



Statement by

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Before the

**Committee on Indian Affairs
United States Senate**

Field Hearing

***America's Nuclear Past: Examining the Effects of Radiation in Indian
Country***

October 7, 2019

Good morning, Chairman Hoeven, Vice-Chairman Udall, and Members of the Senate Committee on Indian Affairs. I am Dr. Loretta Christensen, Chief Medical Officer, Navajo Area Office (NAO), at the Indian Health Service (IHS). Thank you for the opportunity to testify at this field hearing on the topic of “America’s Nuclear Past: Examining the Effects of Radiation in Indian Country.” The IHS mission is to raise the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level. As an agency within the Department of Health and Human Services (HHS), the IHS provides federal health services to approximately 2.6 million American Indians and Alaska Natives from 573 federally recognized tribes in 37 states, through a network of over 605 hospitals, clinics and health stations.

The Navajo Nation has an IHS user population of 241,010 people and the Navajo reservation covers an area of 27,000 square miles extending into the States of Arizona, New Mexico and Utah. The Navajo Area IHS has 5 IHS Direct Care Service Units, 1 Urban Indian Health Center and 2 P.L. 93-638 contracted and 3 compacted tribally-authorized organizations. In addition, the Navajo Area IHS has 3 P.L. 93-638 contracts with the Navajo Nation.

The IHS is aware of the legacy of historical uranium mining on Navajo Nation land and its effects on the Navajo Nation people. Several years ago, the IHS partnered with several agencies and jointly submitted a 5-year multi-agency report of accomplishments to address non-occupational exposures of individuals to uranium. This report was sent to Congress in January 2013. IHS accomplishments that were reported include:

- Increased delivery of clean water to homes during the 5-year period.
- Continuation of a Medical monitoring program using IHS appropriated resources.

- Partnering with the University of New Mexico (UNM) in their implementation of a prospective Navajo Birth Cohort Study (NBCS) funded by Congress through the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR).
- Continued services funded through a Health Resources and Services Administration, Radiation Exposure Screening and Education Program (RECA) grant for individuals with occupation-related exposures to uranium.

All agencies during the first five years focused on collecting data, identifying the most imminent risks and addressing contaminated structures, water supplies, mills, dumps and mines with the highest levels of radiation. The agencies agreed at the conclusion of the first Five-Year plan to develop a second Five-Year Plan based on the information from the initial plan. The following objectives and strategies for the 2014-2018 Five-Year Plan were developed to address the impacts of uranium contamination in the Navajo Nation.

OBJECTIVE 1: Assessment and Cleanup of Contaminated Structures

Background: Uranium mining or milling waste was occasionally used as sand for an aggregate in construction so contaminated stone was incorporated into the walls and floors, including homes. If contaminated structures are occupied, there is a risk to the inhabitants from gamma radiation and alpha radiation (radon), which is a potent carcinogen to the lungs.

Specific Goals:

- a. Navajo Nation Environmental Protection Agency (NNEPA) to scan 100 homes per year.
- b. United States Environment Protection Agency (EPA) to conduct detailed assessments and remediation as necessary based on referrals and potential for health risk.

OBJECTIVE 2: Assessment of Contaminated Water Sources, and Provision of Alternative Water Supplies

Background: Water sources with levels of uranium and other radionuclides were identified by the Centers for Disease Control and Prevention, EPA, NNEPA and the Dine' Network for Environmental Health (DiNEH)

Specific Goals:

- a. Complete water infrastructure projects.
- b. Increase access to safe drinking water and expand to 55 Navajo Nation Chapters.
- c. Continue to implement the water hauling program.

OBJECTIVE 3: Assessment of Abandoned Uranium Mines with Detailed Assessments of Those Most Likely to Pose Environmental or Health Problems

Background: Two-hundred and twenty-six mine claims show gamma radiation levels higher than ten times background levels. The proximity of mines to homes is an important factor in determining risk to residents. Thirty-eight of the mine claims are located within a quarter mile of a potentially inhabited structure.

Specific Goals: EPA, NNEPA and Navajo Nation Abandoned Mine Lands to conduct assessment and urgent cleanup work at the mines most likely to pose a risk to human health or the environment:

- a. Gamma radiation more than ten times background levels located within a quarter mile of a potentially inhabited structure.
- b. Gamma radiation more than two times background levels and located within 200 feet of a potentially inhabited structure.
- c. Potential impact to aquatic resources.
- d. Mines already identified for action.

OBJECTIVE 4: Cleanup of the Northeast Church Rock, New Mexico Mine Site and Additional High Priority Abandoned Mine Sites

Background: The Northeast Church Rock mine site was identified as the highest priority abandoned uranium mine for cleanup

Specific Goals:

- a. To complete the design of the cleanup with input from Navajo Nation, community and other agencies to begin construction cleanup activities.
- b. Identified parties to conduct work.
- c. EPA to conduct/oversee assessments at additional high priority mines.

OBJECTIVE 5: Cleanup of the Tuba City, Arizona Dump Site

Background: The Tuba City Dump was used for over 50 years as an open, uncontrolled dump. Work is ongoing to identify a long-term cleanup strategy.

Specific Goals:

- a. After a remedy is selected, the BIA will begin the Remedial Design/Remedial Action process.

OBJECTIVE 6: Protection of Human Health and the Environment at Former Uranium Processing Sites

Background: The Department of Energy (DOE) responsibility for former mill sites includes ground water remediation and long-term surveillance and maintenance. The Nuclear Regulatory Commission (NRC) has oversight responsibility at the former mill sites on the Navajo Nation that have been transferred to DOE under an NRC general license.

Specific Goals:

- a. DOE to revise groundwater compliance strategies for Shiprock and Tuba City disposal sites.
- b. NRC will continue to review and comment on reports developed by DOE regarding the sites, conduct inspections of the sites in conjunction with DOE, and review and concur on DOE revisions to the long-term surveillance plan or groundwater compliance action plans before they are implemented.
- c. DOE will work with NNEPA on a schedule to accept mill-site-related materials from any further cleanup.

OBJECTIVE 7: Health Studies

Background:

- a. UNM performed a study funded by the National Institutes of Health, on the relationship between uranium in drinking water, kidney disease, and diabetes. Data from the study informed policy changes regarding uranium mining and remediation. The Navajo Area IHS participated in the study.
- b. Navajo Area IHS implemented a Community Uranium Exposure Journey to Healing program consisting of medical screening of individual health histories and health status, and the provision of community based education and information gathering services across the Navajo reservation.
- c. Navajo Area IHS Radiation Exposure Screening and Education Program (RESEP) services were funded by a HHS, Health Resources and Service Administration (HRSA) grant targeting potentially compensation eligible individuals as a result of the RECA.
- d. Navajo Area IHS staff collaborated with the Navajo Nation Department of Health Epidemiology Program on a Navajo Nation cancer report and designation by the Epidemiology Program of a lead epidemiologist to work on uranium related issues.

- e. CDC and ATSDR collaborated with the Navajo Area IHS to conduct health care provider training on the impact of uranium and other heavy metals on the health of individuals.
- f. CDC and ATSDR funding was provided to the UNM, the Navajo Nation Division of Health, and the Navajo Area IHS to implement a NBCS of the health effects of non-occupational exposure on pregnancy outcomes and infant health.

Specific Goals:

- a. Provision of Community Based Services.
 - Listen to community concerns and provide location specific health education to community residents.
 - Provide medical screening evaluations to non-occupationally exposed individuals.
 - CDC and ATSDR will provide community education materials (such as environmental health "frequently asked questions"), handouts, and resources.
 - IHS will transfer health information from medical screening evaluations to each individual's medical home health record.
 - Provision of RESEP services. IHS will provide services as identified in the HRSA grant's Scope of Work to individuals with potentially compensable health conditions.
- b. Collaboration with the Navajo Nation Division of Health Epidemiology Program. IHS and ATSDR will work with the Navajo Nation's Division of Health Epidemiology Program supporting its efforts to:
 - Evaluate various cancer case rates by geographic location of cancer patient's residence and known radiation exposure sources.
 - Evaluate the health status of descendants of uranium miners/mill workers.
 - Evaluate the potential for a longitudinal human health impact study (as requested by the Navajo Nation to include physical, psychological and social parameters).
- c. ATSDR funded NBCS.
 - Continue and complete work on the NBCS in cooperation with the UNM, the Navajo Nation Community Health Representative Program, and Navajo Area IHS.
 - Consider the viability of expanding the laboratory component of the study.
 - Conduct outreach education about study results to participants and Navajo Nation leaders and others at community gatherings.
 - Develop a sustainability plan to evaluate the potential for follow up and/or surveillance of children from the birth cohort study beyond the research study period (with guidance and input from the Navajo Nation).
- d. Health Care Staff Training. Provide continuing education sessions to Navajo Nation hospital/clinic healthcare and community based staff.

Potential Limitations and Challenges:

Achievement of planned goals is dependent on availability of funding for the following objectives: 1) RESEP services, 2) work with the Navajo Nation's Epidemiology Center to conduct two studies and one evaluation, and 3) work on the NBCS.

Navajo Birth Cohort Study

The NBCS, funded by ATSDR, was concluded in August 2018 with the final developmental assessments completed. The study will continue in collaboration with the Environmental influences on Child Health Outcomes (ECHO) with the NIH providing longitudinal surveillance of the birth cohort and addition of new pregnancies. The data from the initial phase of the study is currently being analyzed. The first phase of the NBCS enrolled 781 women, and the early part of the ECHO phase has re-enrolled 292 of the original cohort with the addition of 163 new pregnant women. Early findings from the NBCS potentially related to radiation exposure include:

- a. 36% of males and 26% of women in Navajo Nation have concentrations of uranium in the urine that exceed those found in the highest 5% of the U.S. population.
- b. Some babies are born with concentrations of uranium at those extremes and exposures continue in the first year of life.
- c. Exposures to multiple metals in the higher exposure clusters increase the likelihood of preterm birth. This does not include loss of pregnancy in the early stages.
- d. Neurodevelopment screening in the first year of life has shown that Navajo children's performance on the Ages and Stages Questionnaire (ASQ), development screen suggests a slower trajectory in many domains especially at 10 months of age. There will be examination concerning the use of the screening to predict performance in later childhood.

- e. Higher than expected rates of autoantibody production in parents in the NBCS. These rates have been associated with exposures, and are consistent with increased autoantibody production in studies involving an older population previously.
- f. Through the initial phase of NBCS/ECHO, we show that through age 5, uranium continues to be elevated and increases in some cases, and that arsenic shows a strong increase until age 5. The numbers of samples analyzed for metals in children from ages 2-5 years are very small at this point.
- g. The study is currently looking at the presence of anti-fetal-brain antibody production in moms. These are autoantibodies that can cross the placental barrier and bind to developing fetal brain tissue and have been associated with neurodevelopmental delays as well as autism. We see a higher-than-expected prevalence of these autoantibodies, as well as significant differences in exposures to metals including uranium and arsenic between those who are positive for these antibodies and those who do not have them.
- h. Neurodevelopmental batteries administered to 3-5 year olds in the NBCS/ECHO Phase I have shown delays in language development, primarily in boys. In addition, significantly higher rates of autism spectrum disorder appear in those assessed to date. The delays observed have really pushed us to use the ECHO funding to extend follow-up through 8 years (up to 9 years of age) in all children who will reach middle childhood during the 4+ additional active years of the study to determine if the observed delays persist, are increased, or recover with time. With no existing data on developmental trajectories, it is difficult to assess the importance of these indicators.

The longer follow-up will enable a more-informed interpretation of these results to benefit the intervention recommendations for these children.

- i. Moving forward the assessment of children's focus of attention through tracking of eye-movements, which has been shown to predict performance on some of the more detailed developmental assessments will be utilized. This language-free assessment that can be rapidly administered may provide a good way to do interim assessments that can be used to both validate the use of the standard tools, and to fill in gaps in the developmental trajectory to allow for finer grained assessments.

The IHS remains firmly committed to improving quality, safety, and access to health care for American Indians and Alaska Natives, in collaboration with our federal partners, especially in HHS, across Indian country, and Congress. Thank you, and I am happy to answer any questions you may have.