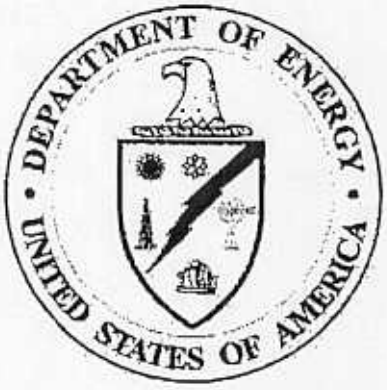
Supplement Analysis
For
USE OF THE 10-160B TRANSPORTATION CASK FOR RH-TRU WASTE SHIPMENTS TO WIPP

DOE/EIS-0026-SA-4



U. S. Department of Energy
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Supplement Analysis for USE OF THE 10-160B TRANSPORTATION CASK FOR RH-TRU WASTE SHIPMENTS TO WIPP

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) is proposing to use the CNS 10-160B, Type B Shipping Cask (referred to in this document simply as the 10-160B) to transport remote handled (RH) transuranic (TRU) wastes to the Waste Isolation Pilot Plant (WIPP). DOE originally examined the impacts of WIPP operations in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact* Statement, DOE/EIS-0026-S-2, (SEIS-II). This Supplement Analysis (SA) discusses environmental impacts associated with the proposed action to determine whether additional National Environmental Policy Act (NEPA) documentation is required.

40 CFR 1502.9 (Reference 2) directs Federal agencies to prepare a supplement to an Environmental Impact Statement (EIS) if:

1. The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
2. There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or impacts

When it is unclear whether a supplement to an EIS is required, DOE procedures for compliance with NEPA (10 CFR 1021.314(c)) require DOE to prepare an SA to assist in making that determination (Reference 3).

2.0 BACKGROUND

The WIPP is located in Eddy County about 26 miles east of Carlsbad, New Mexico. Its boundary encompasses 10,240 acres (16 sections). TRU and TRU mixed waste is appropriately treated and packaged at generator or storage sites. The waste is then shipped to the WIPP facility in NRC certified containers for emplacement in an underground disposal facility approximately 2,150 feet below the surface. The disposal facility operates in accordance with the 1992 Land Withdrawal Act (LWA) (Reference 4), the Compliance Certification Application (CCA) approved by the Environmental Protection Agency (EPA) in 1997 (Reference 5), and the Hazardous Waste Facility permit issued by the New Mexico Environment Department (NMED)(Reference 6) in October 1999. The facility also maintains several miscellaneous permits to support operations.

The facility's surface structures accommodate the personnel, equipment, and support services required for the receipt, preparation, and transfer of TRU waste from the surface to the underground. The surface structures are located in an area of approximately 35 acres surrounded by a perimeter security fence.

TRU waste operations at WIPP can be separated into two categories, Contact handled (CH) and RH. TRU waste is defined as CH waste if the external dose rate at the outer surface of the waste container is 200 millirem per hour or less. TRU waste with an external dose rate greater than 200 millirem per hour is defined as RH. The focus of this SA is on RH waste operations with the 10-160B shipping cask.

The 10-160B shipping cask consists of two carbon steel shells and a lead shield welded to a carbon steel bottom plate. A 12-gauge stainless steel thermal shield surrounds the cask outer shell that is equipped with two steel-encased rigid polyurethane foam impact limiters attached to the top and bottom of the cask. The 10-160B shipping cask is not vented. Up to ten 55-gallon drums would be arranged on two drum carriage units in the 10-160B shipping cask (up to five drums per drum carriage unit). Like the RH 72B, the 10-160B shipping casks are certified by the Nuclear Regulatory Commission (NRC) per 10 CFR 71.63(b). The total radiological material in the 10-160B cask is limited to 20 Plutonium (Pu-239) Equivalent Curies (PE-Ci). For the purpose of this assessment it is assumed that the entire 20 PE-Ci inventory would be located in a single waste drum.

3.0 RH WASTE HANDLING

Upon arrival at WIPP, 10-160B road casks would be transferred into the Waste Handling Building (WHB) for subsequent operations. The WHB RH bay is a high-bay area for receiving and initial handling of the RH 72B and 10-160B road casks. A trailer carrying a road cask enters the RH bay through a set of double doors on the eastern side of the WHB.

As explained in more detail below, transfer of the waste from the road cask to the facility cask is done in the hot cell complex, which provides shielding from radiation. The hot cell complex is at negative pressure during waste handling operations and the air is exhausted through HEPA filters to prevent release of any airborne radioactive contamination.

The 10-160B cask is removed from the trailer, put on a transfer car, moved into the cask unloading room (part of the hot cell complex), and the shielded doors are closed. The two carriages (each holding up to 5 drums of waste) are individually lifted by a crane up one level into the Hot Cell, where the drums inside are remotely surveyed and then loaded into a facility canister (no more than 3 drums in a canister). Each loaded facility canister is then lowered by crane into a shielded insert in the transfer cell (also part of the hot cell complex). From the transfer cell, the facility canister is loaded into the facility cask. The facility canister is then transferred to the WIPP underground for disposal. The 10-160B handling sequence differs from that for the RH-72B cask. Since the waste in the RH 72B is already in a canister when it is received, the RH-72B cask is lowered directly into the transfer cell for direct loading of the canister into the facility cask.

4.0 ENVIRONMENTAL CONSEQUENCES

SEIS-II provides an evaluation of the environmental consequences that the proposed action can be compared to. The WIPP RH Preliminary Safety Analysis Report (PSAR), DOE/WIPP-DRAFT-3174, (Reference 7) provides information on both the RH 72B and 10-160B shipping casks relevant to this environmental consequence assessment.

The SEIS-II assumed the RH 72B shipping cask would be used to transport all RH waste to WIPP from the generator sites. This SA compares impacts of using the 10-160B cask to the impacts already evaluated for the RH 72B cask to determine whether the impacts of using the 10-160B are substantially different from those in the SEIS-II analysis.

Table 1 provides a comparison of the RH 72B cask and the 10-160B cask features that are pertinent to this SA. The source of this information is the WIPP RH PSAR.

TABLE 1.

RH 72B Cask	10-160B Cask
Certified by the Nuclear Regulatory Commission (NRC) per 10 CFR 71.63(b)	Certified by the NRC per 10 CFR 71.63(b)
RH canister filled by direct loading or 3 drums	Drums only (10 drum capacity)
Waste arrives at WIPP inside RH canister	Drums are transferred from shipping cask to facility canister inside Hot Cell complex
Lead shielded	Lead shielded
Transports up to 6000 pounds TRU waste	Transports up to 10,000 pounds TRU waste
Limit of 80 Plutonium Equivalent Curies (PE-Ci) for direct loaded waste and limit of 240 PE-Ci for three 55-gallon drums	Limit of 20 PE-Ci per cask
The consequences of a radiological release from an RH 72B waste canister are significantly greater than the toxicological consequences. Therefore, any toxicological consequences resulting from a release from an RH 72B cask are bounded by the radiological consequences.	The consequences of a radiological release from a 10-160B waste container (cask, facility canister or drum) are significantly greater than the toxicological consequences. Therefore, any toxicological consequences resulting from a release from a 10-160B cask are bounded by the radiological consequences.

Table 1. (Continued)

Loss of confinement in the underground due to waste hoist failure is the highest consequence unmitigated accident involving an RH 72B cask. This scenario has an estimated annual frequency of $\leq 10^{-6}$. Dose rates for this no-mitigation accident are 14.6 rem to the noninvolved worker, 1.37 rem to the Maximum Exposed Individual (MEI), and 116 rem to the involved worker.	Fire in the Hot Cell is the highest consequence unmitigated accident involving waste from a 10-160B cask for the noninvolved worker and the MEI. This scenario has an estimated annual frequency of 10^{-4} to 10^{-6}. Dose rates for this no-mitigation accident are 8.23 rem to the noninvolved worker, 0.649 rem to the MEI. For the involved worker, a puncture of the 10-160B cask in the RH Bay is the highest consequence unmitigated accident involving waste from a 10-160B cask. This scenario has an estimated annual frequency of $\leq 10^{-6}$. Dose rates for this no-mitigation accident are 4.13 rem for the involved worker.

The following discussion examines the environmental impacts of use of the 10-160B shipping cask as compared with the impacts of use of the RH-72B cask, as analyzed in the SEIS-II.

5.1 Land Use and Management, Biological Resources, Cultural Resources, Water Resources and Infrastructure, and Socioeconomics

No substantial changes to any of these impacts would occur as a result of use of the 10-160 B cask in addition to the RH-72B cask for RH TRU waste shipments. Minimal modifications to existing facilities are needed to handle the 10-160B cask and no additional land disturbing activities or resources would be needed.

5.2 Air quality

No new sources of criteria pollutants (e.g. diesel equipment) are needed to implement the proposed action. The proposed action would use the Hot Cell ventilation system; a controlled ventilation system with High Efficiency Particulate Air (HEPA) filters and monitoring equipment would ensure releases remained within the limits analyzed in SEIS-II.

5.3 Noise

The SEIS-II concluded truck transport of waste through Carlsbad would result in a negligible increase in background noise levels from normal automobile and truck traffic. Transportation noise impacts were based on a maximum of eight trucks per day, including eight RH-72B cask shipments per week. The RH PSAR evaluation was conservatively based on an average of 10 RH shipments per week. There would be a small increase in background noise levels from normal automobile and truck traffic over that analyzed in the SEIS-II. However, since

the SEIS-II was prepared, a by-pass road was constructed that routes shipments of TRU waste bound for WIPP around Carlsbad along a sparsely populated route. In addition the 10-160B cask holds about 3 times the volume of waste held by the RH-72B cask. Therefore, the number of RH shipments is likely to decrease, means that noise levels are likely to decrease, resulting in lower noise levels than those assessed in SEIS-II.

5.4 Transportation

The SEIS-II examined 3 categories of impacts from transporting TRU waste.

- The overall number of traffic accidents and the number of resulting fatalities and injuries were calculated. These impacts are directly proportional to the number of additional trucks that transportation of TRU waste would place on the nation's highways and not on the radioactive or hazardous materials being transported. These impacts are "nonradiological impacts."

- Accident-free radiological impacts were calculated. These impacts are associated with the external radiation present around a shipping cask as it is being transported. These impacts are "accident-free radiological impacts."

- The impacts from specific accident scenarios in which a TRU waste package is breached and releases radioactive or hazardous materials were calculated. These impacts are "radiological impacts from transportation accidents."

The SEIS-II transportation analysis was based on commercial truck accident statistics and an NRC reference that estimated releases from a generic type B cask, and would encompass impacts from shipments in an overweight singly contained cask such as the 10-160B.

Nonradiological Impacts

There are no additional nonradiological impacts associated with using the 10-160B shipping cask. Use of the 10-160B shipping cask will likely decrease the overall number of RH shipments to WIPP and thus reduce the nonradiological impacts.

Accident-Free Radiological Impacts

There are no additional accident-free radiological impacts associated with using the 10-160B shipping cask. The external radiation present around a 10-160B cask will be no greater than that of an RH 72B cask. The exposure rate at the surface of both the RH 72B cask and the 10-160B cask will be no greater than 200 millirem per hour. Again, the reduced number of shipments that will result from use of the 10-160B would reduce these impacts as compared to the impacts analyzed in the SEIS-II.

Radiological Impacts From Transportation Accidents

There are no additional radiological impacts from transportation accidents associated with using the 10-160B shipping cask. Both the 10-160B shipping cask and the RH 72B shipping cask are certified by the NRC per 10 CFR 71.63(b). The SEIS-II analysis used accident release figures applicable to all Type B shipping casks and the likelihood of a radiological release from a transportation accident would be equal for both the 10-160B shipping cask and the RH 72B shipping cask. The maximum radionuclide inventory that can be transported in the 10-160B shipping cask is less than the radionuclide inventory used in the SEIS-II accident analysis for the RH 72B shipping cask. Therefore impacts due to a radiological release from a 10-160B shipping cask in a transportation accident would be less than those of the RH 72B shipping cask, since less radioactivity would be released.

5.5 Human Health Impacts - Industrial Safety, Facility Accidents

5.5.1 Human Health Impacts at the Generator/Storage Sites

Activities at the generator or storage sites will be essentially the same, whether the waste is shipped in the RH 72B cask or the 10-160B cask. The proposed action would not result in additional generator/storage site accident scenarios or increase the impacts resulting from those scenarios.

5.5.2 Human Health Impacts at WIPP

There would be no additional industrial safety impacts at WIPP due to use of the 10-160B shipping cask. Operations for handling RH waste are essentially the same for the 10-160B cask and those previously assessed for the RH 72B except for certain operations that take place in the Hot Cell Complex. The Hot Cell Complex is shielded to prevent radiation exposure to workers and operated remotely. Operations performed in these areas would not increase industrial safety impacts.

Potential human health impacts calculated in SEIS-II analyses include the impacts from waste disposal at WIPP. These impacts include those from exposure to radiation and hazardous chemicals for members of the public, workers not directly involved in handling containers of TRU waste, and workers who would directly handle containers of TRU waste.

There are no additional human health impacts associated with using the 10-160B shipping cask. As shown in Table 1, the consequences of an accidental radiological release from either a 10-160B waste container (cask, facility canister or drum) or a RH 72B waste container are significantly greater than the toxicological consequences. Therefore, any toxicological consequences resulting from a release are bounded by the radiological consequences.

Table 2 compares the number of Latent Cancer Fatalities (LCFs) projected for the highest consequence accident evaluated in the SEIS-II (Hoist Failure) to the highest consequence accidents evaluated in the PSAR. This comparison shows that the number of LCFs projected

for the highest consequence unmitigated accident involving a 10-160B cask are lower than the number of LCFs projected for the highest consequence accident evaluated in the SEIS-II.

Table 2

Accident Scenarios	Population (LCFs)	Maximally Exposed Individual (probability of LCF)	Maximally Exposed Non-involved Worker (probability of LCF)	[redacted]
SEIS-II, Hoist failure. (Scenario W6)	2.00E+0	3.00E-02	2.00E-02	*
PSAR, Hoist failure. (Scenario RH4-A)	1.20E+0	5.5E-04	5.9E-03	*
PSAR, Fire in Hot Cell, (Scenario NC1)	6.2E-01	2.60E-04	3.3E-03	[redacted]
Puncture 10-160-B Cask in RH Bay, (NC3-G)	3.10E-02	1.30E-05	1.6E-04	1.7E-03

*These impacts could range from negligible (workers not present or evacuated) to catastrophic (all workers in the immediate vicinity killed by accident debris)

5.6 Long-Term Performance, Retrieval and Recovery

Waste transported to WIPP in the 10-160B shipping cask would be transferred to a facility canister prior to disposal. Once transferred, the waste emplaced at WIPP would be identical in configuration and content as if the same waste had been shipped in the RH-72B. Therefore, use of the 10-160B cask would not change WIPP's long term performance or alter the environmental impacts if the waste were removed from WIPP.

5.7 Environmental Justice

There are no special circumstances that would result in any greater impact on minority or low-income populations as a result of use of the 10-160B shipping cask instead of the RH-72B cask for some RH-TRU shipments. Since the SEIS-II found no environmental justice impacts from transportation in the RH-72B use of the 10-160B would also have no environmental justice impacts.

6.0 CONCLUSION

As discussed above, use of the 10-160B shipping cask for shipment of RH-TRU waste poses no greater environmental consequences than those previously documented in SEIS-II for use of the RH-72B cask.

7.0 DETERMINATION

The results of this SA indicate that the activities and environmental consequences associated with the proposed action are encompassed within those activities analyzed in the NEPA documentation described above. On this basis, DOE has determined that performing this proposed action will not constitute a substantial change in actions previously analyzed and will not constitute significant new circumstances or information relevant to environmental concerns bearing on the previously analyzed actions. Therefore, no further NEPA documentation is required regarding the use of the 10-160B shipping cask.

December 17, 2002

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8.0 REFERENCES

1. U.S. Department of Energy, (DOE, 1997c). *Waste Isolation Pilot Plant Disposal Phase Supplemental Environmental Impact Statement*, DOE-EIS-0026-FS2, September 1997.

2. 40 Code of Federal Regulations, Part 1502. Environmental Impact Statement.

3. 10 Code of Federal Regulations, §1021.314. Supplemental Environmental Impact Statements.

4. Public Law 102-579, 106 stat. 4777. Waste Isolation Pilot Plant Land Withdrawal act. October 1992, as amended October 1996 by Public Law 104-201.

5. U.S. Department of Energy, 1996, "Title 40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant," DOE/CAO-19962184, U.S. Department of Energy, Waste Isolation Pilot Plant, Carlsbad Area Office, Carlsbad, New Mexico.

6. Hazardous Waste Facility Permit issued to the Waste Isolation Pilot Plant, Identification No. NM4890139088-TSDF by the New Mexico Environment Department.

7. WIPP RH Preliminary Safety Analysis Report (PSAR), DOE/WIPP-DRAFT-3174.