



**DOE Oak Ridge Reservation
CERCLA
2013 Remediation Effectiveness Report**

May 8, 2013

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**2013 Remediation Effectiveness Report
(RER)**

Purpose

- **Determine effectiveness of remedial actions in achieving a stated goal and compliance with long-term stewardship requirements.**

Scope

- **Stewardship activities (FY 2012)**
- **Ongoing actions status**
- **Monitoring results (FY 2012)**
- **Remedy effectiveness**
- **Actions/Recommendations**

2013 RER Long Term Stewardship Verification Results

- Tracked 55 CERCLA sites (over 200 checks, includes 7 treatment/collection systems)
 - Includes FY2012 Certification of Land Use Controls for Melton Valley
 - Addition of new appendix to track slab stewardship requirements
 - No new issues or recommendations identified

2013 RER Long Term Stewardship Verification Results

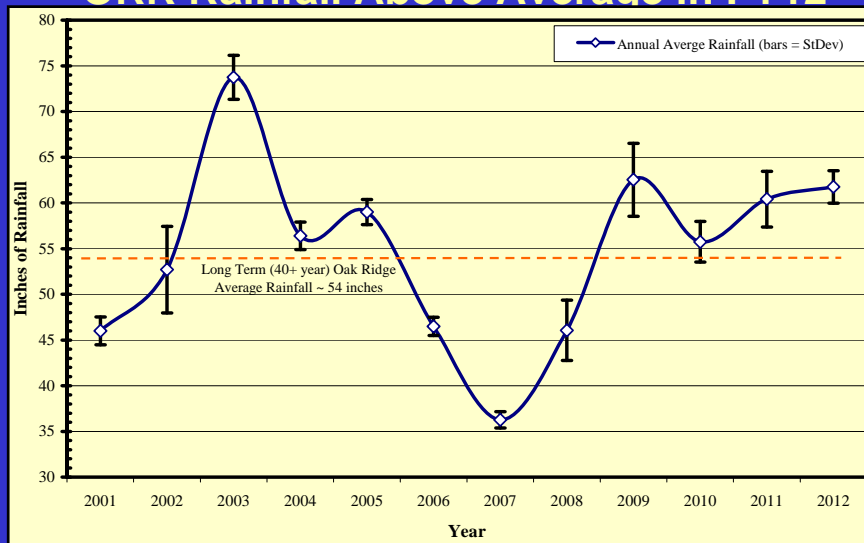
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2013 RER Remedial Action Status

- **UEFPC**
 - D&D work continued and cleanup of the Old Scrap Yard was completed and significant work was performed on Mercury Reduction
 - Mercury discharges from storm sewers decreased to pre-cleanout levels although the downstream levels remained elevated
- **Bear Creek Valley**
 - Uranium flux goal at Integration Point (BCK-9.2) is yet to be attained; monitoring indicates NT-8 (Bear Creek Burial Grounds) remains a significant contributor to uranium flux in Bear Creek
- **ETTP**
 - Demolition of most of the K-25 building East Wing completed, work started on North Wing demolition
 - Contaminant levels in groundwater and surface water generally stable or decreasing
 - Mitchell Branch hexavalent chromium treatment system started operation
 - K-1070-B burial ground excavation completed
 - D1 of Zone 1 Final ROD submitted to regulators
- **Bethel Valley**
 - Tank W-1A soil and tank shell excavation completed
 - CH-8 plume extraction system upgrade completed. Sr-90 levels at 7500 Bridge (Integration Point) decreased
 - RA completed on 18 slabs and associated structures in Northwest Quadrant
 - Legacy material removed from Building 3038
 - Completion documents approved for D&D projects and Bethel Valley Burial Ground RA completed in 2011
- **Melton Valley**
 - Goals at White Oak Dam continue to be met as result of hydraulic isolation of Melton Valley source areas
 - Monitoring of exit pathway and offsite wells shows groundwater flow paths converge toward Clinch River. Groundwater pumping offsite has potential to draw DOE contaminants offsite. As a precaution drinking water provided to offsite residents

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2013 RER ORR Rainfall Above Average in FY12



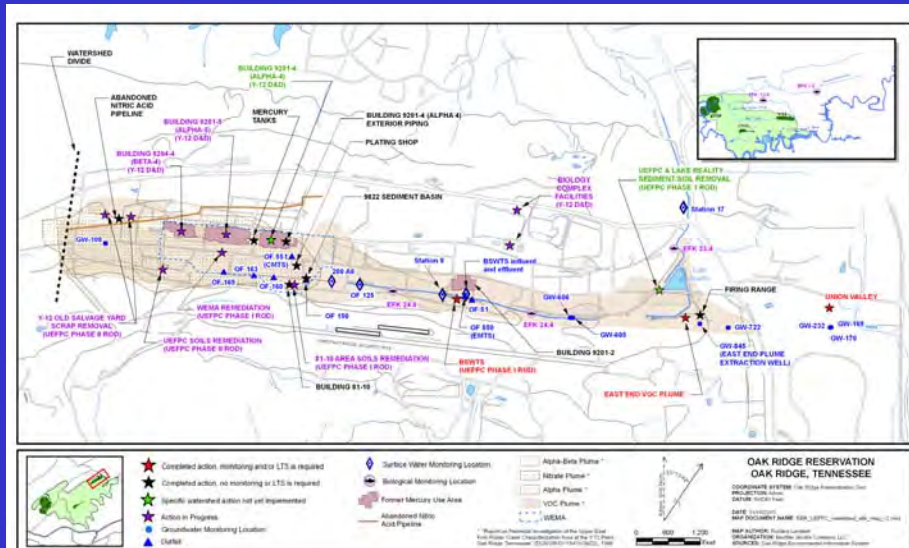
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2013 RER Upper East Fork Poplar Creek

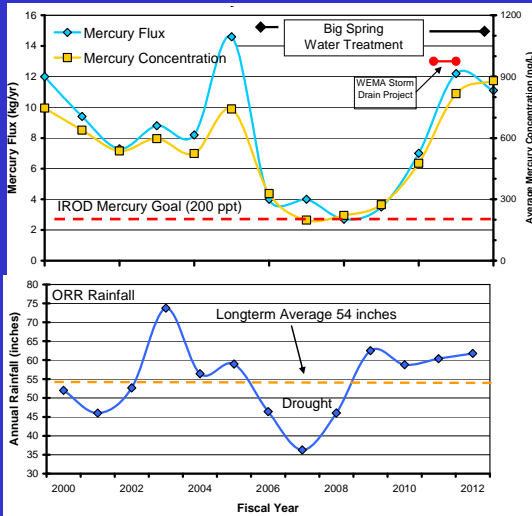
- PCCR for West End Mercury Area Storm Sewer Remediation Project approved in FY 2012
- PCCR for Scrap Metal Removal at the Old Salvage Yard was approved in FY 2012
- Soil remediation at the Old Salvage Yard was completed and PCCR was submitted in FY 2012
- An 11.7 acre area including 81-10 former mercury recovery process site was characterized and a Remedial Design Work Plan for site cleanup was submitted in FY 2012
- Mercury Reduction Project activities included: 1) installation of mercury "traps" for removal of free mercury from selected storm drain locations, 2) treatability study and conceptual design of a storm water mercury treatment plant for Outfall 200, 3) mercury contaminated soil treatability study, 4) designs were completed to retrofit selected drains at Alpha 4, Alpha 5, and Beta 4 to prevent additional release of mercury to the environment, 5) 5 tanks formerly used in mercury related activities were characterized and transported offsite for disposal.
- Approval of RARs for D&D activities completed in FY 2011

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2013 RER Upper East Fork Poplar Creek

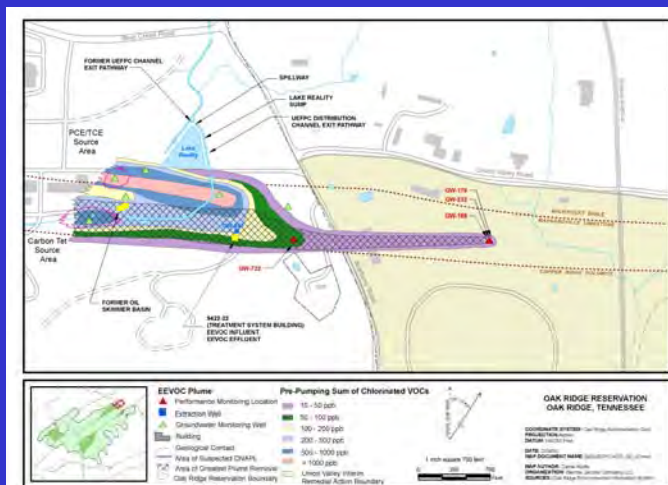


2013 RER Mercury Flux and Concentration at Station 17



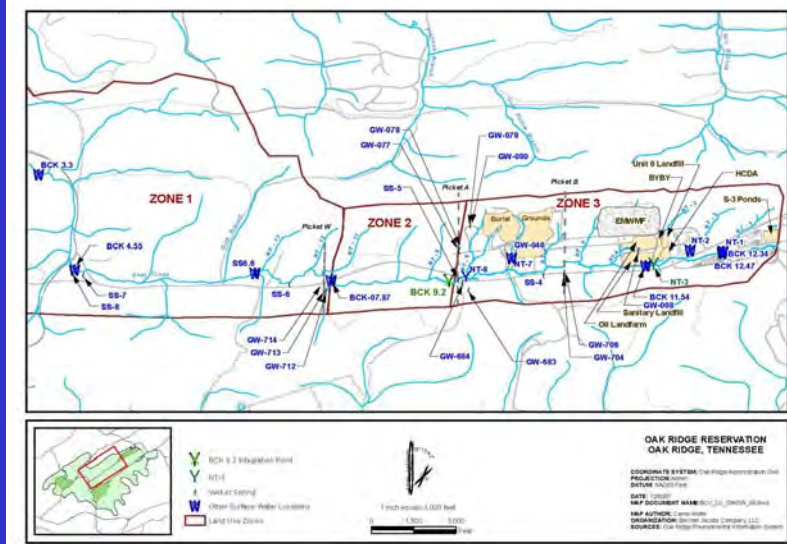
- Mercury discharges remained elevated during FY 2013
- ROD goal not yet attained

2013 RER EEVOC Pump and Treat

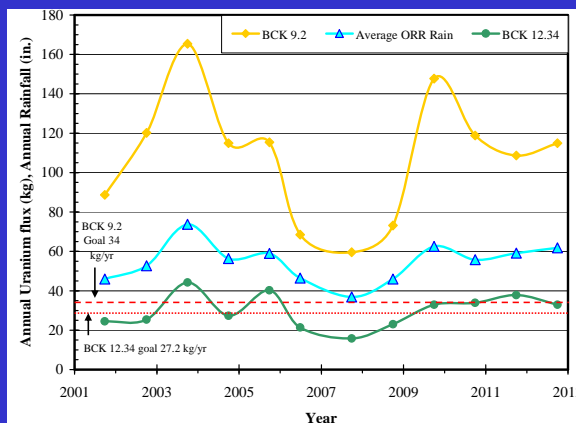


- Pump and treat has contained the VOC plume – protects offsite groundwater quality

2013 RER Bear Creek Valley

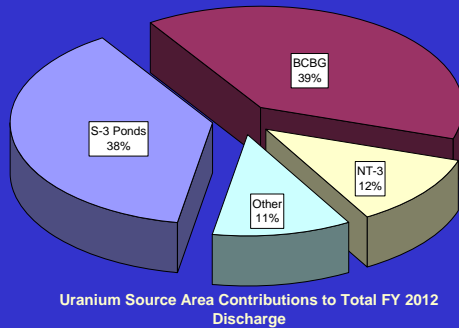


2013 RER Bear Creek Valley Uranium



- BCK 12.34 flux goal met 6 of 11 years when annual rainfall is at or below average
- Flux goal not met at BCK 9.2
- Fluxes trend with annual rainfall

2013 RER Bear Creek Valley



Uranium Source Area Contributions to Total FY 2012 Discharge

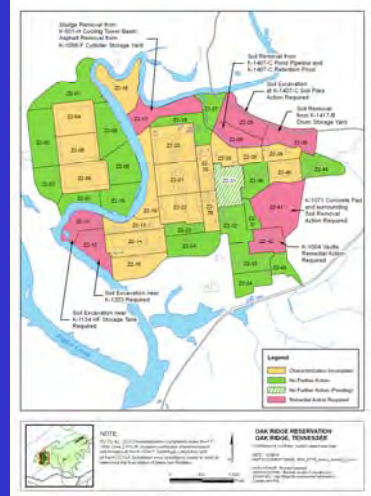
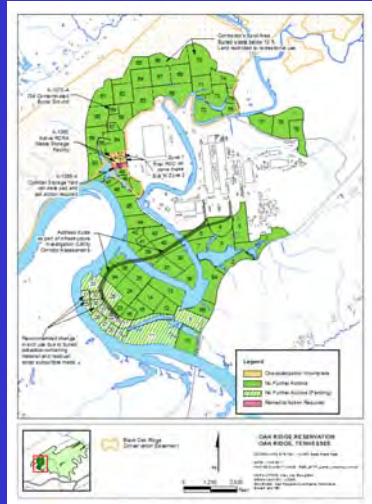
- Uranium and nitrate are principal surface water contaminants
 - Uranium goal not met at Integration Point (IP) and not yet met consistently at BCK 12.34 (S-3 Ponds)
 - NT-8 (western side of Bear Creek Burial grounds) contributed ~ 38% of FY13 uranium flux
 - NT-3 uranium flux was ~ 14 kg which exceeds the BYBY remediation goal and comprises ~ 12% of IP uranium flux. Isotopic signature indicates source is different from the BYBY waste.

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2013 RER Progress at ETPP

- K-1070-B burial ground remediation was completed and PCCR was submitted during FY 2012
- The K-33 Building Demolition PCCR was approved in FY 2012
- K-33 slab was removed in FY 2012
- Most of the K-25 Building East Wing exclusive of the technetium area was demolished in FY 2012
- Demolition was initiated on the K-25 North End
- Characterization was completed on 22 structures within the Poplar Creek D&D project scope
- The PCCR for the 2011 demolition of 14 low-risk/low-complexity facilities was approved in FY 2012
- The PCCR for the 2011 demolition of 20 predominantly uncontaminated facilities was approved in FY 2012.
- Chromium water treatment system at Mitchell Branch started operation in FY 2012
- A technical memorandum was prepared to document interim closure of the K-1401 groundwater treatability test site since further work on the project is deferred
- Completed remediation required by Zone 1 Interim ROD
- Monitoring of groundwater and surface water show that contaminant conditions are generally stable
- Submitted D1 of Final Zone 1 Remedial Investigation and Feasibility Study for East Tennessee Technology Park which addresses groundwater, ecological protection, and land use controls

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2013 RER Bethel Valley

- RA completed for 18 slabs and associated structures in Northwest Quadrant in FY 2012
- 2 PCCRs approved for 34 Buildings D&D Project in FY 2012
- Building 3026 Hot Cells revised approach for hot cell cleanout approved in FY 2012
- Building 3038 legacy materials removed and disposed in FY 2012
- Isotopes Row Facilities PCCR approved in FY 2012
- 4500 Area Gaseous Waste System Upgrade started in FY 2012
- Bethel Valley Burial Ground PCCR approved in FY 2012
- Bethel Valley 7000 Area Plume monitoring continued in FY 2012
- Core Hole 8 Plume Extraction Wells PCCR was approved in FY 2012
- Tank W-1A excavation complete in FY2012
- Ongoing monitoring of surface water, groundwater, and aquatic biota

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2013 RER Core Hole 8 Plume Collection

- Core Hole 8 plume collection system was refurbished in FY 2012
- As a result, strontium-90 levels in White Oak Creek at 7500 Bridge decreased to Bethel Valley ROD goal levels

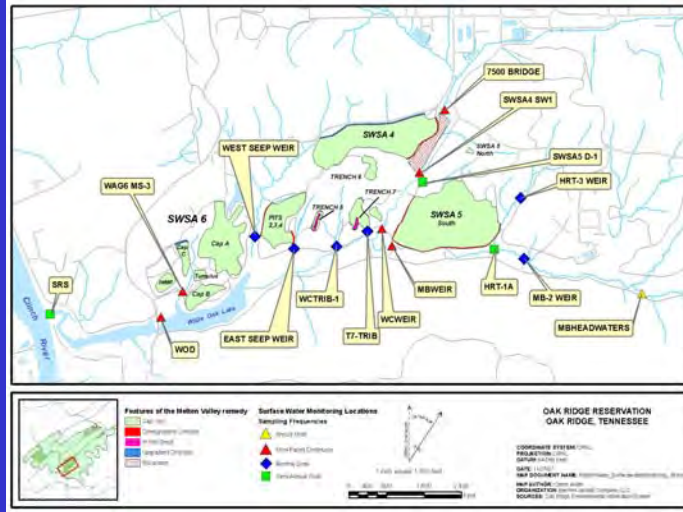
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2013 RER Melton Valley

- ROD actions completed by end of FY06
- Remedy operations ongoing (surveillance & maintenance)
- FY 2012-13 SWSA 4 downgradient trench wells redeveloped to improve performance
- Performance monitoring includes surface water quality and effectiveness of hydrologic isolation of buried waste units
- Aquatic biota monitored to evaluate ecological recovery

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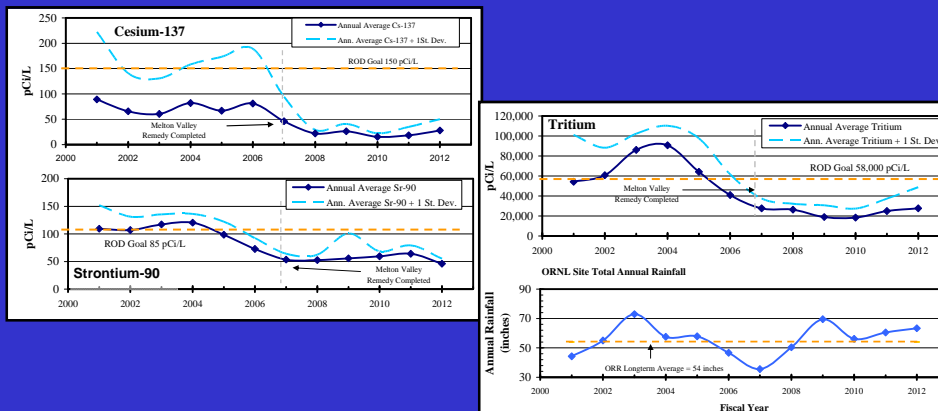
2013 RER Melton Valley Surface Water Monitoring



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2013 RER White Oak Dam (IP) Data

• ⁹⁰Sr, tritium (and ¹³⁷Cs) goals at the IP have been attained and maintained since completion of MV remedy and have shown minimal response to above average rainfall during FY 2009 through FY 2012



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2013 Melton Valley Exit Pathway and Offsite Groundwater

- Past detection of DOE contaminants in onsite exit pathway wells was followed by installation of offsite monitoring wells.
- DOE provided permanent utility water supplies to residents offsite and near Clinch River.
- Monitoring continues at 16 DOE-built offsite wells and 7 offsite residential wells.

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2013 RER ORR Offsite

- LEFPC – mercury concentrations in fish tissue continue to exceed EPA criteria
- Lower Watts Bar/Clinch River/Poplar Cr
 - PCBs in reservoir fish trending downward since 1980's
 - Mercury in LWBR fish are below EPA criteria

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2013 RER Issues/Recommendation Summary

- New issue identified includes performance deterioration of piezometer 4544
- Continuing issues
 - MV exit pathway and offsite groundwater monitoring (revised SAP pending approval)
 - Continued elevated BCV NT-8 uranium flux (ongoing issue)
 - BCV Zone 2 well installation (added to BCV future groundwater ROD scope)
 - Resolve ETPP Zone 1 Land Use difference with BORCE will be addressed by change in end use for that area from industrial to recreation in addendum to Zone 1 Interim ROD.
- 5 previous issues closed during FY 2012

Does not include administrative document items or minor monitoring changes

2013 RER Comments

- Please provide comments to Jason Darby DOE by July 1, 2013
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