

ENVIRONMENTAL AND HEALTH STUDIES OF POTENTIAL IMPACTS FROM EARLY
HANFORD OPERATIONS

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ABSTRACT

During 1985, Washington's Nuclear Waste Board initiated the study of potential health effects associated with the past operations of facilities on the Hanford Reservation. Independently, on February 27, 1986, the U.S. Department of Energy released 19,000 pages of text and data describing planned and inadvertent radionuclide releases from the reservation. In response, Governor Booth Gardner, Washington, Governor Victor Atiyeh, Oregon, and the affected Indian tribes formed the Hanford Historical Documents Review Committee. The task assigned to the committee was to review this new material and make recommendations as to its environmental significance. This paper will summarize the products of these reviews and describe follow-up activities currently in progress.

Hanford Historic Documents

On February 14, 1986, Mr. Michael Lawrence, Manager of the Department of Energy's Richland Operation wrote to Governors Booth Gardner of Washington and Victor Atiyeh of Oregon to inform them of the release of forty years of past environmental monitoring information for the Hanford site. These data were contained in 301 documents, a total of about 19,000 pages, much of which was previously unavailable to the public because of its classified nature. In his letter, Mr. Lawrence anticipated public concern over the environmental significance of this new information and suggested that the states of Washington and Oregon form a small group of experts to provide an assessment of the impact of these radioactive releases to the Northwest. In a press conference following the release of the information, Mr. Lawrence stated that he felt the credibility of the Department of Energy was too low for the public to believe department assessments of health effects.

The governors responded by establishing a Northwest regional review group, the Hanford Historical Documents Review Committee (HHDRC), which includes representatives from Washington, Oregon, the Yakima Indian Nation, the Nez Perce Tribe and the Confederated Umatilla Tribes. The charge given this committee was to organize and conduct a detailed review of the documents and prepare a report of significant findings concerning the environmental and health impacts of the early radioactive releases from the Hanford site. The governors also called on the USDOE to provide sufficient funding to retain the necessary scientific expertise. In the state of Washington all activities are closely coordinated through the state's Nuclear Waste Board, which also provides staff support.

A preliminary review of the three hundred documents revealed many issues of importance. For example:

1. No radiological dose assessments for the public were calculated for Hanford operations during the period of 1944-1956.

2. Information on which to base dose assessments prior to 1957 is limited (except for I-131), and of questionable accuracy given the rudimentary nature of monitoring techniques.
3. Weekly releases of I-131 ranged from 100 to 7,200 curies during the first two years of operation. By the end of 1946 the releases totaled over 470,000 curies.
4. From 1947 to 1949 monthly releases of I-131 averaged from 100 to 2,000 curies (except the "Green Run" in 1949 when 5,500 curies were released).
5. Detectable vegetation contamination by I-131 routinely extended 50 to 150 miles from the Hanford site in the downwind direction.
6. Stack emissions of the federal processing facilities (B, T plants) were not filtered until 1948, when water scrubbers were installed. Silver scrubbers (chemical filters) were not installed until 1950 and failed repeatedly during 1951.

Dose estimates made by Washington Department of Social and Health Services staff projected dose commitments to the maximum exposed individual of 1 to 2 Rem to the whole body and over 2,000 Rem to the thyroid. These dose estimates are very preliminary and involve a number of extremely conservative assumptions.

Hanford Health Effects Panel

Prior to the release of the USDOE Hanford documents, the Washington Nuclear Waste Board directed the Environmental Monitoring Committee (EMC) to organize a study of possible health effects from Hanford operations. This review was to be conducted in a manner similar to that coordinated by the Centers for Disease Control for the Department of Energy's Savannah River operation. Staff for the Environmental Monitoring Committee contracted the Centers for

Disease Control to convene a panel of scientific experts to review the historical documents in an initial study of past Hanford operations.

The CDC established the Hanford Health Effects Panel, a multi-disciplinary group of thirteen members. The panel was asked to:

1. Assess the need for epidemiological studies of health effects in populations of the Hanford region, including the evaluation of radioisotope releases and subsequent public exposure to these releases.
2. Assess the extent and adequacy of current environmental programs at the Hanford site and in the Northwest.
3. Review epidemiological studies previously conducted of populations in the Hanford vicinity.

Panel members met during the week of September 22-26, 1986 and agreed to a consensus process, in which recommendations would have the support of all thirteen panelists.

The Panel conducted a week-long review of information and issued thirty-four preliminary recommendations. These were grouped by the panel into five categories entitled:

1. Community Epidemiology
2. Work Force Epidemiology
3. Environmental Monitoring
4. Dose Reconstruction
5. Release of USDOE Research and Data

Community Epidemiology

The recommendations contained in the Community Epidemiology category addressed the need to review the early I-131 releases. The panel encouraged the study of thyroid morbidity in the region and the possibility that existing thyroid morbidity conditions are associated with past radioactive iodine releases. The panel also recommended the establishment of an integrated health surveillance system and a reproductive outcome registry for the public.

Work Force Epidemiology

The panel recommendations in this area were directed primarily to the U.S. Department of Energy. The panel called for the expansion of current USDOE work force studies to include morbidity and adverse reproductive outcomes, to expand internal dose assessments, to include any hazardous chemical exposure to a worker's background file, to investigate the "healthy" worker effect, and to include statistical power calculations in new study protocols. They also recommended a system to track health insurance claims by workers and a mortality follow-up of past military, construction, and subcontractor personnel who worked at the site during the initial period of Hanford operations.

Environmental Monitoring

The environmental monitoring recommendations centered around providing access to information on site operations, coordinating and assessing existing

monitoring programs and participation by states in emergency drills related to N-reactor and the PUREX facility.

Dose Reconstruction

Recommendations on dose reconstruction called for the development and determination of a credible range of possible doses the public could have received from radioactive emissions. Recommended studies should focus on high risk groups of the region.

Release of USDOE Research and Data

This final recommendation category, was directed to the Department of Energy. In this area the panelists felt USDOE should make raw data available to the public in a timely manner and in sufficient detail so analysis can be replicated through independent assessments, without compromising the investigator's right to prior publication.

Action Concerning Hanford Health Effects Panel Recommendations

The thirty-four panel recommendations were issued on September 26, 1986. At the October 17, 1986 meeting of the Washington Nuclear Waste Board, the Environmental Monitoring Committee presented the preliminary recommendations for Board consideration. The Board endorsed the HHEP recommendations in the form of Nuclear Waste Board Resolution 86-6.

This resolution expressed appreciation to the Hanford Health Effects Panel, the Centers for Disease Control and support staff for their diligent efforts as participants in the week-long meeting. The resolution called on the federal government, as operator of the Hanford facilities, to allow access to all pertinent information available and provide funding for follow-up studies. Finally, the Board directed the Nuclear Waste Board Chair, Mr. Warren Bishop, to work with the Hanford Historical Documents Review Committee, the Board's Environmental Monitoring Committee, and the U.S. Department of Energy to ensure an appropriate follow-up to each recommendation.

After Nuclear Waste Board review in Washington, the thirty-four recommendation were transmitted to the Hanford Historical Documents Review Committee, the Environmental Monitoring Committee or the U.S. Department of Energy. One of these three groups was requested to take primary responsibility for the review and implementation of each specific recommendation. The Board and committee members noted that each group would also have a secondary role in the review of each recommendation and a substantial effort would be necessary to coordinate associated activities.

Progress To-Date

The recommendations that were considered to be the primary responsibility of the U.S. Department of Energy were transmitted by letter to Secretary Herrington. In separate letters, the Nuclear Waste Board and the Chairman of the Hanford Historical Documents Review Committee asked the USDOE to establish priorities for addressing each recommendation and indicate the Department's response. In a December 24, 1986 response, the Director of the Human Health and Assessment's Division of USDOE, Dr. James S. Robertson, stated that a final response to this request was being coordinated and would contain a comprehensive set of actions the USDOE would undertake.

In July 1986, members of the Colville Indian Tribe in northeastern Washington filed a Class Action Suit against the U.S. Department of Energy as operator of the Hanford site. In this suit, these individuals claim that specific health problems have resulted from past Hanford operations. As a result of this suit, the U.S. Department of Energy has decided to perform a dose reconstruction study that would evaluate past information and provide estimates of radiological doses to populations surrounding the Hanford site. The USDOE has proposed that Battelle Pacific Northwest Laboratory take the lead role in this project. The USDOE, Nevada Operations is nearing completion on a major dose reconstruction effort associated with atmospheric testing of nuclear weapons. Although the USDOE has access to a significant group of experts in the area of Dose Reconstruction because of their work in Nevada, they would like to enhance the credibility of any study they perform by involving regional and state entities and independent scientific review. The USDOE has made presentations to the Hanford Historical Documents Review Committee on the Nevada Dose Reconstruction Project and how a similar study could be done in Washington.

The Hanford Historical Documents Review Committee accepted the primary responsibility for implementation of recommendations of a regional nature. Their role also involves the coordination of activities related to the panel recommendations directed at the states, tribes, and USDOE. The HHDRRC identified its highest priorities for follow-up to the HHEP recommendations which included:

1. Dose Reconstruction
2. Thyroid Effects Study

The Dose Reconstruction Project will probably take three to four years and one to two million dollars per year to complete. To date, the HHDRRC is investigating the development of a protocol for doing this study in order to establish the costs more accurately. Discussions are also on-going with USDOE as to their participation in this effort.

The thyroid studies being investigated would review the incidence of thyroid morbidity conditions in residents living in the Hanford region during 1945 to 1956. If the incidence of morbidity in thyroids

immediately surrounding Hanford are in excess of those in a control population an attempt would be made to relate those conditions to early releases of Iodine-131.

The Nuclear Waste Board's Environmental Monitoring Committee (EMC) was assigned the responsibility to coordinate Washington's response to specific panel recommendations. The top committee priorities identified are:

1. Establishment of an integrated prospective health surveillance system.
2. Coordination/assessment of environmental monitoring programs around the Hanford Reservation.

The EMC, working closely with the Department of Social and Health Services, is investigating the establishment of a state-wide tumor registry. This would involve the expansion of the existing tumor registry maintained by the Fred Hutchinson Cancer Research Center for Western Washington, to include the entire state. There are many purposes for establishing a state-wide tumor registry in addition to the concerns over Hanford operations and the EMC is working with all interested state agencies to develop a legislative package for the expansion of the existing system.

The EMC is also reviewing and upgrading the existing federal and state environmental monitoring programs at and around the Hanford site. This effort involves coordination of monitoring done by USDOE with the state's efforts, review of monitoring done by the other states and tribes, and the development of procedures to assure monitoring quality.

The activities necessary for the review and implementation of all Hanford Health Effects Panel recommendations will involve many regional agencies during years to come. The Washington Nuclear Waste Board and the Hanford Historical Documents Review Committee have requested the U.S. Department of Energy to follow-up on those panel recommendations directed at their operations and to support the on-going work of the states and tribes. To date, the resolution of these issues is far from complete.