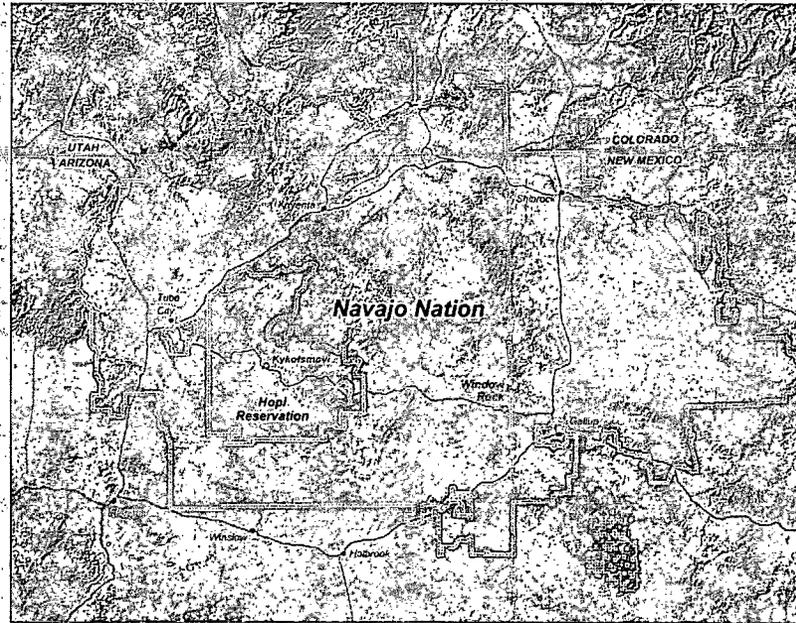


Five-Year Plan to Address Uranium Contamination on Navajo Nation

February 2009 Report



Background

- ◆ Mine operators extracted nearly 4 million tons of uranium ore from 1944 to 1986 under lease agreements with Navajo Nation.
- ◆ There are over 500 abandoned uranium mines (AUMs) across Navajo Nation along with homes and wells with elevated levels of radiation.
- ◆ Four private uranium mill sites operated within Navajo Nation and were closed by DOE under the Uranium Mill Tailing Radiation Control Act (UMTRCA).
- ◆ Unlike uranium mills, there is no specific legislation to address abandoned uranium mines. Superfund covers the “worst” sites in the country, some of which are mines.

Five-Year Agency Action Plans

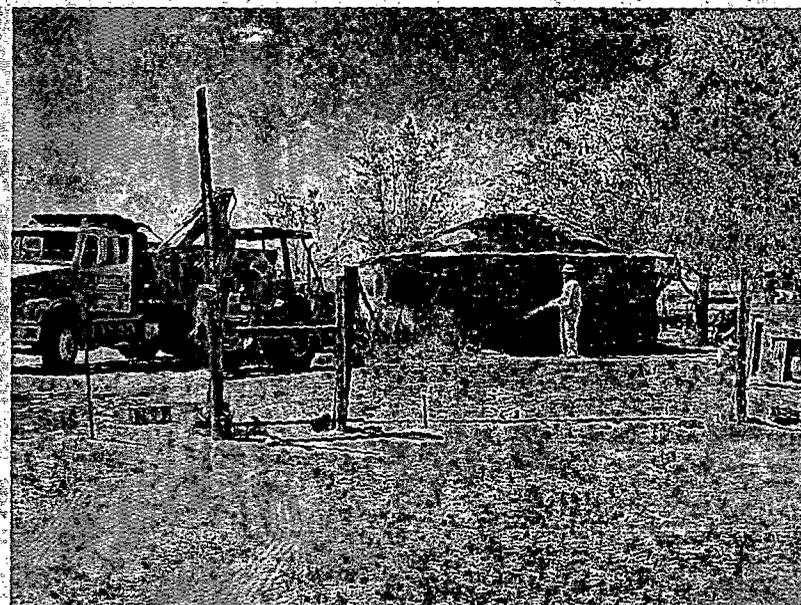
- ◆ Structures – EPA
- ◆ Water Sources – EPA
- ◆ Abandoned Mines – EPA
- ◆ Northeast Church Rock Mine Site – EPA
- ◆ Inactive Milling Sites – DOE
- ◆ Highway 160 Site – DOE
- ◆ Tuba City Dump – BIA
- ◆ Health Assessment – IHS
- ◆ Summary of Activities - NRC

EPA - Structures Background

- ◆ 1975 - EPA surveyed 37 structures around Monument Valley mill site. DOE demolished 4 of the structures.
- ◆ 1990s - EPA contacted local officials in over half of impacted chapters and offered free radiation surveys. EPA surveyed 28 structures. EPA removed 2 of the structures (the remaining 26 structures did not have elevated levels of radiation).
- ◆ 2001-2006 - EPA funded NNEPA's desktop study of suspected radioactive homes, resulting in a list of 33 structures that may have elevated radiation levels.
- ◆ 2007 - EPA mapped structures near each mine site to help NNEPA set priorities.

Structures – Action Plan

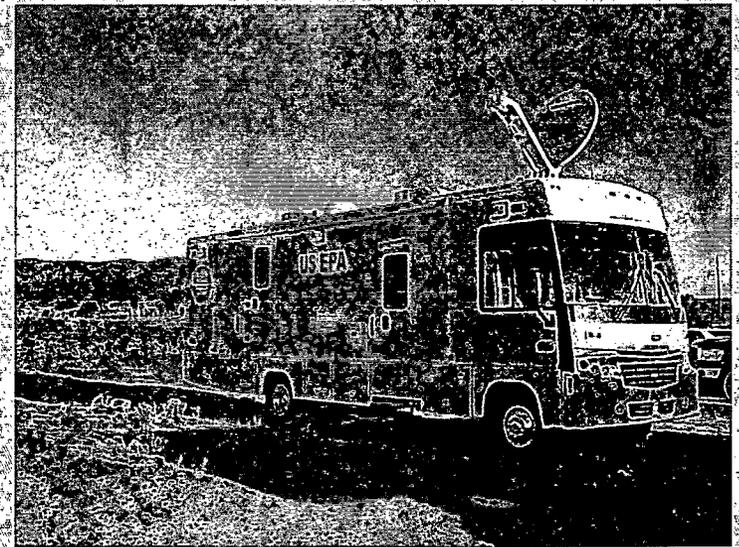
- ◆ Assess structures from previous lists in early 2008.
- ◆ EPA, in coordination with NNEPA, plans to assess about 500 structures over five years.
- ◆ EPA will use Superfund authority for appropriate response actions.



Contaminated Hogan Removal

Structures - Status

- ◆ In April 2008, EPA completed assessments of 113 structures on 56 homesites
- ◆ EPA and NNEPA agreed that 27 structures and 12 residential yards would be remediated. Several of the structures were occupied but none with acute exposures.
- ◆ Owners were informed of results.
- ◆ As of November 2008, all structures in Cove, Red Valley, Teec Nos Pos Chapters and Cane Valley area were demolished. Nine yards have been remediated.
- ◆ Structures and yards will be remediated and replaced by November 2009.



EPA Mobile Command Post

Structures Field Work

- ◆ Requires tremendous coordination, community involvement, and outreach.
 - ❖ Remote locations
 - ❖ Access agreements
 - ❖ Historical preservation clearance
 - ❖ Transitional housing during demolition and rebuilding

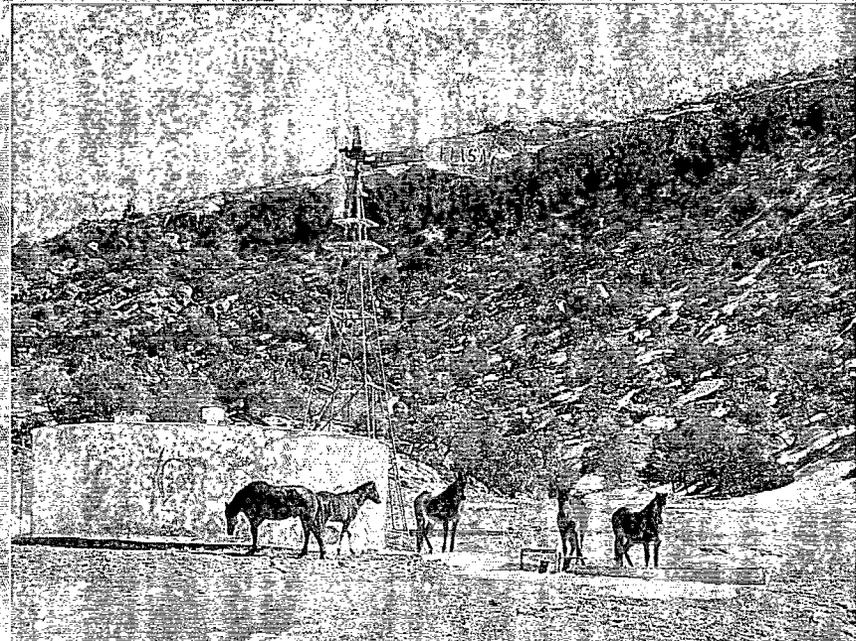


EPA - Water Sources Background

- ◆ 70% of Navajo families get drinking water from regulated public water systems, all of which are in compliance for radiation.
- ◆ 30% of Navajo families (~54,000 people) lack access to safe, piped water, the highest percentage of any U.S. tribe, and get drinking water from thousands of unregulated water sources.
- ◆ From 1998 to 2000, EPA sampled 226 unregulated water sources. 38 sources exceeded EPA's drinking water standard for radionuclides.

Water Sources - Action Plan

- ◆ Test unregulated water sources that may contain elevated radionuclides.
- ◆ Fund a NNEPA “circuit rider” to provide on-site assistance to water users.
- ◆ EPA and NNEPA conduct outreach with partner organizations.
- ◆ EPA and IHS work with other agencies to find alternative water sources where possible.



Rural Water Source

Water Sources - Status

- ◆ EPA tested 50 and CDC tested 199 unregulated water sources.
- ◆ We found 22 sources that exceed standards for radionuclides. Most are located within 10 miles of a safe alternative supply.
- ◆ EPA, NNEPA, and partner organizations issued a health advisory and are conducting extensive outreach to residents.



Water Sampling

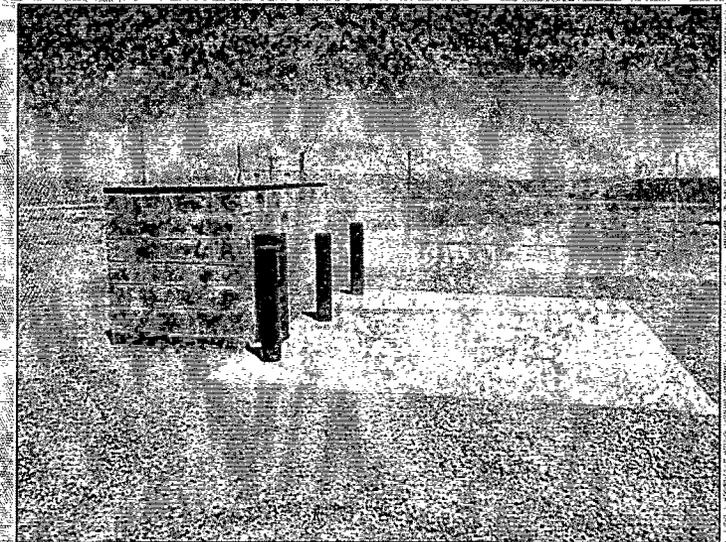
New Water Supplies for Priority Areas

◆ Dennehotso area:

- ❖ EPA allocated \$2 million and will work with the local community, IHS, and the Navajo Nation Community Development Block Grant program to plan and construct a water system to serve 500 residents located near uranium-contaminated wells.

◆ Black Falls area:

- ❖ Using EPA and IHS funding, IHS constructed sewer facilities and a drinking water system with a regulated water hauling point to serve residents near 4 uranium contaminated wells.
- ❖ EPA is temporarily delivering bottled water to two households who rely solely on contaminated wells for potable water.



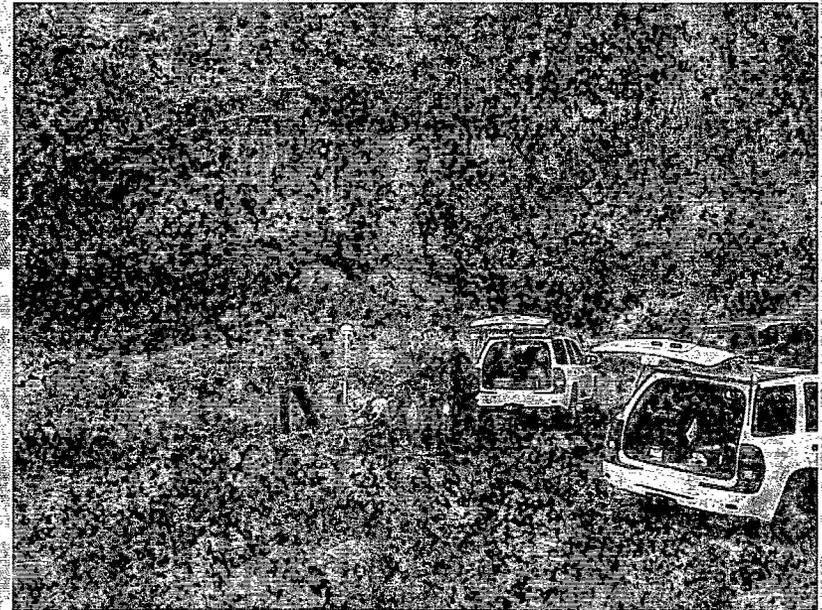
New Black Falls Water Hauling Point

EPA - Abandoned Uranium Mines Background

- ◆ 1988–2008 - EPA awarded NNEPA \$9.5 million in grants for site assessment/program development work.
- ◆ 1991 - EPA conducted removal actions at cluster of 6 mines in Bluewater, NM, involving DOE, BIA and Santa Fe Railroad.
- ◆ 1994–2001 – EPA Superfund Program conducted \$12 million Navajo-wide investigation and outreach effort.
 - ❖ Flew aerial surveys over 1,440 square miles to identify impacted areas.
 - ❖ Sampled 226 unregulated water sources.
 - ❖ Developed atlas with all results and distributed it to 30 impacted communities.
 - ❖ GIS database and Summary Report identified 520 potential AUMs.

Abandoned Uranium Mines - Action Plan

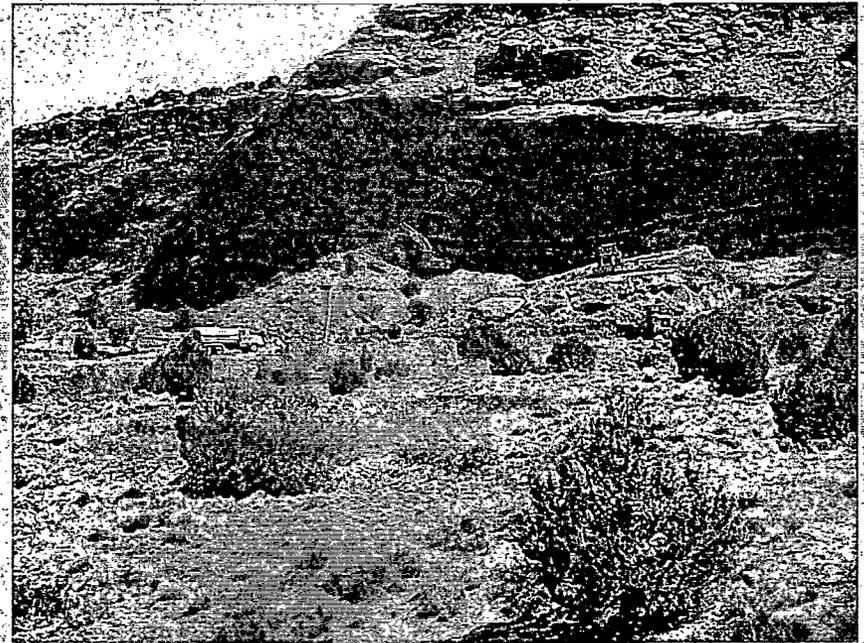
- ◆ EPA working with NNEPA to conduct tiered assessments of all 520 abandoned uranium mines (AUMs).
 - EPA or NNEPA plan to conduct on-site screening evaluations of mines over five years.
 - EPA plans to conduct more detailed assessments as needed.
 - EPA will work with NNEPA to determine appropriate courses of action for highest priority mines.
- ◆ EPA sent information request letters to nine viable companies who owned or operated multiple mines, and will evaluate enforcement options for cleanup actions.



Skyline Mine Assessment

Abandoned Uranium Mines - Status

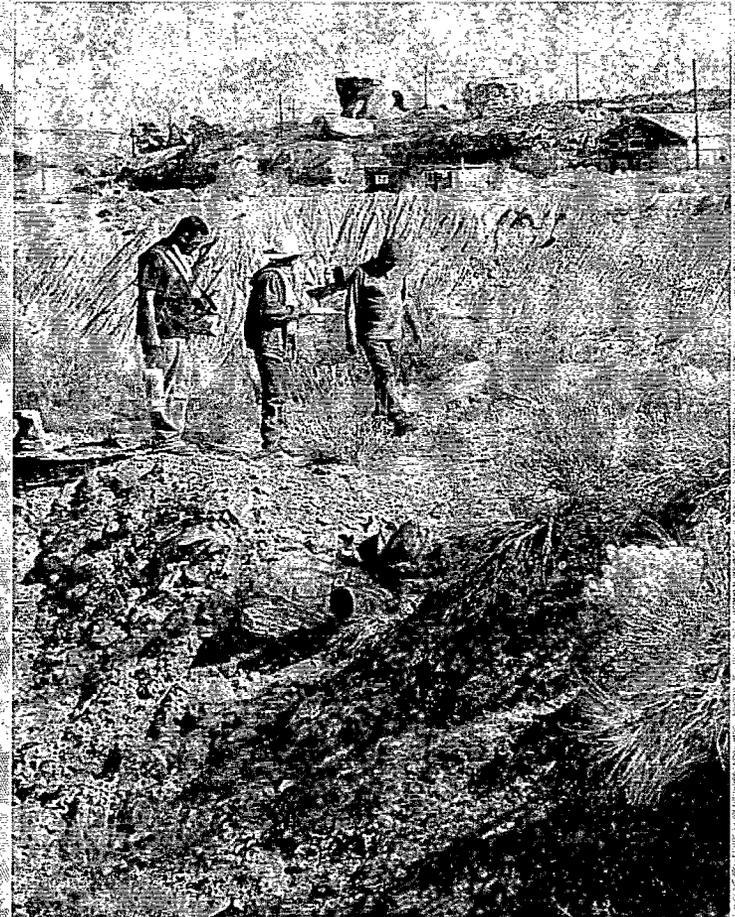
- ◆ EPA, NNEPA, and Navajo AML prioritized the 520 mines by geographic area.
- ◆ EPA conducted a removal assessment at Skyline Mine.
- ◆ EPA completed detailed assessments at 5 mines.
- ◆ EPA conducted on-site screening evaluations of 83 mines in Eastern Agency. Based on these evaluations, additional detailed assessments will be conducted.
- ◆ EPA will begin on-site screening evaluations in Northern Agency in April 2009.
- ◆ EPA plans to complete 160 on-site screening evaluations in 2009, for an overall total of 243 screened sites.



Reclaimed Rattlesnake Mine

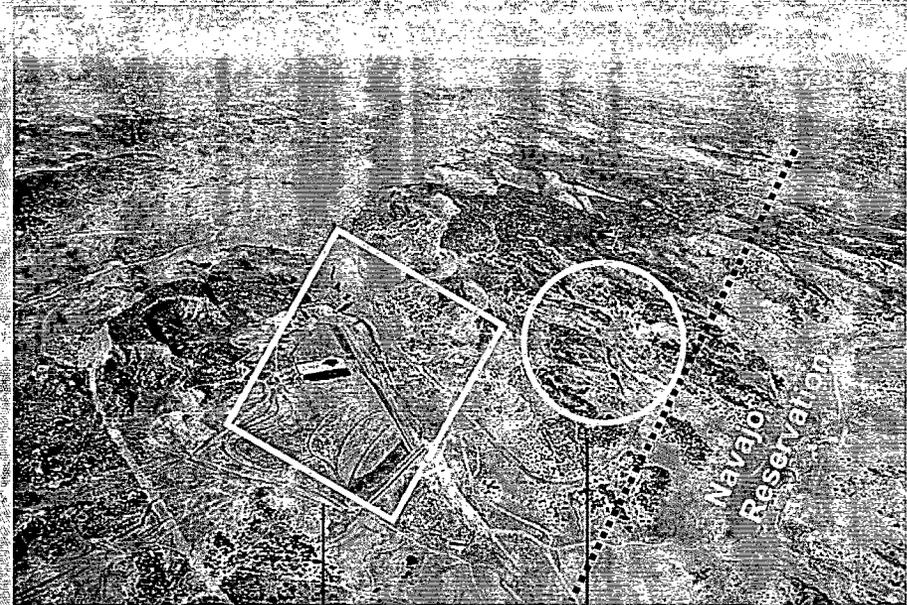
EPA-Northeast Church Rock Mine Background

- ◆ Highest priority site on AUM inventory.
- ◆ Largest former underground uranium mine in the country with about 157 acres of impacted surface soils and sediments.
- ◆ EPA ordered United Nuclear Corporation (UNC) to investigate the mine site in 2006.
- ◆ EPA ordered UNC to clean up one structure and four yards in Summer 2007.
- ◆ In Spring 2008, Navajo Nation requested EPA to delay the mine site-wide cleanup plan to provide time for settlement negotiations with UNC.



Northeast Church Rock Mine Site

- ◆ Release Engineering Evaluation/Cost Analysis (EE/CA) Report with our preferred cleanup alternative for 30-day public comment period in April 2009.
- ◆ Final cleanup plan released by July 2009.
- ◆ Negotiate cleanup enforcement order with UNC.
- ◆ Discuss interim cleanup actions with UNC and Navajo Nation.



Mill Site
(R6/NRC NPL Site)

NECR Mine Site

CDC Investigation: Public Health Risks from Water Hauling

- ◆ Public health problem: Water hauling is widespread on Navajo Nation
 - ❖ 30% of households are not connected to a public water system
 - ❖ Drinking water hauled from unregulated sources may contain natural arsenic, uranium and other contaminants
- ◆ Initial Response: CDC tested 199 unregulated water sources used for drinking water
 - ❖ CDC identified drinking water sources containing bacteria, arsenic, uranium and other contaminants and shared data with EPA
 - ❖ CDC identified high risk regions where drinking water contaminants are concentrated

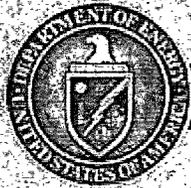
CDC Investigation: Public Health Risks from Water Hauling

- ◆ Current Response: CDC is assessing human exposure to drinking water contaminants in the high risk regions previously identified
 - ❖ CDC collected data from 300 households in the high risk regions
 - Conducted interviews on water hauling practices and relevant health information
 - Tested drinking water stored in the home
 - Tested urine for exposure to arsenic, uranium and other chemicals
 - ❖ Data collection is complete. Data are currently being analyzed. Results will be reported by Spring 2009



**DOE Update on Activities
to Address Uranium
Contamination on the
Navajo Nation**

February 2009

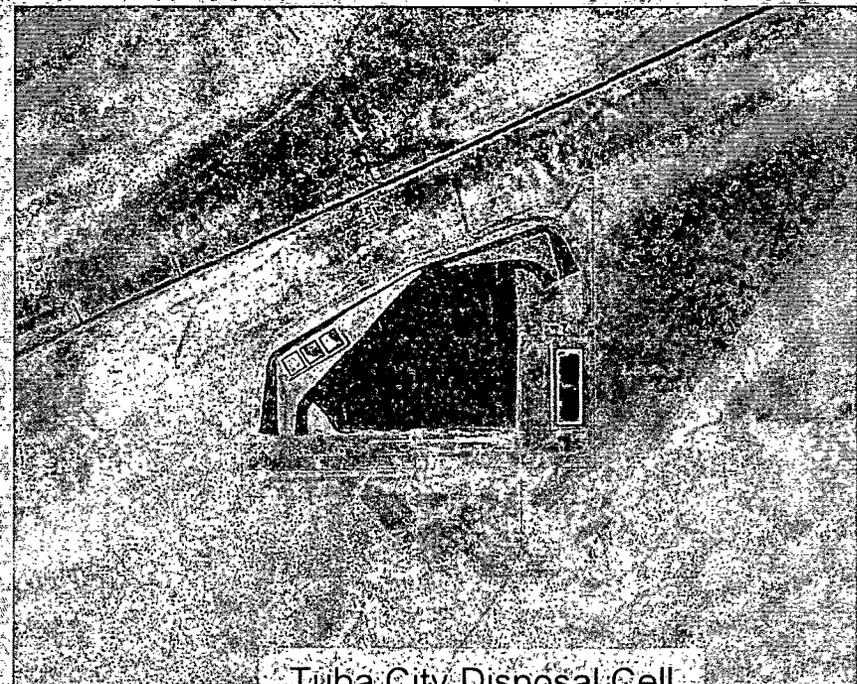


Background – DOE Sites on Navajo Nation

- ◆ DOE remediated four former uranium mill sites located in the Navajo Nation (Tuba City, Arizona; Mexican Hat, Utah; Shiprock, New Mexico; and Monument Valley, Arizona) as authorized under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978.
- ◆ Each of these sites had abandoned mills with associated uranium mill tailings and holding ponds.
- ◆ These former uranium mill sites and associated vicinity properties were remediated to Nuclear Regulatory Commission (NRC) surface cleanup standards promulgated by the EPA (10 CFR Part 192).
- ◆ The mill buildings, tailings, ponds, and other contaminated materials were placed in disposal cells constructed at three of the sites: Tuba City, Shiprock, and, Mexican Hat.

Background – NRC and the Navajo Nation have concurred on designs of DOE-built disposal cells. The disposal cells are meeting performance objectives.

- ◆ DOE placed mill tailings in disposal cells designed to last for 200 to 1,000 years. NRC and the Navajo Nation concurred on the designs.
- ◆ Designs are similar to those of other disposal cells built by DOE. UMTRCA Title I disposal cells do not require a liner to meet performance objectives. Disposal cells are on stable geologic formations and are not threatened by river migration or flooding.
- ◆ The surface cleanup program and authorization ended in 1998.
- ◆ Existing groundwater plumes are primarily the result of previous mill operations.
- ◆ Groundwater contamination is being addressed.



Tuba City Disposal Cell

Background – Long-term surveillance and maintenance of DOE sites within the Navajo Nation ensures protection of human health and the environment.

- ◆ DOE continues to perform surveillance and maintenance activities, including groundwater remediation, at the former mill sites in the Navajo Nation to ensure sites are protective of human health and the environment.
- ◆ After discussion with DOE, the Navajo Nation Department of Natural Resources concurs with activities at the former mill sites.
- ◆ Maintenance activities include active groundwater treatment at Shiprock and Tuba City, a pilot treatment study at Monument Valley, maintenance of three disposal cells (Shiprock, Tuba City and Mexican Hat), and annual inspections at all sites.
- ◆ Average cost at the four sites is \$5 million/year. Average cost of performing surveillance and maintenance at other UMTRCA Title I sites is \$120,000 each/year. The primary difference is the active treatment of groundwater within the Navajo Nation.
- ◆ DOE continues to plan activities and operate in accordance with the Cooperative Agreement with the Navajo Nation.

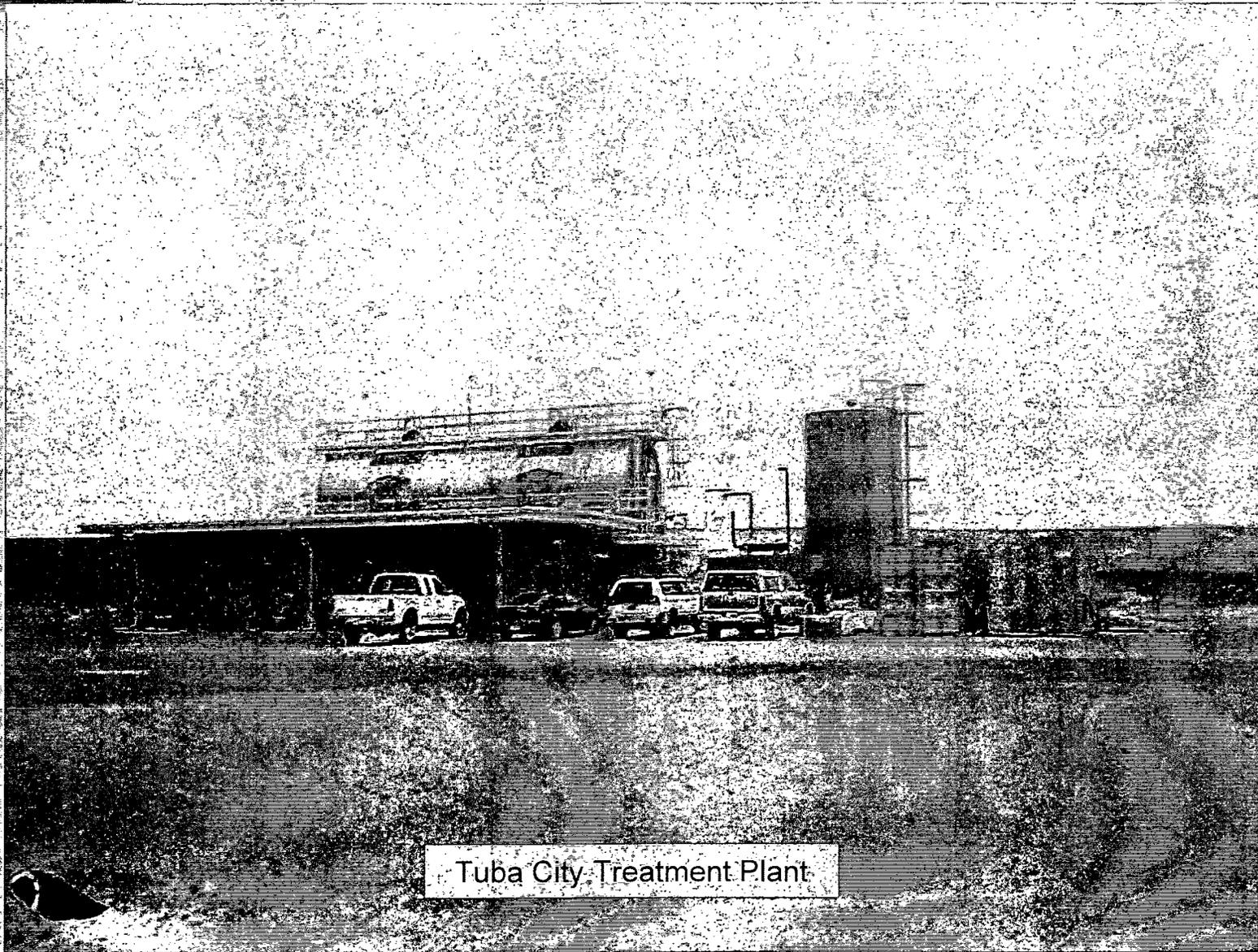
Background – DOE operates state-of-the-art treatment systems at two former uranium-ore processing sites (Tuba City and Shiprock)

◆ Tuba City

- ❖ DOE has been pumping and treating groundwater at the former Tuba City uranium-ore processing site for seven years.
- ❖ The treatment plant has extracted 581 pounds of uranium, 991,000 pounds of nitrate, and 2.5 million pounds of sulfate salts.
- ❖ DOE has no evidence that connects groundwater contamination from the disposal cell (former mill site) to groundwater contamination near the Tuba City municipal landfill. DOE has provided funds to the Navajo Nation to install up to nine wells between the mill site and the landfill to complete investigations into possible connections between the sites.

◆ Shiprock

- ❖ An extraction system installed on the terrace has been successful in reducing groundwater elevations.
- ❖ Extraction wells and trenches installed in the floodplain have been successful in reducing contaminant concentrations by up to 90 percent.



Tuba City Treatment Plant

Five-Year Plan Commitments

- ◆ DOE-Legacy Management (LM) participated in the development of an integrated five-year plan in response to the House Committee on Oversight and Government Reform on the impacts of uranium contamination on the Navajo Nation.
- ◆ LM addressed two issues among the specific objectives in the five-year plan:
 1. Long-term surveillance and maintenance (LTS&M) and treatment of groundwater contamination at the former mill sites; and,
 2. Characterization and possible remediation of the Highway 160 site or Rare Metals site which is across Highway 160 from the former mill site outside Tuba City, Arizona.

Current Status – DOE is implementing the actions outlined in the Navajo Nation Five-Year Plan.

- ◆ DOE continues to monitor and maintain the disposal cells and operate groundwater treatment systems.
- ◆ DOE continues to fund the Navajo Nation (funds have been directed to the Department of Natural Resources per existing cooperative agreement terms) to support implementation of surveillance and maintenance activities under our Cooperative Agreement.
- ◆ DOE continues to supply technical expertise to the Indian Health Service and Bureau of Indian Affairs as requested.
- ◆ DOE continues to consult with the Navajo Nation on status and issues surrounding the UMTRCA Title II, NRC-licensed, Church Rock mill tailings and mine sites.
- ◆ The Navajo Nation has notified the federal government that they intend to file suit pursuant to Resource Conservation and Recovery Act (RCRA).

Current Status – The contaminated portion of the Highway 160 Site has been fenced and El Paso Natural Gas Co. has applied a soil fixative.

- ◆ DOE does not have authority to perform surface characterization or remediation of the Highway 160 site as our authority under UMTRCA for these activities expired in 1998. DOE has provided support for the preparation of a cost estimate for the remaining cleanup work based on the EPNG characterization report (surface radiation and magnetometer readings).
- ◆ Additional characterization would be needed to determine depth and extent of contamination and whether it is mill-site-related i.e., is classified as residual radioactive material).
- ◆ If material is residual radioactive material, it may be disposed of at the Grand Junction, Colorado, Disposal site upon agreement with Mesa County, which has priority for that use. If the material is not mill-site-related, it will need to go to a private disposal facility.
- ◆ The Navajo Nation has entered into an agreement with El Paso Natural Gas Co. on the management of the Highway 160 site.
- ◆ El Paso Natural Gas Co. has sued the federal government with respect to cleanup actions at the Highway 160 site.

Current Status – Technical coordination with the Navajo Nation

- ◆ DOE has coordinated with the Navajo Nation Department of Natural Resources through several avenues:
 - ❖ Has held regular quarterly meetings since 1998 with Navajo UMTRCA staff to discuss groundwater remedies.
 - ❖ Has provided data validation packages, annual performance reports, and annual inspection reports.
 - ❖ Has maintained continuous involvement of Navajo UMTRCA staff through the Cooperative Agreement in site management and surveillance and maintenance.
 - ❖ Has sponsored periodic field trips to UMTRCA sites and has arranged for class visits at Diné College campuses.

Current Status – Technical coordination with the Navajo Nation (continued)

- ❖ DOE has expanded technical coordination with the Navajo Nation to include Navajo EPA and Navajo Justice Department:
 - ❖ December 2007—Tuba City (Tuba City site)
 - ❖ February 2008—Tuba City (Tuba City site)
 - ❖ April 2008—Window Rock and Shiprock (UMTRCA sites)
 - ❖ August 11 and 12, 2008—Focus on further work at the Tuba City site
 - ❖ August 13, 2008—Navajo Uranium Contamination Stakeholder Workshop (Gallup, New Mexico)
 - ❖ September 11, 2008—Shiprock (Shiprock site)
 - ❖ January 21, 2009—Window Rock (UMTRA sites)

TUBA CITY DUMP SITE

Bureau of Indian Affairs Update
on 5-Year Plan
February 20, 2009

TUBA CITY DUMP SITE

Background

- Unmanned, unsecured Dump for 50 + years
- BIA funded ~ \$2 million in site investigations
- Groundwater contamination from Dump and other unknown sources

Objectives:

- Ensure safe drinking water
- Close site in compliance with CERCLA and RCRA
- Perform site activities consistent with CERCLA process

TUBA CITY DUMP SITE

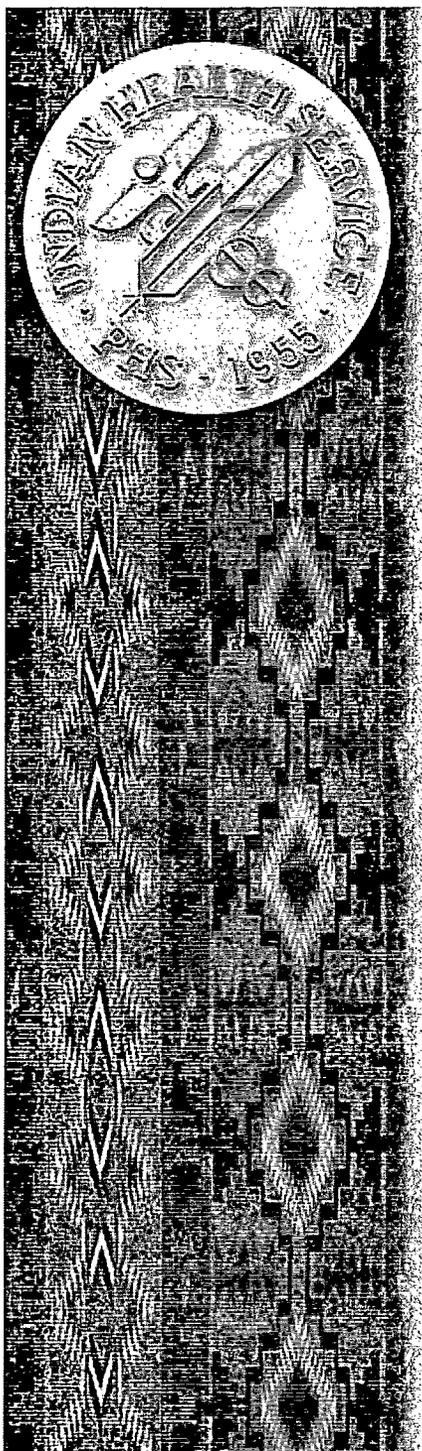
BIA Interim Action Options

- Assess and remove contaminants in vicinity of Monitoring Well #7
- Re-case or replace Moenkopi supply wells to protect water
- Quarterly groundwater monitoring to evaluate contaminant trends
- Fence Old Cell
- Assess waste removal from adjacent residential properties

TUBA CITY DUMP SITE

Status

- Interim Action Report Submitted to Tribes 2/09
- RI/FS Work Plan in development
- IAA with EPA for \$1.2 million to assess MW-7 contaminant source and remove investigative waste
- Continue regular meetings and conference calls with agencies and stakeholders

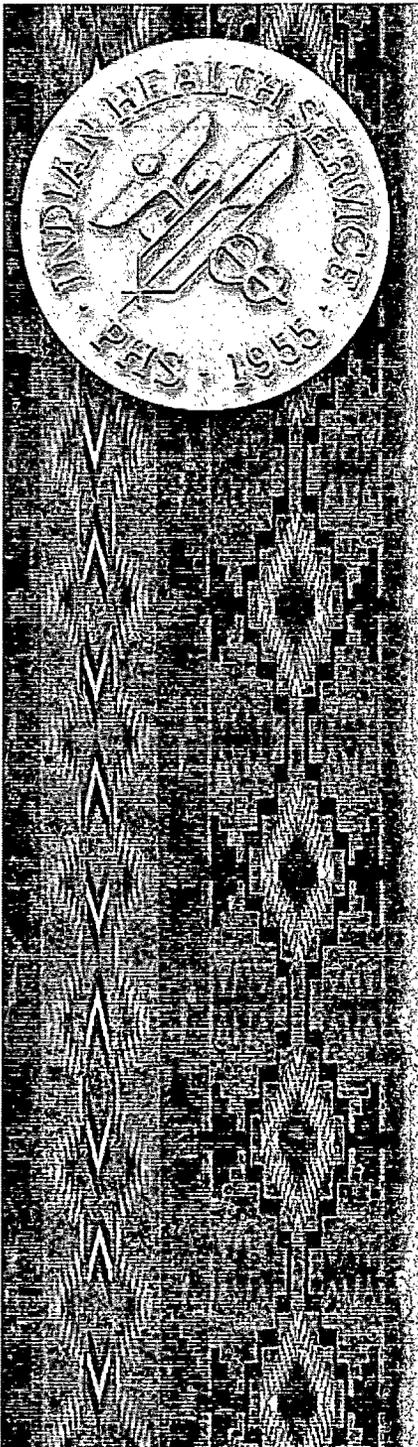


INDIAN HEALTH SERVICE

February 2009

BACKGROUND

- The Navajo Nation (NN), Hopi Tribe, and IHS provide health care to Native American people.
- The Navajo Nation (NN), Hopi Tribe and IHS continue to monitor health risks to individuals as a result of exposures to uranium.
- HHS/IHS has invested an estimated \$3.8 million to provide health screening exams in the last 10 years for patients who were exposed as miners, millers or downwinders to uranium and radiation.



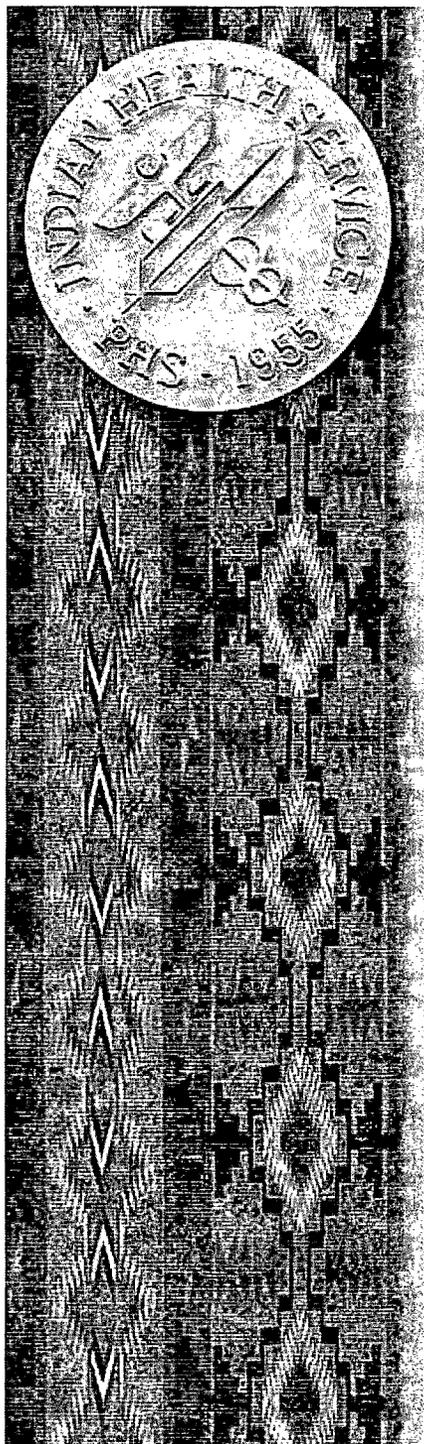
February 2009

FIVE YEAR

Action Plan

Progress Report

February 2009

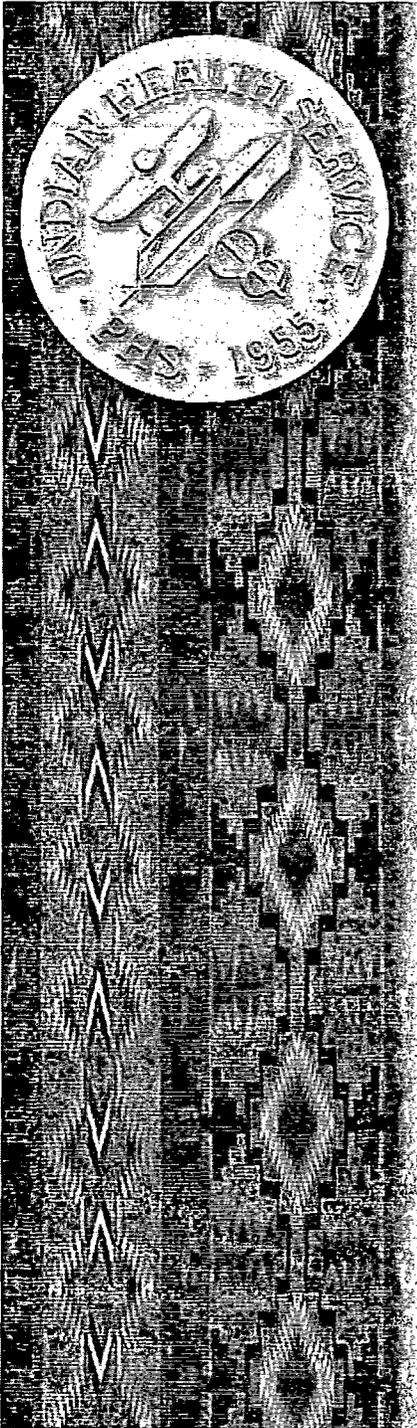


February 2009

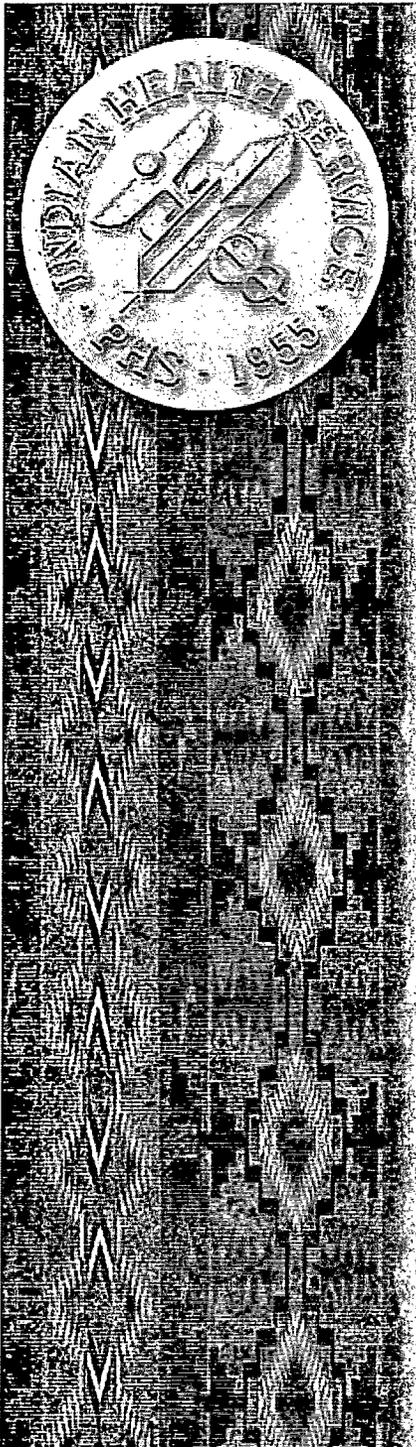
- **OBJECTIVE 1.**

Diagnose and treat known health conditions in eligible Indian beneficiaries...

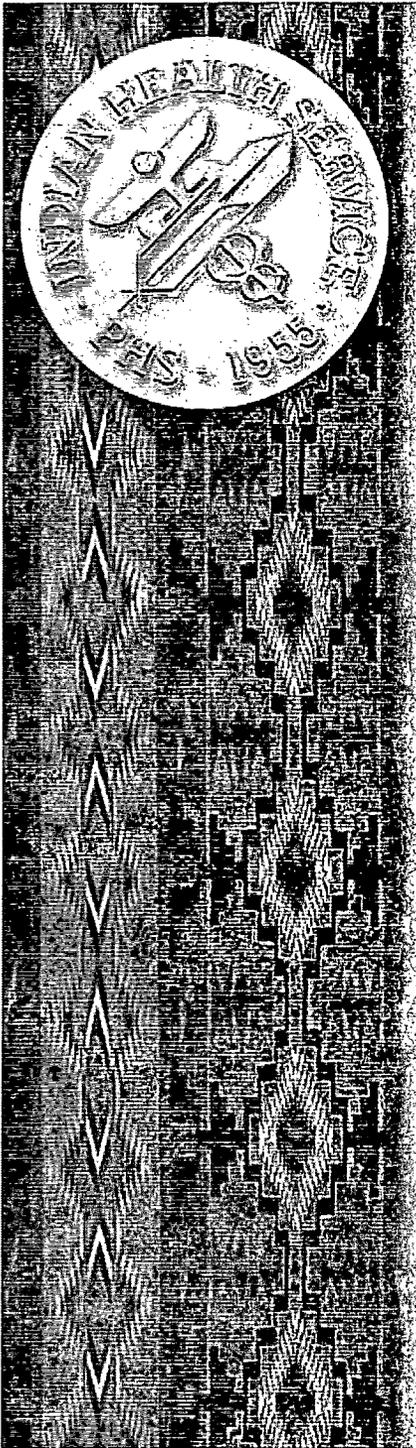
1. Completed uranium screening protocol—
Distributed for use at all hospitals and clinic sites, December, 2008.
2. CDC/ATSDR Grand Rounds on the known health effects of uranium presented December 15-19, 2008 at 4 NAIHS facilities.



February 2009



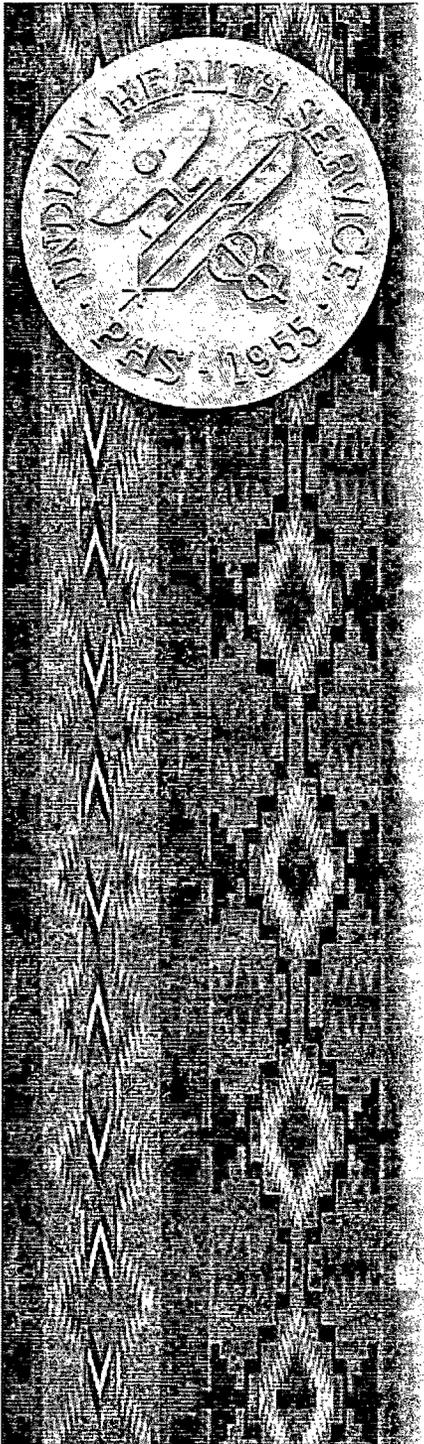
- **OBJECTIVE 2. -Completed**
Support Navajo Area IHS
Radiation Exposure Screening
and Education Program...
- 1. HRSA grant awarded to IHS in Shiprock,
New Mexico for 2009.



- **OBJECTIVE 3.**

In-kind IHS support to Navajo Uranium Assessment and Kidney Health Project, a NIH funded research project awarded to UNM specifically for Eastern Navajo Agency residents...

1. Ongoing.



February 2009

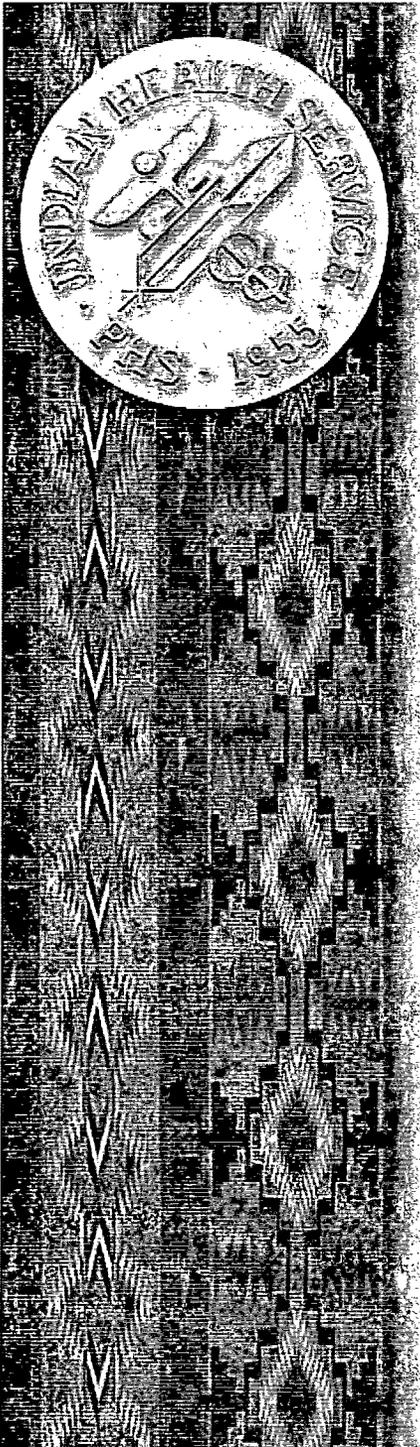
- **OBJECTIVE 4.** - Combined with Objective 5.

February 2009

- **OBJECTIVE 5.**

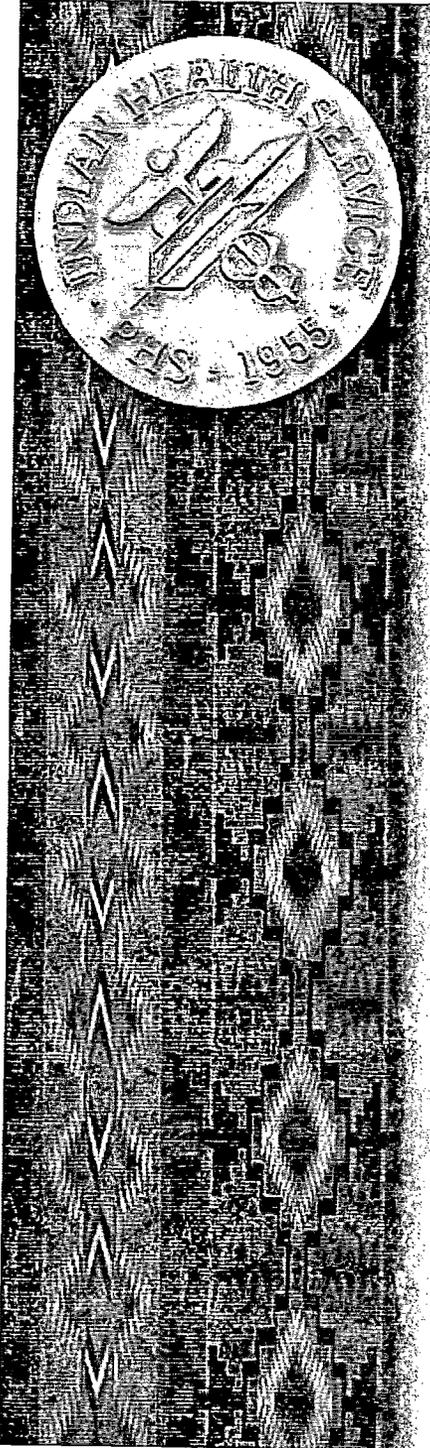
Interagency scientific meetings and discussions consistent with 5 Year Plan....

1. Ongoing discussions increased in frequency involving the Navajo Nation Epi Center, UNM, U of A, NAU, CDC, EPA, ATSDR, NIOSH, BIA, NRC, DOE to assist IHS in the completion of five year plan objectives.
2. IHS funds identified in January 2009 to transfer to BIA for Tuba City landfill fencing.



February 2009

- **OBJECTIVE 6. –
Combined with
Objective 8.**

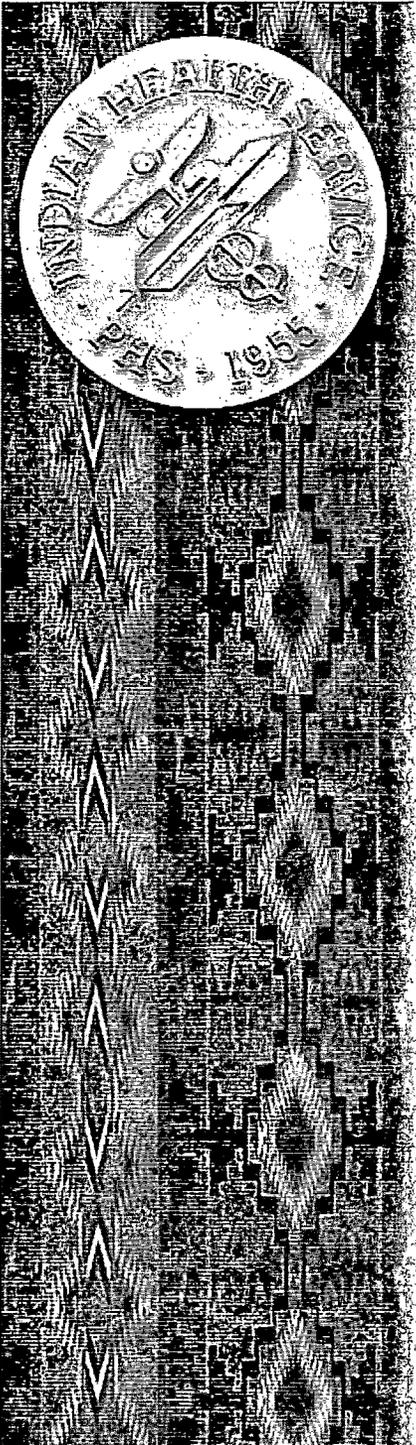


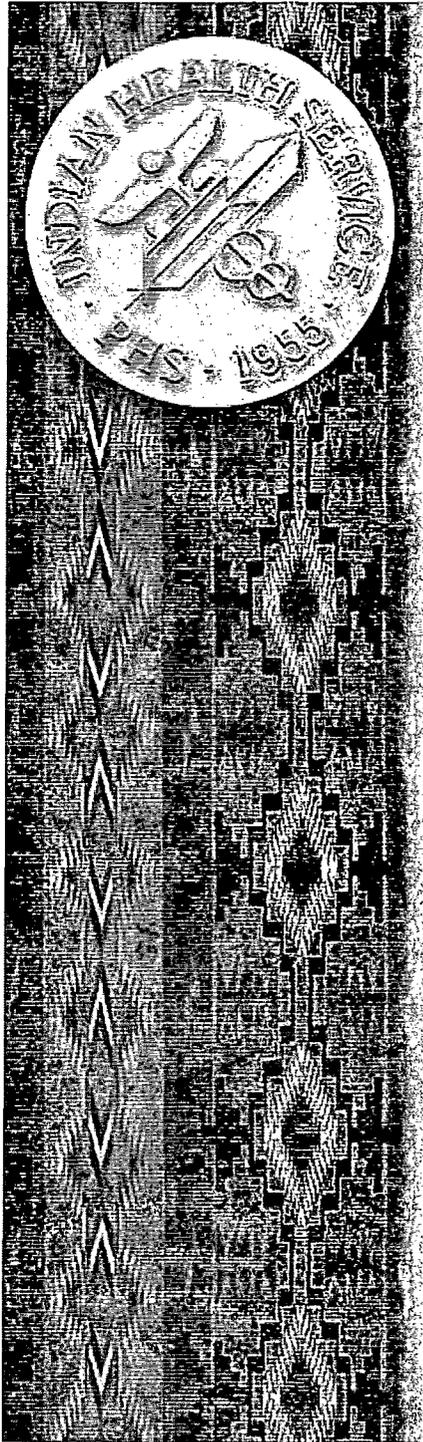
February 2009

- **OBJECTIVE 7.**

Review with CDC/USEPA, water contamination and facility contamination data for potential health impacts.

1. Survey results from patients to be shared with IHS and screening protocol to be used for those at highest risk at NAIHS clinics/hospitals—start late Spring 2009.





February 2009

- **OBJECTIVE 8.**

Assessing the potential for case control studies* on health conditions...

1. Occupational lung cancer case control study.
2. Non-occupational longitudinal case control study.

*Completion of studies contingent on funding.

NRC 5 Year Activity - Update

- **UNC Churchrock mill site:**
 - on-going consultation with EPA and DOE on Northeast Churchrock Mine site cleanup
 - on-going coordination with Navajo Nation, EPA, and State of New Mexico on groundwater contamination
- **Govt.-Govt. meetings with Navajo Nation on February 9, 2009, and other Tribes on-going**

Yolande Norman

From: Bain.Andrew@epamail.epa.gov
Sent: Thursday, March 26, 2009 6:55 PM
To: Purcell.Mark@epamail.epa.gov; Yolande Norman
Subject: Fw: Navajo Ur Contamination Report to House Committee
Attachments: Navajo Ur Contamination 5-Yr Plan - Feb Report.pdf

Mark and Yolande,
I found a note to self that I owed you a copy of our latest 5yr plan. I apologize for the delay. Mark, I still need to chat with you about Questa ARARs.

Thanks,
Andy

Andrew Bain, RPM
EPA Region 9
Superfund Division (SFD62)
San Francisco, CA 94105
(415) 972-3167w
(415) 972-3528f

----- Forwarded by Andrew Bain/R9/USEPA/US on 03/26/2009 03:53 PM -----

From: Scott Stollman/R9/USEPA/US

To: Andrew Bain/R9/USEPA/US@EPA, Brent Maier/R9/USEPA/US@EPA, Carl Warren/R9/USEPA/US@EPA, Clancy Tenley/R9/USEPA/US@EPA, Corine Li/R9/USEPA/US@EPA, Daniel Meer/R9/USEPA/US@EPA, David Albright/R9/USEPA/US@EPA, Debbie Schechter/R9/USEPA/US@EPA, Harrison Karr/R9/USEPA/US@EPA, HarryL Allen/R9/USEPA/US@EPA, Jean Gamache/R9/USEPA/US@EPA, Jeff Inglis/R9/USEPA/US@EPA, Karen Goldberg/R9/USEPA/US@EPA, Luis Garcia-Bakarich/R9/USEPA/US@EPA, Margot PerezSullivan/R9/USEPA/US@EPA, Michael Hingerty/R9/USEPA/US@EPA, Pamela Overman/R9/USEPA/US@EPA, Rich Vaille/R9/USEPA/US@EPA, Steve Calanog/R9/USEPA/US@EPA, Rich Campbell/R9/USEPA/US@EPA, Bessie Lee/R9/USEPA/US@EPA, Leah Butler/R9/USEPA/US@EPA, Libby Vianu/R9/USEPA/US@EPA, Patricia Hudnall/R9/USEPA/US@EPA, Zoe Heller/R9/USEPA/US@EPA, PuiMan Wong/R9/USEPA/US@EPA, Elizabeth Adams/R9/USEPA/US@EPA, Sara Goldsmith/R9/USEPA/US@EPA, Linda Reeves/R9/USEPA/US@EPA, John Lyons/R9/USEPA/US@EPA, Joseph Eidelberg/R9/USEPA/US@EPA, Steve Arbaugh/R9/USEPA/US@EPA, Karen Jurist/R9/USEPA/US@EPA, Kathi Moore/R9/USEPA/US@EPA, Monika OSullivan/R9/USEPA/US@EPA, Dawn Richmond/R9/USEPA/US@EPA, Susan Muza/R9/USEPA/US@EPA, Robert Terry/R9/USEPA/US@EPA, Daniel Stralka/R9/USEPA/US@EPA, Michele Dineyazhe/R9/USEPA/US@EPA, Sara Jacobs/R9/USEPA/US@EPA, Dana Barton/R9/USEPA/US@EPA, Svetlana Zenkin/R9/USEPA/US@EPA, Richard Grow/R9/USEPA/US@EPA, Will Duncan/R9/USEPA/US@EPA

Date: 03/09/2009 04:41 PM

Subject: Navajo Ur Contamination Report to House Committee

Navajo Uranium Team --

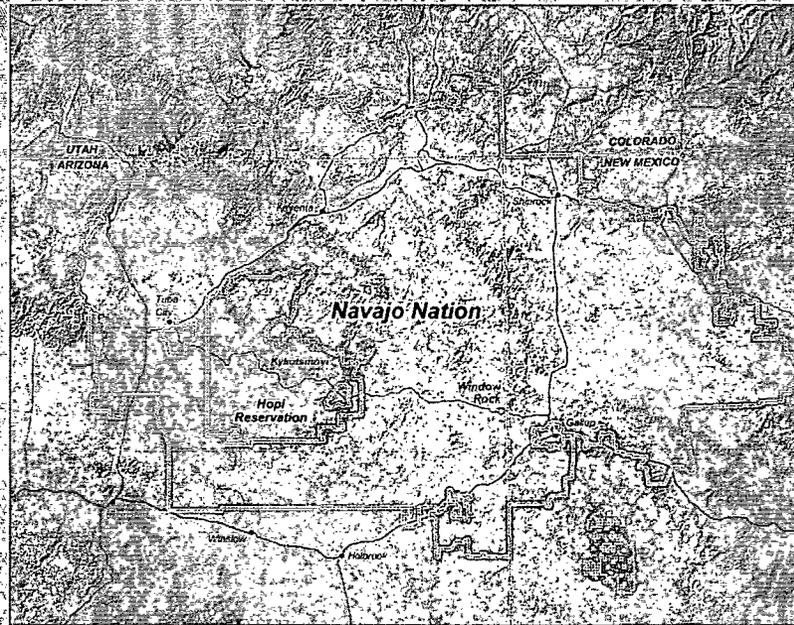
OMB cleared all the agencies' slides late last week. These slides were prepared at the request of Waxman's new committee - House Committee on Energy & Commerce. The slides provide a summary of background issues, commitments made in the 5-year Plan, and current status. The report was requested to help inform the members of this committee, most of whom were not on the Oversight Committee

Thanks,

-- scott

Five-Year Plan to Address Uranium Contamination on Navajo Nation

February 2009 Report



Background

- ◆ Mine operators extracted nearly 4 million tons of uranium ore from 1944 to 1986 under lease agreements with Navajo Nation.
- ◆ There are over 500 abandoned uranium mines (AUMs) across Navajo Nation along with homes and wells with elevated levels of radiation.
- ◆ Four private uranium mill sites operated within Navajo Nation and were closed by DOE under the Uranium Mill Tailing Radiation Control Act (UMTRCA).
- ◆ Unlike uranium mills, there is no specific legislation to address abandoned uranium mines. Superfund covers the “worst” sites in the country, some of which are mines.

Five-Year Agency Action Plans

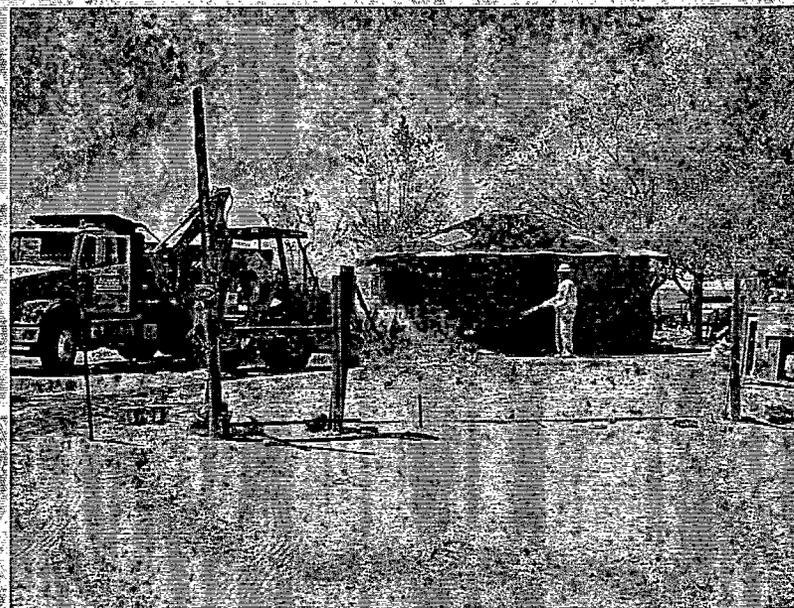
- ◆ Structures – EPA
- ◆ Water Sources – EPA
- ◆ Abandoned Mines – EPA
- ◆ Northeast Church Rock Mine Site – EPA
- ◆ Inactive Milling Sites – DOE
- ◆ Highway 160 Site – DOE
- ◆ Tuba City Dump – BIA
- ◆ Health Assessment – IHS
- ◆ Summary of Activities - NRC

EPA - Structures Background

- ◆ 1975 - EPA surveyed 37 structures around Monument Valley mill site. DOE demolished 4 of the structures.
- ◆ 1990s - EPA contacted local officials in over half of impacted chapters and offered free radiation surveys. EPA surveyed 28 structures. EPA removed 2 of the structures (the remaining 26 structures did not have elevated levels of radiation).
- ◆ 2001-2006 - EPA funded NNEPA's desktop study of suspected radioactive homes, resulting in a list of 33 structures that may have elevated radiation levels.
- ◆ 2007 - EPA mapped structures near each mine site to help NNEPA set priorities.

Structures – Action Plan

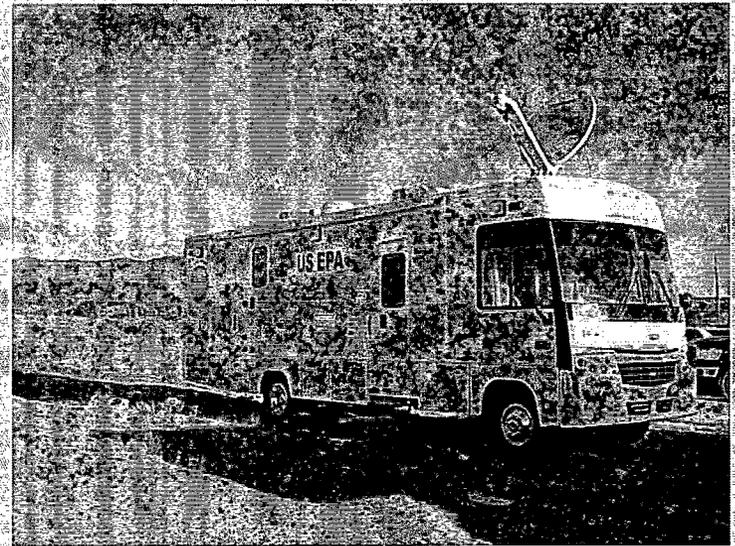
- ◆ Assess structures from previous lists in early 2008.
- ◆ EPA, in coordination with NNEPA, plans to assess about 500 structures over five years.
- ◆ EPA will use Superfund authority for appropriate response actions.



Contaminated Hogan Removal

Structures - Status

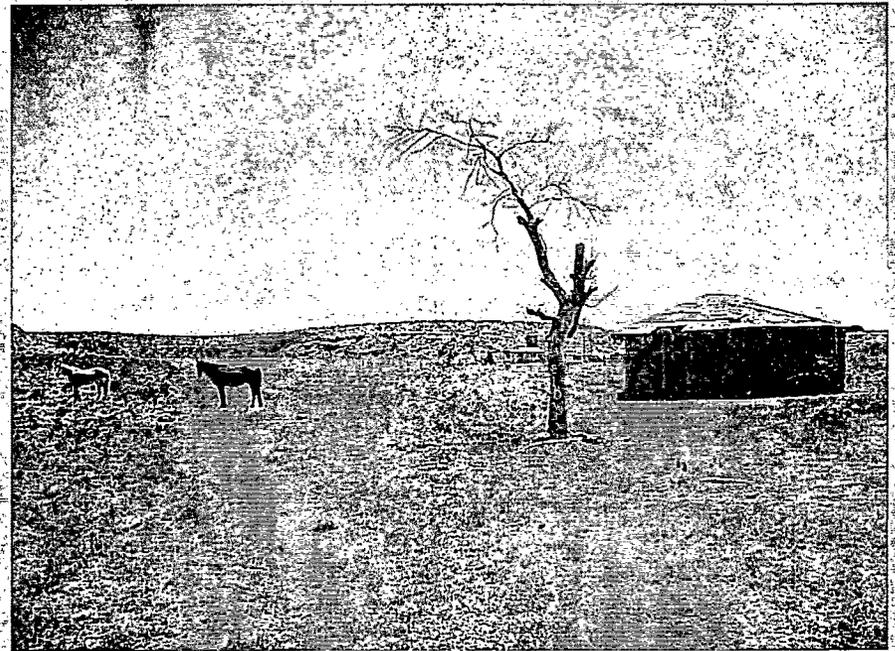
- ◆ In April 2008, EPA completed assessments of 113 structures on 56 homesites.
- ◆ EPA and NNEPA agreed that 27 structures and 12 residential yards would be remediated. Several of the structures were occupied but none with acute exposures.
- ◆ Owners were informed of results.
- ◆ As of November 2008, all structures in Cove, Red Valley, Teec Nos Pos Chapters and Cane Valley area were demolished. Nine yards have been remediated.
- ◆ Structures and yards will be remediated and replaced by November 2009.



EPA Mobile Command Post

Structures Field Work

- ◆ Requires tremendous coordination, community involvement, and outreach.
 - ❖ Remote locations
 - ❖ Access agreements
 - ❖ Historical preservation clearance
 - ❖ Transitional housing during demolition and rebuilding

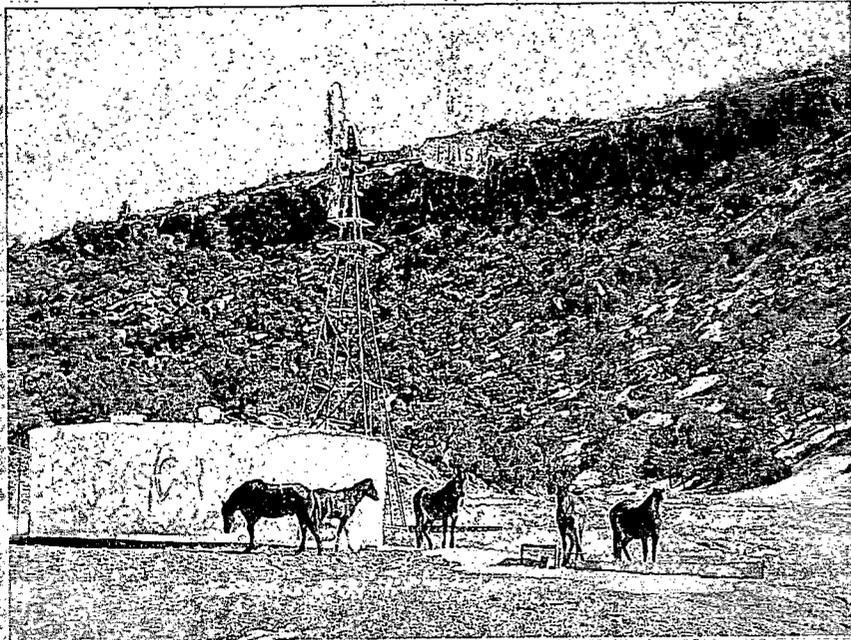


EPA - Water Sources Background

- ◆ 70% of Navajo families get drinking water from regulated public water systems, all of which are in compliance for radiation.
- ◆ 30% of Navajo families (~54,000 people) lack access to safe, piped water, the highest percentage of any U.S. tribe, and get drinking water from thousands of unregulated water sources.
- ◆ From 1998 to 2000, EPA sampled 226 unregulated water sources. 38 sources exceeded EPA's drinking water standard for radionuclides.

Water Sources - Action Plan

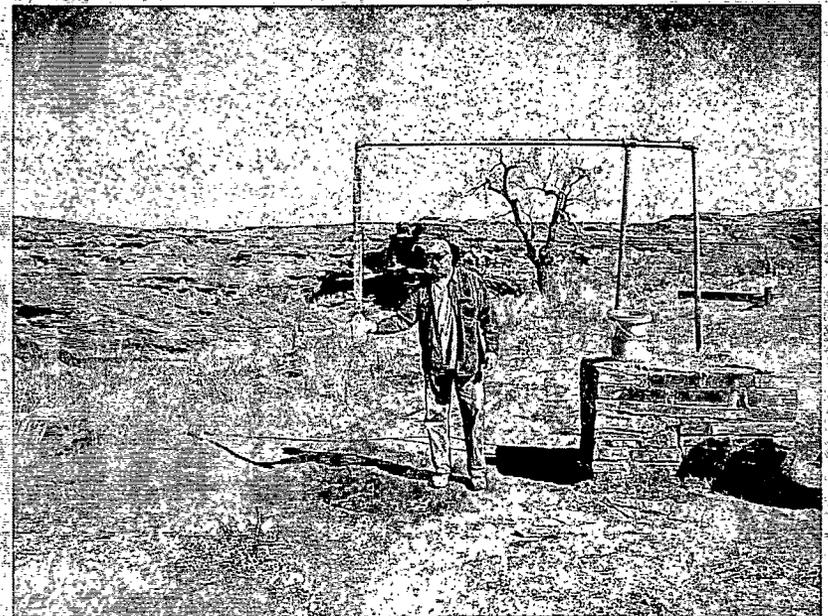
- ◆ Test unregulated water sources that may contain elevated radionuclides.
- ◆ Fund a NNEPA “circuit rider” to provide on-site assistance to water users.
- ◆ EPA and NNEPA conduct outreach with partner organizations.
- ◆ EPA and IHS work with other agencies to find alternative water sources where possible.



Rural Water Source

Water Sources - Status

- ◆ EPA tested 50 and CDC tested 199 unregulated water sources.
- ◆ We found 22 sources that exceed standards for radionuclides. Most are located within 10 miles of a safe alternative supply.
- ◆ EPA, NNEPA, and partner organizations issued a health advisory and are conducting extensive outreach to residents.



Water Sampling

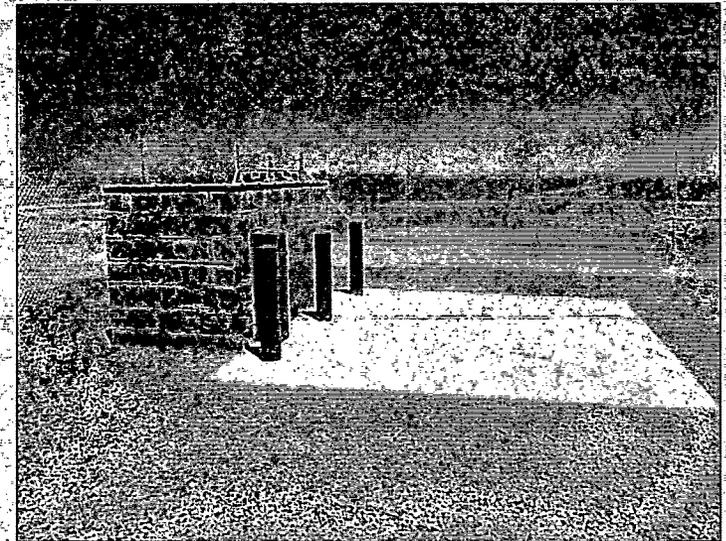
New Water Supplies for Priority Areas

◆ Dennehotso area:

- ❖ EPA allocated \$2 million and will work with the local community, IHS, and the Navajo Nation Community Development Block Grant program to plan and construct a water system to serve 500 residents located near uranium-contaminated wells.

◆ Black Falls area

- ❖ Using EPA and IHS funding, IHS constructed sewer facilities and a drinking water system with a regulated water hauling point to serve residents near 4 uranium contaminated wells.
- ❖ EPA is temporarily delivering bottled water to two households who rely solely on contaminated wells for potable water.



New Black Falls Water Hauling Point

EPA - Abandoned Uranium Mines Background

- ◆ 1988–2008 - EPA awarded NNEPA \$9.5 million in grants for site assessment/program development work.
- ◆ 1991 - EPA conducted removal actions at cluster of 6 mines in Bluewater, NM, involving DOE, BIA and Santa Fe Railroad.
- ◆ 1994–2001 – EPA Superfund Program conducted \$12 million Navajo-wide investigation and outreach effort.
 - ❖ Flew aerial surveys over 1,440 square miles to identify impacted areas.
 - ❖ Sampled 226 unregulated water sources.
 - ❖ Developed atlas with all results and distributed it to 30 impacted communities
 - ❖ GIS database and Summary Report identified 520 potential AUMs.

Abandoned Uranium Mines - Action Plan

- ◆ EPA working with NNEPA to conduct tiered assessments of all 520 abandoned uranium mines (AUMs).

- EPA or NNEPA plan to conduct on-site screening evaluations of mines over five years.
- EPA plans to conduct more detailed assessments as needed.
- EPA will work with NNEPA to determine appropriate courses of action for highest priority mines.

- ◆ EPA sent information request letters to nine viable companies who owned or operated multiple mines, and will evaluate enforcement options for cleanup actions.



Skyline Mine Assessment

Abandoned Uranium Mines - Status

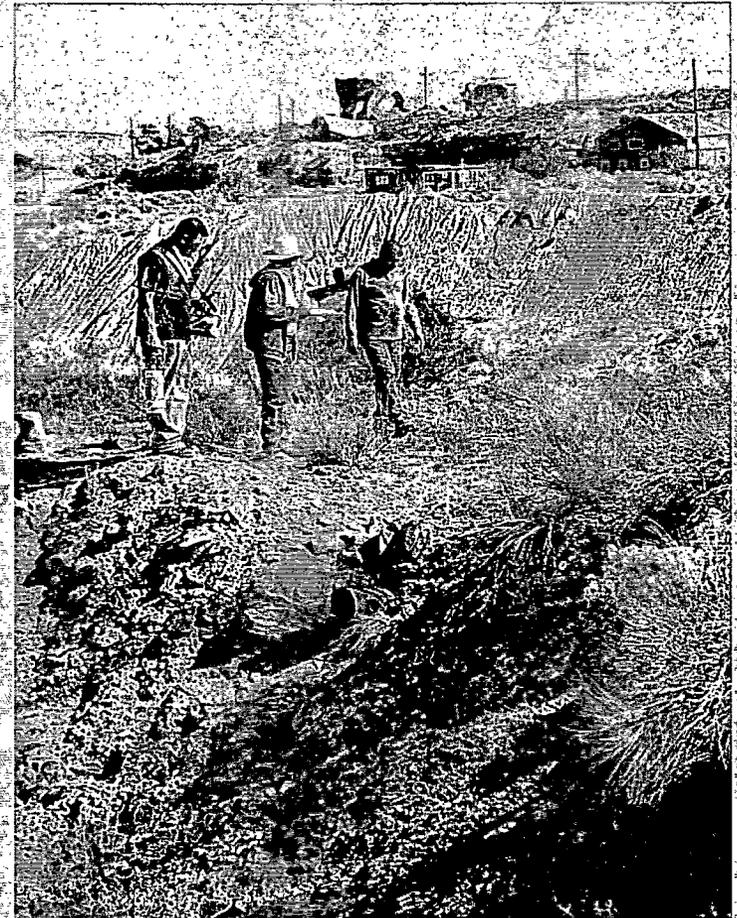
- ◆ EPA, NNEPA, and Navajo AML prioritized the 520 mines by geographic area.
- ◆ EPA conducted a removal assessment at Skyline Mine.
- ◆ EPA completed detailed assessments at 5 mines.
- ◆ EPA conducted on-site screening evaluations of 83 mines in Eastern Agency. Based on these evaluations, additional detailed assessments will be conducted.
- ◆ EPA will begin on-site screening evaluations in Northern Agency in April 2009.
- ◆ EPA plans to complete 160 on-site screening evaluations in 2009, for an overall total of 243 screened sites.



Reclaimed Rattlesnake Mine

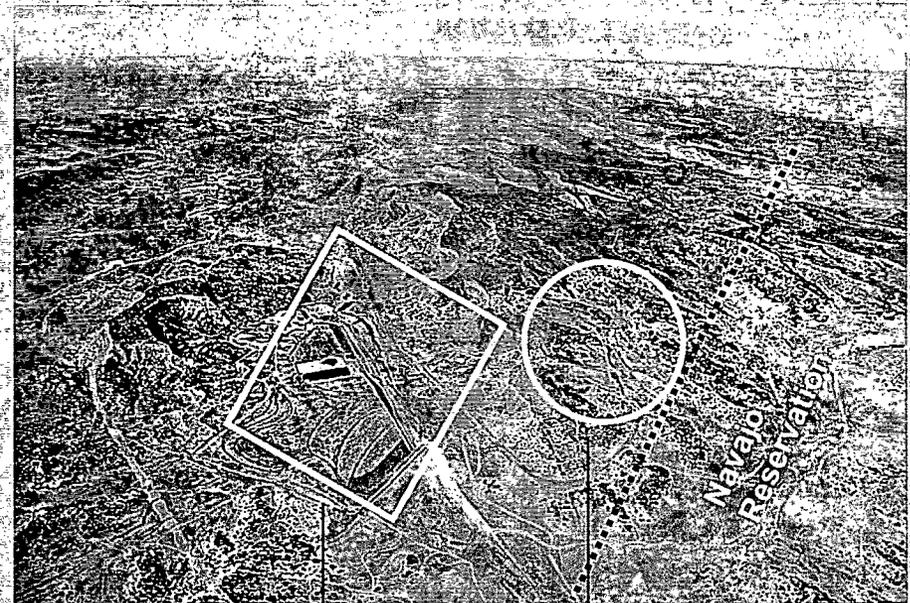
EPA-Northeast Church Rock Mine Background

- ◆ Highest priority site on AUM inventory.
- ◆ Largest former underground uranium mine in the country with about 157 acres of impacted surface soils and sediments.
- ◆ EPA ordered United Nuclear Corporation (UNC) to investigate the mine site in 2006.
- ◆ EPA ordered UNC to clean up one structure and four yards in Summer 2007.
- ◆ In Spring 2008, Navajo Nation requested EPA to delay the mine site-wide cleanup plan to provide time for settlement negotiations with UNC.



Northeast Church Rock Mine Site

- ◆ Release Engineering Evaluation/Cost Analysis (EE/CA) Report with our preferred cleanup alternative for 30-day public comment period in April 2009.
- ◆ Final cleanup plan released by July 2009.
- ◆ Negotiate cleanup enforcement order with UNC.
- ◆ Discuss interim cleanup actions with UNC and Navajo Nation.



Mill Site
(R6/NRC NPL Site)

NECR Mine Site

CDC Investigation: Public Health Risks from Water Hauling

- ◆ Public health problem: Water hauling is widespread on Navajo Nation
 - ❖ 30% of households are not connected to a public water system
 - ❖ Drinking water hauled from unregulated sources may contain natural arsenic, uranium and other contaminants
- ◆ Initial Response: CDC tested 199 unregulated water sources used for drinking water
 - ❖ CDC identified drinking water sources containing bacteria, arsenic, uranium and other contaminants and shared data with EPA
 - ❖ CDC identified high risk regions where drinking water contaminants are concentrated

CDC Investigation: Public Health Risks from Water Hauling

- ◆ Current Response: CDC is assessing human exposure to drinking water contaminants in the high risk regions previously identified
 - ❖ CDC collected data from 300 households in the high risk regions
 - Conducted interviews on water hauling practices and relevant health information
 - Tested drinking water stored in the home
 - Tested urine for exposure to arsenic, uranium and other chemicals
 - ❖ Data collection is complete. Data are currently being analyzed. Results will be reported by Spring 2009



**DOE Update on Activities
to Address Uranium
Contamination on the
Navajo Nation**

February 2009

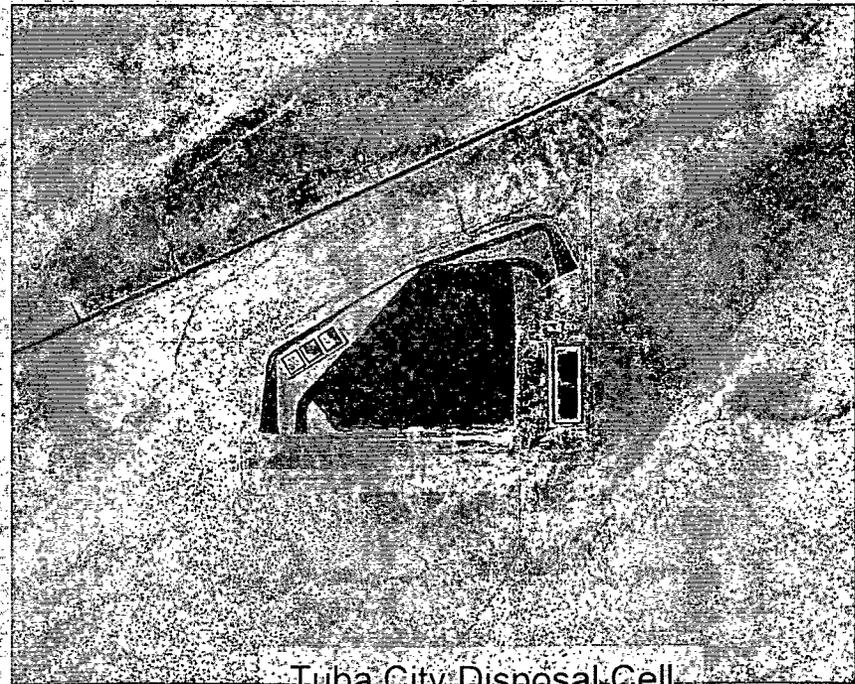


Background – DOE Sites on Navajo Nation

- ◆ DOE remediated four former uranium mill sites located in the Navajo Nation (Tuba City, Arizona; Mexican Hat, Utah; Shiprock, New Mexico; and Monument Valley, Arizona) as authorized under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978.
- ◆ Each of these sites had abandoned mills with associated uranium mill tailings and holding ponds.
- ◆ These former uranium mill sites and associated vicinity properties were remediated to Nuclear Regulatory Commission (NRC) surface cleanup standards promulgated by the EPA (10 CFR Part 192).
- ◆ The mill buildings, tailings, ponds, and other contaminated materials were placed in disposal cells constructed at three of the sites: Tuba City, Shiprock, and Mexican Hat.

Background – NRC and the Navajo Nation have concurred on designs of DOE-built disposal cells. The disposal cells are meeting performance objectives.

- ◆ DOE placed mill tailings in disposal cells designed to last for 200 to 1,000 years. NRC and the Navajo Nation concurred on the designs.
- ◆ Designs are similar to those of other disposal cells built by DOE. UMTRCA Title I disposal cells do not require a liner to meet performance objectives. Disposal cells are on stable geologic formations and are not threatened by river migration or flooding.
- ◆ The surface cleanup program and authorization ended in 1998.
- ◆ Existing groundwater plumes are primarily the result of previous mill operations.
- ◆ Groundwater contamination is being addressed.



Tuba City Disposal Cell

Background – Long-term surveillance and maintenance of DOE sites within the Navajo Nation ensures protection of human health and the environment.

- ◆ DOE continues to perform surveillance and maintenance activities, including groundwater remediation, at the former mill sites in the Navajo Nation to ensure sites are protective of human health and the environment.
- ◆ After discussion with DOE, the Navajo Nation Department of Natural Resources concurs with activities at the former mill sites.
- ◆ Maintenance activities include active groundwater treatment at Shiprock and Tuba City, a pilot treatment study at Monument Valley, maintenance of three disposal cells (Shiprock, Tuba City and Mexican Hat), and annual inspections at all sites.
- ◆ Average cost at the four sites is \$5 million/year. Average cost of performing surveillance and maintenance at other UMTRCA Title I sites is \$120,000 each/year. The primary difference is the active treatment of groundwater within the Navajo Nation.
- ◆ DOE continues to plan activities and operate in accordance with the Cooperative Agreement with the Navajo Nation.

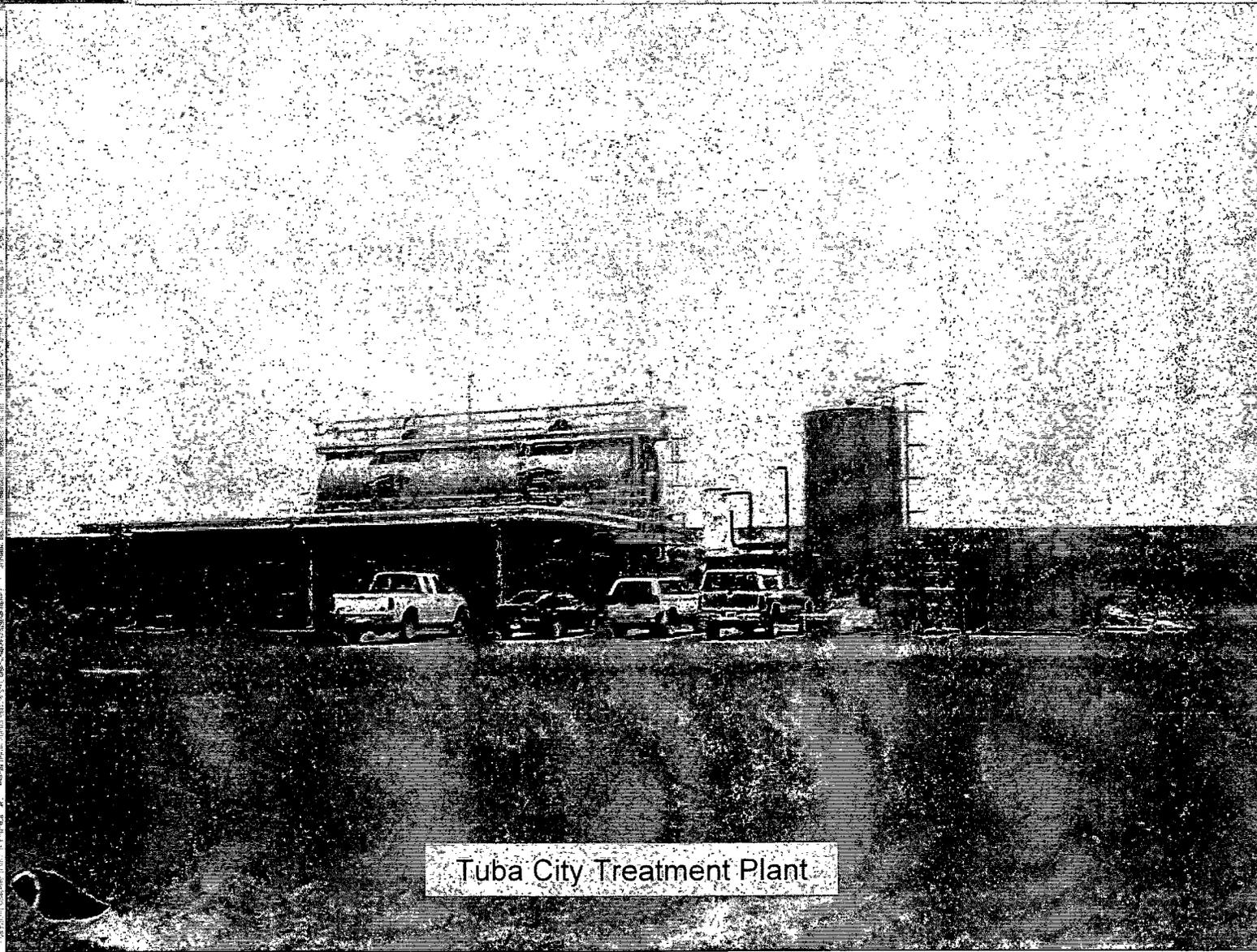
Background – DOE operates state-of-the-art treatment systems at two former uranium-ore processing sites (Tuba City and Shiprock)

◆ Tuba City

- ❖ DOE has been pumping and treating groundwater at the former Tuba City uranium-ore processing site for seven years.
- ❖ The treatment plant has extracted 581 pounds of uranium, 991,000 pounds of nitrate, and 2.5 million pounds of sulfate salts.
- ❖ DOE has no evidence that connects groundwater contamination from the disposal cell (former mill site) to groundwater contamination near the Tuba City municipal landfill. DOE has provided funds to the Navajo Nation to install up to nine wells between the mill site and the landfill to complete investigations into possible connections between the sites.

◆ Shiprock

- ❖ An extraction system installed on the terrace has been successful in reducing groundwater elevations.
- ❖ Extraction wells and trenches installed in the floodplain have been successful in reducing contaminant concentrations by up to 90 percent.



Tuba City Treatment Plant

Five-Year Plan Commitments

- ◆ DOE-Legacy Management (LM) participated in the development of an integrated five-year plan in response to the House Committee on Oversight and Government Reform on the impacts of uranium contamination on the Navajo Nation.
- ◆ LM addressed two issues among the specific objectives in the five-year plan:
 1. Long-term surveillance and maintenance (LTS&M) and treatment of groundwater contamination at the former mill sites, and,
 2. Characterization and possible remediation of the Highway 160 site or Rare Metals site which is across Highway 160 from the former mill site outside Tuba City, Arizona.

Current Status – DOE is implementing the actions outlined in the Navajo Nation Five-Year Plan.

- ◆ DOE continues to monitor and maintain the disposal cells and operate groundwater treatment systems.
- ◆ DOE continues to fund the Navajo Nation (funds have been directed to the Department of Natural Resources per existing cooperative agreement terms) to support implementation of surveillance and maintenance activities under our Cooperative Agreement.
- ◆ DOE continues to supply technical expertise to the Indian Health Service and Bureau of Indian Affairs as requested.
- ◆ DOE continues to consult with the Navajo Nation on status and issues surrounding the UMTRCA Title II, NRC-licensed, Church Rock mill tailings and mine sites.
- ◆ The Navajo Nation has notified the federal government that they intend to file suit pursuant to Resource Conservation and Recovery Act (RCRA).

Current Status – The contaminated portion of the Highway 160 Site has been fenced and El Paso Natural Gas Co. has applied a soil fixative.

- ◆ DOE does not have authority to perform surface characterization or remediation of the Highway 160 site as our authority under UMTRCA for these activities expired in 1998. DOE has provided support for the preparation of a cost estimate for the remaining cleanup work based on the EPNG characterization report (surface radiation and magnetometer readings).
- ◆ Additional characterization would be needed to determine depth and extent of contamination and whether it is mill-site-related i.e., is classified as residual radioactive material).
- ◆ If material is residual radioactive material, it may be disposed of at the Grand Junction, Colorado, Disposal site upon agreement with Mesa County, which has priority for that use. If the material is not mill-site-related, it will need to go to a private disposal facility.
- ◆ The Navajo Nation has entered into an agreement with El Paso Natural Gas Co. on the management of the Highway 160 site.
- ◆ El Paso Natural Gas Co. has sued the federal government with respect to cleanup actions at the Highway 160 site.

Current Status – Technical coordination with the Navajo Nation

- ◆ DOE has coordinated with the Navajo Nation Department of Natural Resources through several avenues:
 - ❖ Has held regular quarterly meetings since 1998 with Navajo UMTRCA staff to discuss groundwater remedies.
 - ❖ Has provided data validation packages, annual performance reports, and annual inspection reports.
 - ❖ Has maintained continuous involvement of Navajo UMTRCA staff through the Cooperative Agreement in site management and surveillance and maintenance.
 - ❖ Has sponsored periodic field trips to UMTRCA sites and has arranged for class visits at Diné College campuses.

Current Status – Technical coordination with the Navajo Nation (continued)

- ◆ DOE has expanded technical coordination with the Navajo Nation to include Navajo EPA and Navajo Justice Department:
 - ❖ December 2007—Tuba City (Tuba City site)
 - ❖ February 2008—Tuba City (Tuba City site)
 - ❖ April 2008—Window Rock and Shiprock (UMTRCA sites)
 - ❖ August 11 and 12, 2008—Focus on further work at the Tuba City site
 - ❖ August 13, 2008—Navajo Uranium Contamination Stakeholder Workshop (Gallup, New Mexico)
 - ❖ September 11, 2008—Shiprock (Shiprock site)
 - ❖ January 21, 2009—Window Rock (UMTRA sites)

TUBA CITY DUMP SITE

Bureau of Indian Affairs Update
on 5-Year Plan
February 20, 2009

TUBA CITY DUMP SITE

Background

- Unmanned, unsecured Dump for 50 + years
- BIA funded ~ \$2 million in site investigations
- Groundwater contamination from Dump and other unknown sources

Objectives:

- Ensure safe drinking water
- Close site in compliance with CERCLA and RCRA
- Perform site activities consistent with CERCLA process

TUBA CITY DUMP SITE

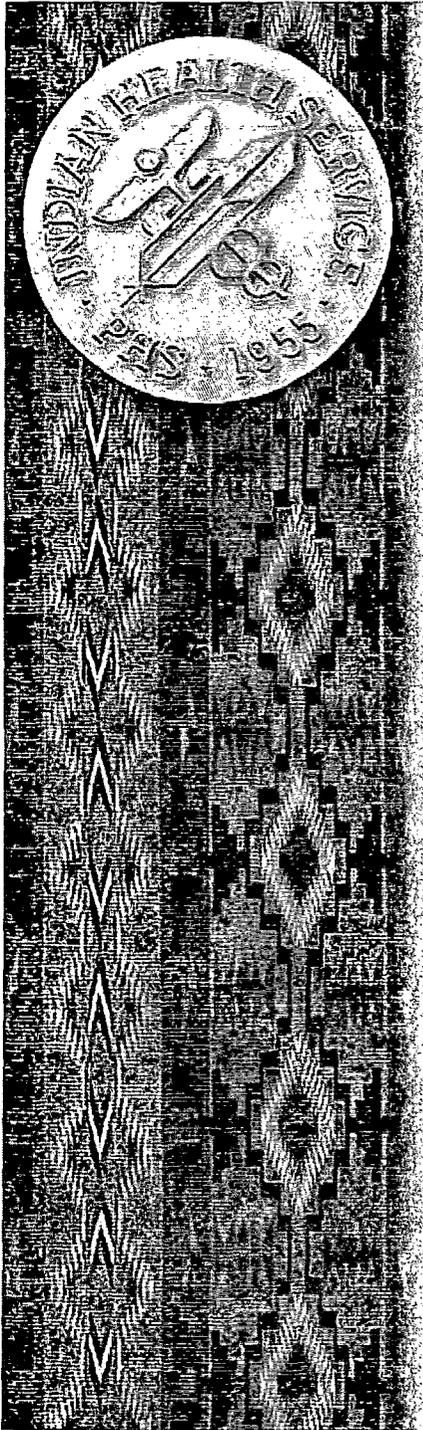
BIA Interim Action Options

- Assess and remove contaminants in vicinity of Monitoring Well #7
- Re-case or replace Moenkopi supply wells to protect water
- Quarterly groundwater monitoring to evaluate contaminant trends
- Fence Old Cell
- Assess waste removal from adjacent residential properties

TUBA CITY DUMP SITE

Status

- Interim Action Report Submitted to Tribes 2/09
- RI/FS Work Plan in development
- IAA with EPA for \$1.2 million to assess MW-7 contaminant source and remove investigative waste
- Continue regular meetings and conference calls with agencies and stakeholders

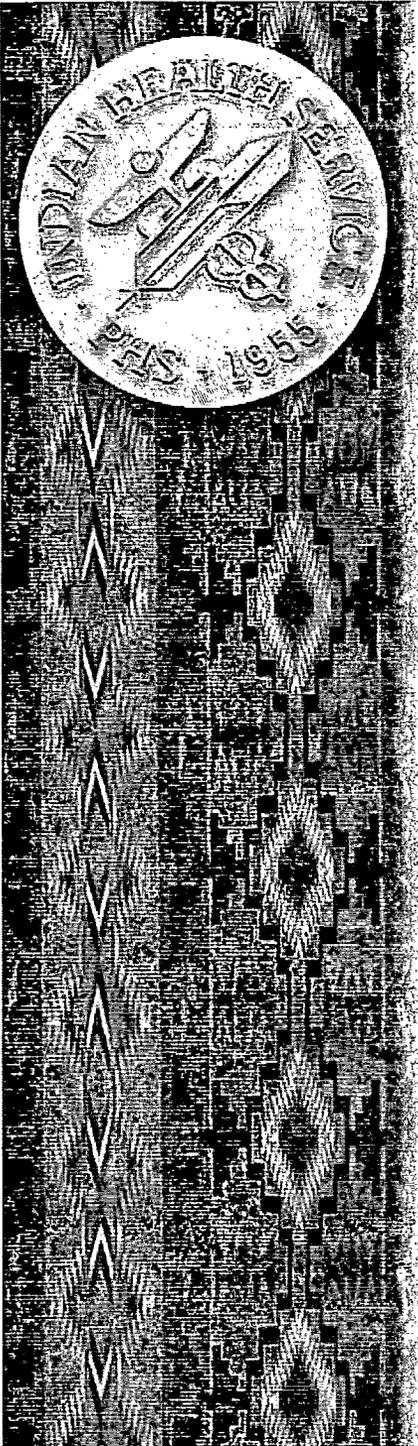


INDIAN HEALTH SERVICE

February 2009

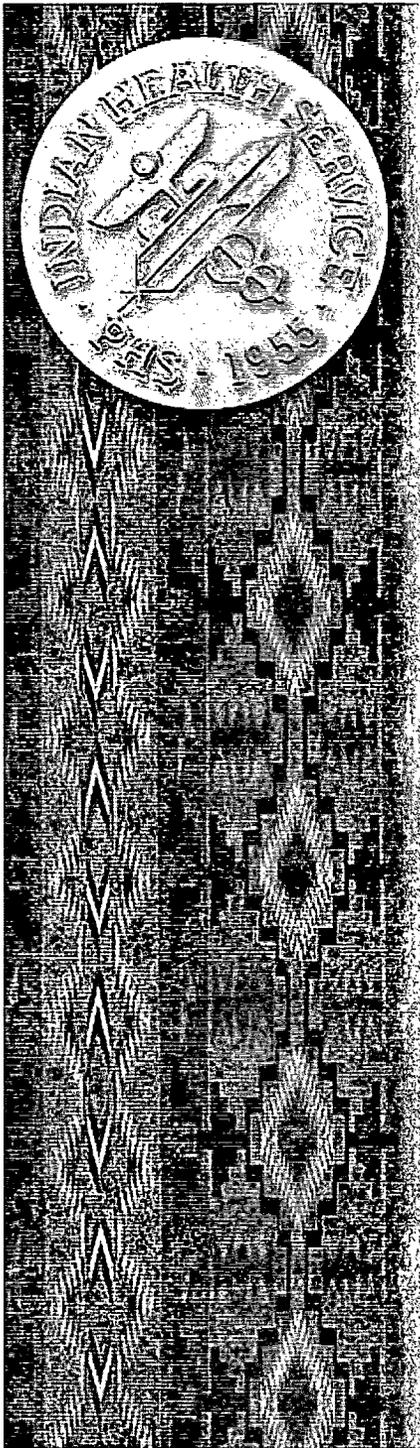
BACKGROUND

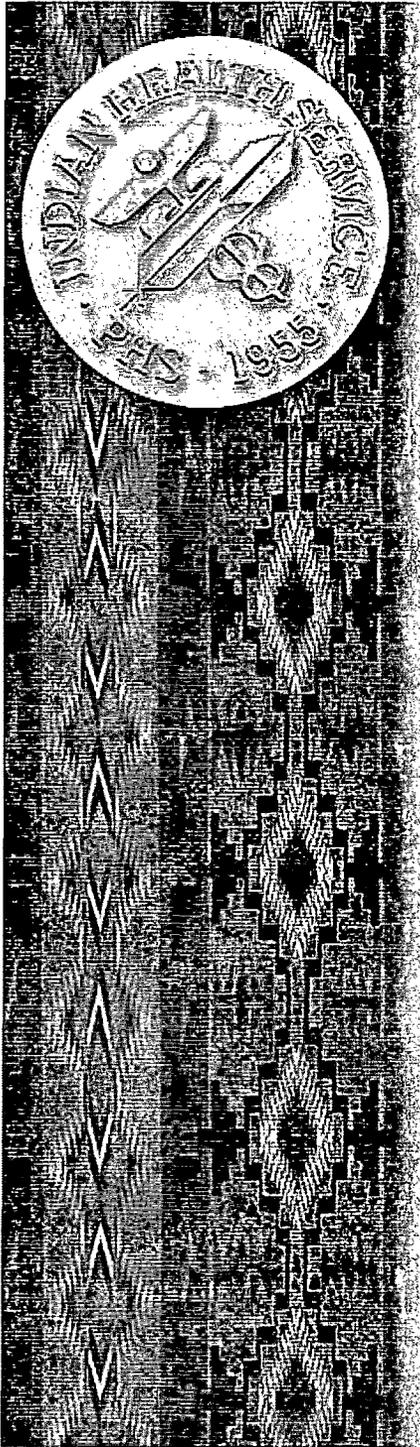
- The Navajo Nation (NN), Hopi Tribe, and IHS provide health care to Native American people.
- The Navajo Nation (NN), Hopi Tribe and IHS continue to monitor health risks to individuals as a result of exposures to uranium.
- HHS/IHS has invested an estimated \$3.8 million to provide health screening exams in the last 10 years for patients who were exposed as miners, millers or downwinders to uranium and radiation.



February 2009

**FIVE YEAR
Action Plan
Progress Report
February 2009**





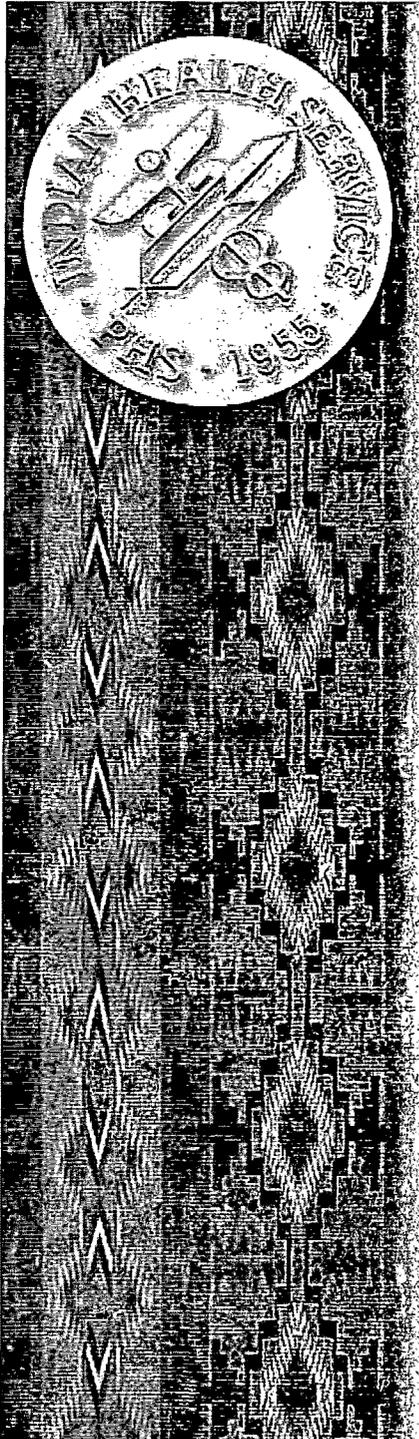
February 2009

- **OBJECTIVE 1.**

Diagnose and treat known health conditions in eligible Indian beneficiaries...

1. Completed uranium screening protocol—
Distributed for use at all hospitals and clinic sites, December, 2008.
2. CDC/ATSDR Grand Rounds on the known health effects of uranium presented December 15-19, 2008 at 4 NAIHS facilities.

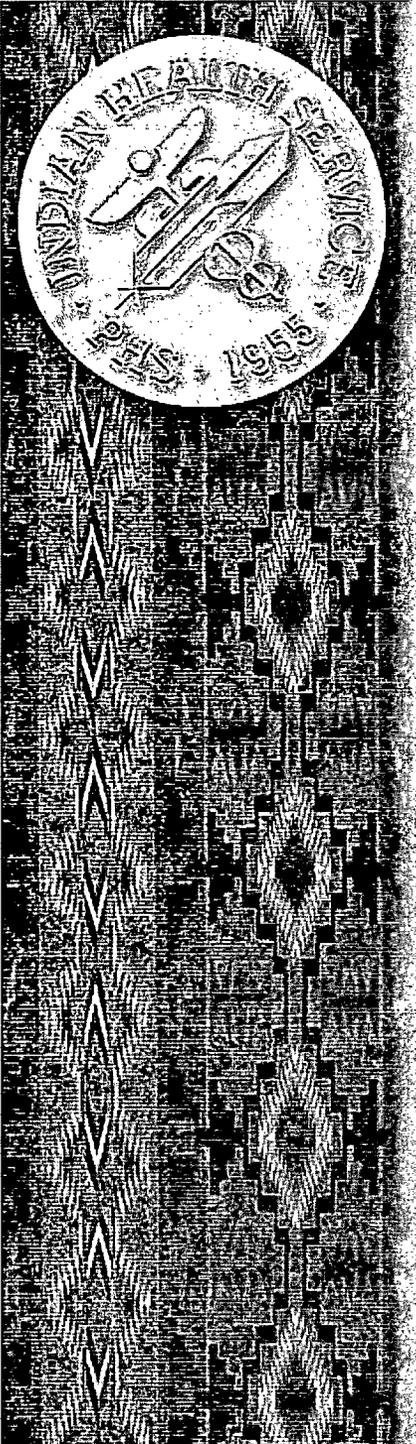
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- **OBJECTIVE 2. -Completed**
Support Navajo Area IHS
Radiation Exposure Screening
and Education Program...

1. HRSA grant awarded to IHS in Shiprock,
New Mexico for 2009.

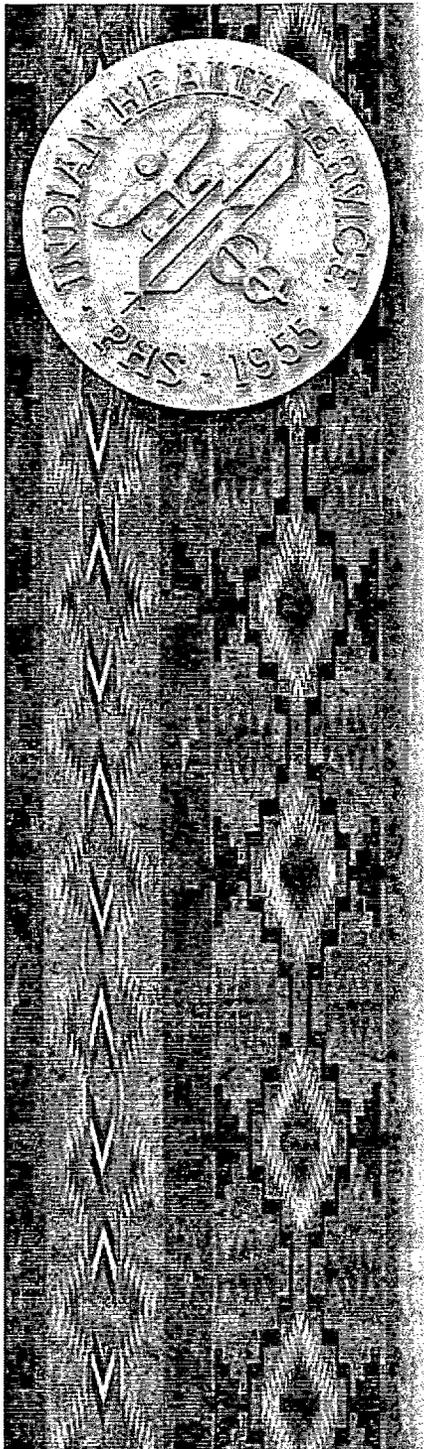
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- **OBJECTIVE 3.**

In-kind IHS support to Navajo Uranium Assessment and Kidney Health Project, a NIH funded research project awarded to UNM specifically for Eastern Navajo Agency residents...

1. Ongoing.



February 2009

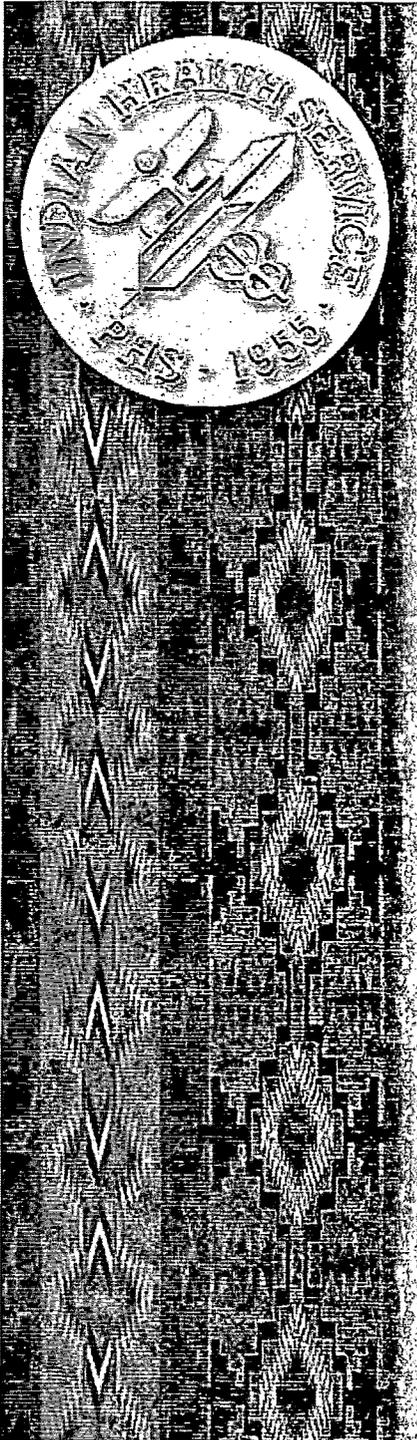
- **OBJECTIVE 4.** - Combined with Objective 5.

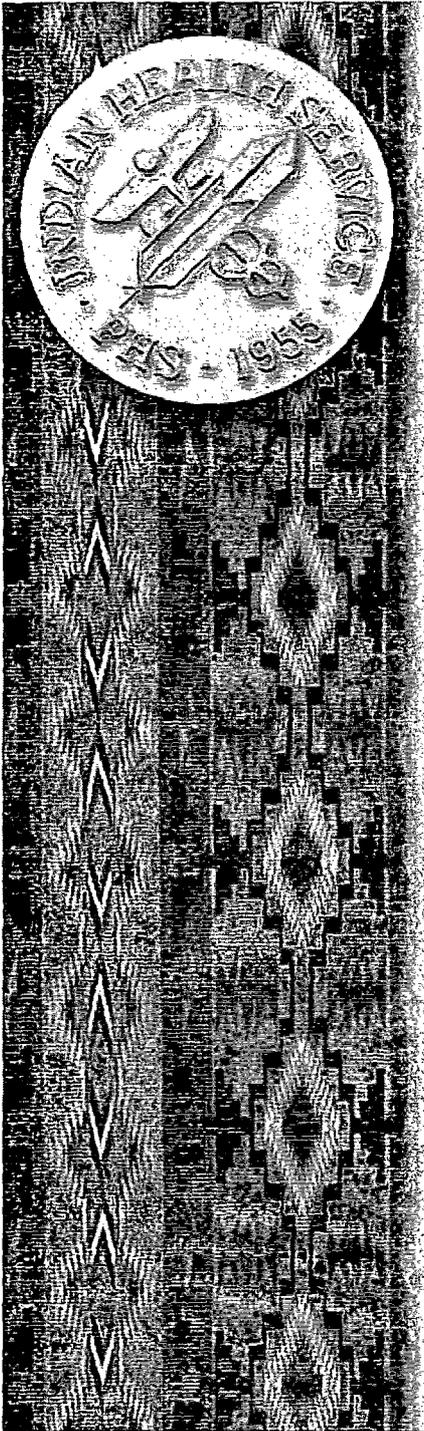
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- **OBJECTIVE 5.**

Interagency scientific meetings and discussions consistent with 5 Year Plan....

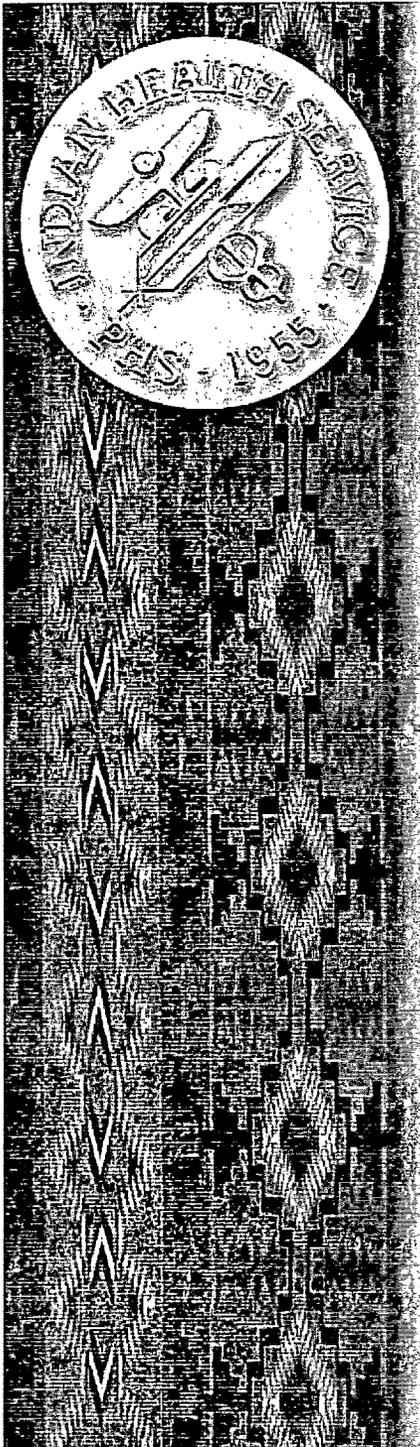
1. Ongoing discussions increased in frequency involving the Navajo Nation Epi Center, UNM, U of A, NAU, CDC, EPA, ATSDR, NIOSH, BIA, NRC, DOE to assist IHS in the completion of five year plan objectives.
2. IHS funds identified in January 2009 to transfer to BIA for Tuba City landfill fencing.





February 2009

- **OBJECTIVE 6. –
Combined with
Objective 8.**

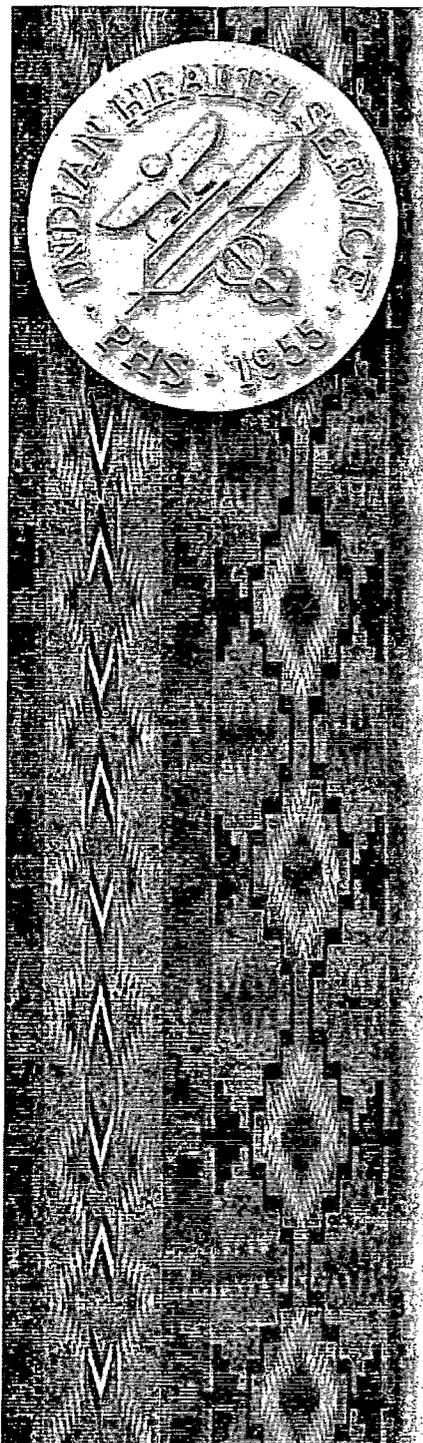


February 2009

- **OBJECTIVE 7.**

Review with CDC/USEPA, water contamination and facility contamination data for potential health impacts.

1. Survey results from patients to be shared with IHS and screening protocol to be used for those at highest risk at NAIHS clinics/hospitals—start late Spring 2009.



February 2009

- **OBJECTIVE 8.**

Assessing the potential for case control studies* on health conditions...

1. Occupational lung cancer case control study.
2. Non-occupational longitudinal case control study.

*Completion of studies contingent on funding.

NRC 5 Year Activity - Update

- **UNC Churchrock mill site:**
 - on-going consultation with EPA and DOE on Northeast Churchrock Mine site cleanup
 - on-going coordination with Navajo Nation, EPA, and State of New Mexico on groundwater contamination
- **Govt.-Govt. meetings with Navajo Nation on February 9, 2009, and other Tribes on-going**