revision) ^I	Inspection Criteria		
				Deterioration ^b	Leaks/ spills	Other
Cask Transfer Car(s)	Waste Operations	Pre-evolution ^{c,d,e}	WP05-WH1701 PM041187 (Semi-Annual)	Yes	NA	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication
RH Bay Overhead Bridge Crane	Waste Operations	Preoperational ^{c,d,e,j}	WP05-WH1741 PM041232 (Quarterly) PM041117 (Annual)	Yes	Yes	Pre-operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication
Facility Cask	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1713 PM041201 (Annual) PM041203 (Annual)	Yes	NA	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication. Electrical PM.
RH Bay Cask Lifting Yoke	Waste Operations	Preoperational ^{c,d,e,j}	WP05-WH1741 PM041169 (Annual)	Yes	NA	Pre-operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication
Facility Cask Transfer Car	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1704 PM041186 (Quarterly) PM041195 (Annual)	Yes	Yes	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication Electrical Inspection
Facility Cask Rotating Device	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1713 PM041175 (Annual) PM041176 (Annual)	Yes	Yes	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication Electrical Inspection
Facility Grapple	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1721 PM041172 (Quarterly) PM041177 (Annual)	Yes	NA	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear. Non-Destructive Examination
6.25-Ton Grapple Hoist	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1721 PM411028 (Annual)	Yes	Yes	Pre-evolution Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication
Transfer Cell Shuttle Car	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1705 PM041184 (Semi-Annual) PM041222 (Annual)	Yes	Yes	Pre-evolution Pre- operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication. Electrical Inspection.

System/ Equipment Name	Responsible Organization ^J	Inspection ^a Frequency	Procedure Number (Latest Revision) ^I	Inspection Criteria		
				Deterioration ^b	Leaks/ spills	Other
Hot Cell Overhead Powered Manipulator	Waste Operations	Preoperational ^{c,d,e,i}	WP05-WH1743 PM041215 (Annual) PM041216 (Annual) IC411037 (Annual)	Yes	Yes	Pre-operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication. Electrical Inspection. Load Cell Calibration
Hot Cell Bridge Crane	Waste Operations	Preoperational ^{c,d,e,i}	WP05-WH1742 PM041217 (Annual) PM041209 (Annual) IC411038 (Annual)	Yes	Yes	Pre-operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication. Electrical Inspection. Load Cell Calibration.
Closed Circuit Television Camera	Waste Operations	Preoperational ^{c,i}	WP05-WH1757	NA	NA	Operability
Radiation Monitoring Equipment	Radiation Control	Preoperational ^{c,d,e}	WP12-HP1245 IC240010 WP12-HP1307 IC534000 WP12-HP1314 (Annual)	Yes	NA	Operability Checks, Functional Checks, Instrument calibrations, Flow Calibration, Efficiency Checks.
Cask Unloading Room Crane	Waste Operations	Preoperational ^{c,d,e,i}	WP05-WH1719 PM041190 (Quarterly) PM041191 (Annual) PM041192 (Annual) IC411035 (Annual)	Yes	Yes	Pre-operational Checks and Operating Instructions. Mechanical Inspection for Wear and Lubrication. Electrical Inspection. Load Cell Calibration.
Horizontal Emplacement and Retrieval Equipment or functionally equivalent equipment	Waste Operations	Pre-evolution ^{c,d,e,f}	WP05-WH1700 PM052010 (Semi-Annual) ^k PM052011 (Annual) PM052013 PM052012 PM052014 (Annual)	Yes	Yes	Assembly and Operating Instructions. Electrical Inspection. Position Transducer Calibration. Tilt Sensor Calibration.

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System/ Equipment Name	Responsible Organization ^J	Inspection ^a Frequency	Procedure Number (Latest Revision) ^I	Inspection Criteria		
				Deterioration ^b	Leaks/ spills	Other
41-Ton Forklift	Waste Operations	Preoperational ^{c,d,e,i}	WP05-WH1602 PM074061 PM052003 (Hours of Use) PM074027 (Quarterly) PM074029 & PM074051 (Annual)	Yes	Yes	Pre-Operational Checks. PM performed every 100 hours of operation, every 500 hours of operation or every 5 Years. Quarterly Engine Emission Test. Annual Electrical Inspection. Annual NDE.
Surface RH TRU Mixed Waste Handling Area	Waste Operations	Preoperational ^f	WP- 05 WH1744	Yes	Yes	Posted Warning, Communications, Container Conditions, and Floor Coating Integrity.

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Table E-1a (Continued)
RH TRU Mixed Waste Inspection Schedule/Procedures Notes

- a Inspection may be accomplished as part of or in addition to regularly scheduled preventive maintenance inspections for each item or system. Certain structural systems of the WHB are also subject to inspection following severe natural events including earthquakes, tornados, and severe storms. Structural systems include columns, beams, girders, anchor bolts, and concrete walls.
- b Deterioration includes: visible cracks, erosion, salt build-up, damage, corrosion, loose or missing parts, malfunctions, and structural deterioration.
- c "Pre-evolution" signifies that inspections are required prior to equipment use in the waste handling process. (An evolution is considered to be from the receipt of a cask into the RH Bay through canister emplacement in the underground.) For an area, preoperational inspection includes: area is clean and free of obstructions (for emergency equipment); adequate aisle space; emergency and communications equipment is readily available, properly located and sign-posted, visible, and operational. For equipment, this includes: checking fluid levels, pressures, valve and switch positions, battery charge levels, pressures, general cleanliness, and that functional components and emergency equipment are present and operational. When the equipment is not in use, no inspections are required.
- d When equipment needs to be inspected while handling waste (i.e., during waste unloading or transfer operations), general cleanliness and functional components will be inspected to detect any problem that may harm human health or the environment. The inspection will verify that emergency equipment is present.
- e Inspection of RH TRU mixed waste equipment and areas in the RH Complex applies only after RH TRU mixed waste receipt begins.
- f The inspection/maintenance activities associated with these pieces of equipment are performed when the RH Complex is empty of RH TRU mixed waste. If contamination is present, a radiation work permit may be needed.
- g For the Hot Cell and Transfer Cell, if RH TRU mixed waste is present, camera inspections will be performed in lieu of physical inspection.
- h The integrity of the floor coating will be inspected weekly if RH TRU mixed waste is present.
- i "Preoperational" signifies that inspections are required prior to the first use in a calendar day.
- J Responsible organizations refers to the organization that owns the equipment. Preventive Maintenance (PM) procedures are conducted by either mine maintenance or surface operations maintenance personnel and Instrument Calibration (IC) procedures are conducted by instrument and calibration maintenance personnel.
- k Inspection will be performed after 250 evolutions (actual and training emplacements), if such usage occurs prior to the semi-annual inspection.
- l Inspections and PM's are not required for equipment that is out of service.

**Table E-2
Monitoring Schedule**

System/Equipment Name	Responsible Organization	Monitoring Frequency	Purpose
Geomechanical ^b	Geotechnical Engineering	Monthly	To evaluate the geotechnical performance of the underground facility and to detect ground conditions that could affect operational safety
Central Monitoring System	Facility Operations	System Dependent	Monitor and provide status for the following facility parameters: Electrical Power Status ^d Fire Alarm System ^e Ventilation System Status ^f Meteorological Data System ^g Facility Systems (compressors ^g , pumps ^h , water tank levels ⁱ , waste hoists ^j)

^b Equipment is listed as Underground-Geomechanical Instrumentation System (GIS) in Table E-1.

^d Equipment listed as Backup Power Supply Diesel Generator in Table E-1.

^e Equipment listed as Fire Detection and Alarm System in Table E-1.

^f Equipment listed as Ventilation Exhaust in Table E-1.

^g Not RCRA equipment.

^h Equipment listed as Fire Pumps in Table E-1.

ⁱ Equipment listed as Water Tank Level in Table E-1.

^j Equipment listed as Waste Hoist in Table E-1.

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