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May 15, 1997

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NM ENVIRONMENT DEPARTMENT
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Mr. Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044-A Galisteo Street
Santa Fe, NM 87505

Subject: Response to NMED Letter of April 29, 1997: Modeling and Parameter Selection Information

Dear Mr. Garcia:

This letter transmits changes that we wish to make in the application as discussed in your memo dated April 29, 1997. In our response dated May 9, 1997, we estimated this material would be provided to you by May, 19, 1997. We have completed the changes and decided to hand deliver these to you during our meeting scheduled for May 16, 1997.

Enclosed are three hardcopies of the specific page changes and three hardcopies of a redline/strikeout version of the changes to facilitate your review. Additionally, we are providing you with an electronic version of both the page changes and redline/strikeout. The electronic version will contain the entire chapter for those where page changes were made. We are also providing you a matrix clearly identifying the application page and lines where these changes have occurred. This matrix also identifies whether the various changes either clarify, modify, or supplement material currently in the application.

I believe these page changes are required to adhere to the standards discussed in 20 NMAC 4.1 Subpart IX, Section 270.43, and I further believe these changes will have no impact on the schedule.

Should you need to discuss the information contained within this submittal, please contact Craig Snider at (505) 234-7452.

Sincerely,

EK Hunter for
George E. Dials
Manager

97-0856
UFC 5486

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cc w/encl:
C&C File

cc w/o encl:
M. McFadden, CAO
C. Wayman, CAO
J. Epstein, WID
K. Donovan. WID

RCRA Part B Permit Application Changes (Revision 6.3)

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
1	Information updates for application items associated with a No-Migration Variance Petition or Determination	C-45	10-18	Replace with: "TRU mixed waste is exempted from LDRs by the Land Withdrawal Amendment (Public Law 104-201). This amendment states that WIPP 'waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not be subject to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act.' Therefore, with each waste shipment of LDR waste, the generator must provide the WIPP facility with a notice that the waste is not prohibited from land disposal. WIPP personnel will review the LDR notice for accuracy and completeness. The generator will prepare this notice in accordance with the requirements of 20 NMAC 4.1, 268.7(s)(3)."	Modifies
		C-108, C-109, C-110, C-111, C-113,C-114, C-115, C-116	2nd Row 4th Bullet	Replace "Support a demonstration of no-migration by headspace VOCs" with "Ensure that environmental performance standards are not exceeded."	
		C8-22	7-15	Replace the first two bullets with "The concentration of VOC constituents in the headspace in the total waste inventory has not exceeded the environment performance standards of 20 NMAC 4.1, Subpart V, 264.601 (b)."	
		C8-22	27-28	In the last bullet, delete "the WIPP facility no-migration variance petition"	
		Appendix D20	All	Replace all of Appendix D20, Confirmatory VOC Monitoring Plan with the updated version, which includes changes in references to a Disposal No-Migration Variance and updated Concentrations of Concern that reflect 40 CFR 264.601 Standards instead of 40 CFR 268 Standards.	
		I-37	24	Delete Bullet starting "The No-Migration Variance Petition..."	
		Chapter L All	All	Replace this Chapter/Appendix with a page containing the following statement: "TRU mixed waste is exempted from LDRs by the Land Withdrawal Act Amendment (Public Law 104-201). This amendment states that WIPP 'waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not be subject to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act.' "	
		Appendix L1	All		
2	Clarification of the description for the minimization of movement of waste material when core samples are drilled for characterization	C4-13	15	Change "...prevent the liner inside the coring tool from rotating with the coring tool..." with "...minimize the rotation of the liner inside the coring tool..."	Clarifies

RCRA Part B Permit Application Changes (Revision 6.3)

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
3	Elimination of information from the Waste Analysis Plan that is not relevant to RCRA compliance	C8-21	7-8, 13	Delete the bullets containing "Total masses of VOCs, hydrogen..." and "Total masses of VOCs, SVOCs..."	Clarifies
4	Clarification of which core sample will be used when more than one is taken from a waste form	C8-8	7-8	Replace the sentence beginning with "The core from the second location..." with "The most representative core shall be used for sample collection."	Clarifies
5	Clarification that forklifts and transporters used in the waste handling process do not have speed governors	D-33	30-32	Delete the sentence "Forklifts that handle waste in the underground have speed governors to prevent speeds that could lead to accidents that would rupture containers."	Clarifies
		F-18	20	Replace "...speed governor..." with "...fire suppression system..."	
6	Change in the Continuous Air Monitor (CAM) for radiation detection that is used to initiate an automatic switch in the mine ventilation system to direct air flow through High Efficiency Particulate Air (HEPA) filters	D-74	29	Replace "...one continuous air monitor at Station A (a monitoring system near the exhaust discharge point)." with "...the continuous air monitor in the exhaust drift of the active waste panel."	Modifies
7	Plan for the installation of a third main mine ventilation fan to improve system reliability	D-75	8	Add the following paragraph after line 8: "Planned Upgrade - Underground Ventilation Normal Mode Redundancy: The underground ventilation system will be provided redundancy in normal ventilation mode by the addition of a third main fan. Ductwork leading to that new fan will tie into the existing main exhaust duct. The connecting saddle, wye, and elbow with an integral damper, is scheduled to be installed and blanked-off, and the hole in the main duct is to be cut before waste receipt. The later addition of the third fan and associated ductwork will then not interfere with the facility operation."	Supplements

RCRA Part B Permit Application Changes (Revision 6.3)

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
8	Update of the Environmental Monitoring Plan (Appendix D5 of the permit application)	Appendix D5	All	Replace all of Appendix D5 with DOE/WIPP 96-2194, Waste IsolationPilot Plant Environmental Monitoring Plan.	Modifies
9	Correct an error on the OSHA 8 hour time-weighted average (TWA) limit for 1,2-Dichloroethane	D-112	14	For 1,2-Dichloroethane, change the OSHA 8 Hour TWA from "100" to "50".	Modifies
		D9-30	21		
		D9-Att.1-9	15		
10	Update of the WIPP Contingency Plan	G-44	15	Replace "Guadalupe Medical Center" with "Columbia (formerly Guadalupe) Medical Center"	Modifies
		G-44	22-23	Replace "Lea Regional Hospital" with "Columbia (Formerly Lea) Regional Hospital", and "August 17, 1993" with "February 15, 1995".	
		G-54	10-14	Delete the rows for: "J. R. (Joe) Franco" and "M. B. (Byron) Cherry", and add the following: Name / Address / Office Phone / Home Phone E. R. (Ed) Flynn[2] / 2110 LaHuerta Drive / 234-8272 or 234-8276 / 887-0151 G. L. (Gary) Kessler[2] / 1313 E. Wood / 234-8326 / 885-9214 A. E. (Alvy) Williams[2] / 113 Coleman Rd. / 234-8216 or 234-8276 / 885-4811 K. (Kim) Jackson[2] / 1120 Tracy Place / 234-8272 or 234-8276 / 887-7345	
		G-87, G-88	All	Update the Pre-Fire Survey Plans with plans dated 2/10/97.	
		G-89 to G-91	All	Update the WIPP Hazardous Material Incident Report forms.	
11	Correction of the administrative limit for action levels for Threshold Limit Values	D-51	15-17	Replace "one/tenth" with "one-half", and "ten percent" to "fifty percent".	Modifies

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
12	Clarification of the prefilter system for the Waste Handling Building ventilation system	D-61	26	Replace "two stages of prefilters" with "a prefilter".	Modifies
13	Update of the Solid Waste Management Units to include the Exhaust Shaft Catchment Basin	J-2	33	Add a new section: " J-1b SWMUs added since April 12, 1996 Since the submittal of Revision 6.0 of the permit application, the DOE has closed one SWMU and has created another. These are in the area of the base of the Exhaust Shaft and are discussed in DOE 1997a. A summary follows. The RFA documents that a visual inspection of the area of SWMU 010c, which is at the base of the Exhaust Shaft, revealed no evidence of past releases of the waste typically expected at the base of the shaft (cement, grout, metal, concrete, grease, brine). Characterizations of waste removed from the area have shown that the contents of this area are consistently below RCRA hazardous waste criteria. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. This brine was tested and determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft (DOE 1997b). The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft (DOE 1996). As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground. Since the corrective action involved removal of debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e. Figure J-2 shows the location of SWMU 010e. These shaft sumps, including the new SWMU, have been added to Table J-1 and Appendix J1."	Supplements

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
13 (cont.)	Update of the Solid Waste Management Units to include the Exhaust Shaft Catchment Basin	J-4	3-5	Add References: "Department of Energy, 1996, Analysis of Corrosion Testing Results for Galvanized Mesh Material Obtained from the Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 96-2212, Westinghouse Electric Corporation, Carlsbad, NM, December 1996. Department of Energy, 1997a, Final Solid Waste Management Unit Assessment Report, DOE/WIPP 97-2220, Westinghouse Electric Corporation, Carlsbad, NM, January 10, 1997. Department of Energy, 1997b, Composition and Origin of Nonindigenous Brine and Water in the Vicinity of the Exhaust Shaft Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 97-2226, Westinghouse Electric Corporation, Carlsbad, NM, February 1997. "	Supplements
		J-6	end of table	Add SWMU "010" unit type "Shaft Sumps", with a unit description: "An area at the bottom to each of the four WIPP shafts that collected construction debris or accumulates brine, including a catchment basin" and waste description: "Welding residue, scrap wood and metal, salt; Class C cement; chemseal; bentonite; grease and oil; cement and chem grout; Salado and overlying formation groundwaters;, condensate from the underground ventilation system; washwater; leaded brine from the Exhaust Shaft"	
		J-9	All	Add figure J-2 for the location of Shaft Sump SWMUs.	

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
13 (cont.)	Update of the Solid Waste Management Units to include the Exhaust Shaft Catchment Basin	J1-6	All	Add: "010 SHAFT SUMPS Unit type: Shaft Sumps Unit use: Collection/Storage Operational status: Active Use period: 1981 - Present Materials managed: Solid Waste Hazardous Waste Hazardous release: Lead Radioactive release: None Information source(s): Process Knowledge, Sampling and Analysis Unit Description Refer to Figure J-2 for location. Four shafts have been completed to the WIPP facility underground. The Salt Handling and the Waste Shafts have sumps (010-a and 010-b) that extend below the facility horizon (148 feet and 119 feet, respectively). The sumps have been cut into the salt and are not lined. The other two shafts, the Exhaust Shaft and the Air Intake Shaft, end at the facility horizon and do not have sumps. The bottoms of these shafts are 010-c and 010-d, respectively. The bottoms of all four shafts have received construction debris. All shafts are lined and grouted to minimize wastewater accumulation. The solid material cleaned up from the bottom of the shafts without sumps is disposed of on the main salt storage area. The Waste Shaft sump periodically collects brine. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. The brine was tested and was determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft. The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft. As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a plastic catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground. Since the corrective action involved the removal of the debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e."	Supplements

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
13 (cont.)	Update of the Solid Waste Management Units to include the Exhaust Shaft Catchment Basin	J1-8	All	Add Table J1-2:	Supplements

TABLE J1-2
SWMU DATA-SHAFT SUMPS

SWMU	Dates	*Location and Description	Status	Material Stored
010-a Salt Handling Shaft	1981 to Pres.	0/0 Sump extends 148 feet below the facility horizon	Active	Welding residue, scrap wood and metal, salt, Class C cement, Chemical-seal, bentonite, grease, and oil
010-b Waste Shaft	1982 to Pres.	640D/E30 Sump extends 119 feet below the horizon.	Active	Concrete, salt, cement grout, chemical grout, brine from Rustler Formation, wash water, grease, and oil, lead
010-c Exhaust Shaft	1985 to 1998	640D/E480 Shaft ends at the facility horizon.	Closed	Salt, concrete, cement grout, chemical grout, brine from Rustler Formation, grease, and oil
010-d Air Intake Shaft	1989 to Pres.	0/W820 Shaft ends at the facility horizon.	Active	Salt, brine from Rustler Formation, concrete, grease, and oil
010-e Exhaust Shaft	1998 to Pres.	640D/E480 Catchment Basin at base of shaft	Active	Salt, brine, lead

* All locations given by underground coordinates.

14	Clarification on the format in which waste characterization data will be transmitted to the WIPP from the generator sites	C-35	12, 19, 20	After "hard copy" add "or electronically (provided a hard copy is available on demand)" the first time, then "or electronically" thereafter.	Clarifies
		C-35	24	Replace "both hard copy and electronic." with "hard copy and/or electronically."	
		C8-22	38	After "Data shall be transmitted by hard copy" add "or electronically (provided a hardcopy is available on demand)"	
		C8-23	17	After "hard copy" add "or electronically"	
		C8-23	19	After "hard" add "or electronic"	

Item	Identifier	Application Page	Application Line(s)	Change	Relation to Previously Submitted Information
15	Clarification on the use of facility pallet hold down clamps and slip sheets	D-63	28-38	Replace text with: "The Facility pallet is a fabricated steel unit designed to support 7-packs of drums, SWBs, TDOPs, or groups of overpack drums, and has a rated load of 25,000 lbs. (11340 kg). The Facility pallet will accommodate up to four 7-packs of drums or four SWBs (in two stacks of two units), two TDOPs, or two groups of overpack drums (maximum of four drums per group). Loads are secured to the Facility Pallet during transport to the emplacement area. Facility pallets are shown in Figure D-29."	Modifies
		D-157	All	Delete this figure. Replace the page with a "intentionally left blank" note, or renumber the subsequent figures.	

Data Transmittal

The DOE/CAO, through the QAPP and generator site QAPjPs, controls aspects of the waste-characterization data transmittal process. Data reports document the analytical results from the required characterization analyses and contain the characterization data plus documentation of required QA/QC activities associated with the sampling and analyses. The QAPP implements the WAP requirements for maintaining the integrity of the data in data reports by requiring data validation at both the data-generation level and the generator-site project level before the data are transmitted to the WIPP facility. Section C8-10 of Appendix C8 discusses the data validation process in more detail.

Data will be transmitted by hard copy or electronically (provided a card copy is available on demand) from the data generation level to the generator site TRU mixed waste characterization project level. Transmitted data will include testing, sampling, and analytical data reports and data review checklists on forms approved under the generator sites QAPjP. Testing, sampling, and analytical data will be reported for each waste container. These data will also be input electronically into the WWIS. Data will be entered into the WWIS in the exact format required by the database (see Section C-5a for WWIS data requirements and Appendix C13 for the WWIS data dictionary). Summarized characterization information will be reported on a waste stream basis and transmitted by hard copy or electronicically to the WIPP Waste Operations when requested. Hard copy or electronically data packages will include site name, program identification, waste container numbers, release signatures from the generator Site Project Manager and Site Project QA Officer, and a concise narrative summarizing the results of the site project-level review. Section C8-12 of Appendix C8 provides the format requirements for generator/storage site data reports; hard copy and/or electronically. The report will briefly describe any problems or noteworthy observations (e.g., nonconformance reports, operational variances).

Once a waste stream is fully characterized, the site project manager will also submit to the WIPP facility a summary of the waste stream information and reconciliation with DQOs (Section C8-11 of Appendix C8). Based on this summary, the generator site project manager will complete a Waste Stream Profile Form (Figure C-4). This will be used as the basis for acceptance of waste characterization information on wastes to be disposed of at the WIPP.

Data Verification

The first level of data verification by the generator site will confirm that the waste characterization data are properly reported for the characterized waste containers that will be shipped to the WIPP. Data review, validation, and verification procedures used by the generator sites are required by the QAPP to assure that 100 percent of the data reported has received an independent technical review to assure that data generation and reduction were conducted in a technically correct manner, calculations have been verified correct, and all variances from accepted analytical methods (appropriate to the waste type being analyzed) have been documented and approved. Data packages will be reviewed for completeness to verify that they include field sampling records, raw analytical data, calculation records, COC documentation,

calibration records, QA sample results, and that sample holding times and preservation methods were met or exceptions documented. Completed data must be signed by the technical supervisor. At the second level of verification, the Site Project Manager, the Site Data Validation Officer, and the Site Data QA Officer will also ensure that a repeat of this review is performed for at least one randomly chosen container quarterly. Finally, a check for the data package elements required by the QAPP will be performed by the WIPP Waste Operations section as the third level of verification for data packages to assure that data packages are complete. Figure C-5 shows the components of each level of data verification. Data verification is discussed in more detail in Appendix C8, Section C8-10.

Records Management

Records related to waste characterization sampling and analysis activities at the generator sites will be maintained in the testing, sampling, or analytical facility files or site project files for those facilities located on sites. Contract waste analytical facilities will forward testing, sampling, and analytical QA documentation along with testing, sampling, and analytical batch data reports to the site project office for inclusion in site central files.

All waste characterization data and related QA/QC records in the site project files for waste to be shipped to the WIPP facility are designated according to NQA-1, Supplement 17S-1, as either Lifetime Records or Non-Permanent Records. Records designated as Lifetime Records shall be maintained for the life of the waste characterization program at a participating site plus six years then offered to the DOE/CAO. Waste characterization records designated as Non-Permanent Records shall be maintained for five years from the date of (record) generation and then discarded. Table C-13 provides a listing of records designated as Lifetime Records and Non-Permanent Records. Records, both Lifetime and Non-Permanent, shall also be maintained during the course of any enforcement action for which they are relevant. An appropriate records inventory and disposition schedule shall be prepared and approved by appropriate site personnel. Site personnel responsible for all aspects of records management shall be identified in the QAPjPs.

All waste characterization data and related records sent to the DOE/CAO are designated as Permanent by the WIPP facility. These records shall be maintained by DOE/CAO or WID for the active life of the WIPP facility plus two years. The active life of the WIPP facility is defined as the Disposal Phase and the Decommissioning Phase. These records shall also be maintained during the course of any enforcement action for which they are relevant. At the time of records disposition, the records shall be sent to the Federal Records Center. These records will then be transferred to the National Archives after an additional 30 years. However, this disposition requirement does not preclude the inclusion of these records in the permanent marker system or other requirements for institutional control.

Raw data obtained by testing, sampling, and analyzing TRU waste in support of this WAP will be identifiable, legible, and provide documentary evidence of quality. The reporting requirements

Data Transmittal

The DOE/CAO, through the QAPP and generator site QAPjPs, controls aspects of the waste-characterization data transmittal process. Data reports document the analytical results from the required characterization analyses and contain the characterization data plus documentation of required QA/QC activities associated with the sampling and analyses. The QAPP implements the WAP requirements for maintaining the integrity of the data in data reports by requiring data validation at both the data-generation level and the generator-site project level before the data are transmitted to the WIPP facility. Section C8-10 of Appendix C8 discusses the data validation process in more detail.

Data will be transmitted by hard copy or electronically (provided a card copy is available on demand) from the data generation level to the generator site TRU mixed waste characterization project level. Transmitted data will include testing, sampling, and analytical data reports and data review checklists on forms approved under the generator sites QAPjP. Testing, sampling, and analytical data will be reported for each waste container. These data will also be input electronically into the WWIS. Data will be entered into the WWIS in the exact format required by the database (see Section C-5a for WWIS data requirements and Appendix C13 for the WWIS data dictionary). Summarized characterization information will be reported on a waste stream basis and transmitted by hard copy or electronicically to the WIPP Waste Operations when requested. Hard copy or electronically data packages will include site name, program identification, waste container numbers, release signatures from the generator Site Project Manager and Site Project QA Officer, and a concise narrative summarizing the results of the site project-level review. Section C8-12 of Appendix C8 provides the format requirements for generator/storage site data reports; ~~both hard copy and electronic~~hard copy and/or electronically. The report will briefly describe any problems or noteworthy observations (e.g., nonconformance reports, operational variances).

Once a waste stream is fully characterized, the site project manager will also submit to the WIPP facility a summary of the waste stream information and reconciliation with DQOs (Section C8-11 of Appendix C8). Based on this summary, the generator site project manager will complete a Waste Stream Profile Form (Figure C-4). This will be used as the basis for acceptance of waste characterization information on wastes to be disposed of at the WIPP.

Data Verification

The first level of data verification by the generator site will confirm that the waste characterization data are properly reported for the characterized waste containers that will be shipped to the WIPP. Data review, validation, and verification procedures used by the generator sites are required by the QAPP to assure that 100 percent of the data reported has received an independent technical review to assure that data generation and reduction were conducted in a technically correct manner, calculations have been verified correct, and all

Documentation of the returned containers will be covered by Waste Operations protocols and the WWIS. Changes will be made to the WWIS data to indicate the current status of the container(s), and a reason will be required to change the data. This reason, plus the record of the WWIS data change will be maintained in the change log of the WWIS and will provide an auditable record of the returned shipment.

The Waste Operations section will be responsible for resolution of discrepancies, notification of the NMED, as well as returning the original copy of the manifest to the generator. The manifest will be returned within 30 days of delivery of the waste.

Examination of the Land Disposal Restriction (LDR) Notice

TRU mixed waste is exempted from LDRs by the Land Withdrawal Amendment (Public Law 104-201). This amendment states that WIPP "waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not be subject to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act." Therefore, with each waste shipment of LDR waste, the generator must provide the WIPP facility with a notice that the waste is not prohibited from land disposal. WIPP personnel will review the LDR notice for accuracy and completeness. The generator will prepare this notice in accordance with the requirements of 20 NMAC 4.1, 268.7(s)(3).

Verification

Waste Operations will make a determination of waste shipment irregularities. The following items will be noted for each waste shipment arriving at the WIPP facility:

- The number and type of containers holding TRU mixed waste match the information in the WWIS

- Container defects

Waste Operations will verify that the containers (as identified by their container ID numbers) are the containers for which accepted data already exists in the WWIS. A check will be performed by Waste Operations comparing the data on the WWIS Shipment Summary Report for the shipment to the actual shipping papers (including the EPA Hazardous Waste Manifest). This check also verifies that the containers included in the shipment are those for which approved shipping data already exist in the WWIS Transportation Data Module (Table C-12). For SWBs and TDOPs, this check will include comparing the barcode on the container with the shipping papers and the data on the WWIS Shipment Summary Report. For 7-pack assemblies, one of the seven container barcodes will be read by the barcode reader and compared to the assembly information for this container on the WWIS Shipment Summary

Report. This will automatically identify the remaining six containers in the assembly. This process enables enables waste operations to identify all of the containers in the assembly with minimum exposure. If all of the container IDs and the information on the shipping papers agree with the WWIS Shipment Summary Report, the operator is assured that the containers have been approved for disposal at the WIPP facility.

Waste Shipment Screening QA/QC

Waste shipment screening QA/QC ensures that waste received is that which has been approved for shipment during the Phase I screening. This is accomplished by maintaining stringent QA/QC control of the waste shipment screening process. The screening process will be controlled by administrative processes which will generate records documenting waste receipt that will become part of the waste receipt record. The waste receipt record documents that container identifications correspond to shipping information and approved waste streams. The WIPP extends QA/QC practices to the management of all records associated with waste shipment screening determinations.

Records Management

As part of the WIPP facility's operating record, data and documents associated with waste characterization data are managed in accordance with standard records management practices. The storage of WIPP's copy of the manifest, LDR information, waste characterization data, waste stream profile forms, and other related records will be identified on the appropriate records inventory and disposition schedule for Waste Operations.

Waste characterization data and documents related to waste characterization that are part of the WIPP facility operating record are managed in accordance with the following guidelines:

General Requirements

- Records must be legible
- Corrections must be made with a single line through the incorrect information, and a date and initial of the person making the correction
- Records must be paginated indicating the total number of pages that make up the record
- Black ink is encouraged, unless a copy test has been conducted to ensure the other color ink will copy
- Use of highlighters on records is discouraged
- Records must be reviewed for completeness
- Records must be validated by the cognizant manager

Records Storage

- Active records must be stored when not in use

TABLE C-6
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	100% radiography or visual examination	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas volatile organic compounds (VOC)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of transuranic (TRU) waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling[a] (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	100% Radiography Visual examination (statistical sample)[a]	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Documentation and verification[b]	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs (VOCs)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling[a] (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	Documentation and verification[b]	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Radiography for wastes <1 rem/hour Acceptable knowledge	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable volatile organic compounds (VOCs) • Determine potential flammability of transuranic (TRU) waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	100% Radiography	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performances standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Documentation and verification	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g. no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas volatile organic compounds (VOCs)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	Documentation and verification	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

through undisturbed geologic units is negligible. (The most recent report on the BSEP is Deal et. al., 1993). This mechanism also implies that brine inflow decreases with time and that the available brine reservoir is limited in extent.

D-9b(1)(b)(ii) Engineered Features and Operations

With regard to the engineered aspects, their design and operation are described in Section D-10 and in Section I-1e(2)(e). The key aspects of the facility design and operation that prevent releases that could contaminate soils, surface water, or groundwater are the use of multiple containments and the prohibition on opening containers of off-site generated waste at the WIPP facility. This is embodied in a "Start Clean-Stay Clean" operating philosophy.

Waste Containment

Primary containment is provided by the waste container. Secondary containment on the surface is provided by the shipping container and the WHB. Once waste is in its final disposal location, containment during the balance of the operational period is provided by the containers until panels are closed and then by the panel closures. Analyses performed by the WIPP architect and engineer and included in Appendix D1, considered expected creep closure rates in determining disposal room sizes. Figures 12-21 and 12-22, in the Final Design Validation Report in Appendix D1, show the creep closure histories used for designing the disposal rooms. The specified size was selected to assure no CH containers would breach due to creep closure while a panel is being filled with waste. A nominal five year life is used for operational purposes for mining, emplacement, and closure with no risk of CH waste containers breaching. RH canisters will not breach in this time period due to the canister wall thickness and the 2 to 4 in. creep tolerance in each RH emplacement hole.

Waste Handling Operations

Operations are conducted in a manner that minimizes the possibility of accidents or fires. In addition, diesel powered waste handling equipment in the underground are equipped with rupture-proof fuel tanks and on-board automatic fire suppression systems for the engines to preclude fires that might involved the waste. On the surface all waste handling equipment is electric (battery), and all loads are secured prior to moving them to avoid spillage. Other safety measures taken to protect the waste, the employees, and the public and environment are discussed in Chapter F.

Repository Seals

After operations and during the post closure period, isolation of waste is provided by the shaft seals and the geologic barriers including the nearly impermeable Salado Formation. The characteristics of the Salado are detailed in Sections D-9a(1)(b) and D-9a(1)(c). The characteristics of the panel closures are detailed in Section I-1e(1). The effectiveness of these barriers is dependent on gas generation, brine inflow, and creep closure.

Repository seal properties are discussed in Appendix I2. For the purposes of long-term modeling, repository seals are divided into two functional elements: those that perform for the first 100 years after final facility closure, and those that perform after the first 100 years. The distinction is important. The short-term seals are made of cementitious and other materials that have little performance histories beyond about 100 years. Consequently, it is difficult to argue persuasively that they will last for several hundred years. In order to avoid a lapse in repository protection, the long-term component of the seal, namely crushed salt, is emplaced in a manner that assures sufficient consolidation by the end of the life of the short-term seals. As can be seen in the design report, this is accomplished by achieving a nominal emplacement compaction density for the long-term seal components in the shaft. Achieving these densities has been demonstrated on a limited scale.

The four shafts connecting the repository to the surface are represented in the computer simulation with a single shaft. This single shaft has a cross section and volume equal to the total cross section and volume of the four actual shafts and is separated from the waste disposal region in the model by the true north-south distance from the waste to the nearest shaft (the Waste Shaft).

Seal component materials and properties used in the simulation are given in Table D-5. From top to bottom, the seal system is represented in the simulation by the following materials (see Appendix I2 for details):

- an earthen fill region above the Rustler Formation
- a clay region in the Rustler Formation (designated Rustler Compacted Clay in Table D-5)
- an asphalt region at the top of the Salado
- three concrete sections (upper, middle, lower) within the Salado
- a thick section of compacted crushed salt within the Salado
- an upper compacted clay region within the Salado (designated Upper Salado Compacted Clay in Table D-5)
- a lower compacted clay region within the Salado (designated Lower Salado Compacted Clay in Table D-5)
- a basal clay component below MB 138 (designated Bottom Clay in Table D-5)
- a lower concrete section at the repository horizon (shaft station concrete monolith)

assessments. The Agency considers a number of factors such as the type of risk presented by the substance, the quality of the underlying data, the reasonableness of the risk assessment, the statistical significance of the findings, and the significance of risk. In the second step, OSHA considers which, if any, of the regulatory provisions being considered will substantially reduce the identified risks. In the third step, OSHA looks at the best available data to set permissible exposure limits that, to the extent possible, both protect employees from significant risks and are technologically and economically feasible. In the fourth step, OSHA considers the most cost-effective way to fulfill its statutory mandate. Because of this process, it is not possible to relate occupational risk to terms that make it directly comparable to public risk such as chances for excess cancer fatality. Therefore, the occupational risk levels used in this analysis are shown as a dose.

In the analysis of occupational exposure, the DOE compares the expected dose to the OSHA recommended permissable exposure limit (PEL) which is an 8-hour time weighted average. In practice, at the WIPP facility, the DOE implements the dose levels endorsed by the American Conference of Governmental Industrial Hygienists (ACGIH). Action levels for WIPP are at one-half of the ACGIH Level. This means that the DOE will take action to mitigate further exposure if an employee's exposure reaches fifty percent of the ACGIH Level.

9-b(4)(a)(ii) Environmental Risk

The performance standard for environmental exposure to carcinogens has been established by the EPA and is based on excess risk of developing cancer in a population. The acceptable excess risk for the public to exposures from class A and B carcinogens is 1×10^{-6}, (i.e., one chance in one million of developing cancer) and class C carcinogens is 1×10^{-5}. The acceptable level of risk for the public to exposures from non-carcinogens is expressed in terms of a hazard quotient. A hazard quotient of less than 1.0 from exposure to emissions poses no known health risk and is acceptable.

D-9b(4)(b) Potential for Health Risks

This section is a summary of the exposure assessment presented in Appendix D9. The exposure assessment includes an analysis of the potential releases of hazardous waste emissions, the physical and chemical properties of the waste, the release pathways, and human exposure to potential releases to the atmosphere. The potential risk to human health from waste emissions is compared to acceptable levels and is summarized in Table D-6.

Since the only substances to be released are gases from the headspace of waste containers, the assessment focused on the release of those VOCs in the gas phase that represent approximately 99 percent of the risk to human health. The only pathway assessed is the atmosphere, or releases to the air from the mine ventilation system. Occupational exposures are assessed from potential VOC concentrations in the mine ventilation air underground and in the atmosphere on the surface of the facility. Public exposures are assessed at all locations where public exposure can occur from potential VOC concentrations in the atmosphere from releases of the mine ventilation air.

The calculation of risk and exposure to classes of public and occupational receptors is documented in Appendix D9. Based on these calculations, Table D-6 shows that the maximum estimated occupational exposure concentrations of VOCs underground and on the surface are 75 to 38,500 times and 4,170 to 263,000 times, respectively, below OSHA limits. The most exposed individual in the underground is a someone emplacing waste in an open panel. This task results in an exposure of 330 hours in 2.5 years for four waste handlers. At all other times, the waste handler will be upwind from the waste and will not be exposed to emissions. Any other workers who may be downwind of the waste will be operating under a safe work permit through which exposures are carefully monitored and controlled. The most exposed individual on the surface resides in the Training Building 1,920 hours per year. The maximum estimated environmental health risk from VOC emissions is to a resident at the WIPP Site Boundary. The risk levels are from one and one-half to three and one-half orders-of-magnitude below acceptable levels for carcinogens, and from five to six orders-of-magnitude below acceptable levels for non-carcinogens. The maximum risk for carcinogens is 3×10^{-8} from carbon tetrachloride. The maximum hazard quotient for non-carcinogens is 4×10^{-6} from chlorobenzene, which is well below the acceptable level of 1.0. Calculations of risk to the public used average headspace concentrations. Calculations of risk to workers use maximum average concentrations in Table C-5.

D-9b(4)(c) Compliance with Air Emission Standards

The air emission modeling for the WIPP underground is presented in Appendix D10. Emissions from the WHB are not regulated under 20 NMAC 4.1, Subpart V. The modeling considered the following aspects:

- The volume and the physical characteristics of the waste were evaluated. Since the waste cannot contain liquid hazardous waste, the emissions are due to residuals of organic compounds that are on surfaces or sorbed by laboratory equipment. An estimate has been made of the quantities of organics that are in the headspace of the containers since these are free to vent into the disposal areas through carbon-composite filters attached to each container of TRU waste. The 930 drums tested were from the Rocky Flats Environmental Technology Site and the INEL. These containers are considered representative of the waste throughout the DOE complex for the purposes of determining the modeling parameters. This is because all of the volatile constituents in the Waste Analysis Plan are represented. Furthermore, modeling results in waste characterization limits as discussed in Chapter C of this application. These limits which are the maximum average values shown in Table C-5 will have to be met by all generators that wish to send waste to WIPP, whether or not their waste was specifically included in the modeling.

- The modeling takes into account the various engineered and operating aspects of the facility; open panels, open rooms, filter vents on each container, the ventilation system for the facility, and the size and use of the land withdrawal area. For closed rooms and closed panels, the modeling takes into account gas generation rates and

Once loaded, the facility cask will be rotated to the horizontal position on the facility-cask transfer car (Figure D-25) and will then be ready for transfer onto the waste hoist. The Cask Loading Room functions as an air lock between the Waste Shaft and the Transfer Cell and RH Bay.

RH TRU Mixed Waste Support Facilities

The Hot Cell Operating Gallery, the Crane Maintenance Room, the Manipulator Repair Room, and the Hot Cell Filter Gallery support RH TRU mixed waste handling operations (see Figure D-26).

The Hot Cell Operating Gallery

The Hot Cell Operating Gallery, adjacent to the Hot Cell, provides the space for Hot Cell operating personnel to monitor and control operations. The fixed manipulators will be operated from this area, and they can be removed through this area to the Manipulator Repair Room for maintenance and repair. To prevent the spread of contamination, manipulators will be bagged out as they are removed from the Hot Cell. After transfer to the Manipulator Repair Room, the manipulators will be surveyed and decontaminated, if necessary. The Hot Cell Operating Gallery also contains closed-circuit television monitors and control-panel stations for selecting and monitoring the Hot Cell and Transfer Cell cameras.

D-10a(2)(b)(iii) Other TRU Mixed Waste Support Systems

Ventilation

The WHB HVAC system provides a filtered-air exhaust path consisting of a prefilter (to remove larger dust particles and to prolong the useful life of the HEPA filters) and two stages of HEPA filters (to remove radioactive particulate contamination). These filters will be tested to American National Standards Institute (ANSI) requirements (ANSI-N-510) and have a combined 99.95 percent removal efficiency per stage of 0.3 micron particles.

Except for local air-handling units and the hot-cell exhaust filters, WHB HVAC equipment is contained within the mechanical equipment room, located on a second level of the CH side of the WHB. This room houses the exhaust fans and associated ducting that control WHB ventilation flow.

The WHB ventilation system channels exhaust through a single stack at a nominal flow of 55,000 ft^3 (1,556.5 m^3) per min. The final exhaust from the stack will be continuously monitored for radioactive particulate contamination.

In the event of a tornado, tornado dampers will close to prevent the outward rush of air caused by a rapid drop in atmospheric pressure. Damper closure mitigates the destruction of HEPA filters and ducts by preventing a high-pressure differential from affecting the filters.

If necessary, the exhaust systems can be powered from the backup-power system if off-site power is lost, thus maintaining negative-differential pressures in potentially contaminated areas.

During the initial opening phases of a TRUPACT-II, the TRUDOCK Vent Hood System (VHS) will function as a local exhaust system to control potential airborne-particulate contamination through the use of HEPA filters. Headspace gases will also be drawn into the WHB HVAC exhaust system.

Fire Protection

The design of the fire-protection system satisfies applicable sections of the National Fire Protection Association codes, DOE Orders, and other federal codes (see Chapter F). Fire barriers protect the cage-loading area and shaft areas within the WHB, separate support areas, and walls enclosing stairwells. In addition, the mechanical equipment room has fire barriers that separate this room from other areas of the WHB.

A sprinkler system is installed throughout the CH and RH TRU mixed waste handling areas of the WHB. A fire-suppression water-collection system is in the floor of the WHB to collect fire-suppression water. Fire-suppression water will be collected and held for hazardous contamination verification, and its management will be determined by the test results. The TRU mixed waste handling area will be provided with interior fire-hose connections and portable extinguishers for nonwaste-related fires. Chapter F provides additional information on fire protection.

Underground Access Control

Access to all HWMUs is restricted for the purposes of entry control to areas where wastes are being handled, the WHB, the boundaries of the parking area south of the WHB, and those portions of the underground where wastes are transported or disposed are posted as Controlled Areas (CAs). The WIPP Radiological Control Manual (Westinghouse, 1994) allows access to a CA by anyone who has successfully completed General Employee Radiological Training which is included in the General Employee Training Course described in Chapter H. Access for visitors can also be arranged with proper training.

D-10a(2)(c) CH TRU Mixed Waste Handling Equipment

The following sections provide descriptions of the major pieces of equipment that are used to manage CH TRU waste. A summary of equipment capacities, as required by 20 NMAC 4.1, Subpart V, is included in Table D-8.

TRUPACT-II Type B Shipping Containers

The TRUPACT-II (Figure D-27) is a double-contained cylindrical shipping container 8 ft (2.4 m) in diameter and 10 ft (3 m) high. It meets DOT Type B shipping container requirements

and has successfully completed rigorous container-integrity tests. The payload consists of 7,265 lbs (3,295 kg) gross weight in up to fourteen 55-gal (208-L) drums, two SWBs, or one TDOP.

Unloading Docks

Each TRUDOCK is designed to accommodate up to two TRUPACT-II shipping containers. The TRUDOCK functions as a work platform, providing TRU mixed waste handling personnel easy access to the container during unloading operations (see Figure D-28 and Drawing 41-M-001-W in Appendix D3).

Forklifts

Forklifts will be used to transfer the TRUPACT-II shipping containers into the WHB and to transfer palletized CH TRU mixed waste to the conveyance loading car. Another forklift will be used for general-purpose transfer operations. This forklift has attachments and adapters to handle individual TRU mixed waste containers, if required.

Cranes and Adjustable Center-of-Gravity Lift Fixtures

At each TRUDOCK, an overhead bridge crane is used with a specially designed lift fixture for disassembly of the TRUPACT-IIs. Separate lifting attachments have been specifically designed to accommodate SWBs and TDOPs. The lift fixture, attached to the crane, has built-in level indicators and two counterweights that can be moved to adjust the center of gravity of unbalanced loads and to keep them level.

Facility Pallets

The facility pallet is a fabricated steel unit designed to support 7-packs of drums, SWBs, TDOPs, or groups of overpack drums, and has a rated load of 25,000 lbs. (11340 kg). The facility pallet will accommodate up to four 7-packs of drums of four SWBs (in two stacks of two units), two TDOPs, or two groups of overpck drums (maximum of four drums per group). Loads are secured to the facility pallet during transport to the emplacement area. Facility pallets are shown in Figure D-29. Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This arrangement reduces the potential for puncture accidents. WIPP facility operational documents define the operational load of the facility pallet as the contents of two TRUPACT-IIs. Since the maximum TRUPACT-II load is 7,265 lbs (3,300 kg), the maximum weight of a loaded facility pallet is less than 19,000 lbs (8,630 kg), including the pallet weight.

Backfill

As specified in Appendix D22, magnesium oxide (MgO) will be used as a backfill in order to provide chemical control over the solubility of radionuclides in order to comply with the requirements of 40 CFR 191.13. The MgO backfill will be purchased prepackaged in the proper containers for emplacement in the underground. Purchasing prepackaged backfill eliminates handling and placement problems associated with bulk materials, such as dust creation. In addition, prepackaged materials will be easier to emplace, thus reducing potential worker exposure to radiation. Should a backfill container be breached, MgO is benign and cleanup is simple. No hazardous waste would result from a spill of backfill. A Material Safety Data Sheet is attached in Appendix D22.

The MgO backfill will be purchased and received in two different containers: 1) a supersack holding 4,000 lbs (1,814 kg); and 2) a mini sack holding 25 lbs (11.3 kg). Quality assurance requirements, such as material quality and quantity, will be addressed by using current quality assurance procedures in the procurement process and receipt inspection. The filled containers will be shipped by road or rail and will be delivered underground using current shaft and material handling procedures and processes.

The mini sack will be 34 in. (86.4 cm) long, 6 in. (15 cm) in diameter and will be fabricated of a single layer of polyethylene or other suitable material. It will have an integral handle/hook attached into the sack closure. Six sacks will be manually placed in the external voids of each 7-pack unit just before the 7-pack is positioned on the waste stack. The mini sack will be lifted up behind the shrink wrap around the top of the 7-pack, slid into place, and held there by the four inch hole in the lower slip sheet. See Figure D-30A. Once the sacks are in place, the 7-pack will be positioned on the waste stack in the normal manner. No new equipment or training of operators is necessary.

A similar process will be used for standard waste boxes (SWB) except that the sacks will be hung from the lift clips on these units. See Figure D-30A. Again, no new equipment or training is necessary.

Super sacks will be handled and placed using the slip sheet/BRUDI technique used for normal waste handling operations. Hence, no new equipment, procedures, or training are required. Once each row of waste units is in place, a layer of 6 super sacks will be placed on top of them. See Figure D-30B. The super sack will be 5 ft (1.5 m) wide by 6 ft (1.8 m) deep by 1.5 ft (0.45 m) high and will be of multi-wall construction with a vapor/moisture barrier. The super sack will have an integral slip sheet or base attachment so that it can be handled and placed in a manner that is identical to how waste units are emplaced, using a BRUDI-like attachment on a lift truck.

Finally, mini sacks will be manually stacked on the floor in the space between the waste stack and ribside. These sacks can be placed horizontally or vertically as may be convenient and loading rates up to 100 lbs per linear foot (148.8 kg per linear meter) can be achieved.

completely filled with waste; be idle, awaiting waste handling operations; or being prepared for waste receipt. Approximately 35,000 ft^3 (990 m^3) per min will be required in each of these active rooms during operations. This quantity of air is required to support the numbers and types of diesel equipment that are expected to be in operation in the area, to support the underground personnel working in that area, and to exceed a minimum air velocity of 60 ft (18 m) per min as specified in the WIPP Ventilation Plan. The remainder of the air is needed in order to account for air leakage through inactive rooms.

Air will be routed into a panel from the intake side. Air is routed through the individual rooms within a panel using underground bulkheads and air regulators. Bulkheads are constructed by erecting framing of rectangular steel tubing and screwing galvanized sheet metal to the framing. Figure D-34A shows a typical bulkhead with a flow regulator installed. In order to accommodate creep, bulkhead members use telescoping extensions that are attached to the framing and which can be adjusted periodically. Since bulkheads are intended to seal the ventilation system, they use either a sheetmetal or rubber gasket that is attached to the bulkhead on one side and the salt on the other. Flow is also controlled using brattice cloth barricades. These consist of chainlink fence that is bolted to the salt and covered with brattice cloth; and are used in instances where the only flow control requirement is to block the air. A brattice cloth air barricade is shown in Figure D-34B. Ventilation will be maintained only in all active rooms within a panel until waste emplacement activities are completed and the panel-closure system is installed. The air will be routed simultaneously through all the active rooms within the panel. The rooms that are filled with waste will be isolated from the ventilation system, while the rooms that are actively being filled will receive a greater volume of air to assure worker safety. After all rooms within a panel are filled, the panel will be closed using a closure system described in Chapter I of this permit application.

Once a disposal room is filled and is no longer needed for emplacement activities, it will be barricaded against entry and isolated from the mine ventilation system by removing the air regulator bulkhead and constructing chain link/brattice cloth barricades at each end. There is no requirement for air for these rooms since personnel and/or equipment will not be in these areas. For air dispersion modeling purposes in Appendix D9, it is assumed that no air goes through each filled room.

The ventilation path for the waste disposal side is separated from the mining side by means of air locks, bulkheads, and salt pillars. A pressure differential is maintained between the mining side and the waste disposal side to ensure that any leakage is towards the disposal side. The pressure differential is produced by the surface fans in conjunction with the underground air regulators.

Underground Ventilation Modes of Operation

The underground ventilation system is designed to perform under two modes of operation: normal (the HEPA exhaust filtration system is bypassed), and filtered (the exhaust is filtered through the HEPA filtration system, if the concentrations of radioactive contaminants exceed pre-set limits).

In the normal mode, the two main surface exhaust fans, located near the Exhaust Shaft, will provide continuous ventilation of the underground areas. All underground flows join at the bottom of the Exhaust Shaft before discharge to the atmosphere.

Outside air will be supplied to the mining areas, the waste disposal areas, and the experimental complex through the Air Intake Shaft, the Salt Handling Shaft, and access entries. A small quantity of outside air will flow down the Waste Shaft to ventilate the Waste Shaft station. The ventilation system is designed to operate with the Air Intake Shaft as the primary source of fresh air. Under these circumstances, sufficient air will be available to simultaneously conduct all underground operations (e.g., waste handling, mining, experimentation, and support).

If the nominal flow of 425,000 cfm (12,028 m^3/min) is not available underground operations may proceed, but the number of activities that can be performed in parallel may be limited depending on the quantity of air available. Ventilation may be supplied by operating one or two of the filtration exhaust fans. To accomplish this, the isolation dampers will be opened, which will permit air to flow from the main exhaust duct to the filter outlet plenum. The filtration fans may also be operated to bypass the HEPA plenum. The isolation dampers of the filtration exhaust fan(s) to be employed will be opened, and the selected fan(s) will be switched on. In this mode, underground operations will be limited, because filtration exhaust fans cannot provide sufficient airflow to support the use of diesel equipment.

In the filtration mode, the exhaust air will pass through two identical filter assemblies, with only one of the three Exhaust Filter Building filtration fans operating (all other fans are stopped). This system provides a means for removing the airborne particulates that may contain radioactive and hazardous waste contaminants in the reduced exhaust flow before they are discharged through the exhaust stack to the atmosphere. The filtration mode is activated manually or automatically if the radiation monitoring system detects abnormally high concentrations of airborne radioactive particulates. Automatic activation will also occur if an alarm is received from the continuous air monitor in the exhaust drift of the active waste panel. The filtration mode is not initiated by the release of gases such as VOCs. This is for three reasons. First, the HEPA filters would not remove VOCs from the air stream. Second, VOCs are continuously being released at concentrations that are shown in Section D-9b(4) to be of little consequence to occupational or environmental receptors and, therefore, do not require filtration. Third, based on the types of accidents modeled in the Safety Analysis Report (SAR), the most severe credible accident results in the breaching of 21 drums of waste in a roof fall in an active panel results in a release (for carbon tetrachloride). That is, at most, 3.3% of the allowable off site dose.[12] This low dose is not a threat to human health or the environment. VOCs will be monitored in the underground using the VOC Confirmatory Monitoring Plan described in Section D-10d(1)(d)(xiv).

[12]For the analysis in the SAR the standard used is the threshold limit value/short term exposure limit (TLV/SLEL).

A set of three booster fans will allow selective reversal of airflow in the mining area, the northern experimental area, the Air Intake Shaft and its associated station, and the Salt Handling Shaft and its associated station. In these modes, airflow can be reversed by opening and closing certain ventilation doors and air regulators and by operating the underground booster fans (in either the forward or the reverse direction). These fans will normally be turned off and will be isolated, with air bypassing the fans and flowing through the air lock. The surface fans will be stopped before attempting any underground air reversals. These modes of ventilation will only be implemented under manual control for off-normal conditions (such as a fire).

Planned Upgrade

Underground Ventilation Normal Mode Redundancy: The underground ventilation system will be provided redundancy in normal ventilation mode by the addition of a third main fan. Ductwork leading to that new fan will tie into the existing main exhaust duct. The connecting saddle, wye, and elbow with an integral damper, is scheduled to be installed and blanked-off, and the hole in the main duct is to be cut before waste receipt. The later addition of the third fan and associated ductwork will then not interfere with the facility operation.

Electrical System

The WIPP facility uses electrical power (utility power) supplied by Southwestern Public Service. If there is a loss of utility power, TRU mixed waste handling and related operations will cease.

Backup, alternating current power will be provided on site by two 1,100-kilowatt diesel generators. These units provide 480-volt power with a high degree of reliability. Each of the diesel generators can carry predetermined equipment loads while maintaining additional power reserves. Predetermined loads include lighting and ventilation for underground facilities, lighting and ventilation for the TRU mixed waste handling areas, and the Air Intake Shaft hoist. The diesel generator can be brought on line within 30 minutes either manually or from the control panel in the Central Monitoring Room (CMR).

Uninterruptible power supply units are also on line providing power to predetermined monitoring systems. These systems ensure that the power to the radiation detection system for airborne contamination, the local processing units, the computer room, and the CMR will always be available, even during the interval between the loss of off-site power and initiation of backup diesel generator power.

D-10a(3) TRU Mixed Waste Management Operations

Prior to receipt of TRU mixed waste at the WIPP facility, waste operators will be thoroughly trained in the safe use of TRU mixed waste handling and transport equipment. The training will include both classroom training and on-the-job training.

D-10a(3)(a) Derived Waste

The WIPP facility operational philosophy is to introduce no new hazardous chemical components into TRU mixed waste or TRU mixed waste residues that could be present in the controlled

area. This will be accomplished through written procedures and the use of Safe Work Permits (SWP)[13] and Radiological Work Permits (RWP).[14] The purpose of this operating philosophy is to avoid generating TRU mixed waste that is compositionally different than the TRU mixed waste shipped to the WIPP facility for disposal.

Some additional TRU mixed waste, such as used personal protective equipment, swipes, and tools, may result from decontamination operations and off-normal events. Such waste will be assumed to be contaminated with RCRA-regulated hazardous constituents in the TRU mixed waste containers from which it was derived. Derived waste may be generated as the result of decontamination activities during the waste handling process. Should decontamination activities be performed, water and a cleaning agent such as those listed in Section G-4d will be used. Derived waste will be considered acceptable for management at the WIPP facility, because any TRU mixed waste shipped to the facility will have already been determined to be acceptable and because no new constituents will be added (see Section C-6). Data on the derived waste will be entered into the WWIS database. Derived waste will be contained in standard DOT approved Type A containers.

The Safety Analysis Report for packaging requires the lids of TRU mixed waste containers to be vented through HEPA-grade filters to preclude container pressurization caused by gas generation and to prevent particulate material from escaping. Filtered vents used in CH TRU mixed waste containers (55-gal (208-L) drums, 85-gal (321 L) drums, TDOPs, and SWBs) have an orifice approximately 0.375-in. (9.53-millimeters) in diameter through which internally generated gas may pass. The filter media is manufactured from composite carbon.

As each derived waste container is filled, it will be closed with a lid containing a carbon-composite HEPA-grade filter and moved to a HWMU using the same equipment used for handling TRU mixed waste.

D-10a(3)(b) <u>CH TRU Mixed Waste Handling</u>

The CH TRU mixed waste handling process is illustrated in Figure B-4. CH TRU mixed waste will arrive by tractor-trailer at the WIPP facility in sealed shipping containers (e.g., TRUPACT-IIs) (see Figure D-35), at which time they will undergo security and radiological checks and shipping documentation reviews. A forklift will remove the TRUPACT-IIs and will transport them a short distance through an air lock that is designed to maintain differential pressure in the WHB. The forklift will place the shipping containers at one of the two TRUDOCKs inside the WHB, where an external survey of the TRUPACT-II inner vessel (see Figure D-27) will be performed as the

[13]SWPs are prepared to assure that any hazardous work (not already covered by a procedure) is performed with due precaution. SWPs are issued by the WIPP Industrial Safety Section after a job supervisor completes the proper form detailing the job location, work description, personnel involved, specific hazards involved, and protective requirements. The Industrial Safety personnel review the form, check on the adequacy of the protective measures, and if sufficient, approve the work permit. Conditions of the SWPs must be met while any hazardous work is proceeding. Examples of activities covered by the SWP program include confined space entry, overhead work, and work on energized equipment.

[14]RWPs are used to control entry into and performance of work within . Managers responsible for work within a CA must generate a work permit that specifies the work scope, limiting conditions, dosimetry, respiratory protection, protective clothing, specific worker qualifications, and radiation safety technician support. RWPs are approved by the Radiation Protection Section after thorough review. No work can proceed in a CA without a valid RWP.

TABLE D-6
MAXIMUM ESTIMATED OCCUPATIONAL AND PUBLIC EXPOSURE FROM UNDERGROUND WASTE VOC EMISSIONS

Indicator Volatile Organic Compounds (ppmv)	Worker Receptor Concentration		OSHA 8 Hour TWA[b] (ppmv)	Estimated Risk for Carcinogens and Hazard Quotients for Non-Carcinogens for Public Exposure to Waste Emissions	Acceptable Level of Risk[f]
	Surface	Underground			
Carbon Tetrachloride	3.0E-04	1.2E-02	10	3E-08	1E-06
Chlorobenzene[a]	6.9E-04	2.9E-02	75	4E-06[e]	1
Chloroform	2.7E-04	1.0E-02	50[c]	2E-09	1E-06
1,1-Dichloroethylene	1.2E-03	4.7E-02	5[d]	2E-09	1E-05
1,2-Dichloroethane	3.8E-04	1.5E-01	50	8E-10	1E-06
Methylene Chloride	4.5E-03	1.6E-02	500	6E-10	1E-06
1,1,2,2-Tetrachloroethane	3.2E-04	1.3E-02	5	3E-09	1E-05
Toluene[a]	1.6E-03	6.7E-02	200	3E-07[e]	1
1,1,1-Trichloroethane	4.0E-03	1.6E-01	350	2E-08	1E-05

a. Non-Carcinogen (all others are class B2 or C carcinogens)
b. 8 hour time weighted averages (TWA) except for chloroform
c. TWA for up to a 10 hour day in a 40 hour workweek
d. TWA from ACGIH
e. Non-Carcinogen hazard quotient
f. Acceptable level of risk for carcinogens is the probability of developing cancer, and for non-carcinogens is a hazard quotient less than or equal to 1

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The WIPP facility has the capability to handle each of the CH TRU containers singly using forklifts and single container attachments. In such cases, the container would be loaded on the waste shaft conveyance and moved underground as a single unit.

RH TRU mixed waste will arrive at the site in road casks (see Figure D-19), will be surveyed for radiation, and will be placed on cask-transfer cars (see Figure D-20). The cask will be moved to canister Transfer Cells in the Hot Cell area of the WHB RH Bay. The RH Bay also provides space for an overhead bridge crane with an auxiliary hoist used for road-cask handling and maintenance operations. The RH cask will be unloaded from the trailer using the overhead bridge crane.

During cask transfer to the Hot Cell, the cask-seal collar and adapter rings provided will allow the interior of the road cask to become an extension of the hot-cell ventilation system when it is mated to the floor port in the Hot Cell to prevent the release of contaminants outside the Hot Cell. Large concrete shield plugs are provided on the floor of the Hot Cell (see FigureD-21). These are removed when the RH waste is transferred to the Transfer Cell. The major waste handling equipment in the Hot Cell includes a remotely operated bridge crane; a remotely operated bridge-mounted power manipulator; two pairs of manipulators; and a portable, remotely operated welder. The crane is designed to stay on its rails and maintain load control in the event of a design-basis earthquake or electrical outage and has a manual override.

All unloading equipment is inspected in accordance with the schedule shown in Table F-1. Cranes and forklifts that are used in the unloading and handling of TRU mixed waste have been designed and constructed so that they will retain their loads in the event of a loss of power. Cranes in the WHB are also designed to withstand a design basis earthquake without moving off of their rails and without dropping their load. Lowering loads is a priority activity after a disruptive event.

The following is a summary of the activities, structures, and equipment that were developed to prevent hazards in transporting TRU mixed waste.

Palletized TRU mixed waste is transferred by a 13-ton (11.8-metric ton) forklift to the conveyance loading car (see Figure D-18), which is designed with an adjustable bed height that is used to transfer the facility pallets to the special pallet-support stands in the waste hoist cage.

The waste hoist system in the waste shaft and all waste shaft furnishings, designated as Design Class IIIA, are designed to resist the dynamic forces of the hoisting system and to withstand a design-basis earthquake. Maximum operating speed of the hoist is 500 ft (152.4 m) per minute. During loading and unloading operations, the waste hoist is steadied by fixed guides. The waste hoist is equipped with a control system that will detect malfunctions or abnormal operations of the hoist system, such as overtravel, overspeed, power loss, or circuitry failure. The control response is to annunciate the condition and shut the hoist down. Operator response is required to recover from the automatic shutdown. Waste hoist operation is continuously monitored by the CMS. A battery powered FM transmitter/receiver allow communication between the hoist conveyance and the hoist house.

The waste hoist shaft system has two pairs of brake calipers acting on independent brake paths. The hoist motor is normally used for braking action of the hoist. The brakes are used to hold the hoist in position during normal operations and to stop the hoist under emergency conditions. Each pair of brake calipers is capable of holding the hoist in position during normal operating conditions and stopping the hoist under emergency conditions. In the event of power failure, the brakes will set automatically.

The hoist is protected by a fixed automatic fire suppression system. Portable fire extinguishers are also provided at several points on the hoist floor and in equipment areas.

Once underground, the facility pallet is removed from the hoist cage by the underground waste transporter (see Figure D-31), a commercially available articulated diesel vehicle. The trailer is designed specifically for transporting palletized TRU mixed waste and is sized to accommodate the facility pallet. All motorized waste handling equipment is equipped with on-board fire-suppression systems.

The underground waste transporter is equipped with a fire suppression system, rupture-proof diesel fuel tanks, and reinforced fuel lines to minimize the potential for a fire involving the fuel system. Waste containers will be placed into underground waste management areas using a battery-powered forklift.

For the RH waste transport, a shuttle car operates beneath the Hot Cell in the canister-transfer cell to move the RH canister to the cask-loading room, where the waste is placed in the facility cask (see Figure D-24) for subsequent transfer underground. The waste hoist is used to move the facility cask to the underground HWMU for emplacement. Transfer operations are monitored by closed-circuit television cameras. The facility cask will be used to move the RH waste underground from the waste hoist to the emplacement area.

All TRU mixed waste transport equipment is inspected at a frequency indicated in Table F-1.

RH inspections in Table F-1 do not apply until receipt of RH waste. The forms in Appendix F1 are primarily for preventive maintenance, to assure the equipment is maintained operational. Logbooks for recording preoperational inspections of RH equipment noted in Table F1 will be established to provide the inspection records. These logs will be established and used as discussed in Section F-2 above.

1997
RECEIVED
HAZARDOUS WASTE
PROGRAM

G-4k Surface Impoundment Spills and Leakage

The WIPP facility does not manage hazardous or TRU mixed waste using a surface impoundment, as defined in 20 NMAC 4.1, Subpart I, §260.10, and as regulated under 20 NMAC 4.1, Subpart V, Subpart K. Surface impoundment regulations are not applicable to the WIPP facility.

G-5 Emergency Equipment

A variety of equipment is available at the facility for emergency response, containment, and cleanup operations in both the HWMUs and the facility in general. This includes equipment for spill control, fire control, personnel protection, monitoring, first aid and medical attention, communications, and alarms. This equipment is immediately available to emergency response personnel. A listing of major emergency equipment available at the WIPP facility, as required by 20 NMAC 4.1, Subpart V, §264.52(e), is shown in Table G-6. Table G-7 identifies the locations where fire suppression systems are provided. Locations of the underground emergency equipment are shown in Figure G-5. The firewater-distribution system map is shown in Figure G-6. The underground fuel area fire-protection system is shown in Figure G-7.

G-6 Coordination Agreements

The DOE/CAO has established MOUs with off-site emergency response agencies for firefighting, medical assistance, hazardous materials response, and law enforcement. In the event that on-site response resources are unable to provide all the needed response actions during either a medical, fire, hazardous materials, or security emergency, the RCRA Emergency Coordinator will notify appropriate off-site response agencies and request assistance. Once on site, off-site emergency response agency personnel will be under the direction of the RCRA Emergency Coordinator.

The MOUs with off-site cooperating agencies are available from the DOE. A listing and description of the MOUs with state and local agencies and mining operations in the vicinity of the WIPP facility, as required by 20 NMAC 4.1, Subpart V, §264.37 and §264.52(c), are:

- An agreement among the DOE, the WIPP MOC, Mississippi Potash Inc., Western Agriculture Minerals, IMC Fertilizer, Eddy Potash Inc., and New Mexico Potash (June 6, 1994) provides for the mutual aid and assistance, in the form of MRTs, in the event of a mine disaster or other circumstance at either of the two facilities. This provision ensures that the WIPP MOC will have two MRTs available at all times when miners are underground, as required by DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards.

- A joint powers agreement among the DOE; the City of Carlsbad, New Mexico; Eddy County, New Mexico; and the New Mexico Energy, Minerals, and Natural Resources Department for Alternate EOC (April 6, 1994) provides for the

coordination of emergency plans, including the DOE emergency radiological response plans; provides for participation in periodic exercises, drills, and training; provides for establishing and maintaining an alternate EOC at the Living Desert State Park; and assigns responsibilities to the participants.

- A memorandum of agreement between the City of Carlsbad, New Mexico, and the WIPP MOC for ambulance service assistance (August 13, 1981) provides that, upon notification by the WIPP MOC, the Carlsbad Fire Department will be dispatched from Carlsbad toward the WIPP site by a designated route and will accept the transfer of patient(s) being transported by the WIPP facility ambulance at the point both ambulances meet. If the patient(s) is not transferrable, the Carlsbad Ambulance Service will provide equipment and personnel to the WIPP facility ambulance, as necessary.

- A MOU between the DOE and the Columbia (formerly Guadalupe) Medical Center Emergency Radiological Treatment Center for the Waste Isolation Pilot Plant (February 1, 1994) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the Columbia Medical Center Emergency Radiological Treatment Center for decontamination and medical treatment.

- A MOU between the DOE and the Columbia (formerly Lea) Regional Hospital Radiological Treatment Center for the WIPP (February 15, 1995) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the Lea Regional Hospital Emergency Radiological Treatment Center for decontamination and medical treatment.

- A MOU between the DOE and the U.S. Department of Interior (DOI), represented by the Bureau of Land Management (BLM), Roswell District (July 19, 1994), provides for a fire-management program that will ensure a timely, well-coordinated, and cost-effective response to suppress wild fire within the withdrawal area using the WIPP incident commander for fire-management activities. The DOI will provide firefighting support if requested. In addition, the MOU provides for responsibilities concerning cultural resources, grazing, wildlife, mining, gas and oil production, realty/lands/rights-of-way, and reclamation.

- A mutual-aid firefighting agreement between the Eddy County Commission and the DOE (February 1, 1994) provides for the assistance of the Otis and Joel Fire Departments (a volunteer fire district created under the Eddy County Commission and the New Mexico State Fire Marshall's Office), including equipment and personnel, at any location within the WIPP Fire Protection Area upon request by an authorized representative of the WIPP Project. These responsibilities are reciprocal.

TABLE G-2
RESOURCE CONSERVATION AND RECOVERY ACT EMERGENCY COORDINATORS

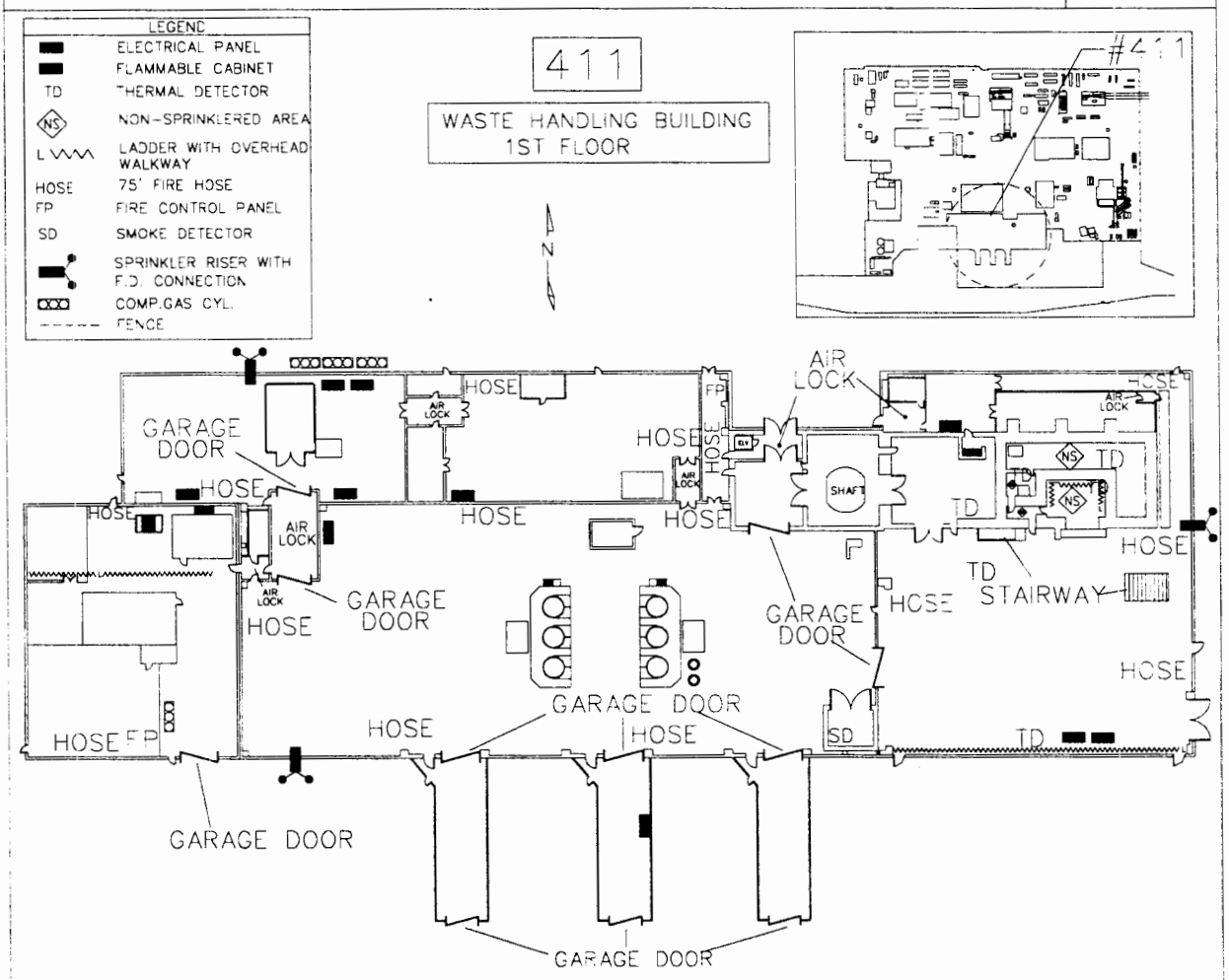
Name	Address	Office Phone	Home Phone
G. A. (Gerry) Burns (primary)[1]	2516 Crown Circle	234-8276 or 234-8635	887-7133
R. A. (Richard) Marshall (primary)[1]	Pine Springs Route	234-8276 or 234-8695	885-2220
R. E. (Bob) Wade (primary)[1]	3306 Falling Star	234-8272	885-2448
T. J. (Tim) Wygant (primary)[1]	1514 N. Country Club	234-8276 or 234-8377	885-1655
B. J. (James) VanWinkle[2]	2409 Wyoming	234-8276	885-4503
G. L. (Garrod) Ashford[2]	1005 Halequeno	234-8272	885-2585
R. C. (Russ) Stroble[2]	3304 Falling Star	234-8554	885-0220
E. R. (Ed) Flynn[2]	2110 LaHuerta Drive	234-8272	887-0151
G. L. (Gary) Kessler[2]	1313 E. Wood	234-8326	885-9214
A. E. (Alvy) Williams[2]	113 Coleman Rd.	234-8216 or 234-8276	885-4811
K. (Kim) Jackson[2]	1120 Tracy Place	234-8272 or 234-8276	887-7345

[1]The on-duty Facility Shift Manager is the primary RCRA Emergency Coordinator pursuant to 20 NMAC 4.1, Subpart V §264.52 and is designated to serve as the RCRA Emergency Coordinator.

[2]The on-duty Facility Operations Engineer is the alternate RCRA Emergency Coordinator and is available as needed.

Pre-Fire Survey

1. Bldg. Name: WASTE HANDLING BUILDING
2. Address: 411 SITE
3. Occ. Type: MAINTENANCE AND OPERATIONS PERSONNEL
4. Map #: 411-1
5. Roof Const.: METAL
6. Floor Const.: CONCRETE
7. Date: 07/27/95
8. Revision Date: 02/10/97
9. Surrounding Bldgs.: 412, 451, 452, 463
10. Fire Hydrants: FH-#8 N, FH-#11 E, FH-#12 S, FH-#13 S,



11. Comments: WATER SHUT-OFF AT PIV #8, PIV #17, P. #19

Figure G-10

Pre-Fire Survey Plan for the First Floor of the Waste Handling Building

Pre-Fire Survey

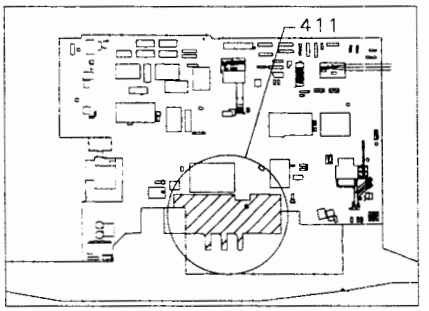
1. Bldg. Name: WASTE HANDLING BUILDING
2. Address: 411 SITE
3. Occ. Type: MAINTENANCE AND OPERATIONS PERSONNEL
4. Map #: 411-2
5. Roof Const.: METAL 6. Floor Const.: CONCRETE
7. Date: 07/27/95 8. Revision Date: 02/11/97
9. Surrounding Bldgs.: 412, 451, 452, 463
10. Fire Hydrants: FH-#8 N, FH-#11 E, FH-#12 S, FH-#13 S

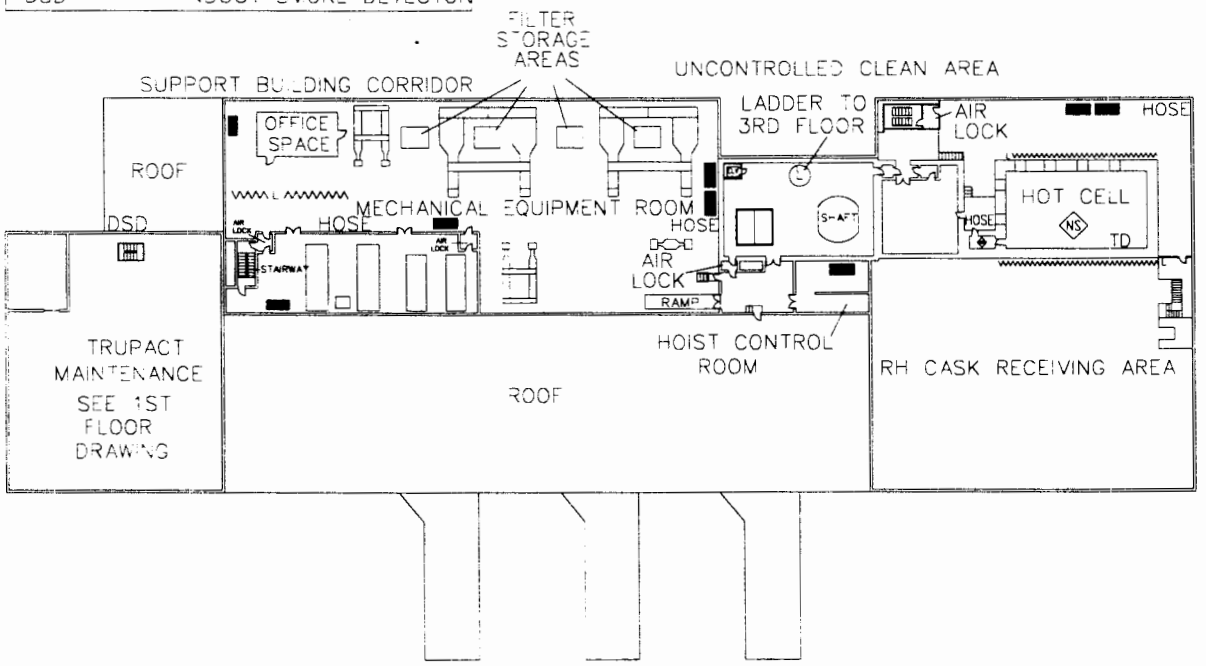
N

411

WASTE HANDLING BUILDING (2ND FLOOR)

LEGEND	
	ELECTRICAL PANEL
	FLAMMABLE CABINET
TD	THERMAL DETECTOR
NS	NONSPRINKLERED AREA
	LADDER & WALKWAY
HOSE	75' FIRE HOSE
DSD	INDUCT SMOKE DETECTOR





11. Comments: WATER SHUT-OFF AT PIV #8, PIV #17, PIV #19

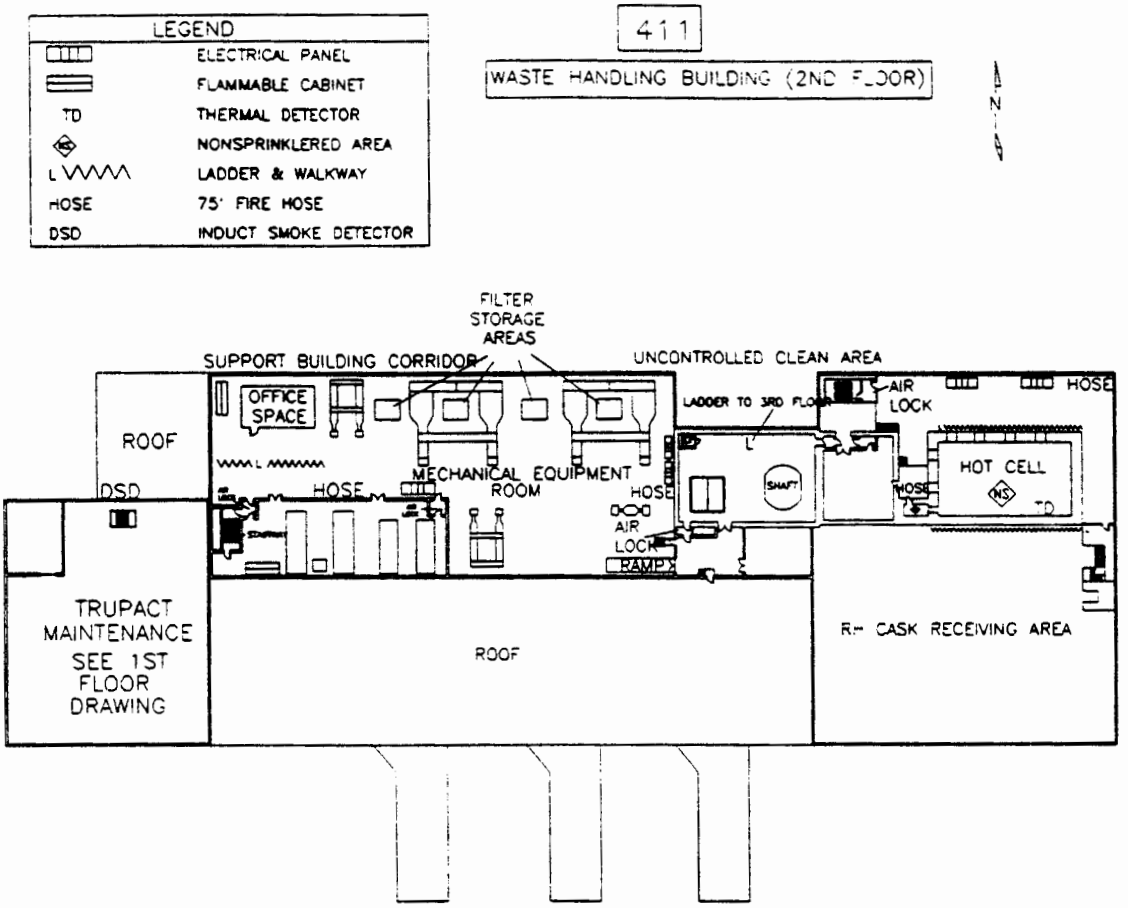
Figure G-11

Pre-Fire Survey Plan for the Second Floor of the Waste Handling Building

Pre-Fire Survey

1. Bldg. Name: WASTE HANDLING BUILDING
2. Address: 411 SITE
3. Occ. Type: MAINTENANCE AND OPERATIONS PERSONNEL
4. Map #: 411-2 5. Landlord: JOE UPTERGROVE
6. Roof Const.: METAL 7. Floor Const.: CONCRETE
8. Date: 07/27/94 9. Revision Date: 07/27/95
10. Surrounding Bldgs.: 412, 463, 451, 452
11. Fire Hydrants: FH-#8 N, FH-#11 E, FH-#12 S, FH-#13 S.

N



12. Comments: NONE

13. Prepared By: JASON BRADLEY

Figure G-11

Pre-Fire Survey Plan for the Second Floor of the Waste Handling Building

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____ Page 1 of 3

I. INITIAL INFORMATION DATE:_____ TIME:_____

EST:_____ REPORTED LOCATION:_____

REPORTED BY:_____DEPT.:_____
INITIALLY REPORTED TO:_____DEPT.:_____
RESPONSIBLE MANAGER:_____DEPT.:_____

II. WEATHER CONDITIONS WIND DIRECTION_____WIND SPEED:_____mph TEMP.:_____F
CONDITIONS (ie., icy, snowing, raining, cloudy, sunny):_____

III. TYPE OF INCIDENT (SPILL, LEAK, ETC.):_____Fire involved: [ ]YES [ ]NO
(If fire is involved attach a copy of the fire report)

MATERIALS INVOLVED	UN/NA NO.	QUANTITY	HAZARD CLASS	NFPA CLASS

IV. PERSONNEL INVOLVED IN CLEAN-UP ACTIVITIES

PERSONNEL/DEPT	DECON METHOD/MEDICAL TREATMENT

V. PERSONNEL CONTAMINATED NOT INVOLVED IN THE CLEANUP ACTIVITIES

PERSONNEL/DEPT.	MATERIAL CONTACTED	DOCON/MEDICAL TREATMENT

Figure G-12
WIPP Hazardous Materials Incident Report

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____

VI. EQUIPMENT USED FOR CLEAN-UP AND CONTROL MEASURES

EQUIPMENT/MATERIAL/PPE	QUANTITY	DISPOSITION (decon or replacement)

VII. DESCRIPTION OF INCIDENT AND RESPONSE (including containment and control)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

VIII. ENVIRONMENTAL COMPLIANCE AND SUPPORT

Date:_____ Time:_____of evaluation.

Waste Category_____

ORGANIZATION	DATE	TIME

EC&S Representative:_____

Print name Signature Date

Figure G-12 (Continued)
WIPP Hazardous Materials Incident Report

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____

IX. INITIAL NOTIFICATION BY CMRO

DEPARTMENT	PERSON CONTACTED	TIME	NOTIFIED BY
Facility Ops (FSM)			
Emerg. Mgmt (EST)			
EC&S			
Industrial Safety			
Facility Ops. (FM/FMD)			

CMRO:_____
Print name Signature Date

FSM:_____
Print name Signature Date

X. CONTINGENCY PLAN IMPLEMENTATION

Contingency Plan implemented [ ]YES [ ]NO

FSM:_____
Print name Signature Date

XI. WASTE OPERATIONS

Disposition:_____

Waste Operations Representative:_____
Print name Signature Date

XII. REVIEWS

Report submitted by:_____
Print name Signature Date

Emergency Management Manger:_____
Print name Signature Date

EC&S Manager:_____
Print name Signature Date

COMMENTS:_____

Figure G-12 (Continued)
WIPP Hazardous Materials Incident Report

Subsurface markers would be less than 2 ft (0.6 m) in the longest dimension, made of inert material, and spaced so that they are likely to be discovered by drilling crews and professional archaeologists. The warning message would be engraved so that slight erosion or fracture of the marker would not render it completely unintelligible. In addition, the markers would be buried at a greater depth than that used for plowing/tilling operations or for amateur archaeological excavation, so that such activities would be unlikely to disturb them. Further details on the subsurface markers may be obtained from the WIPP Active Access Controls After Disposal Design Concept Description (March 1995b).

Written Records

Written documentation of the WIPP will be placed in local, state, and federal agencies. Documentation will also be provided to international entities and commercial organizations that act as resource information centers for the petroleum and gas industries. Records will use the most stable and durable media available at the time that the record deposits are made. These records will describe the location of the repository; the nature and hazard of the waste; the geologic, geochemical, and hydrologic data pertinent to waste containment; and environmental monitoring data from preoperational baseline and summaries of data collected during D&D activities. Overall record selection for storage at the agencies selected will be in accordance with federal, state, and local regulations.

Specific documents which will be included in the archived information portfolio include:

- Detailed maps describing the exact location of the repository
- The SAR and the addenda which describes the disposal phase of the WIPP
- The Final Environmental Impact Statement for WIPP and the Supplement(s) to the Environmental Impact Statement
- The RCRA Permit
- The Certification of Compliance with 40 CFR Part 191 and associated application
- Environmental and ecological background data collected during the preoperational phase of WIPP and summaries of data collected during the disposal and decommissioning phases of WIPP
- Records of the waste containers' contents and disposal locations within the WIPP repository
- Drawings defining the construction and configuration of the repository and shafts

- Drawings, procedures, and the design report(s) describing how the waste was emplaced; how the repository was decommissioned, closed and sealed; and how the shafts were sealed

The organization identified as the record holder responsible for the permanent storage of this information is the National Archives. In addition, other locations for this information will include publicly funded organizations which may expend the resources necessary to preserve the documents in well-controlled environments. However, the most likely strategy for long-term protection of the information is through widespread distribution. The information will be submitted to the following facilities and organizations for archiving:

- Library of Congress

- Within the states of New Mexico and Texas

  - The state archives
  - The state library
  - The city libraries of population centers exceeding 15,000 within 150 miles of Carlsbad

- The state libraries of the remaining 48 states

- The local office of the Bureau of Land Management

- The local office of the Bureau of Mines

- The local office of the Bureau of Reclamation

- The national library and national archives of the nations worldwide which possess nuclear weapons and/or operate nuclear power generating plants

- The archive of the United Nations

- The national archive and libraries of the signatory nations to the nuclear non-proliferation treaty

- The U.S. Nuclear Regulatory Commission

- The 53 federal regional depository libraries

- The American Nuclear Society

This list of receiving organizations will be reviewed and expanded, as appropriate, as the time of the actual transfer of the information approaches.

Location and hazards information will be submitted to various federal and state of New Mexico mapping agencies to ensure that the WIPP location and drilling or mining restrictions are

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CHAPTER J
CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

Introduction

This chapter describes the solid waste management units (SWMU) within the 16-square-mile (mi) (41.4 square-kilometer [km]) Waste Isolation Pilot Plant (WIPP) facility boundary (Title 20 of the New Mexico Administrative Code Chapter 4, Part 1 [20 NMAC 4.1], Subpart V §264.101[a]) which have been identified by U.S. Environmental Protection Agency (EPA) Region 6 as requiring further investigation. SWMU characterization sheets are presented in Appendix J1 in response to regulatory requirements in 20 NMAC 4.1, Subpart IX, §270.14(d).

Corrective actions are only required for SWMUs from which releases of Resource Conservation and Recovery Act (RCRA) hazardous wastes or hazardous constituents have occurred. Hazardous waste is defined in 20 NMAC 4.1, Subpart II, §261.3. Hazardous constituents are listed in 20 NMAC 4.1, Subpart II, Appendix VIII. Based on the RCRA Facility Assessment (RFA) conducted by the New Mexico Environment Department (NMED) for the EPA, 16 SWMUs have been identified as requiring further action (NMED, 1994). These SWMUs are listed in Table J-1. Since the preparation of the RFA, the U.S. Department of Energy (DOE) has created seven additional SWMUs and is closing SWMU 009-f, the Underground Wash Rack, in accordance with written site procedures.

The definition of a SWMU has not yet been finalized by the EPA. The most recent definition, presented in the proposed Subpart S to RCRA regulations in Title 40 of the Code of Federal Regulations (CFR), Part 264, has been used to define SWMUs at the WIPP facility. This definition states that SWMUs are "any discernible unit at which solid wastes have been placed at any time irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units also include any area at or around a facility at which solid wastes have been routinely and systematically released."

J-1 Solid Waste Management Units

According to 20 NMAC 4.1, Subpart §264.90(d), the SWMU requirements of 20 NMAC 4.1, Subpart V, Releases from Solid Waste Management Units, "may apply to miscellaneous units when necessary to comply with §§264.601 through 264.603." The DOE believes compliance with the aforementioned sections is demonstrated in this permit application. Section D-9d(1), Chapter E, and Appendix E1 of this permit application address the requirements of 20 NMAC 4.1, Subpart V, §264.601(a). Section D-9d(2) and D-9d(3) of this permit application address the requirements of

20 NMAC 4.1, Subpart V, §§264.601(b) and (c), respectively. Chapter I of this permit application addresses the requirements of 20 NMAC 4.1, Subpart V, §264.603.

In addition, the DOE will institute corrective actions that are necessary to protect human health and the environment for any releases of hazardous waste or hazardous constituents from SWMUs at the WIPP site. Corrective actions will be performed in compliance with 20 NMAC 4.1, Subpart V, §264.101. Any releases from a SWMU deemed an immediate threat to human health or the environment will be responded to in accordance with the WIPP facility Contingency Plan (Chapter G) of this permit application.

The requirements of 20 NMAC 4.1, Subpart V, §§264.601 through 264.603, including corrective actions, are addressed in this permit application. Therefore, the requirements of 20 NMAC 4.1, Subpart V, Releases from Solid Waste Management Units, are not necessary to show compliance.

To eliminate repetition of information, units that are similar in physical characteristics use or waste type are grouped and described within a SWMU description for the particular type of discernible unit.

The following sections describe characterization of SWMUs identified in the RFA, assessment of potential releases, and corrective actions. Table J-1 provides a list of SWMUs.

J-1a Characterization of the SWMUs

SWMUs at the WIPP facility are identified by a unique number designation shown in the upper left-hand corner of the SWMU characterization sheets in Appendix J1. The individual units grouped within a SWMU are designated by a letter following the SWMU number. The locations of the SWMUs and individual units, if any, within SWMUs are shown in Figure J-1.

The SWMU characterization sheets in Appendix J1 include the name, type, and period of operation for each unit. The unit description includes all available information on the unit, including location, size, dates of operation for the individual units within a SWMU, materials of construction, and waste descriptions. Information on the extent and nature of known releases is also included. The figure showing the location of each individual unit within a SWMU is indicated on the SWMU characterization sheet.

J-1b SWMUs added since April 12, 1996

Since the submittal of Revision 6.0 of the permit application, the DOE has closed one SWMU and has created another. These are in the area of the base of the Exhaust Shaft and are discussed in DOE 1997a. A summary follows.

The RFA documents that a visual inspection of the area of SWMU 010c, which is at the base of the Exhaust Shaft, revealed no evidence of past releases of the waste typically expected at the base of the shaft (cement, grout, metal, concrete, grease, brine). Characterizations of waste removed from the area have shown that the contents of this area are consistently below RCRA hazardous waste criteria. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. This brine was tested and determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft (DOE 1997b). The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft (DOE 1996). As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground.

Since the corrective action involved removal of debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e. Figure J-2 shows the location of SWMU 010e. These shaft sumps, including the new SWMU, have been added to Table J-1 and Appendix J1.

J-2 Releases

Releases from the SWMUs identified in the RFA are described in this section.

J-2a Assessment of Potential Releases

The identified SWMUs were reviewed to assess potential releases. A summary of this assessment is presented in Appendix J1. The assessment includes a description of the material released and the nature of the release.

J-2b Corrective Actions

Based on sampling and analysis data, visual site inspections, and document/record reviews, the DOE believes that no releases of hazardous materials have occurred at any of the WIPP facility SWMUs. The DOE has initiated a voluntary Phase 1 RFI/Release Assessment process as described in the RCRA Corrective Action Plan (EPA 520-R-94-004) to define closure requirements

for SWMUs. If corrective actions are required, they will be completed in compliance with applicable regulations.

Potential closure requirements for selected SWMUs will be defined through a voluntary Phase I RFI/Release Assessment process as described in the RCRA Corrective Action Plan (EPA 520-R-94-004). If corrective actions are required at selected SWMUs, all corrective actions will be completed in accordance with the requirements established by the regulator. Final closure of all other SWMUs described in the Resource Conservation and Recovery Act (RCRA) Operating permit will be completed to demonstrate compliance with the Closure Performance Standards contained in 20 NMAC 4.1, Subpart V, 264.111.

References

Department of Energy, 1996, Analysis of Corrosion Testing Results for Galvanized Mesh Material Obtained from the Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 96-2212, Westinghouse Electric Corporation, Carlsbad, NM, December 1996.

Department of Energy, 1997a, Final Solid Waste Management Unit Assessment Report, DOE/WIPP 97-2220, Westinghouse Electric Corporation, Carlsbad, NM, January 10, 1997.

Department of Energy, 1997b, Composition and Origin of Nonindigenous Brine and Water in the Vicinity of the Exhaust Shaft Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 97-2226, Westinghouse Electric Corporation, Carlsbad, NM, February 1997.

New Mexico Environment Department (NMED), 1994, "Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant," NMED/WIPP 93-001, New Mexico Environment Department, Santa Fe, New Mexico.

TABLE J-1
SOLID WASTE MANAGEMENT UNIT (SWMU) DESCRIPTIONS

SWMU No.	Unit Type	Unit Description	Waste Description
001	Mud Pits	Thirteen decommissioned mud pits on drill pads are identified in the RCRA Facility Assessment (RFA). Additional mud pits associated with seven groundwater monitoring well sites have been created since the RFA. These were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons.	Sodium- and potassium chloride-saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.
002	Landfills	Two landfills used for disposal of construction debris are identified in the RFA.	Foundation excavation soils; concrete; scrap wood; and metal.
003	Storage Yards	One yard used for storage of construction and maintenance materials, wastewater, and used oils or materials that can be reclaimed or recycled has been identified in the RFA.	Water contaminated with motor oil, hydraulic oil, and diesel fuel; used hydraulic oil, motor oil, antifreeze, glycol-based oils, chemical grout; used lead acid batteries; scrap metal. Used hydrocarbons are collected in containers.
010	Shaft Sumps	An area at the bottom to each of the four WIPP shafts that collected construction debris or accumulates brine, including a catchmet basin.	Welding residue, scrap wood and metal, salt; Class C cement; chemseal; bentonite; grease and oil; cement and chem grout; Salado and overlying formation groundwaters;, condensate from the underground ventilation system; washwater; leaded brine from the Exhaust Shaft

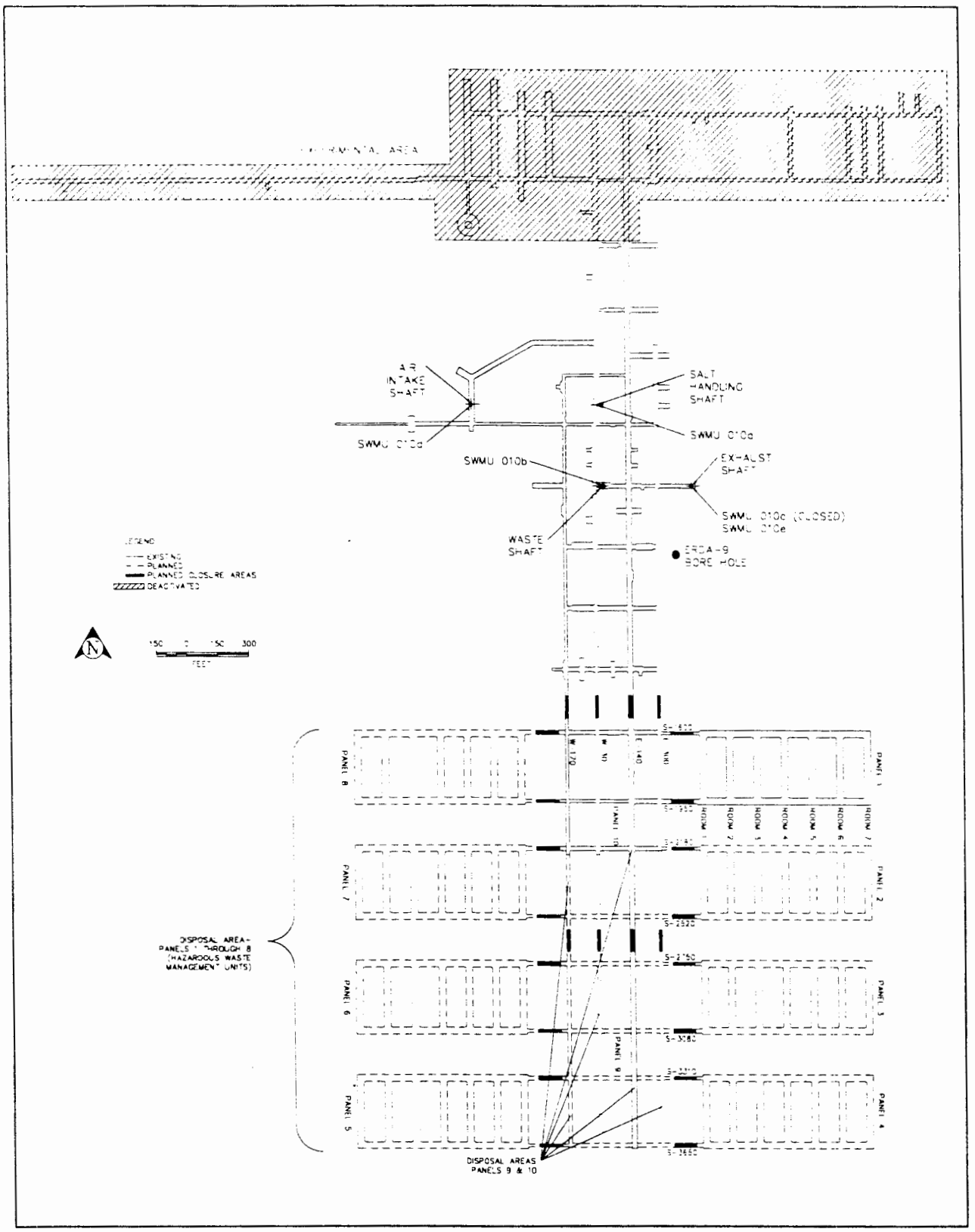

Figure J-2
Location of Shaft Sump SWMU's

CHAPTER L
NO-MIGRATION VARIANCE PETITION

TRU mixed waste is exempted from LDRs by the Land Withdrawal Act Amendment (Public Law 104-201). This amendment states that WIPP "waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Act (42 U.S.C. 6924(m) and shall not be subjected to the Land Disposal prohibitions in section 3004 (d), (e), (f), and (g) of the Solid Waste Disposal Act."

surfaces of the extruder that may come into contact with the core must be cleaned in accordance with the requirements in Section C4-2(b) prior to use.

- Coring tools must be of sufficient length to hold the liner and must be constructed to allow placement of the liner leading edge as close as possible to the coring tools leading edge.

- All surfaces of the coring tool that have the potential to contact the sample core must be cleaned in accordance with the requirements in Section C4-2(b) prior to use.

- The leading edge of the coring tools must be sharpened and tapered to a diameter equivalent to, or slightly smaller than, the inner diameter of the liner. Based on tests conducted with the coring tools described in the Methods Manual, a diameter slightly smaller (e.g., 1/10 in.) has demonstrated a reduction in the drag of the homogenous solids and soil/gravel against the internal surfaces of the liner, thereby enhancing sample recovery.

- Rotational coring tools must have a mechanism to minimize the rotation of the liner inside the coring tool during coring activities, thereby minimizing physical disturbance to the core.

- Rotational coring must be conducted in a manner that minimizes transfer of frictional heat to the core, thereby minimizing potential loss of VOCs.

- Nonrotational coring tools must be designed such that the tool's kerf width is minimized. Kerf width is defined as one-half of the difference between the outer diameter of the tool and the inner diameter of the tool's inlet.

Sample Collection

Sampling must be conducted in accordance with the following requirements:

- Sampling must be conducted as soon as possible after core collection. If a substantial delay (i.e., more than 60 minutes) is expected between core collection and sampling, the core must remain in the liner and the liner must be capped at each end. If the liner containing the core is not extruded from the coring tool and capped, then two alternatives are permissible: 1) the liner must be left in the coring tool and the coring tool must be capped at each end, or 2) the coring tool must remain in the waste container with the air-lock mechanism attached.

- Samples of homogenous solids and soil/gravel for VOC analyses must be collected prior to extruding the core from the liner. The sampling location must be randomly selected along the long axis of the liner and access to the waste must be gained by making a perpendicular cut through the liner and the core. Sites must develop procedures to select, and document the selection, of random sampling locations. True random sampling involves the proper use of random numbers for identifying

sampling locations. A sampling device such as the metal coring cylinder described in ASTM Designation: 4547-91 (ASTM 1991a), or modified disposable syringe described in Procedure 120.1 of the Methods Manual, or equivalent, must be immediately used to collect a 15-gram sample once the core has been exposed to air. Immediately after sample collection, the sample must be extruded into a 40-mL Volatile Organics Analysis (VOA) vial, the top rim of the vial visually inspected and wiped clean of any waste residue, and the vial cap secured. Sample handling requirements are outlined in Table C4-4. Additional guidance for this type of sampling can be found in *Soil Sampling and Analysis for Volatile Organic Compounds* (EPA, 1991).

- Samples of the homogenous solids and soil/gravel for semi-volatile organic compound, polychlorinated biphenyls, and metals analyses must be collected. These samples may be collected from the same location and in the same manner as the sample(s) collected for VOC analysis, or they may be collected by splitting or compositing a representative subsection of the core. The representative subsection is chosen by randomly selecting a location along the core. Sites must develop procedures to select, and document the selection, of random sampling locations. True random sampling involves the proper use of random numbers for identifying sampling locations. Guidance for splitting and compositing solid materials can be found in "Standard Practice for Reducing Field Samples of Aggregate to Testing Size" (ASTM, 1987). All surfaces of the sampling tools that have the potential to come into contact with the sample must be constructed of materials unlikely to affect the composition or concentrations of target analytes in the waste (e.g., Teflon®). Sample sizes and handling requirements are outlined in Table C4-4.

C4-2b Quality Control

QC requirements for sampling of homogenous solids and soil/gravel include collection of collocated cores to determine precision; equipment blanks to verify cleanliness of the coring tools and sampling equipment; and analysis of reagent blanks to ensure reagents, such as deionized or high pressure liquid chromatography (HPLC) water, are of sufficient quality. Coring and sampling of homogenous solids and soil/gravel must comply, at minimum, with the following QC requirements.

Co-located Cores

In accordance with the requirement to collect field duplicates required by Environmental Protection Agency (EPA) methods found in SW-846, co-located cores must be collected to determine the combined precision of the coring and sampling procedures. The co-located core methodology is a duplicate sample collection methodology intended to collect samples from approximately the same location within the drum. Cores must be collected side by side as close as feasible to one another, handled in the same manner, visually inspected through the transparent liner, and sampled in the same manner at the same randomly selected sample location. If the visual examination detects inconsistencies such as color, texture, or waste type in the waste at the sample location, another sampling location may be randomly selected, or the

the variance estimates to be independent. All data must be transformed to normality prior to computing variances and performing the test. The test hypothesis is evaluated using the F distribution and the method for testing the difference in variances. The method will be replaced with the control charting method once sufficient data are available.

Accuracy

Sampling accuracy shall not be measured. Because waste containers containing homogenous solids and soil/gravel with known quantities of analytes are not available, sampling accuracy cannot be determined. However, sampling methods and requirements described are designed to minimize sample degradation and hence maximize sampling accuracy.

Completeness

Sampling completeness shall be expressed as the number of valid samples collected as a percent of the total number of samples collected. Participating sampling facilities must achieve a minimum 90 percent completeness.

Comparability

Consistent use and application of uniform procedures, sampling equipment, and measurement units must ensure that sampling operations are comparable. The analysis results of field duplicates (samples taken of the same medium, under the same conditions, using the same procedures) are examined to determine the comparability. In addition, laboratories analyzing samples must participate in the Performance Demonstration Program (PDP).

Representativeness

Specific steps to ensure the representativeness of samples include the following for both waste containers and smaller containers:

- Coring tools and sampling equipment must be clean prior to sampling.
- The entire depth of the waste must be cored, and the core collected must have a length greater than or equal to 50 percent of the depth of the waste. This is called the core recovery and is calculated as follows:

$$\textit{Core recovery (percent)} = \frac{y}{x} * 100 \qquad \text{(C8-10)}$$

where

x = the depth of the waste in the container
y = the length of the core collected from the waste.

- Coring operations and tool selection should be designed to minimize alteration of the in-place waste characteristics. Minimal waste disturbance must be verified by visually examining the core and describing the observation (e.g., undisturbed, cracked, or pulverized) in the field logbook.

If core recovery is less than 50 percent of the depth of the waste, a second coring location shall be randomly selected. The most representative core shall be used for sample collection.

C8-4 Radiography

Quality Assurance Objectives

The QAOs for radiography are detailed in this section. If the QAOs described below are not met, then corrective action, such as additional operator training must be taken. It should be noted that radiography does not have a specific MDL because it is primarily a qualitative determination. The objective of radiography for the program is to verify the waste matrix parameters for each waste container and to estimate each waste material parameter weight (Table C8-1). All activities required to achieve these objectives must be described in the site quality assurance project plan (QAPjP) and standard operating procedures (SOP).

Data to meet these objectives must be obtained from an audio/videotaped scan provided by trained radiography operators at the sites. Results must also be recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data are presented below.

Precision

The qualitative determinations, such as verifying the waste matrix code, made during radiography do not lend themselves to statistical evaluation of precision. However, comparison of data derived from radiography and visual examination on the same waste containers at the Rocky Flats Environmental Technology Site and the Idaho National Engineering Laboratory indicates that radiography operators can provide estimated inventories and weights of waste items in a waste container. As a measure of precision, the Site Project QA Officer shall calculate and report the RPD between the estimated waste material parameter weights as determined by radiography and these same parameters as determined by visual examination.

Accuracy

The accuracy with which the waste matrix code and waste material parameter weights can be determined must be documented through visual examination of a randomly selected statistical portion of waste containers. The percentage of waste containers that require assignment to a

- Waste matrix code
- Waste material parameter weights
- Average mass and activity of each radionuclide of concern
- If each waste container of waste is TRU radioactive waste
- Average concentration of hydrogen, methane, and each VOC in the headspace gas of waste containers in the waste stream
- The potential flammability of TRU waste headspace gases
- Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, and number of samples collected for VOCs, SVOCs, and metals in the waste stream
- Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C
- Whether the waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level
- Whether a sufficient number of waste containers have been visually examined to determine with a reasonable level of certainty that the UCL_{90} for the miscertification rate is less than 14 percent

If the Site Project Manager determines that insufficient data have been collected to make the determinations listed above, additional data collection efforts must be undertaken.

The statistical procedure presented in Appendix C6 shall be used by participating Site Project Managers to evaluate and report waste characterization data from the analysis of homogenous solids and soil/gravel. The procedure, which calculates UCL_{90} values, shall be used to assess compliance with the DQOs in Section 1.5 as well as with RCRA regulations. The procedure must be applied to all laboratory analytical data for total VOCs, total SVOCs, and total metals. For RCRA regulatory compliance (40 CFR § 261.24), data from the analysis of the appropriate metals and organic compounds shall be compared to the TC levels expressed as total values. These total values will be considered the regulatory threshold limit (RTL) values for the Program. RTL values are obtained by calculating the weight/weight concentration (in the solid) of a TC analyte that would give the regulatory weight/volume concentration (in the toxicity characteristic leaching procedure (TCLP) extract), assuming 100-percent analyte dissolution.

Reconciliation at the CAO Level

CAO must also ensure that data of sufficient type, quality, and quantity have been collected to meet Program DQOs. The CAO Office of Regulatory Compliance manager is responsible for determining if sufficient data have been collected to determine the following:

- The concentration of VOC constituents in the headspace in the total waste inventory has not exceeded the environment performance standards of 20 NMAC 4.1, Subpart V, 264.601 (b);

- The total curie, hydrogen, and methane concentrations in TRU waste to support revision of the thermal power restrictions for shipment of waste in the Transuranic Package Transporter (TRUPACT-II);

- An inventory of radioactive materials and physical waste forms to support an assessment of repository performance;

- Whether waste streams proposed for disposal in WIPP have been adequately characterized; and

- Whether data supports the preparation of the WIPP RCRA permit application, the WIPP facility 40 CFR Part 191 Certification Application, and a revised safety analysis report for the TRUPACT-II.

C8-12 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the project level and from the project level to CAO.

Data Generation Level

Data shall be transmitted by hard copy or electronically (provided a hardcopy is available on demand) from the data generation level to the project level. Transmitted data shall include all testing, sampling, and analytical batch data reports, and data review checklists. The report forms and checklists used must contain all of the information required by the testing, sampling, and analytical techniques described in Sections 7.0 through 15.0 of the QAPP, as well as the signature releases to document the review, validation, and verification as described in Section C8-10. All testing, sampling, and analytical batch data reports and checklists shall be on approved forms, as provided in site-specific documentation.

Testing, sampling, and analytical batch data reports shall be forwarded to the site project office. Site QAPjPs shall specify the individual at the site project office who will receive these reports. Testing batch data reports shall be forwarded to the site project office within 28 days of the

testing of the last waste container in a testing batch. Sampling batch data reports shall be forwarded to the site project office within 28 days of sample collection of the last sample in a sampling batch. Analytical batch data reports shall be forwarded to the site project office within 28 days of the VTSR of the last sample in an analytical batch. After review by the Site Project QA Officer, all batch data reports will be forwarded to the Site Project Manager. All testing, sampling, and analytical batch data reports shall be assigned serial numbers, and each page shall be numbered at the bottom. The serial number used for data reports can be the same as the testing, sampling, or analytical batch number.

QA documentation shall be maintained in either testing, sampling, and analytical facility files, or site project files for those facilities located on sites. Contract waste operation facilities shall forward testing, sampling, and analytical QA documentation along with testing, sampling, and analytical batch data reports to the site project office for inclusion in site central files.

Project Level

There are two aspects to project level reporting. First, summarized testing, sampling, and analytical data must be reported on a per-waste container basis. Second, summarized characterization information must be reported on a waste stream basis.

Summarized testing, sampling, and analytical data shall be transmitted by hard copy or electronically from the Site Project Manager to CAO when requested. Participating sites shall combine data from individual waste containers into data packages for reporting. Hard copy or electronic data packages shall consist of the following:

- Cover page with the site name, program identification, waste container numbers for containers included in the data package, and release signatures of the Site Project Manager and Site Project QA Officer

- Table of contents; and

- A concise narrative that summarizes the results of the project-level review and briefly describes any problems or other noteworthy items of interest associated with the data (i.e., nonconformance reports, operational variances). The narrative shall include separate sections which address results of duplicates/replicates and nonconformance reports associated with the waste containers being reported in the package.

For each waste container being reported in the data package, the following information shall be included:

- Cover page with the site name, program identification, waste container number, and approval/release signatures of the Site Project Manager and Site Project QA Officer

- A table that relates sample numbers (testing, sampling, and analytical) to waste container number

- Table of contents
- Site Project QA Officer Summary
- Data Validation Summary
- Radiography results
- Radioassay (RA) results
- Waste container headspace gas hydrogen, methane, and VOC analytical results
- Innermost layer of confinement headspace gas hydrogen, methane, and VOC analytical results for waste containers with inner layers of confinement (if applicable)
- Total VOC, SVOC, and metal analytical results for homogenous solids and soil/gravel (if applicable)

WIPP Waste Information System (WWIS) Data Reporting

The WWIS Data Dictionary (Appendix C13) contains all of the data fields, the field format and the limits associated with the data as established by various waste acceptance criteria. This data will be subjected to edit and limit checks that are performed automatically by the database.

WIPP will coordinate the data transmission with each generator site using the Internet and the TCP/IP transmission protocol. Actual data transmission will use DES encryption technology to ensure the integrity of the data transmissions. The sites with large waste inventories and large databases will populate a data structure provided by WIPP that contains the required data dictionary fields that are appropriate for the waste stream (or waste streams) at that site. For example, totals analysis data will not be requested from sites that do not have homogeneous solids or soil/gravel waste. WIPP will access this data via the Internet to ensure an efficient transfer of this data. Small quantity sites will be given a similar data structure that is tailored to their types of waste. Sites with very small quantities of waste will be provided with the ability to assemble the data interactively to this data structure on the WWIS.

C8-13 Nonconformances and Operational Variances

The status of work and the Program activities at participating sites shall be monitored and controlled by the Site Project Manager and Site Project QA Officer. This monitoring and control shall include: 1) nonconformance identification, documentation, and reporting; and 2) operational variance identification, documentation, and reporting.

Nonconformances

Nonconformances are uncontrolled and unapproved deviations from an approved plan, procedure, or expected result. Nonconforming items and activities are those that do not meet the Program requirements, procurement document criteria, or approved work procedures.

TABLE D9-7
MAXIMUM AVERAGE HEADSPACE CONCENTRATION LIMITS

Compound	Table C-5 Limit (ppmv)
Carbon Tetrachloride	7,510
Chlorobenzene	17,660
Chloroform	6,325
1,1,-Dichloroethylene	28,750
1,2-Dichloroethane	9,100
Methylene Chloride	100,000
1,1,2,2-Tetrachloroethane	7,924
Toluene	41,135
1,1,1-Trichloroethane	100,000

D9-5.3.1 Carcinogens

VOC contaminant concentrations in air for the Surface Worker and the Underground Worker are given in Table D9-8 along with Occupational Safety and Health Administration (OSHA) 8 hour time-weighted averages (TWAs). This information provides a mechanism for evaluating occupational exposures. The receptor concentrations for the Surface Worker range from four to nearly seven orders of magnitude below the TWAs. The receptor concentrations for the Underground Worker range from two to nearly six orders of magnitude below the TWAs.

Human health risk from carcinogens can be calculated using equation D9-15 with EF = 1920 hours/year for the surface worker and 33 hours per year for the underground worker, ED = 10 years, EC = ECS in Table 9-8, and ADF = 1.2×10^{-2}. The calculated risk from Carbon Tetrachloride is 9E-07 for the surface worker and 6E-07 for the underground worker. The risk from Chloroform is 9E-07 for the surface worker and 6E-07 for the underground worker. The risk from 1,1-Dichloroethene is 8E-06 for the surface worker and 5E-06 for the underground worker. The risk from 1,2-Dichloroethane is 1E-06 for the surface worker and 8E-07 for the underground worker. The risk from Methylene Chloride is 2E-07 for the surface worker and 1E-07 for the underground worker. The risk from 1,1,2,2-Tetrachloroethane is 4E-06 for the surface worker and 3E-06 for the underground worker. The risk from 1,1,1-Trichloroethane is 1E-05 for the surface worker and 8E-06 for the underground worker.

D9-5.3.2 Non-Carcinogens

As for carcinogens, noncarcinogen VOC contaminant concentrations in air for the Surface Worker and the Underground Worker and OSHA 8 hour TWAs are presented (Table D9-9). This information provides a mechanism for evaluating occupational exposures in addition to the risk assessment approach. The receptor concentrations for the Surface Worker are seven orders of magnitude below the TWAs and those for the Underground Worker are more than six orders of magnitude below the TWAs.

Human health risk from non-carcinogens can be calculated using equation D9-23 with EF = 1920 hours/year for the surface worker and 33 hours per year for the underground worker, ED = 10 years, and EC = ECS in Table 9-9. The calculated hazard quotient from Chlorobenzene is 4E-01 for the surface worker and 3E-02 for the underground worker. The risk from Toluene, the hazard quotient is 3E-02 for the surface worker and 3E-03 for the underground worker.

TABLE D9-8
VOC CONTAMINANT CONCENTRATIONS IN AIR FOR THE SURFACE WORKER AND THE UNDERGROUND WORKER

	ECS_{max}	ECU_{max}	*Receptor Concentration*		
Compound	**Exhaust Shaft Concentration for Surface Worker (µg/m³)**	**Exposure Concentration for Underground Worker (µg/m³)**	**(ECS x ADF) Surface Worker (ppmv)**	**Underground Worker (ppmv)**	**OSHA TWA[a] (ppmv)**
Carbon Tetrachloride	1.54E+02	7.70E+01	3.00E-04	1.22E-02	10
Chloroform	1.06E+02	5.03E+01	2.67E-04	1.03E-02	50
1,1,-Dichloroethylene	4.01E+02	1.86E+02	1.24E-03	4.68E-02	5[b]
1,2-Dichloroethane	1.25E+02	6.00E+01	3.81E-04	1.63E-01	50
Methylene Chloride	1.26e+02	5.66E+02	4.45E-03	1.29E-02	500
1,1,2,2-Tetrachloroethane	1.77E+02	8.86E+01	3.17E-04	6.70E-02	5
1,1,1-Trichloroethane	1.77E+03	8.89E+03	4.00E-03	1.63E-01	350

a. 8 hour TWAs except chloroform TWA for up to a 10 hour day in a 40 hour work week.
b. TWA from ACGIH

Table D9-ATT 1-1. Exposure Limits[a]

Substance	OSHA PEL[b]	ACGIH TLV	NIOSH REL[c]
Carbon tetrachloride (Tetrachloromethane)	10 ppm TWA (C) 25 ppm 200 ppm peak for 5 min in any 4 hrs	5 mppm TWA, 31 mg/m^3 10 ppm STEL, 63 mg/m^3 Animal Carcinogen	2 ppm STEL (60 min), 12.6 mg/m^3 Carcinogen 200 ppm IDLH
Chlorobenzene	75 ppm TWA, 350 mg/m^3	10 ppm TWA, 46 mg/m^3	NL[d] 1,000 ppm IDLH
Chloroform (Trichloromethane)	(C) 50 ppm, (C) 240 mg/m^3	10 ppm TWA, 49 mg/m^3 Suspected human carcinogen	NL[e] 2 ppm STEL (60 min), 9.78 mg/m^3 Carcingoen 500 ppm IDLH
1,1-Dichloroethylene (Vinyliden chlorode)	NL	5 ppm TWA, 20 mg/m^3 20 ppm STEL, 79 mg/m^3	NL[e] Carcinogen IDLH not determined
1,2-Dichloroethane (Ethylene dichloride)	50 ppm TWA (C) 200 ppm 300 ppm peak for 5 min in any 3 hrs	10 ppm TWA, 40 mg/m^3	NL[e,f] 1 ppm TWA, 4 mg/m^3 2 ppm STEL, 8 mg/m^3 Carcinogen 50 ppm IDLH
Methylene chloride (Dichloromethane)	500 ppm TWA (C) 1,000 ppm 2,000 ppm peak for 5 min in any 2 hrs	50 ppm TWA, 174 mg/m^3 Suspected human carcinogen	NL[e] Carcinogen 2,300 ppm IDLH
1,1,2,2-Tetrachloroethane	5 ppm TWA, 35 mg/m^3 Skin designation	1 ppm TWA, 6.9 mg/m^3 Skin designation	NL[ef] 1 ppm TWA, 7 mg/m^3 Carcinogen, skin designation 100 ppm IDLH
Toluene	200 ppm TWA (C) 300 ppm 500 ppm peak for 10 min	50 ppm TWA, 188 mg/m^3 Skin designation	100 ppm TWA, 375 mg/m^3 150 ppm STEL, 560 mg/m^3 500 ppm IDLH
1,1,1-Trichloroethane (Methyl chloroform)	350 ppm TWA, 1,900 mg/m^3	350 ppm TWA, 1,910 mg/m^3 450 ppm STEL, 2,460 mg/m^3	(C) 350 ppm (15 min), (C) 1,900 mg/m^3 700 ppm IDLH

Table D9-ATT 1-1. Exposure Limits[a]

(continued)

Substance	OSHA PEL[b]	ACGIH TLV	NIOSH REL[c]

[a]SOURCE: 29 CFR 1910.1000; ACGIH 1995; NIOSH 1994.
[b]8 hr TWA unless noted otherwise, (C) denotes ceiling limit
[c]Up to a 10 hr day in a 40 hr workweek TWA, STEL is a 15 min TWA unless noted otherwise
[d]NIOSH questions whether the OSHA PEL TWA of 75 ppm is adequate to protect workers from recognized health hazards but does not offer an alternative.
[e]NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible level
[f]NIOSH considers the substance to be a potential occupational carcinogen

Acronyms and Units for Table D9-ATT 1-1

OSHA	Occupational Safety and Health Act
PEL	permissible exposure limit
ACGIH	American Conference of Governmental Industrial Hygienists
TLV	threshold limit value
NIOSH	National Institute for Occupational Safety and Health
REL	recommended exposure limit
ppm	parts of vapor or gas per million parts of contaminated air by volume at 25C and 760 torr
TWA	time-weighted average
(C)	ceiling limit
STEL	short-term exposure limit
IDLH	immediately dangerous to life or health concentration
mg/m^3	milligrams per cubic meter
NL	not listed

APPENDIX J1
SOLID WASTE MANAGEMENT UNIT CHARACTERIZATION SHEETS

001 MUD PITS

Unit Type:	Mud Pits
Unit Use:	Storage/Settling
Operational Status:	Decommissioned/In Use
Use Period:	1970s - Present
Materials Managed:	Solid Waste
Hazardous Release:	None
Radioactive Release:	None
Information source(s):	Process Knowledge

Unit Description

Refer to Figure J-1 for location. Thirteen decommissioned mud pits are identified in the WIPP RFA. Additional mud pits associated with seven groundwater monitoring well sites have been created since the RFA. They were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. These mud pits ranged in size from approximately 150 by 150 by 5 feet (ft) (46 by 46 by 1.5 m) to 10 by 30 by 5 ft (3 by 9 by 1.5 m). Diesel fuel, foaming agents and other organic additives were added to the drilling mud to reduce dissolution of the water-soluble rocks, promote hole stability, and to help lubricate the drill rods. It is not known how many of the wells were drilled using diesel in the drilling mud. Each mud pit was lined with a plastic sheet and used for one to two months during drilling, then allowed to dry out. To facilitate drying, holes were cut in the bottom of the liner of some pits. In general, once a pit was dry, it was covered with the soil that had been removed to make the berms and then graded to the original contours. The individual mud pits in SWMU No. 001 are listed on Table J1-1. It is difficult to determine the exact location of most of the mud pits because of the grading and revegetation that has taken place.

Many of these mud pits were the result of exploration activity that was conducted prior to the selection of the area for the WIPP facility and, therefore, were not created by DOE in support of the WIPP Project. All such locations are indicated in Table J1-1.

Waste Description

Materials in the mud pits consisted of sodium- and potassium chloride-saturated brine to which starch, bentonite gel, and diesel fuel were added; drill cuttings; metal cuttings; trace amounts of hydraulic fluid, grease, and motor oil; and the plastic liner.

Release Information

Potential releases from each of the drill sites occurred when the mud pits were drained by cutting holes in the liner. The materials released consisted of saturated brines, which are not considered hazardous under the RCRA. All of the solids confined in the plastic liner of the mud pits were buried when the pits were covered with soil and graded.

TABLE J1-1
SWMU DATA — MUD PITS

SWMU[a]	Location[b]	Hole No.	No. of Pits[c]	Period of Use	Well Status	Size of Drill Pad (Acres/ Hectares)
001-x	NW, NE, SW, 17	WIPP-13	2	8/78 & 10/85	Open	4/1.6
001-p	SW, NE, SW, 34	Cotton Baby	2	1973-1974	Plugged	3/1.2
001-o	NW, NE, SW, 15	Badger Unit	1	1974	Plugged	2/0.8
001-t	SE, SE, SW, 30	IMC-374	1	Unknown (pre-1975)	Plugged	1/0.4
001-q	SE, SE, SE, 28	DOE-1	2	1982	Open	3/1.2
001-n	SW, SW, SW, 31	P-15	1	10/76	Plugged	1/0.4
001-g	SW, SW, SW, 29	H-14 P-1	2	9/86 8/76	Sampled once/3 yrs. Plugged	1/0.4
001-h	NE, NE, NE, 28	H-15 P-2	2	10/86-11/86	Sampled once/3 yrs.	1/0.4
001-s	SE, SE, SE, 20	ERDA-9	1	4/76-6/76	Open	2/0.8
001-j	SE, SE, SW, 20	P-3	1	8/76-9/76	Plugged	0.5/0.2
001-k	SE, SW, SE, 28	P-4	1	8/76-9/76	Plugged	.75/0.3
001-l	SE, SE, SE, 17	P-5 WIPP-12	4	9/76 11/78 & 10/85	Plugged Open	6/2.4
001-m	SW, SW, NW, 30	P-6	1	9/76	Plugged	1/0.4
001-ah	SE, NW, SW, 28	H-19	multiple	1994-present	Open	4.65/1.9
001-ai	NW, NE, NW, 20	WQSP-1	2	1994-present	Open	0.46/0.19
001-aj	SW, NW, SW, 16	WQSP-2	2	1994-present	Open	0.46/0.19
001-ak	SE, SW, SW, 16	WQSP-3	2	1994-present	Open	0.46/0.19
001-al	SE, NW, SW, 28	WQSP-4	2	1994-present	Open	0.46/0.19
001-am	SE, SE, SE, 29	WQSP-5	2	1994-present	Open	0.46/0.19
001-an	SW, NE, SW, 29	WQSP-6 WQSP-6A	4	1994-present	Open	0.46/0.19

[a]SWMU designation in parentheses is the designation used in the WIPP RCRA Facility Assessment.
[b]All of the mud pits are in T22S, R31E. The location column gives the 1/4 of the 1/4 of the 1/4 of the section.
[c]Probable number of mud pits. Many of the drill pads were used to drill several holes, requiring the use of more than one mud pit.
[d]These are wells that were not drilled at the request of DOE; they were drilled for hydrocarbon and potash exploration.

002 LANDFILLS

Unit type:	Landfill
Unit use:	Disposal
Operational status:	Active
Use period:	1976 - Present
Materials managed:	Solid Waste
Hazardous release:	None
Radioactive release:	None
Information source(s):	Process Knowledge Aerial Photos

Unit Description

Refer to Figure J-1 for location. Two areas have been used as landfills at the WIPP facility. The older location, called the Brinderson Landfill (003-a), is located 1 mi (1.6 km) due south of Zone I. Prior to use as a construction landfill, the area was used as a quarry for road-bed materials. It was an active landfill from 1976 to January 1988 and covers about 4 acres (ac) (1.6 hectares [ha]). The closure of the Brinderson Landfill was approved by the U.S. Department of Interior, Bureau of Land Management (BLM). Since it was closed, the Brinderson Landfill has been covered over and reseeded. The new landfill (003-b) is located ½ mi (0.8 km) south of Zone I. The new construction landfill was developed in two parts. The first part, to the south of the current one, was excavated on BLM land and operated under a BLM permit until 1989. It was closed at the request of the BLM. The second part of the landfill was opened on land designated by the BLM as part of the DOE Exclusive Use Area in Public Land Order 6403. Ground was first broken for the new landfill area in November 1989; it is still active and covers about 15 ac (6 ha). Permits were obtained from the BLM for both landfills on BLM-administered land.

Waste Description

Both of the landfills have been used to bury construction debris consisting of foundation excavation soils, waste concrete, scrap wood, and metal. In addition, it has been reported that small amounts of nonconstruction debris (most likely office wastes) were dumped in the Brinderson Landfill. No asbestos materials are known to have been disposed of in the landfills. Disposal of RCRA hazardous waste or hazardous constituents in the construction landfill is done in accordance with written procedures.

Release Information

Releases of RCRA hazardous waste or hazardous constituents have not occurred at these sites.

003 STORAGE YARDS

Unit type:	Storage Areas
Unit use:	Storage
Operational status:	Active
Use period:	1976 - Present
Materials managed:	Solid Waste Hazardous Waste Oils
Hazardous release:	Potential
Radioactive release:	None
Information source(s):	Process Knowledge Aerial Photos

Unit Description

Refer to Figure J-1 for location. One area presently used for storage was designated in the RFA. This storage yard, the Portacamp (004-a), is located about 1,000 ft (305 m) southeast of Zone I. The yard is used to store construction and maintenance materials and as temporary storage for wastewater and waste oils awaiting laboratory analysis or recycling. The waste oils are recycled if free of hazardous contamination. The area is approximately 2 ac (0.8 ha) in extent and has been active since 1976.

Waste Description

The wastes stored at the Portacamp are water contaminated with motor oil, hydraulic oil, and diesel fuel from the vehicle wash bays; used hydraulic oil; used motor oil; glycol-based oils; used antifreeze; discontinued oils and empty 55-gallon drums. In 1987 the excess chemical grout from grouting the Exhaust Shaft and the Waste Shaft was stored in this yard prior to being shipped off site for disposal as hazardous waste.

Release Information

There have been no releases of RCRA hazardous waste or hazardous constituents from the area; however, small areas of stained soil under the pallets where excess or used petroleum products are stored indicate there have been minor releases of oil and petroleum products (non-RCRA regulated materials) from the drums. Any releases from the area used for staging wastewater and waste oils are remediated according to the applicable WIPP facility procedure.

010 SHAFT SUMPS

Unit type:	Shaft Sumps
Unit use:	Collection/Storage
Operational status:	Active
Use period:	1981 - Present
Materials managed:	Solid Waste Hazardous Waste
Hazardous release:	Lead
Radioactive release:	None
Information source(s):	Process Knowledge, Sampling and Analysis

Unit Description

Refer to Figure J-2 for location. Four shafts have been completed to the WIPP facility underground. The Salt Handling and the Waste Shafts have sumps (010-a and 010-b) that extend below the facility horizon (148 feet and 119 feet, respectively). The sumps have been cut into the salt and are not lined. The other two shafts, the Exhaust Shaft and the Air Intake Shaft, end at the facility horizon and do not have sumps. The bottoms of these shafts are 010-c and 010-d, respectively. The bottoms of all four shafts have received construction debris. All shafts are lined and grouted to minimize wastewater accumulation. The solid material cleaned up from the bottom of the shafts without sumps is disposed of on the main salt storage area. The Waste Shaft sump periodically collects brine. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. The brine was tested and was determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft. The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft. As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a plastic catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground.

Since the corrective action involved the removal of the debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e.

Waste Description

The wastes consist of welding debris, scrap steel, concrete from the shaft lining, cement grout, chemical grout, grease, wash water, brine from the Salado and overlying formations some of which contains RCRA levels of lead, and salt.

Release Information

Brine containing lead in excess of RCRA levels has flowed through the Exhaust Shaft area and collected in the Waste Shaft sump. No other RCRA hazardous wastes or hazardous constituents have been detected at these sites.

TABLE J1-2
SWMU DATA-SHAFT SUMPS

SWMU	Dates	*Location and Description	Status	Material Stored
010-a Salt Handling Shaft	1981 to Pres.	0/0 Sump extends 148 feet below the facility horizon	Active	Welding residue, scrap wood and metal, salt, Class C cement, Chemical-seal, bentonite, grease, and oil
010-b Waste Shaft	1982 to Pres.	S400/E30 Sump extends 119 feet below the horizon.	Active	Concrete, salt, cement grout, chemical grout, brine from Rustler Formation, wash water, grease, and oil, lead
010-c Exhaust Shaft	1985 to 1996	S400/E480 Shaft ends at the facility horizon.	Closed	Salt, concrete, cement grout, chemical grout, brine from Rustler Formation, grease, and oil
010-d Air Intake Shaft	1989 to Pres.	0/W620 Shaft ends at the facility horizon.	Active	Salt, brine from Rustler Formation, concrete, grease, and oil
010-e Exhaust Shaft	1996 to Pres.	S400/E480 Catchment Basin at base of shaft	Active	Salt, brine, lead

* All locations given by underground coordinates.

TRU mixed waste is exempted from LDRs by the Land Withdrawal Act Amendment (Public Law 104-201). This amendment states that WIPP "waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not be subjected to the Land Disposal prohibitions in section 3004 (d), (e), and (g) of the Solid Waste Disposal Act."

Appendix L1 was formerly 44 pages, due to the Land Withdrawal Act Amendment pages two through 44 have been deleted.

Documentation of the returned containers will be covered by Waste Operations protocols and the WWIS. Changes will be made to the WWIS data to indicate the current status of the container(s), and a reason will be required to change the data. This reason, plus the record of the WWIS data change will be maintained in the change log of the WWIS and will provide an auditable record of the returned shipment.

The Waste Operations section will be responsible for resolution of discrepancies, notification of the NMED, as well as returning the original copy of the manifest to the generator. The manifest will be returned within 30 days of delivery of the waste.

Examination of the Land Disposal Restriction (LDR) Notice

~~Unless TRU mixed waste is otherwise exempted from the LDRs, the DOE intends to petition the EPA for a variance from the prohibition on land disposal of untreated TRU mixed waste at the WIPP facility. If successful, the WIPP facility may dispose of the restricted waste. With each waste shipment of LDR waste, the generator must provide the WIPP facility with a LDR determination and a notice that the waste is not prohibited from land disposal because the waste is covered by a no-migration determination (NMD). (This assumes that a Disposal Phase NMD will be made by the EPA. Wastes will be in conformance with conditions of the NMD.) WIPP facility personnel will review this notice for accuracy and completeness. The generator will prepare this notice in accordance with the requirements of 20 NMAC 4.1, 268.7(a)(3).~~ TRU mixed waste is exempted from LDRs by the Land Withdrawal Amendment (Public Law 104-201). This amendment states that WIPP "waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not be subject to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid Waste Disposal Act." Therefore, with each waste shipment of LDR waste, the generator must provide the WIPP facility with a notice that the waste is not prohibited from land disposal. WIPP personnel will review the LDR notice for accuracy and completeness. The generator will prepare this notice in accordance with the requirements of 20 NMAC 4.1, 268.7(s)(3).

Verification

Waste Operations will make a determination of waste shipment irregularities. The following items will be noted for each waste shipment arriving at the WIPP facility:

- The number and type of containers holding TRU mixed waste match the information in the WWIS
- Container defects

Waste Operations will verify that the containers (as identified by their container ID numbers)

TABLE C-6
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	100% radiography or visual examination	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas volatile organic compounds (VOC)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of transuranic (TRU) waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling[a] (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000-Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	100% Radiography Visual examination (statistical sample)[a]	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge

		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Documentation and verification[b]	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs (VOCs)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling[a] (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	Documentation and verification[b]	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-6 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR CH TRANSURANIC MIXED WASTE (STORED WASTE)

[a] Number determined per Quality Assurance Program Plan (QAPP), Section 5.0.

[b] See discussion in Section 5.3.3 of the QAPP.

U.S. Department of Energy (DOE), 1995, "TRU Waste Characterization Quality Assurance Program Plan," CAO-94-1010, Rev 0, Carlsbad Area Office, Carlsbad, New Mexico.

TABLE C-7
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Radiography for wastes <1 rem/hour Acceptable knowledge	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable volatile organic compounds (VOCs) • Determine potential flammability of transuranic (TRU) waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (STORED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000–Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	100% Radiography	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performances standards are not exceeded • Verify acceptable knowledge

		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S3000-Homogeneous Solids S4000-Soil/Gravel	• Solidified inorganics • Salt waste • Solidified organics • Contaminated soil/debris	Physical waste form	Documentation and verification	• Verify waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas volatile organic compounds (VOCs)	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Statistical sampling (see Tables C-10 and C-11)	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

TABLE C-7 (CONTINUED)
SUMMARY OF PARAMETERS, CHARACTERIZATION METHODS, AND RATIONALE FOR RH TRANSURANIC MIXED WASTE (NEWLY GENERATED WASTE)

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
S5000-Debris Waste	• Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous waste • Composite filter waste	Physical waste form	Documentation and verification	• Verify waste matrix • Demonstrate compliance with waste acceptance (e.g., no free liquids, no incompatible wastes, no compressed gases)
		Headspace gases • Gas VOCs	100% gas sampling and analysis (see Table C-9)	• Quantify concentration of flammable VOCs • Determine potential flammability of TRU waste headspace gases • Quantify concentrations of VOC constituents in headspace of containers • ~~Support demonstration of no migration by headspace VOCs~~Ensure that environmental performance standards are not exceeded • Verify acceptable knowledge
		Hazardous constituents • Total metals • Total VOCs • Total semi-VOCs	Acceptable knowledge	• Determine characteristic metals and organics • Determine total quantity of metals, VOCs, and semi-VOCs

until panels are closed and then by the panel closures. Analyses performed by the WIPP architect and engineer and included in Appendix D1, considered expected creep closure rates in determining disposal room sizes. Figures 12-21 and 12-22, in the Final Design Validation Report in Appendix D1, show the creep closure histories used for designing the disposal rooms. The specified size was selected to assure no CH containers would breach due to creep closure while a panel is being filled with waste. A nominal five year life is used for operational purposes for mining, emplacement, and closure with no risk of CH waste containers breaching. RH canisters will not breach in this time period due to the canister wall thickness and the 2 to 4 in. creep tolerance in each RH emplacement hole.

Waste Handling Operations

Operations are conducted in a manner that minimizes the possibility of accidents or fires. ~~Fork lifts that handle waste in the underground have speed governors to prevent speeds that could lead to accidents that would rupture containers.~~ In addition, diesel powered waste handling equipment in the underground are equipped with rupture-proof fuel tanks and on-board automatic fire suppression systems for the engines to preclude fires that might involved the waste. On the surface all waste handling equipment is electric (battery), and all loads are secured prior to moving them to avoid spillage. Other safety measures taken to protect the waste, the employees, and the public and environment are discussed in Chapter F.

Repository Seals

After operations and during the post closure period, isolation of waste is provided by the shaft seals and the geologic barriers including the nearly impermeable Salado Formation. The characteristics of the Salado are detailed in Sections D-9a(1)(b) and D-9a(1)(c). The characteristics of the panel closures are detailed in Section I-1e(1). The effectiveness of these barriers is dependent on gas generation, brine inflow, and creep closure.

Repository seal properties are discussed in Appendix I2. For the purposes of long-term modeling, repository seals are divided into two functional elements: those that perform for the first 100 years after final facility closure, and those that perform after the first 100 years. The distinction is important. The short-term seals are made of cementitious and other materials that have little performance histories beyond about 100 years. Consequently, it is difficult to argue persuasively that they will last for several hundred years. In order to avoid a lapse in repository protection, the long-term component of the seal, namely crushed salt, is emplaced in a manner that assures sufficient consolidation by the end of the life of the short-term seals. As can be seen in the design report, this is accomplished by achieving a nominal emplacement compaction density for the long-term seal components in the shaft. Achieving these densities has been demonstrated on a limited scale.

The four shafts connecting the repository to the surface are represented in the computer simulation with a single shaft. This single shaft has a cross section and volume equal to the

assessments. The Agency considers a number of factors such as the type of risk presented by the substance, the quality of the underlying data, the reasonableness of the risk assessment, the statistical significance of the findings, and the significance of risk. In the second step, OSHA considers which, if any, of the regulatory provisions being considered will substantially reduce the identified risks. In the third step, OSHA looks at the best available data to set permissible exposure limits that, to the extent possible, both protect employees from significant risks and are technologically and economically feasible. In the fourth step, OSHA considers the most cost-effective way to fulfill its statutory mandate. Because of this process, it is not possible to relate occupational risk to terms that make it directly comparable to public risk such as chances for excess cancer fatality. Therefore, the occupational risk levels used in this analysis are shown as a dose.

In the analysis of occupational exposure, the DOE compares the expected dose to the OSHA recommended permissable exposure limit (PEL) which is an 8-hour time weighted average. In practice, at the WIPP facility, the DOE implements the dose levels endorsed by the American Conference of Governmental Industrial Hygienists (ACGIH). Action levels for WIPP are at ~~one/tenth~~ one-half of the ACGIH Level. This means that the DOE will take action to mitigate further exposure if an employee's exposure reaches ~~ten percent~~ fifty percent of the ACGIH Level.

9-b(4)(a)(ii) Environmental Risk

The performance standard for environmental exposure to carcinogens has been established by the EPA and is based on excess risk of developing cancer in a population. The acceptable excess risk for the public to exposures from class A and B carcinogens is 1×10^{-6}, (i.e., one chance in one million of developing cancer) and class C carcinogens is 1×10^{-5}. The acceptable level of risk for the public to exposures from non-carcinogens is expressed in terms of a hazard quotient. A hazard quotient of less than 1.0 from exposure to emissions poses no known health risk and is acceptable.

D-9b(4)(b) Potential for Health Risks

This section is a summary of the exposure assessment presented in Appendix D9. The exposure assessment includes an analysis of the potential releases of hazardous waste emissions, the physical and chemical properties of the waste, the release pathways, and human exposure to potential releases to the atmosphere. The potential risk to human health from waste emissions is compared to acceptable levels and is summarized in Table D-6.

Since the only substances to be released are gases from the headspace of waste containers, the assessment focused on the release of those VOCs in the gas phase that represent approximately 99 percent of the risk to human health. The only pathway assessed is the atmosphere, or releases to the air from the mine ventilation system. Occupational exposures are assessed from potential VOC concentrations in the mine ventilation air underground and in the atmosphere on the surface of the facility. Public exposures are assessed at all locations

removed from the Hot Cell. After transfer to the Manipulator Repair Room, the manipulators will be surveyed and decontaminated, if necessary. The Hot Cell Operating Gallery also contains closed-circuit television monitors and control-panel stations for selecting and monitoring the Hot Cell and Transfer Cell cameras.

D-10a(2)(b)(iii) Other TRU Mixed Waste Support Systems

Ventilation

The WHB HVAC system provides a filtered-air exhaust path consisting of ~~two stages of prefilters a~~ prefilter (to remove larger dust particles and to prolong the useful life of the HEPA filters) and two stages of HEPA filters (to remove radioactive particulate contamination). These filters will be tested to American National Standards Institute (ANSI) requirements (ANSI-N-510) and have a combined 99.95 percent removal efficiency per stage of 0.3 micron particles.

Except for local air-handling units and the hot-cell exhaust filters, WHB HVAC equipment is contained within the mechanical equipment room, located on a second level of the CH side of the WHB. This room houses the exhaust fans and associated ducting that control WHB ventilation flow.

The WHB ventilation system channels exhaust through a single stack at a nominal flow of 55,000 ft^3 (1,556.5 m^3) per min. The final exhaust from the stack will be continuously monitored for radioactive particulate contamination.

In the event of a tornado, tornado dampers will close to prevent the outward rush of air caused by a rapid drop in atmospheric pressure. Damper closure mitigates the destruction of HEPA filters and ducts by preventing a high-pressure differential from affecting the filters.

If necessary, the exhaust systems can be powered from the backup-power system if off-site power is lost, thus maintaining negative-differential pressures in potentially contaminated areas.

During the initial opening phases of a TRUPACT-II, the TRUDOCK Vent Hood System (VHS) will function as a local exhaust system to control potential airborne-particulate contamination through the use of HEPA filters. Headspace gases will also be drawn into the WHB HVAC exhaust system.

Fire Protection

The design of the fire-protection system satisfies applicable sections of the National Fire Protection Association codes, DOE Orders, and other federal codes (see Chapter F). Fire barriers protect the cage-loading area and shaft areas within the WHB, separate support areas, and walls enclosing stairwells. In addition, the mechanical equipment room has fire barriers that separate this room from other areas of the WHB.

A sprinkler system is installed throughout the CH and RH TRU mixed waste handling areas of the WHB. A fire-suppression water-collection system is in the floor of the WHB to collect fire-suppression water. Fire-suppression water will be collected and held for hazardous contamination

and two counterweights that can be moved to adjust the center of gravity of unbalanced loads and to keep them level.

Facility Pallets

~~Facility pallets are fabricated steel units designed to support drums, TDOPs, or SWBs and have a rated load of 25,000 lbs (11,340 kg). The facility pallets designed to support SWBs have two recesses on the upper surface sized to accept SWBs. Hold-down plates are used to clamp the lower lip of the SWBs to the facility pallet. The facility pallet will accommodate a maximum of four SWBs (two stacks of two high) with a total weight of 16,000 lbs (7,260 kg). If SWBs are stacked two-high, tie-down straps are used to strap the SWBs to the holding bars in the hold-down plate of the facility pallets. The facility pallets designed to support 7-packs have pockets approximately 3 in. (76 mm) deep in the top plate of the pallet to accommodate two sets of two-high 7-packs, two sets of two-high 4-packs of 85-gal (321 L) drums, or one TDOP. Each stack of waste drums is strapped down to holding bars in the top reinforcement plate of the facility pallet. Sets of 7-packs, SWBs, or 4-packs are separated by slipsheets. Facility pallets are shown in Figures D-29 and D-30.~~The facility pallet is a fabricated steel unit designed to support 7-packs of drums, SWBs, TDOPs, or groups of overpack drums, and has a rated load of 25,000 lbs. (11340 kg). The facility pallet will accommodate up to four 7-packs of drums of four SWBs (in two stacks of two units), two TDOPs, or two groups of overpack drums (maximum of four drums per group). Loads are secured to the facility pallet during transport to the emplacement area. Facility pallets are shown in Figure D-29. Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This arrangement reduces the potential for puncture accidents. WIPP facility operational documents define the operational load of the facility pallet as the contents of two TRUPACT-IIs. Since the maximum TRUPACT-II load is 7,265 lbs (3,300 kg), the maximum weight of a loaded facility pallet is less than 19,000 lbs (8,630 kg), including the pallet weight.

In the normal mode, the two main surface exhaust fans, located near the Exhaust Shaft, will provide continuous ventilation of the underground areas. All underground flows join at the bottom of the Exhaust Shaft before discharge to the atmosphere.

Outside air will be supplied to the mining areas, the waste disposal areas, and the experimental complex through the Air Intake Shaft, the Salt Handling Shaft, and access entries. A small quantity of outside air will flow down the Waste Shaft to ventilate the Waste Shaft station. The ventilation system is designed to operate with the Air Intake Shaft as the primary source of fresh air. Under these circumstances, sufficient air will be available to simultaneously conduct all underground operations (e.g., waste handling, mining, experimentation, and support).

If the nominal flow of 425,000 cfm (12,028 m^3/min) is not available underground operations may proceed, but the number of activities that can be performed in parallel may be limited depending on the quantity of air available. Ventilation may be supplied by operating one or two of the filtration exhaust fans. To accomplish this, the isolation dampers will be opened, which will permit air to flow from the main exhaust duct to the filter outlet plenum. The filtration fans may also be operated to bypass the HEPA plenum. The isolation dampers of the filtration exhaust fan(s) to be employed will be opened, and the selected fan(s) will be switched on. In this mode, underground operations will be limited, because filtration exhaust fans cannot provide sufficient airflow to support the use of diesel equipment.

In the filtration mode, the exhaust air will pass through two identical filter assemblies, with only one of the three Exhaust Filter Building filtration fans operating (all other fans are stopped). This system provides a means for removing the airborne particulates that may contain radioactive and hazardous waste contaminants in the reduced exhaust flow before they are discharged through the exhaust stack to the atmosphere. The filtration mode is activated manually or automatically if the radiation monitoring system detects abnormally high concentrations of airborne radioactive particulates. Automatic activation will also occur if an alarm is received from ~~one continuous air monitor at Station A (a monitoring system near the exhaust discharge point).~~ the continuous air monitor in the exhaust drift of the active waste panel. The filtration mode is not initiated by the release of gases such as VOCs. This is for three reasons. First, the HEPA filters would not remove VOCs from the air stream. Second, VOCs are continuously being released at concentrations that are shown in Section D-9b(4) to be of little consequence to occupational or environmental receptors and, therefore, do not require filtration. Third, based on the types of accidents modeled in the Safety Analysis Report (SAR), the most severe credible accident results in the breaching of 21 drums of waste in a roof fall in an active panel results in a release (for carbon tetrachloride). That is, at most, 3.3% of the allowable off site dose.[12] This low dose is not a threat to human health or the environment. VOCs will be monitored in the underground using the VOC Confirmatory Monitoring Plan described in
Section D-10d(1)(d)(xiv).

A set of three booster fans will allow selective reversal of airflow in the mining area, the northern experimental area, the Air Intake Shaft and its associated station, and the Salt Handling Shaft and its associated station. In these modes, airflow can be reversed by opening and closing certain ventilation doors and air regulators and by operating the underground booster fans (in either the forward or the reverse direction). These fans will normally be turned off and will be isolated, with air bypassing the fans and flowing through the air lock. The surface fans will be stopped before

[12]For the analysis in the SAR the standard used is the threshold limit value/short term exposure limit (TLV/SLEL).

attempting any underground air reversals. These modes of ventilation will only be implemented under manual control for off-normal conditions (such as a fire).

Planned Upgrade

Underground Ventilation Normal Mode Redundancy: The underground ventilation system will be provided redundancy in normal ventilation mode by the addition of a third main fan. Ductwork leading to that new fan will tie into the existing main exhaust duct. The connecting saddle, wye, and elbow with an integral damper, is scheduled to be installed and blanked-off, and the hole in the main duct is to be cut before waste receipt. The later addition of the third fan and associated ductwork will then not interfere with the facility operation.

Electrical System

The WIPP facility uses electrical power (utility power) supplied by Southwestern Public Service. If there is a loss of utility power, TRU mixed waste handling and related operations will cease.

Backup, alternating current power will be provided on site by two 1,100-kilowatt diesel generators. These units provide 480-volt power with a high degree of reliability. Each of the diesel generators can carry predetermined equipment loads while maintaining additional power reserves. Predetermined loads include lighting and ventilation for underground facilities, lighting and ventilation for the TRU mixed waste handling areas, and the Air Intake Shaft hoist. The diesel generator can be brought on line within 30 minutes either manually or from the control panel in the Central Monitoring Room (CMR).

Uninterruptible power supply units are also on line providing power to predetermined monitoring systems. These systems ensure that the power to the radiation detection system for airborne contamination, the local processing units, the computer room, and the CMR will always be available, even during the interval between the loss of off-site power and initiation of backup diesel generator power.

D-10a(3) TRU Mixed Waste Management Operations

Prior to receipt of TRU mixed waste at the WIPP facility, waste operators will be thoroughly trained in the safe use of TRU mixed waste handling and transport equipment. The training will include both classroom training and on-the-job training.

D-10a(3)(a) Derived Waste

The WIPP facility operational philosophy is to introduce no new hazardous chemical components into TRU mixed waste or TRU mixed waste residues that could be present in the controlled area. This will be accomplished through written procedures and the use of Safe Work Permits

TABLE D-6
MAXIMUM ESTIMATED OCCUPATIONAL AND PUBLIC EXPOSURE FROM UNDERGROUND WASTE VOC EMISSIONS

Indicator Volatile Organic Compounds (ppmv)	Worker Receptor Concentration		OSHA 8 Hour TWA[b] (ppmv)	Estimated Risk for Carcinogens and Hazard Quotients for Non-Carcinogens for Public Exposure to Waste Emissions	Acceptable Level of Risk[f]
	Surface	Underground			
Carbon Tetrachloride	3.0E-04	1.2E-02	10	3E-08	1E-06
Chlorobenzene[a]	6.9E-04	2.9E-02	75	4E-06[e]	1
Chloroform	2.7E-04	1.0E-02	50[c]	2E-09	1E-06
1,1-Dichloroethylene	1.2E-03	4.7E-02	5[d]	2E-09	1E-05
1,2-Dichloroethane	3.8E-04	1.5E-01	~~100~~50	8E-10	1E-06
Methylene Chloride	4.5E-03	1.6E-02	500	6E-10	1E-06
1,1,2,2-Tetrachloroethane	3.2E-04	1.3E-02	5	3E-09	1E-05
Toluene[a]	1.6E-03	6.7E-02	200	3E-07[e]	1
1,1,1-Trichloroethane	4.0E-03	1.6E-01	350	2E-08	1E-05

a. Non-Carcinogen (all others are class B2 or C carcinogens)
b. 8 hour time weighted averages (TWA) except for chloroform
c. TWA for up to a 10 hour day in a 40 hour workweek
d. TWA from ACGIH
e. Non-Carcinogen hazard quotient
f. Acceptable level of risk for carcinogens is the probability of developing cancer, and for non-carcinogens is a hazard quotient less than or equal to 1

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pair of brake calipers is capable of holding the hoist in position during normal operating conditions and stopping the hoist under emergency conditions. In the event of power failure, the brakes will set automatically.

The hoist is protected by a fixed automatic fire suppression system. Portable fire extinguishers are also provided at several points on the hoist floor and in equipment areas.

Once underground, the facility pallet is removed from the hoist cage by the underground waste transporter (see Figure D-31), a commercially available articulated diesel vehicle. The trailer is designed specifically for transporting palletized TRU mixed waste and is sized to accommodate the facility pallet. All motorized waste handling equipment is equipped with on-board fire-suppression systems.

The underground waste transporter is equipped with a ~~speed governor~~fire suppression system, rupture-proof diesel fuel tanks, and reinforced fuel lines to minimize the potential for a fire involving the fuel system. Waste containers will be placed into underground waste management areas using a battery-powered forklift.

For the RH waste transport, a shuttle car operates beneath the Hot Cell in the canister-transfer cell to move the RH canister to the cask-loading room, where the waste is placed in the facility cask (see Figure D-24) for subsequent transfer underground. The waste hoist is used to move the facility cask to the underground HWMU for emplacement. Transfer operations are monitored by closed-circuit television cameras. The facility cask will be used to move the RH waste underground from the waste hoist to the emplacement area.

All TRU mixed waste transport equipment is inspected at a frequency indicated in Table F-1.

RH inspections in Table F-1 do not apply until receipt of RH waste. The forms in Appendix F1 are primarily for preventive maintenance, to assure the equipment is maintained operational. Logbooks for recording preoperational inspections of RH equipment noted in Table F1 will be established to provide the inspection records. These logs will be established and used as discussed in Section F-2 above.

- An agreement among the DOE, the WIPP MOC, Mississippi Potash Inc., Western Agriculture Minerals, IMC Fertilizer, Eddy Potash Inc., and New Mexico Potash (June 6, 1994) provides for the mutual aid and assistance, in the form of MRTs, in the event of a mine disaster or other circumstance at either of the two facilities. This provision ensures that the WIPP MOC will have two MRTs available at all times when miners are underground, as required by DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards.

- A joint powers agreement among the DOE; the City of Carlsbad, New Mexico; Eddy County, New Mexico; and the New Mexico Energy, Minerals, and Natural Resources Department for Alternate EOC (April 6, 1994) provides for the coordination of emergency plans, including the DOE emergency radiological response plans; provides for participation in periodic exercises, drills, and training; provides for establishing and maintaining an alternate EOC at the Living Desert State Park; and assigns responsibilities to the participants.

- A memorandum of agreement between the City of Carlsbad, New Mexico, and the WIPP MOC for ambulance service assistance (August 13, 1981) provides that, upon notification by the WIPP MOC, the Carlsbad Fire Department will be dispatched from Carlsbad toward the WIPP site by a designated route and will accept the transfer of patient(s) being transported by the WIPP facility ambulance at the point both ambulances meet. If the patient(s) is not transferrable, the Carlsbad Ambulance Service will provide equipment and personnel to the WIPP facility ambulance, as necessary.

- A MOU between the DOE and the ~~Guadalupe Medical Center~~ Columbia (formerly Guadalupe) Medical Center Emergency Radiological Treatment Center for the Waste Isolation Pilot Plant (February 1, 1994) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the Guadalupe Medical Center Emergency Radiological Treatment Center for decontamination and medical treatment.

- A MOU between the DOE and the ~~Lea Regional Hospital Emergency~~ Columbia (formerly Lea) Regional Hospital Radiological Treatment Center for the WIPP (~~August 17, 1993~~February 15, 1995) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the Lea Regional Hospital ~~Emergency~~ Radiological Treatment Center for decontamination and medical treatment.

- A MOU between the DOE and the U.S. Department of Interior (DOI), represented by the Bureau of Land Management (BLM), Roswell District (July 19, 1994), provides for a fire-management program that will ensure a timely, well-coordinated, and cost-effective response to suppress wild fire within the withdrawal area using the WIPP incident commander for fire-management activities. The DOI will provide firefighting

TABLE G-2
RESOURCE CONSERVATION AND RECOVERY ACT EMERGENCY COORDINATORS

Name	Address	Office Phone	Home Phone
G. A. (Gerry) Burns (primary)[1]	2516 Crown Circle	234-8276 or 234-8635	887-7133
R. A. (Richard) Marshall (primary)[1]	Pine Springs Route	234-8276 or 234-8695	885-2220
R. E. (Bob) Wade (primary)[1]	3306 Falling Star	234-8272	885-2448
T. J. (Tim) Wygant (primary)[1]	1514 N. Country Club	234-8276 or 234-8377	885-1655
~~J. R. (Joe) Franco (primary)[1]~~	~~5107 Old Cavern Hwy~~	~~234-8276 or 234-8641~~	~~887-3285~~
~~M. B. (Byron) Cherry[2]~~	~~1207 Smedley Road~~	~~234-8276 or 234-8635~~	~~887-1971~~
B. J. (James) VanWinkle[2]	2409 Wyoming	234-8276	885-4503
G. L. (Garrod) Ashford[2]	1005 Halequeno	234-8272	885-2585
R. C. (Russ) Stroble[2]	3304 Falling Star	234-8554	885-0220
~~E. R. (Ed) Flynn[2]~~	~~2110 LaHuerta Drive~~	~~234-8272~~	~~887-0151~~
~~G. L. (Gary) Kessler[2]~~	~~1313 E. Wood~~	~~234-8326~~	~~885-9214~~
~~A. E. (Alvy) Williams[2]~~	~~113 Coleman Rd.~~	~~234-8216 or 234-8276~~	~~885-4811~~
~~K. (Kim) Jackson[2]~~	~~1120 Tracy Place~~	~~234-8272 or 234-8276~~	~~887-7345~~

[1]The on-duty Facility Shift Manager is the primary RCRA Emergency Coordinator pursuant to 20 NMAC 4.1, Subpart V §264.52 and is designated to serve as the RCRA Emergency Coordinator.

[2]The on-duty Facility Operations Engineer is the alternate RCRA Emergency Coordinator and is available as needed.

Subsurface markers would be less than 2 ft (0.6 m) in the longest dimension, made of inert material, and spaced so that they are likely to be discovered by drilling crews and professional archaeologists. The warning message would be engraved so that slight erosion or fracture of the marker would not render it completely unintelligible. In addition, the markers would be buried at a greater depth than that used for plowing/tilling operations or for amateur archaeological excavation, so that such activities would be unlikely to disturb them. Further details on the subsurface markers may be obtained from the WIPP Active Access Controls After Disposal Design Concept Description (March 1995b).

Written Records

Written documentation of the WIPP will be placed in local, state, and federal agencies. Documentation will also be provided to international entities and commercial organizations that act as resource information centers for the petroleum and gas industries. Records will use the most stable and durable media available at the time that the record deposits are made. These records will describe the location of the repository; the nature and hazard of the waste; the geologic, geochemical, and hydrologic data pertinent to waste containment; and environmental monitoring data from preoperational baseline and summaries of data collected during D&D activities. Overall record selection for storage at the agencies selected will be in accordance with federal, state, and local regulations.

Specific documents which will be included in the archived information portfolio include:

- Detailed maps describing the exact location of the repository
- The SAR and the addenda which describes the disposal phase of the WIPP
- The Final Environmental Impact Statement for WIPP and the Supplement(s) to the Environmental Impact Statement
- ~~The No-Migration Variance Petition and the No-Migration Determination for Disposal~~
- The RCRA Permit
- The Certification of Compliance with 40 CFR Part 191 and associated application
- Environmental and ecological background data collected during the preoperational phase of WIPP and summaries of data collected during the disposal and decommissioning phases of WIPP
- Records of the waste containers' contents and disposal locations within the WIPP repository
- Drawings defining the construction and configuration of the repository and shafts

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CORRECTIVE ACTION FOR
SOLID WASTE MANAGEMENT UNITS
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20 NMAC 4.1, Subpart V, §§264.601(b) and (c), respectively. Chapter I of this permit application addresses the requirements of 20 NMAC 4.1, Subpart V, §264.603.

In addition, the DOE will institute corrective actions that are necessary to protect human health and the environment for any releases of hazardous waste or hazardous constituents from SWMUs at the WIPP site. Corrective actions will be performed in compliance with 20 NMAC 4.1, Subpart V, §264.101. Any releases from a SWMU deemed an immediate threat to human health or the environment will be responded to in accordance with the WIPP facility Contingency Plan (Chapter G) of this permit application.

The requirements of 20 NMAC 4.1, Subpart V, §§264.601 through 264.603, including corrective actions, are addressed in this permit application. Therefore, the requirements of 20 NMAC 4.1, Subpart V, Releases from Solid Waste Management Units, are not necessary to show compliance.

To eliminate repetition of information, units that are similar in physical characteristics use or waste type are grouped and described within a SWMU description for the particular type of discernible unit.

The following sections describe characterization of SWMUs identified in the RFA, assessment of potential releases, and corrective actions. Table J-1 provides a list of SWMUs.

J-1a Characterization of the SWMUs

SWMUs at the WIPP facility are identified by a unique number designation shown in the upper left-hand corner of the SWMU characterization sheets in Appendix J1. The individual units grouped within a SWMU are designated by a letter following the SWMU number. The locations of the SWMUs and individual units, if any, within SWMUs are shown in Figure J-1.

The SWMU characterization sheets in Appendix J1 include the name, type, and period of operation for each unit. The unit description includes all available information on the unit, including location, size, dates of operation for the individual units within a SWMU, materials of construction, and waste descriptions. Information on the extent and nature of known releases is also included. The figure showing the location of each individual unit within a SWMU is indicated on the SWMU characterization sheet.

J-1b SWMUs added since April 12, 1996

Since the submittal of Revision 6.0 of the permit application, the DOE has closed one SWMU and has created another. These are in the area of the base of the Exhaust Shaft and are discussed in DOE 1997a. A summary follows.

The RFA documents that a visual inspection of the area of SWMU 010c, which is at the base of the Exhaust Shaft, revealed no evidence of past releases of the waste typically expected at the base of the shaft (cement, grout, metal, concrete, grease, brine). Characterizations of waste removed from the area have shown that the contents of this area are consistently below RCRA hazardous waste criteria. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. This brine was tested and determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft (DOE 1997b). The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft (DOE 1996). As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground.

Since the corrective action involved removal of debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e. Figure J-2 shows the location of SWMU 010e. These shaft sumps, including the new SWMU, have been added to Table J-1 and Appendix J1.

J-2 Releases

Releases from the SWMUs identified in the RFA are described in this section.

J-2a Assessment of Potential Releases

The identified SWMUs were reviewed to assess potential releases. A summary of this assessment is presented in Appendix J1. The assessment includes a description of the material released and the nature of the release.

J-2b Corrective Actions

Based on sampling and analysis data, visual site inspections, and document/record reviews, the DOE believes that no releases of hazardous materials have occurred at any of the WIPP facility SWMUs. The DOE has initiated a voluntary Phase 1 RFI/Release Assessment process as described in the RCRA Corrective Action Plan (EPA 520-R-94-004) to define closure requirements

References

Department of Energy, 1996, Analysis of Corrosion Testing Results for Galvanized Mesh Material Obtained from the Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 96-2212, Westinghouse Electric Corporation, Carlsbad, NM, December 1996.

Department of Energy, 1997a, Final Solid Waste Management Unit Assessment Report, DOE/WIPP 97-2220, Westinghouse Electric Corporation, Carlsbad, NM, January 10, 1997.

Department of Energy, 1997b, Composition and Origin of Nonindigenous Brine and Water in the Vicinity of the Exhaust Shaft Waste Isolation Pilot Plant, New Mexico, DOE/WIPP 97-2226, Westinghouse Electric Corporation, Carlsbad, NM, February 1997.

New Mexico Environment Department (NMED), 1994, "Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant," NMED/WIPP 93-001, New Mexico Environment Department, Santa Fe, New Mexico.

TABLE J-1
SOLID WASTE MANAGEMENT UNIT (SWMU) DESCRIPTIONS

SWMU No.	Unit Type	Unit Description	Waste Description
001	Mud Pits	Thirteen decommissioned mud pits on drill pads are identified in the RCRA Facility Assessment (RFA). Additional mud pits associated with seven groundwater monitoring well sites have been created since the RFA. These were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons.	Sodium- and potassium chloride-saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.
002	Landfills	Two landfills used for disposal of construction debris are identified in the RFA.	Foundation excavation soils; concrete; scrap wood; and metal.
003	Storage Yards	One yard used for storage of construction and maintenance materials, wastewater, and used oils or materials that can be reclaimed or recycled has been identified in the RFA.	Water contaminated with motor oil, hydraulic oil, and diesel fuel; used hydraulic oil, motor oil, antifreeze, glycol-based oils, chemical grout; used lead acid batteries; scrap metal. Used hydrocarbons are collected in containers.
010	Shaft Sumps	An area at the bottom to each of the four WIPP shafts that collected construction debris or accumulates brine, including a catchment basin	Welding residue, scrap wood and metal, salt; Class C cement; chemseal; bentonite; grease and oil; cement and chem grout; Salado and overlying formation groundwaters;, condensate from the underground ventilation system; washwater; leaded brine from the Exhaust Shaft

The wastes consist of welding debris, scrap steel, concrete from the shaft lining, cement grout, chemical grout, grease, wash water, brine from the Salado and overlying formations some of which contains RCRA levels of lead, and salt.

Release Information

Brine containing lead in excess of RCRA levels has flowed through the Exhaust Shaft area and collected in the Waste Shaft sump. No other RCRA hazardous wastes or hazardous constituents have been detected at these sites.

TABLE J1-2
SWMU DATA-SHAFT SUMPS

SWMU	Dates	*Location and Description	Status	Material Stored
010-a Salt Handling Shaft	1981 to Pres.	0/0 Sump extends 148 feet below the facility horizon	Active	Welding residue, scrap wood and metal, salt, Class C cement, Chemical-seal, bentonite, grease, and oil
010-b Waste Shaft	1982 to Pres.	S400/E30 Sump extends 119 feet below the horizon.	Active	Concrete, salt, cement grout, chemical grout, brine from Rustler Formation, wash water, grease, and oil, lead
010-c Exhaust Shaft	1985 to 1996	S400/E480 Shaft ends at the facility horizon.	Closed	Salt, concrete, cement grout, chemical grout, brine from Rustler Formation, grease, and oil
010-d Air Intake Shaft	1989 to Pres.	0/W620 Shaft ends at the facility horizon.	Active	Salt, brine from Rustler Formation, concrete, grease, and oil
010-e Exhaust Shaft	1996 to Pres.	S400/E480 Catchment Basin at base of shaft	Active	Salt, brine, lead

* All locations given by underground coordinates.

CHAPTER L
NO-MIGRATION VARIANCE PETITION

~~In March 1989, the U.S. Department of Energy (DOE) submitted to the U.S. Environmental Protection Agency (EPA) a no-migration variance petition (NMVP) under 40 CFR §268.6 for the Waste Isolation Pilot Plant (WIPP) facility. The document was subsequently expanded to include an addendum and was resubmitted to the EPA in March 1990. The addendum provided additional information specifically requested by the EPA. The petition demonstrated that site characteristics (i.e., the ability of the bedded salt to isolate emplaced wastes from groundwater); operational practices, which would prevent releases to air, soil, and surface water; and characteristics of the waste designated for disposal at the WIPP were sufficient to prevent migration of hazardous constituents beyond the unit boundary during the Test Phase.~~

~~On November 14, 1990, the EPA issued a Conditional No-Migration Determination (NMD) for the WIPP facility (55FR47700). The Federal Register notice provided information relevant to the NMD, described the EPA's responses to comments provided on the proposed NMD (55FR13068), and specified the conditions and limitations of the NMD.~~

~~The DOE abandoned plans for a Test Phase at the WIPP facility. Prior to initiating disposal operations, the DOE must seek another NMD from the EPA for disposal operations. The DOE will not receive transuranic mixed waste for disposal at the WIPP facility unless a disposal-phase NMD is granted by the EPA or this waste is otherwise exempted from the Land Disposal Restrictions (LDR) of 40 CFR Part 268. Currently, the DOE has no plans for treatment of the waste to meet the LDR, and in the event that a variance is not granted, the DOE would manage only non-mixed waste until appropriate treatment methods have been identified and that waste has been treated.~~

~~In May 1995, the DOE issued a draft NMVP for the disposal phase. This draft submittal focused on a demonstration of compliance with the no-migration standards during disposal operations and the closure period. The long-term demonstration of no migration will be presented in the final NMVP, which is scheduled to be submitted to the EPA in June 1996. Once an NMD has been issued by the EPA for the disposal phase, the DOE will comply with all associated terms and conditions.~~

~~In order to fulfill the requirement of Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1, Subpart IX, §270.14(b)(21), a copy of the Test Phase NMD is included as Appendix L1. However, as previously stated, the DOE has abandoned plans for a Test Phase and does not propose to conduct any activities relating to a Test Phase.~~ TRU mixed waste is exempted from LDRs by the Land Withdrawal Act Amendment (Public Law 104-201). This amendment states that WIPP "wste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal prohibitions in section 3004 (d), (e), (f), and (g) of the Solid Waste Disposal Act."

- Coring tools must be of sufficient length to hold the liner and must be constructed to allow placement of the liner leading edge as close as possible to the coring tools leading edge.

- All surfaces of the coring tool that have the potential to contact the sample core must be cleaned in accordance with the requirements in Section C4-2(b) prior to use.

- The leading edge of the coring tools must be sharpened and tapered to a diameter equivalent to, or slightly smaller than, the inner diameter of the liner. Based on tests conducted with the coring tools described in the Methods Manual, a diameter slightly smaller (e.g., 1/10 in.) has demonstrated a reduction in the drag of the homogenous solids and soil/gravel against the internal surfaces of the liner, thereby enhancing sample recovery.

- Rotational coring tools must have a mechanism to ~~prevent the liner inside the coring tool from rotating with the coring tool~~minimize the rotation of the liner inside the coring tool during coring activities, thereby minimizing physical disturbance to the core.

- Rotational coring must be conducted in a manner that minimizes transfer of frictional heat to the core, thereby minimizing potential loss of VOCs.

- Nonrotational coring tools must be designed such that the tool's kerf width is minimized. Kerf width is defined as one-half of the difference between the outer diameter of the tool and the inner diameter of the tool's inlet.

Sample Collection

Sampling must be conducted in accordance with the following requirements:

- Sampling must be conducted as soon as possible after core collection. If a substantial delay (i.e., more than 60 minutes) is expected between core collection and sampling, the core must remain in the liner and the liner must be capped at each end. If the liner containing the core is not extruded from the coring tool and capped, then two alternatives are permissible: 1) the liner must be left in the coring tool and the coring tool must be capped at each end, or 2) the coring tool must remain in the waste container with the air-lock mechanism attached.

- Samples of homogenous solids and soil/gravel for VOC analyses must be collected prior to extruding the core from the liner. The sampling location must be randomly selected along the long axis of the liner and access to the waste must be gained by making a perpendicular cut through the liner and the core. Sites must develop procedures to select, and document the selection, of random sampling locations. True random sampling involves the proper use of random numbers for identifying sampling locations. A sampling device such as the metal coring cylinder described

visually examining the core and describing the observation (e.g., undisturbed, cracked, or pulverized) in the field logbook.

If core recovery is less than 50 percent of the depth of the waste, a second coring location shall be randomly selected. ~~The core from the second location shall be used for sample collection regardless of the core recovery.~~ The most representative core shall be used for sample collection.

$$MDC = K \; [illegible] \; (3.71 + 4.65 * [illegible]) \qquad \text{C8-11}$$

C8-4 Radiography

Quality Assurance Objectives

The QAOs for radiography are detailed in this section. If the QAOs described below are not met, then corrective action, such as additional operator training must be taken. It should be noted that radiography does not have a specific MDL because it is primarily a qualitative determination. The objective of radiography for the program is to verify the waste matrix parameters for each waste container and to estimate each waste material parameter weight (Table C8-1). All activities required to achieve these objectives must be described in the site quality assurance project plan (QAPjP) and standard operating procedures (SOP).

Data to meet these objectives must be obtained from an audio/videotaped scan provided by trained radiography operators at the sites. Results must also be recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data are presented below.

Precision

The qualitative determinations, such as verifying the waste matrix code, made during radiography do not lend themselves to statistical evaluation of precision. However, comparison of data derived from radiography and visual examination on the same waste containers at the Rocky Flats Environmental Technology Site and the Idaho National Engineering Laboratory indicates that radiography operators can provide estimated inventories and weights of waste items in a waste container. As a measure of precision, the Site Project QA Officer shall calculate and report the RPD between the estimated waste material parameter weights as determined by radiography and these same parameters as determined by visual examination.

Accuracy

The accuracy with which the waste matrix code and waste material parameter weights can be determined must be documented through visual examination of a randomly selected statistical portion of waste containers. The percentage of waste containers that require assignment to a different waste matrix code after visual examination must be calculated and reported by the Site Project QA Officer as a measure of radiography accuracy.

- Waste matrix code
- Waste material parameter weights
- Average mass and activity of each radionuclide of concern
- If each waste container of waste is TRU radioactive waste
- Average concentration of hydrogen, methane, and each VOC in the headspace gas of waste containers in the waste stream
- ~~Total masses of VOCs, hydrogen, and methane in the headspace gas of the waste stream~~
- The potential flammability of TRU waste headspace gases
- Mean concentrations, UCL_{90} for the mean concentrations, standard deviations, and number of samples collected for VOCs, SVOCs, and metals in the waste stream
- ~~Total masses of VOCs, SVOCs, and metals in the waste stream~~
- Whether the waste stream exhibits a toxicity characteristic (TC) under 40 CFR Part 261, Subpart C
- Whether the waste stream can be classified as hazardous or nonhazardous at the 90-percent confidence level
- Whether a sufficient number of waste containers have been visually examined to determine with a reasonable level of certainty that the UCL_{90} for the miscertification rate is less than 14 percent

If the Site Project Manager determines that insufficient data have been collected to make the determinations listed above, additional data collection efforts must be undertaken.

The statistical procedure presented in Appendix C6 shall be used by participating Site Project Managers to evaluate and report waste characterization data from the analysis of homogenous solids and soil/gravel. The procedure, which calculates UCL_{90} values, shall be used to assess compliance with the DQOs in Section 1.5 as well as with RCRA regulations. The procedure must be applied to all laboratory analytical data for total VOCs, total SVOCs, and total metals. For RCRA regulatory compliance (40 CFR § 261.24), data from the analysis of the appropriate metals and organic compounds shall be compared to the TC levels expressed as total values. These total values will be considered the regulatory threshold limit (RTL) values for the Program. RTL values are obtained by calculating the weight/weight concentration (in the solid) of a TC analyte that would give the regulatory weight/volume concentration (in the toxicity characteristic leaching procedure (TCLP) extract), assuming 100-percent analyte dissolution.

Reconciliation at the CAO Level

CAO must also ensure that data of sufficient type, quality, and quantity have been collected to meet Program DQOs. The CAO Office of Regulatory Compliance manager is responsible for determining if sufficient data have been collected to determine the following:

- ~~The concentration of headspace gas VOCs in the total waste inventory to support a demonstration that VOCs will not migrate through the air beyond the WIPP unit boundary in concentrations greater than Environmental Protection Agency (EPA)-determined health-based limits during WIPP operations;~~

- ~~The concentration of VOCs, SVOCs, and metals in the total waste inventory to support a demonstration that hazardous constituents will not migrate beyond the WIPP unit boundary in concentrations greater than EPA-determined health-based limits;~~The concentration of VOC constituents in the headspace in the total waste inventory has not exceeded the environment performance standards of 20 NMAC 4.1, Subpart V, 264.601 (b);

- The total curie, hydrogen, and methane concentrations in TRU waste to support revision of the thermal power restrictions for shipment of waste in the Transuranic Package Transporter (TRUPACT-II);

- An inventory of radioactive materials and physical waste forms to support an assessment of repository performance;

- Whether waste streams proposed for disposal in WIPP have been adequately characterized; and

- Whether data supports the preparation of ~~the WIPP facility no-migration variance petition,~~ the WIPP RCRA permit application, the WIPP facility 40 CFR Part 191 Certification Application, and a revised safety analysis report for the TRUPACT-II.

C8-12 Data Reporting Requirements

Data reporting requirements define the type of information and the method of transmittal for data transfer from the data generation level to the project level and from the project level to CAO.

Data Generation Level

Data shall be transmitted by hard copy or electronically (provided a hardcopy is available on demand) from the data generation level to the project level. Transmitted data shall include all testing, sampling, and analytical batch data reports, and data review checklists. The report forms and checklists used must contain all of the information required by the testing, sampling, and analytical techniques described in Sections 7.0 through 15.0 of the QAPP, as well as the signature releases to document the review, validation, and verification as described in Section C8-10. All testing, sampling, and analytical batch data reports and checklists shall be on approved forms, as provided in site-specific documentation.

Testing, sampling, and analytical batch data reports shall be forwarded to the site project office. Site QAPjPs shall specify the individual at the site project office who will receive these reports. Testing batch data reports shall be forwarded to the site project office within 28 days of the testing of the last waste container in a testing batch. Sampling batch data reports shall be forwarded to the site project office within 28 days of sample collection of the last sample in a sampling batch. Analytical batch data reports shall be forwarded to the site project office within 28 days of the VTSR of the last sample in an analytical batch. After review by the Site Project QA Officer, all batch data reports will be forwarded to the Site Project Manager. All testing, sampling, and analytical batch data reports shall be assigned serial numbers, and each page shall be numbered at the bottom. The serial number used for data reports can be the same as the testing, sampling, or analytical batch number.

QA documentation shall be maintained in either testing, sampling, and analytical facility files, or site project files for those facilities located on sites. Contract waste operation facilities shall forward testing, sampling, and analytical QA documentation along with testing, sampling, and analytical batch data reports to the site project office for inclusion in site central files.

Project Level

There are two aspects to project level reporting. First, summarized testing, sampling, and analytical data must be reported on a per-waste container basis. Second, summarized characterization information must be reported on a waste stream basis.

Summarized testing, sampling, and analytical data shall be transmitted by hard copy or electronically from the Site Project Manager to CAO when requested. Participating sites shall combine data from individual waste containers into data packages for reporting. Hard copy or electronic data packages shall consist of the following:

- Cover page with the site name, program identification, waste container numbers for containers included in the data package, and release signatures of the Site Project Manager and Site Project QA Officer

- Table of contents; and

- A concise narrative that summarizes the results of the project-level review and briefly describes any problems or other noteworthy items of interest associated with the data (i.e., nonconformance reports, operational variances). The narrative shall include separate sections which address results of duplicates/replicates and nonconformance reports associated with the waste containers being reported in the package.

For each waste container being reported in the data package, the following information shall be included:

- Cover page with the site name, program identification, waste container number, and approval/release signatures of the Site Project Manager and Site Project QA Officer

Appendix D5 has been updated in whole; therefore redline/strikeout is not provided

D9-5.3.2 Non-Carcinogens

As for carcinogens, noncarcinogen VOC contaminant concentrations in air for the Surface Worker and the Underground Worker and OSHA 8 hour TWAs are presented (Table D9-9). This information provides a mechanism for evaluating occupational exposures in addition to the risk assessment approach. The receptor concentrations for the Surface Worker are seven orders of magnitude below the TWAs and those for the Underground Worker are more than six orders of magnitude below the TWAs.

Human health risk from non-carcinogens can be calculated using equation D9-23 with EF = 1920 hours/year for the surface worker and 33 hours per year for the underground worker, ED = 10 years, and EC = ECS in Table 9-9. The calculated hazard quotient from Chlorobenzene is 4E-01 for the surface worker and 3E-02 for the underground worker. The risk from Toluene, the hazard quotient is 3E-02 for the surface worker and 3E-03 for the underground worker.

TABLE D9-8
VOC CONTAMINANT CONCENTRATIONS IN AIR FOR THE SURFACE WORKER AND THE UNDERGROUND WORKER

	ECS_{max}	ECU_{max}	*Receptor Concentration*		
Compound	**Exhaust Shaft Concentration for Surface Worker (µg/m³)**	**Exposure Concentration for Underground Worker (µg/m³)**	**(ECS x ADF) Surface Worker (ppmv)**	**Underground Worker (ppmv)**	**OSHA TWA[a] (ppmv)**
Carbon Tetrachloride	1.54E+02	7.70E+01	3.00E-04	1.22E-02	10
Chloroform	1.06E+02	5.03E+01	2.67E-04	1.03E-02	50
1,1,-Dichloroethylene	4.01E+02	1.86E+02	1.24E-03	4.68E-02	5[b]
1,2-Dichloroethane	1.25E+02	6.00E+01	3.81E-04	1.63E-01	~~100~~50
Methylene Chloride	1.26e+02	5.66E+02	4.45E-03	1.29E-02	500
1,1,2,2-Tetrachloroethane	1.77E+02	8.86E+01	3.17E-04	6.70E-02	5
1,1,1-Trichloroethane	1.77E+03	8.89E+03	4.00E-03	1.63E-01	350

a. 8 hour TWAs except chloroform TWA for up to a 10 hour day in a 40 hour work week.
b. TWA from ACGIH

Appendix D20 has been updated in whole; therefore redline/strikeout is not provided

010 SHAFT SUMPS

Unit type:	Shaft Sumps
Unit use:	Collection/Storage
Operational status:	Active
Use period:	1981 - Present
Materials managed:	Solid Waste Hazardous Waste
Hazardous release:	Lead
Radioactive release:	None
Information source(s):	Process Knowledge, Sampling and Analysis

Unit Description

Refer to Figure J-2 for location. Four shafts have been completed to the WIPP facility underground. The Salt Handling and the Waste Shafts have sumps (010-a and 010-b) that extend below the facility horizon (148 feet and 119 feet, respectively). The sumps have been cut into the salt and are not lined. The other two shafts, the Exhaust Shaft and the Air Intake Shaft, end at the facility horizon and do not have sumps. The bottoms of these shafts are 010-c and 010-d, respectively. The bottoms of all four shafts have received construction debris. All shafts are lined and grouted to minimize wastewater accumulation. The solid material cleaned up from the bottom of the shafts without sumps is disposed of on the main salt storage area. The Waste Shaft sump periodically collects brine. In June 1995, increased volumes of brine flow into the Waste Shaft sump (SWMU 010b) were noticed. The brine was tested and was determined to contain RCRA levels of lead. A corrective action plan was immediately implemented. The source of the increased flow into the Waste Shaft sump was traced to water entering the mine from condensation and seepage in the Exhaust Shaft. The source of the lead in the brine appears to be chain-link mesh used for support in the Exhaust Shaft. As part of the corrective action, the debris and muck at the base of the Exhaust Shaft were cleared and a plastic catchment basin installed to collect water coming down the shaft and to prevent further flow to the Waste Shaft sump. The collected water is managed in accordance with New Mexico Solid Waste and Water Quality Control Commission (WQCC) Regulations. The lead containing waters are currently being managed and disposed of at an off-site treatment, storage, and disposal facility in accordance with the requirements of 20 NMAC 4.1 Subpart III. Alternatively, when the levels of lead are below the limits in the DOE's WQCC Discharge Plan DP-831, the water is discharged to the WIPP sewage lagoon along with other waters collected from the WIPP underground.

Since the corrective action involved the removal of the debris and muck at the base of the Exhaust Shaft, the SWMU previously identified as SWMU 010c is considered closed. The catchment basin has been designated as a new SWMU and assigned the designation SWMU 010e.

Waste Description

- A MOU between the DOE and the ~~Lea Regional Hospital Emergency~~ Columbia ~~for Lea Regional Hospital~~ Radiological Treatment Center for the WIPP (~~August 17, 1993~~February 15, 1995) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the ~~Lea~~ Columbia Regional Hospital Emergency Radiological Treatment Center for decontamination and medical treatment.

- A MOU between the DOE and the U.S. Department of Interior (DOI), represented by the Bureau of Land Management (BLM), Roswell District (July 19, 1994), provides for a fire-management program that will ensure a timely, well-coordinated, and cost-effective response to suppress wild fire within the withdrawal area using the WIPP incident commander for fire-management activities. The DOI will provide firefighting support if requested. In addition, the MOU provides for responsibilities concerning cultural resources, grazing, wildlife, mining, gas and oil production, realty/lands/rights-of-way, and reclamation.

- A mutual-aid firefighting agreement between the Eddy County Commission and the DOE (February 1, 1994) provides for the assistance of the Otis and Joel Fire Departments (a volunteer fire district created under the Eddy County Commission and the New Mexico State Fire Marshall's Office), including equipment and personnel, at any location within the WIPP Fire Protection Area upon request by an authorized representative of the WIPP Project. These responsibilities are reciprocal.

- A mutual-aid agreement between the City of Hobbs and the DOE (December 3, 1993) provides for mutual ambulance, medical, fire, rescue, and hazardous material response services; provides for joint annual exercises; provides for use of WIPP facility radio frequencies by the City of Hobbs during emergencies; and provides for mutual security and law enforcement services, within the appropriate jurisdiction limits of each party.

- A mutual-aid agreement between the City of Carlsbad and the DOE (November 24, 1993) provides for mutual ambulance, medical, fire, rescue, and hazardous material response services; provides for joint annual exercises; provides for use of WIPP facility radio frequencies by the City of Carlsbad during emergencies; and provides for mutual security and law enforcement services, within the appropriate jurisdiction limits of each party.

- A MOU between the DOE and the New Mexico Department of Public Safety (DPS) concerning Mutual Assistance and Emergency Management (March 19, 1992) applies to any actual or potential emergency or incident that: 1) involves a significant threat to employees of the DOE\DOE contractor or general public; 2) involves

fire, hazardous materials, or security emergency, the RCRA Emergency Coordinator will notify appropriate off-site response agencies and request assistance. Once on site, off-site emergency response agency personnel will be under the direction of the RCRA Emergency Coordinator.

The MOUs with off-site cooperating agencies are available from the DOE. A listing and description of the MOUs with state and local agencies and mining operations in the vicinity of the WIPP facility, as required by 20 NMAC 4.1, Subpart V, §264.37 and §264.52(c), are:

- An agreement among the DOE, the WIPP MOC, Mississippi Potash Inc., Western Agriculture Minerals, IMC Fertilizer, Eddy Potash Inc., and New Mexico Potash (June 6, 1994) provides for the mutual aid and assistance, in the form of MRTs, in the event of a mine disaster or other circumstance at either of the two facilities. This provision ensures that the WIPP MOC will have two MRTs available at all times when miners are underground, as required by DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards.

- A joint powers agreement among the DOE; the City of Carlsbad, New Mexico; Eddy County, New Mexico; and the New Mexico Energy, Minerals, and Natural Resources Department for Alternate EOC (April 6, 1994) provides for the coordination of emergency plans, including the DOE emergency radiological response plans; provides for participation in periodic exercises, drills, and training; provides for establishing and maintaining an alternate EOC at the Living Desert State Park; and assigns responsibilities to the participants.

- A memorandum of agreement between the City of Carlsbad, New Mexico, and the WIPP MOC for ambulance service assistance (August 13, 1981) provides that, upon notification by the WIPP MOC, the Carlsbad Fire Department will be dispatched from Carlsbad toward the WIPP site by a designated route and will accept the transfer of patient(s) being transported by the WIPP facility ambulance at the point both ambulances meet. If the patient(s) is not transferrable, the Carlsbad Ambulance Service will provide equipment and personnel to the WIPP facility ambulance, as necessary.

- A MOU between the DOE and the ~~Guadalupe Medical Center Columbia (formerly Guadalupe) Medical Center~~ Emergency Radiological Treatment Center for the Waste Isolation Pilot Plant (February 1, 1994) provides for the treatment of radiologically contaminated personnel who have incurred injuries beyond the treatment capabilities at the WIPP facility. The DOE will provide transport of the patient(s) to the ~~Guadalupe Medical CenterColumbia~~ Emergency Radiological Treatment Center for decontamination and medical treatment.

CHAPTER L
NO-MIGRATION VARIANCE PETITION

~~In March 1989, the U.S. Department of Energy (DOE) submitted to the U.S. Environmental Protection Agency (EPA) a no-migration variance petition (NMVP) under 40 CFR §268.6 for the Waste Isolation Pilot Plant (WIPP) facility. The document was subsequently expanded to include an addendum and was resubmitted to the EPA in March 1990. The addendum provided additional information specifically requested by the EPA. The petition demonstrated that site characteristics (i.e., the ability of the bedded salt to isolate emplaced wastes from groundwater); operational practices, which would prevent releases to air, soil, and surface water; and characteristics of the waste designated for disposal at the WIPP were sufficient to prevent migration of hazardous constituents beyond the unit boundary during the Test Phase.~~

~~On November 14, 1990, the EPA issued a Conditional No-Migration Determination (NMD) for the WIPP facility (55FR47700). The Federal Register notice provided information relevant to the NMD, described the EPA's responses to comments provided on the proposed NMD (55FR13068), and specified the conditions and limitations of the NMD.~~

~~The DOE abandoned plans for a Test Phase at the WIPP facility. Prior to initiating disposal operations, the DOE must seek another NMD from the EPA for disposal operations. The DOE will not receive transuranic mixed waste for disposal at the WIPP facility unless a disposal-phase NMD is granted by the EPA or this waste is otherwise exempted from the Land Disposal Restrictions (LDR) of 40 CFR Part 268. Currently, the DOE has no plans for treatment of the waste to meet the LDR, and in the event that a variance is not granted, the DOE would manage only non-mixed waste until appropriate treatment methods have been identified and that waste has been treated.~~

~~In May 1995, the DOE issued a draft NMVP for the disposal phase. This draft submittal focused on a demonstration of compliance with the no-migration standards during disposal operations and the closure period. The long-term demonstration of no migration will be presented in the final NMVP, which is scheduled to be submitted to the EPA in June 1996. Once an NMD has been issued by the EPA for the disposal phase, the DOE will comply with all associated terms and conditions.~~

~~In order to fulfill the requirement of Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1, Subpart IX, §270.14(b)(21), a copy of the Test Phase NMD is included as Appendix L1. However, as previously stated, the DOE has abandoned plans for a Test Phase and does not propose to conduct any activities relating to a Test Phase.~~ TRU mixed waste is exempted from LDRs by the Land Withdrawal Act Amendment (Public Law 104-201). This amendment states that WIPP "waste is exempt from treatment standards promulgated pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S.C. 6924(m)) and shall not be subjected to the land prohibitions in section 3004 (d), (e), (f), and (g) of the Solid Waste Disposal Act."

visually examining the core and describing the observation (e.g., undisturbed, cracked, or pulverized) in the field logbook.

If core recovery is less than 50 percent of the depth of the waste, a second coring location shall be randomly selected. ~~The core from the second location shall be used for sample collection regardless of the core recovery.~~ The most representative core shall be used for sample collection.

~~$MDC = K_1K_2 (2.71 + 4.65 \times s_b)$~~ ~~C8-11~~

C8-4 Radiography

Quality Assurance Objectives

The QAOs for radiography are detailed in this section. If the QAOs described below are not met, then corrective action, such as additional operator training must be taken. It should be noted that radiography does not have a specific MDL because it is primarily a qualitative determination. The objective of radiography for the program is to verify the waste matrix parameters for each waste container and to estimate each waste material parameter weight (Table C8-1). All activities required to achieve these objectives must be described in the site quality assurance project plan (QAPjP) and standard operating procedures (SOP).

Data to meet these objectives must be obtained from an audio/videotaped scan provided by trained radiography operators at the sites. Results must also be recorded on a radiography data form. The precision, accuracy, completeness, and comparability objectives for radiography data are presented below.

Precision

The qualitative determinations, such as verifying the waste matrix code, made during radiography do not lend themselves to statistical evaluation of precision. However, comparison of data derived from radiography and visual examination on the same waste containers at the Rocky Flats Environmental Technology Site and the Idaho National Engineering Laboratory indicates that radiography operators can provide estimated inventories and weights of waste items in a waste container. As a measure of precision, the Site Project QA Officer shall calculate and report the RPD between the estimated waste material parameter weights as determined by radiography and these same parameters as determined by visual examination.

Accuracy

The accuracy with which the waste matrix code and waste material parameter weights can be determined must be documented through visual examination of a randomly selected statistical portion of waste containers. The percentage of waste containers that require assignment to a

Table D9-ATT 1-1. Exposure Limits[a]

Substance	OSHA PEL[b]	ACGIH TLV	NIOSH REL[c]
Carbon tetrachloride (Tetrachloromethane)	10 ppm TWA (C) 25 ppm 200 ppm peak for 5 min in any 4 hrs	5 mppm TWA, 31 mg/m^3 10 ppm STEL, 63 mg/m^3 Animal Carcinogen	2 ppm STEL (60 min), 12.6 mg/m^3 Carcinogen 200 ppm IDLH
Chlorobenzene	75 ppm TWA, 350 mg/m^3	10 ppm TWA, 46 mg/m^3	NL[d] 1,000 ppm IDLH
Chloroform (Trichloromethane)	(C) 50 ppm, (C) 240 mg/m^3	10 ppm TWA, 49 mg/m^3 Suspected human carcinogen	NL[e] 2 ppm STEL (60 min), 9.78 mg/m^3 Carcingoen 500 ppm IDLH
1,1-Dichloroethylene (Vinyliden chlorode)	NL	5 ppm TWA, 20 mg/m^3 20 ppm STEL, 79 mg/m^3	NL[e] Carcinogen IDLH not determined
1,2-Dichloroethane (Ethylene dichloride)	~~100~~50 ppm TWA (C) 200 ppm 300 ppm peak for 5 min in any 3 hrs	10 ppm TWA, 40 mg/m^3	NL[e,f] 1 ppm TWA, 4 mg/m^3 2 ppm STEL, 8 mg/m^3 Carcinogen 50 ppm IDLH
Methylene chloride (Dichloromethane)	500 ppm TWA (C) 1,000 ppm 2,000 ppm peak for 5 min in any 2 hrs	50 ppm TWA, 174 mg/m^3 Suspected human carcinogen	NL[e] Carcinogen 2,300 ppm IDLH
1,1,2,2-Tetrachloroethane	5 ppm TWA, 35 mg/m^3 Skin designation	1 ppm TWA, 6.9 mg/m^3 Skin designation	NL[ef] 1 ppm TWA, 7 mg/m^3 Carcinogen, skin designation 100 ppm IDLH
Toluene	200 ppm TWA (C) 300 ppm 500 ppm peak for 10 min	50 ppm TWA, 188 mg/m^3 Skin designation	100 ppm TWA, 375 mg/m^3 150 ppm STEL, 560 mg/m^3 500 ppm IDLH
1,1,1-Trichloroethane (Methyl chloroform)	350 ppm TWA, 1,900 mg/m^3	350 ppm TWA, 1,910 mg/m^3 450 ppm STEL, 2,460 mg/m^3	(C) 350 ppm (15 min), (C) 1,900 mg/m^3 700 ppm IDLH

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____ Page 1 of 3

I. INITIAL INFORMATION DATE:_____ TIME:_____

EST:_____ REPORTED LOCATION_____

REPORTED BY:_____DEPT.:_____

INITIALLY REPORTED TO:_____DEPT.:_____

RESPONSIBLE MANAGER:_____DEPT.:_____

II. WEATHER CONDITIONS WIND DIRECTION_____WIND SPEED:_____mph TEMP.:____F

CONDITIONS (ie., icy, snowing, raining, cloudy, sunny):_____

III. TYPE OF INCIDENT (SPILL, LEAK, ETC.):_____Fire involved: [ ]YES [ ]NO

(If fire is involved attach a copy of the fire report)

MATERIALS INVOLVED	UN/NA NO.	QUANTITY	HAZARD CLASS	NFPA CLASS

VI. PERSONNEL INVOLVED IN CLEAN-UP ACTIVITIES

PERSONNEL/DEPT	DECON METHOD/MEDICAL TREATMENT

V. PERSONNEL CONTAMINATED NOT INVOLVED IN THE CLEANUP ACTIVITIES

PERSONNEL/DEPT.	MATERIAL CONTACTED	DOCON/MEDICAL TREATMENT

Figure G-12
WIPP Hazardous Materials Incident Report

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____

~~V~~VI. EQUIPMENT USED FOR CLEAN-UP AND CONTROL MEASURES

EQUIPMENT/MATERIAL/PPE	QUANTITY	DISPOSITION (decon or replacement)

~~VI~~VII. DESCRIPTION OF INCIDENT AND RESPONSE (including containment and control)

_____

~~VII~~VIII. ~~TO BE COMPLETED BY~~ ENVIRONMENTAL COMPLIANCE AND SUPPORT ~~SECTION~~

Date:_____ Time:_____of evaluation.

Waste Category_____Disposal Method_____

ORGANIZATION	DATE	TIME

EC&S Representative:_____

Print name Signature Date

Figure G-12 (Continued)
WIPP Hazardous Materials Incident Report

WIPP HAZARDOUS MATERIAL INCIDENT REPORT

Date:_____ Location:_____ Page 3 of 3

VIIIX. ~~TO BE COMPLETED BY THE CMRO AND FSM~~INITIAL NOTIFICATION BY CMRO

DEPARTMENT	PERSON CONTACTED	TIME	NOTIFIED BY
Facility Ops (FSM)			
Emerg. Mgmt (EST)			
EC&S			
Industrial Safety			
Facility Ops. (FM/FMD)			

CMRO:_____

Print name Signature Date

FSM:_____

Print name Signature Date

X. CONTINGENCY PLAN IMPLEMENTATION

Contingency Plan Implemented? Y N

FSM:_____

Print name Signature Date

XI. ~~TO BE COMPLETED BY HAZARDOUS~~ WASTE OPERATIONS

Disposition:_____

Hazardous Waste Operations Waste Operations Representative:_____

_____

Print name Signature Date

~~X~~XII. REVIEWS

Report submitted by:_____

Print name Signature Date

Emergency Management Manger:_____

Print name Signature Date

EC&S Manager:_____

Print name Signature Date

COMMENTS:_____

_____

_____

_____

_____

Figure G-12 (Continued)
WIPP Hazardous Materials Incident Report