

# **2017 ANNUAL MITIGATION REPORT FOR THE WASTE ISOLATION PILOT PLANT**



**JULY 10, 2017**

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## ACRONYMS

AMR	Annual Mitigation Report
ASER	Annual Site Environmental Report
BECR	Biennial Environmental Compliance Report
CAM	continuous air monitor
CBFO	Carlsbad Field Office
CFR	Code of Federal Regulations
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Plan
EMS	Environmental Management System
EPA	Environmental Protection Agency
ER	emergency response
FAS	fixed air sampler
FEIS	Final Environmental Impact Statement
FR	FEIS ROD
HEPA	high-efficiency particulate air
IART	Incident/Accident Response Team
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
MAP	Mitigation Action Plan
MERRTT	Modular Emergency Response Radiological Transportation Training
MOC	Management and Operating Contractor
MSHA	Mine Safety and Health Administration
NC	NEPA compliance
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMED	New Mexico Environment Department
OSHA	Occupational Safety and Health Administration
RC	regulatory compliance
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SEIS	Supplemental Environmental Impact Statement
STEP	States and Tribal Education Program
TP	test phase
TR	transportation
TRANSCOM	Transportation Tracking and Communication System
TRU	<u>transur</u> anic
TRUPACT-II	<u>Transur</u> anic <u>Package</u> <u>Transporter</u> Type B Shipping Container, Model <u>II</u>
VOC	volatile organic compound
VPP	Voluntary Protection Program
WIPP	Waste Isolation Pilot Plant

## INTRODUCTION

The guidance for the development of a Mitigation Action Plan (MAP) is contained in U.S. Department of Energy (DOE) Order 451.1B, *National Environmental Policy Act Compliance Program*, and 10 Code of Federal Regulations (CFR) 1021, *National Environmental Policy Act Implementing Procedures*. These documents specify that a MAP be prepared to mitigate environmental impacts resulting from the implementation of commitments made in the Record of Decision (ROD) for an Environmental Impact Statement. The order further requires that an annual report be prepared to demonstrate the progress made in implementing the commitments and the effectiveness of any mitigation activity until the activity has been completed. The Waste Isolation Pilot Plant (WIPP) MAP was prepared to address commitments made in the RODs for the *WIPP Final Environmental Impact Statement (FEIS)*, and the *WIPP Final Supplemental Environmental Impact Statement (SEIS)*. This *2017 Annual Mitigation Report (2017 AMR)* addresses only those open WIPP project-related mitigation activities (see shaded commitments in Table 1, Categories of Commitments made in the FEIS and SEIS-I RODs).

The mitigative actions for the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (SEIS-II)* were addressed and mitigative actions are either in effect or are complete. The following are those commitments for SEIS-II and the mitigation of those commitments.

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A summary of each ROD commitment and its status is presented in Table 1. Each commitment has been assigned an alpha-numeric code. The alphabetic component designates the source and/or subject area of the commitment as noted below.

<b>Alphabetic Code</b>	<b>Designation</b>
<b>FR</b>	<b>FEIS ROD – All commitments are included in this code.</b>
<b>NC</b>	<b>NEPA compliance (SEIS-I ROD)</b>
<b>RC</b>	<b>Regulatory compliance (SEIS-I ROD)</b>
<b>TR</b>	<b>Transportation (SEIS-I ROD)</b>
<b>TP</b>	<b>Test phase (SEIS-I ROD)</b>
<b>ER</b>	<b>Emergency response (SEIS-I ROD)</b>

The numeric component designates the sequential order of the commitment. Commitment numbers are identical to those presented in the original MAP.

The table also includes a category code that represents the current status of the mitigation actions for each commitment. As in previous mitigation reports, the 2017 AMR uses the following definitions for the four status categories:

- Category 1: Active commitments with ongoing implementation activities
- Category 2: Commitments that have been fulfilled
- Category 3: Commitments that will not be implemented under the present site configuration due to DOE policy changes
- Category 4: Commitments or portions of commitments that are being tracked as environmental compliance or data collection commitments in other DOE reports. Commitments or portions of commitments designated as Category 4 require the DOE to comply with applicable state and federal regulations. The status of compliance with these regulations is tracked in the compliance chapter of the current *WIPP Annual Site Environmental Report* (ASER), and in the *WIPP Biennial Environmental Compliance Report* (BECR).

Table 2 contains tracking number(s) for active mitigation commitments (or commitment portions), the relevant text from the ROD, and a description of the implementation status for each commitment.

**Table 1 - Categories of Commitments made in the FEIS and SEIS-I RODs**

COMMITMENT	CATEGORY	COMMITMENT	CATEGORY	COMMITMENT	CATEGORY
FR-1	2	FR-6h	2	RC-2b	2
FR-2	2	FR-6i	2	RC-2c	2
FR-3	2	FR-7	1	RC-2d	2
FR-4	3	FR-7a	1 & 4	RC-2e	2
FR-5	3	FR-7b	1 & 4	RC-2f	2
FR-6	1	FR-7c	4	RC-2g	4
FR-6a	1 & 4	FR-7d	2	RC-2h	4
FR-6b	2	FR-7e	4	RC-2i	4
FR-6c	2	FR-7f	1 & 4	RC-2j	1
FR-6c(1)	2	FR-8	1	RC-3	4
FR-6c(2)	2	NC-1	2	TR-1	2
FR-6c(3)	2	NC-1	2	TP-1	3
FR-6c(4)	2	NC-2	3	TP-2	3
FR-6d	1 & 4	RC-1	4	TP-3	3
FR-6e	2	RC-2	1	TP-4	3
FR-6f	3	RC-2a	1	ER-1	1
FR-6g	3	-----	-----	-----	-----

## NOTE:

Shaded boxes pertain to commitments, or commitment portions, with on-going commitment activities, which are discussed in the 2017 AMR.

The non-shaded boxes indicate mitigative actions that have been completed, that will not be implemented under the present site configuration, or are not currently relevant.

Dashed lines are place holders and indicate no information in the box.

**Table 2 - Status of Mitigation Implementation for Commitments made in WIPP RODs**

No.	Commitment	Status of Mitigation Implementation
FR-6	<p><b>Commitment:</b> <i>DOE will mitigate adverse impacts of the WIPP project on the quality of the human environment by implementing the proposed mitigation activities as described in Section 9.6 of the FEIS.</i></p> <p><b>Reference:</b> FEIS ROD, p. 9-164</p>	<p>Methodologies for meeting the implementing mitigation activities described in Section 9.6 of the FEIS are described in commitments FR-6a through FR-6i. Of these, 6a and 6d have not been completed and are therefore discussed in this table.</p>
FR-6a	<p><b>Commitment:</b> <i>Environmental monitoring will allow the DOE to be continuously aware of environmental conditions and will alert them to any unexpected impacts, so appropriate action can be taken.</i></p> <p><b>Reference:</b> FEIS, Vol. I, p. 9-114</p>	<p>Environmental data reported by the WIPP project are collected in accordance with the requirements of the <i>WIPP Environmental Monitoring Plan</i> (EMP). The EMP defines the extent and scope of the WIPP environmental monitoring programs. It describes the environmental parameters that are sampled by the WIPP staff in addition to the criteria and methodologies by which samples are collected.</p> <p>The EMP will continue to define the scope and extent of the WIPP facility emission/effluent and environmental monitoring programs during the operational life of the facility.</p> <p>The WIPP ASER includes annual monitoring data collected as part of the environmental monitoring program. The information in the WIPP ASER includes VOC (volatile organic compound) and radioactivity. Media examined include: ambient air, soil, biota, surface water, sediment, and ground water.</p>
FR-6d	<p><b>Commitment:</b> <i>Radiation monitors will be used to activate a system whereby the disposal-exhaust air will be diverted to high efficiency particulate air (HEPA) filters if an accident releases radioactivity underground.</i></p> <p><b>Reference:</b> FEIS, Vol. I, p. 9-117</p>	<p>The WIPP facility began receiving transuranic (TRU) waste on March 26, 1999. On February 14, 2014, a Continuous Air Monitor (CAM) alarmed and activated the shift to filtration of the Underground Ventilation System. The CAM alarm resulted from a drum deflagration in Room 7 of Panel 7. The facility has been exhausting through HEPA filtration continuously since then. The decision to shift to filtration is explained in the WIPP Radiological Control Position Paper, No. 96-05, <i>Numbers and Placement of Effluent Continuous Air Monitors for WIPP Disposal-Phase Operations</i>.</p>
FR-7	<p><b>Commitment:</b> <i>In addition to the active mitigation measures to be taken, the monitoring activities described in Section 2, Appendix J, of the FEIS will be implemented.</i></p> <p><b>Reference:</b> FEIS ROD, p. 9164</p>	<p>Implementation of the monitoring activities described in Section 2, Appendix J, of the FEIS is discussed in commitments FR-7a through FR-7f. Commitments 7c and 7e are no longer being tracked in this report. However, information pertaining to their implementation is provided in the WIPP BECR and the WIPP ASER. Commitment 7d has been completed and is not discussed in this table.</p>
FR-7a	<p><b>Commitment:</b> <i>Continuous monitoring of seismic activity will be conducted near the surface.</i></p> <p><b>Reference:</b> FEIS, Vol. II, p. J-28</p>	<p>Currently, two different seismic monitoring programs are underway for the WIPP Project, one to evaluate regional seismic activity and the other to monitor WIPP facility-specific seismic activity. The regional program examines evidence of regional seismic activities such as magnitude,</p>
FR-7a (cont.)		

No.	Commitment	Status of Mitigation Implementation
		<p>depth, and patterns. Quarterly summary reports are provided to the DOE. These reports, most recently the <i>Report on the Seismicity of the WIPP Site for the Period January 1, 2017 through March 31, 2017</i>, utilize data from the WIPP off-site network (an eight-instrument array within 300 kilometers of the facility) and other networks in New Mexico. Seismic monitoring data are presented annually in the ASER.</p> <p>The on-site seismic monitoring program utilizes accelerometers to detect ground motion or ground acceleration at the site. Earthquakes with ground motion of 0.008 g (gravitational constant) or greater, are recorded. In the event of an earthquake of 0.015 g, on-site accelerometers would activate alarms at the Central Monitoring Room, and then physical structures and the mine would be inspected. In the event of a design-basis earthquake (0.10 g) measured at the surface seismic panel, a signal is sent to close the tornado dampers in the Waste Handling Building. When the tornado dampers close, the Waste Handling Building ventilation system is automatically stopped.</p>
FR-7b	<p><b>Commitment:</b> <i>It is expected that ground-water sampling for the long-term monitoring will be performed on an annual basis. However, after mining for the WIPP has started, sampling will be performed quarterly until conditions stabilize.</i></p> <p><b>Reference:</b> FEIS, Vol. II, p. J-29</p>	<p>This original FEIS commitment pertained to water level measurements that were designed to evaluate the impacts of mining shafts and rooms on the area's formation waters. Thus, the groundwater monitoring program was implemented to meet these commitments involving the collection of water-level data only. The U.S. Geological Survey monitored water levels at the WIPP site and surrounding areas from 1977 to 1985. Sandia National Laboratories managed these studies from 1985 through 1988. The M&amp;O contractor took over the management of the groundwater level monitoring program in 1988.</p> <p>Under the current program defined by the WIPP Hazardous Waste Facility Permit, groundwater level measurements are taken monthly in at least one accessible completed interval at each available well pad. At well pads with two or more wells completed in the same interval, quarterly measurements are taken in the redundant wells.</p> <p>The groundwater monitoring program is described in the WIPP EMP, the WIPP Groundwater Protection Program Plan, and Part 5 and Attachment L of the WIPP Hazardous Waste Facility Permit. Water-level measurements are collected monthly and submitted semi-annually by May 31 and November 30 in the Waste Isolation Pilot Plant Semi-Annual Groundwater Surface Elevation Report to the New Mexico Environment Department (NMED). The November water level data report is combined with the Annual Culebra Groundwater Report specified in Permit Part 5.10.2.2.</p>
FR-7f FR-7f (cont.)	<p><b>Commitment:</b> <i>Monitoring will be conducted at all gaseous-exhaust locations and will consist of devices to sample airborne particulate radioactivity. Both alpha and beta-gamma continuous air monitors will</i></p>	<p>The Fixed Air Samplers (FAS) at Stations B and C are used to satisfy the National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements for periodic confirmatory sampling contained in 40 CFR Part 61, Subpart H and to document compliance with the <i>Environmental Radiation Protection Standards for the Management and Disposal of</i></p>

No.	Commitment	Status of Mitigation Implementation
	<p><i>be located at all release points.</i></p> <p><i>All systems will be designed to withstand the effects of a design-basis earthquake and will be supplied with emergency power.</i></p> <p><b>Reference:</b> FEIS, Vol. II, p. J-32</p>	<p><i>Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes</i>, 40 CFR Part 191, Subpart A.</p> <p>The effluent sampling system is made up of a series of FASs. The FASs at Stations B and C have back-up power in the form of an uninterruptible power supply that can power the monitor for up to 30 minutes. The effluent samplers have also been tested to withstand the effects of a design-basis earthquake. The results of these tests are described in the <i>Seismic Test of Waste Isolation Pilot Plant Station A Effluent Monitoring System Equipment</i>. Any modification to the effluent monitoring systems installed at the WIPP facility would retain back-up power and seismic qualification.</p> <p>The effluent samples are collected and screened for alpha and beta activity, then sorted by sampling station. Composite samples from each of the two emissions monitoring stations (B &amp; C) are submitted to a qualified laboratory for radio-analysis. The key isotopes associated with WIPP repository waste streams are reported, reviewed, and assessed using compliant methods and software for estimated public dose from airborne radioactivity emissions.</p> <p>The Station B exhaust also has an in-line CAM that measures airborne alpha and beta-gamma particulate activity in near real-time both locally and in a remote, manned Control Monitoring Room (CMR).</p> <p>CAM indication is provided in the Waste Handling Building, with remote CMR readout and alarm to indicate any pre-filtered airborne release that may affect Station C emissions.</p>

No.	Commitment	Status of Mitigation Implementation
FR-8	<p><b>Commitment:</b> <i>DOE also intends to implement the Post-operational Monitoring Program described in Section J-3 of the FEIS.</i></p> <p><b>Reference:</b> FEIS, Volume II, Section J.3</p>	<p>The DOE has developed a post-operational monitoring plan based on the requirements of 40 CFR Part 191.14 and Part 194.42. The initial Environmental Protection Agency (EPA) certification (U.S. Environmental Protection Agency 1998a), and the Compliance Recertification Application (CRA), Appendix MON 2004, Attachment A establish a plan for preclosure and postclosure monitoring. Entitled Preclosure and Post Closure (Long-Term) Monitoring Plan, the plan was included as Appendix MON of the Compliance Certification Application submitted to the EPA in October 1996. This plan was updated in the March 24, 2004, WIPP Compliance Recertification Application (DOE/WIPP 04-3231), the March 24, 2009, WIPP Compliance Recertification Application (DOE/WIPP-09-3424) and the March 26, 2014 WIPP Compliance Recertification Application (DOE/WIPP-14-3503).</p> <p>The Postclosure Monitoring Plan will not be finalized until final facility closure (sealing of the shafts), and it will not be implemented until after facility closure. Further, post-closure monitoring shall be complementary to monitoring required pursuant to applicable federal hazardous waste regulations at 40 CFR parts 264 and 270 and shall be conducted with techniques that do not jeopardize the containment of waste in the disposal system. The final Postclosure Monitoring Plan will be approved by the appropriate regulatory authorities.</p>
RC-2	<p><b>Commitment:</b> <i>The DOE is committed...to evaluating further the potential mitigation measures described in Section 6 of the Supplement.</i></p> <p><b>Reference:</b> SEIS-I ROD, p. 25692</p>	<p>Commitments RC-2a and 2j are addressed below. Mitigation commitments RC-2b through 2f have been completed and are not discussed in this document. Commitments RC-2g, 2h, and 2i are no longer being tracked in this report. However, information pertaining to their implementation can be found in the WIPP BECR and the WIPP ASER.</p>
RC-2a          RC-2a (cont.)	<p><b>Commitment:</b> <i>Measures would be incorporated into all of the activities to minimize the health and safety risks to the workers and the general public.</i></p> <p><b>Reference:</b> SEIS-I, Vol. 1, p. 6-2</p>	<p>In addition to complying with the Occupational Safety and Health Administration (OSHA) standards contained in 29 CFR Part 1910 and the Mine Safety and Health Administration (MSHA) standards contained in 30 CFR Part 57, the WIPP facility staff employs a variety of measures to minimize the health and safety risks to workers, the general public, and the environment. The following are some of the programs in place to reduce environmental and safety risks at the WIPP facility:</p> <p>The WIPP Environmental Management System (EMS) and Integrated Safety Management System (ISMS) are implemented to integrate safe and environmentally sound practices into WIPP activities and operations. The WIPP EMS continues to be certified to the ISO 14001:2004 EMS standard. The EMS includes processes that assure environmental impacts are identified, appropriate controls are in place to minimize impacts, and that routine monitoring is performed to assess impacts to the environment. The environmental monitoring program results continue to demonstrate environmental impacts are minimal. Routine audits (both internal and third party) of the EMS and its implementing</p>

No.	Commitment	Status of Mitigation Implementation
		<p>programs and procedures confirm that the system is effective.</p> <p>The Integrated Safety Management System Description is updated annually. ISM Core Functions are integrated into the work control process. Feedback and improvement are tracked through multiple related systems. An annual ISMS review and declaration is also completed annually which includes DOE headquarters guidance criteria on program maintenance and safety conscious work environment sustainment.</p> <p>The WIPP Landlord Program provides a safety inspection process that appoints individuals to be accountable for safety concerns in their area or building. Oversight of the program is performed quarterly by the Landlord Council that includes management representation from Environmental Safety &amp; Health and Operations in addition to Site Infrastructure. Improvements have been realized in quarterly inspections with new “owners” assigned in some cases, increased tracking/accountability and checklist improvements.</p> <p>The Condition Assessment Survey/Capital Asset Management Process ensures that every structure on the WIPP site is thoroughly inspected, with inspections to include safety concerns. Inspections are performed by teams including employees, engineers, landlords, managers, and safety professionals.</p> <p>The WIPP Lessons Learned Program provides a disciplined and integrated process to identify, communicate, and ensure understanding by employees of applicable lessons-learned information gleaned from government, industry, and the WIPP Project. Lessons Learned materials determined to be applicable to the WIPP Project are disseminated to appropriate personnel for their review and use. Managers at the WIPP Site are encouraged to use distributed Lessons Learned at meetings as safety topics and in pre-job briefings and work control documents, if appropriate.</p>
RC-2j	<p><b>Commitment:</b> <i>While State, Tribal, and local authorities are responsible for initial response and command and control at accidents, the DOE, as owner and shipper, will be present at the scene to assess the damage, to determine whether any release of radioactive material has occurred, and to help the State and local authorities promptly inform the public about the situation. In the unlikely event that a release of radioactive material has occurred, the DOE will collect the TRU waste and any debris; decontaminate soil, vehicles, and persons as needed; reload the TRU waste into new shipping containers;</i></p>	<p>The WIPP Project employs a number of methods to assure safe shipments of waste to the WIPP facility, including:</p> <ul style="list-style-type: none"> <li>• Maintaining constant communication with the drivers to relate adverse weather or road conditions and diverting shipments to safe parking areas when warranted.</li> <li>• Tracking the progress of shipments via the Transportation Tracking and Communication System (TRANSCOM) in accordance with three operating procedures.</li> <li>• Carrier compliance with 49 CFR 392.9(b)(2) and 392.9(b)(3)(i)(ii)(iii) that inspections of the shipments be performed within the first 50 miles at the beginning of each trip, every 3 hours or every 150</li> </ul>

No.	Commitment	Status of Mitigation Implementation
RC-2j (cont.)	<p><i>and return the site of the accident to normal use.</i></p> <p><b>Reference:</b> SEIS-I, Vol. 1, p. 6-7</p>	<p>miles thereafter, and when a driver makes a change in their duty status.</p> <p>To address transportation emergencies, the DOE has established an Incident/Accident Response Team (IART) to provide off-site transportation-related emergency response capabilities. The team’s mission is to protect the public and the environment, recover CBFO assets, and quickly resolve transportation incidents/accidents in the field. This team operates in accordance with CBFO 94-1007 <i>Recovery Guide for TRU Waste Packages</i>, CBFO 10-3448 Response to Abnormal Occurrence and Incident Accident Response Team Activation and a local procedure, WP 12-10 “WIPP Incident/Accident Response Team Plan.”</p> <p>In June 2011 the DOE issued Revision 6 of the <i>Recovery Guide for TRU Waste Packages</i> (DOE/CBFO-94-1007), which addresses transportation incidents that could occur involving a truck shipment. This guide delineates the equipment and steps necessary to recover a package(s) and transporter as a result of an incident. It is intended to apply to all recovery situations, but will remain subject to local modifications as conditions indicate.</p> <p>WIPP transportation emergency exercises WIPPTREX/WIPPTRAX are conducted to validate plans, procedures, and training of local responders to respond to WIPP Project transportation-related incidents. These exercises are tailored to the specifications outlined in the guidance documents referenced above.</p> <p>All exercises conducted are required to conform to the Homeland Security Exercise and Evaluation Program (HSEEP). HSEEP provides a set of guiding principles for exercise programs, as well as a common approach to exercise program management, design and development, conduct, evaluation and improvement planning.</p> <p>On September 9-11, 2015 Carroll County Georgia tested its response capabilities by conducting three identical exercises to include all (3) shifts A, B, &amp;C. This method of conducting the exercises ensures as many responders as possible participated and is prepared to respond to a radiological transportation accident.</p> <p>On December 27, 2005, following an accident in Blackfoot, Idaho involving a TRUPACT-II transporter carrying three empties, members of the IART were in constant communications via teleconference with the incident commander at the scene; assisting with the recovery efforts. Successful recovery was achieved within less than eight hours.</p>



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