



U.S. Department of Energy  
Office of Civilian Radioactive Waste Management



# Update on DOE Actions in Response to USGS E-mail Issue

Presented to:  
**Nuclear Waste Technical Review Board**

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# Background

- **In March 2005, Department of Energy (DOE) managers learned of e-mails written by a small number of U.S. Geological Survey (USGS) employees**
- **E-mails suggested technical product output, software, and information related to the infiltration analysis and model report (AMR) prepared by the USGS may not have been fully compliant with quality assurance requirements**
- **E-mails were found in November 2004, during reviews of legacy e-mails for potential inclusion in Licensing Support Network**



# Background (continued)

- **Response actions included**
  - **DOE Office of Inspector General (OIG) investigation into potential misconduct**
    - ◆ Conducted in coordination with Department of Interior OIG and Department of Justice
    - ◆ Concluded April 24, 2006, with no charges being filed
  - **OCRWM technical evaluation of USGS net infiltration rate estimates**
    - ◆ Found net infiltration rate estimates are corroborated by independent studies of infiltration and recharge in southwestern U.S. and therefore support the 2001 Site Recommendation
    - ◆ Report issued February 17, 2006
  - **Validation and rework of infiltration products**
    - ◆ OCRWM directed Sandia National Laboratories to develop new infiltration rate estimates and maps, incorporate net infiltration uncertainty, and develop a new infiltration AMR



# Root Cause Analysis Overview

- **Team looked carefully at USGS e-mail situation**
- **Determined root cause and contributing causes**
- **Addressed additional questions**
  - **Whether the 2000 and 2004 infiltration AMRs met applicable requirements**
  - **Whether the attitudes and behaviors exhibited by the USGS employees who wrote the e-mails were seen in other parts of the project**
  - **Whether opportunities were missed to identify and act on conditions adverse to quality associated with the infiltration AMR**



# Root Cause Analysis Overview (continued)

- **The root cause report has been completed**
- **The action plan is being developed by the OCRWM Director, and the senior managers from the Management and Operating (M&O) Contractor, the Lead Lab, and the USGS**
- **The root cause report and action plan must be fully integrated; they will be released in the near future**



# USGS E-mail Situation

- **E-mails were written over a six-year period, between 1998 and 2004, by a small group of USGS employees**
- **E-mails expressed negative attitude about the quality assurance program and suggested noncompliance with requirements (e.g. backdating, making up dates of task completions, and misrepresenting information)**
- **Some USGS managers and personnel in other Yucca Mountain Project organizations were aware of the negative attitudes, but there is no evidence they were addressed before condition report (CR) 5223 was initiated**
- **An examination of modeling software, model reports, and scientific notebooks associated with the USGS work found no evidence that information was falsified or modified as suggested in the e-mails**



# Extent of Condition

- **Extent of condition was assessed through**
  - **Keyword searches of over 900,000 e-mails**
  - **Physical review of more than 50,000 LSN-relevant and nonrelevant e-mails from 14 million e-mail records in the OCRWM e-mail warehouse**
  - **Review of over 7,000 documents related to the Corrective Action Program**
  - **Review of 1,138 records from the employee concerns programs**



# Extent of Condition (continued)

- **Review found**
  - **Additional USGS e-mails written by the same individuals and suggesting similar attitudes and behaviors**
  - **Five other isolated instances suggesting similar attitudes and behaviors**
  - **No instances comparable in significance or duration to those associated with the USGS e-mails**
- **The review did not find a widespread or pervasive pattern across OCRWM of a negative attitude toward quality assurance or willful noncompliance with quality assurance requirements**



# GAO Analysis of USGS E-mail Database

## Review of E-mails

DOE's three types of e-mail reviews examined database of 14 million e-mails and led to seven new issues

	Universe of e-mails	Population of e-mails sampled	Screening & # identified	Sample read	YMP staff review	Expert review	Disposition
<b>Review of relevant e-mails</b>	About 1 million	959,102 Identified as relevant	N/A	9,000	88	23	<ul style="list-style-type: none"> <li>No further action: 17</li> <li>Covered in existing CR: 6</li> <li>New issues or CR: 0</li> </ul>
			Keyword search 178,831	20,853	828	179	<ul style="list-style-type: none"> <li>No further action: 54</li> <li>Covered in existing CR: 76</li> <li>Referred to employee concerns or litigation: 33</li> <li>New issues or CR: 4</li> </ul>
<b>Review of nonrelevant e-mails</b>	About 13 million not identified as relevant	237 Key staff 332,447	32 Key staff 69,516 e-mails	695	7	1	<ul style="list-style-type: none"> <li>No further action: 1</li> <li>New issues or CR: 0</li> </ul>
				4,500	14	14	<ul style="list-style-type: none"> <li>No further action: 7</li> <li>Covered in existing CR: 4</li> <li>Referred to litigation: 2</li> <li>New issues or CR: 1</li> </ul>
<b>Review of all e-mails</b>	About 14 million	14 million		25,055	198	111	<ul style="list-style-type: none"> <li>No further action: 96</li> <li>Covered in existing CR: 13</li> <li>New issues or CR: 2</li> </ul>
<b>Totals</b>	<b>About 14 million</b>			<b>60,103<sup>a</sup></b>	<b>1,135</b>	<b>328</b>	<ul style="list-style-type: none"> <li>No further action: 175</li> <li>Covered in existing CR: 99</li> <li>Referred for action: 35</li> <li>New issues or CR: 7</li> </ul>

Source: GAO analysis of estimates provided by DOE

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Source: *Yucca Mountain Project: Information on Project Costs, Briefing to the Chairman of the Federal Workforce and Agency Organization Subcommittee, the Committee on Government Reform, U.S. House of Representatives, October 23, 2006. GAO-07-297R.*



# Infiltration AMR Findings

- **The infiltration AMRs prepared by the USGS and by BSC were not fully compliant with the traceability and transparency requirements of *Quality Assurance Requirements and Description***
- **Quality assurance processes were not always effective**
  - **Multiple CRs were written on infiltration products after review and acceptance**
  - **Some of the data files were not available and the infiltration rate estimates and maps could not be reproduced without further support from USGS**
- **The infiltration AMR is being redone by Sandia National Laboratories to ensure quality assurance requirements are fully implemented before inclusion in the license application**



# Programmatic Issues

- **Reporting of the USGS e-mails as a condition adverse to quality was not timely**
- **Issues with infiltration products were identified multiple times, but corrective actions were not completely effective in preventing recurrence**
- **Trending was not effective in identifying recurring and systemic issues with the infiltration products**
- **The infiltration work products are being reworked to ensure accuracy, transparency, and traceability**



# Summary

- **USGS net infiltration rates are corroborated by data from the southwestern United States and therefore support the Site Recommendation**
- **A negative attitude toward quality assurance, or willful noncompliance with quality assurance requirements, displayed by some USGS employees was not pervasive across OCRWM**
- **Sandia National Laboratories is developing new infiltration rate estimates and maps, incorporating net infiltration uncertainty, and redoing the infiltration AMR to ensure full traceability and transparency**
- **The root cause report and associated action plan are being finalized and will be released in the near future**

