Carson River Mercury Superfund Site Operable Unit 2 Update Feasibility Study Overview

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Carson River Mercury Site Team

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Operable Units

Superfund sites are large and complex. Often, we divide sites into smaller, more manageable projects called operable units (OUs).

CRMS Site has two OUs:

- 1. Upland/Source Areas
- River channel including floodplain, sediments, and biota (divided into four subareas)



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Contamination at Carson River OU2

Remedial investigation (RI) findings:

- Estimated 7,500 tons of mercury was lost to the environment during Comstock era (OU1 and OU2)
- Mercury sequestered in paleochannels, but released during river bank erosion or construction from meander scars (1997)
- 1997 flood transferred contaminated downriver, with little impact to the river reaches beyond the Lahontan Dam
- About 80-90% of mercury contaminated sediments carried in the river is trapped in Lahontan Reservoir
- Elemental mercury trapped in river and reservoir sediments converts to methylmercury (bacteria) through the food chain, reaching extreme levels in sport fish, such as walleye

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Risk assessment and attribution analysis

Risk managers use risk and hazard estimates in the decisionmaking process (Feasibility Study)

- We evaluated the ways people and the environment can be affected by contamination from the site by looking at:
 - ➢ fish, animals, insects and plants
 - sediment/soils and surface water
 - > tribal exposures
 - residential and recreational use
- We found that mercuric chloride and methylmercury are the most toxic forms of mercury
- We will further evaluate these risks, using additional statistics and spatial analysis in the FS



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Results of risk assessment fish ingestion

Studied mercury exposure from the food-chain pathway, accounting for bioaccumulation

- Eating fish is a human health risk to:
 - Adult and child eating Sacramento blackfish commercially harvested from Indian Lakes area or Lahontan Reservoir and sold at Asian markets
 - A child recreational user consuming fish throughout OU2B subarea (including Lahontan Reservoir)
 - Adult or child practicing traditional lifestyles of eating large amounts of fish caught throughout OU2 (except fish caught <u>on</u> the Fallon- Paiute Shoshone Reservation)





Results of risk assessment wild plants and waterfowl

Studied mercury exposure from the foodchain pathway, accounting for mercury bioaccumulation from soil/sediment

- Eating wild plants and waterfowl is only a human health risk to:
 - traditional tribal lifestyles in OU2, excluding the FPST reservation.



Other risk considerations

- Existing residential properties in the OU2 floodplain <u>may</u> present a current risk within areas that have not been characterized
- Future land development in OU2 floodplain presents a potential future risk within areas that have not been characterized





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Technology Review

Based on the RI report and the risks, we evaluated remedial technologies that could be used to treat contaminated soils/sediments and surface water, including:

- Land Use Controls
- Monitoring
- Containment (capping/barriers and bank stabilization)
- In-situ treatment
- Ex-situ treatment



Technology Review cont.

- Removal (dredging and excavation)
- Disposal
- Beneficial Reuse
- Management of removed sediments (dewatering, treatment prior to disposal)



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Development of Alternatives

Remedial alternatives were developed from the technologies most suitable to address the site-specific conditions for CRMS OU2. Four remedial alternatives were developed to address risks:

- Alternative No. 1 No action
- Alternative No. 2 Land use controls (LUCs)/institutional controls (ICs) and Monitoring
- Alternative No. 3 Same as No. 2, plus limited areas of riverbank stabilization with sediment excavation and disposal
- Alternative No. 4 Same as No. 3, plus limited areas of riverbank and river bed removal and disposal



Nine-Criteria for Remedy Selection

Threshold Criteria	 Overall protectiveness of human health and the environment Compliance with applicable or relevant and appropriate requirements (ARARS)
Balancing Criteria	 Source and permanence Reduction of toxicity, mobility, or volume Short-term effectiveness Implementability Cost
Modifying Criteria	8. State and Tribal acceptance 9. Community acceptance

What comes next?

- inform and involve agency partners and government representatives
- peer review draft FS (July 2018)
- complete the FS report (August 2018)
- using the nine remedy criteria, determine a preferred remedy plan ("alternative")
- present to the public in a Proposed Plan and hold a formal comment period (2019)
- EPA Record of Decision (remedy plan) and response to comments (2020)

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- design the remedy (2021)
- implement remedy (2022)
- reuse and redevelopment (ongoing)



Teamwork and collaboration





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