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Supplement Analysis for the Transportation of Transuranic Waste in TRUPACT-III Containers

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TABLE OF CONTENTS

Section Page

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CH	contact-handled
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
INL	Idaho National Laboratory
LANL	Los Alamos National Laboratory
LCF	latent cancer fatality
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
ROD	Record of Decision
RH	Remote-handled
WIPP SEIS-II	*Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*
SA	Supplement Analysis
SRS	Savannah River Site
TRU	transuranic (waste)
TRUPACT	Transuranic Package Transporter
WIPP	Waste Isolation Pilot Plant

Supplement Analysis for the Transportation of Waste in TRUPACT-III Containers

1.0 INTRODUCTION

This supplement analysis (SA) addresses a proposed action to transport some waste directly to WIPP using a new transportation container design called the Transuranic Package Transporter Model III (TRUPACT-III).

TRU waste is waste that contains alpha particle-emitting radionuclides with atomic numbers greater than uranium (92) and half-lives greater than 20 years in concentrations greater than 100 nanocuries per gram of waste. TRU waste is categorized as either contact-handled (CH-TRU) or remote-handled (RH-TRU), based on the radiation level at the surface of the waste container. CH-TRU can be handled directly by trained workers. RH-TRU requires special handling and shielding to protect workers. The WIPP, located near Carlsbad, New Mexico, is the only facility permitted to dispose of the Department of Energyôs (DOEôs) TRU waste generated by defense activities.

2.0 PURPOSE AND NEED FOR ACTION

DOE needs to increase the efficiency of its operations by using the TRUPACT-III transportation container for transportation of CH-TRU waste that is currently stored in larger than standard size waste containers. The use of TRUPACT-III would avoid the need to repackage these larger waste containers and the associated expense and worker exposure associated with the repackaging activities.

3.0 PROPOSED ACTION

DOE proposes to use the TRUPACT-III transportation container for transportation of some wastes in oversize boxes directly to WIPP from the Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), and the Savannah River Site (SRS). Table 1 shows the volumes that could be shipped directly to WIPP in the TRUPACT-III. A total of about 1,260 shipments would move directly to WIPP from these sites in the TRUPACT-III. Use of the TRUPACT-III for waste shipments would be contingent on the TRUPACT-III being certified by the NRC. DOE has completed its initial testing of the TRUPACT-III and is preparing the application for approval of this container by the NRC.

Table 1 – CH-TRU Waste to be Shipped Directly to WIPP in TRUPACT-III[a]

Waste Generator Sites	CH-TRU Waste Volume (cubic meters)
Idaho National Laboratory	205
Los Alamos National Laboratory (LANL), Los Alamos, NM	3,170
Savannah River Site (SRS), SC	3,800
Total	7,175

[a.] Only the portion of the inventory from each site that is expected to move to WIPP in the TRUPACT-III is included in this table, not the total site inventory.

The use of the TRUPACT-III transportation container would allow DOE to avoid repackaging of some waste at the generator sites to fit into the currently available CH-TRU waste transportation containers, TRUPACT-II or HalfPACT, due to the larger volume capacity of the TRUPACT-III. This would avoid

the expense and worker radiation exposure associated with repackaging to fit into presently available transportation containers.

4.0 EXISTING EIS ANALYSES

In the Waste *Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* , DOE /EIS-0026-S-2 (WIPP SEIS-II), DOE analyzed the potential environmental impacts associated with disposing of TRU waste at WIPP. DOEôs proposed action in the WIPP SEIS-II was to open WIPP and dispose of up to 175,600 cubic meters of defense TRU waste. DOE announced its decision to implement the proposed action in the *Record of Decision for the Department of Energy's Waste Isolation Pilot Plant Disposal Phase*, 63 Fed. Reg. 3623 (1998)(WIPP ROD).

The WIPP SEIS-II analyzed the impacts associated with shipment, treatment and characterization of CH-TRU and RH-TRU wastes at various sites (including LANL, INL, and SRS) and shipping these wastes to the WIPP and disposing of them there.

The direct movement of waste to WIPP in TRUPACT-III shipping containers is most comparable to the WIPP SEIS-II Action Alternative 1, and the impacts of these direct movements are compared to that alternative. In this analysis, DOE considered whether the current proposed action presents substantial changes to the proposal analyzed in the WIPP SEIS-II or significant new circumstances or information relevant to environmental concerns and bearing on the actions or impacts previously analyzed.

None of the activities involved in this current proposed action for the generator sites or WIPP would require any new excavation or facility construction. Therefore, DOEôs previous estimates of potential impacts to geological and hydrological resources, land use, biological resources, cultural resources, socioeconomics, and noise at those sites would remain substantially unchanged.

To determine whether the human health impacts (worker and public) of the current proposed action are consistent with the impacts reported in the WIPP SEIS-II, DOE examined the impacts that could be associated with the current proposed action during transportation, routine operations, and facility accidents.

5.0 ENVIRONMENTAL IMPACTS

5.1 Transportation Impacts

5.1.1 Shipment from INL, LANL, and SRS to WIPP in TRUPACT-III

Under the current proposed action, a total of about 1,260 shipments of CH-TRU waste would move from INL, LANL, and SRS, to WIPP in the TRUPACT-III container. Since the TRUPACT-III holds less waste than three TRUPACT-IIs filled with 55-gallon drums (the shipping configuration assumed for the WIPP SEIS-II analysis), the use of the TRUPACT-III would increase the number of shipments over those assumed in the WIPP SEIS-II by about 50%. The transportation impacts for this volume of waste would thus increase over those calculated in the WIPP SEIS-II in some instances[1].

[1] DOE estimated potential impacts of the Proposed Action using 2000 Census data. The analysis of shipment impacts for waste moving from SRS, LANL, and INL to WIPP in TRUPACT-IIIs also used the most recent accident statistics reported for highway types by state and changes in the estimated number of members of the public exposed to radiation during times when shipments are stopped, which are based on operating experience at WIPP, both of which are less than used for the WIPP SEIS-II analysis. These estimates indicate that the number of traffic fatalities and the number of Latent Cancer Fatalities (LCFs) to members of the public resulting from TRUPACT-III shipments are predicted to be less than the SEIS-II impacts, even though the number of shipments would be greater.

Specifically, the impacts of the current proposed action would be about 4.8×10^{-2} traffic fatalities, 7.5×10^{-3} fatalities from air pollution, 3.1×10^{-2} Latent Cancer Fatalities (LCFs) to workers, and 1.2×10^{-2} LCFs to the public. This compares to about 7.7×10^{-2} traffic fatalities, 2.9×10^{-3} fatalities from air pollution, 6.1×10^{-3} LCFs to workers, and 5.3×10^{-2} LCFs to the public for shipping approximately the same amount of waste under the WIPP SEIS-II proposed action (derived from SEIS-II, Table E-12). This increase in some transportation impacts (two of the four impacts examined) from these shipments over the WIPP SEIS-II proposed action is small and would not significantly change the results reported in the WIPP SEIS-II. This increase in transportation impacts would also be offset by the reduction in potential impacts to waste management workers at the generator sites since use of the TRUPACT-III would minimize activities to reduce the size of large waste items and the resulting accidents and worker radiation exposure.

5.1.2 Transportation Accidents

A TRUPACT-III transportation accident was analyzed for the current proposed action. The accident was based on a radionuclide inventory from SRS that would produce the highest adverse impacts in an accident situation. The expected impacts of that highly unlikely postulated accident ranged from 1.8 to 2.9 $\times 10^{-2}$ LCFs (depending on whether the accident occurs in an urban or rural area). This is much less than the comparable TRUPACT-II accident analyzed in the WIPP SEIS-II (pages 5-22), which predicted 16 LCFs (that accident was assumed to occur in an urban area), which used a hypothetical maximum radionuclide inventory estimate instead of actual site specific waste data.

5.2 Site Impacts

5.2.1 Waste Repackaging at INL, LANL and SRS

Under the proposed action DOE would not have to repackage more than 7,000 cubic meters of waste currently packaged in larger than standard size waste containers. This would reduce worker radiation exposure compared to repackaging of these containers, which was assumed in the SEIS-II analysis.

5.2.2 WIPP Site Impacts

There would be no increase in the total amount of waste disposed of at WIPP as a result of the current proposed action. The impacts due to handling and disposal of the standard large waste box that is transported in the TRUPACT-III were examined to determine whether those impacts would differ from the impacts calculated in the WIPP SEIS-II. A postulated accident involved a container drop of a maximally loaded standard large waste box (the particular waste stream that would produce this maximal loading was from SRS) inside the WIPP waste handling building was examined. DOE estimates that the risk of a LCF from this accident would be 2.7×10^{-8} for the maximally exposed worker and 1.1×10^{-8} for the population around WIPP. Comparable impacts from a single hypothetical bounding drum drop in the WIPP SEIS-II analysis are 1×10^{-4} risk of a LCF to the maximally exposed worker and 9×10^{-3} to the population around WIPP (see SEIS-II, Table 5-19).

6.0 INTENTIONAL DESTRUCTIVE ACTS

DOE also considered the potential impacts of intentional destructive acts (i.e., acts of sabotage or terrorism) and estimated that the impacts would be no greater than the impacts of an accident as analyzed in this SA because the initiating forces and resulting quantities of radioactive or hazardous material potentially released by an intentional destructive act would be similar to those for severe accidents analyzed in this SA.

7.0 CONCLUSION

Table 2 compares the predicted impacts of the current proposed action with comparable impacts predicted by the WIPP SEIS-II. The table shows that all of the estimated potential impacts of the current proposed action are less than, i.e., are within, those reported in the WIPP SEIS-II, except for worker LCFs from transportation and air pollution fatality risk. In this case, there is a slight increase with the current proposed action, although this increase would not be expected to result in an additional LCF.

Table 2 – Comparison of Environmental Impacts

Impact Category	Impacts of Proposed Action	Comparable SEIS-II Impacts
Shipment from SRS, INL and LANL to WIPP in TRUPACT-III	1,260 shipments	840 shipments
Traffic fatalities	4.8×10^{-2}	7.7×10^{-2}
Fatalities from pollution	7.5×10^{-3}	2.9×10^{-3}
Latent Cancer Fatalities (workers)	3.1×10^{-2}	6.1×10^{-3}
Latent Cancer Fatalities (public)	1.2×10^{-2}	5.3×10^{-2}
TRUPACT-III Transportation Accidents (Latent Cancer Fatalities)	$1.8 \text{ to } 2.9 \times 10^{-2}$	16
RePackaging at Generator Sites and Unloading at WIPP	Less than SEIS-II impacts	
WIPP Site Impacts (LCFs)		
Maximally Exposed worker	2.7×10^{-8}	1×10^{-4}
Offsite population	1.1×10^{-8}	9×10^{-3}

8.0 DETERMINATION

Based on the analyses of the potential impacts of the current proposed action as discussed in this SA, DOE concludes that the current proposed action is not a substantial change to the proposal analyzed in prior NEPA documents that are relevant to environmental concerns. Further, there are no significant new circumstances or information relevant to environmental concerns and bearing on the current proposed action or its impacts identified in the WM PEIS and the WIPP SEIS-II. Therefore, a supplement to the WM PEIS or a new EIS is not needed.

Approved September 25, 2007

Signature on file

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