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MEMORANDUM

TO: Senator Ray Shaffer, Chairman
Senate Transportation Committee

FROM: Robert R. Loux
Executive Director

DATE: March 18, 2003

SUBJECT: Supplemental Information on Transportation of Radioactive Waste in Nevada

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To supplement my presentation before the Assembly Transportation Committee on February 27th, I am providing you with the following information on U.S. Department of Energy (DOE) radioactive waste shipments ongoing or projected in Nevada. The following describes the different types of shipments with which Nevada must contend:

(1) Yucca Mountain: High-level radioactive waste (HLW) and spent nuclear fuel (SNF)

The Yucca Mountain program, if allowed to go forward over Nevada's objections, would be a facility for disposing spent fuel from commercial nuclear power plants and highly radioactive waste materials from nuclear weapons production activities. There is currently no HLW or SNF at the NTS or at Yucca Mountain.

SNF and HLW shipments to Yucca Mountain are still a long way off, even in the unlikely event that the State loses its pending legal challenges to the project. The earliest DOE projects that a Yucca Mountain repository could be opened for waste acceptance is 2010 or 2011, and that time frame is considered extremely optimistic by almost all knowledgeable observers.

Under current law, Yucca Mountain is limited to a total of 70,000 metric tons of SNF and HLW. However, there are over 120,000 metric tons projected to require disposal in the

next 30 years. In the final environmental impact statement for Yucca Mountain, DOE analyzed a scenario wherein all of this waste would be disposed of at Yucca Mountain.

Estimates of the number of shipments needed to move SNF and HLW from sites around the country to Yucca Mountain vary considerably depending on assumptions about shipping mode (rail vs. truck), the size of the shipping casks to be used, and the amount of SNF and HLW allowed to be disposed of at Yucca Mountain. There could be as many as 108,544 legal weight truck shipments plus 355 rail shipments over a 38 year period or as few as 9,646 rail shipments plus 1,079 truck shipments over 24 years, depending on the assumptions used.

It should be noted that there is no rail access to Yucca Mountain, and creating such access will require construction of a new rail line between 100 - almost 400 miles long at a cost exceeding $1 billion. At present, the only feasible way to ship waste to Yucca Mountain is by legal weight truck.

(2) Transuranic waste (TRU waste) destined for the WIPP facility in New Mexico

There is a small amount of transuranic (TRU) waste at the Nevada Test Site (NTS) that was shipped there over the years for temporary storage until the Waste Isolation Pilot Plant (WIPP) facility in Carlsbad, New Mexico became operational. TRU waste is comprised of materials such as tools, gloves, clothing, etc., that are contaminated with plutonium and other extremely long-lived radioisotopes. TRU waste is considered an intermediate form of radioactive waste - it is not as radioactive as HLW and SNF, but more radioactive and longer-lived than LLW. No TRU waste will be permanently disposed of at NTS. DOE expects to make between 80 - 100 shipments of TRU waste from the NTS to WIPP beginning sometime this summer (June or July, 2003), although the schedule remains highly uncertain.

(3) Low-Level radioactive waste (LLW) and Mixed Low-Level radioactive waste (MLLW)

NTS began disposing of LLW[1] from DOE's weapons complex in the 1960s. For the most part, the material disposed of includes contaminated soils, tools, clothing, and other materials. The LLW disposal activities at NTS should be clearly differentiated from the proposed repository for high-level radioactive waste at Yucca Mountain and the transuranic waste that is being stored at NTS prior to shipment to the Waste Isolation Pilot Plant facility in New Mexico.

Several years ago, DOE completed a Programmatic Environmental Impact Statement (PEIS) for waste management throughout the DOE weapons complex. As a result of that

[1] Low-Level Radioactive Waste is defined as material that is contaminated with low specific activity radioactive materials. It generally has a shorter half-life than high-level waste, transuranic waste, and spent nuclear fuel and give off much less radiation.

PEIS, DOE designated NTS and the Hanford reservation in Washington as regional facilities for disposing LLW and mixed low-level waste (MLLW)[2] from the various weapons complex facilities. DOE currently does not have the necessary permit from the Nevada Division of Environmental Protection to dispose of MLLW at NTS. However, a permit application has been filed with State regulators and is under review.

LLW disposal at NTS is a long-term federal program. It involves two distinct waste streams related to past weapons production activities at DOE sites around the country and to present and future efforts to clean up those sites. "Legacy LLW waste" is byproduct material generated during the production of nuclear weapons. It is being stored in drums and barrels at the various generator sites awaiting final disposal. "Environmental Restoration LLW waste"(or ER waste) is LLW (primarily soils, clothing, tools, furniture, etc.) resulting from the clean up of contaminated facilities.

The LLW disposal program at NTS is fraught with a number of uncertainties that complicate long-term planning. Principal among these is the uncertainty over the actual amount of LLW that will need to be disposed of. For the "legacy waste," this is not a problem. DOE has a complete inventory of these materials and knows exactly how much requires disposal. For the ER waste, however, the situation is much less ceratin. This is waste that is being generated as the various DOE facilities are being cleaned up and decontaminated. Volumes are generally not known with certainty until the clean-up work at each site is completed or well along. In addition, there is uncertainty as to what LLW will be disposed of on-site (at the facility where it was generated), what may be disposed of in commercial waste facilities, and what amount needs to be disposed of at a federal facility (i.e., NTS or Hanford). The Waste Management PEIS estimated that there are in excess of 15 million cu. ft. of LLW and MLLW that may require disposal at either NTS or Hanford. The total volume of waste could be less, depending on decisions yet to be made about on-site disposal. In addition, pending decisions about the potential use of commercial LLW disposal sites (such as the Envirocare site in Utah) for disposing of DOE-complex wastes could significantly impact the amount of wastes needing disposal at NTS or Hanford.

As a result of the likely increase in LLW shipments due to DOE's decision to designate NTS as one of two regional LLW disposal facilities, Governor Guinn successfully interceded with then-Secretary of Energy Richardson and obtained a commitment to address a number of Nevada's equity concerns. These include instructing LLW shippers to use highway routes to NTS that avoid the heavily populated and congested Las Vegas Valley; directing DOE's Nevada Operations Office to provide funding to the State Health Division to improve the State's health information system, especially the cancer registry; and providing for an increase of 50 cents per cu. ft. in the fee charged to waste generators for disposing of LLW at NTS, with the additional money earmarked for training of local

[2] Mixed Low-Level Waste is LLW that also contain materials designated as "hazardous materials" as defined under federal regulations. This may include dioxins, petrochemicals, and numerous other materials.

emergency response personnel along LLW shipping routes in Nevada. DOE provides the funds to the Nevada Division of Emergency Management, which has established a program whereby all funds made available as a result of the "tipping fee" increase are passed through to local governments located along LLW shipping routes in Nevada. The funds are to be used to train and equip local emergency response personnel.

(4) Historic amounts of LLW delivered to NTS historically

Since 1976, over 23 million cubic feet of LLW have been shipped to NTS for disposal.[3] The material is low specific activity waste from DOE generator sites like the Fernald Feed Materials Plant in Ohio, Rocky Flats in Colorado, Lawrence Livermore Laboratory in California, and other weapons complex facilities. It is difficult to accurately translate this amount of cubic feet of waste into the number of shipments required to transport it to NTS because the type of packaging and size of the trucks and shipping containers varies. However, a rough estimate can be obtained by dividing the total amount of waste disposed (21,084,877) by the average amount of cubic feet per shipment during FY 2000 (1,242 cu. ft.). That works out to a total of approximately 16,976 shipments over a period of 24 years.

In federal FY 2002 (October 1, 2001 - September 30, 2002), there were 1,642 shipments of LLW waste into the NTS from 18 off-site generators. The total amount of LLW disposed of was 2,275,862 cubic feet.

(2) Amount of LLW projected for disposal at NTS

DOE does forecasts of potential LLW volumes for a rolling 3 year period which are considered to be fairly accurate because they are based on firm planning by the generator sites. Actual figures LLW waste volumes at NTS for FY 2001 and 2002 plus estimates for FY 2003 - FY 2005 are as follows:

FY 2001	1,230,147 cu. ft. (actual)
FY 2002	2,275,862 cu. ft. (actual)
FY 2003	2,980,000 cu. ft. (est.)
FY 2004	3,400,000 cu. ft. (est.)
FY 2005	1,487,643 cu. ft. (est.)

At 50 cents per cu. ft., the amount of funds expected to be available for emergency response training activities is:

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[3] In addition to the LLW that has been shipped to NTS over the years, a comparable amount of LLW resulting from nuclear testing activities has also been disposed of at NTS. Much of this waste is material that was used in the above ground testing program (i.e., remnants of structures, destroyed trees, dirt, etc.) that was disposed of by burying it in bomb craters on the NTS.

FY 2001	$ 615,073
FY 2002	$ 1,137,931
FY 2003	$ 1,490.000
FY 2004	$ 1,700,000

The projected increase in waste volumes is due to the fact that DOE, through the Record of Decision for the Waste Management Programmatic EIS, has designated NTS as one of two regional sites for disposal of LLW and MLLW from weapons complex generator facilities. This means that additional waste generators are expected to begin disposing of waste at NTS during the period. In addition, it is expected that, as cleanup activities proceed at the various weapons complex facilities, the amount of ER waste requiring off-site disposal at NTS will increase somewhat.

(3) How long will LLW and MLLW continue to be disposed of at NTS?

The time frame for LLW and MLLW disposal activities is directly related to the cleanup of DOE weapons complex sites around the country. This, in turn, is dependent upon the amount of funds appropriated each year by Congress for cleanup work, the technical and operational capacities for doing the work at the various sites, decisions about what waste will be disposed of on-site and what will be shipped to the regional facilities, and the extent to which commercial disposal facilities are utilized by DOE. Consequently, the uncertainties about long-term LLW and MLLW operations at NTS are considerable. However, it is expected that waste disposal operations will continue at NTS for at least the next 25 - 30 years, and possibly longer.

(4) Waste that is destined to be shipped from NTS to New Mexico

In addition to the LLW and MLLW activities at NTS, DOE is also temporarily storing a small amount of low specific activity, plutonium-contaminated waste (know as transuranic waste or TRU waste) at the NTS. This TRU waste is comprised of materials such as tools, gloves, clothing, etc., that are contaminated with plutonium and other extremely long-lived radioisotopes. TRU waste at NTS was shipped there over the years from other DOE facilities (primarily Lawrence Livermore National Laboratory in California) in anticipation of it being transported to the Waste Isolation Pilot Plant (WIPP) facility in Carlsbad, New Mexico. Delays in opening WIPP caused the waste to be kept at NTS for longer than expected.

DOE plans to begin shipping TRU waste from NTS to WIPP in November 2001. DOE now estimates that there will be approximately 80 - 100 shipments (depending on how the material is packaged) that will occur over the next 6 years. Approximately 60 shipments are scheduled to occur between June or July, 2003 and September 2004. According to DOE most current estimates, the remaining shipments would take place in 2004 - 2005 and 2008 - 2009. The shipping schedule is dictated by operational considerations at the receiving facility (WIPP), budget realities, and internal DOE considerations. It has been extremely uncertain and unpredictable up to this time.

Nevada and other affected western states have been participating in a Western Governors' Association (WGA) lead effort to prepare for WIPP shipments for over 10 years. The WGA WIPP Technical Advisory Group works closely with and receives funding from DOE for training emergency responders along potential WIPP routes and otherwise preparing states and communities for the shipments. The work done with respect to WIPP shipment preparations and training is distinct from that being funded by NTS for LLW and MLLW shipments. All WIPP shipments are required to follow a set of strict protocols developed by WGA and agreed to by DOE.

As part of the protocols agreed to by DOE and the states affected by WIPP shipments, specific routes are identified. Drivers transporting TRU waste to WIPP are not permitted to deviate from these routes, except under extraordinary circumstances - and then only after notifying appropriate state personnel. The route between NTS and WIPP has been identified as US 95 north from Mercury to Amargosa Valley[4], then south on State route 373 to CA 127, then west on I-15 to Baker to Barstow and east on I-40 through Arizona and into New Mexico. This route involves only about 45 miles of Nevada highways (less if the Lathrop Wells gate is used) and completely avoids population centers like Las Vegas and Pahrump.

The Governors' Office, Agency for Nuclear Projects has established a State agencies WIPP working group comprised of the Nevada Highway Patrol, the Division of Emergency Management, the State Health Division, the Division of Environmental Protection, and the Department of Transportation that is actively working to prepare for WIPP shipments. The various agencies are also working with Nye County emergency management/public safety personnel and their counterparts in California to assure that these shipments occur in a safe and uneventful manner. All TRU waste shipments will be inspected by State personnel prior to departure from NTS and then escorted by the NHP from the Test Site to the California border. Extensive training and equipping of state and local public safety/emergency response personnel has been done, and a full-scale exercise to test preparedness was carried out in 2002.

(5) Primary transportation routes routes for LLW shipments to NTS

Attached are map showing the primary routes nationally and in Nevada for LLW shipments destined for NTS. Except for one shipment that slipped through the cracks in 2002 due to a mis-communication between DOE and a shipper, all shipments during FY 2002 avoided the Las Vegas "spaghetti bowl," and no shipments were made over Hoover Dam. This is the result of a long process of negotiations with DOE to find an acceptable way of keeping LLW out of the heavily populated and increasingly congested Las Vegas metro area.

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[4] Negotiations are currently under way with DOE to permit TRU waste to leave the NTS via the Lathrop Wells gate. That would considerably shorten the distance shipments would have to travel on US 95. Instead of exiting the Test Site at Mercury, the shipments would enter US 95 just north (i.e., about 1/4 mile) of the intersection with NV 373.

Prior to 1998, most LLW shipments coming to NTS came on US 93, across Hoover Dam, and through the "spaghetti bowl" interchange. As the Las Vegas area has grown in population and tourists, and as traffic congestion has increased, State and Clark County officials became increasingly concerned about that use of US 93, I-15, and US 95 for LLW shipments. Likewise, the continuing shipments of LLW over Hoover Dam was thought to pose unnecessary risks due to the highway characteristics (sharp turns, high drop offs) on either side of the dam and the extensive tourist traffic on the dam itself.

The need to move LLW shipments off Hoover Dam and out of the metro Las Vegas area was identified as one of several "equity issues" Nevada raised with DOE at the Secretarial level. Governor Guinn has received assurances from then-Secretary Richardson that DOE will continue to work with its LLW waste generator facilities to require the use of routes that avoid metro Las Vegas. DOE has continued to honor this agreement under Secretary Abraham.

DOE now reports to the State quarterly on the numbers of shipments of LLW to NTS and the route taken by each shipment. For the most part, the northern/eastern routes shown on the attached map (I-80 to Wendover, US 93 to US 6 to US 95 south and SR 393 to Panaca, US 93 to SR 375 to US 6 to US 95 south) are used for shipments occurring in the summer months when weather is not a problem. The southern/western routes are used more in the cold weather/winter months. DOE has assured us that, as of July 1, 2002, no LLW is being shipped through the Las Vegas "spaghetti bowl"or across Hoover Dam.

I hope this information is helpful to the committee. If you have questions or if you need additional information, please do not hesitate to contact me.

RRL/cs
Attachments

cc Governor Guinn

Figure 1
FY 2002 National Low-Level Waste Transportation Routes

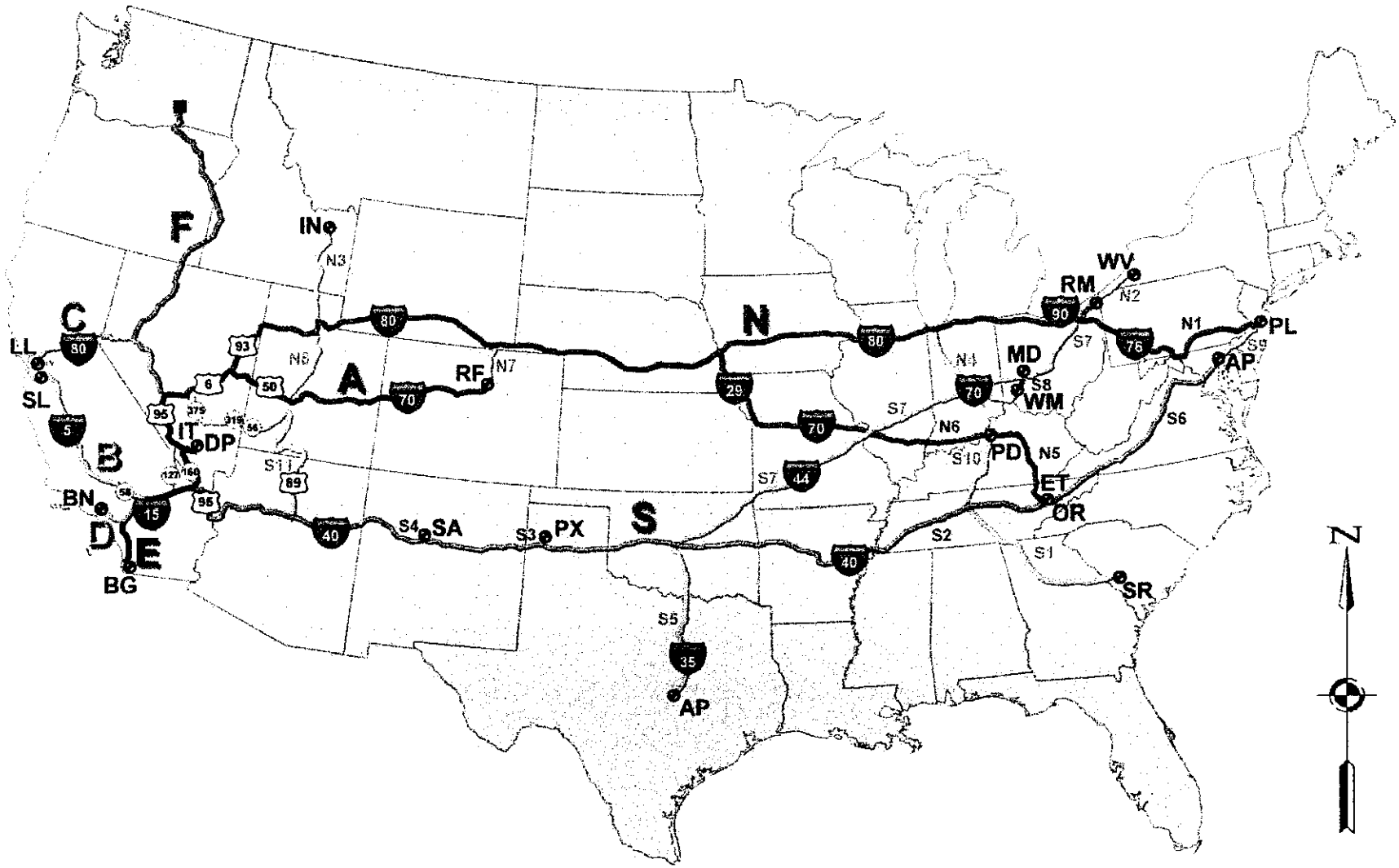

Figure 2. Regional Transportation Routes for LLW and MLLW Carriers (as identified in Table 3)