



Remediation of Uranium Mine Contamination Under Multiple Regulators and Regulations

Steve Rima, CHP, CSP, CPM

Vice President, Radiological Services & Engineering

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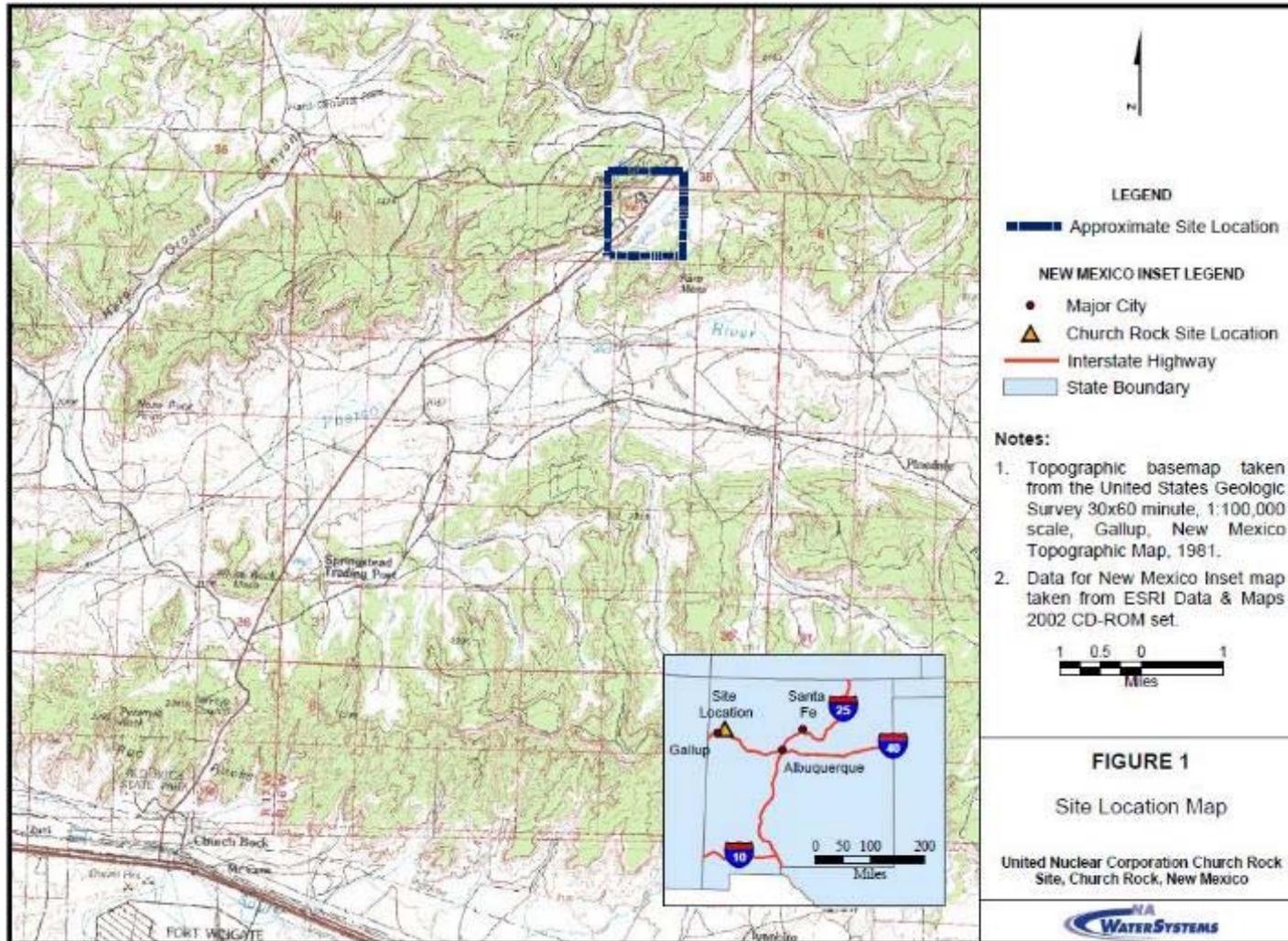


Introduction

- Legacy Uranium Mine and Millsite in Western NM
- Mill previously remediated and now under DOE/NRC oversight
- Mine and windborne contamination have undergone some remediation but much remains to be done
- Presentation will cover one Interim Removal Action project under various regulators/regulations:
 - EPA Region 9
 - 37 page AOC agreed to by client drove project
 - State of NM
 - Navajo EPA



Location



Site View



Mine Works



Interim Removal Actions

- Remediation of windborne radioactive material on Navajo reservation
 - Next to and under public road
 - In drainage arroyos
 - Around occupied houses
 - Waste brought back onto mine site waste pile
 - As-bid value (FFP): \$2.6M
 - Final value: \$2.8M
 - Increase due to 300% volume growth of excavated material



Unique Cultural Concerns & Issues



Historic, sacred, or valuable items/areas (sweat lodge, vehicles, etc.) could not be touched, but had to be remediated around without doing any damage. Trees could not be removed or damaged.



House and Hillside Post-Remediation



Other Issues



- Old concrete slab was found, which had asbestos tiles, so asbestos abatement was required.
- Waterborne contamination in arroyo was much deeper than expected.



Arroyo Excavation and Restoration



Arroyo (over)excavation and (over)restoration was driven by different “wants” from different regulators, not by any real or perceived risk to the environment or the public, or by published regulations.



Verification Process



Waste Mound



All waste material, except asbestos, was brought onto the mine site, contoured, and seeded. Erosion control is maintained until final site remediation in the future.



Issues and Solutions

- Various regulators and stakeholders had very different priorities and expectations
 - Worked with client on initial and frequent public meetings
 - Worked closely with Navajo EPA to address unique cultural concerns
 - Hired local staff and subcontractors to the extent possible and provided training
 - Led working groups including representatives from regulator and stakeholder groups
 - Approach was successful



Issues and Solutions

- In the middle of the project EPA requested a change to how field radiological screening was accomplished (which was not in our scope of work) which would have proven very costly to the project and client
 - We provided expert advice to the client on how to respond to EPA's request
 - We met with the EPA to explain why the requested change was not in compliance with their guidance documents, as well as why it would not enhance protection of the public or the environment
 - EPA rescinded the change request

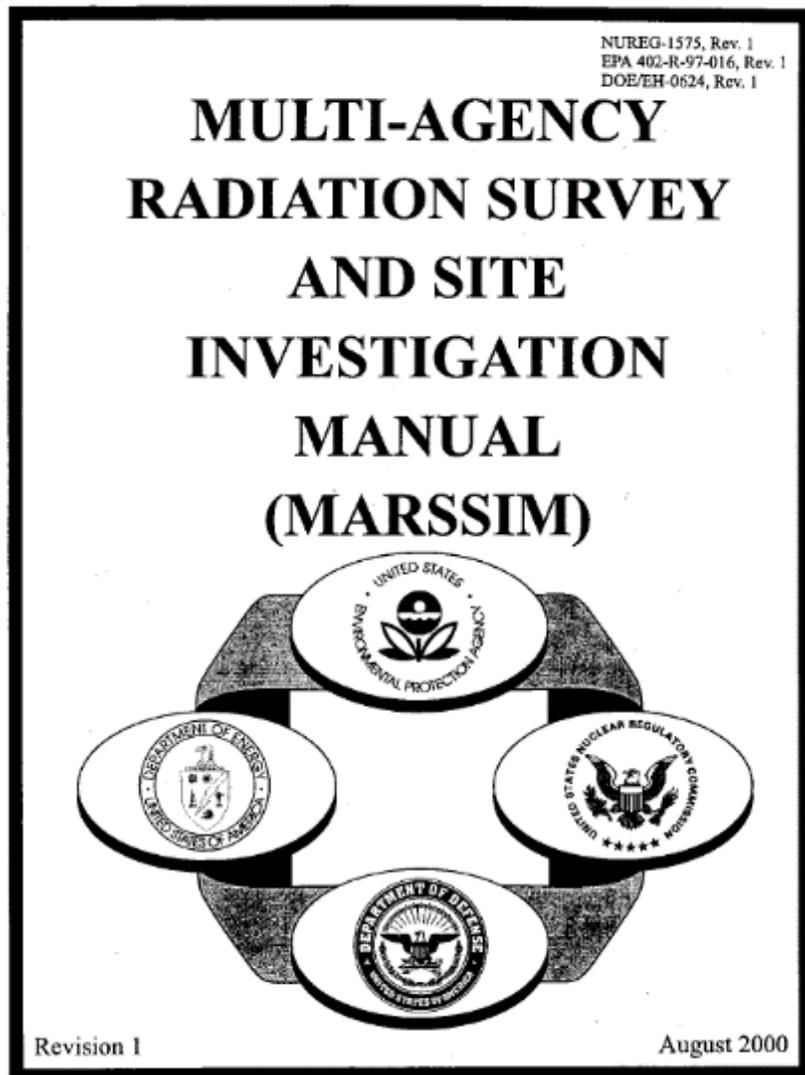


Unique Radiological Remediation Issues

- Regulators don't care what you spend and aren't your consultant.
- Regulations and guidance for remediation of radioactive materials are different
 - MARSSIM is your friend!
- There is no lookup table of what clean means for radioactivity
 - Develop reasonable site-specific limits, **NOT** >bkgd
- The public is afraid of radiation
 - Perception matters, listen and engage the public
- Just because you can detect it doesn't mean it's dangerous or needs to be remediated
- Engage with regulators early in the process and don't agree to unreasonable remediation goals



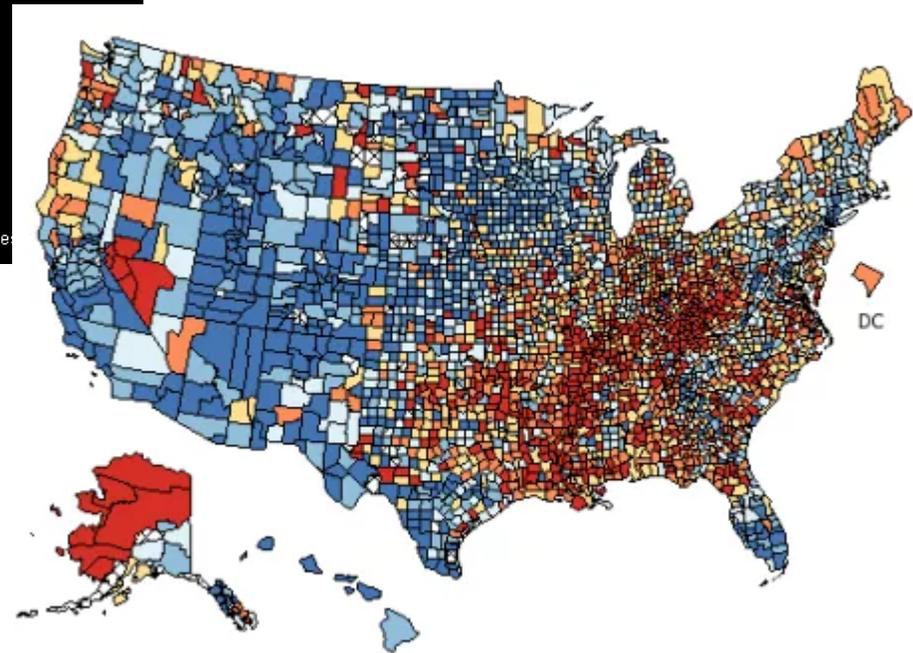
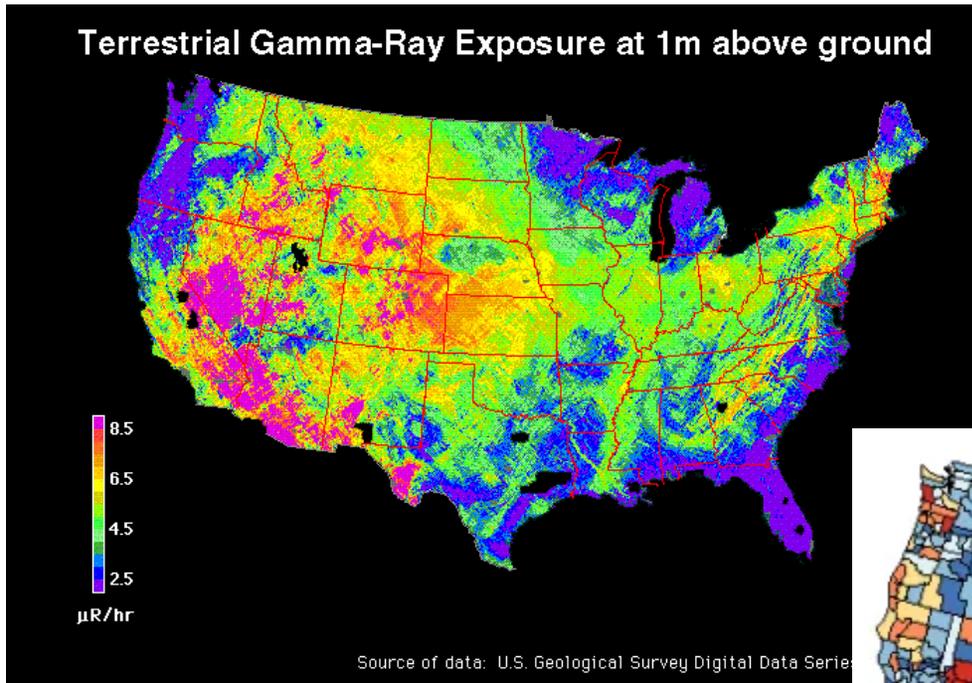
MARSSIM



- Provides guidance (662 pages) for characterization and Final Status Surveys for radiological remediation.
- Joint publication of EPA, DOE, DOD, NRC. Accepted by most states.
- MARSSIM, when used correctly, is your friend.
- When used correctly, will prevent costly “scan & dig” approach, which inevitably leads to large volume and cost overruns.



How Bad – Really – is Low Dose Radiation?



wood.

QUESTIONS?

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