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# **Risk Perception and Risk Communication at the Shiprock, New Mexico, Uranium Mill Tailings Disposal Site**

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# Site Description and History

- The Shiprock site is the location of a former uranium and vanadium ore-processing facility
- Kerr-McGee built the mill and operated it from 1954 to 1963
- VCA purchased and ran the mill until it closed in 1968
  - Milling operations created process-related waste and radioactive tailings
  - The mill, ore storage area, and raffinate pond consisted of 230 acres that were leased from the Navajo Nation



# Regulatory Setting

- Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978
  - DOE remediated 22 inactive uranium ore-processing sites under UMTRCA
- Disposal cells are licensed by the U.S. Nuclear Regulatory Commission
  - Shiprock disposal site was licensed in 1996



# Disposal Cell

- The disposal cell occupies 77 acres
- Contains 2,520,000 wet tons of contaminated materials
  - Includes materials removed from off-site vicinity properties
- Located on river terrace between Bob Lee Wash and Many Devils Wash
  - Distance from San Juan River to disposal site is 600 feet



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# Office of Legacy Management (LM) Activities

- DOE is responsible for ensuring compliance with environmental standards to protect human health and the environment
- DOE will also monitor the effectiveness of all institutional controls
- DOE will manage the site to prevent release of contaminants
- DOE will conduct annual inspections to evaluate the condition and verify and integrity of the cell



# Significant Navajo Stakeholders

- Navajo Nation
  - Navajo UMTRA
  - Abandoned Mine Lands Program
  - Navajo Environmental Protection Agency
- Local government
  - Shiprock chapter
    - Chapter officials
    - Grazing officials
    - Farm board
    - Advisory committee
    - Planning committee
    - Community land use planning committee
- Shiprock community members
- Residents who lived near the mill or the site
- Miners, mill workers, transporters



# DOE Policy on Public Participation and Community Relations

- Purpose: ensure public participation and community outreach to make more-informed decisions with input from the local community



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# Policy + Goals + Core Values + Success

- Policy: the fundamental component in program operation
- Goals
  - DOE will seek to identify stakeholders
  - Public will be informed in a timely manner and empowered to participate
  - Credible, effective, public participation process into DOE programs
  - DOE will conduct periodic reviews of its public and community relations efforts





# Risk Perception and Our Response to Risk Communication Is a Result of the Way We Think

- Perception is the subjective judgment that people make about the characteristics and severity of risks, issues, or topics
- Why do different people make different estimates of the severity of risks?
- Cultural influences are key to perceptions



# Risk Perception Theory

## Major families of theory

### ■ Psychology approach

- Heuristics: shortcut thinking that can lead to inaccurate judgments
- Cognitive: wait-and-see attitude, lack of understanding

### ■ Anthropology/sociology approach

- Perceptions are socially constructed by institutions, cultural values, and ways of life

### ■ Interdisciplinary approach

- Social amplification of risk framework; how communication is passed from sender through intermediate receiver to others; which information is sorted and understood



# The Navajo Perspective: Through S.N.B.H.

- sa'ah naaghai bik'eh hozhoon – our Navajo traditional living system as “walking or being in the pattern of beauty that surrounds you,” placing human life in harmony with the natural world
- nitsahakees – thinking process
- nahata' – planning
- iina' – life or living
- siih hasin – assurance of personal stability with life's achievements



# The Navajo Perspective (continued)

- bila' ashda'ni', or “the five finger people,” who are physical and spiritual beings with the four forces of life:
  - **Fire/light** – our grandmother and the renewable energy technology
  - **Air** – our father, to evaluate and improve the air quality and health of the Navajo people
  - **Water** – our grandfather, improve research and the community outreach effort
  - **Earth** – our mother, guides the policy agenda and the recommendations of environmental health for long-term sustainability



# Diné Fundamental Law

- Law – Title 1 *Navajo Nation Code* section 1005(c)(10), 11-13-02. Navajo Nation has four foundations of Diné Law
  - Ss5.Nahasdzaan dooYadilhil Bits'aadee Beehaz'aanii – Diné Natural Law declares and teaches that:
    - Four sacred elements of life must be respected, honored, and protected to sustain life
      - Air
      - Fire
      - Water
      - Earth
- Four sacred mountains must be protected
- All creation is from mother earth and father sky to the animals; plants have their own laws and rights and freedom to exist
- Diné have duty to respect, preserve, and protect all that was provided for language and thinking
- Diné must treat this sacred bond with love and respect
  - Ensure the rights and freedom of the people to use sacred elements of life
  - It is the duty and responsibility to protect and preserve the beauty of the natural world for future generations



# Perception = Misperception of One Another's Cultural Influences: Native vs. Nonnative Perceptions

Native perception of uranium/disposal sites:

- Nuclear fear, fear of radiation
- Perceptions affected by popular fiction
  - Fantasy movies – sci-fi
- Fearful monster – Yeitsoh of uranium
- Which leads to ....
  - Blaming authorities
  - Navajo believe they saw evil in the walls of underground mines
  - Leetso (uranium), aka monster, or something that gets in the way



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# Perception = Misperception of One Another

Cultural Influences: Native vs. nonnative perceptions

## ■ Native community?

- Lack of cultural awareness approach
- Lack of knowledge of DOE research studies
- Lack of knowledge of health and safety issues
- Lack of participation



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# Perception of Harm to Individuals

- Can include blaming, looking for who's responsible
- For Navajos, the risk is not financial, but spiritual, because we believe that uranium represents the very things that they try to avoid and attacks the things that support and sustain lives – the water, land, and our religious beliefs
- Others continue to blame authorities because of the ...
  - Radiation Exposure Compensation Act of 1990 (RECA)
  - Burden of application process, delayed benefits, or denial of claims and restrictive regulations





# Navajo View of Environmental Responsibilities

- Baa 'ahashchiih – to be aware of it
- Baa 'ahayaagi – taking care of; watching it
- Baa'ahoolya' – we all should be taking care of it (disposal cell)
- Ye'itsoh – monster in negative perception
- Leetso – one that gets in the way
- Yee' – terror or fright
- Baahadzid – fearful and threatening
- Baadahadzidii – those that are awful, taboo



# These Are the Reasons Why This Community Meeting Is Important

- Check your assumptions
- Don't hold grudges on issues from the past
- Deal in a way that will support relationships
- Protect interests of those on the "other side"
- Have both parties work on solutions
- Collaboration is important and necessary for a safe and healthy environment
- True collaboration begins inside the person, the agency, and the community
- Making choices and taking responsibility for the community



# Radical Collaboration

- Lessons learned from each participant because each is unique
- More trusting relationships
- Requires skill set and mindset to become more effective for all parties
- Overcome defensiveness for better, successful relationships
- Leads to building collaborative environment
- Increase trust and problem solving



# Conclusion

## The Promise of Nuclear Technology

“Research on partitioning and transmutation is rather seductive to all of us. It requires new reprocessing techniques, new field development, additional nuclear data, new reactors and irradiation facilities, new waste treatment and disposal concepts with specific safety studies. The Global nuclear scientific and engineering community is challenged by this opportunity.

Everybody realizes, however, **that this voyage to the promised land will pass a desert with a lot of mountains and that we are not so sure that the horizon will be bright as one can hope.”**

*Paul Govaerts*



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