

Notice of RCRA Class 1 Permit Modification
in Accordance with 20 NMAC 4.1.900
(40 CFR Part 270)

Waste Isolation Pilot Plant
Carlsbad, New Mexico

January 25, 2000

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Consistent with requirements of 20 New Mexico Administrative Code (NMAC) 4.1.900 (hereafter referred to as Part 270 or Section 270.XX) the U.S. Department of Energy, Carlsbad Area Office is submitting to the New Mexico Environment Department (NMED) a notice of Class 1 modifications to the Hazardous Waste Facility Permit (#NM4890139088-TSDF) for the Waste Isolation Pilot Plant (WIPP). Specifically, this information is provided to comply with the requirements of Section 270.42(a)(i).

Modifications are listed in Table 1. Listed information includes a reference to the applicable section of the permit, a brief description of the item, and the class of the item, as identified in Appendix I to Section 270.42. The relevant permit modification category, as also identified in Appendix I, is provided as well. More complete descriptions of the class 1 modifications are provided in Attachment 1.

One of these modifications cannot be classified based on Appendix I of 40 CFR §270.42. This is because this is a change affecting the calculation of VOC emissions from the miscellaneous unit. The DOE is requesting that the Secretary review and approve this modification request as a Class 1. The rationale for this request is included with Item 4.

The identified changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment and the modified permit is no less stringent than the current permit.

Table 1. Class 1 Hazardous Waste Facility Permit Modification

No.	Affected Permit Section	Item	Category	Attachment 1 Page #
1	I.F.	Reword condition to be consistent with the applicable regulations and to eliminate the need for unnecessary documentation	A.1	A-1
2	Table B3-7	Require the use of a 5-point initial calibration for analysis of PCB in homogeneous solids or soils and gravels.	B.2.a	A-2
3	B1-4	Change the use of custody seals to be consistent with other portions of the permit and with standard laboratory practice.	B.2.a	A-3
4	IV.D.2	Change the basis for VOC emission calculation in the underground from container-based to room-based	*	A-4
5	Attachment D1	Replace Self-Rescuer Inspection form to indicate new procedure number and different organization responsible for the review and validation of the self-rescuer quarterly check.	A.1	A-9
6	B-4b(1)	Revise names of WWIS reports to agree with software	A.1	A-10
7	Table F-2	Change in address for emergency coordinator	B.6.d	A-12
8	III.A.2 D-1b(1) Figure M1-2	Move fence to allow maneuvering room for trucks.	A.1	A-13
9	Figure F-1 Figure G-1	Modify figures to show the addition of a shelter for Salt Hauling Trucks	A.1	A-15
10	Attachment D1	Changes to several Facility Operations Log Sheets	A.1	A-16

11	H-1b(1) Attachment H1 Attachment H2	Update Training course number to reflect century change	B.5.b	A-18
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*Appendix I of §270.42 does not contain guidance for modifications for 40 CFR 264 Subpart X Miscellaneous Units. Therefore, consistent with 40 CFR §270.42(d)(1), the DOE requests that the NMED determine that this modification should be reviewed and approved as a Class 1 modification. The basis for this request is provided in the “Basis” and “Discussion” sections for this modification. Information supporting this request is contained in Attachment C.

ATTACHMENT 1

DESCRIPTIONS OF THE HAZARDOUS WASTE FACILITY PERMIT MODIFICATION

Item - 1

Description:

Move the words “required by this permit” to follow the word “reports” to make the condition consistent with the regulations at 20 NMAC 4.1.900 (incorporating 40 CFR §270.11(a) and (b)).

Basis:

The regulations at 20 NMAC 4.1.900 (incorporating 40 CFR §270.30(k)) require that certain information be signed by the Permittees as specified in 20 NMAC 4.1.900 (incorporating 40 CFR §270.11(a) and (b)). This section requires that certification statements accompany certain submittals. The language in the Permit extends the requirement for certification beyond certain submittals to all submittals. Certifying all submittals required by the Permit was not intended by the regulations. Making the indicated change would not lessen the Permittees obligation to certify permit applications and reports and would not affect human health and the environment.

Discussion:

The requirement in Condition I.F. dictates that every submittal required by the WIPP Permit be certified in accordance with 20 NMAC 4.1.900 (incorporating 40 CFR §270.11(a) and (b)). This means that such items as letters listing auditors (as required by Attachment B6-3) must be certified. Discussions with NMED have indicated that such certification is not necessary for such lists. The regulations at 20 NMAC 4.1.900 (incorporating 40 CFR §270.11(a) and (b)) were not intended to require that all submittals be certified. Instead, §§270.11(a) and (b) only require that applications and reports required by the permit be certified. It appears that the EPA intended that the phrase “required by the permit” modify only “reports” and not every item required by a permit. Furthermore, §270.11, titled “Signatories or Permit Applications and Reports,” is interpreted to require certification of permit applications and reports required by the permit, but not every correspondence, such as lists and other information.

The item above is a Class 1 permit modification under Section 270.42, Appendix I, A.1. This change to the permit is most appropriately classified as an administrative and informational change. The item neither substantially alters the permit conditions nor reduces the capacity of the facility to protect the human health and the environment.

Revised Permit Text:

Permit Module I, Page I-8 of 11

I.F. SIGNATORY REQUIREMENT

The Permittees shall sign and certify, as specified in 20 NMAC 4.1.900 (incorporating 40 CFR §270.11) all applications, ~~or reports required by this Permit, or information submitted to or requested by the Secretary or required by this Permit.~~ [20 NMAC 4.1.900 (incorporating 40 CFR §270.30(k))]

Item - 2

Description:

Change the “3-pt. Initial Calibration initially and as needed” in Table B3-7 to “5-pt. Calibration initially and as needed” to align with SW-846 requirements.

Basis:

This change eliminates an inconsistency between the permit and a requirements of the EPA’s analytical method for Gas Chromatography/Electron Capture Detectors (GC/ECD).

Discussion:

Table B-1 requires use of SW-846 Method 8082 for PCB analysis. Table B3-7 provides calibration requirements for GC/ECD (i.e., PCBs). The table requires a 3-point initial calibration, which is inconsistent with the calibration requirements in Method 8082. Method 8082 requires the user to calibrate using a 5-point curve with Aroclors 1016 and 1260 (they contain peaks representative of the other 5 Aroclors) and a single-point calibration for all other Aroclors. The 5-point curve is more stringent.

The item above is a Class 1 permit modification under Section 270.42, Appendix I, B.2.a. This change to the permit is most appropriately classified as change to the waste analysis quality assurance/quality control plan in order to conform with agency guidance. The change is more stringent than the existing condition and therefore does not reduce the capacity of the facility to protect the human health and the environment.

Revised Permit Text:

Table B3-7

QC Sample	Minimum Frequency	Acceptance Criteria	Corrective Action
GC/ECD Calibration	3-pt. Initial 5-pt. Calibration initially and as needed Continuing Calibration every 12 hours	Correlation Coefficient \geq 0.990 or %RSD < 20 for all analytes %D or %Drift for all analytes # 15 of expected values, RT \pm 3 standard deviations of initial calibration	Repeat until acceptable

Item - 3

Description:

Clarify the requirement regarding the use of custody seals on samples when being handled within the analytical laboratory.

Basis:

Attachment B1-4 of the Permit contains conflicting language with regard to the maintenance of custody of samples within the analytical laboratory. The text of the permit refers to samples as “custody sealed”, but also refers to the use of “sealed containers” and one of several options for maintaining sample integrity. The proposed clarification of the permit aligns the permit with common laboratory practice and precludes the need to re-seal samples within a laboratory glovebox after an aliquot is removed for analysis.

Discussion:

Permit Attachment B1-4 requires the following:

Chain-of-Custody on field samples (including field QC samples) will be initiated immediately after sample collection or preparation. Sample custody will be maintained by ensuring that custody sealed samples are in the possession of an authorized individual, in that individual's view, in sealed or locked container controlled by that individual, or in a secure controlled access location. Sample custody will be maintained until the associated analyses are completed and the data have been validated at the project level. Sample custody will be maintained until the sample is expended or until the sample is removed from the sample analysis program.

In this text, the reference to samples as custody “sealed” indicates that samples are to have seals on them from the time they are sampled until final disposition. Attachment B1-5 indicates that these seals should be signed by the individual placing the seal on the sample. This means that when the sample is opened in the laboratory, and an aliquot extracted, the sample must be re-sealed with a tamper-indicating device. These operations would typically be performed in a glovebox and may be extremely difficult, if not impossible to complete without greatly increasing the risk of radiological exposure. Alternatively, the text also indicates that “sealed containers” is but one option for maintaining sample custody within the analytical laboratory. If samples are under an individual's control, are kept in the glovebox, or locked in a cabinet when not undergoing analysis, security is sufficient to meet the intent of the custody requirements.

EPA guidance in SW-846 addresses the use of custody seals from the sampling site to the laboratory. However, the guidance is silent on the use or maintenance of seals within the laboratory.

The proposed change does not result in any less rigorous management of samples,

because the same level of control is required within the laboratory whether or not signed seals are reattached to samples. Instead, the change allows the laboratory to reduce risk of exposure to radiation consistent with DOE's ALARA policy.

Revised Permit Text:

B1-4 Custody of Samples

Chain-of-Custody on field samples (including field QC samples) will be initiated immediately after sample collection or preparation. Sample custody will be maintained by ensuring that ~~custody sealed~~ samples are **custody sealed during shipment to the laboratory. After samples are accepted by the analytical laboratory, custody is maintained by assuring the samples are** in the possession of an authorized individual, in that individual's view, in a sealed or locked container controlled by that individual, or in a secure controlled access location. Sample custody will be maintained until the associated analyses are completed and the data have been validated at the project level. Sample custody will be maintained until the sample is expended or until the sample is removed from the sample analysis program. The Permittees shall require that site QAPjPs or site-specific procedures include a copy of the sample chain-of-custody form and instructions for completing sample chain-of-custody forms in a legally defensible manner. This form will include provisions for each of the following:

Item - 4

Description:

Replace the existing reliance on the existing VOC emissions modeling assumptions with the requirement to meet calculated VOC room-based emission rate limits.

Basis:

The Permit currently requires that containers be fitted with a filter that is equivalent to or better than the filter used in the VOC emission modeling. This requirement is based on the assumptions made during the VOC emissions modeling that were based on VOC concentration limits being required for individual containers. The permit included VOC limits based on disposal room concentrations instead of the concentrations in individual containers. In order to be consistent with the emissions limit basis in the permit, the requirement for the filter to be equivalent to or better than the filter used in the VOC emission modeling should be replaced with the functionally equivalent requirement of VOC room-based emission rate limits. Because the new requirement is functionally equivalent and does not decrease the amount of waste characterization or monitoring required by the permit, this change should be considered a Class 1 modification.

Discussion:

Permit Attachment M1-1b requires that all containers be fitted with a filter vent that meets the requirements of Attachment M1-1d(1) as follows:

The filter media can be any material (e.g., composite carbon, sintered metal) as long as the filter VOC diffusion characteristics are equivalent to (or better than) those used in the VOC emission modeling.

The VOC emission modeling that is referred to is the modeling presented in Appendix D9 of the WIPP RCRA Part B Permit Application (Permit Application). At the time the modeling in Appendix D9 was being conducted, there were established container-based VOC concentration limits. Currently, the Permit has established room-based VOC concentration limits in lieu of the container-based limits. This allows the Permittees to manage any VOC concentration in a container as long as the overall room-based concentration limits are not exceeded. However, when the NMED imposed room-based limits in lieu of the container-based limits in the permit application, they retained the container specific limitation on filter characteristics. Retaining the container specific parameters regarding filters is inconsistent with the concept of regulating VOC concentrations on a room basis.

The VOC monitoring requirements establish a VOC concentration of concern for VOC monitoring station A in Table IV.F.2.c that, if exceeded, results in the corrective action specified in Module IV, Section IV.F.2.d. The concentrations specified in Table IV.F.2.c establish a condition to ensure that any VOC emissions are at levels that do not adversely impact human health and the environment. In addition, the Permit establishes a condition regarding filter diffusion characteristics based on the analyses presented in

Appendix D9.

At the time the VOC emission modeling calculations presented in Appendix D9 were conducted, the VOC limits were applied on a per container basis rather than the existing room average basis (i.e., Permit Table IV.D.1). The filter diffusivity value specified in the original calculations was necessary to demonstrate that a room full of containers with maximum allowable headspace gas concentrations would result in emissions that are below the regulatory limits. However, with the current provision that the allowable VOC concentrations are applied on a room average, a permit condition on emission rate should be tied to a corresponding room average VOC room-based emission rate limit rather than a specific filter diffusion characteristic.

A study was conducted to develop a bounding VOC room-based emission rate limit based on maintaining compliance with existing Permit conditions. This study developed a set of emission rates necessary to meet the concentrations associated with the Appendix D9 occupational exposure and public exposure scenarios and the Permit VOC concentrations of concern (i.e., Permit Table IV.F.2.c). A final set of bounding room-based VOC emission rates was then developed by selecting the most restrictive emission rate from the results of each of the scenarios. A copy of a study presenting the basis for the final proposed VOC room-based emissions rate limits is attached to this permit modification request (See Attachment C). This study fulfills the requirement to present "necessary information to support the requested classification" as required by 20 NMAC 4.1.900 (incorporating 40 CFR §270.42(d)(1)).

It should be noted that this request will allow for multiple filters on a single container, because the diffusivity of the filters is additive. In other words, having two filters of a known diffusivity is equivalent to having one filter with the simple sum of those two known diffusivities.

Revised Permit Text:

A. Module IV.D should be modified as follows:

IV.D. VOLATILE ORGANIC COMPOUND CONCENTRATION LIMITS

The Permittees shall limit releases to the air of volatile organic compound waste constituents (**VOCs**) as specified by the following conditions, as required by 20 NMAC 4.1.500 (incorporating 40 CFR §264.601(c)):

IV.D.1 Room-Based Limits

The Permittees shall maintain control over room-based limits for VOC concentration and emission rate.

IV.D.1.a VOC Room-Based Concentration Limits -

The average measured concentration of VOCs in the headspace gas of all containers in any single room within an Underground HWDU

shall not exceed the limits specified in Table IV.D.1.a below:

Table IV.D.1.a - VOC Room-Based Limits	
Compound	VOC Room-Based Concentration Limit (PPMV)
Carbon Tetrachloride	9625
Chlorobenzene	13000
Chloroform	9930
1,1-Dichloroethene	5490
1,2-Dichloroethane	2400
Methylene Chloride	100000
1,1,2,2-Tetrachloroethane	2960
Toluene	11000
1,1,1-Trichloroethane	33700

There are no maximum concentration limits for other VOCs.

IV.D.1.b VOC Room-Based Emission Rate Limits - The average calculated emission rate of VOCs from the headspace gas of all containers in any single room within an Underground HWDU shall not exceed the limits specified in Table IV.D.1.b below:

Table IV.D.1b - VOC Room-Based Emission Rate Limits	
Compound	VOC Room-Based Emission Rate Limit (mole/room/year)
Carbon Tetrachloride	5.83E+03
Chlorobenzene	8.95E+03
Chloroform	4.95E+03
1,1-Dichloroethene	4.44E+03
1,2-Dichloroethane	1.95E+03
Methylene Chloride	8.75E+04

1,1,2,2-Tetrachloroethane	2.08E+03
Toluene	7.83E+03
1,1,1-Trichloroethane	2.45E+04

There are no maximum concentration limits for other VOCs.

IV.D.2 Determination of VOC Room-Based Limits Concentrations

The Permittees shall ~~determine~~ confirm the ~~concentrations of the VOCs~~ concentrations and emission rate limits identified in Permit Condition IV.D.1 using the following procedures.

IV.D.2.a VOC Confirmatory Monitoring - the Permittees shall conduct confirmatory monitoring of VOCs as specified in Permit Condition IV.F.2.

IV.D.2.b WIPP Waste Information System (WWIS) Report - the Secretary shall have the capability of generating a report from the WWIS database identifying the average concentrations and emission rates of the VOCs specified in Table IV.D.1.a and Table IV.D.1.b on a room and panel basis, based upon the actual waste containers disposed, and the VOC headspace gas sampling data for those containers, and the filter diffusion characteristics for those containers.

B. Permit Attachment M1, Section M1-1d(1) should be modified as follows:

The Safety Analysis Report (DOE 1997b) for packaging requires the lids of TRU mixed waste containers to be vented through high efficiency particulate air (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 can be any material (e.g., composite carbon, sintered metal) as long as the filter VOC diffusion characteristics are equivalent to (or better than) those used in the VOC emission modeling.

Item-5

Description:

Change the header on the Self-Rescuer Inspection form, contained in Permit Attachment D1, to reflect the implementing procedure number (WP 04-AU1026). Change the last block on the form to state: "NOTE: Completion of this step by an Underground Operations Manager constitutes validation of this record."

Basis:

WIPP Procedure WP 04-AD3026 has been re-classified from an "administrative procedure" to a "technical procedure", therefore the self-rescuer quarterly check inspection form is now contained in Attachment 1 of WP-AU1026. The updated inspection form also indicates that the activity is now performed by the Underground Operations Section instead of the Hoisting Operations Section. The new form does not contain any changes to the content of the inspection or the frequency of the activity being performed.

Discussion:

The item described above is a Class 1 permit modification under Section 270.42, Appendix I, A.1. The most appropriate classification of this change to the permit would be as an administrative and informational change. It is a minor change to the permit necessary to keep it current with facility operations. This item does not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment and the modified permit is no less stringent than the current permit.

Revised Permit Text:

Attachment D1:

See Attachment B for updated form.

Item - 6

Description:

The titles of the WIPP Waste Information System (WWIS) Reports that are required in the final permit are different than those programmed into the WWIS software. This modification changes the reports in the permit to avoid confusion.

Basis and Discussion:

The Final Permit, Attachment B-4b(1) requires that the WWIS be capable of printing several reports. The titles used in the Final Permit are different than the actual titles that are programmed into the software. This modification changes the titles only and does not change the content of the reports. Making the titles consistent will avoid confusion should anyone which to compare the output from the WWIS with the final permit.

Permit Text Changes:

Attachment B-4b(1):

B-4b(1)(i) WWIS Description

All generator/storage sites planning to ship TRU mixed waste to WIPP will supply the required data to the WWIS. The Permittees will use the WWIS to verify that all of the supplied data meet the edit and limit checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically will notify the generator/storage site if any of the supplied data fails to meet the requirements of the edit and limit checks via an appropriate error message. The generator/storage site will be required to correct the discrepancy with the waste or the waste data and re-transmit the corrected data prior to acceptance of the data by the WWIS. The Permittees will review data reported for each container of each shipment prior to providing notification to the shipping generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be provided to the NMED. Table B-8 gives a partial listing of the data fields contained in the WWIS that are required as part of this permit.

The WWIS will generate the following:

C ~~Container~~Waste Emplacement Report

This report will be added to the operating record as an indication of the quantities of waste, date of emplacement, and location of authorized containers or container assemblies in the repository. The Permittees will document the specific panel room or drift that an individual waste container is placed in as well as the row/column/height coordinates location of the container or containers assembly. This report will be generated on a weekly basis. Locations of containers or container assemblies will also be placed on a map separate from the WWIS. Reports and maps that are included as part of the operating record will be retained at the WIPP site, for the life of the facility.

C Shipment Summary Report

This report will contain the container IDs of every container in the shipment, listed by TRUPACT-II number and by assembly number (for seven packs), for every assembly in the TRUPACT-II. This report is used by the Permittees to verify containers in a shipment and will be generated on a shipment basis.

C ~~Characterization~~ Waste Container Data Report

This report will be generated on a waste stream basis and will be used by the Permittees in the Waste Stream Profile Form review and approval process. This report will contain the data listed in the Waste Characterization Data Module on Table B-8. This report will be generated and attached to the Waste Stream Profile Form for inclusion in the facility operating record and will be kept for the life of the facility.

C Reports of Change Log

This will consist of a short report that lists the user ID and the fields changed. The report will also include a reason for the change. A longer report will list the information provided on the short report and include a before and after image of the record for each change, a before-record for each deletion, and the new information for added records. These reports will provide an auditable trail for the data in the database.

Item-7

Description:

Revise Table F-2 “Resource Conservation and Recovery Act Emergency Coordinators” on page 52 to reflect a change in home address and phone number for one of the emergency coordinators. Note that personal information (i.e., home address and phone numbers) for the other emergency coordinators is unchanged and has not been repeated in this submittal.

Basis:

Update of information on Emergency Coordinators as required by 40 CFR 264.54(d).

Permit Text Changes:

Table F-2

**TABLE F-2
RESOURCE CONSERVATION AND RECOVERY ACT
EMERGENCY COORDINATORS**

Name	Address*	Office Phone	Home Phone*
G. A. (Gerry) Burns (primary) ¹		234-8276 or 234-8635	
R. A. (Richard) Marshall (primary) ¹		234-8276 or 234-8695	
K. (Kim) Jackson (primary) ¹		234-8276 or 234-8453	
M. L. (Tex) Winans (primary) ¹		234-8276 or 234-8273	
G. L. (Garrod) Ashford ²	1005 N. Halagueno	234-8272	628-3987
R. C. (Russ) Stroble ²		234-8554	
E. R. (Ed) Flynn ²		234-8272 or 234-8276	
G. L. (Gary) Kessler ²		234-8326	
A. E. (Alvy) Williams ²		234-8216 or 234-8276	
P.J. (Paul) Paneral ²		234-8498	
M..L. (Mark) Long ²		234-8107	
D.A. (David) Frye		234-8272	

¹ The on-duty Facility Shift Manager is the primary RCRA Emergency Coordinator pursuant to 20 NMAC 4.1.500 (incorporating 40 CFR '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.

Item-8

Description:

Additional maneuvering room is needed behind the Waste Handling Building for trucks delivering and removing TRUPACT-IIs. Ample space is available by moving the southern fence. This fence marks the boundary of the Parking Lot Storage Area.

Basis:

In order to facilitate the movement of waste loaded in TRUPACT-IIs and the movement of empty TRUPACT-IIs within the area south of the Waste Handling Building, more space is needed. Sufficient area is available by moving a portion of the existing fence to just south of the railroad tracks, making the area over the tracks available for backing and turning trucks. This area is not to be used for parking or storage of TRUPACT-IIs. Since the fence that must be moved is described in the permit as part of the boundary of the Parking Lot Container Storage Unit, it is necessary to change the description to exclude the fence and specify the boundary is north of the railroad tracks. In this way, the size of the storage area is unchanged.

Description:

This is an administrative change to assure that after the fence is moved, the Parking Lot Storage Area boundary and size remain unchanged.

Permit Text Changes:

A. Module III.A.2.

III.A.2. Parking Area Container Storage Unit

The Parking Area Container Storage Unit (**Parking Area Unit**) is an asphalt and concrete surface extending from ~~the fence north of~~ **inside** the rail sidings to the WHB, within the Controlled Area. The Parking Area Unit shall be enclosed by chain link fence. The Parking Area Unit shall comprise a surface area of no more than 115,000 ft² (10,700 m²), as depicted in Permit Attachment M1, Figure M1-2.

B. Attachment D-1b(1)

Inspections will be conducted in the Parking Area Unit at a frequency not less than once weekly. These inspections are applicable to loaded, and stored TRUPACT-IIs. The perimeter fence located at the lateral limit of the Parking Area Unit, coupled with personnel access restrictions into the WHB Unit, will provide the needed security. The perimeter fence and the southern border of the WHB shall mark the lateral limit of the Parking Area Unit. Radiologically controlled area can be established temporarily with barricades. More permanent structures can be installed. The western boundary can be established with temporary barricades since this area is within the perimeter fence. Access to radiologically controlled areas will only be permitted to personnel who have

completed General Employee Radiological Training (**GERT**), a program defined by the Permittees, or escorted by personnel who have completed GERT. This program ensures that personnel have adequate knowledge to understand radiological posting they may encounter at the WIPP site. ~~If a fence is moved in the future, a permit modification will be submitted identifying the changes.~~ **The fence of the Radiologically Controlled Area, south from the WHB airlocks, was moved to provide more maneuvering space for the trucks delivering waste.** Since waste to be stored in the Parking Area Unit will be in sealed TRUPACT-II shipping containers, there will be no additional requirements for engineered secondary containment systems. Inspections of the TRUPACT-IIs stored in the Parking Area Unit shall be conducted at a frequency no less than once weekly and will focus on the inventory and integrity of the shipping containers and the spacing between trailers carrying the TRUPACT-II shipping containers. This spacing will be maintained at a minimum of four feet.

C. Figure M1-2

See attached Figure M1-2. (ATTACHMENT B)

Item-9

Description:

Modify two figures in the permit to show the addition of a structure.

Basis:

It is necessary to provide covered storage for salt haulage equipment on the surface. A structure is to be located west of the Salt Shaft. Construction of this structure does not impact the management of TRU or TRU mixed waste. However, it does alter two figures in the permit. This modification is to update the two affected figures.

Discussion:

This modification updates two figures in the permit and does not impact the ability of the facility to safely manage hazardous waste. This change is considered to be administrative in nature.

Permit Text Changes:

A. Figure F-1

See Attached Figure F-1. (ATTACHMENT B)

B. Figure G-2

See Attached Figure G-2. (ATTACHMENT B)

Item-10

Description:

Several Facility Operations Log Sheets have been updated to reflect changes. These changes do not affect the content or frequency of the inspection schedule.

Basis:

Several Facility Operations Log Sheets were obsolete because of the removal of unused (non-RCRA) equipment. In addition, several log sheets in the Permit were pre-signed. These should only be signed after the inspection is completed. This modification affects the following Facility Operations Log Sheets:

POWER SUPPLY DIESEL GENERATOR

Old Sheet: DIESEL GENERATOR LOG, Diesel Generator # ___ Sheet

New Sheet: DIESEL GENERATOR LOG, Diesel Generator # ___ Sheet

Change: Replace pre-signed sheet with unsigned sheet.

UNINTERRUPTIBLE POWER SUPPLY(UPS)

Old Sheet: FACILITY OPERATIONS ROUND SHEET, 451, ELEC.

EQUIP. RM. 104 & RM. 116 Log Sheet

New Sheet: FACILITY OPERATIONS LOG SHEET, 451, ELEC. EQUIP. RM. 116

Change: Delete unused equipment, remove comment, delete signature.

WATER TANK LEVEL

Old Sheet: FACILITY OPERATIONS ROUND SHEET, 456,

PUMPHOUSE BUILDING Log Sheet

New Sheet FACILITY OPERATIONS LOG SHEET, 456 PUMPHOUSE BUILDING

Change: Replace pre-signed sheet with unsigned sheet.

Discussion:

This modification updates three facility inspection log sheets in the permit and does not impact the ability of the facility to safely manage hazardous waste. This change is considered to be administrative in nature.

Permit Text Changes:

A. Attachment D1

See Attached DIESEL GENERATOR LOG, Diesel Generator # ___ Sheet

(ATTACHMENT B)

B. Attachment D1

See Attached FACILITY OPERATIONS LOG SHEET, 451, ELEC. EQUIP. RM. 116

(ATTACHMENT B)

C. Attachment D1
See Attached FACILITY OPERATIONS LOG SHEET, 456 PUMPHOUSE BUILDING
(ATTACHMENT B)

Item-11

Description:

General Employee Training and its associated refresher course are designated with a number that reflects the century (e.g., GET 20X). Previously courses were designated with a "19". These have now been updated to "20".

Basis:

The content of General Employee Training may change from year to year as facility conditions, regulatory conditions, or management policies change. In addition, employees are required to take a General Employee Training refresher course each year. Therefore, it is necessary to use a numbering system that allows the year to be identified. This system previously used "19" as the first two digits of the number. These have now been changed to "20". A permit change is necessary to update the course numbers. No change in the content or amount of training is included, therefore, this change is a Class 1 modification.

Discussion:

This modification updates numerous portions of Attachments H, H1, and H2 to reflect the new General Employee Training numbering system. There are numerous changes since General Employee Training is a prerequisite to many hazardous waste management worker courses. The revised text reflects both the "19" and "20" numbers since many workers satisfied the Initial General Employee Training requirement with a "19" series course. This change is administrative in nature.

Permit Text Changes:

A. Attachment H-1b(1)

This training is provided in GET-19X¹/GET-20X, conducted by the WIPP certified instructors, and must be completed within 30 days of employment.

Annual refresher training on the topics taught in GET-19X/GET-20X is given in the General Employee Training Annual Refresher (GET-19XA/GET-20XA). This self-paced module provides employees with a review and update of the topics covered in GET-19X/GET-20X.

WIPP employees involved in managing site-generated, nonradioactive waste, or TRU mixed waste will receive the Hazardous Waste Worker course (HWW-101). This comprehensive course will provide job specific training required to safely receive, transfer, or handle waste at the WIPP facility. Review and update of HWW-101 topics is provided annually in the Hazardous Waste Worker refresher course (HWW-102).

¹ The "X" in the course number is assigned the last number of the current year (e.g., GET-195 is General Employee Training for 1995, GET-200 is for the year 2000). Course content is updated annually to provide the latest information available to students.

Course outlines for GET-19X/GET-20X, GET-19XA/GET-20XA, HWW-101, and HWW-102 are provided in Permit Attachment H-2.

B. Attachment H1

RCRA Hazardous Waste Management Job Descriptions

Position Title: Hazardous Waste Worker

Duties:

- Performs hazardous waste operations in accordance with WIPP procedures

Requisite Skills, Experience and Education:

Academic or vocational high school diploma or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)

RCRA Hazardous Waste Management Job Descriptions

Position Title: TRU Waste Handlers

Duties:

- Operates waste handling equipment and support systems to unload, handle and emplace TRU mixed waste and backfill into the repository
- Performs functional and operational checks of waste handling equipment and support systems as well as conduct waste container storage area inspections
- Performs spot decontamination of shipping casks, waste containers, and waste handling equipment
- Perform waste container overpacking operations

Requisite Skills, Experience and Education:

Academic or vocational high school graduate with courses in algebra and physics or chemistry, or equivalent, plus two years of college-level technical study with courses in nuclear waste management and health physics, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Waste Handling Operations Qualification Card Signature (WH-01A Backfill Technician, WH-01B Floor, Yard, and Emplacement Technician, and WH-01C Waste Handling Technician or WH-02 Waste Handling Engineers) and Waste Handling Operations Guidebook (WH-GUIDE-1)
- ! Radworker II (RAD-201)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Respiratory Protection (SAF-630/631)
- ! Hazardous Waste Responder (HWR-101, 101A)
- ! Hazardous Waste Transportation (HMT-102)
- ! Forklift Safety (EQP 402) (Once)
- ! Conduct of Shift Operations (OPS 115) (Once)
- ! Technical Safety Requirements (OPS 122) (Once)
- ! Incident Rigger (OPS 402) (Biennial)
- ! Procedure Guidelines (PDI 101) (Once)
- ! 40-Hour Inexperienced Miner (SAF 501/502) (Annual)
- ! Subject Matter Expert/On the Job Trainer (TRG 293/298) (Biennial)
- ! Waste Handling Systems (STC-003) (Once)

NOTE: Waste Handling Technicians will not participate in TRU waste handling activities and integrated system functions unsupervised until full qualification is acquired.

RCRA Hazardous Waste Management Job Descriptions

Position Title: Underground Hazardous Waste Worker

Duties:

- Move waste from generation point to waste hoist
- Containerize waste generated at the wash bay and exhaust shaft catchment basin

Requisite Skills, Experience and Education:

High school diploma or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/~~GET-20X~~) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Non-TRU Waste Handlers

Duties:

- Supervises/oversees the preparation of hazardous waste for shipment
- Inspects and inventories hazardous waste staging areas
- Assists the transfer of site-generated hazardous waste to on-site staging areas
- Directs storage of hazardous waste in the hazardous waste staging areas
- Conducts inspections of Satellite Accumulation Areas

Requisite Skills, Experience and Education:

Associate degree in engineering, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Transportation of Hazardous Material (HMT-102)
- ! Hazardous Materials Qualification Card (TE-03)
- ! Hazardous Waste Shipments by Public Highway Qualification Card (TE-05)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Waste Operations Administrative Assistant

Duties:

- Review hazardous waste manifests and accompanying land disposal restriction notification forms upon receipt of TRU mixed waste shipments
- Interface with waste generators and external agencies to resolve manifest discrepancies
- Prepare hazardous waste manifests and supporting documentation for outgoing shipments of TRU mixed waste
- Provide generator sites with a signed copy of the hazardous waste manifest

Requisite Skills, Experience and Education:

Associate degree in engineering, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/~~GET-20X~~)
- ! General Employee Training Refresher (GET-19XA/~~GET-20XA~~)
- ! Transportation of Hazardous Material (HMT-102)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Radioactive Transportation Qualification Card (TE-01)
- ! Federal Motor Carrier Safety Regulations Qualification Card (TE-02)
- ! Hazardous Materials Qualification Card (TE-03)
- ! Hazardous Waste Shipments by Public Highway Qualification Card (TE-05)

RCRA Hazardous Waste Management Job Descriptions

Position Title: WWIS Data Administrator

Duties:

- Supervise the day to day operation of the WWIS
- Review and approve waste characterization, certification, and shipping data
- Manage the WWIS, including data change control, archival of the database, and reporting functions
- Review Waste Stream Profile Forms (WSPF) and compare with WWIS data on specific containers. Make approval/rejection recommendations to the WSPF review team

Requisite Skills, Experience and Education:

Bachelor of Science degree with technical courses in nuclear waste management, chemistry and health physics, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/~~GET-20X~~)
- ! Subject Matter Expert/On-The-Job Training (TRG-293/298)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Manager, Waste Operations

Duties:

- Oversee all TRU waste and non-TRU waste handling activities conducted by Waste Operations personnel

Requisite Skills, Experience and Education:

B.S. degree, or equivalent, in nuclear-related field.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Worker Supervisor (HWS-101/101A)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Radiological Control Technician

Duties:

- Conducts routine surveys of all incoming shipping containers for radiation, contamination, and damage
- Conducts routine radiological surveys (monitoring for surface and airborne contamination and radiation exposure) of various areas at the WIPP site
- Serves as emergency response personnel for any event involving radiation and radioactive materials
- Oversees any radiological work at the facility. This duty involves writing radiological work permits (RWPs), issuing radiological protective clothing and supplemental dosimetry, conducting radiological monitoring of the job (including personnel, equipment, and areas involved), as well as providing any other radiological safety oversight function
- Monitors TRU waste handling and related operations, as well as any other radiological work, to determine compliance with radiological control documents and procedures
- Performs operational and functional checks of radiological detection and monitoring equipment
- In the unlikely event of personnel radiological contamination, the RadCon Tech is qualified to perform personnel decontamination and provide radiological oversight to medical personnel if an injury is contaminated
- Posts radiological areas with applicable signs and barriers
- Controls radioactive sources (including leak testing) used in the performance/functional checks and calibrations of radiological instrumentation
- Operates some non-radiological measurement equipment associated with radiological monitoring (gravimetric scale, chart recorders, data loggers, etc.)

Requisite Skills, Experience and Education:

Academic or vocational high school graduate, or equivalent, with courses in chemistry, physics, geometry, or trigonometry, or equivalent; associate degree in radiation safety or health physics preferred.

**RCRA Hazardous Waste Management Job Descriptions
(continued)**

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Health Physics Technician Qualification (RCT-01/02)
- ! Radiological Worker II (RAD-201)
- ! Respiratory Protection (SAF-630/631)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Responder (HWR-101/101A)
- ! Conduct of Shift Operations (OPS-115)
- ! First Aid/CPR (MED-101 or 101A)
- ! Electrical Safety (ELC 103) (Annual)
- ! Hazardous Material Transportation (HMT 102/103) (Biennial)
- ! 40-Hour Inexperienced Miner (SAF 501/502) (Annual)
- ! compressed Gas Cylinder Safety (SAF 619) (Once)
- ! Fundamental Academic Lessons
- ! Site-Specific Academic Lessons

RCRA Hazardous Waste Management Job Descriptions

Position Title: Manager, Radiation Control

Duties:

- Supervises/oversees hazardous waste management duties performed by personnel in the Radiation Control section

Requisite Skills, Experience and Education:

B.S. degree in engineering, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Worker Supervisor (HWS-101/101A)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Technical Trainer

Duties:

- Conduct Hazardous Waste Management training

Requisite Skills, Experience and Education:

High school graduate with knowledge in areas of skills taught.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Level II Trainer (TRG-300)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Manager, Technical Training

Duties:

- Directs hazardous waste management training

Requisite Skills, Experience and Education:

B.S. degree and 5 years nuclear experience, or seven years nuclear training experience, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Level II Trainer (TRG-300)
- ! Subject Matter Expert/On-the-Job Training (TRG-293/298)
- ! Hazardous Waste Supervisor ((HWS-101)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Emergency Services Technician

Duties:

- Responds to hazardous waste spills in emergency situations
- Provides emergency fire-response services
- Conducts routine inspections and maintains all response equipment on site
- Directs emergency teams to control hazardous situations

Requisite Skills, Experience and Education:

Vocational or commercial high school graduate, or equivalent, plus additional training in emergency fire and medical response, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! EST Qualification Card (EST-01)
- ! Subject Matter Expert/On-The-Job Training (TRG-293/298)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Respiratory Protection (SAF-630/ 631)
- ! Firefighter I (SAF-621)
- ! Hazardous Waste Responder (HWR-101/101A)
- ! Incident Command Structure (ERT 113) (Once)
- ! Radiological Worker II (RAD 201) (Annual)
- ! 40-Hour Inexperienced Miner (SAF 501/502) (Annual)
- ! Heated Environment/Confined Space (SAF 515/515A) (Annual)
- ! Compressed Gas Cylinder Safety (SAF 619) (Once)

NOTE: The trainee may perform duties prior to qualification only for those evolutions and/or operations for which training has been completed.

RCRA Hazardous Waste Management Job Descriptions

Position Title: Quality Assurance Technician

Duties:

- Observes waste handling operations and verifies adherence with hazardous waste handling procedures

Requisite Skills, Experience and Education:

Vocational, technical or high school graduate, or equivalent, plus two years of technical training with courses in inspection techniques, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Quality Assurance Inspector Qualification Card

RCRA Hazardous Waste Management Job Descriptions

Position Title: Team Leader, Inspection Services

Duties:

- Ensures that items or services that do not conform with specified quality requirements are controlled to prevent use until disposition and corrective action, where applicable, are implemented
- Provides technical supervision for Quality Assessment Technicians inspecting and verifying waste handling operations

Requisite Skills, Experience and Education:

Associate of science degree in a technical field, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Worker Supervisor (HWS-101/101A)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Facility Inspection, Repair, and Service Team (FIRST) Leader

Duties:

- Oversee the packaging and shipment of hazardous and non-hazardous waste

Requisite Skills, Experience and Education:

High school graduate, or equivalent, supervisory experience and one year maintenance-related experience.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Worker Supervisor (HWS-101/101A)
- ! Hazardous Materials and Waste Transportation (HMT-102, 103)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Facility Inspection, Repair, and Service Team (FIRST)

Duties:

- Support hazardous and non-hazardous waste packaging and shipments

Requisite Skills, Experience and Education:

High school graduate, or equivalent, and one year maintenance-related experience.
Maintain CDL Driver's License

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)
- ! Hazardous Materials and Waste Transportation (HMT-102, 103) (Biennial)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Sampling Team Member

Duties:

- Collects samples of waste for characterization and environmental media for determination of possible releases

Requisite Skills, Experience and Education:

Academic or vocational high school graduate, or equivalent, with courses in algebra and chemistry or biology, plus Associate degree in engineering or science with courses in computer science, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Responder (HWR-101/101A)
- ! Sampling Team Qualification (ST-001)
- ! Respiratory Protection (SAF 630/631) (Annual)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Manager, Environmental Compliance & Support

Duties:

- Supervises/oversees hazardous duties performed by Sampling Team members

Requisite Skills, Experience and Education:

B.S. degree in an environmental science, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Supervisor (HWS-101/101A)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Facility Shift Engineer

Duties:

- Notifies emergency response personnel and on-call facility manager during emergency occurrences
- Serves as backup RCRA Emergency Coordinator

Requisite Skills, Experience and Education:

Associate degree in engineering or scientific discipline, or equivalent, and five years related practical experience, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Facility Operations Shift Supervisor Qualification Card (FO-FOSE-3 or FO-FOSE-3R)
- ! Roving Watch Qualification (FO-RW-1)
- ! Central Monitoring Room Operator Qualification (FO-CMRO-2)
- ! Conduct of Shift Operations (OPS-115)
- ! Hazardous Materials Emergency Response (HMT-104)
- ! Root Cause Analysis (TRG-296)
- ! WIPP Occurrence Reporting for Facility Managers (OPS-110)
- ! WIPP Contingency Plan Procedure (SAF-645)
- ! Hazardous Waste Worker (HWW-101)

NOTE: Full Qualification must be completed prior to the candidate operating any equipment or performing any operating evolutions without the direct supervision of a qualified operator.

RCRA Hazardous Waste Management Job Descriptions

Position Title: Facility Shift Manager

Duties:

- Serves as RCRA Emergency Coordinator
- Notifies emergency response personnel and on-call facility manager during emergency occurrences

Requisite Skills, Experience and Education:

Academic or vocational high school (mechanical/electrical) graduate and eight years of nuclear plant operating experience, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Facility Operations Shift Engineer Qualification Card (FO-FOSE-3 or FO-FOSE-3R)
- ! Roving Watch Qualification (FO-RW-1)
- ! Central Monitoring Room Operator Qualification (FO-CMRO-2)
- ! Conduct of Shift Operations (OPS-115)
- ! Hazardous Materials Emergency Response (HMT-104)
- ! Root Cause Analysis (TRG-296)
- ! WIPP Occurrence Reporting for Facility Managers (OPS-110)
- ! WIPP Contingency Plan Procedure (SAF-645)
- ! Hazardous Waste Worker (HWW-101)

NOTE: Full Qualification must be completed prior to the candidate operating any equipment or performing any operating evolutions without the direct supervision of a qualified operator.

RCRA Hazardous Waste Management Job Descriptions

Position Title: Central Monitoring Room Operator

Duties:

- Notifies emergency response personnel
- Documents emergency actions

Requisite Skills, Experience and Education:

Vocational or academic high school graduate, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Roving Watch Qualification (FO-RW-1)
- ! Central Monitoring Room Operator (FO-CMRO-2 or FO-CMRO-2R)
- ! Hazardous Materials Emergency Response (HMT-104)
- ! Conduct of Shift Operations (OPS-115)

NOTE: Full Qualification must be completed prior to the candidate operating any equipment or performing any operating evolutions without the direct supervision of a qualified operator.

RCRA Hazardous Waste Management Job Descriptions

Position Title: Waste Hoist Operator

Duties:

- Operates waste shaft hoist in accordance with established procedures
- Maintains daily hoist operations log
- Performs routine inspections of the Waste Shaft hoisting equipment

Requisite Skills, Experience and Education:

Vocational or academic high school graduate, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Waste Hoist Qualification (M-30)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Waste Hoist Shaft Tender

Duties:

- Oversees and directs loading and unloading of the Waste Hoist above and below ground

Requisite Skills, Experience and Education:

Vocational or academic high school graduate, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Waste Hoist Shaft Tender (M-31)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Waste Hoisting Manager

Duties:

- Coordinate and direct the daily operations and maintenance of the operating hoist and shaft
- Supervise/oversee hazardous waste management duties performed by hoisting personnel

Requisite Skills, Experience and Education:

B.S. degree, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Hazardous Waste Worker (HWW-101/102)
- ! Hazardous Waste Worker Supervisor (HWS-101/101A)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Chief Office Warden

Duties:

- Cooperate, participate, and comply with the provisions of WIPP Emergency Plan
- Primary function is to coordinate personnel accountability in the event of an evacuation
- Responsible for surface accountability at staging areas in the event of an evacuation

Requisite skills, Experience and Education:

High School Diploma or equivalent, approval from employee's manager, compliance with the requirements of the WIPP Emergency Plan, and current knowledge of emergency evacuations, staging and assembly areas, and the site notification system.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Office Warden Training (SAF-632)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Assistant Chief Office Warden

Duties:

- Cooperate, participate, and comply with the provisions of WIPP Emergency Plan
- Primary function is to coordinate personnel accountability in the event of an evacuation
- Responsible for surface accountability at staging areas in the event of an evacuation

Requisite skills, Experience and Education:

High School Diploma or equivalent, approval from employee's manager, compliance with the requirements of the WIPP Emergency Plan, and current knowledge of emergency evacuations, staging and assembly areas, and the site notification system.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Office Warden Training (SAF-632)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Mine Rescue Team Member

Duties:

- Cooperate, participate, and comply with provisions of the Supplemental Emergency Response Program Plan (SERP)
- Trained in accordance with 30 CFR to respond to mine emergencies beyond that of the FLIRT
- Responsible for underground reentry and rescue after an underground evacuation

Requisite Skills, Experience and Education:

High School Diploma or equivalent, written approval from employee's manager (Authorization Card MRT-01), compliance with health and physical requirements, 1) Initial examination and clearance by the Occupational Medical Director, 2) Examined and cleared annually by the Occupational Medical Director, 3) Additional tests: pulmonary function test, cardiac stress test every five years, drug screen, 4) Encouraged to maintain good medical and physical condition, Compliance with requirements of the SERP, current knowledge regarding rescue and recovery of personnel involved in mine emergencies according to 30 CFR.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! First Aid and CPR (MED-101)
- ! Respiratory Protection (SAF-630/SAF-631 D)
- ! Radiological Worker II (RAD-201)
- ! Mine Rescue Team Initial training (EOC-101)
- ! Inexperienced Miner Training (SAF-501/502)
- ! Compressed Gas Cylinder Safety (SAF 619) (Once)

RCRA Hazardous Waste Management Job Descriptions

Position Title: First Line Initial Response Team member

Duties:

- Cooperate, participate, and comply with provisions of the Supplemental Emergency Response Program Plan (SERP)
- Primary function is to provide medical and hazardous material response to the WIPP underground

Requisite Skills, Experience, and Education:

High School Diploma or equivalent, written approval from employee's manager (Authorization Card FLIRT-01), compliance with health and physical requirements, 1) Initial examination and clearance by the Occupational Medical Director, 2) Examined and cleared annually by the Occupational Medical Director, 3) Additional tests: pulmonary function test, cardiac stress test every five years, drug screen, 4) Encouraged to maintain good medical and physical condition, compliance with requirements of the SERP, current knowledge regarding medical response and hazardous materials response.

Training (Type/Amount):

The following training must be completed and current prior to participation during an emergency response:

- ! General Employee Training (GET-19X/GET-20X)
- ! General Employee Training Refresher (GET-19XA/GET-20XA)
- ! Inexperienced miner (SAF 501/502)
- ! Confined Space Training (SAF-515)
- ! Hazardous Waste Worker (HWW-101)
- ! Respiratory Protection (SAF-630 and SAF-631 D)
- ! First Aid and CPR (MED-101)
- ! Radiological Worker II (RAD-201)
- ! Confined Space Rescue (ERT 102/102A) (Annual)
- ! Annual Live Fires Practical (ERT 107) (Annual)
- ! Introduction to Firefighting (ERT 117) (Once)
- ! Eight hours of training quarterly

RCRA Hazardous Waste Management Job Descriptions

Position Title: Emergency Response Team

Duties:

- Responding to hazardous waste incidents or releases due to fires, HAZMAT, and medical emergencies
- Operating as part of the WIPP Supplemental Emergency Response Program

Requisite Skills, Experience, and Education:

High School Diploma or equivalent, written approval from employee's manager (Authorization Card MRT-01), compliance with health and physical requirements:
1) Initial examination and clearance by the Occupational Medical Director
2) Examined and cleared annually by the Occupational Medical Director
3) Additional tests: pulmonary function test, cardiac stress test every five years, drug screening.

Training (Type/Amount):

- ! Emergency Response Team (ERT-102/102A) (Annual)
- ! General Employee Training (GET-19X/~~GET-20X~~ --GET-19XA/~~GET-20XA~~) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)
- ! Hazardous Waste Responder (HWR-101/101A) (Annual)
- ! Respiratory Protection (SAF-630/ SAF-631C/ SAF-631 D) (Annual)
- ! First Aid and CPR (MED-101/101A) (Annual)
- ! Radiological Worker (RAD-201/202) (Annual)
- ! Confined Space/Heated Environment (SAF-515/515A)
- ! Emergency Response Team Member Authorization Card (ERT-01)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Fire Brigade

Duties:

- Fight fires

Requisite Skills, Experience, and Education:

High School Diploma or equivalent, fire fighting training, compliance with health and physical requirements:

- 1) Initial examination and clearance by the Occupational Medical Director.
- 2) Examined and cleared annually by the Occupational Medical Director.
- 3) Encouraged to maintain good medical and physical condition.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X --GET-19XA/GET-20XA) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)
- ! Hazardous Waste Responder (HWR-101/101A) (Annual)
- ! Radiological Worker (RAD-201/202) (Annual)
- ! Respiratory Protection (SAF-630/ SAF-631D) (Annual)

RCRA Hazardous Waste Management Job Descriptions

Position Title: Fire Protection Technician

Duties:

- Provide immediate emergency medical- and fire-response services, on and off site
- Provide hazardous material release response to contain releases

Requisite Skills, Experience, and Education:

Vocational or commercial high school graduate, or equivalent, plus additional training in emergency fire and medical response, or equivalent. Two years EMT and fire fighting experience, or equivalent.

Training (Type/Amount):

- ! General Employee Training (GET-19X/GET-20X --GET-19XA/GET-20XA) (Annual)
- ! Hazardous Waste Worker (HWW-101/102) (Annual)
- ! Hazardous Waste Responder (HWR-101/101A) (Annual)
- ! Radiological Worker (RAD-201/202) (Annual)
- ! Respiratory Protection (SAF-630/ SAF-631D) (Annual)
- ! Fire Protection Technician Qualification Card (FTP-01) (Annual)

C. Attachment H2–Table of Contents

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Course Outlines H2-1
GET-19X /GET-20X - General Employee Training H2-3
GET-19XA/GET-20A - General Employee Training Refresher H2-8

D. Attachment H2–Course Outlines

GET-19X/GET-20X - General Employee Training

DURATION: . 16 Hours

PREREQUISITES: None

SCOPE:

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to perform their job in a safe manner and will have an overview of the site organization and description.

Mastery of the terminal objectives will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: GET-19XA/GET-20XA annually

COURSE DESCRIPTION (by module)

- 1. Site Overview & WIPP Description . 1 hour
 - a. Mission of DOE and CAO
 - b. Relationship of WIPP organizations
 - c. Surface structures
 - d. WIPP shafts
 - e. Underground area

- 2. Emergency Preparedness (includes Occurrence Reporting) . 1 hour
 - a. Definition of occurrence
 - b. DOE Order 5000.3B
 - c. WP 12-ES3918
 - d. Occurrence reporting process
 - e. Employee involvement with Emergency Preparedness
 - f. Types of emergencies
 - g. Emergency response by WIPP groups
 - h. Off-site response groups

- i. WIPP emergency procedures
 - j. Emergency equipment
 - k. Employee actions during emergencies

- 3. General Safety
. 1 hour
 - a. Personal Protective Equipment
 - b. Requirements for PPE
 - c. Warning Tags
 - d. WIPP safety hazards
 - e. Medical assistance
 - f. Actions to take for injuries
 - g. Reporting injuries/accidents
 - h. Employee concerns

- 4. Computer Security
. 1 hour
 - a. Department to contact
 - b. WIPP policies and procedures for:
 - 1. Personally owned software
 - 2. Computer games
 - 3. Passwords/password protection
 - c. Computer virus prevention

- 5. Fire Protection
. 1 hour
 - a. WIPP Fire Protection Program
 - b. Fire sources at WIPP
 - c. Fire Tetrahedron
 - d. Classes of fires
 - e. Fire extinguisher
 - f. Office Warden Program
 - g. Employee responsibilities during a fire

- 6. RCRA & Storm Water Management
. 2 hours
 - a. RCRA history
 - b. RCRA goals
 - c. WIPP goals and relation to RCRA
 - d. Definition of RCRA wastes
 - e. Site generated waste program
 - f. Training requirements for treatment storage and disposal facilities
 - g. Contingency Plan
 - h. Waste Minimization Program
 - i. RCRA regulatory agencies
 - j. RCRA enforcement options
 - k. Application of Storm Water Management policy in relation to the general employee

- 8. Work Policies and Procedures
. 1 hour
 - a. DOE Orders and Westinghouse Procedures
 - b. Teamwork
 - c. Conduct of Operations Policy
 - 1. Elements of Conduct of Ops
 - d. Quality Assurance Program
 - e. Responsibility for following procedures

- f. Resuming work after stoppage
 - g. Stopping work for unsafe acts
 - h. Purpose and uses of "Hold Tag"
 - i. Quality records and requirements
 - j. Correcting errors on QA Records
 - k. Configuration Management and affected departments
9. Electrical Safety
. 1 hour
- a. Variables of electrical circuits
 - b. Severity of electrical shock
 - c. Areas where electrical accidents occur
 - d. WIPP policy on using damaged electrical equipment
 - e. WIPP policy for modifying electrical protective devices
 - f. Requirements for use of Ground Fault Interrupters.
 - g. Purpose of GFI's
 - h. WIPP policy for resetting breakers
 - i. WIPP policy for using extension cords, plug-in devices, and other equipment exposed to energized electrical circuits
10. Hazard Communications
. 1 hour
- a. Description of Haz Comm Std.
 - b. Health and Safety hazards
 - c. Protection from workplace hazards
 - 1. PPE
 - 2. Preparedness/Prevention
 - 3. Employee responsibilities
 - d. Emergency procedures
 - e. WIPP Hazard Communication Prog.
 - 1. Training
 - 2. Container labels
 - 3. Chemical transfers
 - 4. Material Safety Data Sheets
 - f. Other information sources
11. Personal Protective Equipment
. 1 hour
- a. Requirements for head protection
 - b. Requirements for hearing conservation
 - c. Requirements for face/eye protection
 - d. Requirements for foot protection
12. Bloodborne Pathogens
. 1 hour
- a. Def. of Bloodborne Pathogens
 - b. Def. of Hepatitis B and Human Immunodeficiency Virus
 - c. Bloodborne Pathogen transmission
 - d. Prevention of bloodborne pathogen infection
 - e. WIPP Exposure Control Plan

- 13. Ergonomics
. 2 hours
 - a. Cumulative Trauma Disorder
 - b. Risk factors for CTD
 - c. Prevention of CTD
 - d. Recognition of CTD
 - e. Steps to take when CTD develops

- 14. Security
. 1 hour
 - a. Security Mission
 - b. Def. of Security Officer
 - c. Security Officer Tasks
 - d. Access and Property Control at WIPP
 - e. Badge accountability
 - f. Property Pass system
 - g. Physical security
 - h. Telephone threat list
 - i. Employee responsibilities during demonstration
 - j. Fitness for duty
 - k. Computer security
 - l. Parking requirements

- 15. General Employee Radiological Training (GERT)
. 1 hour

This program will be implemented prior to declaration of site readiness for all site employees. The standardized core materials for GERT include the following topics:

- Sources of Radiation
- Non-ionizing and Ionizing Radiation
- Risk in Perspective
- ALARA Concept
- Radiological Controls
- Monitoring/Dosimetry
- Emergency Procedures
- Employee Responsibilities

All times are approximate and do not reflect time spent on additional topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e. Job Performance Measures)

COURSE: GET-19XA /GET-20XA - General Employee Training Refresher

DURATION: Self-paced Course

PREREQUISITES: None

SCOPE:

TYPE: Self-paced Module

OBJECTIVES: Objectives are stated at the beginning of each module, including security, radiological basics, general safety, hazard communications, bloodborne pathogens, hearing protection, and OSHA/RCRA.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the module examination.

REFRESHER: Annually

COURSE DESCRIPTION (by module)

1. Introduction
 - a. Self Paced Course
 - b. Information about WIPP organizations
 - c. Appendix Information
 1. Storm Water Management
 2. WIPP Land Withdrawal Act
 3. DOE Mission
 - d. Exam Guidelines
2. General Security
 - a. Prohibited Articles
 - b. Primary responding agencies
 - c. Wearing your badge
 - d. Escort Responsibility
 - e. Number of visitors an employee may escort
 - f. When to turn off your computer
 - g. Personal Property Passes
3. Computer Security
 - a. Point of contact
 - b. WIPP policies and procedures for:
 1. Personally owned software
 2. Computer games
 3. Passwords/password protection
 - c. Computer virus prevention
4. Fitness for Duty
 - a. Reasons for the Fitness for Duty Program
 - b. General Employee Responsibilities

- 5. RCRA
 - a. Types of waste disposed
 - b. Waste Identification

- 6. Storm Water Management
 - a. Application of Storm Water Management policy in relation to the general employee

- 7. Bloodborne Pathogens
 - a. Transmission Identification of Bloodborne Pathogens
 - b. Prevention of Hepatitis B and Human Immunodeficiency Virus
 - c. Actions to take if exposed

- 8. Hazard Communications
 - a. Purpose of MSDS
 - b. Responsibilities when transferring hazardous materials
 - c. WIPP Hazard Communication Prog.
 - 1. Training
 - 2. Container labels
 - 3. Chemical transfers
 - 4. Material Safety Data Sheets

- 9. Ergonomics
 - a. Identification of CTD
 - b. Ways to prevent CTD
 - c. Required actions

- 10. Personal Protective Equipment
 - a. Requirements for head protection
 - b. Requirements for hearing conservation
 - c. Requirements for face/eye protection
 - d. Requirements for foot protection

- 11. General Safety
 - a. Requirements for obeying signs and tags
 - b. Requirements for reporting an occurrence
 - c. Actions for emergency situations
 - d. Resolving employee concerns
 - e. Proper uses of extension cords
 - f. WIPP Circuit Breaker Policy
 - g. Steps to take when responding to fire

 - h. Responsibilities when fighting a fire
 - i. When to use the sign-out board

- 12. Conduct of Operations
 - a. Goals of In-House Management Program
 - b. Required actions before posting information
 - c. Correcting a written record
 - d. Point of Contact for Records Management

ATTACHMENT B
REVISED FIGURES AND LOG SHEETS

ATTACHMENT C
ALLOWABLE EMISSION RATES FROM WIPP

ALLOWABLE EMISSION RATES FROM WIPP

1.0 INTRODUCTION

The Waste Isolation Pilot Plant (WIPP) is operating under a Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit (Permit) that contains limitations on allowable emissions from waste. The environmental performance standard imposed on the WIPP consists of controlling volatile organic compound (VOC) emissions to ensure the public and facility worker safety. The environmental performance standard for VOC emissions is based on the container headspace gas concentration, filter type, number of containers emitting, and the mine ventilation rate. All of these factors were considered in the requirements specified in the Permit. The Permit specifies the following conditions to ensure compliance with VOC emissions:

- VOC room-based limits for nine VOCs, Module IV, Section IV.D
- VOC concentrations of concern at VOC station A for nine VOCs, Module IV, Section IV.F.2
- the filter diffusion characteristics, Attachment M1-1d(1), and
- the typical operations ventilation rate related to the concentrations of concern, Attachment N-3e.

Permit Attachment M1 specifies that filter diffusion characteristics must be equal to or better than those used in the VOC emissions modeling conducted to demonstrate compliance with health-based limits. Appendix D9 of the WIPP RCRA Part B Permit Application (Permit Application) details the assessment of human exposure to waste VOC emissions in the atmosphere, and a comparison of that potential exposure to acceptable regulatory levels. Specifically, the appendix provides calculation details and summaries of risk assessments and worker exposures for the operational phase of the WIPP facility. The analyses in Appendix D9 include:

- Risk to a hypothetical member of the public at the site boundary
- Risk to potential members of the public within the site boundary
- Assessments of worker exposure on the surface within the site boundary
- Assessments of worker exposure in the underground portion of the facility

These analyses demonstrated that potential public exposures to waste emissions are well below the regulatory risk-based levels and that worker exposures are well below the Occupational Safety and Health Act (OSHA) time-weighted average (TWA) concentration limits. The results of these analyses are the basis for the Permit conditions listed previously to ensure that VOC emissions do not exceed levels that could potentially be harmful to human health and the environment.

A number of U.S. Department of Energy (DOE) filter suppliers and manufacturers are developing improved filters for use on transuranic (TRU) waste containers. These improved

filters may have hydrogen diffusivity characteristic values that are two orders of magnitude higher than the current filters being used and evaluated in Appendix D9. These improved filters will increase the rate of hydrogen release from containers, thereby minimizing the buildup of hydrogen in containers that exhibit higher decay heat. Increasing the container decay heat limits will also reduce the number of TRU waste containers that must be repackaged for shipment; therefore, reducing worker exposure from repackaging waste that can be safely shipped using an improved filter. However, the increased release of hydrogen through the improved filters will be accompanied by a similar increase in the VOC emissions from these containers.

This study documents how the improved filters can be used while maintaining compliance with the existing Permit conditions for room-based VOC concentration limits (Table IV.D.1), VOC concentrations of concern (Table IV.F.2.c), and mine ventilation rate without relying on the filter diffusion characteristics used in the Appendix D9 VOC emissions modeling. This was accomplished by developing room-based VOC emission rate limits using the methodology and parameter values in Appendix D9 and the room-based VOC concentration limits and VOC concentrations of concern from the Permit.

2.0 METHODOLOGY

In order to maintain consistency with the requirements of the Permit, the final calculated VOC room-based emission rate limits must result in emissions that result in VOC concentrations that meet all of the existing Permit conditions. In order to accomplish this, a set of three scenarios was developed for the calculations. The scenarios consisted of calculated emission rates necessary to meet the following three conditions:

- Appendix D9 occupational exposure calculations,
- Appendix D9 public exposure calculations, and
- Permit Table IV.F.2.c VOC concentrations of concern.

A final set of bounding room-based VOC emission rates was then developed by selecting the most restrictive emission rate for each VOC from the results of each of the scenarios.

In order to evaluate the emissions based on emission rate instead of headspace gas concentration, the equations found in Appendix D9 were rearranged to allow calculation of allowable drum VOC emission rates using the Permit required limits as the starting point. The specific implementation for each of the scenarios is presented in Sections 2.1 through 2.3 using the VOC-specific parameters summarized in Table 1.

2.1 Acceptable VOC Emission Rates for Underground Worker

The acceptable VOC emission rates for the underground worker were derived by rearranging the equation (D9-10), D9-2.5 of the RCRA Part B Permit application into the following form:

$$ADE_{VOC} = \frac{RU_{CW}Q[(mg/m^3) ppmv](0.0283 m^3 / ft^3)(525,000 \text{ min / year})}{R_c^*MW(10^6 \text{ mg / g})P_o X} \quad (1)$$

Where,

ADE_{VOC}	=	Average drum VOC emission rate (mole/drum/year)
RC_{UW}	=	Underground Worker allowable VOC receptor concentration (ppmv) (These are set equal to the Occupational OSHA TWA concentration limits listed in Table 1.)
$(Fg/m^3)/ppmv$	=	VOC specific conversion factor from ppmv to Fg/m^3 listed in Table 1
Q	=	Ventilation rate through the open room (35,000 ft^3 /minute)
R_c^*	=	Number of closed rooms in the open panel (6 rooms/panel)
MW	=	Molecular weight of VOC (g/mol)
P_o	=	Number of open panel equivalents (1 panel)
X	=	Number drums in a room (11,571 drums/room)

2.2 Acceptable VOC Emission Rates for Surface Worker

The acceptable VOC emission rates for the surface were derived by rearranging the equations in Section D9-2.4 of Appendix D9 as documented below:

$$ADE_{VOC} = \frac{RC_{SW}[(mg/m^3)/ppmv]V(0.0283 m^3 / ft^3)(525,600 \text{ min / year})}{MW(10^6 \text{ mg / g})ADF} - \frac{GR X MF_{VOC}(P_c R_c + R_c^*)}{R_o X} \quad (2)$$

Where,

ADE_{VOC}	=	The average drum VOC emission rate (mole/drum/year)
RC_{SW}	=	The Surface Worker allowable VOC receptor concentration (ppmv) (These are set equal to the Occupational OSHA TWA concentration limits listed in Table 1.)
$(Fg/m^3)/ppmv$	=	The VOC specific conversion factor from ppmv to Fg/m^3 listed in Table 1
V	=	The ventilation rate through the mine (425,000 ft^3 /minute)
MW	=	Molecular weight of VOC (g/mol)
ADF	=	The Air Dispersion Factor (ADF) for the scenario (1.23E-02)
GR	=	Effective drum gas generation rate (0.5 mole/drum/year)
X	=	The number drums in a room (11,571 drums/room)
MF_{VOC}	=	VOC mole fraction in drum headspace (dimensionless)
R_c	=	Number of closed rooms in the closed panel (7 rooms/panel)
P_c	=	Number of closed panel equivalents (9 panels)

R_c^* = Number of closed rooms in the open panel (6 rooms/panel)
 R_o = Number of open rooms in the open panel (1 room/panel)

The VOC mole fraction in the drum headspace is calculated using the following equation.

$$MF_{VOC} = \frac{ADE_{VOC}}{D_{VOC}(31,536,000 \text{ s/year})} \quad (3)$$

Where,

D_{VOC} = The VOC diffusion characteristic through a model NFT-013 carbon composite filter (mole/s/mole fraction). These values are tabulated in Table D9-1 (Section D9-2.2, Page D9-6 of the Appendix D9) and in Table 4.

Because the acceptable mole fraction was not known in advance, Equations 2 and 3 were solved iteratively until the VOC mole fraction in the right hand side of Equation 2 yielded the same calculated mole fraction in Equation 3.

2.3 Acceptable VOC Emission Rates for Public Exposure

The acceptable VOC emission rates for each of the three public exposure scenarios (i.e., WIPP Boundary, Livingston Ridge Rancher, and Antelope Ridge Rancher) were derived by rearranging the equations in Sections D9-2.3 and D9-5 of the Permit Application as documented below:

$$ADE_{VOC} = \frac{\left[\frac{EC - P_c}{P_o} SCPE \right] V(0.0283 \text{ m}^3 / \text{ft}^3)(525,600 \text{ min/year})}{X MW(10^6 \text{ mg/g})} \quad (4)$$

$$SCPE = \frac{X GR MF_{VOC} MW(10^6 \text{ mg/g})}{V (0.0283 \text{ m}^3 / \text{ft}^3)(525,600 \text{ min/year})} \quad (5)$$

The EC for carcinogens is calculated by rearranging equation D9-15 (Section D9-5.1, Page D9-18 of the Permit Application) into the following form:

$$EC = \frac{\text{Risk AT}}{\text{ADF URF EF ED}} \quad (6)$$

The EC for noncarcinogens is calculated by rearranging equation D9-23 (Section D9-5.2, Page D9-23 of the Permit Application) into the following form:

$$EC = \frac{\text{HQ AT RfC } (10^3 \text{ mg/mg})}{\text{ADF EF ED}} \quad (7)$$

Where,

ADE_{VOC}	=	The average drum VOC emission rate (mole/drum/year)
EC	=	The maximum public receptor VOC concentration (Fg/m^3)
V	=	The ventilation rate through the mine (425,000 $\text{ft}^3/\text{minute}$)
MW	=	Molecular weight of VOC (g/mol)
P_c	=	Number of closed panel equivalents (9 panels)
P_o	=	Number of open panel equivalents (1 panel)
SCPE	=	Exhaust shaft concentration of the VOC from a single closed panel
GR	=	Effective drum gas generation rate (0.5 mole/drum/year)
X	=	The number drums in a full panel (81,000 drums/panel)
MF_{VOC}	=	VOC mole fraction in drum headspace (dimensionless)
Risk	=	Acceptable risk level for a public receptor. Acceptable risk levels are 1E-06 for Class B carcinogens and 1E-05 for Class C carcinogens.
HQ	=	The public receptor acceptable Hazard Quotient for Non-Cancer (Non-carcinogen) health effects. These values are listed in the last column of Tables D9-4 and D9-6 (Pages D9-26 and D9-28, respectively of Appendix D9) and are summarized in Table 1 of this white paper.
AT	=	The averaging time (hours). The averaging time for carcinogens is 613,200 hours (equation D9-15, Page D9-18 of Appendix D9). The averaging time for noncarcinogens is 306,600 hours (one-half that for carcinogens (equation D9-23, Page D9-23 of Appendix D9).
URF	=	Unit risk factor for carcinogens ($[\text{Fg/m}^3]^{-1}$). The URFs for carcinogens are listed in Table D9-3 (Page D9-24 of Appendix D9) and are also listed in Table 1 of this white paper.
RfC	=	Reference concentration for noncarcinogens (mg/m^3). The RfCs for noncarcinogens are listed in Table D9-4 (Page D9-26 of Appendix D9) and are also listed in Table 1 of this white paper.
EF	=	Exposure frequency (8,760 hours/year) from equations D9-15 (carcinogens) and equation D9-23 (noncarcinogens) (Pages D9-18 and D9-23, respectively, of Appendix D9)

ED = Exposure duration (35 years) from equations D9-15 (carcinogens) and equation D9-23 (noncarcinogens) (Pages D9-18 and D9-23, respectively, of Appendix D9)

ADF = Air dispersion factor (dimensionless). The values for the three public exposure scenarios are as follows (from Table D9-2, Page D9-17 of Appendix D9):

ADF (WIPP Site Boundary) = 1.2E-04
 ADF (Livingston Ridge) = 9.8E-05
 ADF (Antelope Ridge) = 6.7E-05

The VOC mole fraction in the drum headspace was calculated using Equation 3. Because the acceptable mole fraction was not known in advance, Equations 3, 4, and 5 were solved iteratively until the VOC mole fraction in the right hand side of Equation 5 yielded the same calculated mole fraction in Equation 3.

2.4 Acceptable VOC Emission Rates Based on Permit Concentrations of Concern

The acceptable VOC drum emission rates were based on the VOC Drift E-300 concentrations of concern from Table N-2 in Attachment N of the Permit, which are also listed in Table 1. A bounding assumption of nine closed panels with seven closed rooms per panel and one open panel with 6 closed rooms and one open room was made in deriving the emission rates.

$$ADE_{VOC} = \frac{\left\{ \frac{C_c [\text{mg}/\text{m}^3/\text{ppmv}] V (0.0283 \text{ m}^3 / \text{ft}^3) (525,600 \text{ min} / \text{year})}{MW (10^6 \text{ mg} / \text{g})} - (9 * 7 + 6) GR \right\} X MF_{VOC}}{X} \quad (8)$$

Where,

ADE_{VOC} = Average drum VOC emission rate (mole/drum/year)
 C_c = VOC Drift E-300 concentration of concern from Table N-2 in Attachment N of the WIPP Permit, which are also listed in Table 1 (ppmv)
 V = Ventilation rate through Drift E-300 (130,000 ft³/minute)
 MW = Molecular weight of VOC (g/mol)
 $(Fg/m^3)/ppmv$ = VOC specific conversion factor from ppmv to Fg/m³ listed in Table 1
 GR = Effective drum gas generation rate (0.5 mole/drum/year)
 X = Number drums in a room (11,571 drums/room)
 MF_{VOC} = VOC mole fraction in drum headspace (dimensionless)

The VOC mole fraction in the drum headspace that will produce the emission rate calculated through Equation 8 was calculated using Equation 3. Because the acceptable mole fraction was not known in advance, Equations 3 and 8 were solved iteratively until the VOC mole

fraction in the right hand side of Equation 8 yielded the same calculated mole fraction in Equation 3.

3.0 RESULTS

The acceptable drum emission rates calculated using Equations 1, 2, 4, and 8 for the various scenarios are summarized in Table 2. Bounding emission rates are highlighted in bold. The bounding emission rates for carbon tetrachloride and chloroform are based on the public exposure risk levels at the WIPP Boundary. The bounding emission rates for the remaining VOCs are based on the Drift E-300 concentrations of concern listed in Table IV.F.2.c and Table N-2 of the Permit.

The bounding VOC drum emission rates from Table 2 are listed in Table 3. Bounding room-based VOC emission rates were calculated by multiplying the bounding VOC drum emission rates by the number of drums in a room (11,571 drums/room) and are also listed in Table 3.

4.0 SAMPLE CONCENTRATION COMPARISONS

Using the bounding VOC room-based emission rate limits and the assumption that all drums in the room are the same (i.e., have the same filter and headspace gas concentration), a set of sample VOC headspace gas concentrations by filter type were developed. However, for some of the cases, if all of the drums in a room were the same, the VOC room-based concentration limits listed in Table IV.D.1 of the Permit would be exceeded. Therefore, the values listed in the table should only be considered as an example to be used for comparison to the existing filter specified in the Permit.

The VOC diffusion characteristics for the following five types of filters are listed in Table 4.

- The model NFT-013 carbon composite filter used as the baseline in the Permit with a hydrogen diffusivity characteristic of $1.17\text{E-}05$ mole/s/mole fraction
- A drum filter with a hydrogen diffusivity characteristic of $1.9\text{E-}06$ mole/s/mole fraction based on the TRUPACT-II Safety Analysis Report for Packaging (SARP) value
- A standard waste box (SWB) filter with a hydrogen diffusivity characteristic of $3.7\text{E-}06$ mole/s/mole fraction based on the TRUPACT-II SARP value
- A proposed 10X type filter with a hydrogen diffusivity characteristic of $3.7\text{E-}05$ mole/s/mole fraction based on a proposed TRUPACT-II SARP Value
- A proposed 100X type filter with a hydrogen diffusivity characteristic of $3.7\text{E-}04$ mole/s/mole fraction based on a proposed TRUPACT-II SARP Value

The corresponding drum headspace VOC concentrations were calculated using Equation 3, appropriate VOC filter diffusivity characteristics listed in Table 4, and the bounding VOC room-based emission rate limits in Table 3.

5.0 IMPLEMENTATION

To implement the use of the improved filters, a permit modification must be developed that adds the following two requirements:

- a table of VOC room-based emission rate limits, and
- a WIPP Waste Information System (WWIS) VOC room-based emission rate report.

The table of VOC room-based emission rate limits and the WWIS report would be incorporated into Permit Module IV. The existing WWIS report that calculates the VOC room-based concentrations can be expanded to use information that is already available in the WWIS with one new reference table to track the VOC room-based emission rate limits using the following steps:

- Obtain the VOC headspace concentration for each of the nine VOCs from the appropriate existing WWIS table.
- Obtain the filter type for the drum from the appropriate existing WWIS table.
- Based on the type of filter, obtain the appropriate VOC diffusivity characteristic for the VOC from a newly developed WWIS table.
- Calculate and record in a separate database field the drum emission rate, which is the product of the appropriate VOC headspace gas concentration and diffusivity characteristic.
- Calculate and record in a separate data base field the emission rate for each room by summing the drum emission rate for each drum emplaced in the room.

6.0 CONCLUSION

Improved filters can be used to reduce worker exposure due to repackaging operations, while maintaining protection of human health and the environment and compliance with existing Permit conditions. This can be accomplished by developing a Permit modification to implement two additional Permit conditions:

- a table of VOC room-based emission rate limits, and
- a WWIS VOC room-based emission rate.

Table 1. VOC Specific Parameter Values

VOC	Molecular Weight	RfC (mg/m ³)	URF (Fg/m ³) ⁻¹	HQ	(Fg/m ³)/ppmv	Excess Cancer Risks Public Limit	Occupational Worker OSHA TWA (ppmv)	Drift E-300 Concentrations of Concern (ppmv)
Carbon Tetrachloride	153.84	NA	1.5E-05	NA	6.29E03	1.0E-06	10	0.165
Chloroform	119.39	NA	2.30E-05	NA	4.88E03	1.0E-06	50	0.180
1,1-Dichloroethylene	96.95	NA	5.00E-05	NA	3.96E03	1.0E-05	5	0.100
1,2-Dichloroethane	98.97	NA	2.60E-05	NA	4.05E03	1.0E-06	50	0.045
Methylene chloride	84.94	NA	4.70E-07	NA	3.47E03	1.0E-06	25*	1.930
1,1,2,2-Tetrachloroethane	167.86	NA	5.80E-05	NA	6.86E03	1.0E-05	5	0.050
1,1,1-Trichloroethane	133.42	NA	1.60E-05	NA	5.46E03	1.0E-05	350	0.590
Chlorobenzene	112.56	2.00E-02	NA	1	4.60E03	NA	75	0.220
Toluene	92.13	4.00E-01	NA	1	3.77E03	NA	200	0.190

* Value reflects current (1999) OSHA TWA limits. The older value of 500 ppmv was used in Appendix D9.

Table 2. Acceptable Emission Rates for Occupational and Public Exposure

Compound	Underground Worker Emission Rate (mole/drum/year)	Surface Worker Emission Rate (mole/drum/year)	Public Exposure at WIPP Boundary Emission Rate	Public Exposure Livingston Ridge Rancher Emission Rate (mole/drum/year)	Public Exposure at Antelope Ridge Rancher Emission Rate	Emission Rate Based on Drift E-300 Concentrations of Concern
Carcinogens						
Carbon tetrachloride	3.07E+00	9.54E+03	5.04E-01	6.17E-01	9.03E-01	5.92E-01
Chloroform	1.53E+01	5.00E+04	4.28E-01	5.24E-01	7.67E-01	6.77E-01
1,1-Dichloroeth(yl)ene	1.53E+00	5.10E+03	2.44E+00	2.98E+00	4.36E+00	3.84E-01
1,2-Dichloroethane	1.53E+01	4.97E+04	4.56E-01	5.59E-01	8.17E-01	1.68E-01
Methylene chloride	7.67E+00	2.60E+04	2.97E+01	3.64E+01	5.32E+01	7.56E+00
1,1,2,2-Tetrachloroethane	1.53E+00	4.77E+03	1.20E+00	1.46E+00	2.14E+00	1.79E-01
1,1,1-Trichloroethane	1.07E+02	3.34E+05	5.45E+00	6.67E+00	9.76E+00	2.12E+00
Noncarcinogens						
Chlorobenzene	2.30E+01	7.01E+04	1.03E+02	1.26E+02	1.84E+02	7.74E-01
Toluene	6.13E+01	1.89E+05	2.52E+03	3.09E+03	4.52E+03	6.77E-01

Table 3. Bounding VOC Drum and Room Emission Rates and Room Concentrations

Compound	Bounding VOC Drum Emission Rates (mole/drum/year)	Bounding VOC Room Emission Rates (mole/room/year)
Carbon tetrachloride	5.04E-01	5.83E+03
Chloroform	4.28E-01	4.95E+03
1,1-Dichloroeth(yl)ene	3.84E-01	4.44E+03
1,2-Dichloroethane	1.68E-01	1.95E+03
Methylene chloride	7.56E+0	8.75E+04
1,1,2,2-Tetrachloroethane	1.79E-01	2.08E+03
1,1,1-Trichloroethane	2.12E+00	2.45E+04
Chlorobenzene	7.74E-01	8.95E+03
Toluene	6.77E-01	7.83E+03

Table 4. VOC Diffusivity Values for Various Filter Types

Compound	Permit Filter Diffusivity Value (mole/s/mole fraction)	TRUPACT-II SARP Drum Filter Diffusivity Value (mole/s/mole fraction)	TRUPACT-II SARP SWB Filter Diffusivity Value (mole/s/mole fraction)	Proposed TRUPACT-II SARP 10X Filter Diffusivity Value (mole/s/mole fraction)	Proposed TRUPACT-II SARP 100X Filter Diffusivity Value (mole/s/mole fraction)
Carcinogens					
Carbon tetrachloride	1.21E-06	1.96E-07	3.83E-07	3.83E-06	3.83E-05
Chloroform	1.34E-06	2.18E-07	4.24E-07	4.24E-06	4.24E-05
1,1-Dichloroeth(yl)ene	1.40E-06	2.27E-07	4.43E-07	4.43E-06	4.43E-05
1,2-Dichloroethane	1.32E-06	2.14E-07	4.17E-07	4.17E-06	4.17E-05
Methylene chloride	1.47E-06	2.39E-07	4.65E-07	4.65E-06	4.65E-05
1,1,2,2-Tetrachloroethane	1.21E-06	1.96E-07	3.83E-07	3.83E-06	3.83E-05
1,1,1-Trichloroethane	1.21E-06	1.96E-07	3.83E-07	3.83E-06	3.83E-05
Noncarcinogens					
Chlorobenzene	1.16E-06	1.88E-07	3.67E-07	3.67E-06	3.67E-05
Toluene	1.19E-06	1.93E-07	3.76E-07	3.76E-06	3.76E-05