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Title: LANL Environmental ALARA Program Status Report for CY 2015

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Form 836 (7/06)

LANL Environmental ALARA Program Status Report for CY 2015

Introduction

Los Alamos National Laboratory (LANL) ensures that radiation exposures to members of the public and the environment from LANL operations, past and present, are below regulatory thresholds and are as low as reasonably achievable (ALARA) through compliance with DOE Order 458.1 *Radiation Protection for the Public and the Environment*, and LANL Policy 412 *Environmental Radiation Protection*. In 2007, a finding (RL.2-F-1) and observation (RL.2-0-1) in the NNSA/ LASO report, *September 2007, Release of Property (Land) Containing Residual Radioactive Material Self-Assessment Report,* indicated that LANL had no policy or documented process in place for the release of property containing residual radioactive material. In response, LANL developed *PD410, Los Alamos National Laboratory Environmental ALARA Program.* The most recent version of this document became effective on September 28, 2011. The document provides program authorities, responsibilities, descriptions, processes, and thresholds for conducting qualitative and quantitative ALARA analyses for prospective and actual radiation exposures to the public and to the environment resulting from DOE activities conducted on the LANL site.

PD410 also specifies requirements for reporting program status to the NNSA/ Los Alamos Field Office:

> If the potential dose from a chosen ALARA alternative exceeds 10 mrem TEDE to any member of the public per year or a collective dose of 100 person-rem TEDE per year, the National Nuclear Security Administration/ Los Alamos Site Office (NNSA/ LASO) will be notified in writing.
>
> In addition, a report summarizing the activities of the program is submitted to NNSA/ LASO for the previous calendar year no later than the end of the first quarter of the following year. This report describes any changes to the Laboratory Environmental ALARA Program, including organizational structure, responsibilities, and authorities. All environmental ALARA records for the previous calendar year generated as a result of implementing the program are submitted to the NNSA/ LASO as an appendix to the report. These records include letters, determinations, and analysis reports.

The remainder of this report provides the information required by *PD410*.

Exceedances of Potential Doses from ALARA Alternatives

During 2015, there were no potential doses in any alternative assessed that exceeded either: 1) 10 mrem TEDE to any member of the public per year, or, 2) a collective dose of 100 person-rem TEDE per year. Related, the annual dose to the Maximally Exposed Individual (MEI) in 2014 was 0.24 mrem while the collective population dose was 0.28 person-rem. Both of these doses are well within dose limits and ALARA considerations (LANL 2015a).

Summary of Environmental ALARA Activities

Changes to the Program and Associated Documents

1) Administration of Order 458.1

The LANL ALARA program for public radiation exposure was implemented in 2011 and found to be in compliance with DOE Order 458.1, and with Change 3 in 2014. There were no changes made to the LANL environmental ALARA program in 2015.

Implementation of Environmental ALARA

1) Release of personal and real property to the public

Land Transfer- Specific activities in 2015 included dose assessments and ALARA analyses that were performed for the conveyance of land under Public Law 105-119. Land tracts C-2, C-3, C-4, and A-16-b are candidates for transfer from the DOE to Los Alamos County (LANL 2015c). Of these, only tract C-2 required an ALARA analysis. The background subtracted all pathway dose for tract C-2, as calculated from radionuclide concentrations in the sediment, was 3.8 mrem/yr, which exceeded the LANL 3 mrem/yr ALARA threshold (Attachment 1). This ALARA analysis concluded that the cost for additional cleanup to lower doses beyond the 3.8 mrem/yr dose rate was not justified. Though these tracts were not conveyed in 2015, the dose and ALARA assessments for each of these tracts were independently validated by the DOE Field Office and its subcontractor. These tracts are scheduled to be conveyed in 2016.

Metal Recycling- Using processes defined in LANL procedures, and in compliance with DOE O458.1, approximately 550,000 lbs of unencumbered metal (i.e., outside the DOE metal moratorium) were released from LANL's LANSCE accelerator for metal recycle. Because these metals were potentially activated, systematic measurements for any residual radioactivity were performed, and released metals were required to pass "indistinguishable from background" criteria.

Decommissioning and Demolition- A number of buildings and materials that were potentially radiologically impacted were surveyed using the Multi-Agency Radiation Survey and Assessment for Materials and Equipment (MARSAME) protocol prior to release. Depending on the disposition path, criteria for public release of materials with residual radioactivity include being indistinguishable from background or based on a dose threshold of 1 mrem/yr, which are considered ALARA. The released materials included TA-39 building 2, TA-54 building 1009, TA-53 building 621, TA-46 building 41, and the sewage treatment facility at TA-21. Much of the concrete and metal from these buildings were released to landfills or for recycle after meeting radiological and waste management release criteria. Other materials were disposed of as low-level waste.

2) Authorized Limits

Screening Action Levels (SALs) for radionuclides in soils are evaluated every year to determine if an update is needed. In 2015, recalculation of the SALs was required due to a

significant update to version 7.0 of the dose assessment code RESRAD (Yu et al. 2001). SALs have been recalculated for common LANL-derived radionuclides (LANL 2015b), and LANL will seek DOE authorization for the new SALs in 2016. Changes in the SALs may slightly affect dose estimates for some nuclides, which could impact ALARA evaluations for future land conveyance tracts.

3) *Integrated Review Tool*

The EPC-ES Environmental Health Physics program reviewed projects through the Project Review and Requirements Identification tool (PR-ID) in 2015. Through the PR-ID tool, EPC-ES health physicists primarily support LANL Air Quality (Rad-NESHAPs) and Radiological Engineering design reviews for new facilities and facility modifications. Several projects were identified which had potential environmental and public dose implications. However, no projects (beyond the land conveyance and D&D projects described above) resulted in individual or collective doses above the thresholds for formal ALARA review.

Attachments

Attachment 1: Dose assessment of Los Alamos National Laboratory-Derived residual radionuclides in soils within C Tracts (C-2, C-3, and C-4) for land transfer decisions

References

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