



Centers for Disease Control
and Prevention (CDC)
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Dear Dr. Worthington:

Enclosed is the final report of the Los Alamos Historical Document Retrieval and Assessment (LAHDRA) project, prepared by ChemRisk under contract with the Centers for Disease Control and Prevention (CDC). In 1998, the Department of Energy (DOE) provided funding to the Centers for Disease Control and Prevention (CDC) to begin a study of records at the Los Alamos National Laboratory (LANL) to better understand whether radioactive materials (radionuclides) and toxic chemicals were released into the environment by the lab during its historical operations in the 1940s through 1960s. CDC began the Los Alamos Historical Document Retrieval and Assessment Project (LAHDRA) in 1999 and continued work through 2009. The project was managed by CDC; ChemRisk, a contractor with extensive expertise and experience in the risk analysis of chemicals and radionuclides, conducted the document retrieval and examination.

Radiation dose reconstruction is a multi-stage process that is used to determine past releases of radiological materials, the dose or amount of radiation received by persons in the vicinity, and the possible health effects of the radioactive substances on those persons. The basic stages of dose reconstruction process are:

1. Gather information about area of radiation exposure and assess data
2. Identify pathways of internal and external exposure
3. Determine methods of calculation to estimate screening doses and exposures
4. Develop methods to assess and estimate environmental doses
5. Determine risk of environmental exposures through selected calculation method
6. Document reconstruction procedures and results

CDC contracted with ChemRisk to work on identifying records of interest, developing a collection of relevant records for public review, and estimating whether toxic chemicals or radionuclides were released that might affect the public's health. This work represents the completion of the first stage of a dose reconstruction at LAHDRA, and the initiation of the next two stages.

Following is a brief summary of this work, as well as CDC's recommendations related to the project.

ChemRisk's Major Findings

The LAHDRA project was designed to gather information only. However, the project team made an effort to list the substances used at LANL that were of greatest concern. Plutonium was at the top of the list for radionuclides released to air or water, while trichloroethylene was the highest priority for toxic chemicals.

LANL's original Technical Area was the first site in the world in which plutonium was handled in visible quantities, purified, converted to metal, and used to make atomic weapon parts. Los Alamos also used significant quantities of beryllium in several areas, including explosive testing, before they fully understood its health hazards.

The Trinity Test, the world's first test of an atomic bomb, was conducted on July 16, 1945, at a site near Socorro in south-central New Mexico. The local terrain and wind patterns caused "hot spots" where higher amounts of radioactive materials settled in public areas northeast of the tower that launched the bomb. Radiation levels near some homes were almost 10,000 times what is currently allowed in public areas.

Tritium had been used at LANL to "boost" weapons (increase the power obtained from a given amount of fissionable material) and as "fuel" to support fusion in hydrogen bombs. Its use before 1967 was of key concern. It has also been used in fusion research and to produce neutrons in accelerators. A wide variety of applications at LANL used uranium, primarily as a fissionable material in atomic weapons and to make other weapon parts.

In 1996, the New Mexico Department of Health reported that the thyroid cancer incidence rate in Los Alamos County from 1986 to 1990 had been nearly four times the rate for New Mexico as a whole and surrounding counties did not show a similar rise. Because it is known that radioactive iodine taken into the body can accumulate in the thyroid gland and increase one's risk of thyroid cancer, there was increased interest in identifying any historical operations at LANL that could have released radioactive iodine to the environment. The LAHDRA team collected information pertaining to a number of operations that resulted in the production of radioactive iodine.

In summary, ChemRisk's key findings were that:

- Early airborne releases of plutonium may have been higher than earlier reports indicated.
- Significant quantities of beryllium were used before the health hazards were fully understood, and it was processed close to residential areas.

- Nearby residents were not warned before the 1945 Trinity blast or informed of health hazards afterward, and no residents were evacuated.
- Early airborne releases of uranium and releases of tritium could not be assessed.
- There was insufficient information about most of the chemicals, including trichloroethylene, to warrant additional work at this time.

CDC's Recommendations

Based on the major findings outlined in ChemRisk's assessment, the following should be considered:

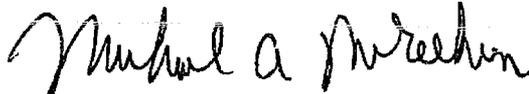
1. The world's first test of an atomic bomb was conducted at the Trinity site in south-central New Mexico on July 16, 1945. The National Cancer Institute (NCI) is currently preparing a report on the potential radiation doses to residents of New Mexico as a result of the Trinity test based, in part, on data gathered by LAHDRA. When the NCI report is completed, government officials should meet with interested stakeholders from around the Trinity site to determine if any additional work is warranted at this site.
2. Based on the results of the screening analyses, airborne plutonium releases appear to have the greatest potential for impacting residents of Los Alamos. One factor that contributes significantly to this finding is the close proximity of the historic plutonium processing facilities at LANL to local residences. The amount of plutonium historically released by LANL activities is still highly uncertain, and the screening analysis is deliberately designed to overestimate the impact of any releases, but the results presented in the LAHDRA report clearly indicate that additional work in this area should be considered.
3. The screening analyses in the LAHDRA report identify five additional radionuclides or chemicals that might be considered for additional study: beryllium, tritium, uranium, iodine, and mixed fission products. The last of these items was specifically identified during the peer review of the draft final report. All of these materials exceed the screening levels used in the LAHDRA analyses, but at a much lower level than that of airborne plutonium. If sufficient resources are available, additional work on one or more of these materials should be considered. However, consideration of additional work for the Trinity site and the airborne plutonium releases should be a higher priority if resources are limited.

As with all dose reconstruction projects, CDC worked to allow effective input by all stakeholders, including the impacted community. A mechanism should be developed to continue this process should additional work be undertaken as a follow-up to the LAHDRA project.

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We appreciate the opportunity to have contributed this information on an important public health issue. If you have any questions about the report or recommendations for potential additional work, please contact Dr. Charles Miller at 770/488-3800 or by e-mail at CMiller1@cdc.gov.

Sincerely,



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Enclosure

cc:

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