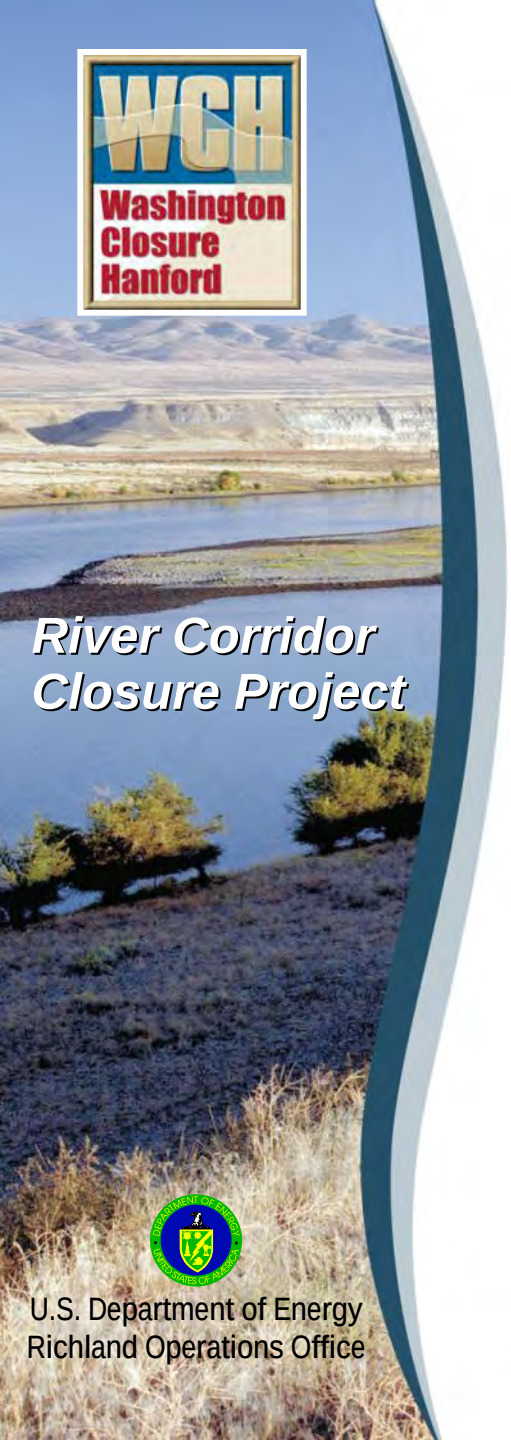


River Corridor Closure Project

U.S. Department of Energy
Richland Operations Office

324 Soil Contamination

Update for River and Plateau Committee

Mark French
DOE-R

Don McBride
Washington Closure Hanford

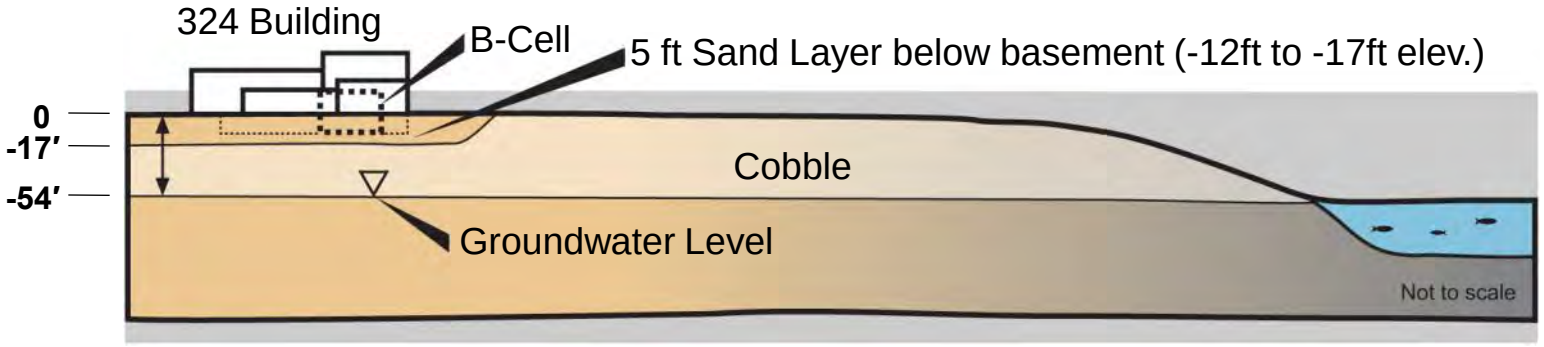
April 18, 2012

324 Building

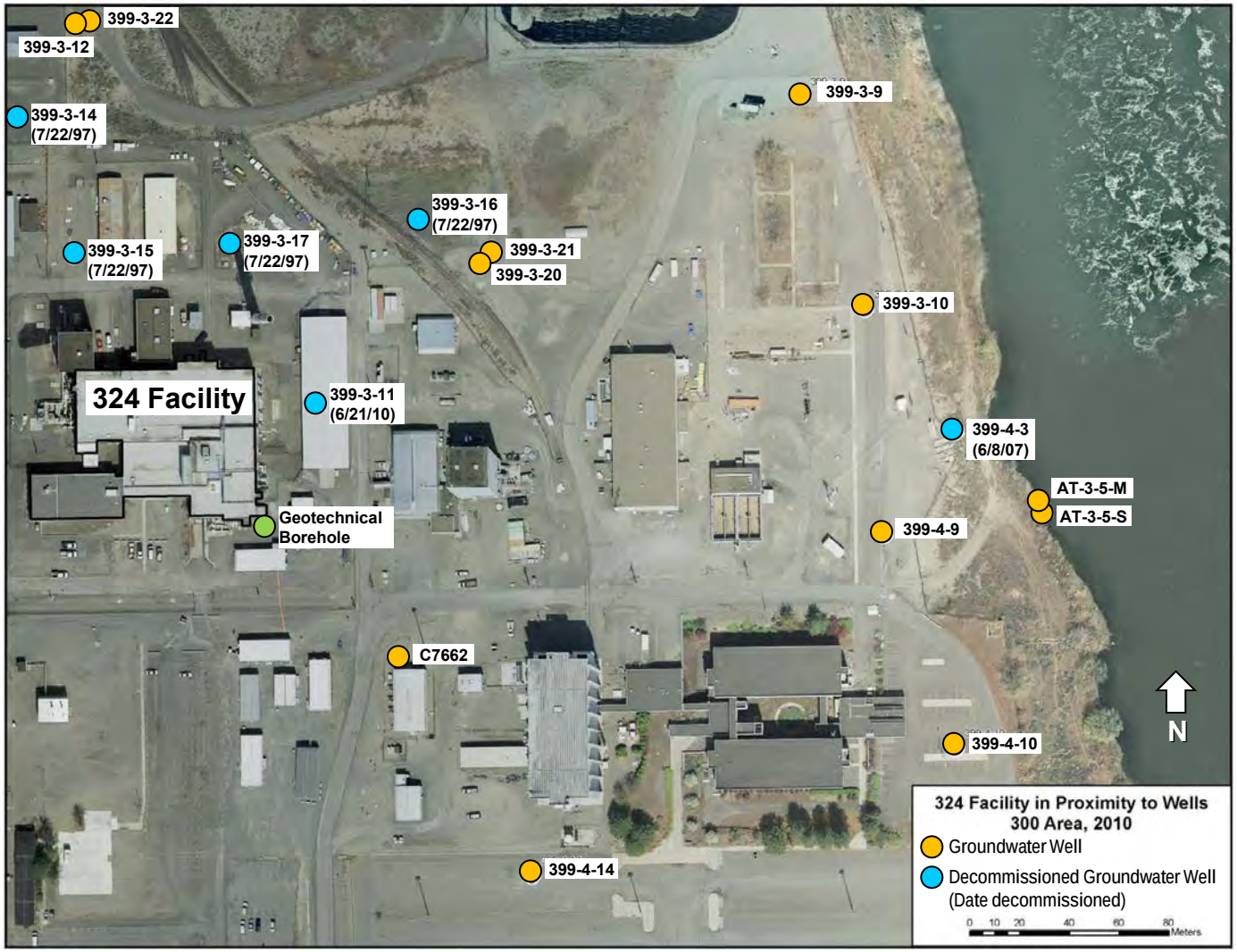
324 Facility Background

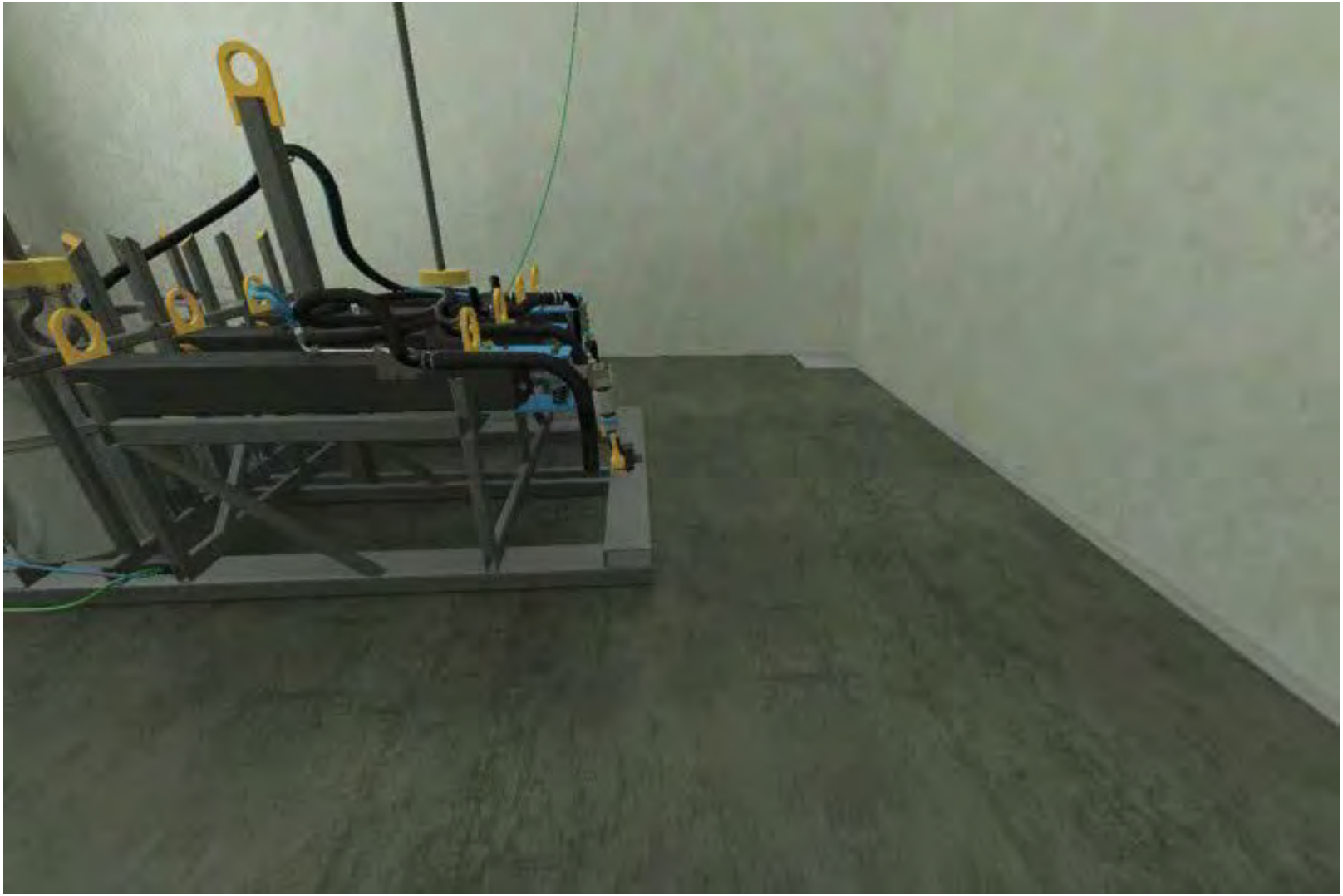
- Hazard Category 2 Nuclear facility
- The 324 Building is located in the 300 Area and began operation in 1965, ceasing research operation in 1996
- 324 is the most complex and hazardous research facility being demolished along Hanford's river corridor
- Hot cells are contaminated from research with high-levels of radioactive material
- A significant spill occurred in B-Cell in the mid-1980s
- B-Cell cleanout and stabilization conducted from mid-1990s through 2010

324 Facility Background



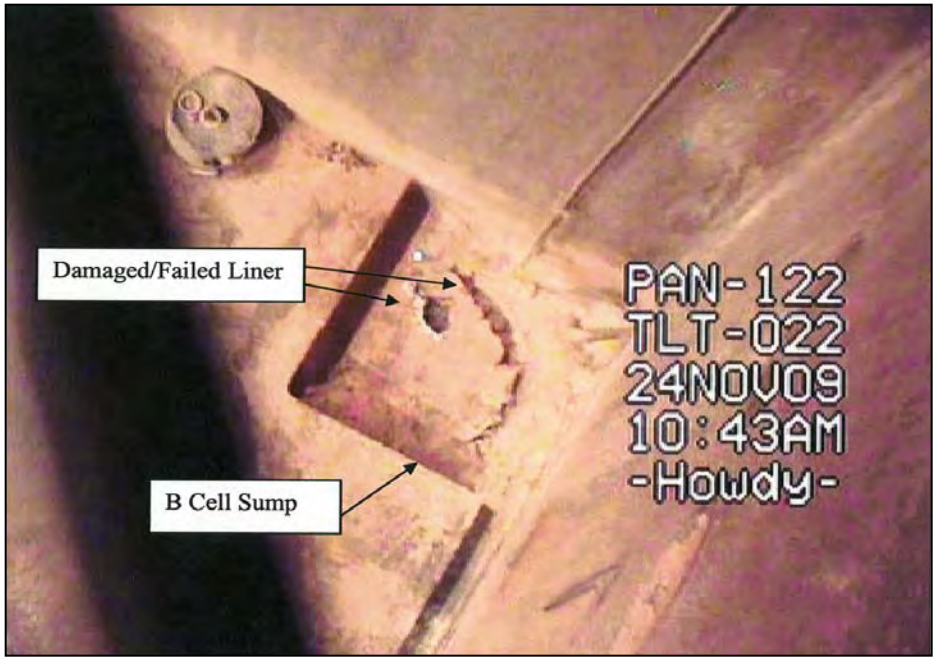
Location of Groundwater Wells





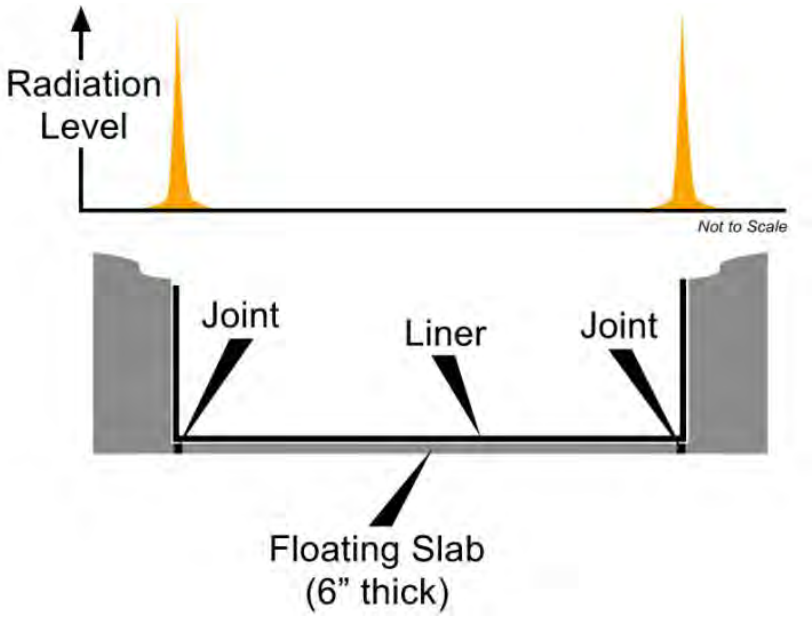
Soil Contamination

- Grout removed from B-Cell trench and sump (November 2009) uncovered a breach in the liner
- Dose profile of B-Cell floor showed 14,400 R/hr at failed location in sump floor
- Breach constituted a changed condition
- Planning began to determine if a new hazard was located beneath the building



Soil Contamination (cont'd)

- Installed closed casings using Geoprobe through sand under B-Cell to gather dose measurements
- November 2010 obtained reading from closed casing as high as 8,900 Rad/hr
- High dose measurements following the plane of the B-Cell floor expansion joint perimeter
- Little or no contamination detected beneath center of cell or outside cell footprint
- Established environmental controls to ensure the hazardous material does not pose a risk to workers



Soil Contamination (cont'd)

- Additional characterization performed with larger push unit to determine bottom edge of contamination plume
- Physical samples retrieved in June 2011 for laboratory analysis after extensive mockups and practice with long-handled tooling and containment sleeving
- Two samples collected/analyzed from different elevations under the sump
- Sample results indicate that the highly contaminated soil can be retrieved and packaged in a form that should be suitable for disposal at ERDF

Remediation Alternative Study

- During soil characterization efforts, technical team established to evaluate remediation alternatives
- Technical team chartered to:
  - Establish grading criteria early in the process (eliminate biased thinking)
  - Search the DOE complex and beyond for remediation methods
  - Shortlist the applicable remediation methods then apply the grading criteria once laboratory data became available

Shortlist of Remediation Alternatives

Removal Alternatives from within 324

- **Alternative A**
  - Soil removed through B Cell
  - Use a combination of remote excavator and soil vacuum
- **Alternative B**
  - Soil stabilized in place (jet-grout)
  - Removed through B Cell using a remote excavator
- **Alternative C**
  - Soil removed through B Cell
  - Use a mud-rotary drill with grout as a lubricant
- **Alternative D**
  - Soil stabilized in place (jet-grout)
  - Removed through B Cell using a combination of remote excavator, air knife, and soil vacuum

Alternatives A thru D each have two disposal paths:

- Soil mixed with grout and placed into waste containers or
- Soil mixed with grout and pumped into C and D Cells as monoliths

Shortlist of Remediation Alternatives (cont.)

Removal Alternatives from Outside of 324

- **Alternative E**
  - New Nuclear Category 3 Facility constructed adjacent to the 324 Building
  - Soil removed into new facility using a horizontal mud-rotary drill with grout as a lubricant
- **Alternative H**
  - Grout injected into the soil through B Cell
  - After 324 Building D4, horizontal steel members placed through the grouted soil
  - Grouted soil and below-grade portion of B Cell removed as a very large monolith

Alternative E has two disposal paths similar to A thru D:

- Soil mixed with grout and placed into waste containers or
- Soil mixed with grout and pumped into C and D Cells as monoliths

Shortlist of Remediation Alternatives (cont.)

Stabilize In-Situ and Cap

- **Alternative P**
  - Grout injected into the soil through B Cell
  - Below-grade portion of B Cell and stabilized soil left in place and a cap constructed over the area
- **Alternative Q**
  - Horizontal barrier system installed below contaminated soil
  - Below-grade portion of B Cell and stabilized soil left in place and a cap constructed over the area
- **Alternative R**
  - After 324 Building D4, electrodes placed through B Cell floor into soil for in-situ vitrification
  - New structure constructed to capture and treat off-gassing
  - Vitrified soil left in place and cap constructed over the area

Remediation Alternative Selection

- Detailed evaluation performed of the Remediation Alternatives considering:
  - Radiation and Industrial Safety, ALARA, Contamination Control
  - Air Impacts, Nuclear Safety, QA, Readiness Assessment
  - Waste Packaging/Transportation/Treatment/Disposal
  - Proven Technology, Ability to Construct, Duration, Cost
- Recommended Alternative: Removal from within 324 B-Cell
  - Solidify soil in C/D Cells for disposal as monoliths
- Recommendation based on Remediation Alternatives Evaluation Report

324 Work in Progress – Current Timeline

• Establish Remediation Methodology Grading Criteria	Complete
• Collect Soil Samples – Perform Analysis	Complete
• Develop Remediation Alternative Report	Complete
• Decision Point for Utilization of Building	Complete
• Issue Expression of Interest	Complete
• Produce Fate and Transport Report	January
• DOE HQ TAG review of Remediation Report	February
• Selection of Remediation Methodology	February
• Issue Request for Proposal	May
• Receive Proposals from Bidders	June
• Complete HQ and Corporate Review	TBD

Path Forward

- Preparing building for operations readiness
- RFP development for removal in process
  - Expression of Interest closed January 25, 2012
  - Prequalification questionnaire responses received April 2, 2012
  - Developing scope of work with flexibility allowing bidders to propose varying approaches within established parameters
  - Proposals due in June 2012
- Award Subcontract after 60 day review
  - Assumes DOE HQ review/approval