

THE HANFORD NUCLEAR RESERVATION

The Hanford Nuclear Reservation is located on 570 square miles of land in southeastern Washington, near the cities of Richland, Pasco, and Kennewick. The federal government chose this area as one of the sites for the Manhattan Project – the secret program to build an atomic bomb. The Hanford area was chosen for its remote location, arid climate, abundant electricity, and access to river water to cool nuclear reactors. Construction began in 1943 and the first reactor became operational in 1944. During the early years of operation, large amounts of radioactive materials, primarily iodine-131, were released to the atmosphere. Radioactive releases to the Columbia River also occurred.

Public concern about past Hanford operations led the U. S. Department of Energy (DOE) in 1986 to release thousands of pages of previously classified or unavailable documents. These documents detailed Hanford's operating history and demonstrated off-site releases of radioactive material. Following the release of this information, Washington, Oregon, regional Native American Tribes and CDC convened a panel of experts to evaluate this information. The panel, named the Hanford Health Effects Review Panel, found that people in the area were exposed to radioactive materials and recommended dose reconstruction and thyroid health effects feasibility studies.

THE HANFORD DOSE RECONSTRUCTION PROJECT (HEDR)

Consequently, a dose reconstruction project (HEDR) began at Hanford in the late 1980s. A DOE contractor conducted the work. Public distrust of this relationship paved the way to the development of a Memorandum of Understanding (MOU) between DOE and the Department of Health and Human Services (HHS). This MOU, signed in 1990, transferred responsibility for analytic epidemiologic research at DOE sites to the Centers for Disease Control and Prevention (CDC). The National Center for Environmental Health (NCEH) assumed responsibility for community research (including HEDR) and the National Institute of Occupational Safety and Health (NIOSH) assumed responsibility for occupational health studies. The purpose of the HEDR Project was to determine how much radioactive material was released from Hanford, how that material may have reached and exposed people, and what radiation dose people may have received. The HEDR Project developed mathematical computer models to estimate radiation doses to people. HEDR was completed in 1995. Additional scientific work for the HEDR Project is in progress. This work focuses on: (1) exposures to radioactive particles and short-lived radionuclides on the Hanford site, and (2) the doses people may have received from Hanford's radioactive releases to the Columbia River.

THE HANFORD THYROID DISEASE STUDY

In 1988, the Hanford Thyroid Disease Study (HTDS) was mandated by an act of Congress. The CDC was directed by Public Law 100-607 to conduct a study of thyroid morbidity among persons who lived near the Hanford Nuclear Site between 1944 and 1957. The Fred Hutchinson Cancer Research Center (FHCRC) of Seattle, Washington was selected by CDC to conduct the study and a contract was awarded to the FHCRC in 1989. The primary purpose of the study was to determine whether thyroid disease in the population surrounding Hanford is associated with exposure to I-131 released from Hanford between 1944 and 1957, the years when the greatest releases of iodine-131 occurred. Since the dose models developed by the HEDR project would be used by HTDS, close coordination of these two studies occurred throughout the life of both projects.

The HTDS was conducted as a retrospective cohort study. Because health effects resulting from exposure to radioactive iodine would most likely have affected those who were children at the time of exposure, the study focused on people who were children during the time of highest releases. A group of individuals, or cohort, was selected to participate in the study from among persons born in 1940-46 to mothers whose usual residence was in one of seven counties in eastern Washington State: Benton, Franklin, Walla Walla, Adams, Ferry, Stevens, and Okanogan. An extensive tracing effort located these individuals throughout the United States. Study participants had a dose estimate calculated from answers to a dosimetry questionnaire, and were examined for the presence or history of thyroid disease. The work was conducted in two stages. The first phase was a Pilot Study, the primary purpose of which was to evaluate the feasibility of the methods proposed, and to develop the specific operational procedures and data collection instruments needed for a full study. The second stage was to implement the remaining fieldwork to complete such a study. The Pilot Study was completed in December 1994, with a report issued publicly in January 1995. Reviews of the Pilot Study by the National Research Council's Board of Radiation Effects Research of the Commission on Life Sciences and the federal Advisory Committee for the HTDS concluded that a full-scale epidemiologic study should be undertaken. The fieldwork for the Full Study was completed in December 1997. Since then, analysis of the data and writing of the final report have been underway.