



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# TAN Groundwater Update Citizens Advisory Board

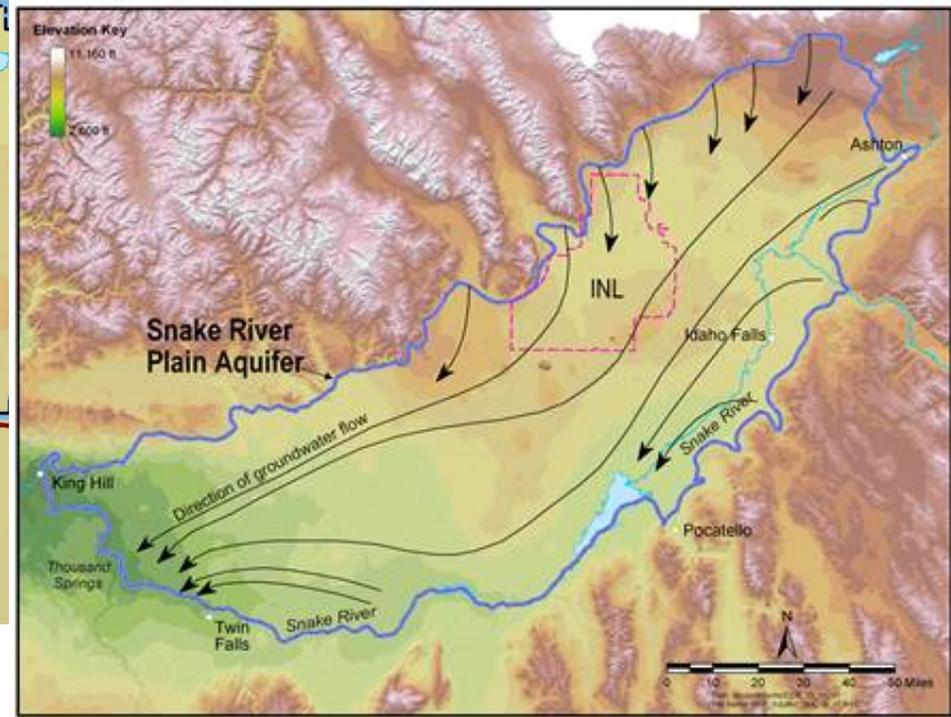
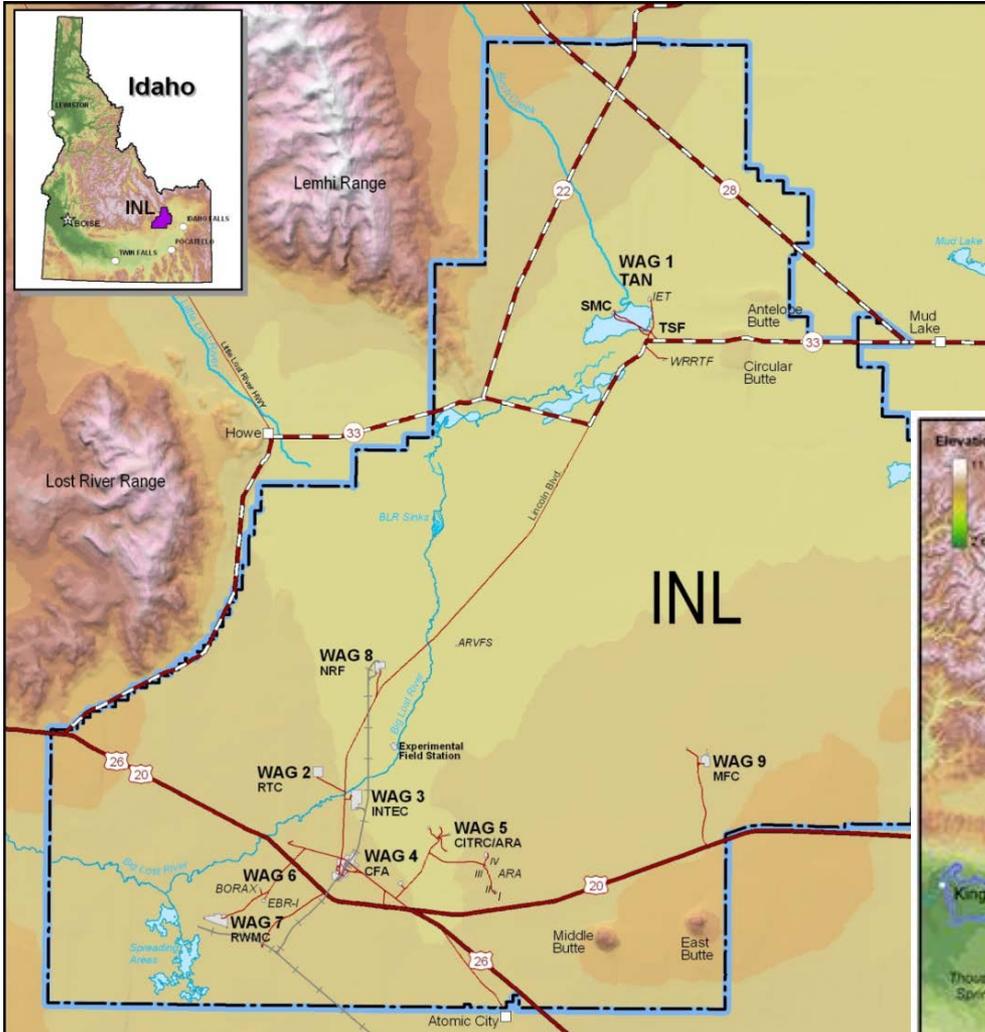
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**Nicole Badrov**

*Project Manager*

Idaho Cleanup Project

**April 8, 2015**



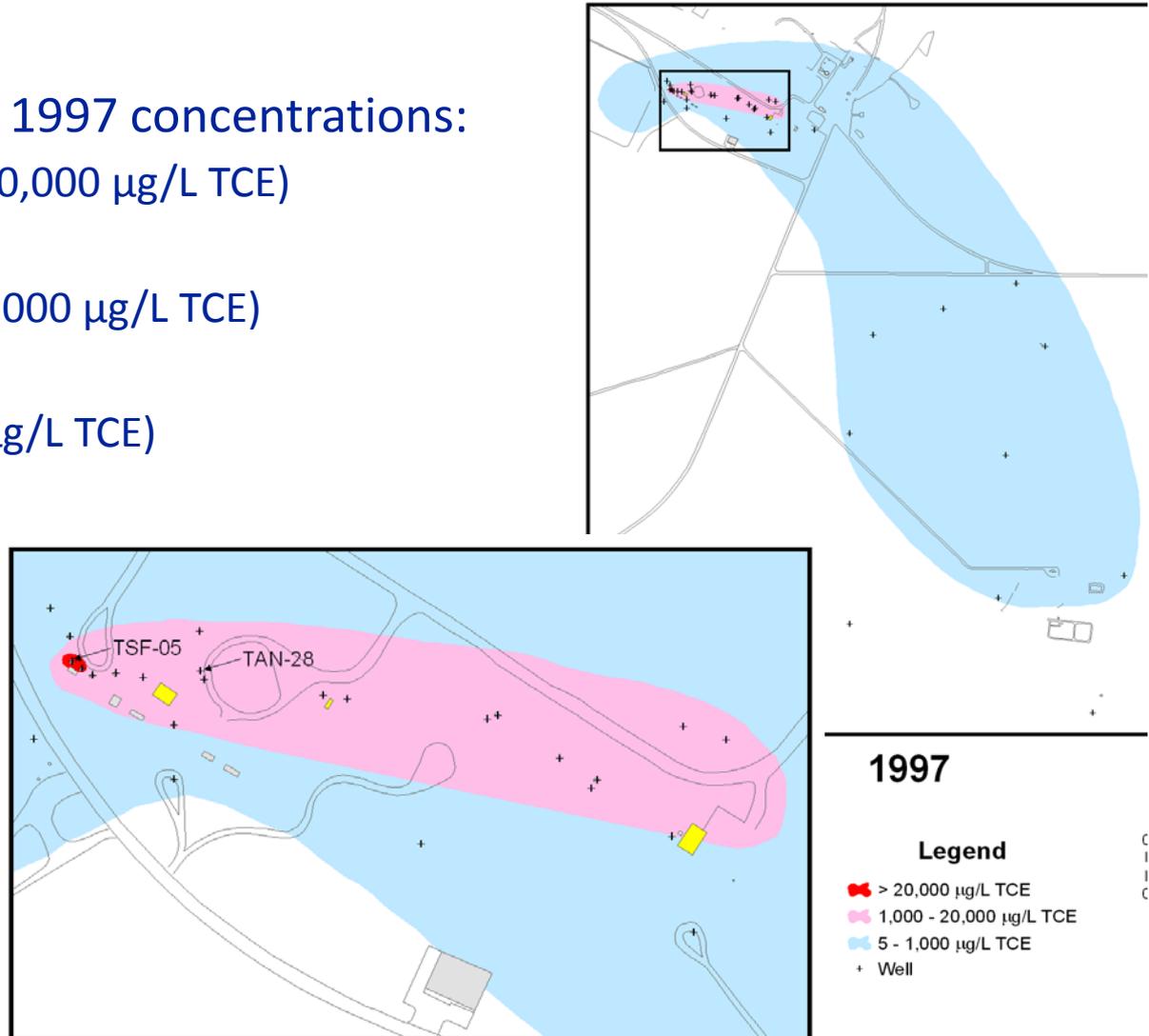
# *Test Area North*



# Three Plume Zones 1997

Zones based on 1997 concentrations:

- Hot spot (>20,000 µg/L TCE)
- Medial zone (1,000 to 20,000 µg/L TCE)
- Distal zone (5 to 1,000 µg/L TCE)



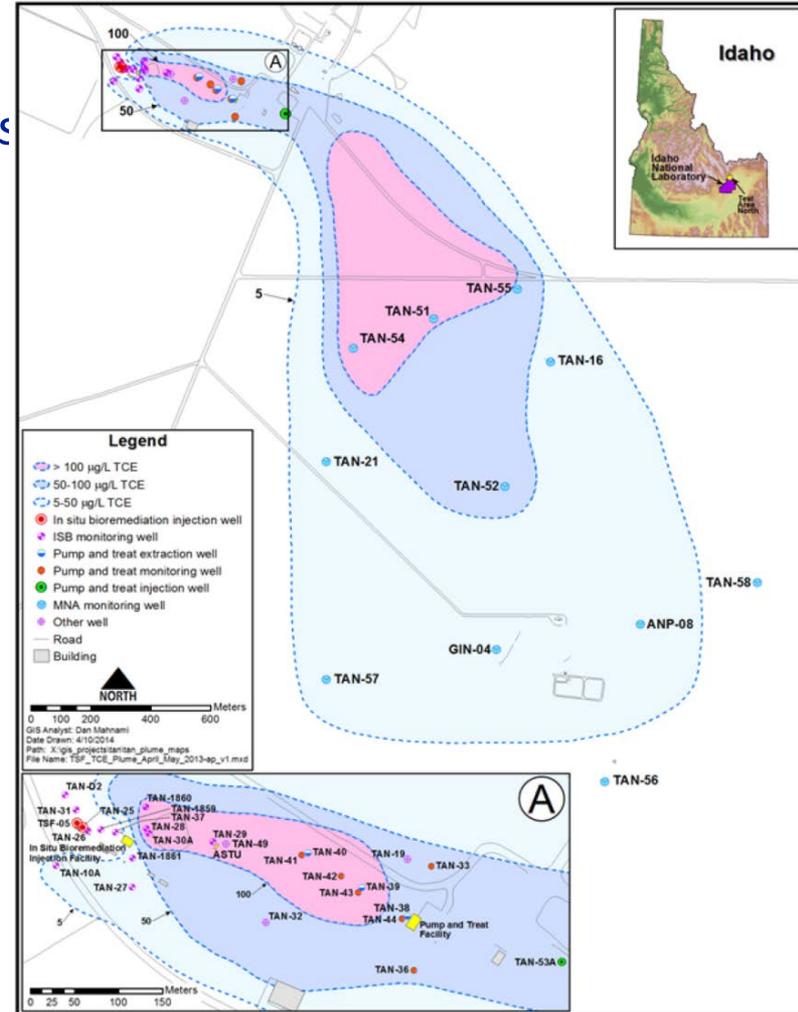
# *Three Remedy Components*

- **In situ bioremediation (ISB)** – Injects food source (whey/lactate) into *hot spot* to feed naturally occurring microbes that degrade volatile organic compounds (VOCs).
- **Pump and treat** – Strips VOCs out of groundwater pumped from the *medial zone* using the New Pump and Treat Facility (NPTF)
- **Monitored natural attenuation (MNA)** – TCE concentrations in the *distal zone* are monitored to determine if MNA will be effective
  - Expected to meet cleanup level by 2095
  - Plume allowed to expand by 30%.

# Distribution of TCE 2014

## Plume based on 2014 concentrations

- Hot spot (<math>< 10 \mu\text{g/L TCE}</math>)
- Medial zone (50 - to 1,100  $\mu\text{g/L TCE}</math>)$
- Distal zone (5 to 123  $\mu\text{g/L TCE}</math>)$



# *ISB Rebound Test*

- ISB Rebound Test was initiated in July, 2012 after 13 years of ISB treatment.
- Objectives of the ISB Rebound Test:
  - Determine if a residual source of TCE remains after ISB injections stopped
  - Determine if there is a vadose zone source of TCE that is impacting groundwater
  - Determine if radionuclide trends for Sr-90 and Cs-137 will trend lower after ISB treatment is stopped
  - Determine the cause of persistent high TCE concentrations in TAN-28

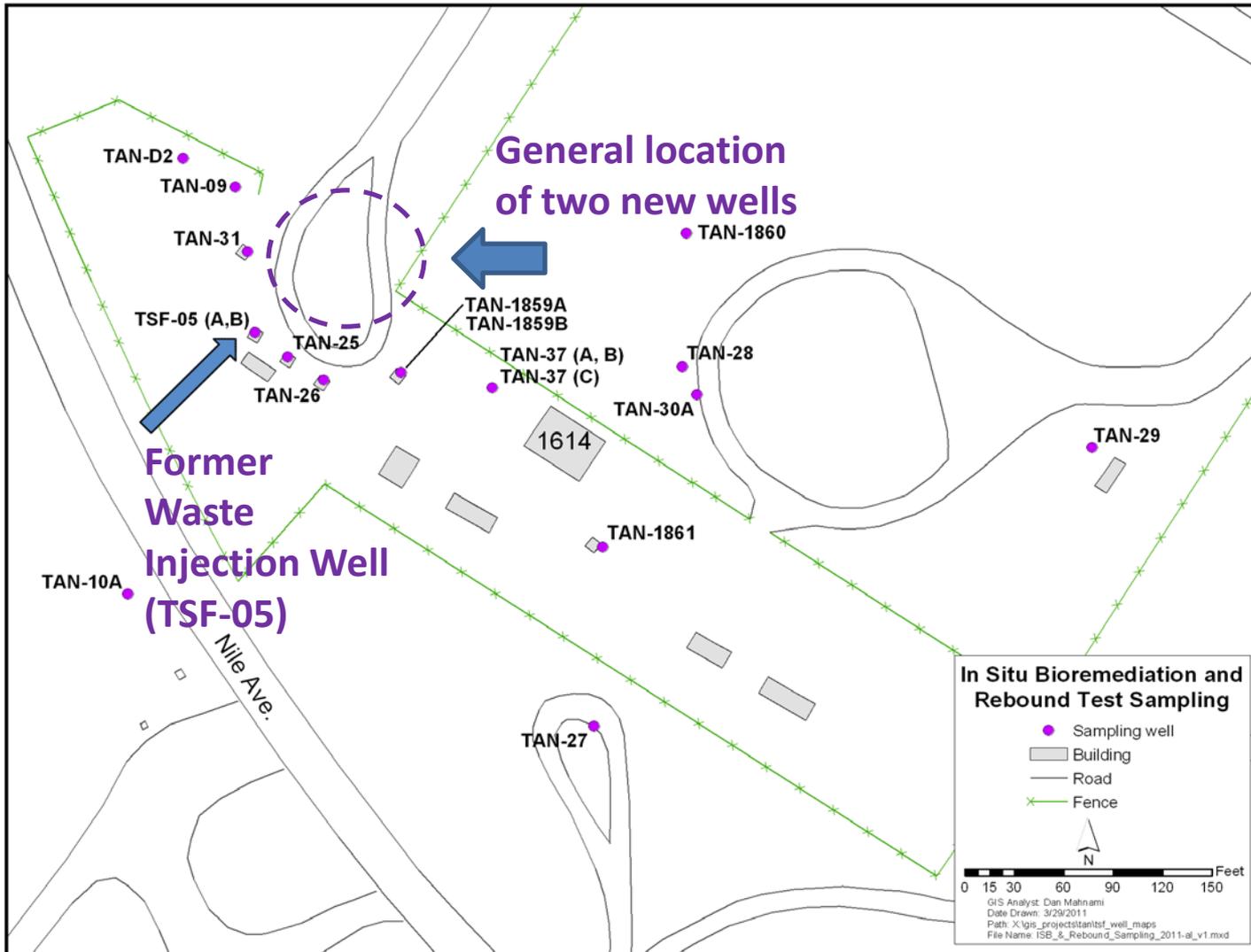
# *ISB Rebound Test Results*

- ISB Rebound Test Results:
  - Conditions are slowly changing, but more time is needed for conditions to return to background redox conditions (conditions existing prior to starting ISB) in order to assess the residual source of TCE.
  - A vadose zone source of TCE is not significantly affecting the aquifer and no additional vadose zone investigation is required at this time.
  - Radionuclide trends for Sr-90 and Cs-137 not trending lower due to cations produced from the ISB amendment competing with radionuclides for adsorption sites.
  - TCE levels still remain high at TAN-28 suggesting an untreated source that has not been impacted by the ISB treatment.

# *Overall Status*

- Rebound test will be extended several years.
- Revised Rebound Test Plan was submitted for Agency review mid-February
- Additional monitoring/injection wells will be installed in the suspected TAN-28 TCE source area during the 2015 field season.
  - Wells will be drilled by USGS with CWI RadCon and technical support
- Ground water pump and treat facility continues to be operated 4 days per week
- Monitoring of all three plume zones continues to ensure that Remedial Action Objectives will be met by 2095.

# TAN Hot Spot Area



# *Schedule*

- Finalize ISB Rebound Test Plan (Spring 2015)
- Install two wells in target area (Spring/Summer 2015)
- Geophysical logs of each well (Summer 2015)
- Sample newly installed wells (Summer 2015)
- Based on sampling, determine ISB injection strategy (Fall 2015)
  - Inject into one or both wells
  - Evaluate ISB injection frequency and amendment
  - Sampling strategy to optimize injections
- Perform ISB injections until area is successfully treated (Start Fall/Winter 2015)

# Dashboard Summary

Key Questions	Dashboard Indicator	Comments
Impact on budget for activity/cleanup		Project continues to be ahead of schedule and under budget
Impact on employment/economic development		CWI has maintained employment for ER activities
Affect on agreements		Milestones have been met in accordance with the FFA/CO and supporting documents
Impact on safety and environment		Clean-up activities and GW monitoring continue to progress
Impact on cleanup DOE-wide		Clean-up accomplishments reflect positively on DOE complex