General

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

For John Kieling
827-1544
from greg mello

AUG 2 2 2000

Mr. Greg Mello
Los Alamos Study Group
212 East Marcy Street
Santa Fe, NM 87501

Dear Mr. Mello:

Enclosed for your information is a draft Supplement Analysis (SA) that has been prepared by the Department of Energy to determine if the existing *Site-Wide Environmental Impact Statement for Continued Operations of Los Alamos National Laboratory* (DOE/EIS-0238) adequately encompasses the environmental effects of the Offsite Source Recovery Project (OSRP), or if additional documentation is required under the National Environmental Policy Act (NEPA). The OSRP would modify current methods of receiving and managing certain offsite unwanted radioactive sealed sources at Los Alamos National Laboratory (LANL).

The fundamental modification proposed for the management of these sealed sources is the elimination of chemical processing to recover constituent components, thereby limiting the management of the sealed sources to packaging, transportation, receipt, and storage as waste through approximately 2006. Waste storage would be on an interim basis until a strategy is developed for final disposition of the sealed sources. The objective of the OSRP is to increase the rate of recovery of radioactive sealed sources. This would reduce the risk to the health and safety of the public and LANL workers and eliminate the potential for commingling of defense and non-defense wastes.

The conclusion reached by the SA is that the effects analyzed in the Site-Wide Environmental Impact Statement bound the effects of the proposed OSRP, and no further NEPA review is considered necessary for proposed OSRP activities.

We will issue a final version of the SA on September 5, 2000. Should you have any questions or comments regarding this document, please call Mr. Mark Sifuentes at (505) 845-5175 or Ms. Elizabeth Withers at (505) 667-8690. Your continued participation in the decision making process is appreciated.

Sincerely,

David A. Gurulé, P.E.
Area Manager

LAAME:4EW-243

Enclosure

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CONCLUSION

DOE has not identified any other differences in parameters relevant to the analysis of environmental impacts between the proposed OSRP and the action analyzed in the SWEIS for the Expanded Operations Alternative. The scope of the proposed federal action, as managed by LANL under the OSRP, has not changed (in ways that would significantly affect human health or the environment) from the scope of proposed management actions described in previously cited NEPA documentation. Only the management methods and the technology employed have changed (i.e., the sealed sources stored at LANL would not be chemically separated before storage). The objectives of the proposed OSRP are to (1) satisfy DOE's legislative responsibility under Public Law 99-240, (2) efficiently recover excess and unwanted GTCC sealed sources from the commercial sector and store them at LANL, and (3) discontinue chemical processing, thereby eliminating potential commingling of waste streams and reducing radiation dose to workers.

Impacts of the proposed activity have been bounded by the impacts analyzed in the SWEIS and no further NEPA review is considered necessary for proposed OSRP activities described. Reliance on the waste management information contained in the SWEIS is reasonable and this information was publicly disclosed. The information used in the SWEIS is also up to date. Any changes in approaches in the proposed action have been identified in this SA. As stated, further NEPA review will be necessary to analyze the final disposition of these stored materials.

SUPPLEMENT ANALYSIS

Site-Wide Environmental Impact Statement
for
Continued Operation of Los Alamos National Laboratory

Modification of Management Methods for Certain Unwanted Radioactive Sealed Sources at Los Alamos National Laboratory

August 2000

INTRODUCTION – PURPOSE OF SUPPLEMENT ANALYSIS

This Supplement Analysis (SA) has been prepared to determine if the *Site-Wide Environmental Impact Statement for Continued Operations of Los Alamos National Laboratory* (SWEIS) adequately addresses the environmental effects of a proposal for modifying current methods utilized to receive and manage certain offsite unwanted radioactive sealed sources at Los Alamos National Laboratory or if additional documentation under the National Environmental Policy Act (NEPA) is needed. The need for a SA to an existing environmental impact statement (EIS) is initiated by subsequent changes in the basis upon which the original EIS was prepared and the need to evaluate whether or not the EIS is adequate in light of those changes. It is submitted according to the requirements for determining the need for supplemental environmental impact statements (10 CFR 1021.314) in the Department of Energy's regulation for implementing NEPA.

This SA specifically compares key impact assessment parameters of a program evaluated in the SWEIS with those of a proposal that would change the approach of this management. It also provides an explanation of any differences between the proposed action and activities described in earlier NEPA analysis.

PROPOSAL DESCRIPTION

The Department of Energy (DOE), Albuquerque Operations Office is proposing to modify methods that are currently being utilized to manage excess and unwanted radioactive sealed sources at LANL. The proposal is entitled the Offsite-Source Recovery Project (OSRP). The OSRP focuses on the proactive recovery and storage of unwanted sealed sources exceeding the U. S. Nuclear Regulatory Commission (NRC) limits for Class C low level waste (also known as Greater than Class C waste, or GTCC)[1]. The primary radioactive materials contained in

[1] Sealed sources would be managed as "material" until they are taken into DOE possession. When these sources are determined to have no programmatic use their safeguard requirements would be terminated. Upon termination of the safeguard requirements the sealed sources would be managed as TRU waste (which is defined later in this SA).

ORSP sealed sources are plutonium-239, plutonium-238, and americium-241. These radioactive materials are typically enclosed in multiple stainless steel jackets to form the "sealed source". In addition, the OSRP would accept and manage a limited number of sealed sources from the government sector, including the DOE. Research has shown that there are approximately 21,000 sealed sources that are in this category for which no storage or disposal option is currently available. Unwanted and excess sealed sources may present a public health and safety risk when abandoned, lost, or disposed of inappropriately. Los Alamos National Laboratory (LANL) has been involved in the management of limited numbers of these sealed sources since 1979. LANL has been designated as the DOE laboratory to establish the OSRP since this represents a continuation of their current assignment as analyzed in the SWEIS, with the change in management strategy discussed in this document. LANL's OSRP would package, transport, receive, and store unwanted or abandoned radioactive sealed sources obtained from commercial licensees, other government agencies, and the DOE. The sources would be stored on an interim basis until the longer-term decisions on storage or disposition are made and implemented. This interim period would be about six years (2000 through 2006). Programmatic options for final disposition and a separate NEPA analysis would be accomplished prior to that time.

DOE, through the OSRP, and in cooperation with the NRC and other agencies, would identify sealed sources for which DOE is responsible under Public Law 99-240 (discussed later). The OSRP would package the sealed sources at the origination point. These packaged sealed sources would either be sent to LANL directly or would be consolidated at a licensed commercial facility under contract with DOE before being shipped to LANL. The sources would routinely be transported and stored in multi-function 55-gallon drum containers or other U.S. Department of Transportation (DOT) compliant shipping containers. These sealed sources, when packaged for shipping and storage, would be secured within an inner stainless steel pipe component container located in the center of the 55-gallon drum. This inner pipe would be surrounded with neutron or gamma shielding, or both, or other appropriate container configuration as required to minimize radioactive dose to workers. Any damaged or leaking sealed sources would be contained in a sealed insert in the field before being packaged and shipped to LANL. In any given year about 170 drums would be received at LANL. Proposed increased funding for the OSRP would result in an accelerated rate at which the drums are received during the early years of OSRP activity at LANL.[2] The total number of drums received and stored over the life of the project is estimated to be about 1000. This number of drums would have a volume of 208 cubic meters (m^3).

The packaged sealed sources would be received at LANL's central receiving facilities (SM-30 at TA-3 or other buildings equipped to handle radioactive materials). The packages would then be transferred to one of two types of Material Balance Areas (MBAs)[3]. If there were a known immediate need for special handling of the sealed sources contained in the shipment, the packages would be transferred to a Processing MBA such as the Chemistry and Metallurgy

[2] See July 13, 2000 memorandum from Secretary of Energy.

[3] A Material Balance Area is an administrative definition for a formally controlled Special Nuclear Material (which includes plutonium and americium) storage area.

Research Building (CMR) Wing-9 (or other buildings equipped to handle radioactive materials). Instances of such needs could include opportunities for immediate reuse, or required inspections and verification. If there were no immediate need for unpacking the shipping packages, they would be transferred directly to a Holding MBA located at TA-54 West.

At a Processing MBA facility like the CMR, the sealed sources would be removed from their respective shipping containers and screened for three purposes: (1) to separate the sealed sources for which there are immediate reuse opportunities; (2) to separate the sealed sources that are defense-related and, thus, would be eligible for disposal at the Waste Isolation Pilot Plant (WIPP); and (3) to separate sealed sources that require special handling, further analysis, or repackaging for other reasons. Sealed sources with intact steel jackets would require no special handling. Certain sealed sources containing plutonium-239 and americium-241 are designated as "Attractiveness Level C" for the purposes of materials control and accountability. These sealed sources require special safeguards and, consequently, would require special handling. Facilities such as the CMR provide such safeguards and could store up to 1,000 sealed sources of this designation. The WIPP eligible sealed sources and remaining sealed sources (other than reused ones) would be repackaged and transferred to a Holding MBA. A Holding MBA would perform the record keeping without opening the shipping packages and would provide notice of the availability of these sealed sources for reuse on existing and new excess material exchanges.

Sealed sources without identified reuse opportunities would be managed as waste and placed in interim retrievable storage along with similar transuranic (TRU) waste[4] that is stored at TA 54, Area G. The sealed sources would remain in storage until approximately 2006, or until a final disposal option is implemented - after appropriate NEPA review. Each drum placed in storage would contain up to 30 Curies (Ci) of radioactive contents for neutron emitting sources or up to 50 Ci for non-neutron emitters. It is estimated that the OSRP would involve about 30,000 Ci of radioactivity contained in approximately 1000 drums (1000 drums x 30 Ci/drum). The surface dose rate for each drum would typically range from less than 5 millirem/hour (mrem/hr) to 75 mrem/hr, and would always meet requirements for contact handled waste containers.

BACKGROUND

History of Radioactive Sealed Sources

Radioactive sealed sources have been used by qualified public and private organizations since the early 1950s. Since the passage of the Atomic Energy Act of 1954, qualified public and private organizations have been licensed to possess and use nuclear materials for a wide variety of applications such as measuring the thickness of materials. Tens of thousands of radioactive sealed sources containing materials such as cobalt-60, cesium-137, americium-241, and

[4] Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years. Transuranic isotopes are those elements having an atomic number greater than that of uranium (90).

plutonium-239 and –238 were manufactured, licensed by NRC, and distributed. These radioactive materials were placed within multiple stainless steel jackets and welded closed; hence, they are referred to as "sealed" sources. In most cases, the radioactive material for use in the sealed sources was produced and provided by the Atomic Energy Commission, a predecessor agency to DOE. Most of these sealed sources are still held under NRC or Agreement State radioactive materials licenses. During this period of radioactive source manufacture and use, future disposal mechanisms were not well defined. Sealed sources become excess and unwanted because (1) design specification and certification requirements change over time, rendering older sealed sources unusable, (2) economic downturns in commercial industries using sealed sources result in many nuclear businesses no longer having a need for the sealed sources, and (3) in some instances, firms are going out of business and can no longer insure responsible handling and storage of the sealed sources. As stated, unwanted and excess sealed sources present a public health and safety risk when abandoned, lost, or disposed of inappropriately. There are no NRC-licensed disposal facilities currently available for these sealed sources. GTCC sealed sources exceed the requirements for disposal at existing NRC-licensed disposal facilities.

Since 1979, LANL has participated in the limited recovery of excess and unwanted radioactive sealed sources consisting mostly of plutonium-239/beryllium neutron sources. Additional sealed sources were recovered from the commercial sector on a case by case basis as requested by NRC. Approximately 1100 unwanted neutron generating sealed sources and other sealed sources have been recovered from regulated licensees, DOE sites, and other governmental agencies by LANL. At LANL, these sealed sources were opened, their radioactive contents chemically separated, and their radioactive products and wastes stored. Recognizing the danger posed by excess and unwanted radioactive sealed sources, Congress included them in Public Law 99-240 (the *Low-Level Radioactive Waste Policy Amendments Act of 1985).* This Act assigned DOE the responsibility for disposal of NRC regulated low-level radioactive waste categorized as GTCC (commercial). As stated, approximately 21,000 GTCC sealed sources that have no disposal path exist within the commercial sector. Sealed source recovery has been limited to emergency recoveries and long-term disposition strategies have not been aggressively studied.

Since the early 1990's DOE has been encountering increased costs and inefficiencies associated with the case by case response to NRC requests for recovery and management of unwanted or abandoned sealed sources. Facing an overall scope of several thousand of these sealed sources, a more proactive approach to recovery and management was required. Consequently, in 1995, LANL received additional DOE funding to build on its existing ability to receive and chemically process plutonium-239/beryllium sealed neutron sources. LANL was asked to develop a plan to receive surplus americium/beryllium and plutonium-238/beryllium sealed sources. LANL chose a management strategy that would chemically separate the plutonium and americium, and store the residual nuclear material and processing waste. This program, the Radioactive Source Recovery Program (RSRP), and its environmental effects were evaluated in the *Environmental Assessment for the Radioactive Source Recovery Program* (EA) dated December 20, 1995. An expanded RSRP was subsequently incorporated into the 1999 SWEIS and environmental effects assessed.

At the close of Fiscal Year 1998, LANL was responsible for executing three activities involving the recovery of radioactive materials from off site locations. These were the Plutonium-239/Beryllium Source Recovery Project, the RSRP, and the Off-site Waste Recovery Project. Both the RSRP and the Plutonium-239/Beryllium Source Recovery Project involved bringing radioactive sealed sources to LANL for management and eventual storage of the radioactive material for which there was no disposal path. These activities were described in the LANL Mission of the 1999 SWEIS. Beginning in Fiscal Year 1999 these three projects were consolidated into a single project, the present OSRP. As described, the OSRP would utilize different management practices and methods from those of the three composite activities.

This subsequent supplement analysis is performed to determine if the SWEIS is still an adequate analysis of the environmental impacts of the current OSRP proposal to recover and store GTCC sealed sources.

1995 Environmental Assessment for the Radioactive Sealed Source Recovery Program

A discussion of the 1995 EA, including a later comparison of impact analysis parameters, is provided in this SA because it contains a perspective on the evolution of this activity. Even though the SWEIS updated and incorporated this proposed activity in its analysis, information is presented in this EA which is useful to discuss here also.

This EA and a Finding of No Significant Impact was issued in December 1995. The EA analyzed the receipt, short-term storage, chemical processing to recover the radioactive material, and longer-term storage of separated radioactive products and process waste from unwanted or abandoned sealed sources over a 15-year period. These sealed sources would be received from companies, universities, source brokers, and government agencies across the country. Unwanted or abandoned sealed sources would be packaged and shipped to LANL in approved DOT shipping containers. The LANL receiving facility, SM-30 at TA-3, would then accept the radioactive sealed sources. From the receiving facility the sealed sources would be transferred to either the CMR Wing-9 or the Plutonium Facility Building 4 (PF-4) at TA-55 for short-term storage. CMR would perform the short-term storage and chemical recovery of plutonium-238 and americium. PF-4 would recover americium and perform interim storage of recovered radioactive material. The combined short-term storage areas of the CMR Building and PF-4 could accommodate approximately 1,100 sealed sources at any given time. These recovered materials, in the form of a low-grade plutonium or americium oxide, would be transferred to the Special Nuclear Material vaults at TA-55 and placed in the LANL nuclear materials inventory pending disposition action which was, and remains, undefined. As sealed sources were processed and recovered material placed in interim storage, additional sources would be received for processing.

Aqueous waste generated during chemical processing operations at CMR and PF-4 would be sent directly through existing waste lines to the TA-50 Radioactive Liquid Waste Treatment Facility for treatment. Solid low-level waste (LLW) and TRU waste generated during recovery

operations at CMR and PF-4 would be certified in accordance with applicable waste acceptance criteria for disposal or long-term storage. Solid LLW would be disposed of at LANL's TA-54, Area G. TRU waste would be held in long-term storage at TA-54, Area G pending disposal at WIPP if it met the acceptance criteria for that disposal facility.

The full scope of this activity remained unfunded in the DOE budget through fiscal year 1998. Funding was provided to fabricate sealed source processing equipment and to support emergency sealed source recoveries based upon specific NRC requests. Approximately 30 sealed sources were recovered based on NRC requests. The fabrication of the processing equipment was not completed and the sealed sources remain in storage at LANL.

Key impact assessment parameters associated with the RSRP are presented in the matrix in the Discussion Section of this SA.

Site-Wide Environmental Impact Statement and Record of Decision for the Continued Operation of the Los Alamos National Laboratory

The September 1999 Record of Decision (ROD) for the SWEIS documents DOE's decision to continue to operate LANL for the foreseeable future and to expand the scope and level of its operations. Under the ROD, DOE will implement the selected Expanded Operations Alternative. This alternative will expand operations at LANL, as the need arises, to increase the level of existing operations to the highest reasonably foreseeable levels, and to fully implement the mission elements assigned to LANL. This alternative includes the expansion of the low-level waste disposal site and TRU waste storage at TA-54, Area G.

The Expanded Operations Alternative reflects the activities described for the RSRP (see above), i.e., sealed source receipt, storage, radioactive material separation, radioactive material and waste disposal and storage, but at higher rates or greater volumes. The projected sealed source material chemical separation rate is 10,000 Ci/year for the 10-year analysis period of the SWEIS (or 100,000 Ci total for 10 years). These activities are reflected as integral elements of facility capabilities, e.g., the Plutonium Facility Complex and the CMR Building. All parameters from this activity related to environmental impacts were included in the SWEIS analysis. The SWEIS also addresses the overall planned expansion of Area G and associated environmental effects. The SWEIS envisioned a 10-year period for the management of radioactive sealed sources.

More detailed assessment parameters are presented in the matrix that is presented in the Discussion Section below.

DISCUSSION

As stated, the SWEIS analyzed the activities described in the earlier 1995 RSRP EA for the management of sealed sources, i.e., sealed source receipt, storage, material separation, radioactive material storage, and waste storage and disposal. The SWEIS describes a significantly higher projected sealed source material recovery rate over a shorter duration of

time. The scope of the currently proposed OSRP action is similar to that described in the two earlier NEPA documents but is more limited. First, there is no recovery processing (i.e., chemical processing) of recovered sealed sources. Second, the sealed sources would be directly reused or placed in interim waste storage, and the sealed sources eligible for disposal at the WIPP would be packaged and sent to WIPP for disposal. Third, the total radioactivity anticipated for acceptance at LANL by the OSRP is lower than estimates originally projected for the RSRP and the SWEIS. The originally projected estimates were conservative.

Both the EA and the SWEIS anticipated chemical processing would be conducted in facilities that were performing defense-related missions. Neither the EA nor the SWEIS anticipated or analyzed the consequences of potential commingling of defense and non-defense TRU wastes which would be created by chemical processing. This commingling of DOE defense TRU waste, DOE non-defense TRU waste, and commercial GTCC LLW is prohibited by DOE directives. If the chemical processing activities had proceeded as described in the EA and the SWEIS, this commingling would have been avoided only through the use of burdensome and costly procedures. The new management approach that would be implemented under the OSRP eliminates any potential for commingling of wastes.

This section discusses and compares key impact assessment parameters of the program evaluated in the SWEIS for managing unwanted radioactive sealed sources with the key parameters of the current proposal. A matrix is provided to enable a rapid, comprehensive comparison of coverages provided. The last column of the matrix provides comments regarding coverage of the impact assessment parameter for the proposed project (the OSRP) and for the earlier RSRP contained in the scope of the SWEIS.

The key assessment parameters evaluated and compared are the following:

- Material Throughput
- Program Duration
- Radioactive Air Emissions
- Radioactive Waste
- Radioactive Sealed Source and Waste Storage Location/Capacity
- Occupational Radiation Exposure
- Transportation
- Accidents (Operations)
- Accidents (Transportation)

Material Throughput

Material throughput is the total quantity of radioactivity that would be received and managed over the life of the program. The material throughput for the proposed OSRP is 30,000 Ci and the material throughput evaluated in the SWEIS is 100,000 Ci. This parameter is within the scope of the evaluation contained in the SWEIS. The fact that the throughput quantities differ

for the OSRP and the RSRP is related to differences in projections at different periods. The higher material projection for the SWEIS reflects multiple facility capabilities.

Duration

Duration is the expected period that is forecasted to address the task of interim management of unwanted sealed sources. The duration period for the proposed OSRP and the SWEIS are the same, since a version of the OSRP was included in the SWEIS and activity under that earlier strategy has already occurred. The current management strategy requires decisions on disposition prior to 2007.

Radioactive Air Emissions

Radioactive air emissions are those emissions that may be dispersed into the atmosphere either directly from the sealed source, through its processing, or from the processed material. Because sealed sources are airtight and would not be opened under the proposed OSRP, there would not be any expected routine emissions. If a leak were detected from a sealed source during its removal from the shipping container, the sealed source would be immediately repackaged in an airtight sealed insert. However, the potential for any leakage during interim storage is extremely remote. Accident scenarios for Area G are already addressed in the SWEIS. The storage of the additional containers with sealed sources would remain within the bounds of the previously considered accident scenarios for Area G.

As described, the management scenario presented in the SWEIS for the Expanded Alternative involves the opening of the sealed sources and processing (i.e., chemical separation) of the radioactive contents. Radiological air quality impacts are discussed as a component of facility capabilities, which include the chemical processing of the sealed radioactive sources.

The absence of air emissions associated with the proposed OSRP places this effect well within the scope of the evaluation contained in the SWEIS.

Radioactive Waste

Radioactive waste, for the purposes of this SA refers to transuranic (TRU) waste. Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years. Transuranic isotopes are those elements having an atomic number greater than that of uranium (90).

Radioactive waste at LANL is typically stored in 55-gallon drums, except for large waste items that are too large to fit in these containers. Accumulations of waste in various size containers are typically measured in cubic meters. A cubic meter can accommodate approximately 4.8 drums.

The current OSRP proposal does not involve chemical processing, and while some amount of LLW would be generated from routine handling, the only radioactive waste stream of direct interest is the sealed sources themselves. They would be managed like similar TRU waste.

A total projection of the TRU waste resulting from the collection and storage of sealed sources under the proposed OSRP was compared to the TRU waste projections contained in the SWEIS and to recent TRU waste generation rates at LANL. TRU waste generation in recent years has been below that projected in the SWEIS such that even if one presumes that future rates would be at SWEIS-projected levels, totals over the 10-year analysis period of the SWEIS would not be exceeded. The total estimated waste volume that would have been generated during the chemical processing of sealed sources is 140m^3. If the sealed sources went to waste storage directly, and the entire contents of sealed source storage drums were assumed to be waste, the estimated volume would be 208 m^3 over six years. This difference has been more than accommodated by the fact that actual TRU waste generation rates have been substantially underrunning the projection of 330 m^3/year (1997, 102 m^3; 1998, 152 m^3; 1999, 212 m^3).

Based on this evaluation and discussion, the total volume of TRU waste from new activities is not expected to be greater than that analyzed in the SWEIS.

Radioactive Waste Storage Location/Capacity

This parameter includes the locations where sealed sources, which have been declared waste, would be stored as well as their storage capacity. TRU waste is stored in Area G in a number of facilities, and the current amount of retrievably stored TRU waste is about 9,000 m^3.[5] Some of the TRU waste is stored in inspectable facilities in accordance with Resource Conservation and Recovery Act (RCRA) regulations. Some of the TRU waste is stored in facilities and is not required to be inspected in compliance with RCRA. Newly generated TRU waste is stored in inspectable facilities. All retrievably stored, but uninspectable, TRU waste will eventually be moved to inspectable facilities. Waste from the proposed OSRP would be stored in the inspectable storage facilities. Current RCRA permitted storage capacity in Area G is about 28,000 m3.[6] Legacy waste (retrievably stored/uninspectable) is being moved from older storage facilities to these facilities, and this waste, along with other TRU waste stored in Area G, will be shipped to WIPP upon certification.

Although the amount of TRU waste in storage at any one time is variable, depending on the pace of current waste generation as well as the various retrieval, waste sorting, size reduction, waste characterization, and shipment projects, this storage capacity is expected to meet the needs of the site over the period of analysis of the SWEIS. Approximately 12,340 m^3[7] of newly generated and legacy TRU waste was projected to be managed over this period of analysis. As stated, the amount of TRU waste that would be stored in Area G resulting from the proposed OSRP is about 208 m^3 and that forecasted from chemical processing of sealed sources in the

[5] Waste Management Strategies for Los Alamos National Laboratory – 1997, LA-UR-97-4764 p.41,46,50-51.
[6] State of New Mexico Part B RCRA Permit for LANL.
[7] Please see footnote number 5.

SWEIS was 140 m^3. This difference of 68 m^3 is not expected to perturb storage accommodations in Area G, and it is expected that TRU waste can be managed within these constraints.

The proposed OSRP would also utilize MBAs such as CMR for storing up to 1,000 sealed sources prior to repackaging as waste and transfer to a waste storage facility.
Interim storage of up to 1,000 sealed sources at CMR is analyzed and described in the SWEIS.

Occupational Radiation Exposure

The occupational radiation exposure is the total effective dose equivalent incurred by workers. The dose is a combination of external whole body dose and internal dose.

The OSRP has calculated potential doses to worker at LANL for activities involving sealed source management and storage as TRU waste. The worst-case worker exposure potential for the OSRP with 1000 drums in storage amounts to 6.6 person-rem.

The sealed source management program evaluated in the SWEIS included dismantling of the sealed sources, chemical separation of the radioactive contents, generation of radioactive liquid and solid wastes, and interim storage of separated material and waste storage and disposal. Exposure estimates presented in the SWEIS were based upon the 15 groups of LANL workers who historically combined to represent more than 84 percent of the worker collective dose. Projections were based on the alternative descriptions (which included the subject activity), and the remainder of the LANL radiation worker dose was estimated from these projections to get a total for LANL under each operational level alternative analyzed. A collective worker dose of 833 person-rem/year was projected for the Expanded Operations Alternative (Table 5.3.6.2-1 of SWEIS and Table D2.2.1-1 of Volume III, Appendix D of SWEIS). Operational Health Physics and Actinide Process Chemistry were two of these worker groups.

The OSRP proposal involves source inventory and storage. Additional handling would only be required for repackaging or handling of damaged sources and could take place in CMR shielded hot cells to minimize radiation exposure. An alternative to the proposed action identified (but eliminated from detailed analysis) in the earlier 1995 RSRP EA discussed the increased radiation dosage to workers resulting from long-term storage of sealed sources without recovery of radioactive materials. However, radiation emissions can be reduced to acceptable levels for worker exposure by the use of shielded shipping and storage drums as discussed for the OSRP. This engineering control was not analyzed in the 1995 EA or in the SWEIS. With shielding, the surface dose rates for OSRP storage drums would vary from less than 5 mrem/hr to 75 mrem/hr. These dose rates are well below the standards for workers of contact-handled material of 200 mrem/hr.

It is also noted that the OSRP proposal is for interim sealed source storage through 2006. As stated, final disposition of sealed sources not eligible for disposal at WIPP would be analyzed in a separate future NEPA document, when alternatives have been sufficiently developed.

The scope of the occupational radiation exposure analysis for the proposed interim storage of sealed sources is well within the scope of the exposure analysis contained in the SWEIS.

Transportation

The transportation analysis consists of the number of shipments of radioactive materials, including the number of packages in a shipment. It also consists of an abnormal events analysis that was also analyzed in the SWEIS.

As discussed, the anticipated number of drums that would be shipped in any given year under the proposed OSRP would be about 170 drums. The number could increase in the early years of the project, and decrease in later years, if proposed funding increases for the OSRP take place. A total of about 1000 drums would be received over the life of the project. Sealed sources would be consolidated in drums at commercial sites to reduce the number of drums and the number of shipments to LANL. It is anticipated that each shipment to LANL would consist of approximately 10 drums. The stated total quantity of radioactivity that would be managed over the duration of the project would be about 30,000 Ci, or about 300 Ci per shipment.

The SWEIS extensively discussed the shipments of radioactive materials (and hazardous materials) including those under discussion in this SA (see SWEIS, App. F). Considering the number of shipments for the proposed OSRP described above and comparing the total quantity of radioactivity that would be managed by the OSRP proposal (30,000 Ci) versus that projected in the SWEIS (100,000 Ci) would indicate that the number of shipments under the OSRP would be considerably fewer.

Because the total quantity of radioactive material that would be managed under the proposed action is appreciably less than that evaluated in the SWEIS, it is reasonable to conclude that the total number of shipments is also significantly less than that evaluated in the SWEIS transportation scenario. For this reason, any transportation impacts associated with the proposed action are within the parameters of those previously analyzed in the SWEIS.

Accidents (Operations)

Accidents are defined as unexpected or undesirable events that lead to the release of hazardous material within a facility or into the environment, exposing workers, or the public, or both, to hazardous materials or radiation.

The absence of chemical processing and recovery of constituent components of the sealed sources under the proposed OSRP, and a focus on storage of intact sealed sources, limits the opportunities for unexpected or undesirable releases of radioactive material. These limitations are reflected in transportation, handling, and storage activities. The definition of sealed sources as "radioactive sources sealed in impervious containers having sufficient mechanical strength to prevent contact with and dispersion of the radioactive material under the conditions of use and wear for which it was designed" reflects the resistance of these sources to rupture and dispersal of contents.

Appendix G of the SWEIS contains detailed and extensive discussions of the process used for screening, binning, and selection of events for detailed analysis from all operations described in the SWEIS. Several waste material dispersal events that were evaluated in the SWEIS (RAD-01, RAD-06, RAD-07, RAD-08, and RAD-09) are representative of the proposed OSRP, although the SWEIS events could be considered overly conservative since the sealed sources under consideration in this SA would be managed in a less dispersible form. RAD-09, for example, is a relatively high probability event of a waste drum puncture by a forklift. Radioactive material from the OSRP sealed sources would not be expected to disperse in such an event because of their robust cladding. Other accidents involved multiple containers of waste and catastrophic events. OSRP waste sources do not present greater risks of material dispersal, and because of their form, are considered better protected. The OSRP proposal was reviewed for any potential changes that would be needed in the safety authorization for Area G. The analysis determined that the proposed OSRP does not affect the safety of operations at TA-54, Area G (see Matrix for reference).

The SWEIS accident analysis presumed that TRU waste would be generated and stored as a consequence of the receipt and chemical processing of the sealed sources. The change introduced by the current proposal for source management is to store the intact sources directly at Area G as opposed to the TRU waste generated from their processing. A review of the safety analysis for storage at Area G showed that this change in physical characteristics of the waste did not change the accident analysis for Area G (see Matrix for reference). The high mechanical strength of the sealed sources provides a correspondingly high degree of safety from accidental breakage and dispersal of contents. Consequently, the proposed OSRP is encompassed within the bounds of the accident scenario evaluated in the SWEIS.

Accidents (Transportation)

Similarly, the SWEIS contained an extensive transportation risk analysis (see Appendix F of SWEIS) and included shipments of sealed sources to LANL. A change in management measures proposed in the OSRP does not change the accident analysis performed in the SWEIS. Consequently, the proposed OSRP is within the bounds of the accident scenario evaluation in the SWEIS.

COMPARISON MATRIX

Impact Assessment Parameter	Proposed OSRP Program[1]	1995 EA[2]	SWEIS[3]	Comment
Material Throughput	30,000 Ci[4]	50,000 Ci[5]	100,000 Ci[6]	Parameter within scope of the SWEIS
Duration	6 years	15 years[7]	10 years[8]	Parameter within scope of the SWEIS
Radioactive Air Emissions	None anticipated;	No direct estimate; small contribution to building total[9]	Estimate specifically provided for chemical material recovery of all 100,000 Ci[10]	Parameter within scope of the SWEIS
Radioactive Waste	208 m^3 TRU[11] over project life	0.03 m^3 TRU[12] over 15-year project life (waste projection very low based on anticipated technological methods to reduce TRU waste)	140 m^3 TRU[13] over 10-year project life (assumed no reductions in TRU waste)	Parameter within scope of the SWEIS; Actual waste volume currently underrunning SWEIS projection primarily because operations still in early phases of Expanded Operations alternative; no significant difference in Proposal vs. SWEIS[14]
Sealed Source and Radioactive Waste Storage Location/Capacity	Area G	Waste sent to Area G. Storage Without Planned Recovery alternative eliminated from detailed discussion [15]	RCRA permitted storage capacity available at Area G – 28, 000 m^3	Capacity not an issue, parameter evaluated in the SWEIS; Parameter within scope of SWEIS
Occupational Radiation Exposure	6.6 person-rem for receipt, handling, and storage	17.3 person rem for chemical separation of material[16]	Exposure estimates based on the processing of 100,000 Ci of source material[17]	Management changed to direct storage in shielded containers to minimize personnel exposure; Projected exposure well below that projected in SWEIS
Transportation	1000 drums in 100 shipments over 6 years; Onsite/offsite transportation	Onsite transportation evaluated[18]	Onsite and Offsite transport included; very conservative[19] – one source type alone accounts for 3800 offsite trips[20]	Parameter within the scope of the SWEIS
Accidents (Operations)	Transport, handling and storage activities; No unreviewed safety question for Area G[24]	Evaluated material dispersal from catastrophic events, assuming chemical separation[25]	Appendix G detailed discussion of process for screening, binning, and selection of events for detailed analysis from all operations described in the SWEIS	Several waste material dispersal events were evaluated which are representative of the current proposal, although would be considered overly conservative given that material is now in a less dispersible form (RAD-01, RAD-06, RAD-07, RAD-08, RAD-09)[26] Parameter within scope of SWEIS
Accidents (Transportation)	Transport, handling and storage activities	Not evaluated as credible	Conservative evaluation of 10 g Pu-238 dispersal[27]	Parameter within scope of SWEIS

[1]LAN-99-LAN-99-049 Rev 1, Offsite Recovery Program – Interim Storage, 12/10/99
[2]Environmental Assessment for the Radioactive Source Recovery Program, DOE/EA-1059, 12/20/95
[3]Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, DOE/EIS-0238, 1/99; Record of Decision 9/99
[4]1000 drums x 30 Ci/drum = 30,000 Ci
[5]EA Sec. 2.1.4, p 6
[6]SWEIS Tables 3.6.1-1, p 3-71 and 3.6.1-5, p 3-79
[7]EA Sec. 2.1, p 3
[8]SWEIS Sec. 1.6.2
[9]EA Sec. 4.2.4, p 17-18
[10]CMR Radiological Air Emissions Data Development for the SWEIS – REVISED, Miller, Garvey/Abu-Shehadeh, Sept. 30, 1996 TA-55
[11]Assuming all 1000 drums are full (likely < .5), 1000 drums x 55 gal/drum x3.78 E-03 m^3/gal = 208 m^3
[12]EA Sec. 4.4, p 21
[13]Waste Projections from the Sealed Source Recovery Program/Capability, Loughead/Hargis, 9/30/96
[14]E-mail Vozella, OSRP TRU data, 2/18/00
[15]EA Sec. 2.3.4, p 9
[16]EA Sec. 4.2.2, p 17
[17]SWEIS sec. D.2.2.1, p D-33
[18]EA Sec. 4.2.3, p 17
[19]SWEIS Sec. F.5.3, p F-33
[20]SWEIS Table F.5.3-1, p F-38
[21]LAN-99-049 Rev 1, Offsite Recovery Program – Interim Storage, 12/10/99
[22]Environmenal Assessment for the Radioactive Source Recovery Program, DOE/EA-1059, 12/20/95
[23]Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, DOE/EIS-0238, 1/99; Record of Decision 9/99
[24] Review of Authorization Basis Documentation Relative to the Storage of Materials at TA-54 Under the Off-Site Recovery Project, Steele/Leonard 12/17/99
[25]EA Sec. 4.2.5.2
[26]SWEIS Table G.5-1, p G-79
[27]SWEIS Table F.5.3-2, p F-41