THE HANFORD SITE

100-BC Area Proposed Plan Overview

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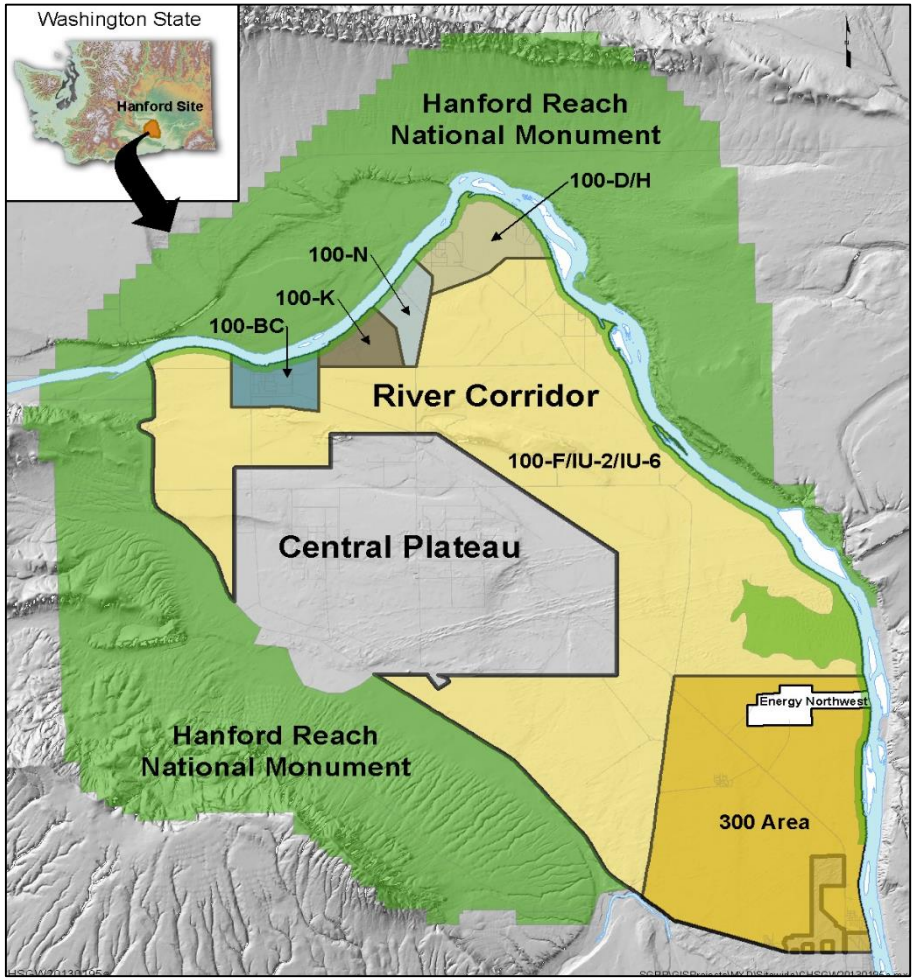
U.S. Department of Energy

September 16, 2019

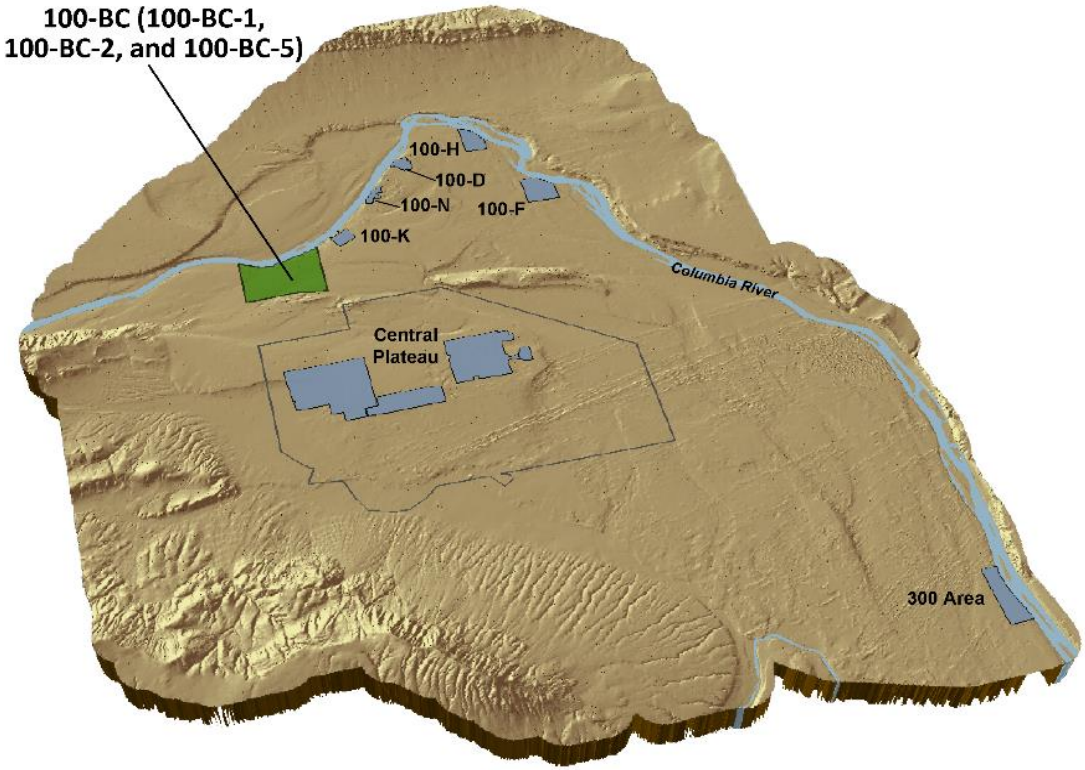
River Corridor CERCLA Records of Decision Overview



- 220 square miles
- 100 and 300 Areas on National Priorities List
- Six Geographical Areas
  - 300 Area
    - Record of Decision (ROD) completed November, 2013
  - 100-F,100-IU-2, and 100-IU-6 Area
    - ROD completed September, 2014
  - 100-D/H Area
    - ROD completed July, 2018
  - 100-B/C Area
    - ROD planned 2020
  - 100-K Area
    - ROD scheduled 2021
  - 100-N Area
    - ROD scheduled 2021

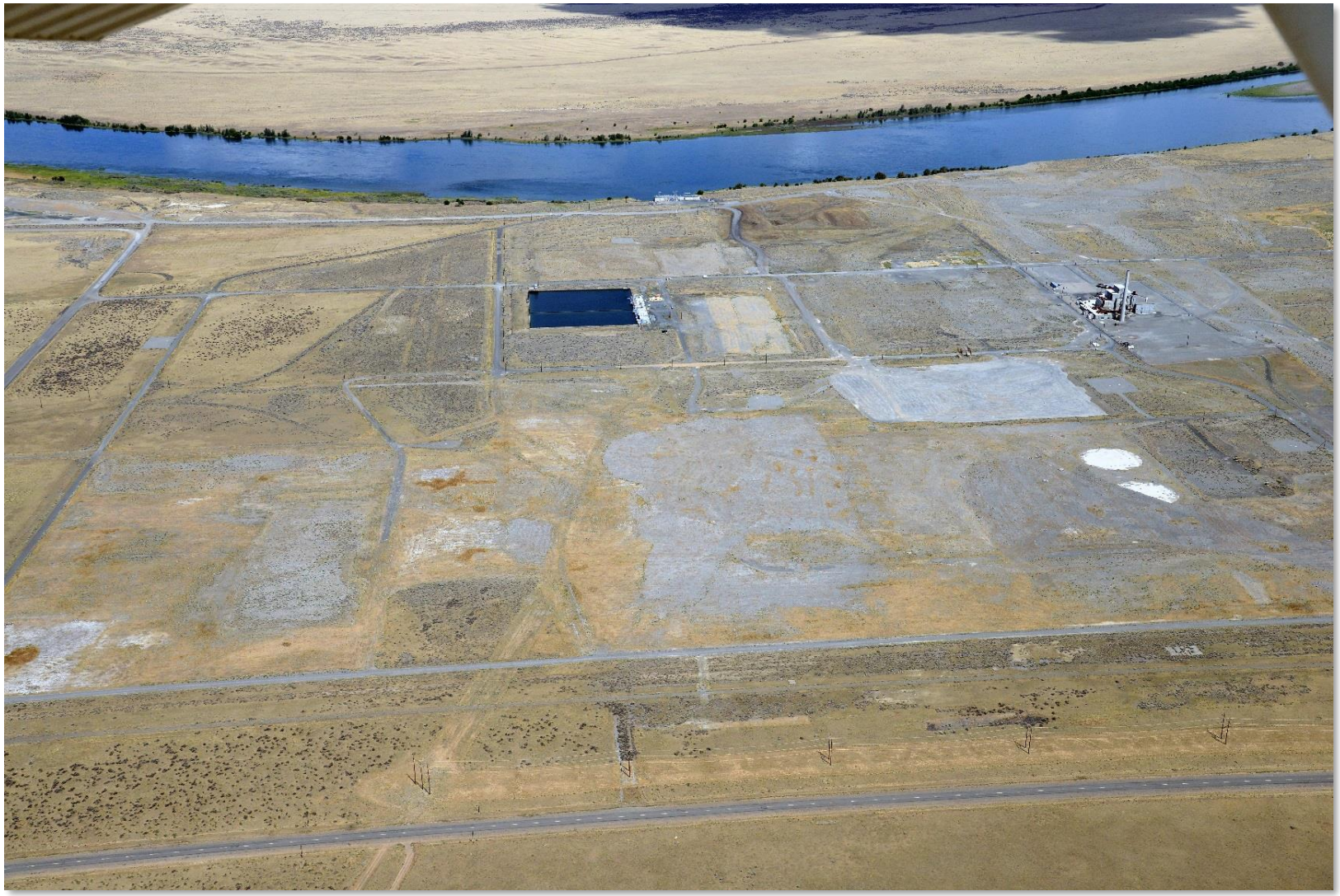
100-B/C Area Overview

- About 4.5 square miles
- Includes deactivated B and C Reactors and support facilities operated from 1944 to1969
- B Reactor preserved as part of Manhattan Project National Historical Park
- C Reactor in Interim Safe Storage
- Remaining active facilities include part of Hanford Site water supply system (river pumphouse, reservoir, and electrical substations)



100-B/C in 1953

100-B/C in 2015

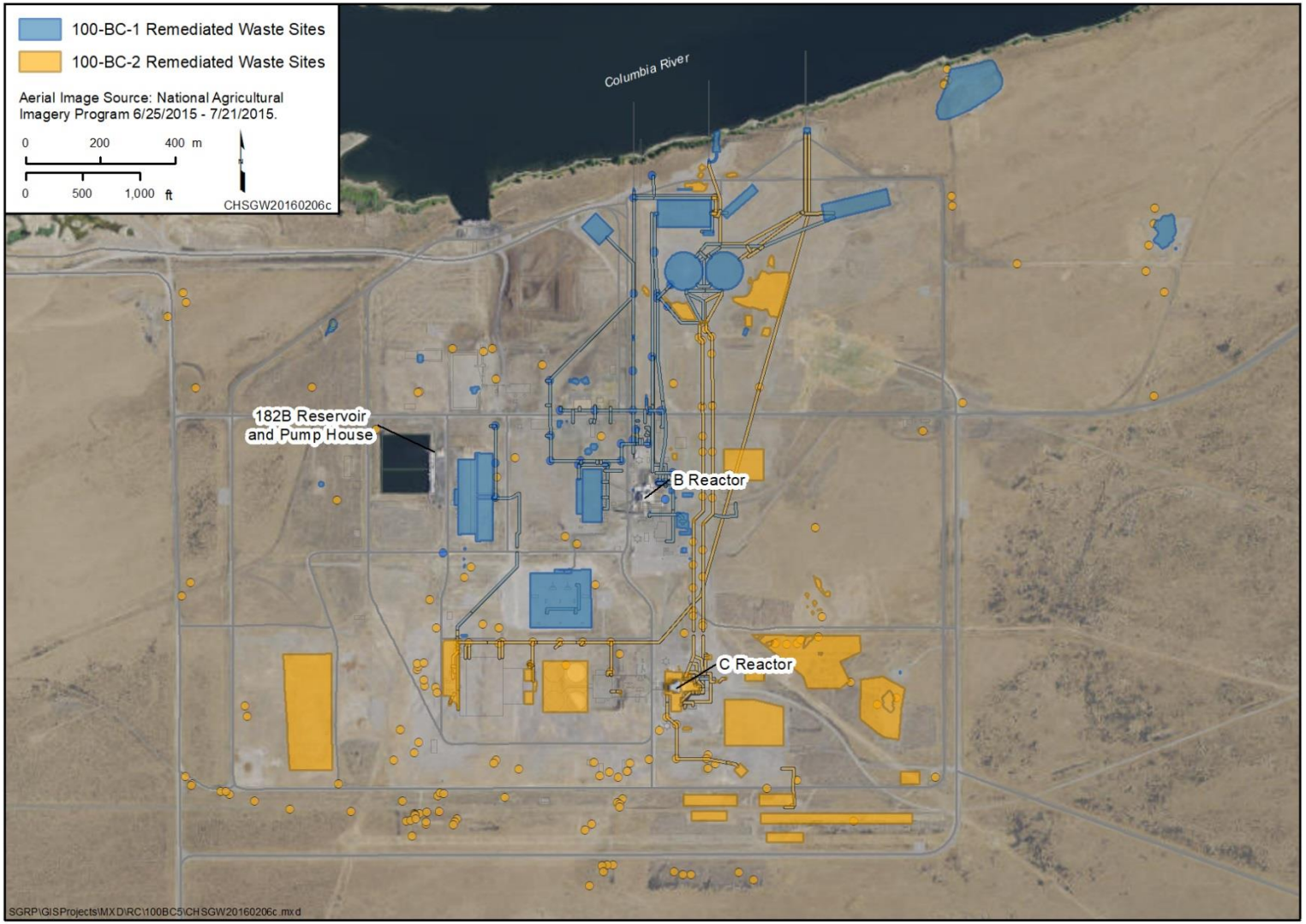


Cleanup Completed to Date

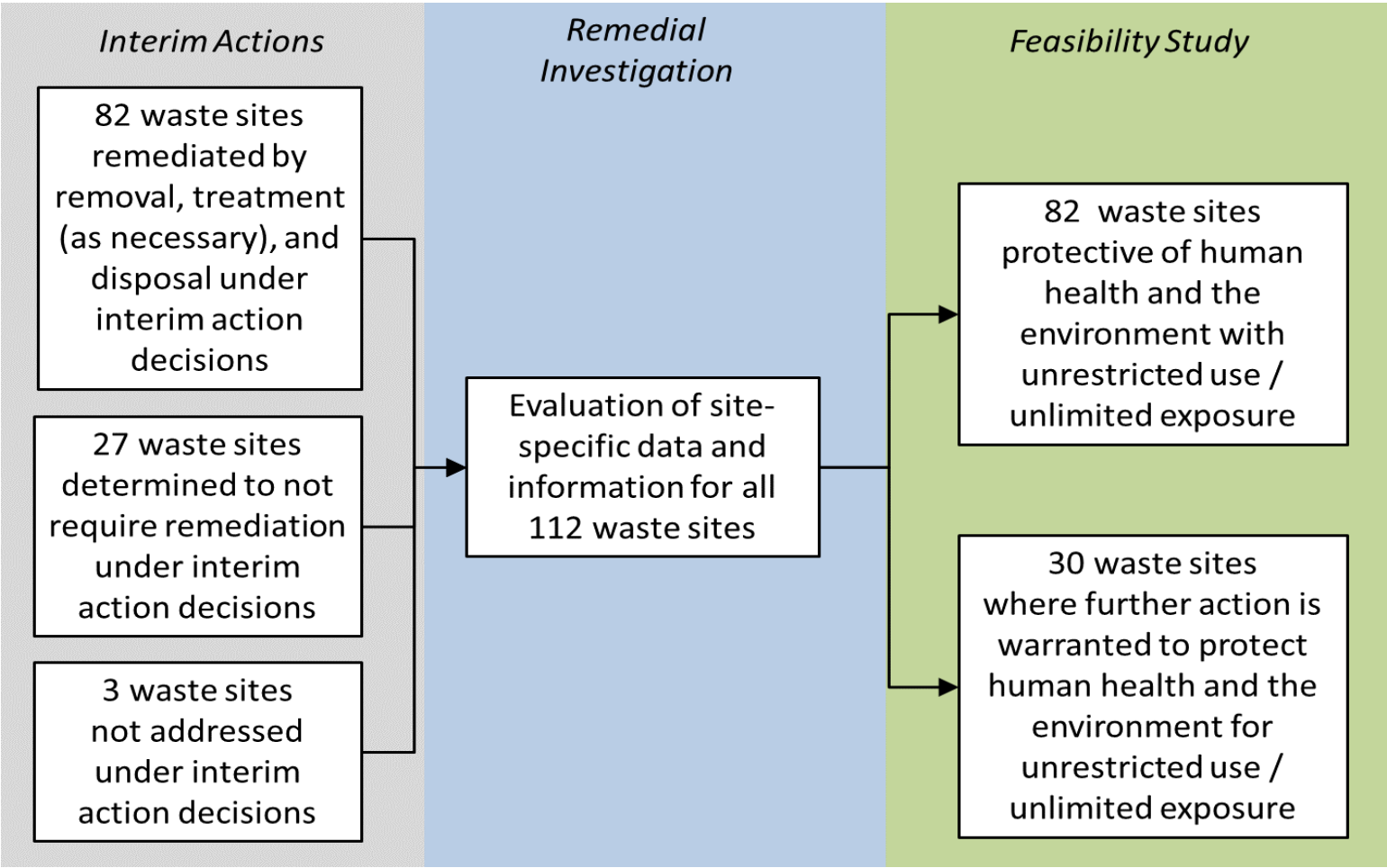
- Waste site remediation began in 1995
- 104 of 117 facilities used to support B and C Reactor operations were demolished and removed
- About 3 million tons of soil and debris excavated from 82 waste sites, treated (as necessary), and disposed of
- “Deep digs” reached up to 85 feet below ground surface (to groundwater level) to remove, treat and dispose of hexavalent chromium-contaminated soil

Excavation of the 100-C-7 and 100-C-7:1 Waste Sites

Remediated Waste Sites



Scope of the Proposed Plan: Waste Sites



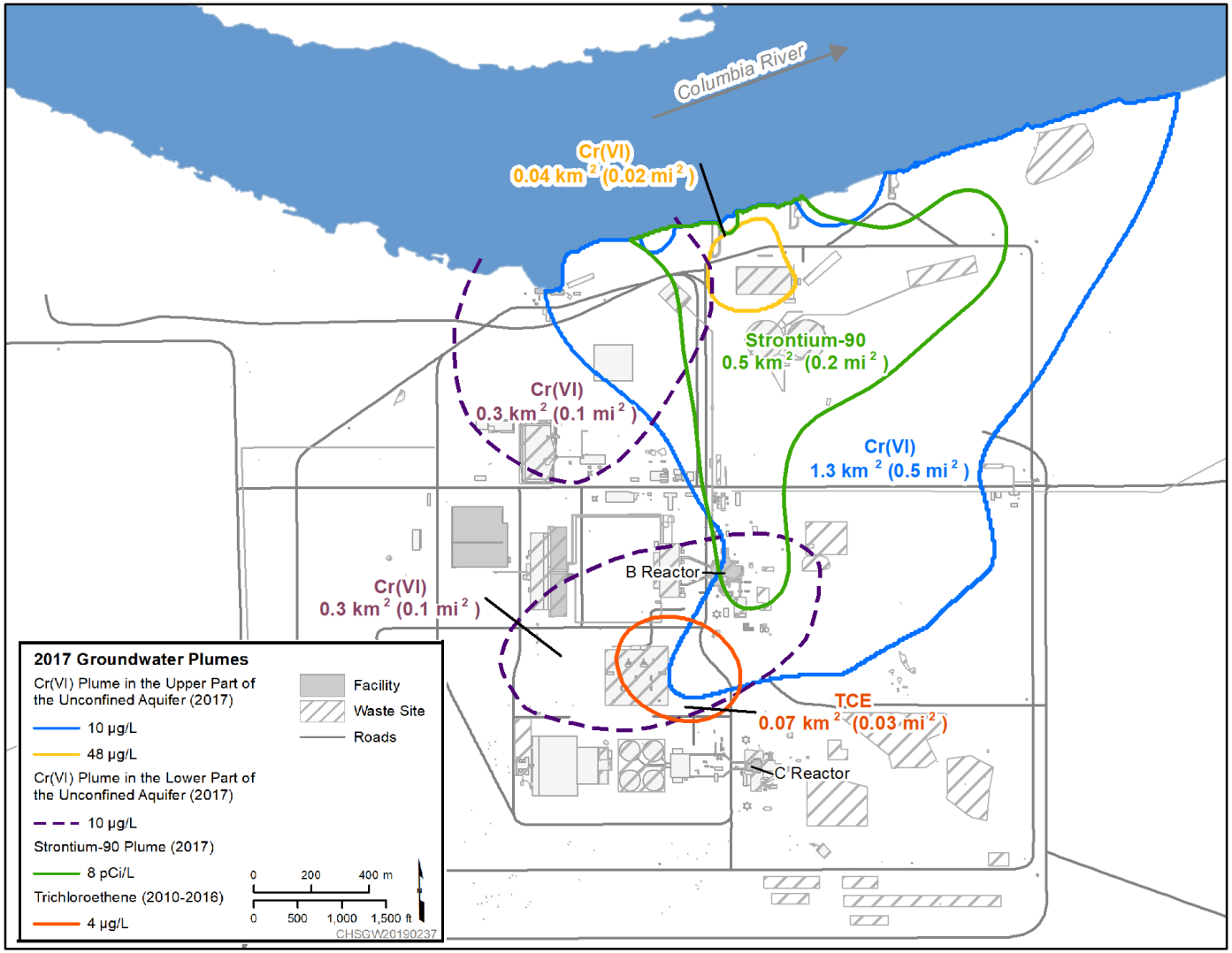
Scope of the Proposed Plan: Waste Sites

- Further action for 30 waste sites is warranted:
  - 7 sites have residual contamination that pose a shallow direct-contact risk for residential use and/or effect on groundwater or surface water quality
  - 23 sites that have residual radionuclide contamination in the deep zone (only) and do not have potential to effect groundwater or surface water
  - No sites have residual contaminant concentrations that pose a potential risk to ecological receptors

Scope of the Proposed Plan: Groundwater

- Groundwater actions were not prescribed by interim action ROD for 100-B/C
- Current contamination levels warrant remedial action consideration
- All groundwater contaminants exceeding standards are addressed by alternatives in the proposed plan
- Differences between the alternatives primarily affect how hexavalent chromium is addressed

Scope of the Proposed Plan: Groundwater



Summary of Alternatives Evaluated (Alternative 2 is Preferred)

Alternative	Waste Sites	Groundwater	Cost
1	No Action for all 112 waste sites and groundwater (required by the NCP)		-
2	ICs for 30 waste sites, RTD for 1 waste site, and No Action for 82 waste sites	MNA with ICs	$23M
3		P&T for Cr(VI) and MNA with ICs for strontium-90, tritium, TCE, and Cr(VI) located further inland and outside the influence of P&T operation	$160M
4	ICs for 29 waste sites, RTD for 5 waste sites, and No Action for 82 waste sites		$270M
5	ICs for 30 waste sites, RTD for 1 waste site, and No Action for 82 waste sites	Cr(VI) Source Treatment with P&T for Cr(VI) and MNA with ICs for strontium-90, tritium, TCE, and Cr(VI) located further inland and outside the influence of P&T operation	$99M
6	ICs for 29 waste sites, RTD for 5 waste sites, and No Action for 82 waste sites		$210M

Note: Some waste sites have more than one remedial action, so site subtotals for Alternatives 2 through 6 do not sum to 112.

Cr(VI) = hexavalent chromium
IC = institutional control
MNA = monitored natural attenuation
NCP = National Contingency Plan (40 CFR 300)
P&T = pump and treat
RTD = remove, treat, and dispose
TCE = trichloroethene

Remediation Timeframes

Alternative	Waste Sites	Groundwater				
		Cr(VI)	Cr(VI)	Strontium-90	Tritium	TCE
		10 µg/L (surface water)	48 µg/L (groundwater)	8 pCi/L (groundwater)	20,000 pCi/L (groundwater)	4 µg/L (groundwater)
2	5 to 187 yrs	60 yrs	15 yrs	70 yrs	N/A	25 yrs
3	5 to 187 yrs	15 yrs*	5 yrs	70 yrs	N/A	25 yrs
4	5 to 33 yrs	15 yrs*	5 yrs	70 yrs	N/A	25 yrs
5	5 to 187 yrs	15 yrs	5 yrs	70 yrs	N/A	25 yrs
6	5 to 33 yrs	15 yrs	5 yrs	70 yrs	N/A	25 yrs

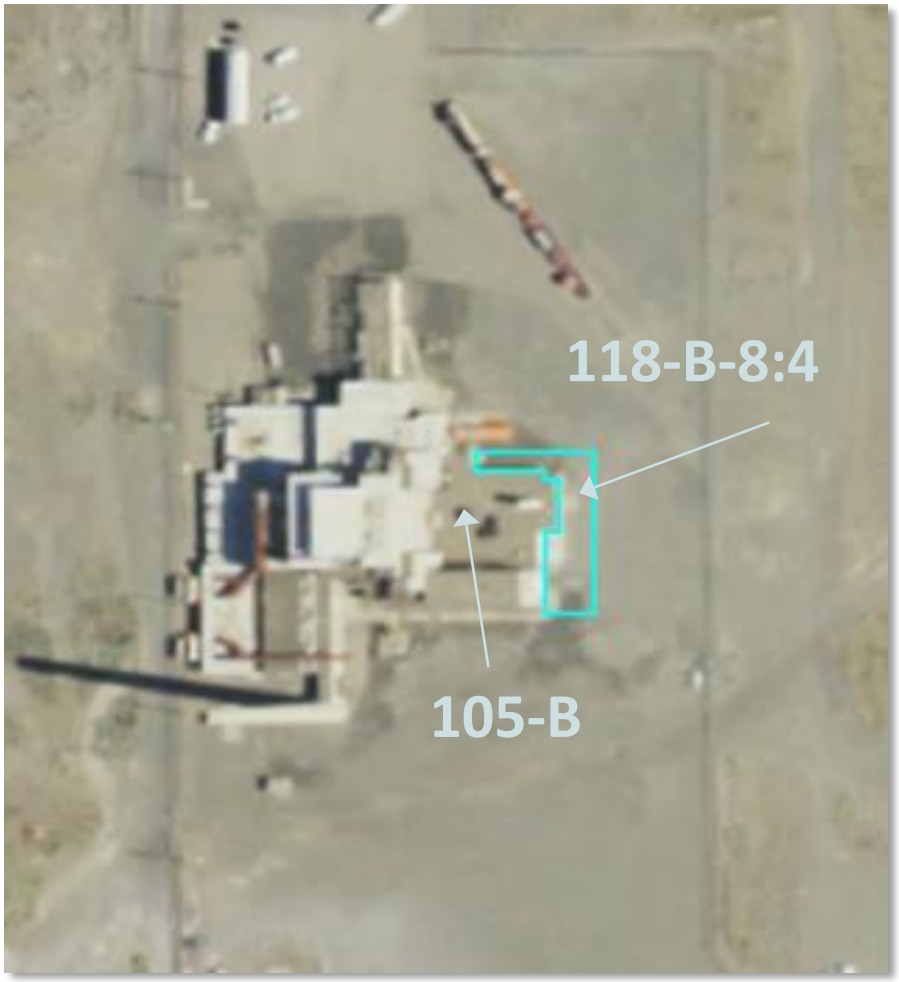
*Pump and treat required for an additional 25 years to maintain compliance

Preferred Alternative: Alternative #2

- Removal, treatment and disposal of a remaining grouted segment of sodium dichromate transfer line
- Natural attenuation with institutional controls (restrict uncontrolled excavation/drilling, prevent residential use, and/or prohibit irrigation) for 30 waste sites
- No action for 82 waste sites
- Monitored natural attenuation with institutional controls for groundwater (restrict drinking water and other domestic uses)

Why 187 years for 1 waste site?

- 118-B-8:4 site next to B Reactor
- Shallow radionuclide contamination 12.5-15 feet below ground surface
- 187 years of decay to be protective of a residential scenario
- Currently protective for recreational uses, including B Reactor tours (contamination is not accessible)
- Excavation/removal ability is limited by the waste site's proximity to the reactor building



Estimated Future Costs for the Preferred Alternative

Waste site remediation	$2.2M
Waste site institutional controls	$6.7M
New monitoring well installations	$1.5M
Groundwater monitoring and institutional controls	$12.5M
Total	**$23M**

Consideration of Previous HAB Advice (#296)

- Advice was considered and the proposed plan has been redrafted to provide greater clarity in areas
  - Clearer explanation of elements common to all alternatives so that elements that differ can be more readily distinguished
  - Clearer explanation of the combination of waste site and groundwater components in the alternatives
  - Revised evaluation of several balancing criteria to be more objective
- Responses to comments received during the public comment period for the proposed plan will be included in the responsiveness summary in the ROD

TPA Public Involvement Schedule

- Oct. 7 to Nov. 6: Hold 30-day public comment period
- Send Comments to: 100BCAreaPP@rl.gov
- Questions?
  - Jennifer Colborn, Mission Support Alliance: (509) 376-5840
  - Laura Buelow, EPA: (509) 376-5466

Key Takeaways

- Our focus is on completing remediation of the B / C Reactor Area
- DOE believes that the preferred alternative is protective and provides the best balance of tradeoffs in consideration of the CERCLA balancing criteria
- The 100-BC Proposed plan was redrafted in consideration of previous HAB advice
- Because strontium contamination in groundwater will require institutional controls for 70 years, we are not planning to build a pump and treat system for chromium, because it will disperse naturally within 60 years

Questions/Discussions