100-BC Area Proposed Plan
Overview

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U.S. Department of Energy

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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 to 1969
- 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)
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
Remediated Waste Sites
Scope of the Proposed Plan: Waste Sites

**Interim Actions**
- 82 waste sites remediated by removal, treatment (as necessary), and disposal under interim action decisions
- 27 waste sites determined to not require remediation under interim action decisions
- 3 waste sites not addressed under interim action decisions

**Remedial Investigation**
- Evaluation of site-specific data and information for all 112 waste sites

**Feasibility Study**
- 82 waste sites protective of human health and the environment with unrestricted use / unlimited exposure
- 30 waste sites where further action is warranted to protect human health and the environment for unrestricted use / unlimited exposure
Scope of the Proposed Plan: Waste Sites

• Further action for 30 waste sites is warranted:
  o 7 sites have residual contamination that pose a shallow direct-contact risk for residential use and/or effect on groundwater or surface water quality
  o 23 sites that have residual radionuclide contamination in the deep zone (only) and do not have potential to effect groundwater or surface water
  o 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)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Waste Sites</th>
<th>Groundwater</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Action for all 112 waste sites and groundwater (required by the NCP)</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>ICs for 30 waste sites, RTD for 1 waste site, and No Action for 82 waste sites</td>
<td>MNA with ICs</td>
<td>$23M</td>
</tr>
<tr>
<td>3</td>
<td>ICs for 29 waste sites, RTD for 5 waste sites, and No Action for 82 waste sites</td>
<td>P&amp;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&amp;T operation</td>
<td>$160M</td>
</tr>
<tr>
<td>4</td>
<td>ICs for 29 waste sites, RTD for 5 waste sites, and No Action for 82 waste sites</td>
<td>Cr(VI) Source Treatment with P&amp;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&amp;T operation</td>
<td>$270M</td>
</tr>
<tr>
<td>5</td>
<td>ICs for 30 waste sites, RTD for 1 waste site, and No Action for 82 waste sites</td>
<td></td>
<td>$99M</td>
</tr>
<tr>
<td>6</td>
<td>ICs for 29 waste sites, RTD for 5 waste sites, and No Action for 82 waste sites</td>
<td></td>
<td>$210M</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste site remediation</td>
<td>$2.2M</td>
</tr>
<tr>
<td>Waste site institutional controls</td>
<td>$6.7M</td>
</tr>
<tr>
<td>New monitoring well installations</td>
<td>$1.5M</td>
</tr>
<tr>
<td>Groundwater monitoring and institutional controls</td>
<td>$12.5M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$23M</strong></td>
</tr>
</tbody>
</table>
Consideration of Previous HAB Advice (#296)

• Advice was considered and the proposed plan has been redrafted to provide greater clarity in areas
  o Clearer explanation of elements common to all alternatives so that elements that differ can be more readily distinguished
  o Clearer explanation of the combination of waste site and groundwater components in the alternatives
  o 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?
  o Jennifer Colborn, Mission Support Alliance: (509) 376-5840
  o 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