LA-UR-00-5888

Sherwood and Scyllac Buildings, TA-3-105 and TA-3-287; An Eligibility Assessment Report

Historic Building Survey Report No. 189

Los Alamos National Laboratory

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Prepared for the Department of Energy Los Alamos Area Office

prepared by

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Introduction:

The following information has been prepared as part of a notification of potential adverse effect to two historic Los Alamos National Laboratory (LANL) properties, TA-3-105 and TA-3-287. The proposed decontamination and decommissioning (D&D) action is related to a revitalization project at Technical Area (TA) 3, the main administrative area at LANL. D&D activities will adversely effect the attributes that make these two buildings eligible for the National Register of Historic Places.

This report is intended to provide the initial background information necessary to initiate the Section 106 consultation process; additional documentation will follow when a treatment plan for the resolution of adverse effects is developed. This short report contains a description of the proposed action, brief property descriptions, historical background information, building integrity and contamination information, and recommendations for National Register of Historic Places eligibility.

The SHPO is requested to concur with the eligibility determinations contained in this report and to concur that the proposed decontamination and decommissioning action will adversely effect TA-3-105 and TA-3-287.

Project Description:

In May and June 1999, a historic building survey was conducted for two buildings proposed for decontamination and decommissioning, TA-3-105 (the Sherwood Building) and TA-3-287 (the Scyllac Building). Work processes carried on in both buildings were related to fusion energy and plasma physics. The buildings were operational during the Cold War years at Los Alamos (1956–1990).

Ancillary structures associated with building TA-3-105 are also scheduled for decontamination and decommissioning: four modular office buildings (TA-3-400, -401, -402, and -403), a trailer office (TA-3-1597), and a single substation (TA-3-122). These structures are not eligible for the National Register due to their recent age and lack of historical significance.

A 1998 engineering analysis concluded that upgrading TA-3-105 and TA-3-287 to conform with the TA-3 revitalization effort would not be cost effective. Furthermore, the buildings could no longer be used for their original experimental purposes because of the densely populated nature of TA-3. In the event that the proposed D&D project is carried out, all buildings and structures listed above will be destroyed.

Background Information:

Physical Description - TA-3 and Buildings TA-3-105 and TA-3-287

TA-3, South Mesa Site, is a large technical area located on top of South Mesa, across Los Alamos Canyon from the town of Los Alamos, New Mexico. TA-3 functions as the

administrative center of LANL. The main administrative building (TA-3-43), the Oppenheimer Study Center, the Otowi Building, and numerous office and laboratory buildings are located at this technical area. Buildings TA-3-105 and TA-3-287 are in a centrally located complex of buildings near the LANL administrative building. TA-3-105, the Sherwood Building, was constructed from 1956 to 1959. It is a grouping of rectangular structures joined by common walls and corridors constructed in stages. Building materials include steel frame, masonry block and transite siding, and concrete foundations and sub-grade walls. TA-3-287, the Scyllac Building, was constructed from 1968 to 1970. It is a three-floor, steel framed building with a basement (see attached maps, photos, and drawings).

Brief Historical Background

The United States began its controlled thermonuclear research program, "Project Sherwood," in 1951. Project Sherwood's mission was to develop an essentially inexhaustible source of energy from the controlled fusion of the nuclei of light atoms. Experiments in controlled thermonuclear reactions were started at Los Alamos in 1951 (GTS Duratek 1999). In 1957, Los Alamos achieved the first controlled thermonuclear plasma using the Scylla theta pinch device (Los Alamos National Laboratory 1995).

In the early days, there were two categories of approach: the steady state approach and the pulsed approach. The steady state approach used stellerators and mirrors. The pulsed approach was represented by theta and z-pinch technology. Los Alamos scientists concentrated on the "pinch concept" developed by Willard Bennett in 1934. When pinch technology is used, an electric current is passed through the plasma creating a magnetic field, which constricts or "pinches" the plasma, thus pulling the plasma away from the material walls. Work continued at Los Alamos from 1959-1990 using theta and z-pinch technologies in the hope of developing an efficient fusion energy source that could be used commercially (GTS Duratek 1999).

Work processes conducted in TA-3-105 and TA-3-287 were key components of Los Alamos' controlled thermonuclear research program. Important Sherwood experiments included the Perhapsatron Series, the Columbus Series, Picket Fence, Ixion, the Hydromagnetic Plasma Gun, the Plasma Acceleration Machine, Plasma Shield Research, and the Scylla Series. Other experiments included the Reverse Field Pinch, the ZT-40, and the Compact Torus Facility. Work conducted at the Scyllac Building included the Scyllac Toroidal Sector and the Scyllac full torus (GTS Duratek 1999).

Integrity Issues and Potential for Contamination

All original experimental equipment from both buildings has been removed resulting in a loss of interior integrity. The buildings have not otherwise been significantly modified. Both TA-3-105 and TA-3-287 are currently being used as office space and storage.

Hazardous materials present in both buildings include asbestos-containing materials (ACM) and lead-based paint. ACM are present in piping insulation and wrapping

materials, wallboard, floor tile, and possibly some roofing materials. Other potential contaminants in both buildings include polychlorinated biphenyls (PCBs), a group of chemicals commonly used in transformers and capacitors. Radiological contamination is not expected in either building due to the nature of the equipment and the types of experiments and operations conducted in the buildings (GTS Duratek 1999).

Eligibility Recommendation:

TA-3-105 and TA-3-287, although less than fifty years old, are eligible for nomination to the National Register of Historic Places. This determination is made under Criterion A of the National Historic Preservation Act of 1966, due to their association with important events during the Cold War years at Los Alamos (criteria consideration G: "properties that have achieved significance within the last fifty years") (U.S. Department of Interior, 1991). Although TA-3-105 and TA-3-287 have suffered a loss of interior integrity, they are still eligible under Criterion A for their associations with Cold War events of historical importance—experiments conducted at both buildings have contributed to internationally important research in both fusion energy and plasma physics.

References Cited:

- GTS Duratek
 - 1999 Sherwood and Scyllac historical background information prepared by GTS Duratek, Commodore Advanced Sciences, Inc. for LANL EM/D&D. Draft on file at ESH-20, Los Alamos National Laboratory, Los Alamos, New Mexico.

Los Alamos National Laboratory

1995 Dateline: Los Alamos, Special Issue, LALP-95-2-6&7, Los Alamos, New Mexico.

U.S. Department of the Interior

1991 How to Apply the National Register Criteria for Evaluation, *In National Register Bulletin*, No. 15, U.S. National Park Service, Washington, D.C.







Sherwood Building (TA-3-105) – East View



Sherwood Building (TA-3-105) – Northeast View



Sherwood Building (TA-3-105) - Northeast View



Sherwood Building (TA-3-105) - North View



Sherwood Building (TA-3-105) - Main East Bay



Sherwood Building (TA-3-105) - Main West Bay



Scyllac Building (TA-3-287) - Southeast View



Scyllac Building (TA-3-287) – South View



Scyllac Building (TA-3-287) - North View



Scyllac Building (TA-3-287) - Main Bay













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