



INL CERCLA Five-Year Review

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Soil and Groundwater Remediation

January 28, 2021



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What We'll Cover

Five-Year Review Purpose and Evaluation Process

Summary of Results of the Five-Year Review

- Source of contamination and status of remedial actions
- Technical assessment summary
- Issues and actions identified
- Protectiveness determination

DOE/ID-12034
Revision 0

Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site— Fiscal Years 2015–2019

January 2021



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Schedule Status

| Activity | Deadline |
|--|-----------------------------|
| <input checked="" type="checkbox"/> Notify CAB | February 27, 2020 |
| <input checked="" type="checkbox"/> Publish public notice | February 28, 2020 |
| <input checked="" type="checkbox"/> Compile data | October 2019 - May 31, 2020 |
| <input checked="" type="checkbox"/> Submit Draft for internal review | July 29, 2020 |
| <input checked="" type="checkbox"/> Submit Draft for Agency review | September 28, 2020 |
| <input checked="" type="checkbox"/> Submit Draft Final for Agency review | December 14, 2020 |
| <input checked="" type="checkbox"/> Submit Final to Agencies | January 20, 2021 |
| <input checked="" type="checkbox"/> Brief CAB | January 28, 2021 |
| <input type="checkbox"/> Receive EPA's letter of concurrence | February 7, 2021 |
| <input type="checkbox"/> Publish Public Notice | February 2021 |

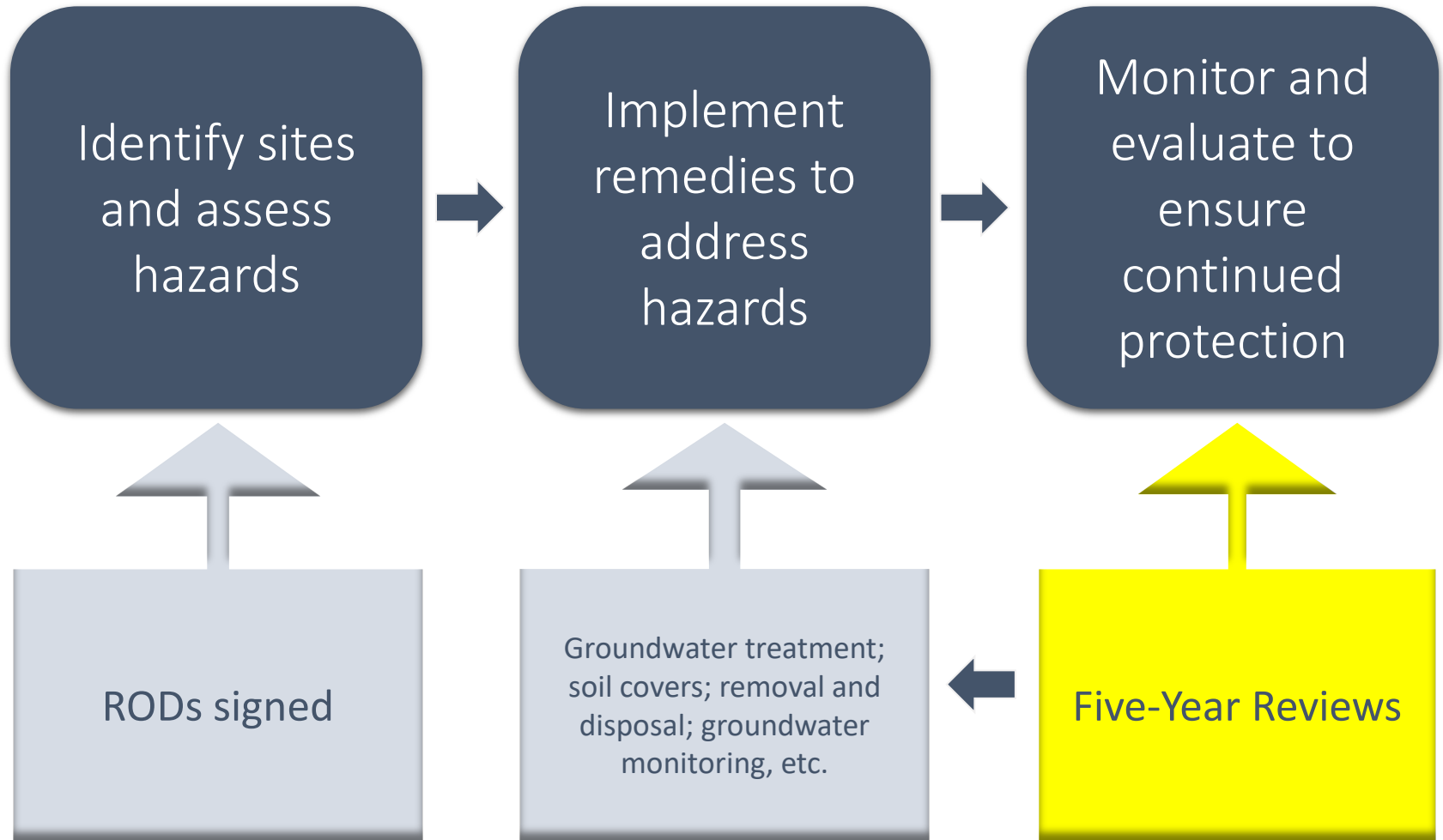


Purpose of a Five-Year Review

- The purpose of a five-year review is to evaluate the implementation and performance of a CERCLA remedy in order to determine if it is, or will be, protective of human health and the environment
- Five-Year Reviews must be conducted no less than every 5 years
- Identifies issues and recommends actions to improve performance where necessary



Five-Year Reviews and the CERCLA Process



Major Steps Identified by EPA Guidance

Gather information

Assess Progress
Since Last Review

Technical
Assessment

Issues/
Recommendations

Protectiveness
Determination



United States
Environmental
Protection Agency

Office of Emergency
and Remedial
Response (5204G)

EPA 540-R-01-007
OSWER No. 9355.7-03B-P
June 2001

Superfund

Comprehensive Five-Year Review Guidance

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, D.C. 20460

URL: <http://www.epa.gov/superfund/pubs.htm>
Superfund Information 1-800-424-9346



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Is the Remedy Protective?

Protective

Short-Term Protective

Will be Protective

Protectiveness Deferred

Not Protective

EPA Guidance requires one of five protectiveness statements for each Operable Unit



Roles and Responsibilities



DOE-ID

- Lead Agency, conducts the review, prepares report, submits to Agencies for review and approval



Idaho DEQ

- Reviews and comments



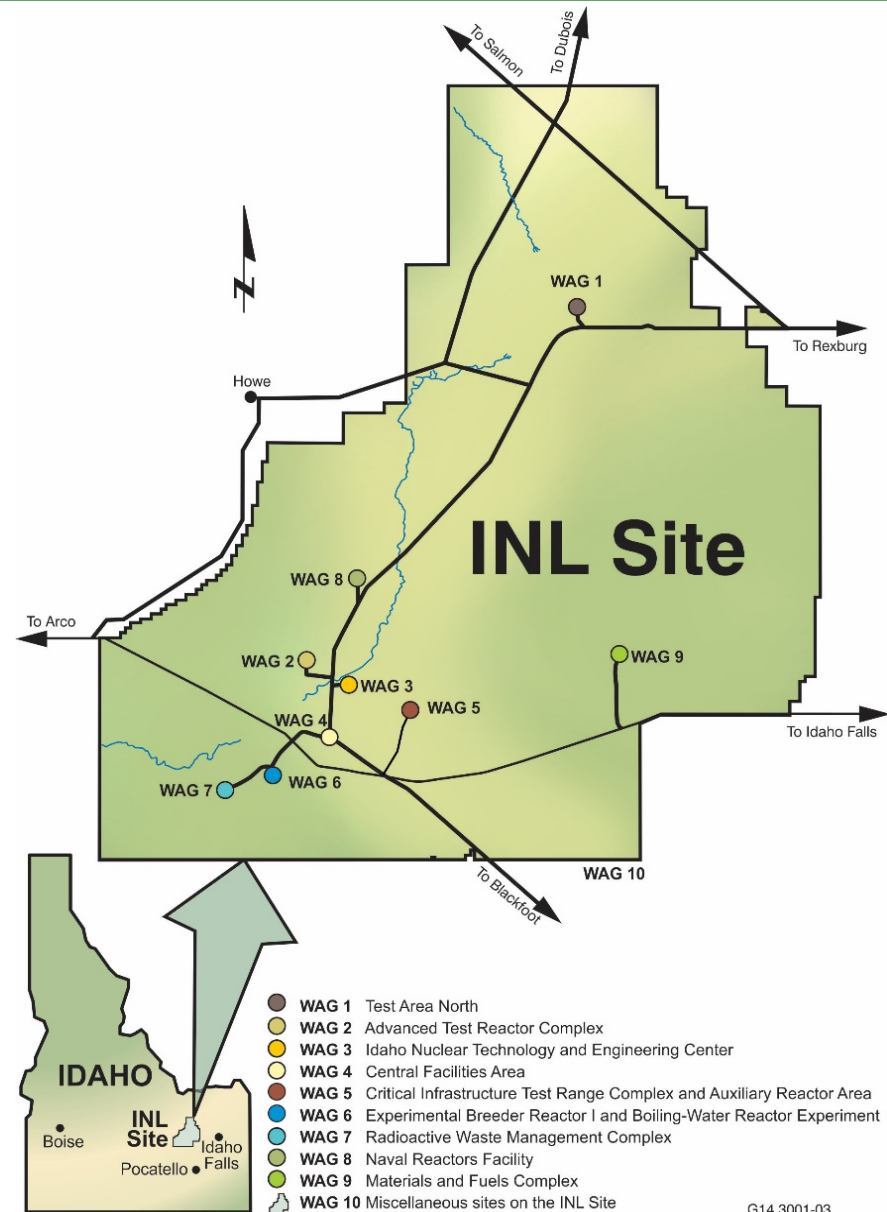
EPA

- Reviews and comments
- Concurs with lead agency or issues separate findings
- Retains final authority regarding the protectiveness of remedies



Scope of the FY2015 - FY2019 Five-Year Review

- Covers FY2015 – FY2019
- Assess CERCLA response actions for sites (Operable Units) where contamination remains above levels that would prevent unlimited use/unrestricted exposure



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WAG 1 – Test Area North (TAN)

Record of Decision (ROD) for OU 1-07B

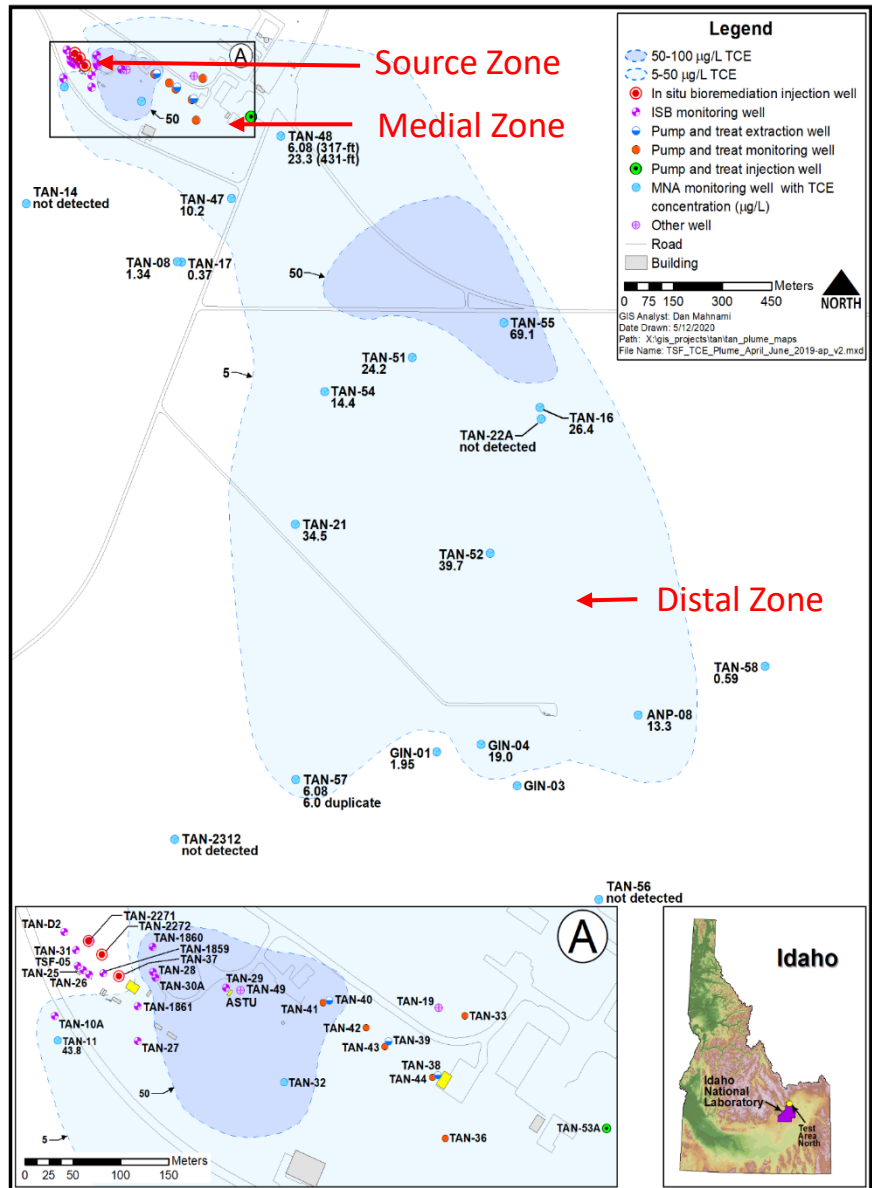
- Addresses groundwater contamination from an injection well in the source zone used from 1953 to 1972

Primary Groundwater Contaminants of Concern (COC)

- Trichloroethylene (TCE)
- Strontium-90 (Sr-90)
- Cesium-137 (Cs-137)

Technical Assessment

- Remediation is active/ongoing
- Evaluated groundwater monitoring and operations data for the remedy components
 - In-Situ Bioremediation (Source Zone)
 - Pump and Treat (Medial Zone)
 - Monitored Natural Attenuation (Distal Zone)
- Two issues identified

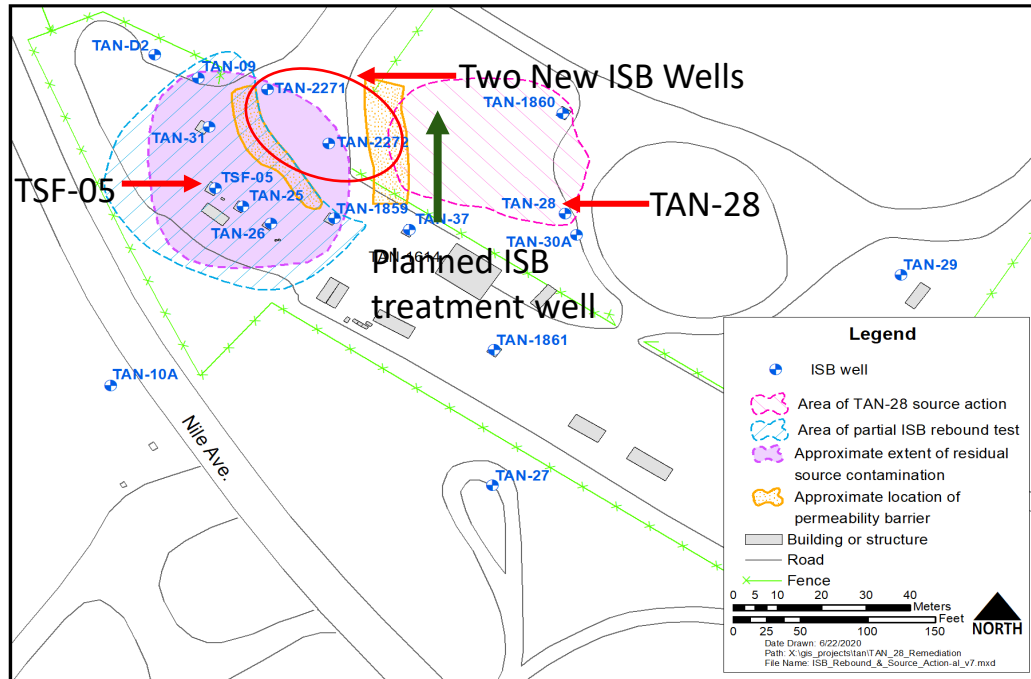


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WAG 1 – Issues from 5YR



ISSUE 1 – TAN: TCE concentrations have not decreased at monitoring well TAN-28 downgradient from the Source Zone

Actions taken

- Installed two new In Situ Bioremediation (ISB) treatment wells in 2015
- Performed ISB treatment in new wells upgradient

Actions planned

- Drill an additional treatment well in 2021

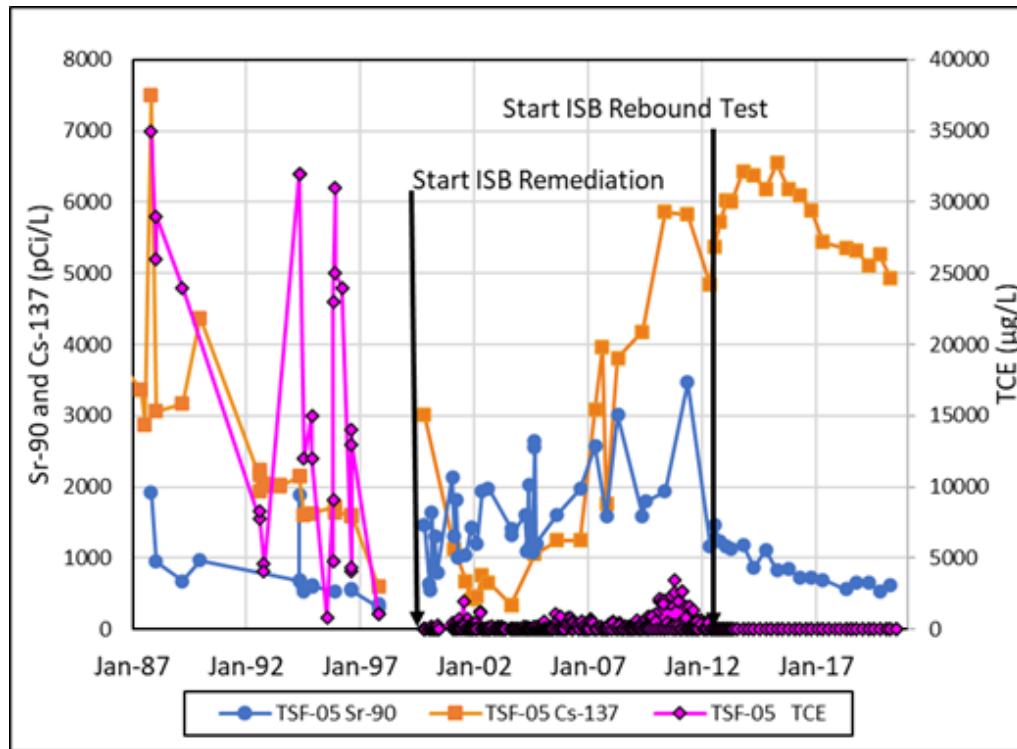


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WAG 1 - Issues from 5YR (con't)



ISSUE 2 – TAN: Although radionuclide concentrations are generally decreasing, they remain high at several locations compared to their pre-ISB concentrations

Actions

- In Situ Bioremediation (ISB) rebound test is in progress
- As conditions created by ISB dissipate in the aquifer, evaluate the radionuclide levels



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Summary WAG 1 - TAN

Summary

- The three remedy components are progressing toward achieving the Remedial Action Objectives by 2095

Recommended Actions for Issues

- Additional ISB treatment well to address the TAN-28 TCE source
- Radionuclide concentrations will be monitored to ensure that they are declining as expected

Protectiveness Determination

- The remedy will be protective upon completion



USGS Drilling Monitoring Well at TAN



Totes of ISB Treatment Amendment



ISB Treatment Injection into TAN-2271



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WAG 2 – Advanced Test Reactor Complex (ATR_x)

Record of Decision for OU 2-13

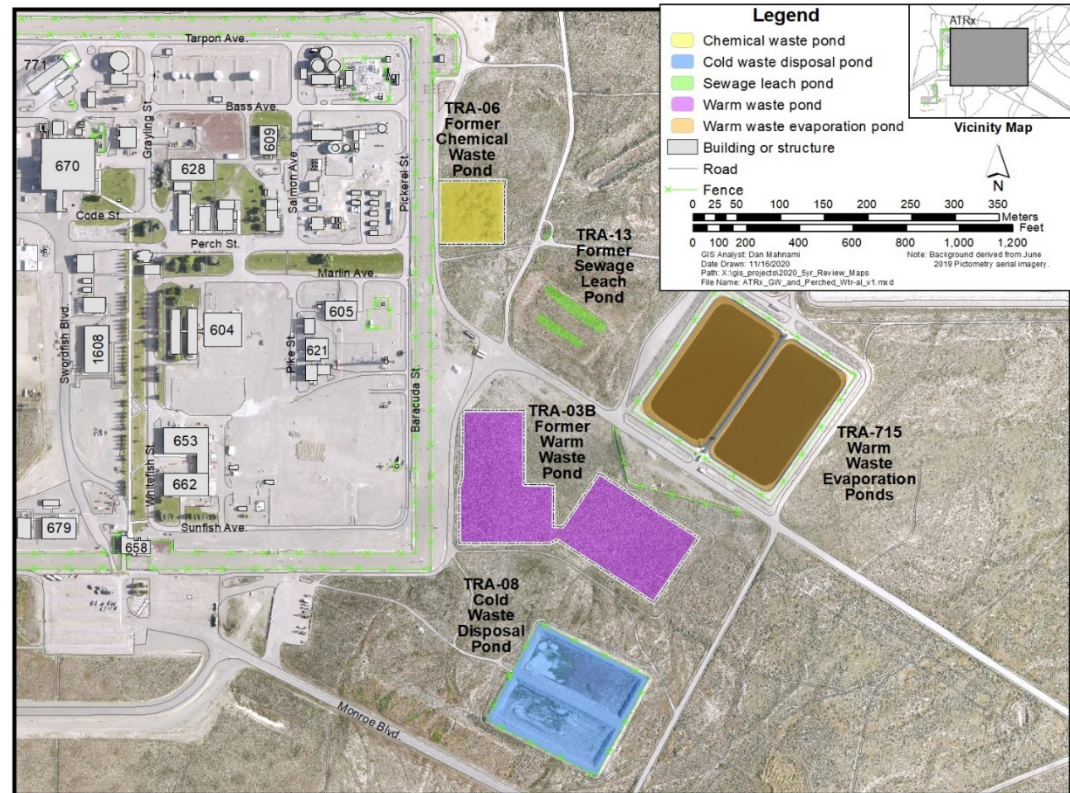
- Addresses contamination from former injection wells and former wastewater ponds

Primary Groundwater COCs

- Tritium, Cobalt-60, Strontium-90
- Chromium

Technical Assessment

- Active remediation is complete
- Evaluated perched and groundwater monitoring data



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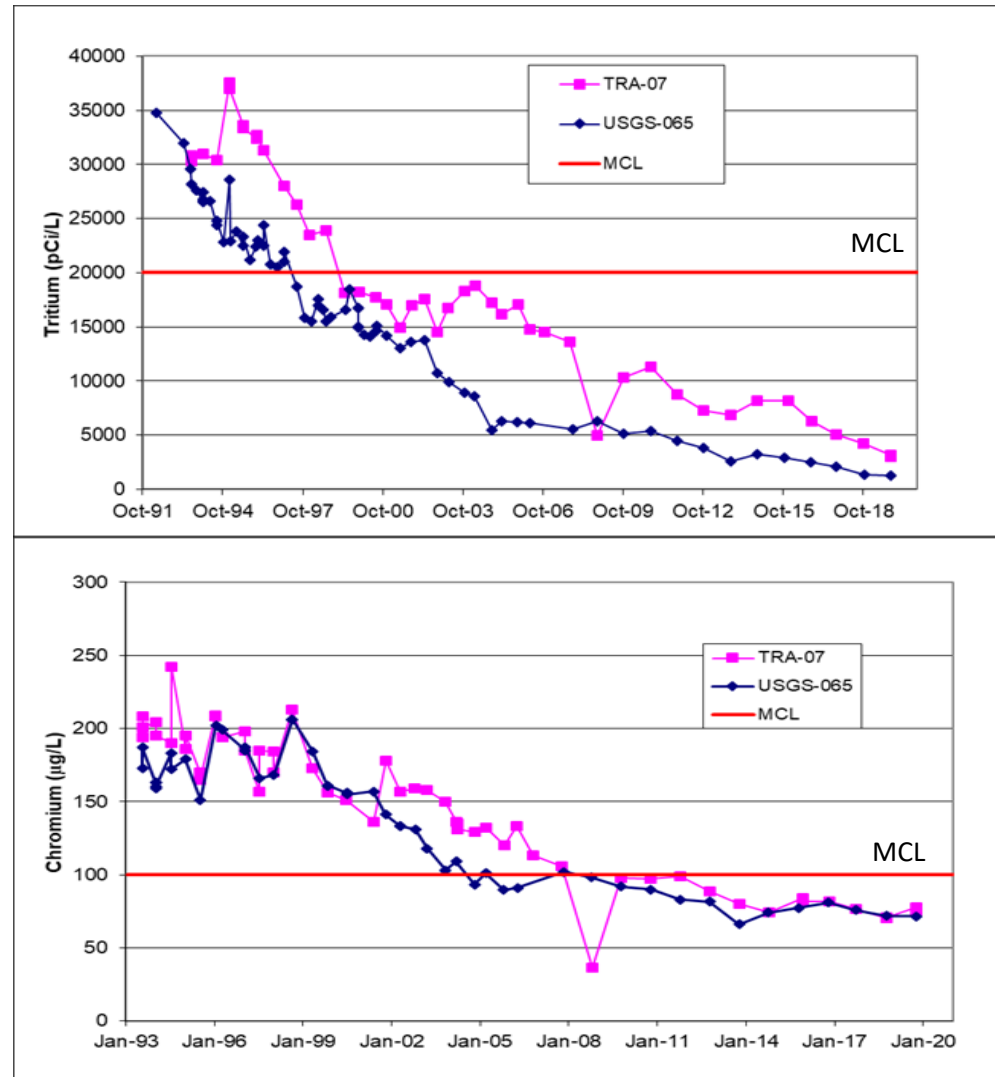
Summary WAG 2 – ATRx

Summary

- Remedies are functioning as intended
- Aquifer wells below Maximum Contaminant Levels for all COCs

Protectiveness Determination

- The remedy is protective
- No issues identified



WAG 3 – Idaho Nuclear Technology and Engineering Center (INTEC)

The CERCLA ROD for OU 3-14 addresses

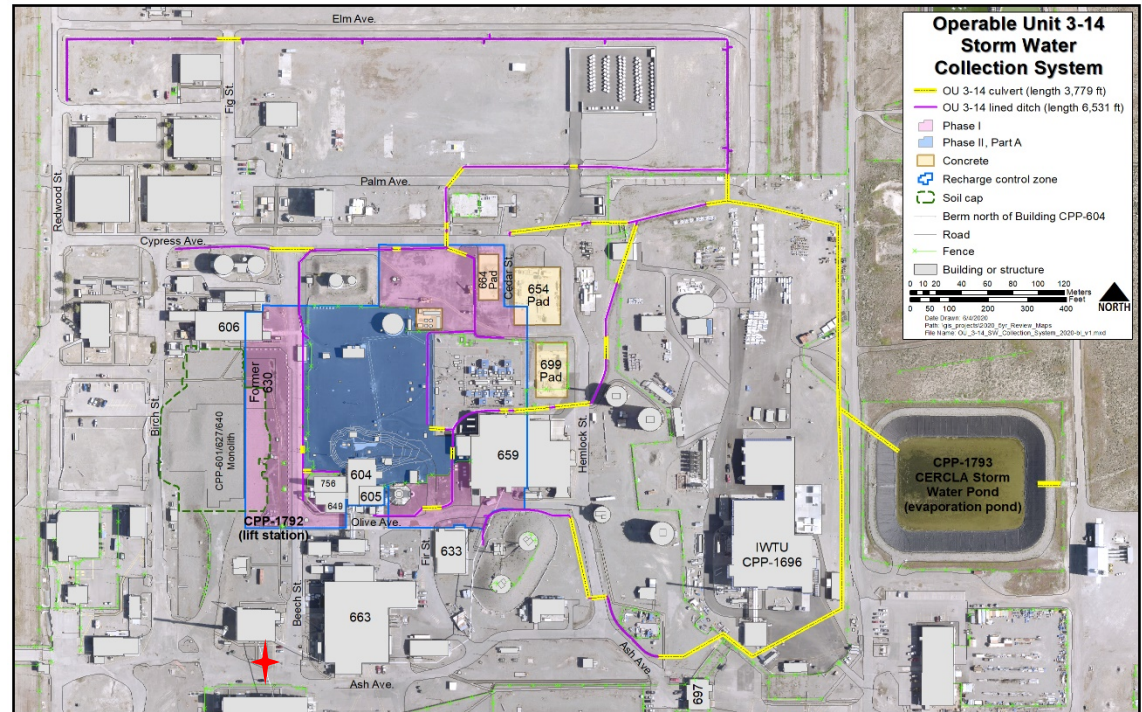
- Groundwater contamination from former injection well; soil and groundwater contamination from past industrial leaks

Primary groundwater COCs

- Strontium-90, Technetium-99, Iodine-129, Nitrates

Technical Assessment

- Remediation is active/ongoing
- Evaluated groundwater data and operations and maintenance of the remedy components



Remedy components

- Anthropogenic and surface water controls
- Low permeability pavement on/around Tank Farm
- Installation of final cap (estimated 2036)



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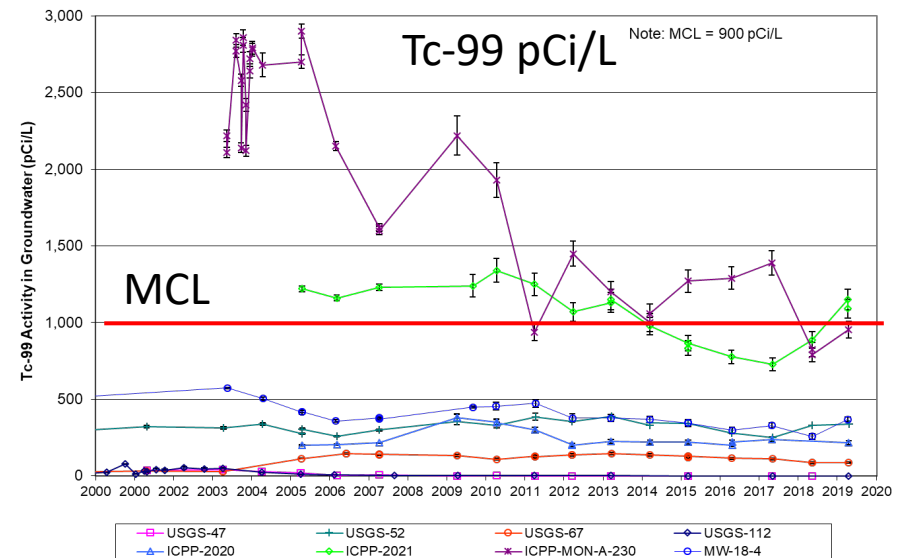
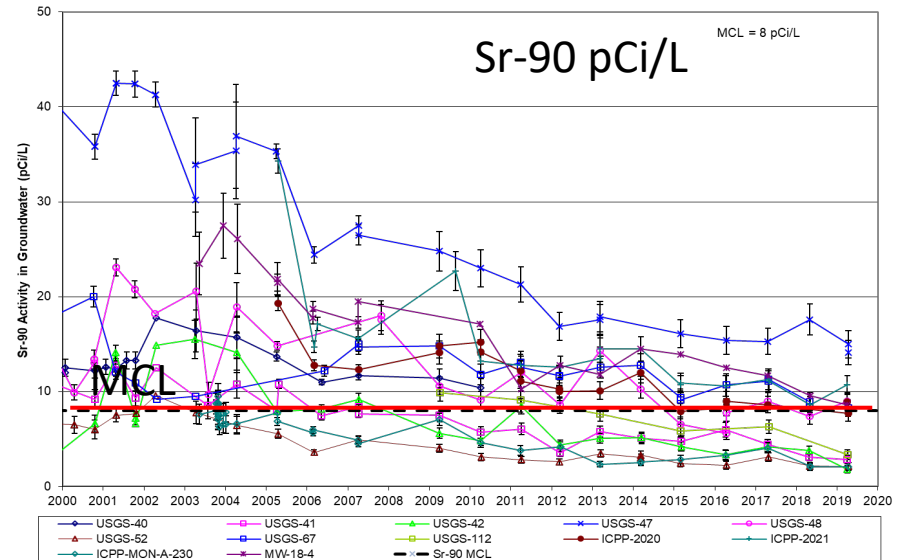
Summary WAG 3 – INTEC

Summary

- Concentrations of some COCs in both perched and aquifer wells are still above Maximum Contaminant Levels
- Trends show steady or declining levels

Protectiveness Determination

- The remedy will be protective upon completion
- No issues identified



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WAG 3 – Idaho CERCLA Disposal Facility (ICDF)



The CERCLA ROD for OU 3-13 addresses

- Contaminated soils/debris and selected onsite disposal at ICDF

Technical Assessment

- Remediation is active/ongoing
- Evaluated operations and maintenance of the disposal cell and evaporation ponds

Summary

- ICDF is operating in accordance with the OU 3-13 ROD
- No issues identified

Protectiveness Determination

- The remedy will be protective upon completion



WAG 4 – Central Facilities Area (CFA)

The CERCLA ROD for OU 4-12/13 addresses

- Nitrate groundwater contamination from the CFA-04 industrial wastewater pond and remedial actions for industrial landfills

Primary groundwater COC

- Nitrate

Technical Assessment

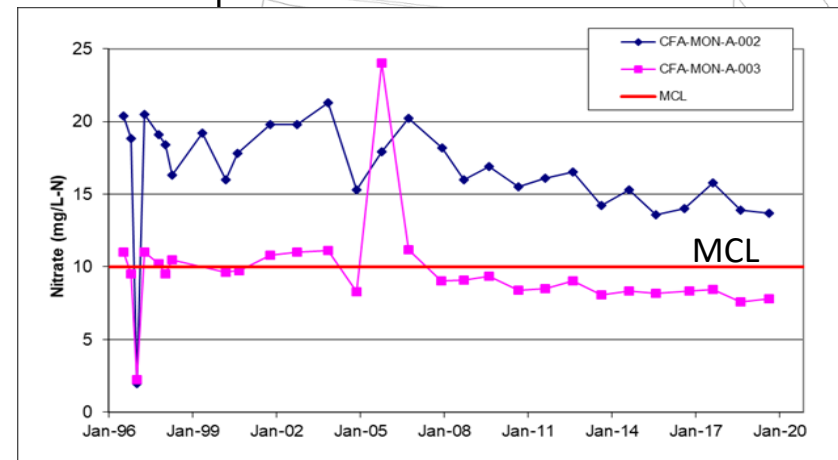
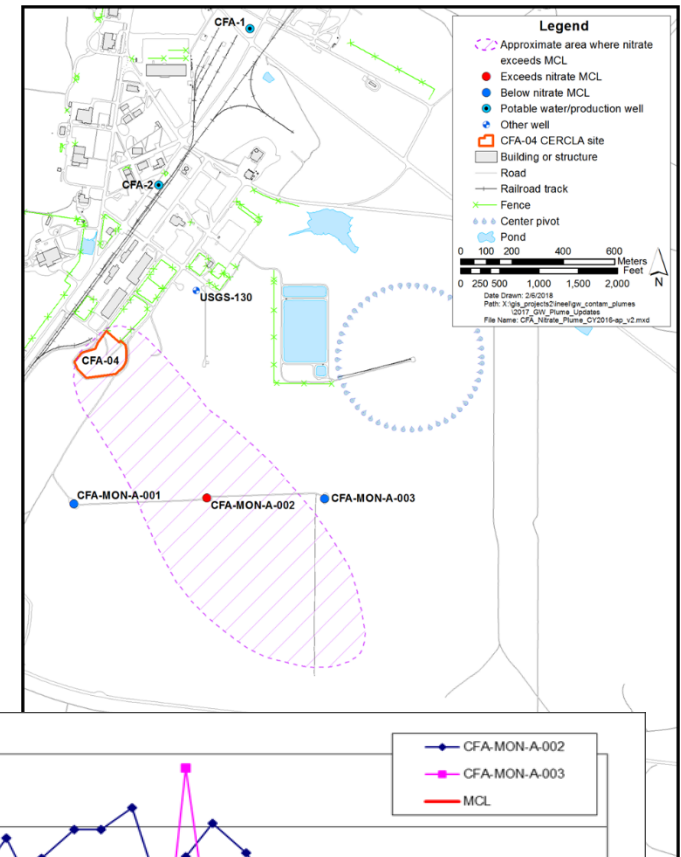
- Active remediation is complete
- Evaluated groundwater and vapor monitoring data

Summary

- One groundwater well exceeds Maximum Contaminant Level for nitrate

Protectiveness Determination

- The remedy is protective
- No issues identified



WAG 7 – Radioactive Waste Management Complex (RWMC)

The CERCLA ROD for OU 7-13/14 addresses

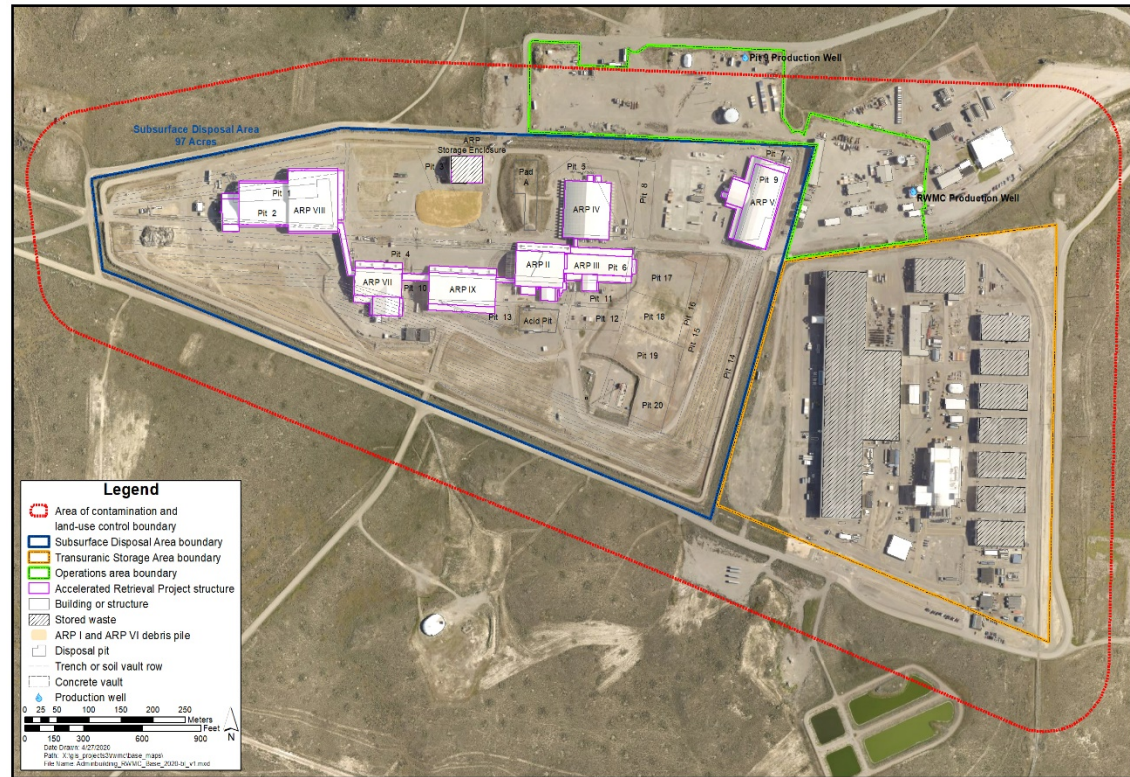
- Controlling the source of contamination (buried waste) in the SDA to prevent migration to the aquifer

Primary groundwater COCs

- Carbon Tetrachloride
- Technetium-99
- Transuranic nuclides

Remedy components

- Targeted waste retrieval
- Vapor vacuum extraction
- In situ grouting
- Cap construction



Technical Assessment

- Remediation is active/ongoing
- Evaluated vadose zone and groundwater monitoring data, ongoing operations of remedy components



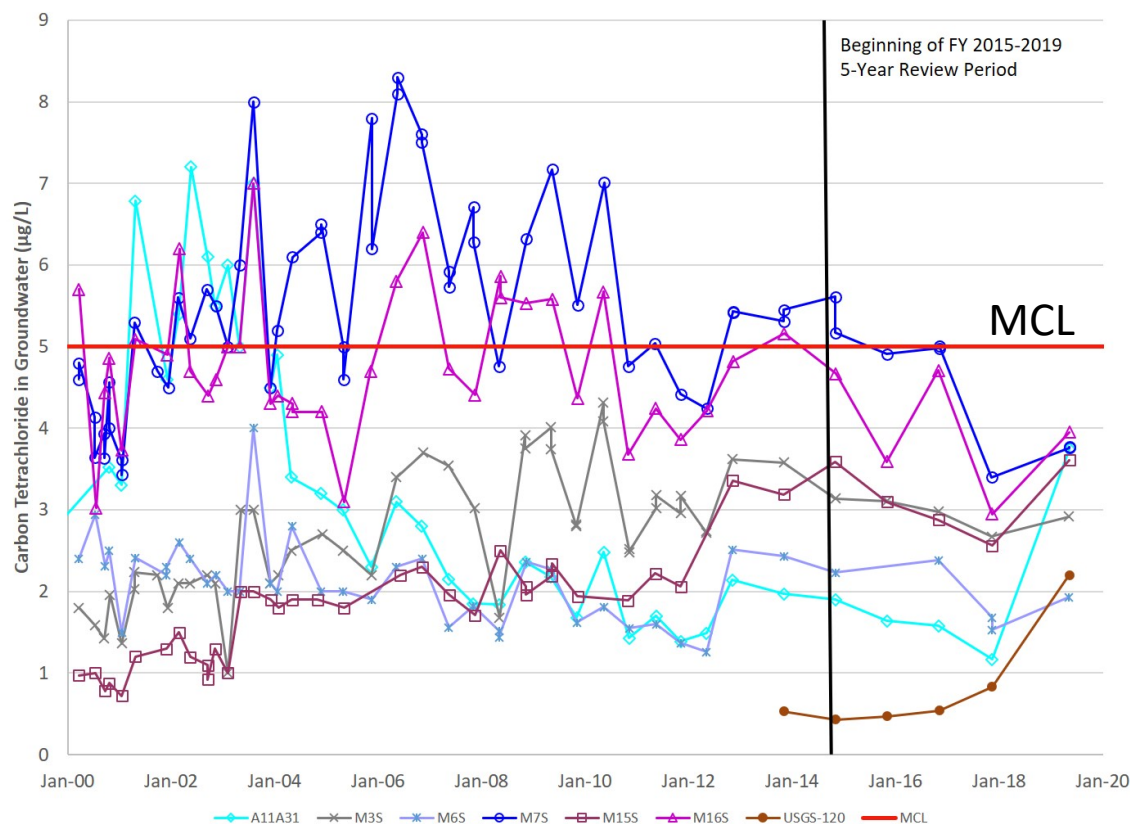
Summary WAG 7 – RWMC

Summary

- Remedial actions are ahead of schedule
- Trends show COCs in vadose zone and aquifer are steady or declining

Protectiveness Statement

- The remedy will be protective upon completion
- No issues identified



WAG 10 – Sitewide Institutional Controls

The CERCLA ROD for OU 10-04 addresses

- Institutional controls and maintenance activities

Technical Assessment

- Active remediation is complete
- Evaluated institutional controls and maintenance activities (e.g., soil covers, vegetative covers, erosion, signage and other access controls)

Summary

- 106 institutional control sites and 17 maintenance sites
- Institutional controls and maintenance activities functioning as intended

Protectiveness Determination

- The remedy is protective
- No issues identified



Institutional Control Sign at CFA Landfill



WAG 10 – New Sites & Sitewide Groundwater

The CERCLA ROD for OU 10-08 addresses

- New site identification & sitewide groundwater

Primary COCs

- Groundwater: Chloride, Nitrate, Tritium, Gross Alpha, Gross Beta
- New Soil Sites: radionuclides (Sr-90, Cs-137), metals (e.g., lead, mercury)

Technical Assessment

- Remediation is active/ongoing
- Evaluated remediation activities of new soil sites and groundwater monitoring data of southern site boundary

Summary

- 14 new soil sites were identified during the period and 1 new site was remediated (TRA-75)
- No groundwater contaminants exceeded MCLs during the period



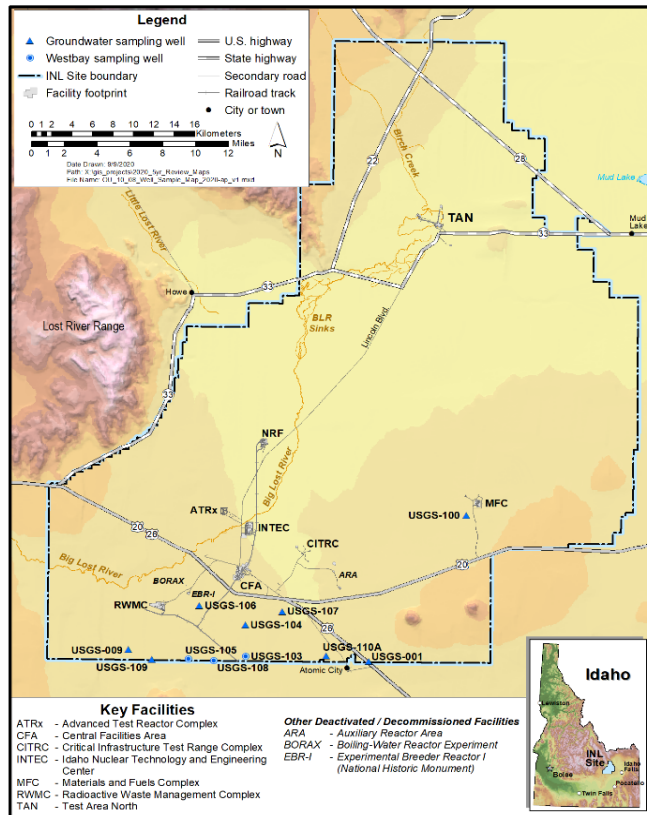
Remediation of TRA-75



After remediation of TRA-75

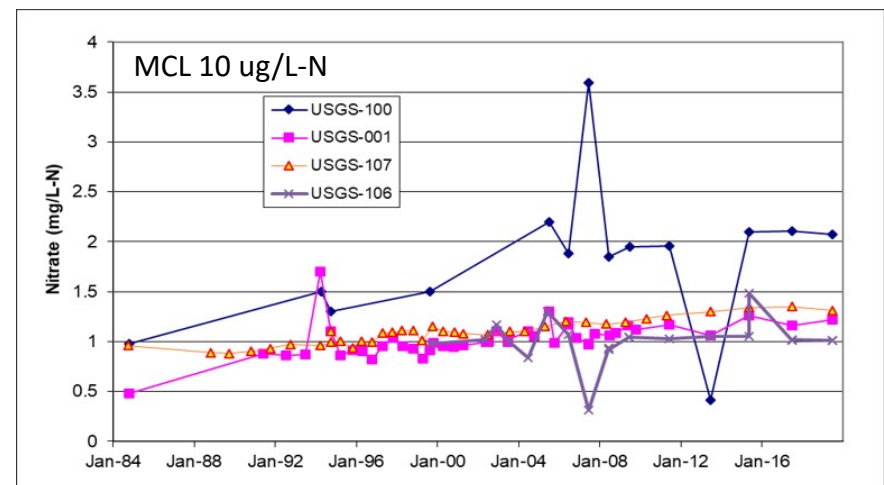
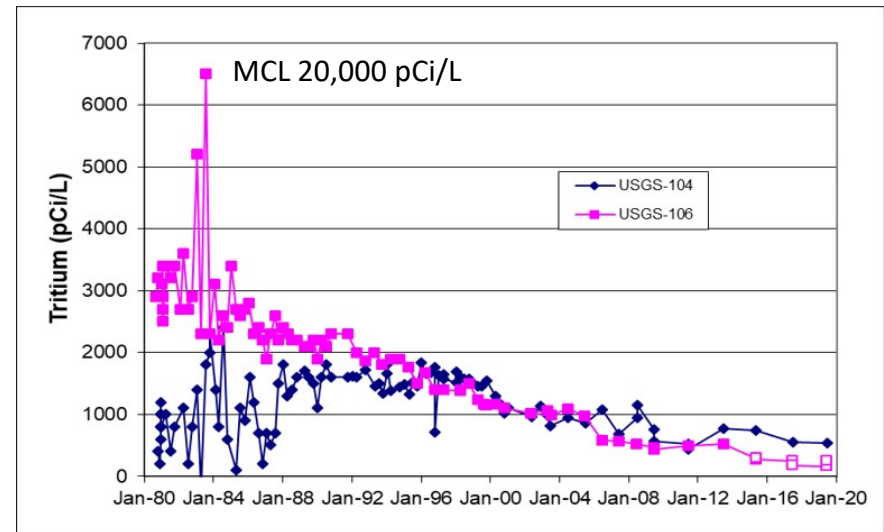


WAG 10 – New Sites & Sitewide Groundwater (con't)



Protectiveness Determination

- The remedy will be protective upon completion
- No Issues identified



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Conclusion

- Remedies at the INL Site are protective, or will be protective upon completion
- Remedial Actions will continue to be evaluated until sites meet Remedial Action objectives and achieve Unlimited Use/Unrestricted Exposure
- Institutional controls are in place and operations, maintenance and groundwater monitoring activities will continue to ensure remedies remain protective
- DOE and EPA track issues to closure
- Next Five-Year Review is due to EPA by February 2026



Questions?



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CERCLA Five Year Review Crosswalk

| WAG | OU | Description | Action Status | FYR Evaluation | Protectiveness Statement | Issues |
|------------|-------------------|--|---|--|--|--------|
| WAG 1 | OU 1-07B | TAN Groundwater Remediation | Remediation ongoing | <ul style="list-style-type: none"> Technical assessment focuses on groundwater treatment, monitoring data and O&M ICs addressed under OU 10-04 | Will be protective upon completion; and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. | Yes |
| WAG 2 | OU 2-13 | ATRx Comprehensive | Remediation complete . Remedies working to meet long term RAOs Ongoing ICs, O&M, and monitoring | <ul style="list-style-type: none"> Technical assessment that focuses on groundwater monitoring data ICs/O&M deferred to OU 10-04 | The remedy is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. (See 10-04 Protectiveness Statement for IC/O&M) | None |
| WAG 3 | OU 3-13 | INTEC soil under buildings /ICDF | Remediation ongoing | <ul style="list-style-type: none"> Technical assessment that focuses on O&M at ICDF ICs addressed under OU 10-04 | Will be protective upon completion; and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. | None |
| WAG 3 | OU 3-14 | INTEC Tank Farm Soil and Groundwater | Remediation ongoing | <ul style="list-style-type: none"> Technical assessment that focuses on monitoring data and O&M ICs addressed under OU 10-04 | Will be protective upon completion; and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. | None |
| WAG 4 | OUs 4-12 and 4-13 | CFA Landfills I, II, and III and CFA Comprehensive | Remediation complete . Remedies working to meet long term RAOs Ongoing ICs, O&M, and monitoring | <ul style="list-style-type: none"> Technical assessment that focuses on monitoring data ICs/O&M deferred to OU 10-04 | The remedy is protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. (See 10-04 Protectiveness Statement for IC/O&M) | None |
| WAGs 5,6,9 | All | All | All remediation is complete Ongoing ICs /O&M | <ul style="list-style-type: none"> IC and O&M addressed under OU 10-04 | See Protectiveness Statement for OU 10-04 | None |
| WAG 7 | OU 7-13/14 | RWMC | Remediation ongoing | <ul style="list-style-type: none"> Technical assessment focused on groundwater, vadose zone data and O&M ICs addressed under OU 10-04 | Will be protective upon completion; and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. | None |
| WAG 10 | OU 10-04 | Site-wide IC/O&M | Remediation complete with ongoing ICs and O&M | <ul style="list-style-type: none"> Technical assessment focused on IC/O&Ms IC/O&Ms from other OUs addressed here | The remedy is protective of human health and the environment and exposure pathways that could result in unacceptable risks are being controlled. | None |
| WAG 10 | OU 10-08 | Site-wide Groundwater and Future Sites | Remediation ongoing | <ul style="list-style-type: none"> Technical assessment ICs/O&M addressed under OU 10-04 | Will be protective upon completion; and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. | None |

