

APPENDIX A

COMMENTS AND RESPONSES

This appendix contains the comments that were received during the 30-day public comment period on the draft EA (October 23 through November 22, 2000) and their responses. Comments were obtained during public meetings held in Santa Fe, New Mexico, on November 14, 2000, and in Carlsbad, New Mexico, on November 16, 2000, as well as from letters and electronic mail messages. The comment entries are organized according to comment categories.

In compliance with the provisions of the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations, public comments on the draft EA were assessed individually and collectively. Some comments resulted in changes or modifications that have been incorporated into the final EA. Comments not requiring modifications to the EA resulted in a response to correct the commenter's misinterpretation, to clarify the scope of the EA, or to answer technical questions.

A.1 AIR QUALITY

Comment Number C-35

Comment Section 4.9 of the draft environmental assessment addresses impacts on air quality; however, these impacts are not quantified. A table of the expected emissions of nitrogen dioxide, sulfur dioxide, carbon monoxide, and PM₁₀ should be included so that the reviewers may come to their own conclusions of whether these emissions are negligible. In addition, the draft environmental assessment should address the impacts of the fugitive emissions that are quantified in the document as "negligible" for the same reasons.

Response The requested analysis has been conducted; the results are in Section 4.9.

Comment Number C-36

Comment During construction of any additional facilities at the WIPP site, care should be taken to minimize emissions of fugitive dust.

Response Text has been added to Sections 2.1.3 and 4.9.1 to state that fugitive dust emissions would be minimized.

Comment Number C-50

Comment Section 4.1.1 Proposed Action, paragraph one on page 4-6 and Section 4.2.1 Proposed Action on numerous pages: statements declare that the ventilation airflow is split between

the experimental area and the disposal area. A figure should be added depicting the split between the two areas. There should also be a statement somewhere in the EA, referencing this figure, supporting the conclusion that activities in the experiment gallery will have no impact on the Confirmatory VOC Monitoring Plan required by the NMED hazardous waste facility permit.

Response New Figure 2-8 has been added showing the split ventilation airflow in the WIPP underground. In addition, a footnote has been added to Section 4.1.1 stating that activities in the experiment gallery would not impact the VOC monitoring plan referred to by the reviewer.

Comment Number C-52

Comment Section 4.9 AIR QUALITY, on pages 4-17 through 4-18, a statement should be made relating to the potential release of Xenon-136, due to the great quantity of the material proposed for use.

Response This statement has been added to Section 4.9.

By their very nature experimental activities are difficult to anticipate and variable in execution. As an underground facility, WIPP has a unique record of performing underground evaluations and experimentation due to the extensive site characterization that was performed prior to waste receipt. WIPP has the processes and procedures in place to confidently evaluate the potential hazards involved with a proposed experiment and to ameliorate them in ways that would be protective of human health and the environment. For example, pressurized gases are controlled through procedures, and job hazard analyses have been conducted to ensure that onsite staff and responders are properly prepared to deal with possible accidents.

WIPP has an enviable safety record, and it is not compromised in any way when experimental activities are performed.

A.2 EA ANALYSIS

Comment Number C-05

Comment Section 2.1.4, Operation of Experiments, assumes that 15 experiments will require two individuals to be in the repository 5 days a week, for a total of 30 people. The EA should specify whether 5 days a week is equal to 40 hours a week.

The EA is unclear about what will happen when it will become necessary for workers to be working for more than 40 hours a week, e.g., some outer space events require round-the-clock work at WIPP. Dose calculations for all contingencies should be included in the final EA, e.g., 40 hours a week, 80 hours a week, and 24/7.

Response Nearly all of the experiments would be monitored remotely once in place. The monitoring may occur 24 hours a day, 7 days a week, but the scientists would not be in the facility during that time. Instead, computers and pagers would be used to inform them of events occurring underground. For this reason, DOE believes the 5-day-a-week assumption used for analysis is a conservative assumption. The workers would not be in the facility more than 5 consecutive days a week for a total of more than 40 hours a week. Section 2.1.4 has been modified to note that 5 days a week means 40 hours over 5 consecutive days per week.

Comment Number C-06

Comment Section 2.1.5: Include and describe regulatory and legal “drivers” for closure and decommissioning, on the surface and underground, and within the experiment gallery.

Response A text box has been added to Section 2.1.5 describing these activities for WIPP generally. They would not change due to the use of the experiment gallery.

Comment Number C-07

Comment Figure 3-2, Minority Population, WIPP ROI, and Figure 3-3, Low-Income Population, WIPP ROI. Please update these graphics - they are over a decade old.

Response Section 3.9 has been revised to state that the best available block group data were presented in the draft EA and that Census 2000 block group data were not available at the time the final EA was published. New tables (Tables 3-2 and 3-3) have been added to Section 3.9 that contain more recent data, although they are at the county level and not at the block group level. Therefore, the new data are more recent but not as detailed.

Comment Number C-12

Comment The draft EA does not meet the legal requirements for adequately describing the proposed experiments, their impacts, and all reasonable alternatives.

Response DOE believes the EA meets the legal requirements for adequately describing the proposed experiments, their impacts, and all reasonable alternatives. The EA describes 15 experiments in five categories (particle physics experiments, other astrophysics and physics experiments, mine safety and geophysical studies, nonproliferation and nuclear accountability experiments, and chemical and material processing experiments) that are currently proposed to be conducted in the WIPP facility or that DOE expects may be proposed in the future (see Section 2.1.1). The five categories represent the range of experiments that DOE believes are reasonably foreseeable. DOE analyzed the potential impacts associated with the conduct of this range of experiments at WIPP in the EA.

Additional analysis has been conducted for air quality impacts; the results of the analysis are contained in Section 4.9 of the final EA.

No additional experiments have been described in the EA in response to this comment. However, should experiments other than the 15 experiments described be proposed for WIPP, DOE would determine the extent to which these other experiments and their associated impacts and risks were within the range of the experiments and impacts considered in this EA. If the other experiments fell outside the range of experiments already analyzed or if the potential impacts had not been adequately analyzed, DOE would prepare additional NEPA documentation before determining whether to allow the experiments to be conducted at WIPP.

Comment Number C-13

Comment The draft EA does not adequately analyze the probability or impacts of a roof fall and floor heaving in the experiment gallery or in Panel 1. Bring in Jack Parker (Michigan), salt mine expert.

Response As noted in Section 4.2.1.3 of the draft EA, “there is a risk of roof falls and cave-ins onto experimental workers and equipment” and as is common in evaporite mines, there also is the potential for floor heave. However, the Salado Formation and the WIPP facility are probably the best-monitored and -understood excavations in salt in the world. Many of the experimental rooms have been open for close to 20 years, and in that time there have been only two roof falls in unheated rooms (SPDV 1 and 2). In both cases, the failures were understood and predicted, and no measures were taken to prevent them. Floor heave is a common occurrence in Panel 1, largely because of the room width, the proximity of MB139, and the age of the panel.

In relating this experience to the proposed experiment gallery, a number of factors should be considered. First, while several of the proposed experimental rooms have spans similar to a standard panel waste disposal room, none are appreciably larger and many are smaller. Second, much of the ground movement associated with the panel rooms is a result of the presence of MB139 close to the floor and Clay G close to the back. Third, any potential for roof falls associated with the ground movement has been successfully contained by the support systems employed. Finally, the current rooms are not designed for a long operational life, and indeed the design life has been successfully exceeded by a large amount.

In designing experimental rooms, all of this accumulated knowledge would be used to ensure an adequate operational life without damaging ground movement. While it is difficult to generalize due to the different design lives and geometries for the various experiments, certain design principles can be specified. First, designs would account for excavation sizes and layout (for example, by not placing rooms too close together). Second, where necessary, rooms can be placed at somewhat different horizons to account for the influence of partings and seams on ground movement, which can be most beneficial if used correctly. Third, where needed, design strategies such as shaping can and would be used to enhance stability. Fourth, rooms can be designed to account for

creep closure (for example, by oversizing in the horizontal plane), and, if necessary, access can be provided to allow ongoing maintenance of long-lived rooms. Finally, proven ground control materials and techniques (bolting, cabling, etc.), which provide adequate safety, are available.

The design of experimental rooms would be based on experimental needs and known *in situ* salt behavior, and the design would be carried out by professional engineers with extensive validated experience at WIPP. While Mr. Parker has expertise in commercial salt mining applications, his knowledge of WIPP is not current, and any relevant augmentation would have to be provided by these same WIPP experts. No changes have been made to the EA as a result of this comment.

Comment Number C-16

Comment Include mine ventilation pathways and monitors (diagrams).

Response Figure 2-8 showing ventilation pathways and monitors has been added to Section 2.1.3.

Comment Number C-17

Comment Table 4-2: Include a summary table about each experiment, indicating how long the experiment would last and the hazards involved, for assessment of different impacts.

Response Each experiment would be operated for a different length of time, depending, in part, on when it was funded, was fully designed, and met WIPP criteria for emplacement. For this reason, the length of time each would operate is unknown. For purposes of analysis, analysts assumed that each was emplaced immediately and operated for the remaining planned lifetime of WIPP, 35 years.

The descriptions of the proposed experiments in Section 2.1.1 have been revised to give more details about the potential hazards from the experiments. However, detailed analyses are dependent upon the specifics of each experiment. Detailed calculations of specific factors such as bearing loads, ventilation rates, hoisting impacts, etc., would be performed when an experiment proposal warrants that level of detail.

Comment Number C-37

Comment Section 2.1.5, Decommissioning, should require that no waste be generated in decommissioning process. In 35 years, a zero waste policy should be in effect. DOE should anticipate a zero waste policy and plan accordingly.

The second sentence of the second paragraph should include the EPA requirements for closing WIPP.

Response WIPP currently has a waste minimization policy in effect. Decommissioning would be conducted to minimize the waste. A text box has been added to Section 2.1.5 discussing the activities that will be conducted during WIPP closure and decommissioning. The establishment of a zero waste policy is beyond the scope of this EA.

Comment Number C-54

Comment On the one hand, DOE says that the salt in the WIPP underground will enclose the waste; on the other hand, DOE is proposing to allow long-term experiments to be conducted underground. How will the openings in the experiment gallery be maintained to allow these experiments to be conducted long-term?

Response While it is difficult to generalize about design principles due to the different design lives and geometries for the various experiments, certain design principles can be specified. First, designs would account for excavation sizes and layout (for example, by not placing rooms too close together). Second, where necessary, rooms can be placed at somewhat different horizons to account for the influence of partings and seams on ground movement, which can be most beneficial if used correctly. Third, where needed, design strategies such as shaping can and would be used to enhance stability. Fourth, rooms can be designed to account for creep closure (for example, by oversizing in the horizontal plane), and, if necessary, access can be provided to allow ongoing maintenance of long-lived rooms. Finally, proven ground control materials and techniques (bolting, cabling, etc.), which provide adequate safety, are available. The design of experimental rooms would be based on experimental needs and known *in situ* salt behavior, and the design would be carried out by professional engineers with extensive validated experience at WIPP.

A.3 EDITORIAL

Comment Number C-01

Comment In the first paragraph of Section 1.1, there should be a statement about the fact that there are two kinds of waste at WIPP - contact handled (CH) waste and remote handled (RH) waste. This statement should include the dose one could receive from the waste containers.

Response As requested by the public, a text box has been added to Section 1.1 defining RH- and CH-TRU waste. However, very few of the experiments under consideration in this EA would involve CH- or RH-TRU waste, and the experiment gallery is a great distance from any activities that involve the disposal of transuranic waste. The only dose that workers in the experiment gallery would receive from the CH- or RH-TRU waste would be that received when they leave the elevator at the bottom of the elevator shaft.

Section 4.1.1 of the EA states that the health impacts from such exposure would be about 0.04 person-rem (assuming 35 years of operation) or about 2E-05 latent cancer fatalities.

Comment Number C-02

Comment Figure 2-1 needs length measurements.

Response Figure 2-1 has been modified to show the dimensions of the lead detector.

Comment Number C-04

Comment Figure 2-7 requires a north directional arrow.

Response Figure 2-7 has been modified to include a north directional arrow.

Comment Number C-08

Comment Table 4-1. Summary of Potential Hazards That Could Be Introduced by the Proposed Science Experiments (continued), on page 4-4, Xenon-136 should be added to the list of Cause/Source for the Toxicity/inadequate oxygen levels (oxygen displacement) row.

Response Xenon-136 has been added to Table 4-1 as suggested.

Comment Number C-09

Comment In Table 4-1, add oxygen deficiency where appropriate in the Cause/Source column for potential hazards.

Response Table 4-1 lists “oxygen deficiency” under “Cause/Source” where appropriate.

Comment Number C-33

Comment Conversions between the metric and the English units are incorrect at several places in the document. For example, 30,690 square feet is shown equivalent to 2,118 square meters (should be 2,853 square meters) (Section 2.1.2) and 137,280 square feet equal to 41,600 square meter (should be 12,760 square meters) (Section 2.1.3).

Response These measurements and conversions have been corrected, and other conversions have been checked for accuracy and found to be correct as is.

Comment Number C-34

Comment The location for the Neutrino Factory detector in the text (p. 2-9) is shown to be east of the experiment gallery, whereas the figure referred to in the text, Figure 2-6, shows it to be west of the experimental gallery.

Response The neutrino factory detector drift slopes downward to the northwest toward Fermi National Accelerator Laboratory, as shown in Figure 2-6, and the detectors in the drift are oriented in a downward direction (i.e., pointing toward Fermi). In the draft EA, the arrow in Figure 2-6 pointing toward the southwest was indeed pointing in the wrong direction; the figure has been revised to indicate that the “front” of the detector (at the low end of the sloping drift) is oriented to the northwest, toward Fermi.

A.4 ENDORSEMENT

Comment Number C-27

Comment The WIPP facility should be used to its maximum potential, assuming such activities do not create safety problems for TRU waste disposal.

Response Thank you for your comment.

A.5 EXPERIMENTS

Comment Number C-03

Comment All experiments described within Section 2.1.1 should include hazard statements. All experiments should be required to provide triple containment. The EA should study magnetic and RAD field interaction, mine tremor and sensor studies, other mine safety/geological studies.

Response Section 2.1.1 has been revised to include hazard statements. The appropriate level of containment would be determined based upon the hazards analysis of each type of experiment, prior to approval of an experiment's design. Magnetic and RAD field interaction, mine tremor and sensor studies, and other mine safety/geological studies would be conducted, if necessary, on an experiment-by-experiment basis, once the experiments are better defined.

Comment Number C-10

Comment DOE needs to clarify management of hazardous waste and spills.

Response The contracts between the sponsors and DOE for use of the facility would state that removal of hazardous materials and associated costs from the repository is the responsibility of the scientists conducting the experiments. If a spill should occur, DOE hazardous waste managers would ensure the spill is cleaned up, but the sponsors would be required to reimburse for the expense of the cleanup. The management of potential spills would be completed in accordance with existing WIPP emergency management and spill control procedures. The operator and/or underground operations personnel would conduct equipment, storage container, and spill management equipment inspections on a daily basis. Weekly inspections would also be conducted by environmental personnel.

The WIPP staff would evaluate project hazards and design containment requirements for every project at the site. As a part of meeting its NEPA and hazardous materials management commitments, DOE would evaluate each experimental project plan prior to implementation to assess the need for containment based on the size or volume and nature of the potential hazard. All hazardous materials would be double-contained. The scintillation vessel or tank would provide primary containment, and the secondary containment would be provided by a spill container(s) or basin(s) included in the design of the scintillation tank(s) used in each experiment. Materials stored underground or on the surface would be similarly double-contained.

No changes have been made to the EA as a result of this comment.

Comment Number C-11

Comment The Draft EA is overly broad. The EA must be limited only to experiments (“proposed actions” under NEPA) that can be described and evaluated in detail, as required by NEPA and the CEQ regulations. These experiments cannot be used to usher in other experiments.

Response The EA describes 15 experiments in five categories (particle physics experiments, other astrophysics and physics experiments, mine safety and geophysical studies, nonproliferation and nuclear accountability experiments, and chemical and material processing experiments) that are currently proposed to be conducted in the WIPP facility or that DOE expects may be proposed in the future (see Section 2.1.1). The five categories represent the range of experiments that DOE believes are reasonably foreseeable. DOE analyzed the potential impacts associated with the conduct of this range of experiments at WIPP in the EA.

Should experiments other than the 15 experiments described in the EA be proposed for WIPP, DOE would determine the extent to which these other experiments and their associated impacts and risks were within the range of the experiments and impacts considered in this EA. DOE would evaluate each individual experiment prior to implementation to specifically define hazards, establish spill hazards and spill containment,

provide spill response training, and update existing procedure to reflect potential hazards associated with that specific experiment. If the other experiments fell outside the range of experiments already analyzed or if the potential impacts had not been adequately analyzed, DOE would prepare additional NEPA documentation before determining whether to allow the experiments to be conducted at WIPP. No changes have been made to this EA as a result of this comment.

Comment Number C-14

Comment Some experiments (INPAC and OMNIS, for example) would place heavy loads on the floor, which overlies the incipiently fractured anhydrite and clay layers of “marker bed 139.” For example, the OMNIS experiment would require placing 20 modules of 450 metric tons each, constructed of lead and/or iron. No analysis of the impact of such heavy loads on the floor of the experimental area has been presented.

Response The most extreme load from the experiments noted in the EA would come from the OMNIS lead modules. These would occupy rows 5 meters wide and nearly 4 meters wide (Section 2.1.1.1). With a density for lead of $11,340 \text{ kg/m}^3$, this represents an added pressure on the floor of $45,360 \text{ kg/m}^2$, which is equivalent to 0.445 MPa or 65 psi. This additional pressure would have an insignificant effect on the floor of the experimental rooms. No changes have been made to the EA as a result of this comment.

WIPP maintains an extensive geotechnical program with well-qualified staff under the direction of a registered Professional Engineer. This program provides comprehensive monitoring and evaluation of ground conditions at WIPP. Validated models are available to assess the performance of planned excavations, and proven ground control techniques and materials are in use. For many years, this program has included independent oversight by recognized experts in salt rock mechanics. Should the circumstances of a particular experiment warrant the use of such oversight, it can readily be provided.

The WIPP staff would evaluate project hazards and design containment requirements for every project at the site. As a part of meeting its NEPA and hazardous materials management commitments, DOE would evaluate each experimental project plan prior to implementation to assess the need for containment based on the size or volume and nature of the potential hazard. All hazardous materials would be double-contained. The scintillation vessel or tank would provide primary containment, and the secondary containment would be provided by a spill container(s) or basin(s) included in the design of the scintillation tank(s) used in each experiment. Materials stored underground or on the surface would be similarly double-contained.

The management of potential spills would be completed in accordance with existing WIPP emergency management and spill control procedures. The operator and/or underground operations personnel would conduct equipment, storage container, and spill management equipment inspections on a daily basis. Weekly inspections would also be conducted by environmental personnel.

Comment Number C-15

Comment The experience of WIPP excavations shows that due to salt creep the roof sags, the floor heaves up and the walls heave into the excavation. After a few years the excavations require roof support through the installation of roof bolts, cables and wire meshing; milling of the floor and reconstituting it with crushed salt to keep it flat; and maintenance of the walls. The maintenance operations, particularly to keep the roof stable, would be very difficult, if not impossible, to perform with large tanks and other structures in place. The EA does not address how excavations of various sizes (both horizontally and vertically) will be maintained for 35 years.

Response Maintenance of the experiment gallery would be part of the design criteria of the experiments. The experiment gallery would be maintained in the same way as other areas of WIPP where workers would be present for its full lifetime. For instance, the drifts used as hallways in the repository are maintained by inspecting for salt creep, heaving in the floors, etc., and maintenance is done to ensure they do not present safety risks. The same would be done in the experiment gallery. Text has been added to Section 2.1.3 describing these maintenance activities.

As noted in Section 4.2.1.3 of the draft EA, “there is a risk of roof falls and cave-ins onto experimental workers and equipment” and as is common in evaporite mines, there also is the potential for floor heave. However, the Salado Formation and the WIPP facility are probably the best-monitored and -understood excavations in salt in the world. Many of the experimental rooms have been open for close to 20 years, and in that time there have been only two roof falls in unheated rooms (SPDV 1 and 2). In both cases, the failures were understood and predicted, and no measures were taken to prevent them. Floor heave is a common occurrence in Panel 1, largely because of the room width, proximity of MB139, and the age of the panel.

In relating this experience to the proposed experiment gallery, a number of factors should be considered. First, while several of the proposed experimental rooms have spans similar to a standard panel waste disposal room, none are appreciably larger and many are smaller. Second, much of the ground movement associated with the panel rooms is a result of the presence of MB139 close to the floor and Clay G close to the back. Third, any potential for roof falls associated with the ground movement has been successfully contained by the support systems employed. Finally, the current rooms are not designed for a long operational life, and indeed the design life has been successfully exceeded by a large amount.

In designing experimental rooms, all of this accumulated knowledge would be used to ensure an adequate operational life without damaging ground movement. While it is difficult to generalize due to the different design lives and geometries for the various experiments, certain design principles can be specified. First, designs would account for excavation sizes and layout (for example, by not placing rooms too close together). Second, where necessary, rooms can be placed at somewhat different horizons to account for the influence of partings and seams on ground movement, which can be most beneficial if used correctly. Third, where needed, design strategies such as shaping can and would be used to enhance stability. Fourth, rooms can be designed to account for creep closure (for example, by oversizing in the horizontal plane), and, if necessary, access can be provided to allow ongoing maintenance of long-lived rooms. Finally,

proven ground control materials and techniques (bolting, cabling, etc.), which provide adequate safety, are available.

The design of experimental rooms would be based on experimental needs and known *in situ* salt behavior, and the design would be carried out by professional engineers with extensive validated experience at WIPP.

Such analyses are dependent upon the specifics of each experiment. Detailed calculations of specific factors such as bearing loads, ventilation rates, hoisting impacts, etc., would be performed when an experiment proposal warrants that level of detail.

Comment Number C-18

Comment For remote monitoring, how will information be transmitted to the surface? What will be the effects on the facility's shafts?

Response The experiment gallery would have its own separate computer network and domain. Currently, there is fiber optic cable installed in the waste shaft, and 4 of the 24 lines would be allocated to the experiments. There would be no modification to the shafts. No changes have been made to the EA as a result of this comment.

Comment Number C-19

Comment Will the existence of these experiments at the end of 35 years become a reason to keep the WIPP underground -- that is, WIPP completes its primary mission, and the experiments become the mission?

Response WIPP's mission is to dispose of 175,600 cubic meters (6.2 million cubic feet) of transuranic waste. When this mission is complete, WIPP will be decommissioned and any experiments running at that time would be terminated and removed from the facility. No changes have been made to the EA as a result of this comment.

Comment Number C-21

Comment Include information about the experiments in the information centers that will be part of the "Markers."

Response Thank you for your suggestion. Decommissioning of the facility and preparation of the markers is 35 years away. Much discussion about what should be included on those markers will occur during that time. Your suggestion will be taken into consideration. No changes have been made to the EA as a result of this comment.

Comment Number C-22

Comment In the event of an explosion caused by materials brought in, would materials go up the shaft?

Response The explosions discussed as presenting a hazard would be no larger than a large firecracker. That type of explosion would not result in materials moving up the shaft. In fact, the greatest hazard, perhaps, would be the accidental release of nitrogen that would displace the oxygen in the repository. Should such an accident occur (and the potential is very, very slight), then oxygen and nitrogen would move up the shaft. Both, though, are part of our natural environment. No changes have been made to the EA as a result of this comment.

Comment Number C-23

Comment Will workers wear oxygen?

Response Not necessarily. Workers in the experiment gallery would be given the same safety training and equipment as others working in the repository. Also, monitors and other safety controls throughout the facility would be emplaced based upon hazards analyses for the experiments in the experiment gallery. The monitors and controls would be designed to allow workers to evacuate should a problem occur. No changes have been made to the EA as a result of this comment.

Comment Number C-24

Comment Section 2.2 No Action Alternative. A statement should be included stating that salt is currently stored in the experiment gallery at WIPP.

Response Salt is currently stored in some portions of the gallery formerly planned for underground experiments, but not in the area described in this EA as the experiment gallery. That area currently is vacant. No changes have been made to the EA as a result of this comment.

Comment Number C-25

Comment CCNS strongly suggests that long-term stewardship principles be required in the planning, operations, and decommissioning plans for these experiments.

Response Those principles would be required. The experiments would not leave any materials behind, even if they continued until WIPP decommissioning. All materials would have to be removed and properly disposed of. No changes have been made to the EA as a result of this comment.

The existing WIPP Conduct of Operations process implements the long-term stewardship process that will govern all experimental processes just as it affects all current operational activities at WIPP. Conduct of Operations concepts are implemented through existing procedures and will be integrated into all experimental activities. Planning, operations, maintenance, auditing and corrective actions, and decommissioning are all a part of the overall Conduct of Operations process that are fully implemented at the site.

Comment Number C-26

Comment The draft EA does not consider alternative locations (such as Yucca Mountain) for the experiments, as required by NEPA.

Response The only proposal pending before DOE is whether to allow WIPP to be used for the conduct of the range of experiments analyzed in the EA. DOE is not proposing to conduct the experiments; rather, the agency is only deciding whether to allow its underground facility to be used for experiments proposed by others. Thus, DOE has no basis on which to decide that the experiments should be conducted elsewhere. For this reason, DOE did not analyze the potential impacts of conducting these experiments at other locations.

Comment Number C-30

Comment Nine experiments are proposed to be conducted underground at WIPP. While general space requirements for each of these are provided in the EA, there is no attempt to plan a layout of all these experiments in the 9,146 square meter experimental gallery. While the EA states (Section 2.1.1.1, page 2-9, and Section 2.1.3, page 2-15) that additional excavations up to the size of a full WIPP panel may be necessary to accommodate the proposed experiments, there is no attempt to plan the layout. The final EA should show the layout of all the experiments planned, and with the help of the drawings, should show the dimensions of the new excavations and where these will be. Also, greater detail is needed on the ventilation requirements and planning.

Response DOE does not know which experiments would actually be funded and emplaced, nor does it know the exact configuration that the scientists conducting the experiments would request. Therefore, there is no way to present a layout at this time. However, a new Figure 2-8 showing ventilation pathways has been added to Section 2.1.3.

Comment Number C-31

Comment Very little thought appears to have been given to the requirement for hoisting of equipment, materials, and personnel for these experiments. The EA assumes (Section 2.1.3, page 2-15) that the requirement for lowering tons of lead, iron, liquids, equipment and modular rooms would last only for a period of 4 to 5 years. The

experiments described in Section 2.1.1 do not, however, all begin at the same time. There appears to be a need for substantial hoisting resources to last the full 35 years of experiments. The EA casually mentions (Section 2.1.3, page 2-15) that the existing WIPP hoisting facilities will be used for these needs, “as they are available around disposal activities.” This is not good enough. The WIPP plan is to start receiving 17 shipments per week of CH-TRU and 4.4 shipments of RH-TRU waste, per week, as soon as possible. A proper analysis of the hoisting needs of the proposed experiments vis-à-vis the needs of the waste disposal operations is needed.

Response Although the specific requirements of each individual experiment are not yet available, DOE has evaluated the potential bounding impacts on hoist usage associated with the experimental programs. As previously stated, experiments would not impact waste operations. Based on these criteria, an assessment of hoist usage was developed to examine potential hoisting needs. It was assumed that the materials hoist services would only be available to experimental personnel during the back shift to move and set up experiments. For assessment purposes, it was also assumed that the hoist would only be available 50 percent of the time during the back shift to support hoist maintenance and inspection activities. Thus, only five complete trips could be completed in a 10-hour shift. This analysis shows that the experimental needs could be accommodated using the existing hoist.

DOE would make the facility available only to the extent that doing so would not interfere with the disposal of waste. No additional hoist would be added and WIPP officials would not allow the needs of the scientists to interfere with WIPP's primary mission. Those scientists intending to use the facility would have to design their experiments such that their use of the hoist would not interfere with waste emplacement activities. No changes have been made to the EA as a result of this comment.

Comment Number C-32

Comment Several experiments would require huge amounts of liquids to be stored underground. For example, the GENIUS experiment would place up to 450 metric tons of liquid nitrogen. The OMNIS experiment would require 106,000 liters of mineral oil (scintillation liquid). The EXO experiment would use 9 metric tons of Xenon-136 under up to 20 atmospheres of pressure. The INPAC experiment would require a 381.5 cubic meter cylinder filled with ultra-pure water. The EA should include a discussion of the handling of these liquids. Would pipelines be installed to pump the liquids in? How will the liquids be removed from the underground when the experiments are finished?

Response DOE plans to transport containerized liquids to the underground using the hoisting mechanisms in place at WIPP. The use of pipelines to transfer liquids would pose at least two problems. First, the required purity of some of the liquids that would be used in the experiments would likely require several pipelines, rather than just one, to avoid potential contamination of pure fluids by other fluids transferred in the same pipeline. Second, the use of a pipeline to transfer liquids underground would result in high fluid pressures at the underground outlet, which would pose an unnecessary safety hazard, and would require additional engineering controls to reduce the fluid pressure to a point that would

allow safe handling at the underground outlet. No changes have been made to the EA as a result of this comment.

A.6 GEOLOGY

Comment Number C-53

Comment Consider how you will maintain the underground facility for 20 to 35 years. In some rooms, facilities already reach marker beds. Scientists should know the risks of working in the WIPP underground.

Response The scientists are aware of the risks of working in a salt repository. Many of them have worked in similar repositories elsewhere in the world. The experiment gallery would be maintained in the same way as other areas of WIPP where workers would be present for its full lifetime. For instance, the drifts used as hallways in the repository are maintained by inspecting for salt creep, heaving in the floors, etc., and maintenance is done to ensure they do not present safety risks. The same would be done in the experiment gallery. No changes have been made to the EA as a result of this comment.

A.7 NEPA PROCESS

Comment Number C-20

Comment If you come up with experiments that are beyond the analysis of this EA, I recommend you perform other NEPA analysis and include public meetings.

Response If an experiment is outside of the scope of this EA, a separate NEPA document describing the impacts of the experiment would be necessary, and it is possible that public hearings would be held then. No changes have been made to this EA as a result of this comment.

Comment Number C-28

Comment It appears that the legal framework to allow any activity other than the disposal of defense transuranic waste in the WIPP underground may not currently exist. It would be wise to clarify this point and, if necessary, initiate actions to obtain such authority at an early stage of this decision making process.

Response DOE believes the Land Withdrawal Act clearly allows these activities, as stated in Section 1.2 of the EA. No changes have been made to the EA as a result of this comment.

Comment Number C-29

Comment The LWA, Section 4(3)(e), requires that any amendments to the land management plan be “submitted promptly to the Congress and the State.” While Section 1.4.2 of the EA shows that various departments of the New Mexico government are aware of the proposals, there is no indication that the Congress has been notified.

Response Should DOE implement the proposed action, it will evaluate whether amendments to the land management plan are needed to implement those actions. DOE will amend the plan when appropriate and seek the required approvals.

Comment Number C-41

Comment Section 1.4.1 WIPP NEPA Compliance, starting on page 1-7 and ending on page 1-9: there should be a NEPA reference for closure of the facility. There must be such a document. This document should be inclusive in the narrative.

Response SEIS-II is the only existing document that addresses closure activities for WIPP. A text box summarizing closure and decommissioning activities, as described in SEIS-II, has been added to Section 2.1.5 of the EA. However, a NEPA document specifically addressing site closure would likely be prepared immediately prior to closure to examine the impacts in more detail.

Comment Number C-43

Comment Section 1.4.2 Stakeholder Outreach and Involvement Activities, on page 1-9: NMED should be considered for inclusion on Table 1-2. Government Agencies Consulted due to the fact that hazardous, low level mixed radioactive, and low level radioactive wastes may be generated during the experiments. However, the paragraph mentioning NMED following Table 1.2 may suffice.

Response Table 1.2 has been modified as suggested by the reviewer. The paragraph mentioning NMED has also been left in the text.

A.8 OPPOSITION

Comment Number C-39

Comment I quite oppose astrophysics and other basic science experiments being done at the WIPP, because it diverts too much attention from storing nuclear waste at the WIPP safely, with increased chances of lost trucks, nuclear accidents in which people lose their lives, and so on.

Response Thank you for your comment.

A.9 OTHER

Comment Number C-38

Comment We have no specific comments to offer on the draft EA. However, the proposed activities may have an impact on current operations and these activities must be considered under applicable regulations.

Response Thank you for your comment. DOE intends to work with EPA's Region 6 to ensure activities are compliant with all applicable regulations. No changes have been made to the EA as a result of this comment.

A.10 WASTE GENERATION

Comment Number C-40

Comment Section 1.3 Permits Required, page 1-7: there should be a clause to indicate that hazardous, low level mixed radioactive, and low level radioactive wastes may potentially be generated as a result of the experiments, and that these wastes shall be managed by WIPP and shipped off site, per existing generator regulations specified in 40 CFR §262.

Response DOE does not anticipate that such wastes would be generated. Still, text has been added to Section 1.3 stating that DOE would comply with regulations for managing any such waste.

Comment Number C-42

Comment Table 1-1. Required Permits and Approvals for Ongoing Activities at WIPP, page 1-8: the relevant NMED document is properly entitled the "Hazardous Waste Facility Permit." The footnote referencing RCRA may be eliminated.

Response These changes have been made to Table 1-1.

Comment Number C-44

Comment Section 2.1.1.1 Range of Possible Experiments, pages 2-3 through 2-9: each category (LANL WIMP Dark Matter HpSi Detector, Observatory for Multi-flavor Neutrino

Interactions from Supernovae [OMNIS], Surface Experiment Related to OMNIS, Enriched Xenon-136 Observatory [EXO], Germanium in Liquid Nitrogen Underground System [GENIUS], Institute for Nuclear and Particle Astrophysics and Cosmology [INPAC], Majorana Project, and Neutrino Factory Detector at WIPP), should have statements for the potential to produce wastes.

Response Because many of the experiments are in the theoretical planning stages, it is difficult to state specifically what wastes would be produced. Instead, the EA discusses the types of wastes that could be produced in a general sense, given the types of experiments proposed to date. However, before any experiment would be placed in the WIPP underground, a hazards analysis would be performed for that experiment. This analysis would provide specific information about (1) the types of waste that could be produced, and (2) waste handling methods to be used. Section 2.1.3 of the EA has been revised to state that a hazards analysis would be performed for each experiment before it began.

Comment Number C-45

Comment Sections 2.1.1.4 Nonproliferation and Nuclear Accountability Experiments and 2.1.1.5 Chemical and Material Processing Experiments, page 2-12: statements should be made pertaining to the potential to produce wastes.

Response Because many of the experiments are in the theoretical planning stages, it is difficult to state specifically what wastes would be produced. Instead, the EA discusses the types of wastes that could be produced in a general sense, given the types of experiments proposed to date. However, before any experiment would be placed in the WIPP underground, a hazards analysis would be performed for that experiment. This analysis would provide specific information about (1) the types of waste that could be produced, and (2) waste handling methods to be used. Section 2.1.3 of the EA has been revised to state that a hazards analysis would be performed for each experiment before it began.

Comment Number C-46

Comment Section 2.1.2 WIPP Experimental Gallery, page 2-13: a statement regarding the establishment of a less than 90-day waste accumulation area should be included in the narrative.

Response A less-than-90-day satellite waste accumulation area would be located near the experiment gallery once the need for such an area was determined. A statement to that effect has been added to Section 2.1.2.

Comment Number C-47

Comment Figure 2-7. Closeup of Experimental Gallery, page 2-14: the figure should indicate the location of the less than 90-day waste accumulation area.

Response A less-than-90-day waste accumulation area would be located near the experiment gallery. The exact location of the waste accumulation area would be determined when DOE knows which experiments would be conducted in the experiment gallery and how the experiments would be arranged physically. Figure 2-7 has not been revised as a result of this comment.

Comment Number C-48

Comment Section 2.1.5 Decommissioning, page 2-15: a statement should be included in the narrative to indicate that the experiment gallery will also be decommissioned in compliance with requirements in the NMED hazardous waste facility permit.

Response This change has been made to Section 2.1.5.

Comment Number C-49

Comment Section 4.1.1 Proposed Action, paragraph four on page 4-1: an inclusive statement should be amended to identify potential waste production.

Response Because many of the experiments are in the theoretical planning stages, it is difficult to state specifically what wastes would be produced. Instead, the EA discusses the types of wastes that could be produced in a general sense, given the types of experiments proposed to date. However, before any experiment would be placed in the WIPP underground, a hazards analysis would be performed for that experiment. This analysis would provide specific information about (1) the types of waste that could be produced, and (2) waste handling methods to be used. Section 2.1.3 of the EA has been revised to state that a hazards analysis would be performed for each experiment before it began.

The WIPP staff would evaluate project hazards and design containment requirements for every project at the site. As a part of meeting its NEPA and hazardous materials management commitments, DOE would evaluate each experimental project plan prior to implementation to assess the need for containment based on the size or volume and nature of the potential hazard. All hazardous materials would be double-contained. The scintillation vessel or tank would provide primary containment, and the secondary containment would be provided by a spill container(s) or basin(s) included in the design of the scintillation tank(s) used in each experiment. Materials stored underground or on the surface would be similarly double-contained.

The management of potential spills would be completed in accordance with existing WIPP emergency management and spill control procedures. The operator and/or underground operations personnel would conduct equipment, storage container, and spill management equipment inspections on a daily basis. Weekly inspections would also be conducted by environmental personnel.

Comment Number C-51

Comment Section 4.2 ACCIDENTS, on pages 4-6 through 4-14, a subsection should be created to discuss the potential of spills and /or releases of wastes stored in the less than 90-day waste accumulation area.

Response DOE is unsure what specific wastes would be stored in such an area because the experiments are currently only proposed and information on many of them is limited. For this reason, the less-than-90-day satellite waste accumulation area has not yet been identified.

However, the EA does analyze the potential impacts of spills, leakages, or other releases that could occur from the experiments themselves; DOE believes that any potential impacts from spills in a waste accumulation area would be considerably less than the potential impacts already analyzed in the EA. No changes have been made to the EA as a result of this comment.

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