

2010 Remediation Effectiveness Report (RER)

**Jason Darby
DOE EM Program**

April 14, 2010

2010 RER

Purpose

- Assess progress of remedial actions toward a stated goal

Scope

- Ongoing actions status
- Monitoring results (FY 2009)
- Remedy effectiveness
- Stewardship activities (FY 2009)
- Recommend monitoring changes

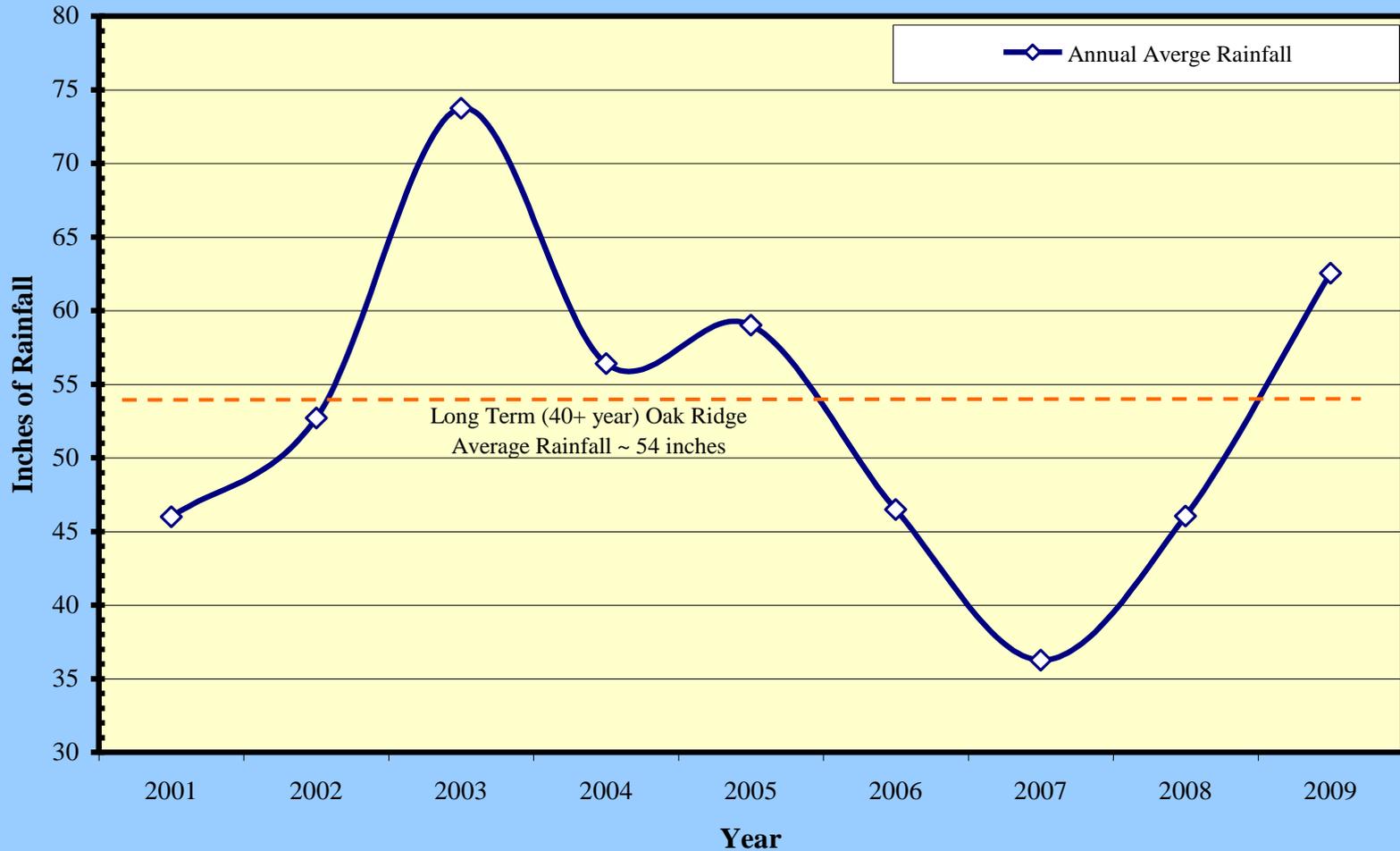
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Remedial Action Status

- **UEFPC – BSWTS captures and treats significant mercury mass. Annual Hg flux measured at Station 17 (IP) shows the influence of BSWTS and above average FY 09 rainfall**
- **Bear Creek Valley – uranium flux goal at IP (BCK-9.2) is yet to be attained; monitoring indicates NT-8 (BCBGs) remains a significant contributor to uranium flux at (IP)**
- **ETTP D&D – Approximately 2/3 of the K-25 building west wing was demolished and 4 predominantly uncontaminated and 11 low-complexity facilities were demolished and debris removed in FY 2009.**
- **ETTP RA –**
 - Mitchell Branch hexavalent chromium removal action
 - K-1070-B burial ground excavation
 - Groundwater Treatability Study
 - Ponds Removal Action
 - K-770 Scrap Yard soil
 - Zone 1/Zone 2 soil
- **Bethel Valley**
 - continued significant decrease in Hg concentrations in WOC following maintenance action at Bldg. 4501
 - significant releases from CH-8 plume collection system
- **Melton Valley – goals at WOD continue to be met as result of hydraulic isolation of Melton Valley source areas**

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ORR Rainfall Above Average in FY09



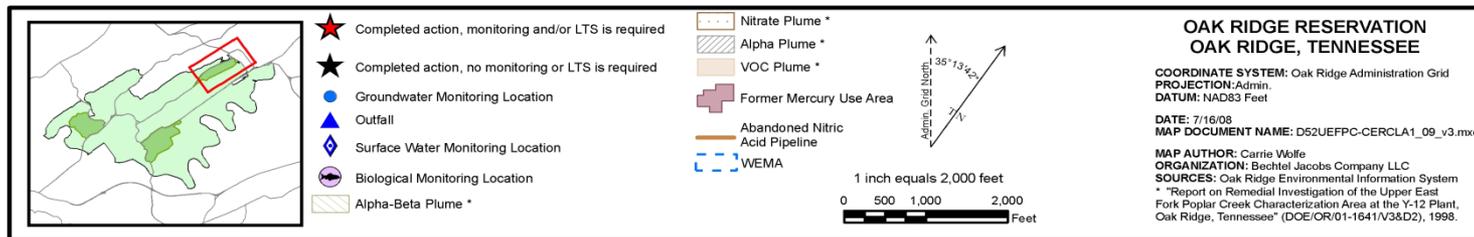
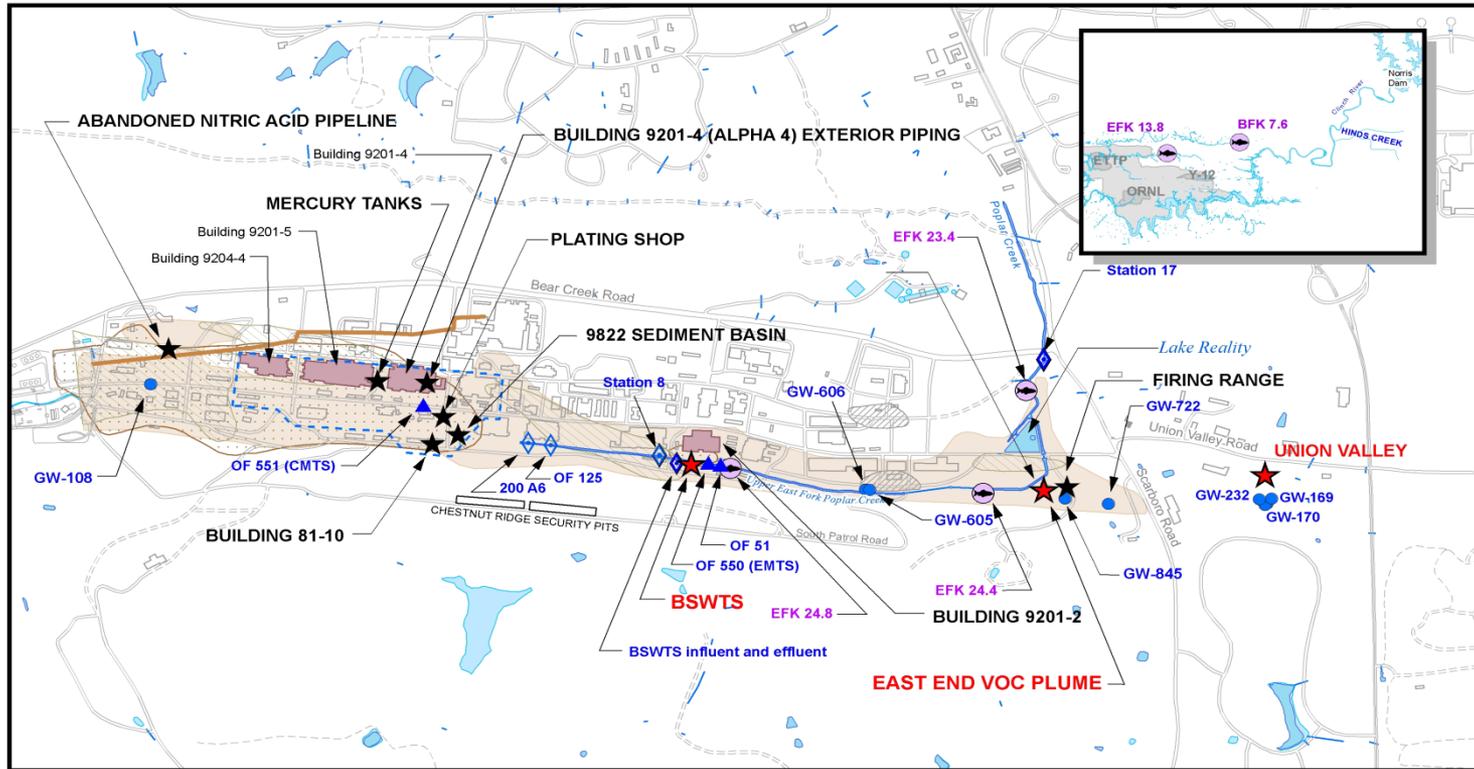
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Upper East Fork Poplar Creek

- Key remedial actions include:
 - East End VOC Plume Pump and Treat
 - Big Springs Mercury Treatment System
- Both actions continue to effectively reduce offsite contamination

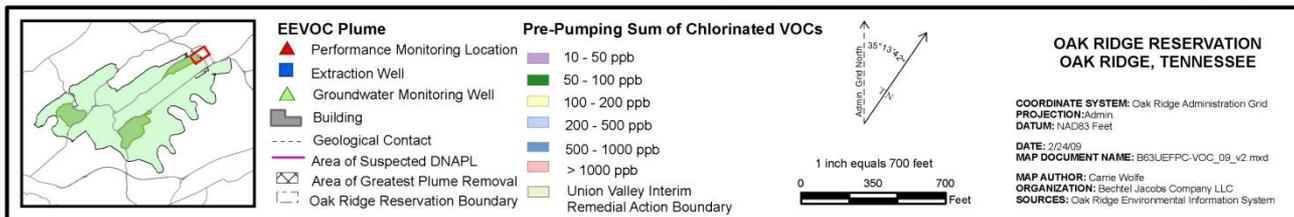
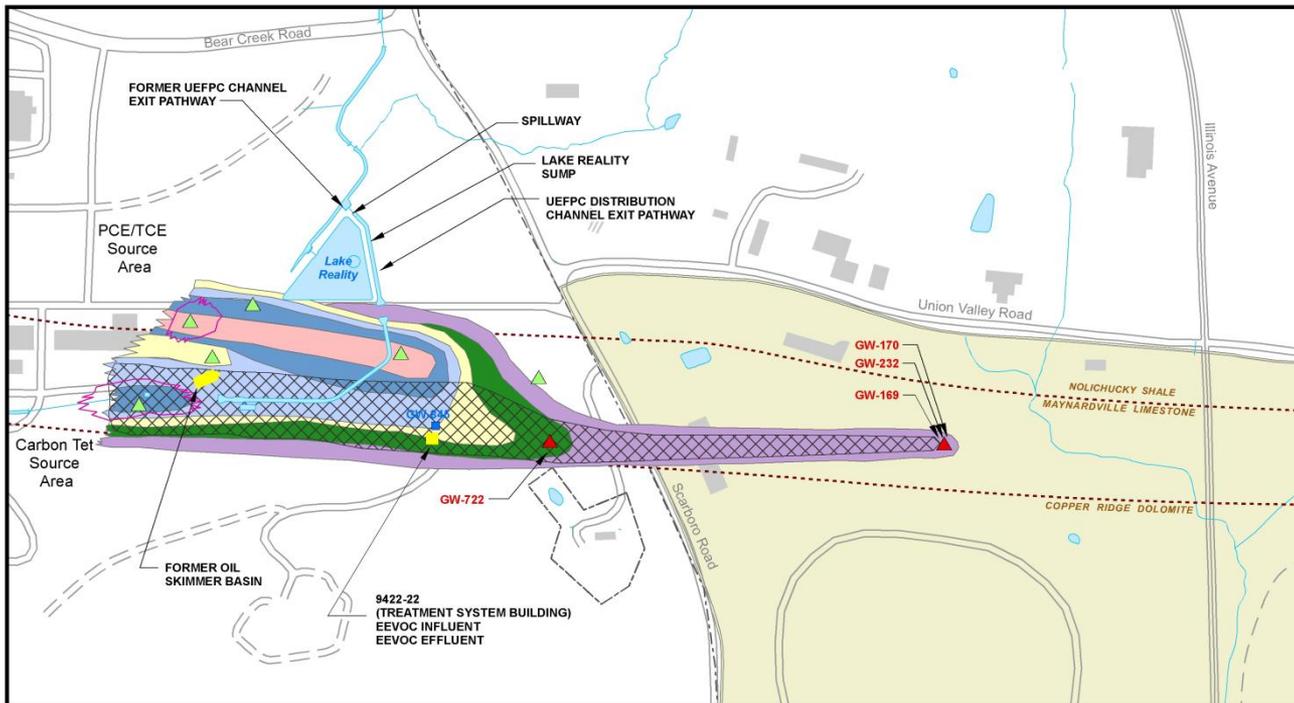
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Upper East Fork Poplar Creek



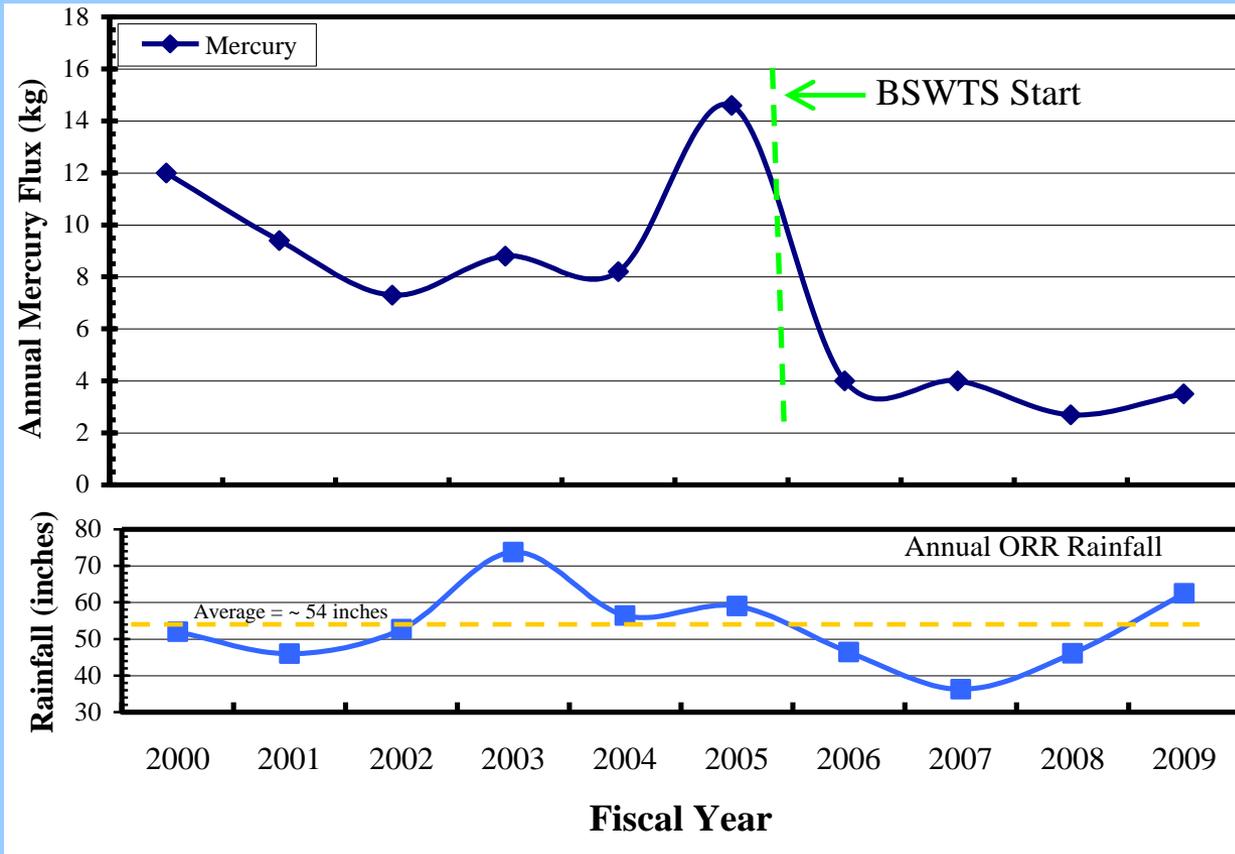
2010 RER EEVOC Pump and Treat

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



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Mercury Flux Reduction at Station 17



- BSWTS captures and removes several kg's of mercury per year reducing offsite releases
- ROD goal not yet attained

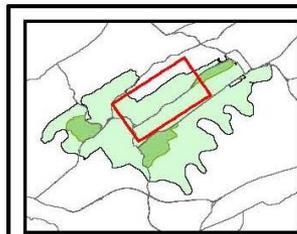
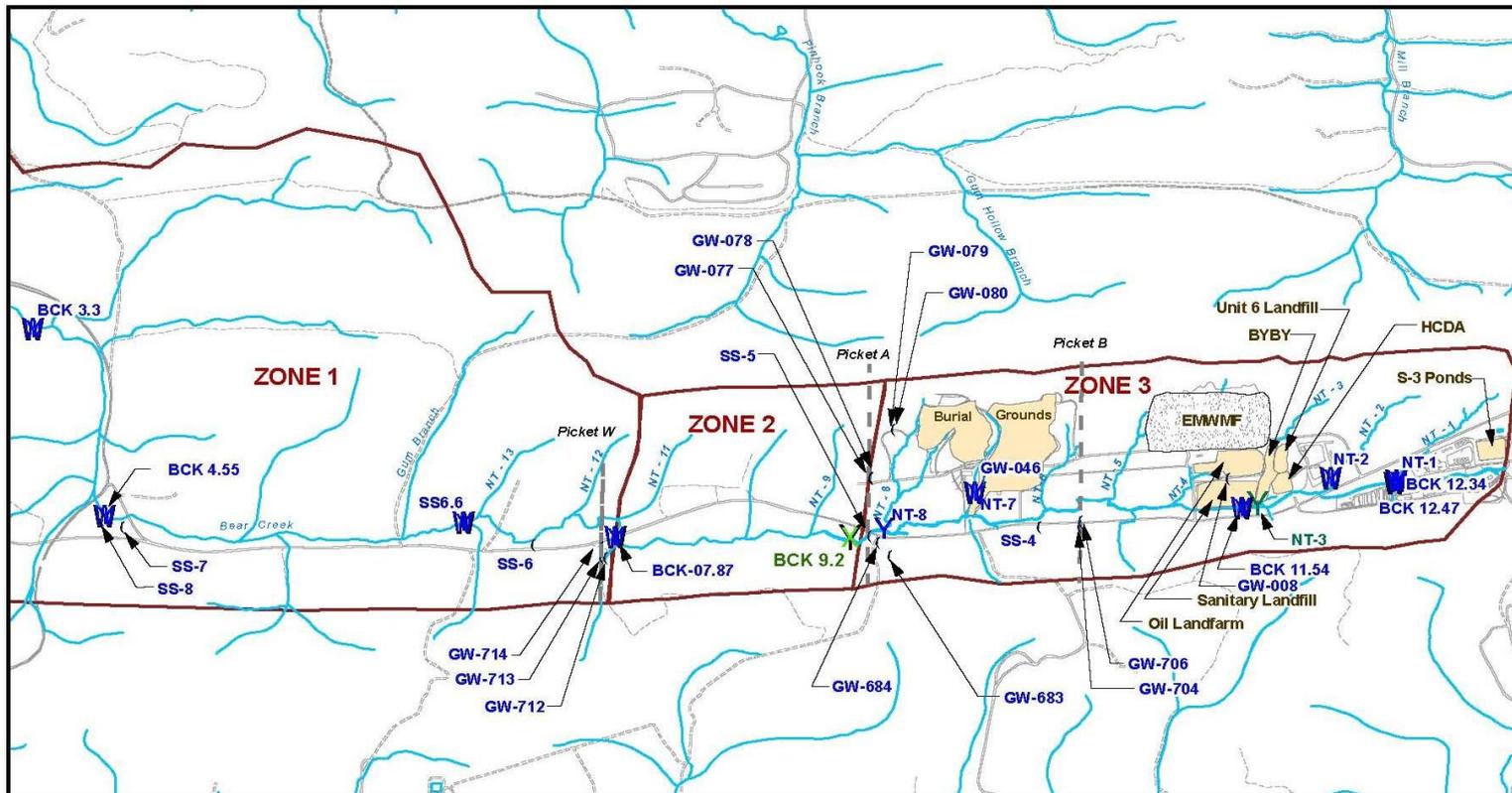
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Bear Creek Valley

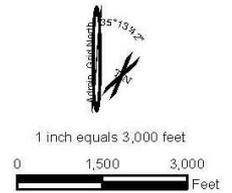
- Uranium and nitrate are principal surface water contaminants
 - Uranium goal not met at Integration Point (IP) and not yet met consistently at BCK 12.34 (S-3 Ponds)
 - NT-8 (western side of Bear Creek Burial grounds) contributed ~ 40% of FY09 IP uranium flux
 - Uranium increasing slightly at NT-3. Investigations ongoing to determine source.

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Bear Creek Valley



- BCK 9.2 Integration Point
- NT-3
- Well or Spring
- Other Surface Water Locations
- Land Use Zones

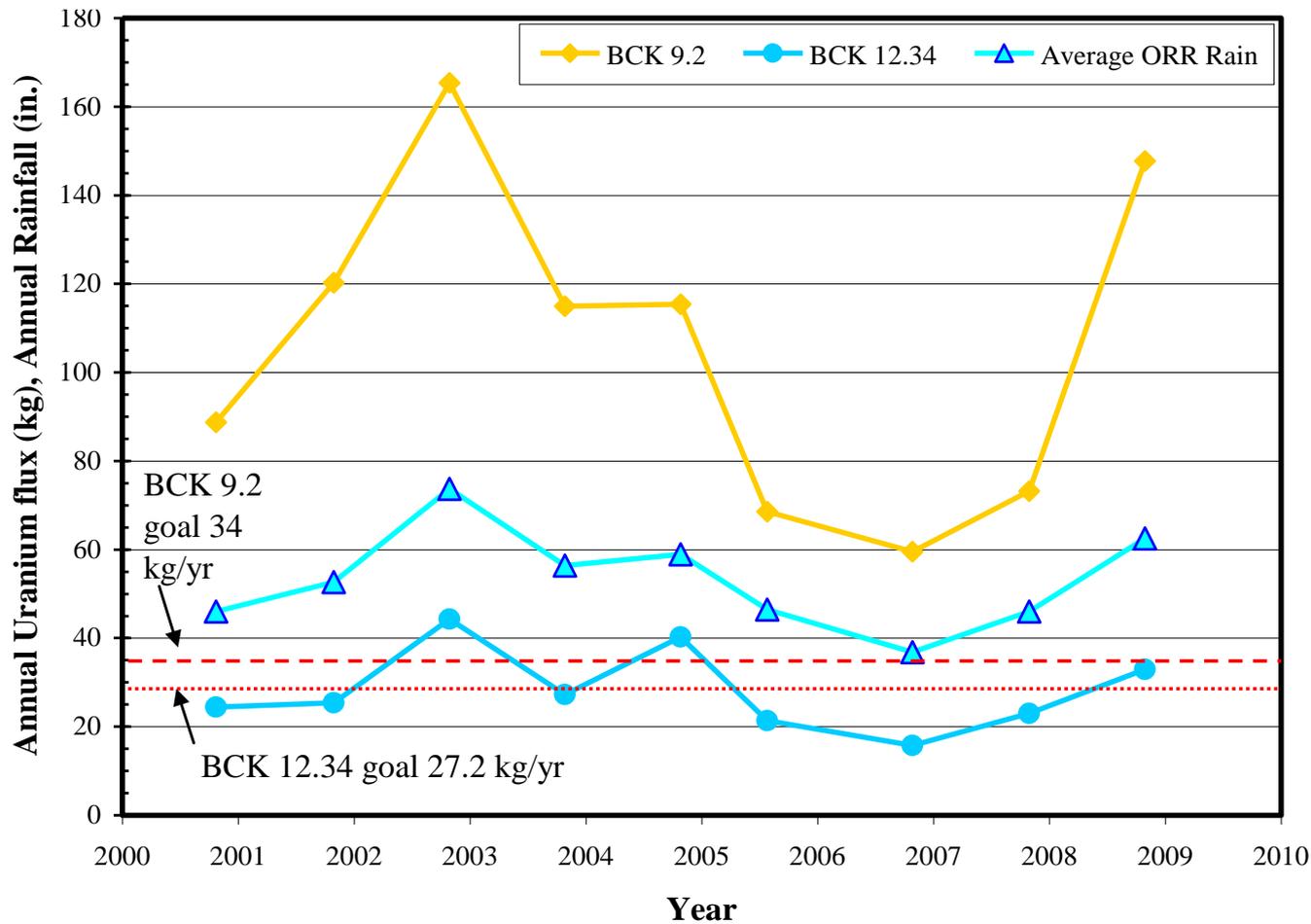


OAK RIDGE RESERVATION OAK RIDGE, TENNESSEE

COORDINATE SYSTEM: Oak Ridge Administration Grid
PROJECTION: Admin.
DATUM: NAD83 Feet
DATE: 12/03/07
MAP DOCUMENT NAME: BCV_LU_SWGW_08.mxd
MAP AUTHOR: Carrie Wolfe
ORGANIZATION: Bechtel Jacobs Company, LLC
SOURCES: Oak Ridge Environmental Information System

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Bear Creek Valley Uranium



- Flux goal met 6 of 8 years BCK 12.34
- Flux goal not met at BCK 9.2
- Fluxes trend with annual rainfall

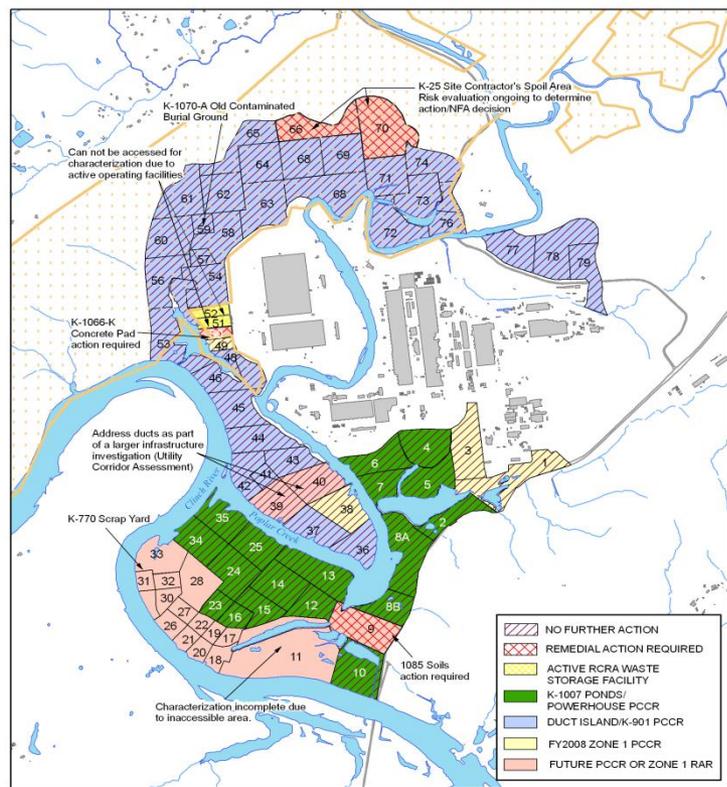
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Progress at ETTP

- D&D Program FY 2009 accomplishments
 - Demolition of 2/3 of the K-25 building west wing generated 5,500 truck loads of debris, 1,500 compressors, and 700 converters disposed at EMWMF. Pre-demolition activities continued in the east wing
 - Pre-demolition work was initiated in the K-27 building
- Four predominantly uncontaminated facilities and 11 low-risk/low-complexity facilities were demolished along with 3 high-risk buildings (K-1231, K-1233, and K-413)
- K-1007-P1 Pond remediation field work was completed. Some fish stocking still remains
- Excavation ongoing at K-770 Scrap Metal Yard and K-1070-B Classified Burial Ground
- Plume containment pumping and treatment of the hexavalent chromium plume near Mitchell Branch is controlling contamination below TDEC AWQC limit. Non-TC RmA proposed for longterm pump and treat.
- Monitoring of groundwater and surface water show that contaminant conditions are stable
- Groundwater treatability study for VOC source treatment ongoing

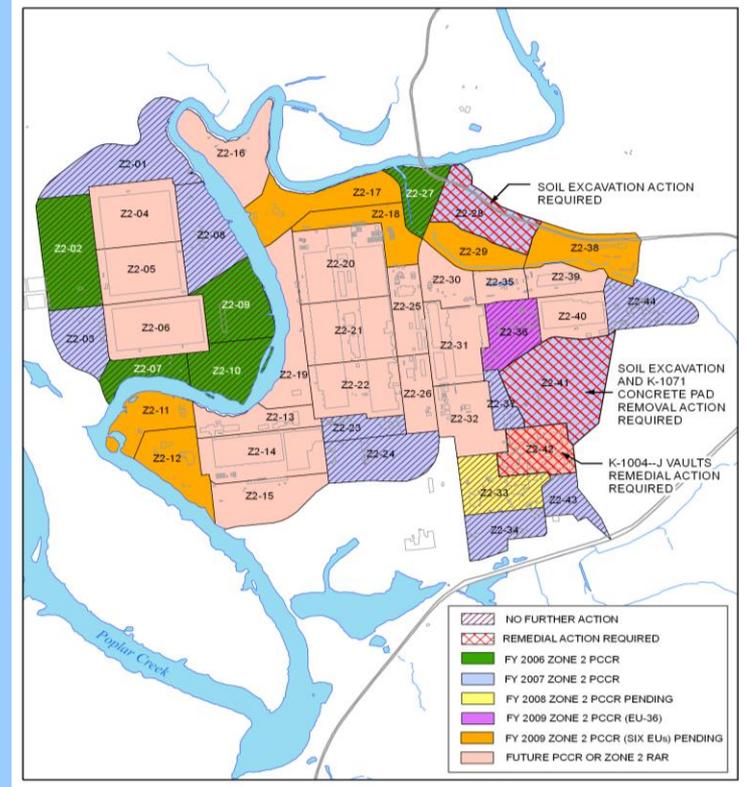
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ETTP Zone 1 / Zone 2 Soils



NOTE:
 EUs 17-22: Characterization in progress. To be completed after powerhouse D&D.
 EUs 26-33: Characterization in progress. To be completed after scrap removal.
 Black Oak Ridge Conservation Easement

**OAK RIDGE RESERVATION
 OAK RIDGE, TENNESSEE**
 COORDINATE SYSTEM: NAD83 State Plane Feet
 DATE: 11/19/09
 MAP DOCUMENT NAME: RER_ETTP_zone1_closure_v0.mxd
 MAP AUTHOR: Richard Lambert
 ORGANIZATION: Bechtel Jacobs Company LLC
 SOURCES: Oak Ridge Environmental Information System and RRI



NOTE:
 EU Z2-42: DVS Characterization completed under the FY 2009 Zone 2 PCCR; however additional characterization still remains at the K-1004-T Centrifuge Laboratory and at the K-1210-A Substation once operations cease in order to determine the final status of these two facilities.

**OAK RIDGE RESERVATION
 OAK RIDGE, TENNESSEE**
 COORDINATE SYSTEM: NAD83 State Plane Feet
 DATE: 11/19/09
 MAP DOCUMENT NAME: RER_ETTP_zone2_closure_v0.mxd
 MAP AUTHOR: Richard Lambert
 ORGANIZATION: Bechtel Jacobs Company LLC
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ETTP Zone 1 / Zone 2 Status

Zone	Number of Exposure Units				
	Evaluated	NFA	RA Required	RA Completed	RA Remaining
Zone 1	79 total				
2006	60	55	5	0	5
2007	0	0	0	0	0
2008	0	0	0	4 ¹	1
2009	0	0	0	0	1
Remaining	19				1
<hr style="border-top: 1px dashed black;"/>					
Zone 2	44 total				
2006	6	5	1	0	1
2007	11	9	2	0	2
2008	1	0	1	1	0
2009	7	2	5	0	5
Remaining	19				8

¹Remediation completed during FY08 on 4 EUs evaluated in FY06.

NFA – No further action

RA – Remedial action

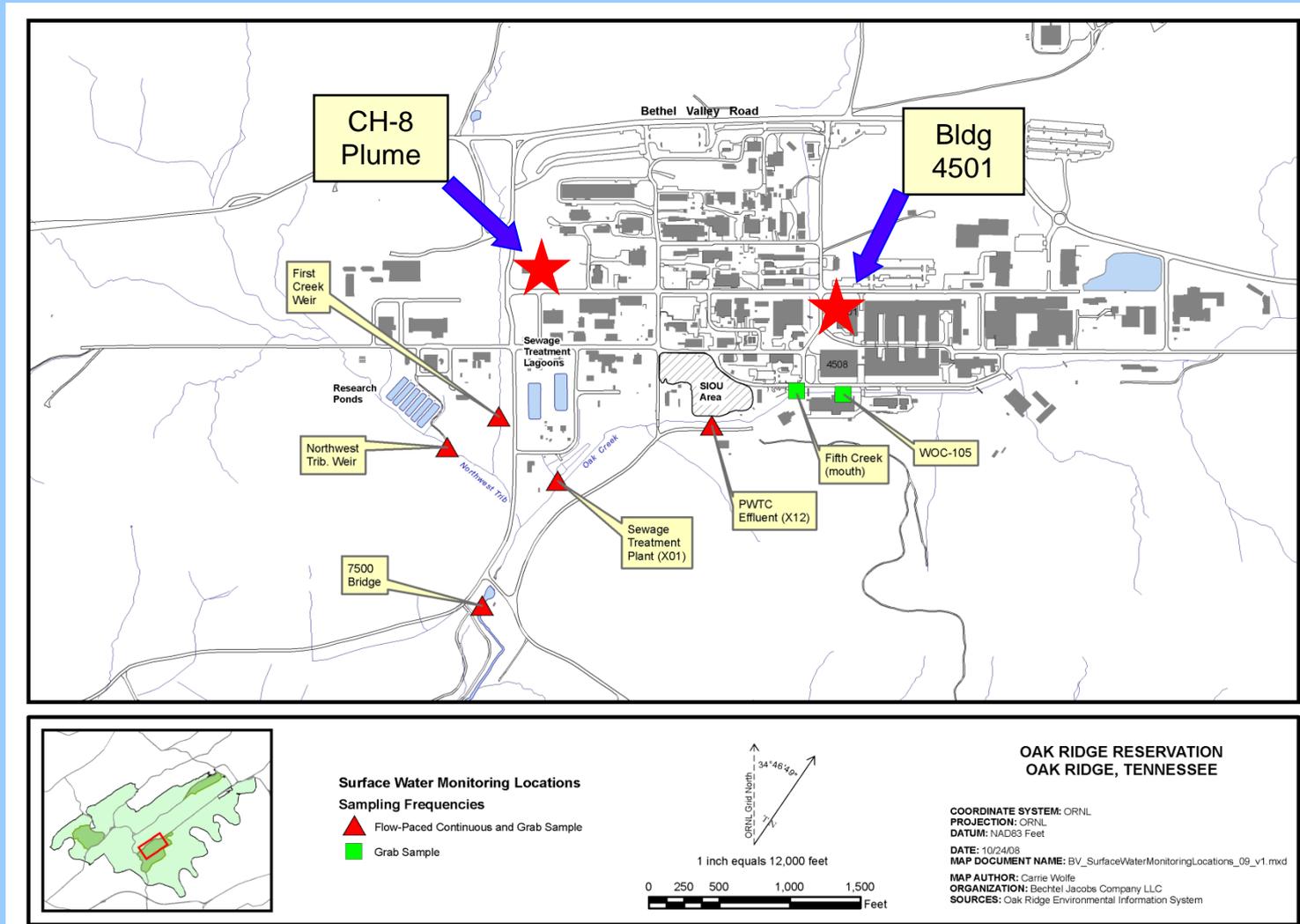
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Bethel Valley

- Key CERCLA environmental actions to date
 - Bldg 4501/4505 basement sump mercury diversion to treatment
 - Core Hole 8 Plume containment pumping
- Ongoing monitoring of surface water, groundwater, and aquatic biota

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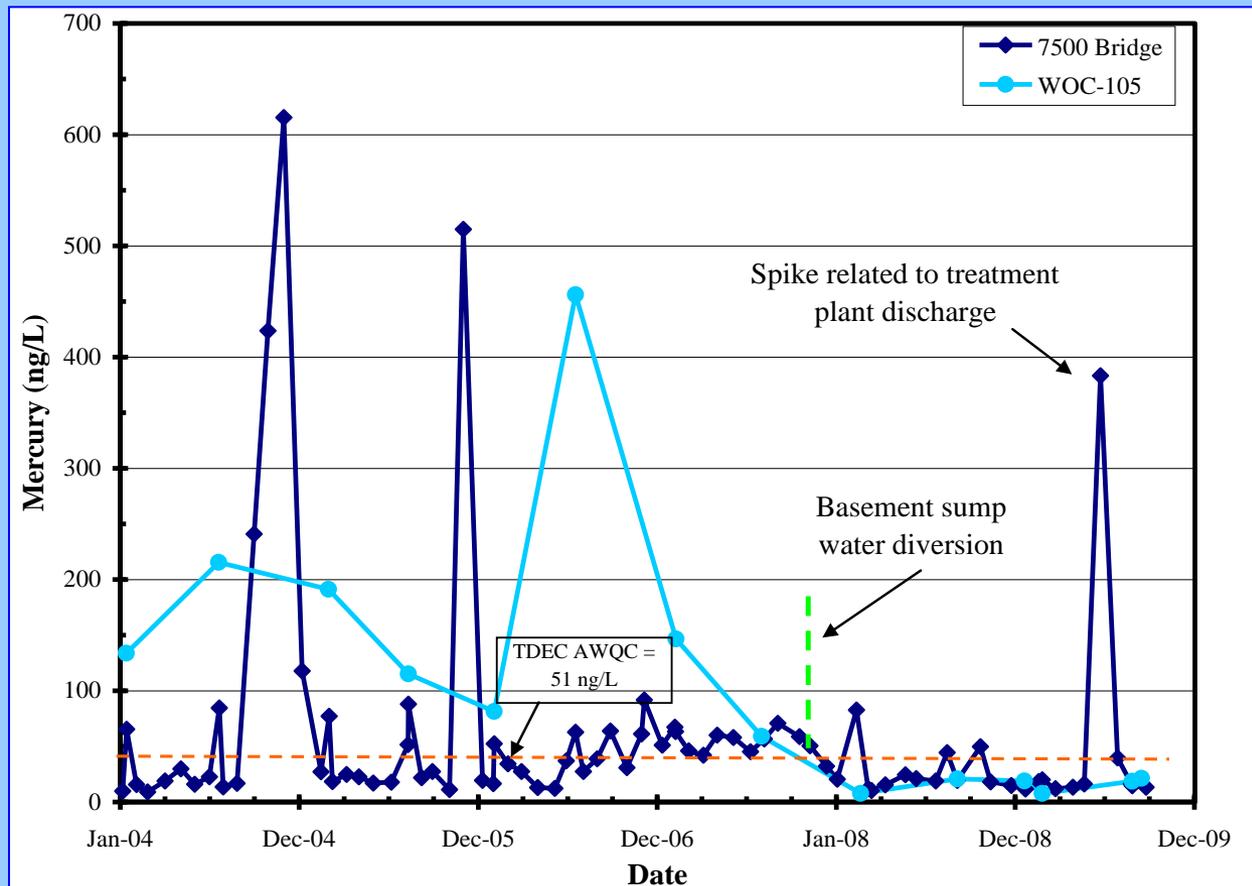
Bethel Valley Surface Water Monitoring



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Reduction of Mercury in White Oak Creek

- Routing of Bldg 4501/4505 basement sump water to treatment reduces mercury in surface water



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Core Hole 8 Plume Collection

- Core Hole 8 plume collection system did not meet performance goals for FY09.
- Combination of mechanical problems and utility water line leaks caused increased plume water discharges to First Creek.
- Corrective actions are under way.

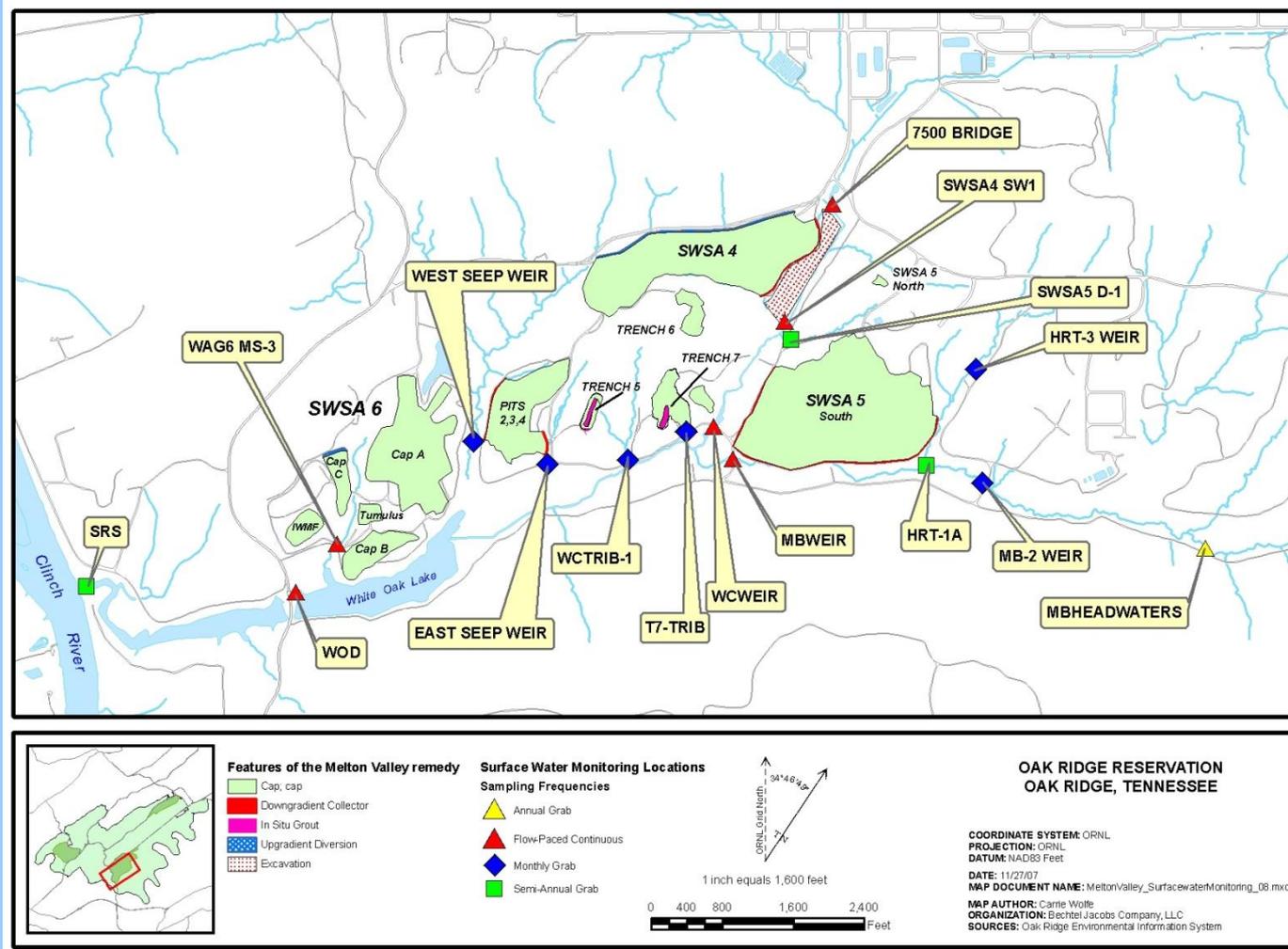
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Melton Valley

- ROD actions completed by end of FY06
- 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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Melton Valley Surface Water Monitoring



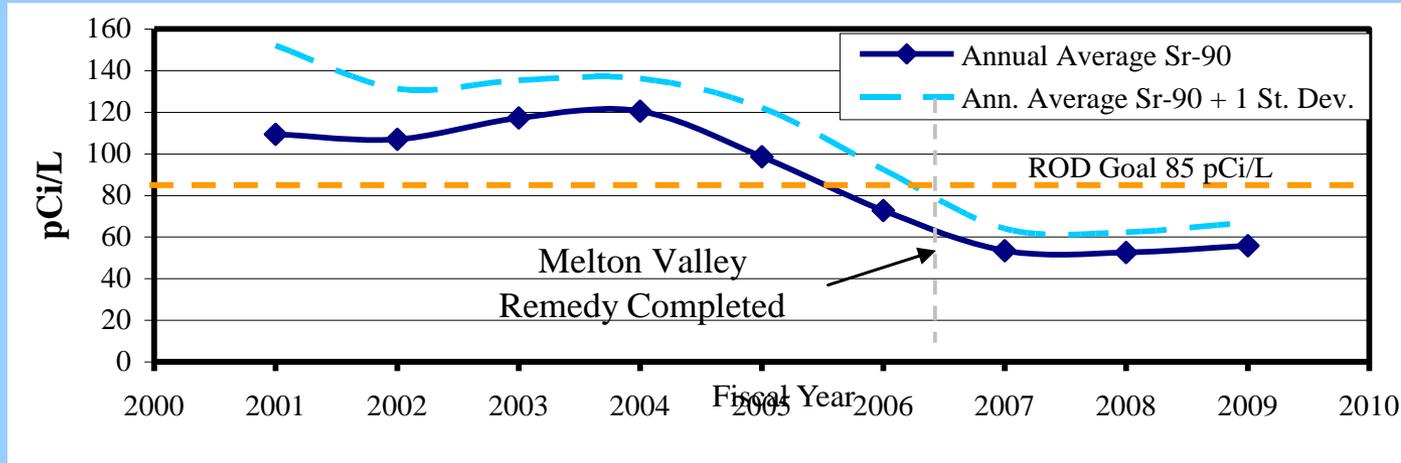
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MV ROD Water Quality Goals

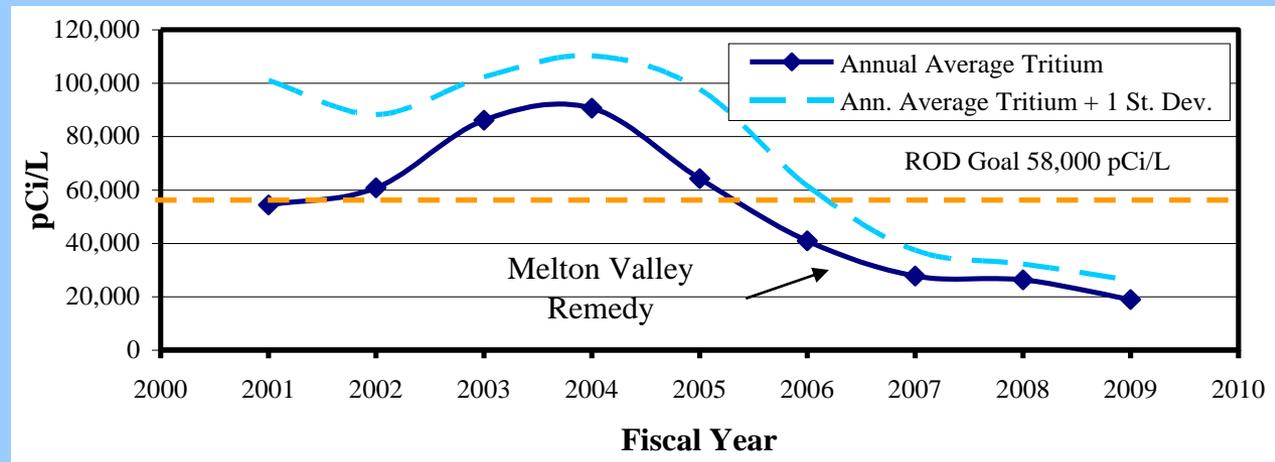
- Residential-based goals to protect water quality at the integration point (White Oak Dam)
 - Goals have been met in FY 2007 through 2009
- Recreation-based goals established for streams within Melton Valley
 - Goals have been met in FY 2007 through 2009
- Ambient Water Quality Criteria for fish and aquatic life
 - Most metals, VOCs, semi-VOCs below AWQC
 - VOCs and semi-VOCs not problematic
 - Mercury and PCBs near thresholds at most locations
 - Dioxins, pesticides widespread at low levels

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White Oak Dam (IP) Data

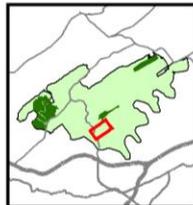
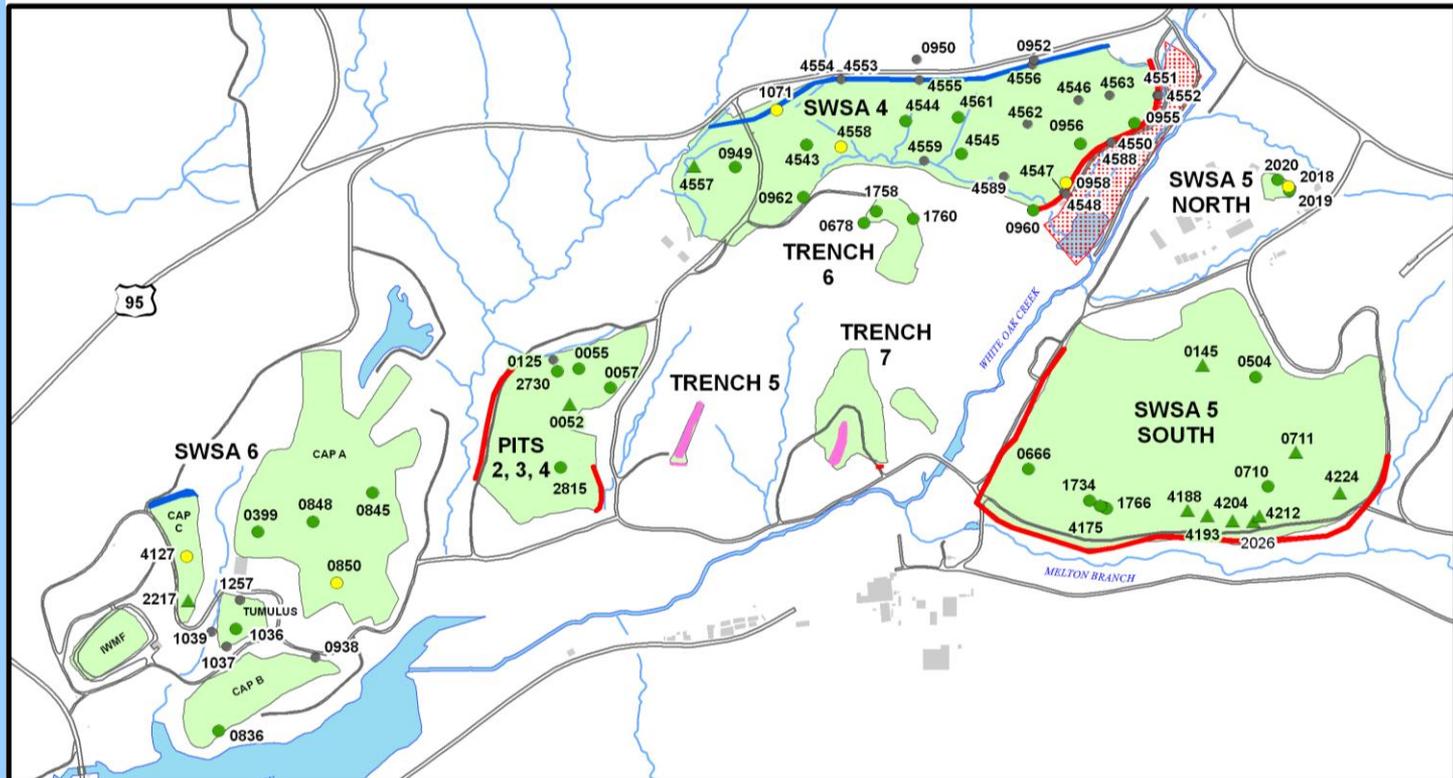


•⁹⁰Sr, tritium (and ¹³⁷Cs) goals at the IP have been attained and maintained since completion of MV remedy



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MV Hydrologic Isolation



Features of the Melton Valley remedy

- Downgradient Collector
- In Situ Grout
- Upgradient Diversion
- Cap
- Excavation

FY2009 Groundwater Level Summary

- Target not specified - trend monitoring
- ▲ Well has gone dry
- Maximum exceeds target
- Maximum attains target



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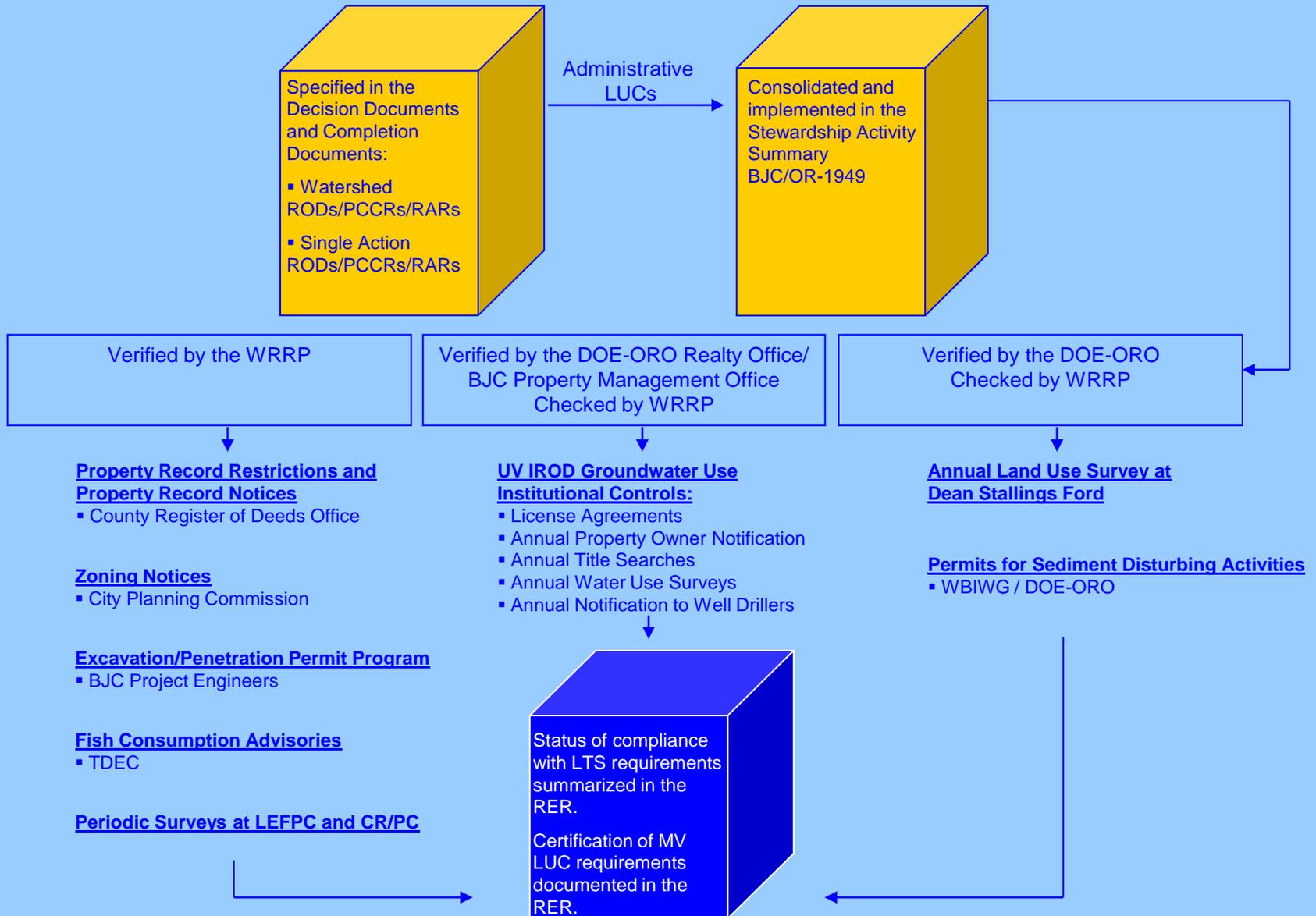
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 MAP DOCUMENT NAME: RER_MV_GW_level_monitoring_v0.mxd
 MAP AUTHOR: Richard Lambert
 ORGANIZATION: Bechtel Jacobs Company LLC
 SOURCES: Oak Ridge Environmental Information System

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LTS Implementation and Verification Process

- **Physical LUCs and Engineering Controls**
 - Physical LUCs
 - access controls
 - signs
 - security patrols
 - Engineering Controls
 - maintain caps/covers
 - maintain treatment facilities
 - routine inspections/maintenance
 - radiological surveys
- **Administrative LUCs**
 - property record restrictions (filed at courthouse)
 - property record notices (public notice, e.g., newspaper)
 - zoning notices (filed at City Planning Commission)
 - excavation/penetration permit program

2010 RER - Tracking of Administrative LUCs



2010 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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- Comments due June 28, 2010

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