



INL CERCLA Five-Year Review

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Soil and Groundwater Remediation

January 28, 2021



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

Idaho Cleanup Project

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

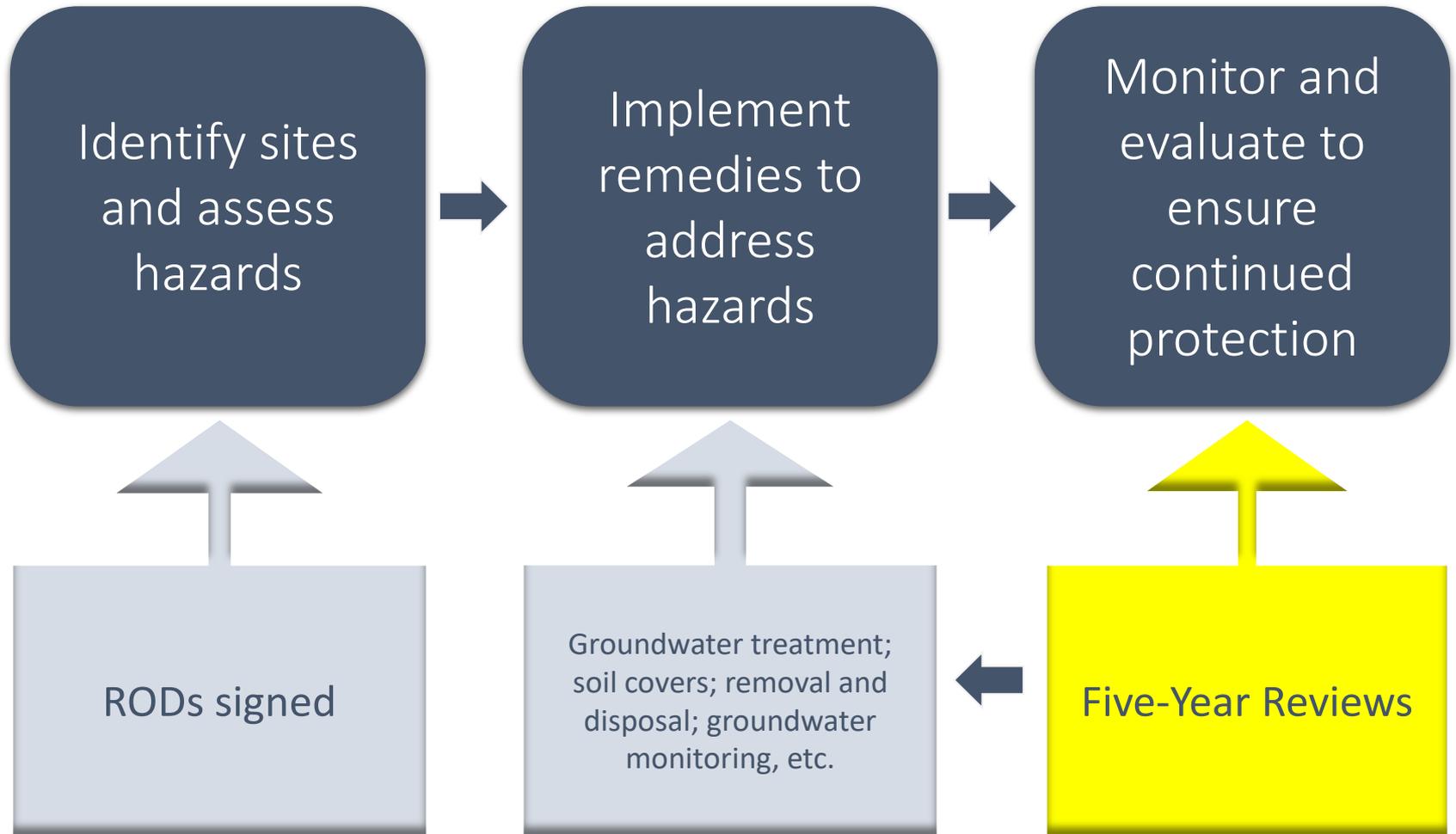


Purpose of a Five-Year Review

- 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. 5355.7-03B-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



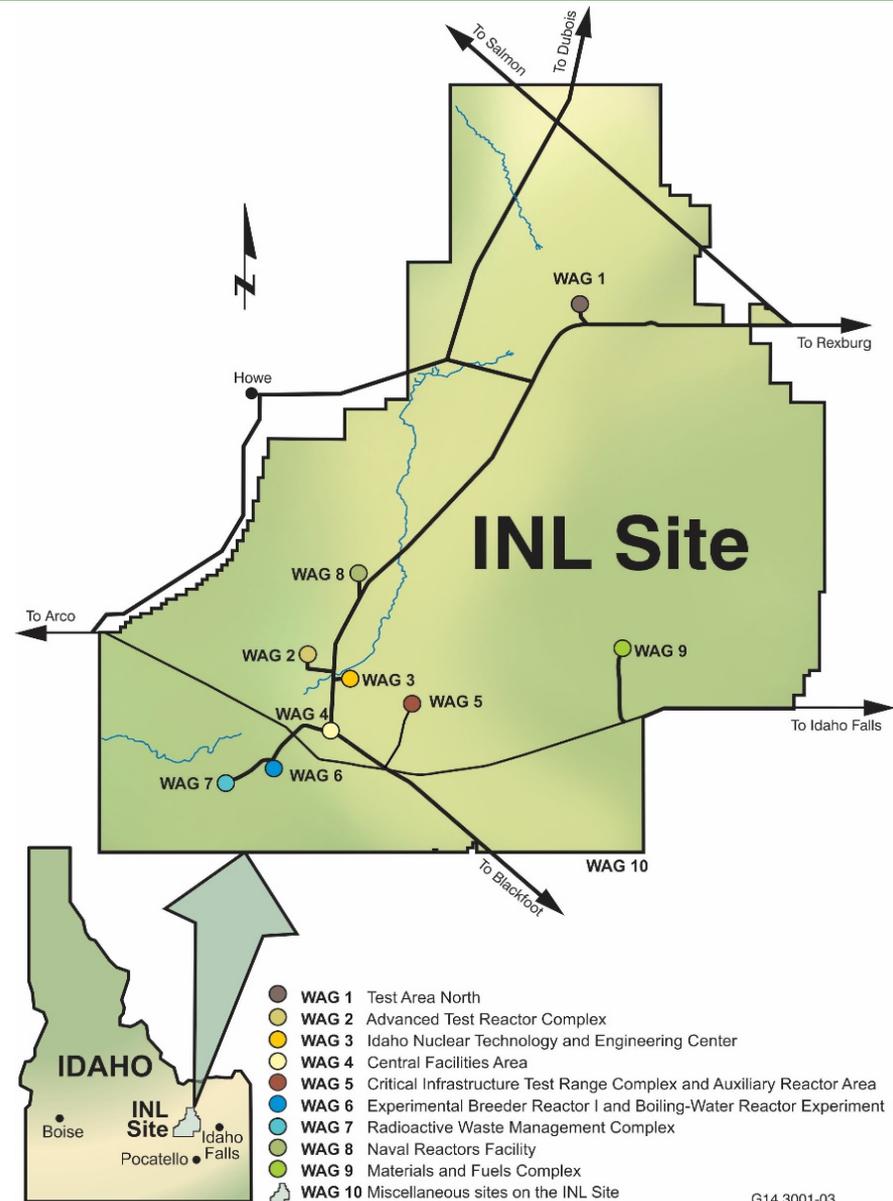
EPA

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

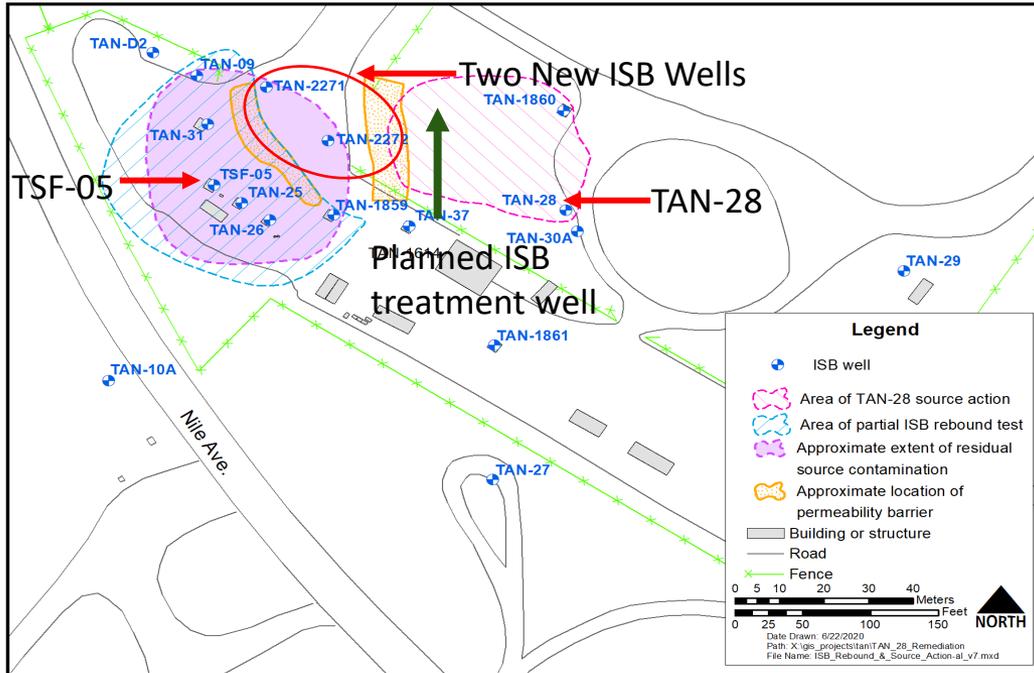


Scope of the FY2015 - FY2019 Five-Year Review

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



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

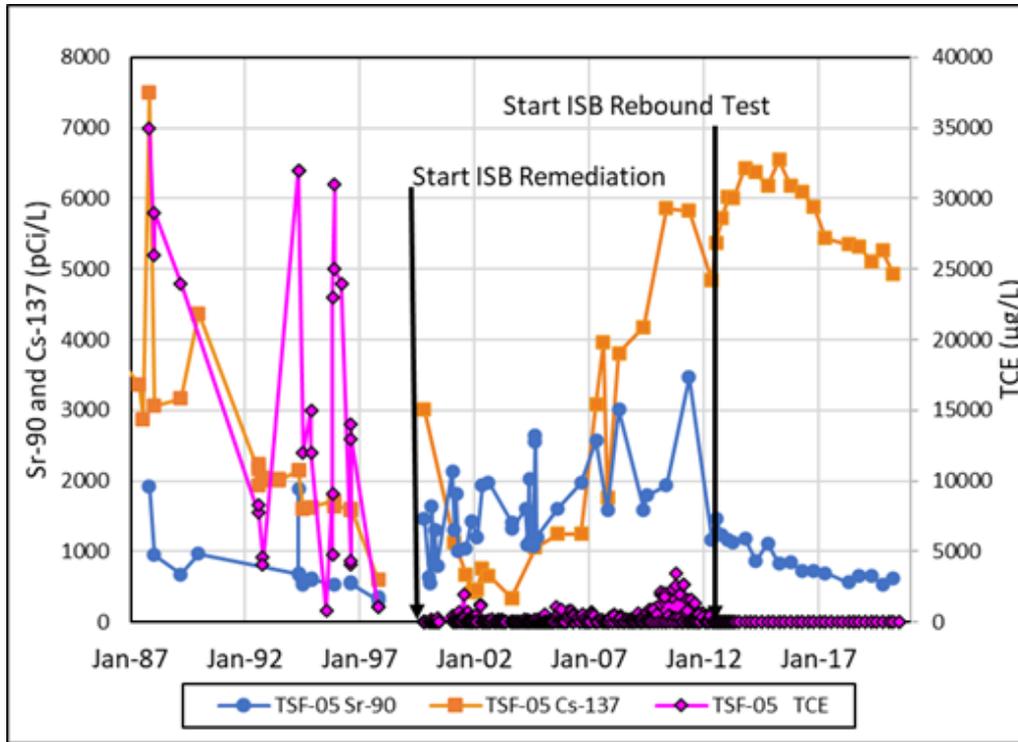
- Installed two new In Situ Bioremediation (ISB) treatment wells in 2015
- Performed ISB treatment in new wells upgradient

Actions planned

- Drill an additional treatment well in 2021



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



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

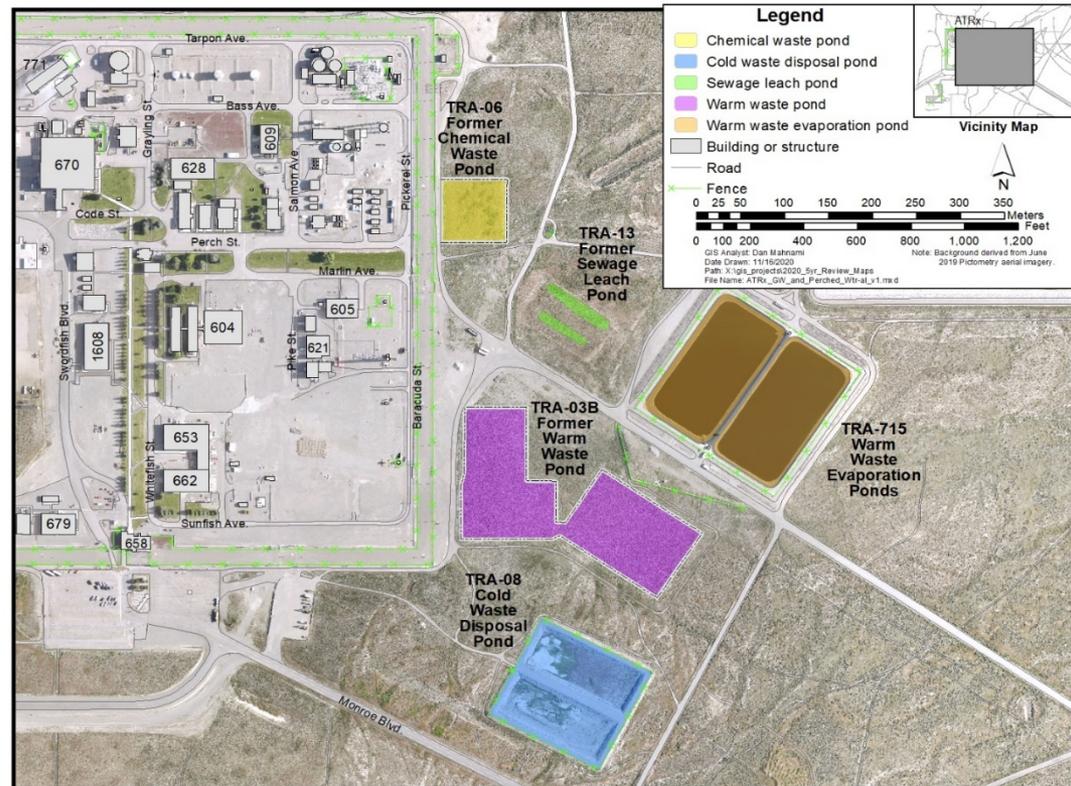
- Addresses contamination from former injection wells and former wastewater ponds

Primary Groundwater COCs

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

Technical Assessment

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



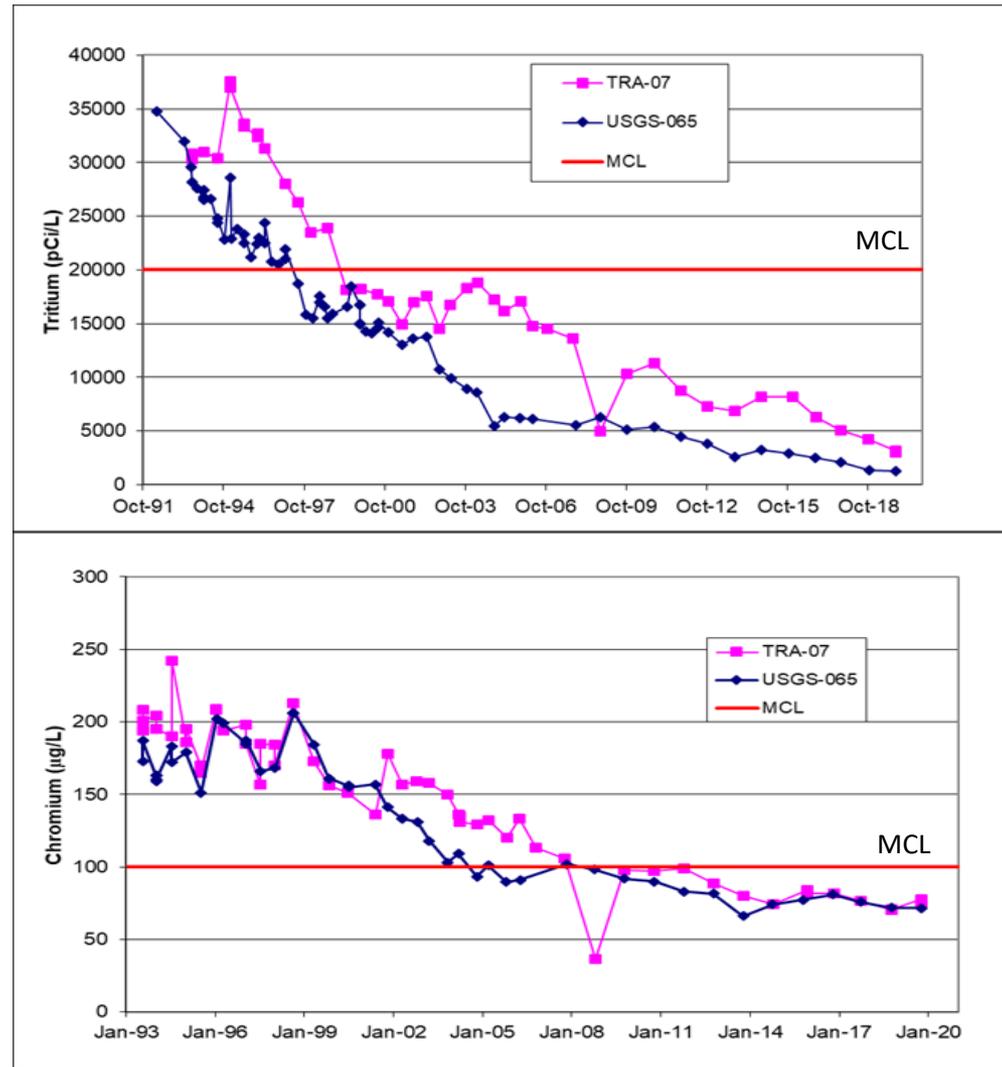
Summary WAG 2 – ATRx

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

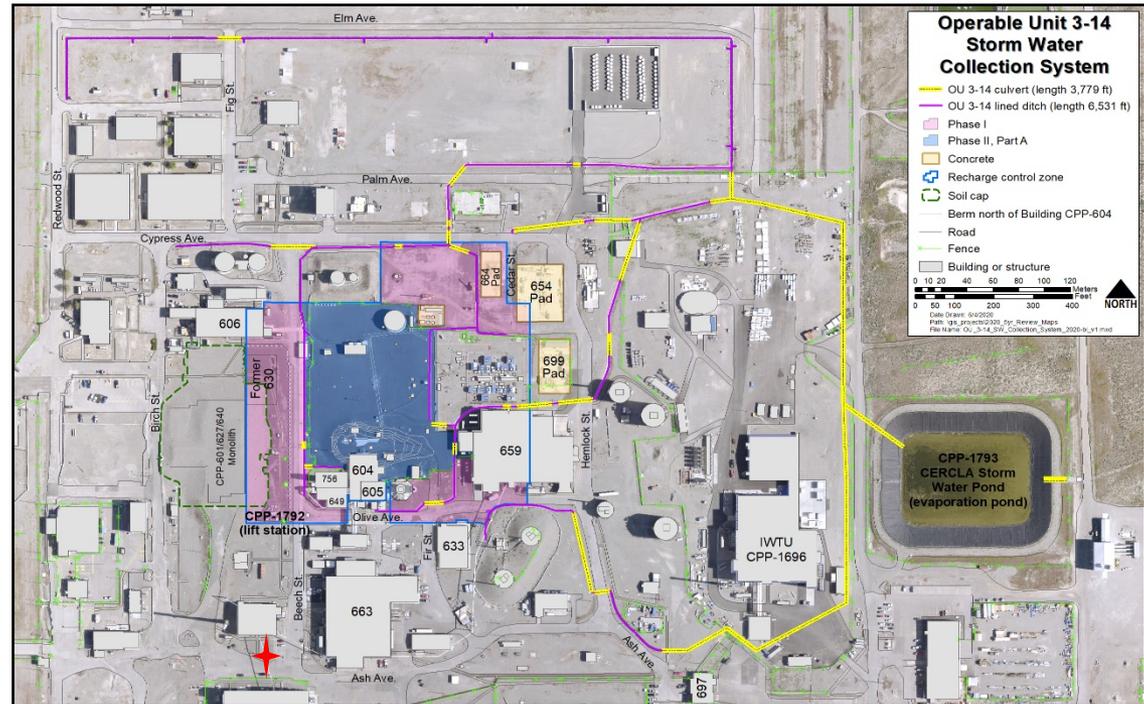
- Groundwater contamination from former injection well; soil and groundwater contamination from past industrial leaks

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)



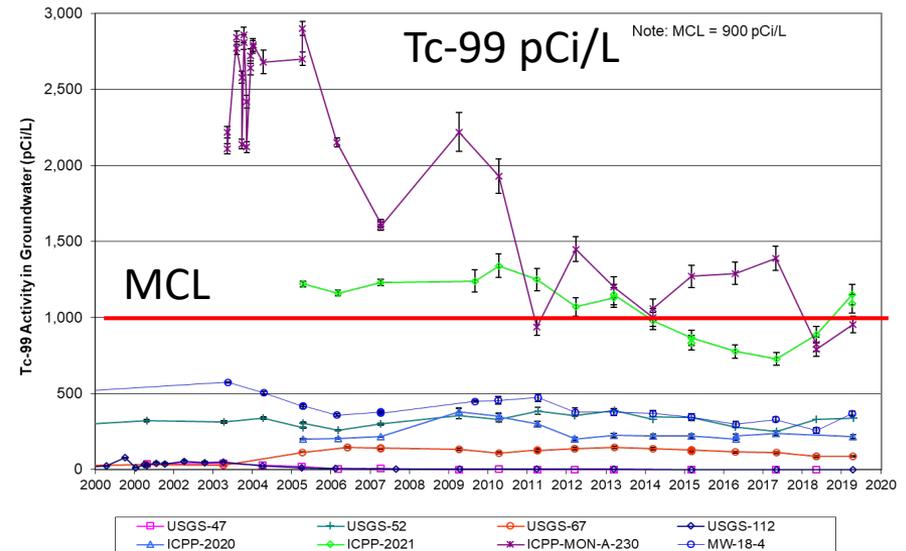
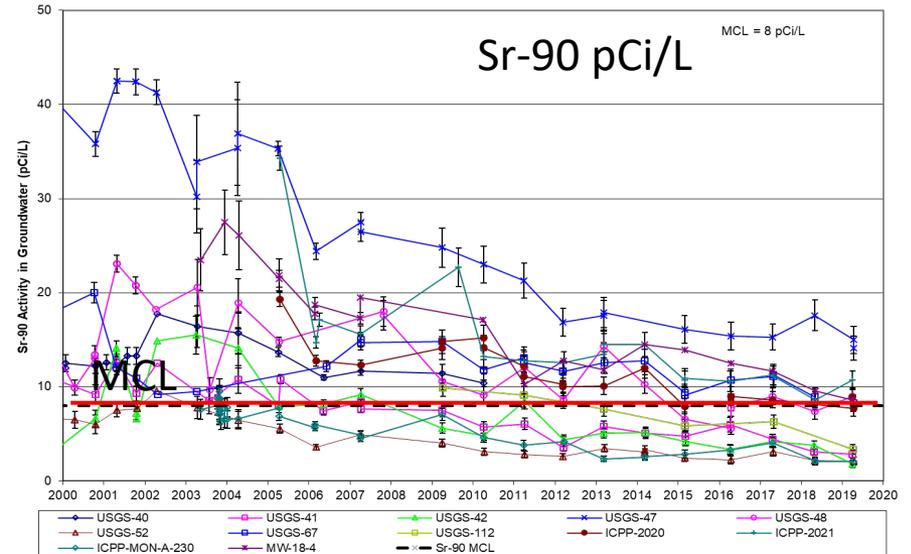
Summary WAG 3 – INTEC

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



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

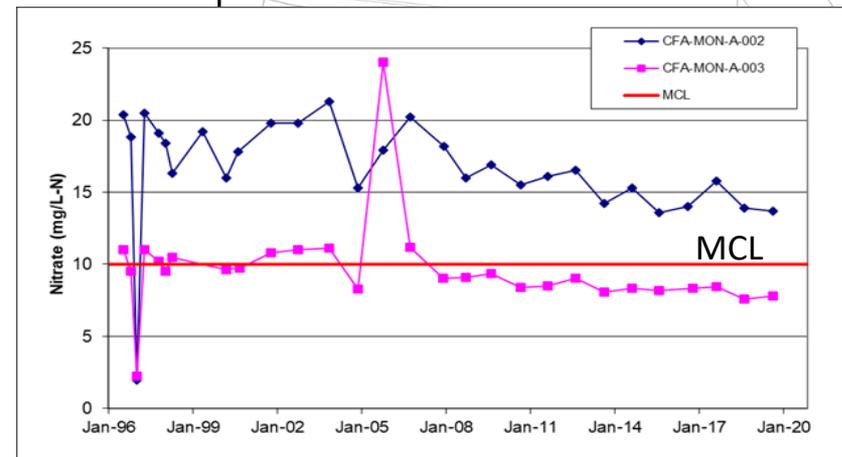
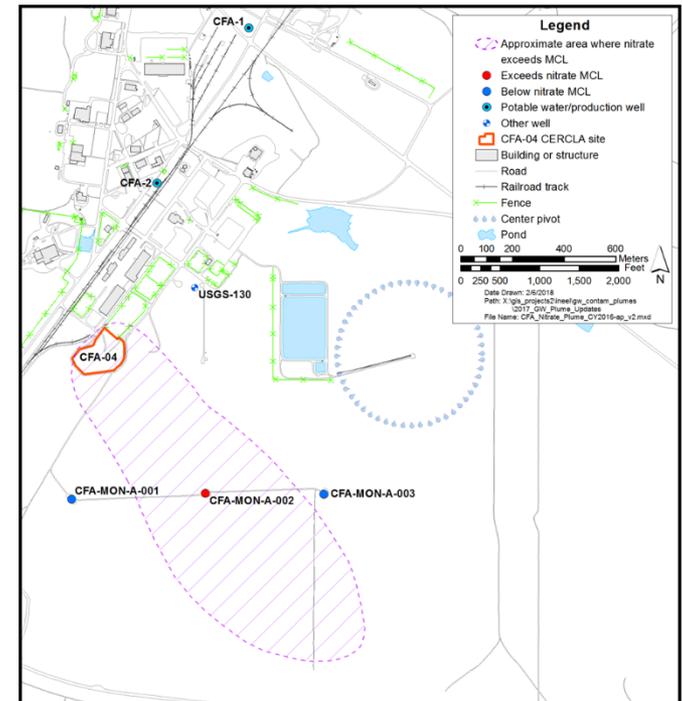
- Active remediation is complete
- Evaluated groundwater and vapor monitoring data

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

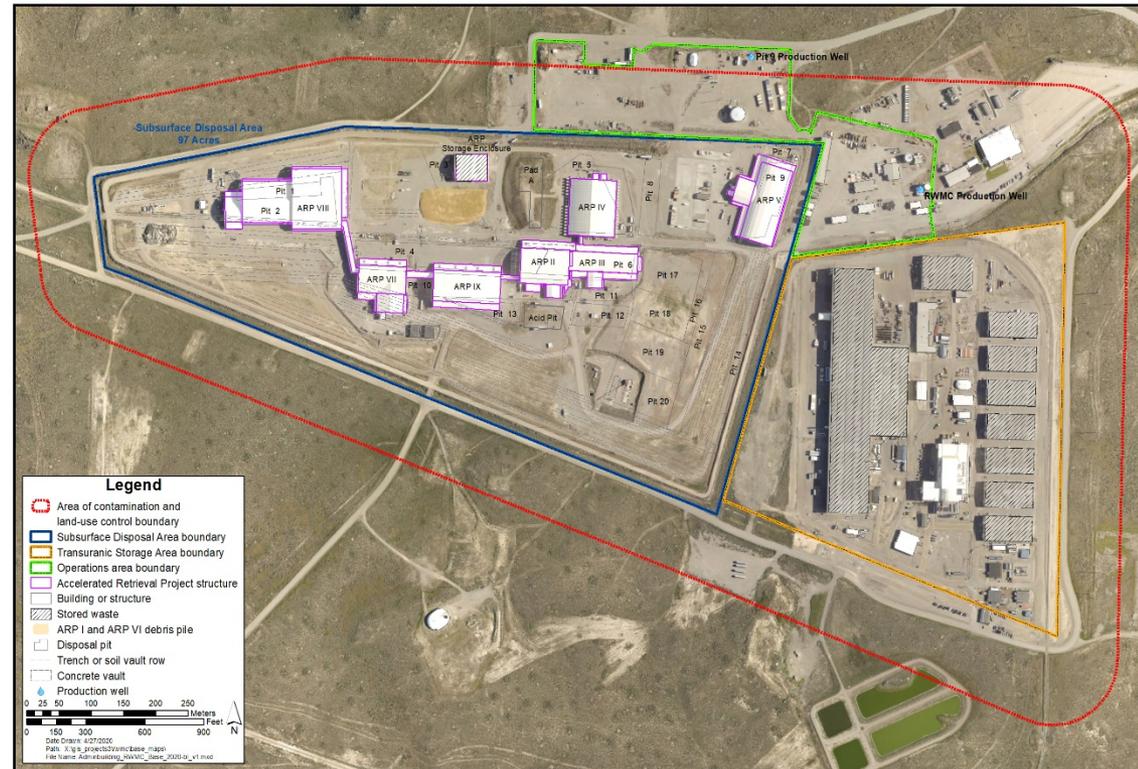
- Controlling the source of contamination (buried waste) in the SDA to prevent migration to the aquifer

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



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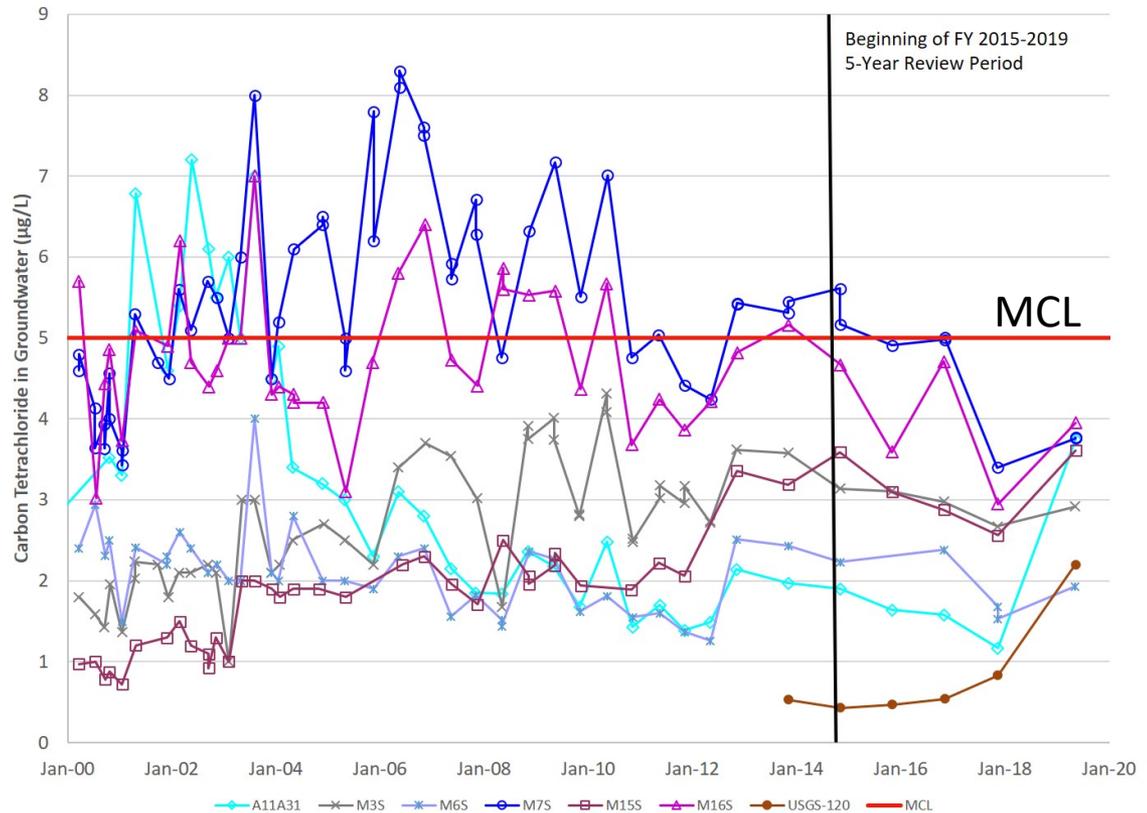
Summary WAG 7 – RWMC

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



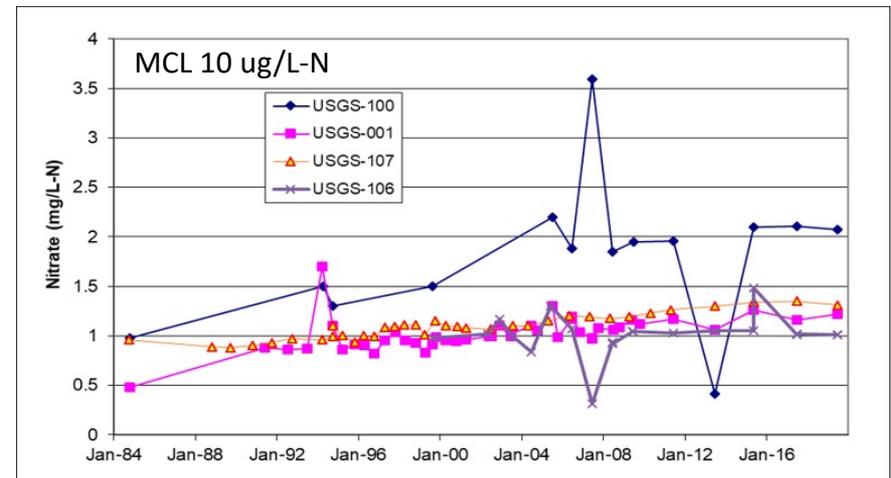
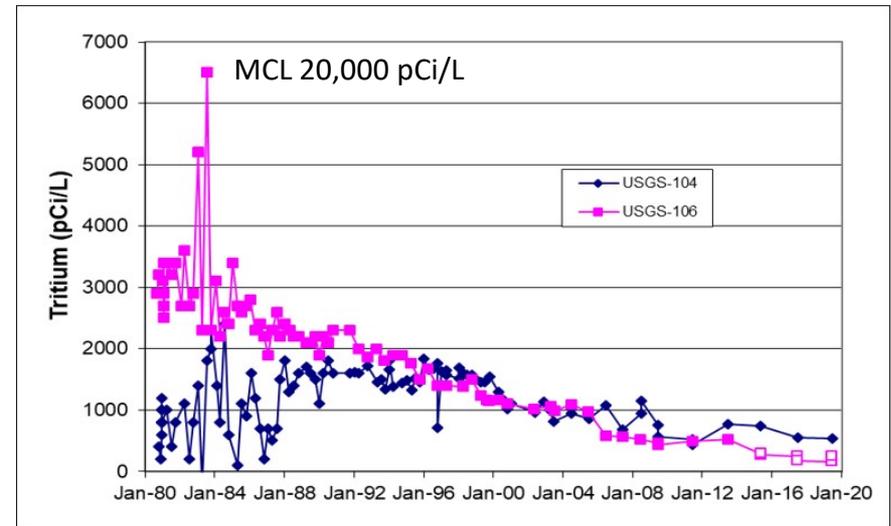
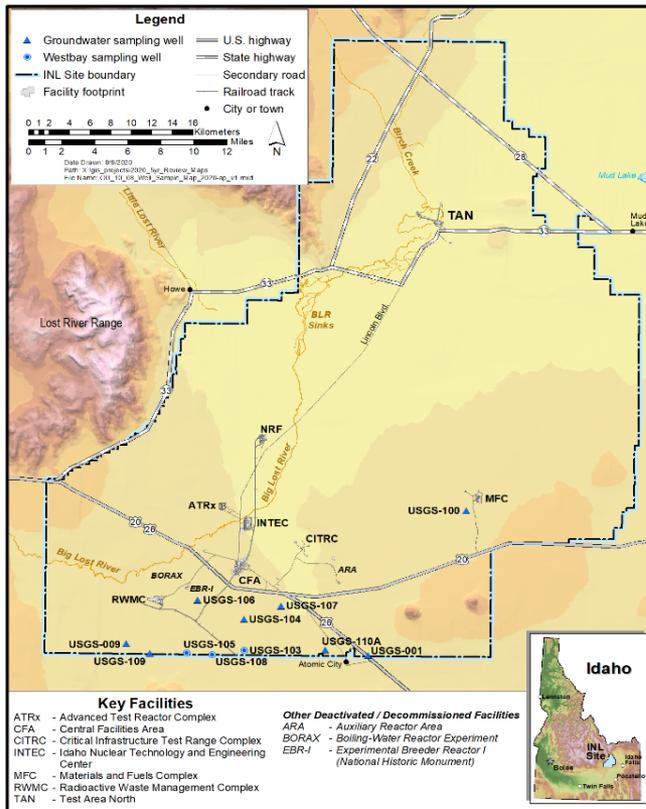
Remediation of TRA-75



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



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

