The Mercury Challenge At The Y-12 National Security Complex

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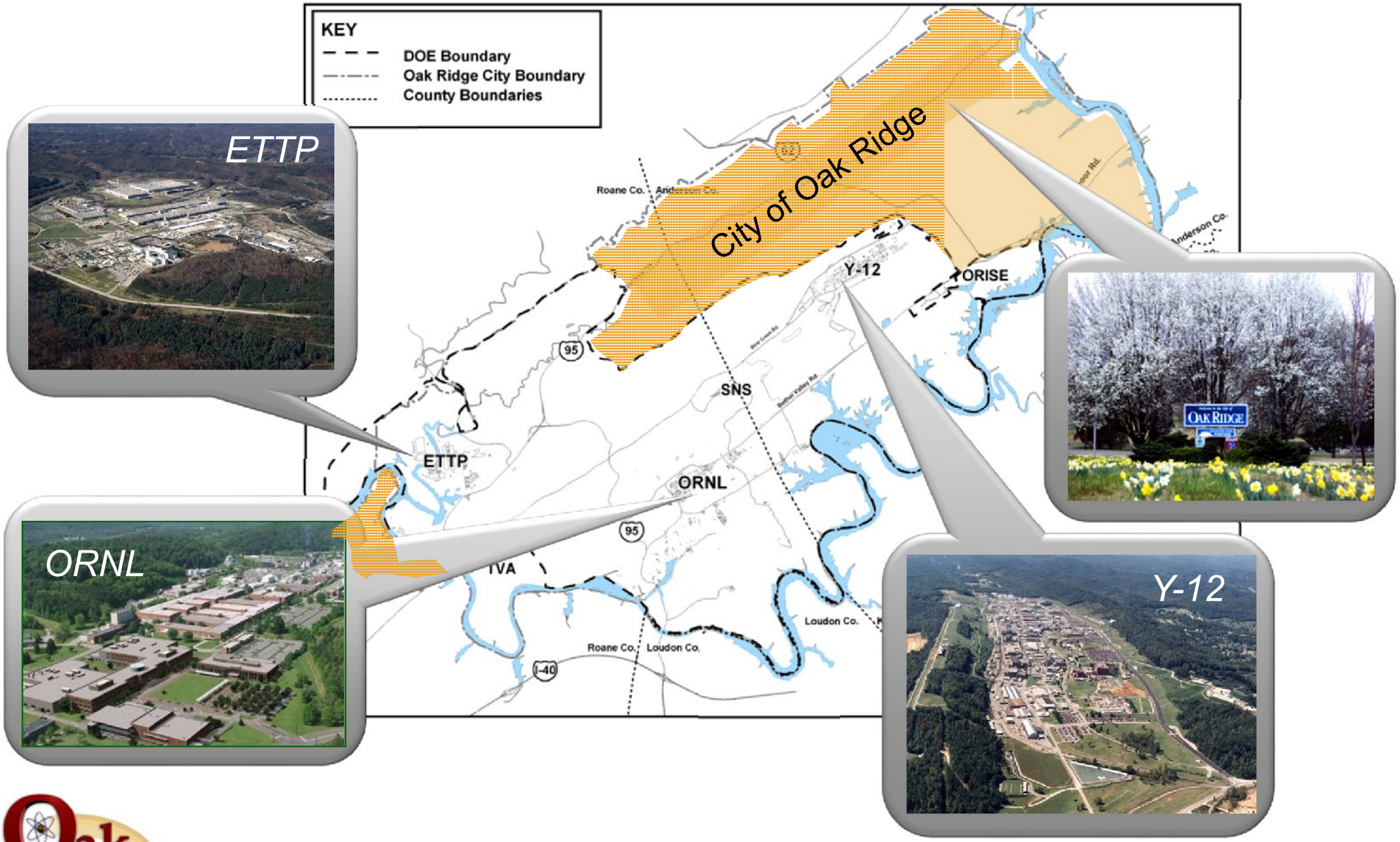
Oak Ridge Reservation: Y-12



MOVING TO THE FUTURE BY CLEANING UP THE PAST

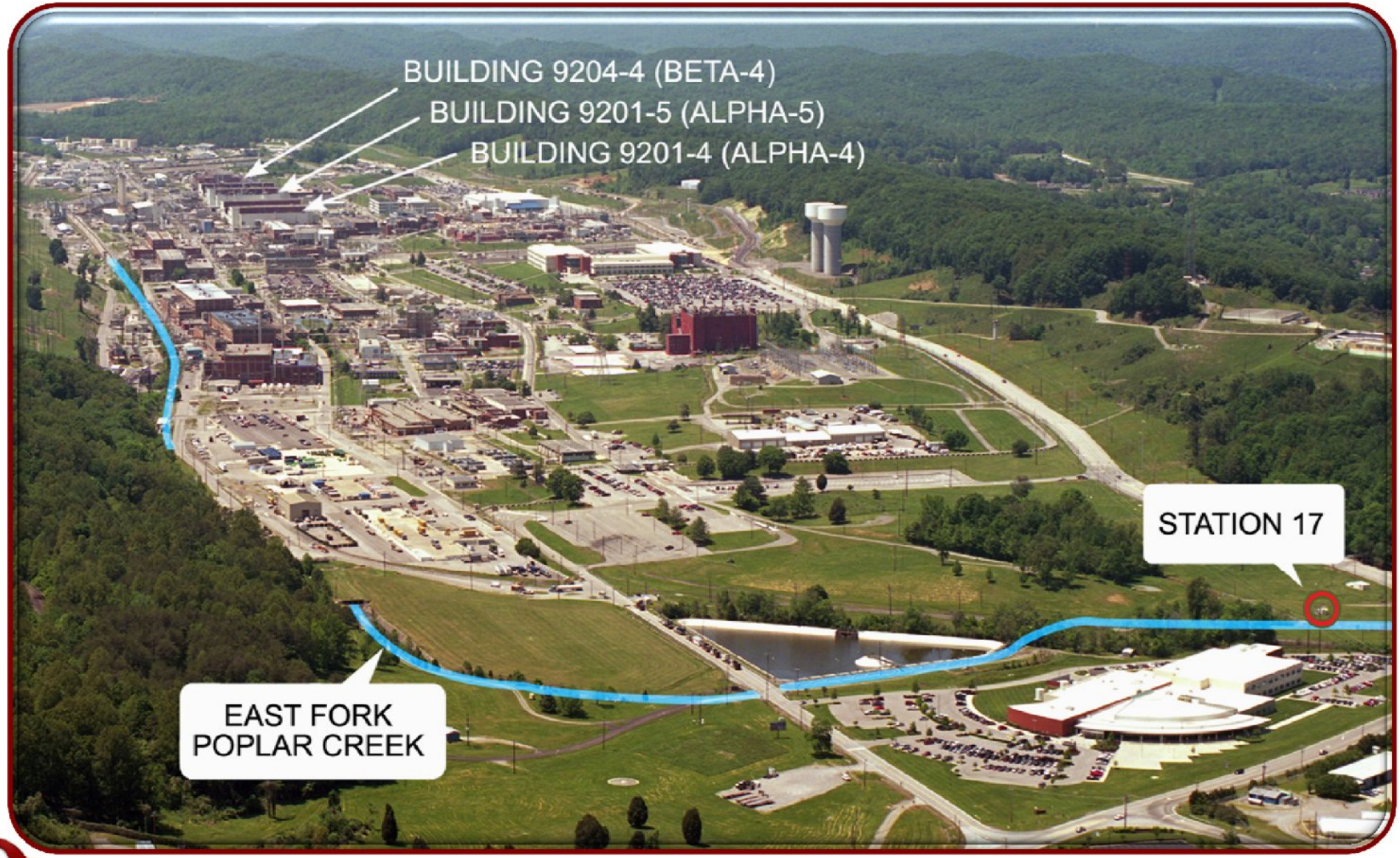
The Y-12 National Security Complex

Y-12 is Undergoing a Major Modernization Effort But Large Legacy Buildings Remain at the Site

- Legacy Facilities

- New Facilities

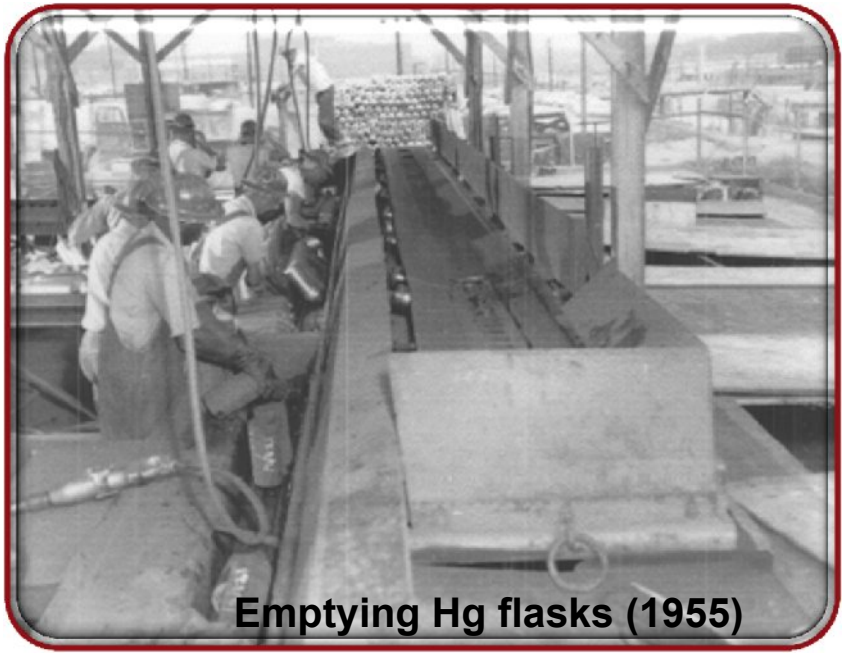
Mercury Contamination at Y-12 is the Highest Environmental Risk on the Oak Ridge Reservation



Mercury Contamination Resulted from Historic Operations

- 1950-1963 industrial processes required >20 million pounds Hg
- Approximately 2 million pounds of Hg unaccounted for
- Over 700,000 pounds of Hg released to the environment:
  - Air
  - Upper East Fork Poplar Creek
  - Soils/sediments

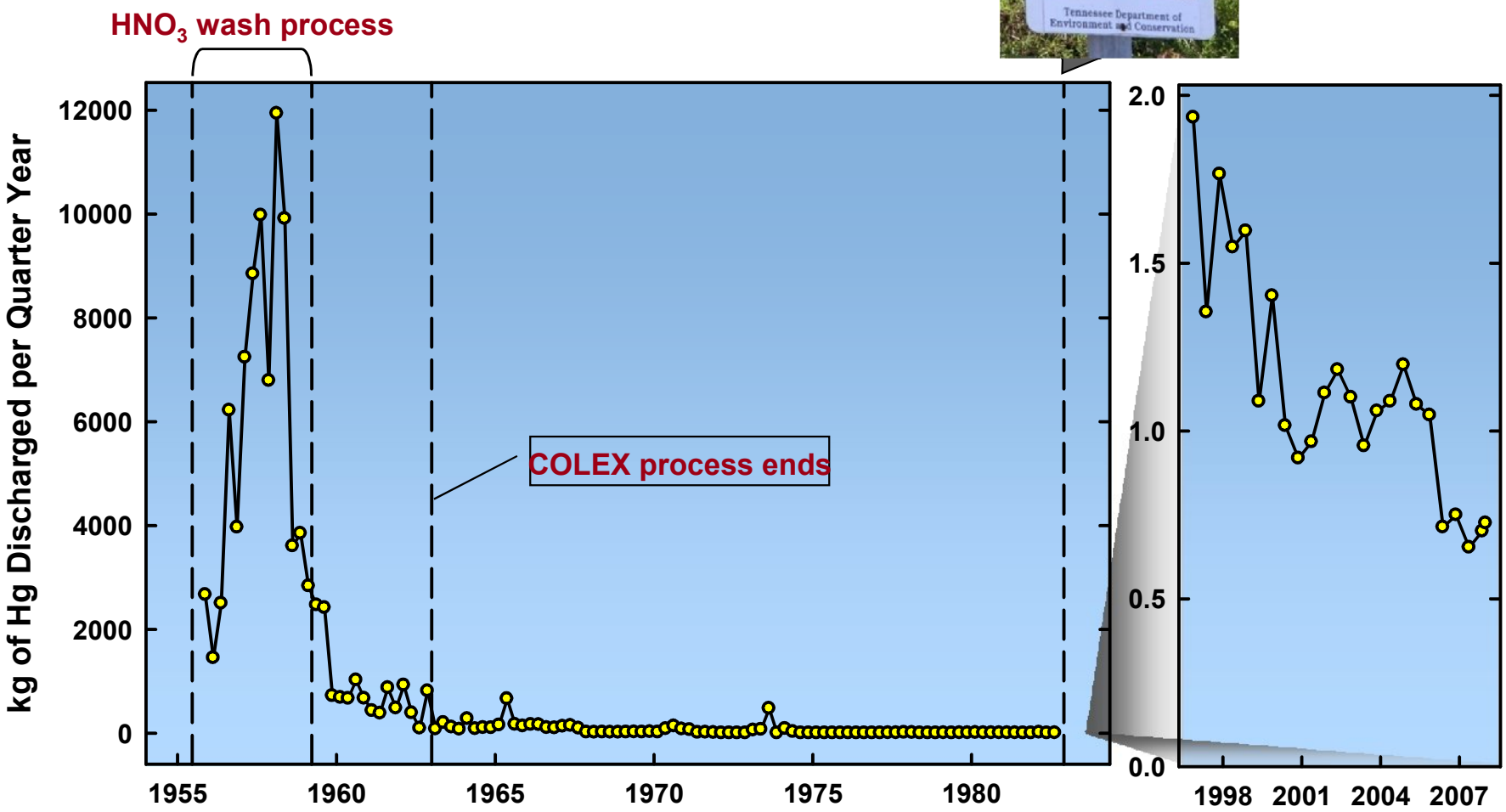
Hg flasks arriving at Y-12 (1955)



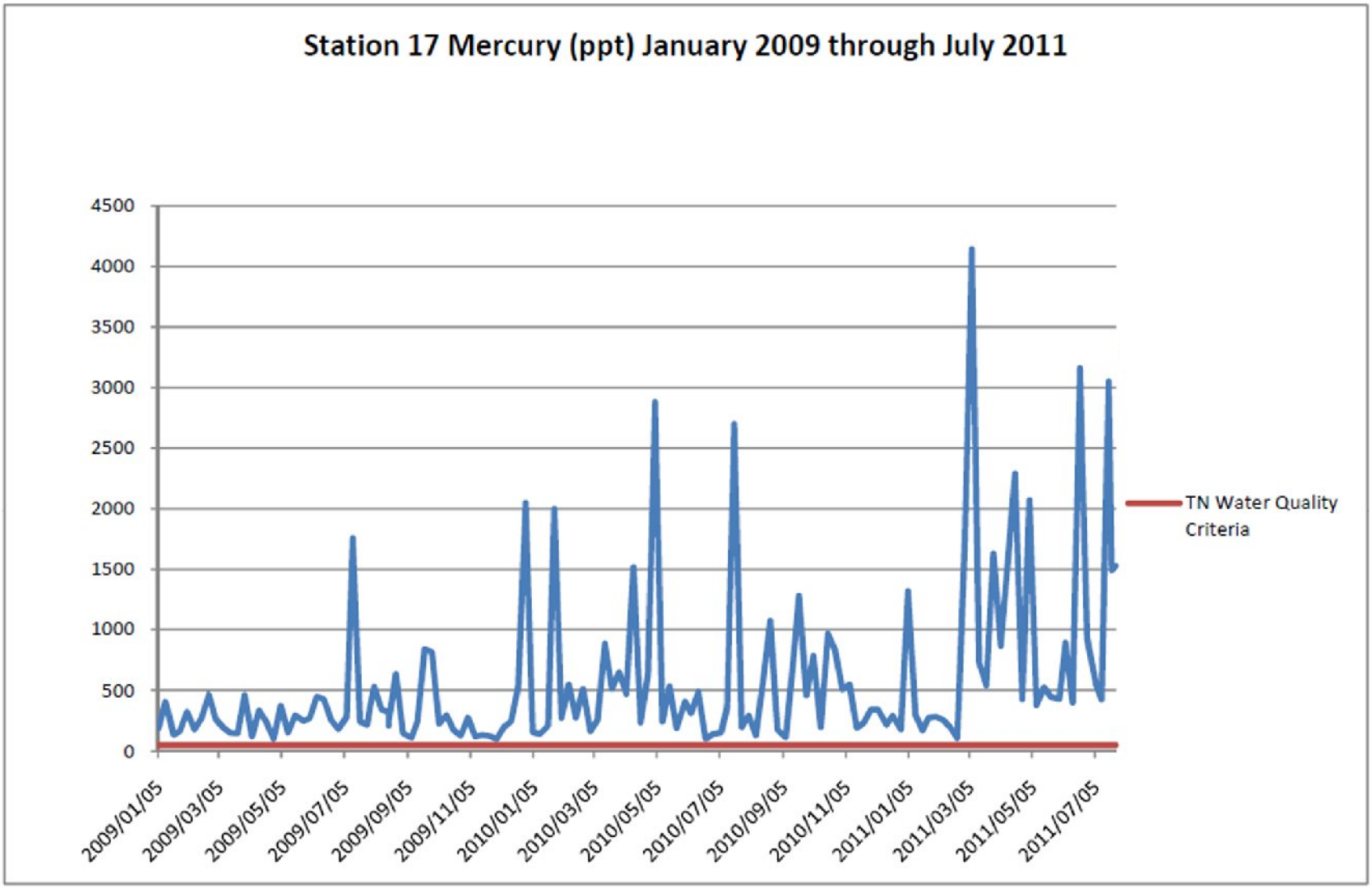
Emptying Hg flasks (1955)

Mercury Discharges to East Fork Poplar Creek Have Been Dramatically Reduced

Total 1955 – 1983: 99,300 kg

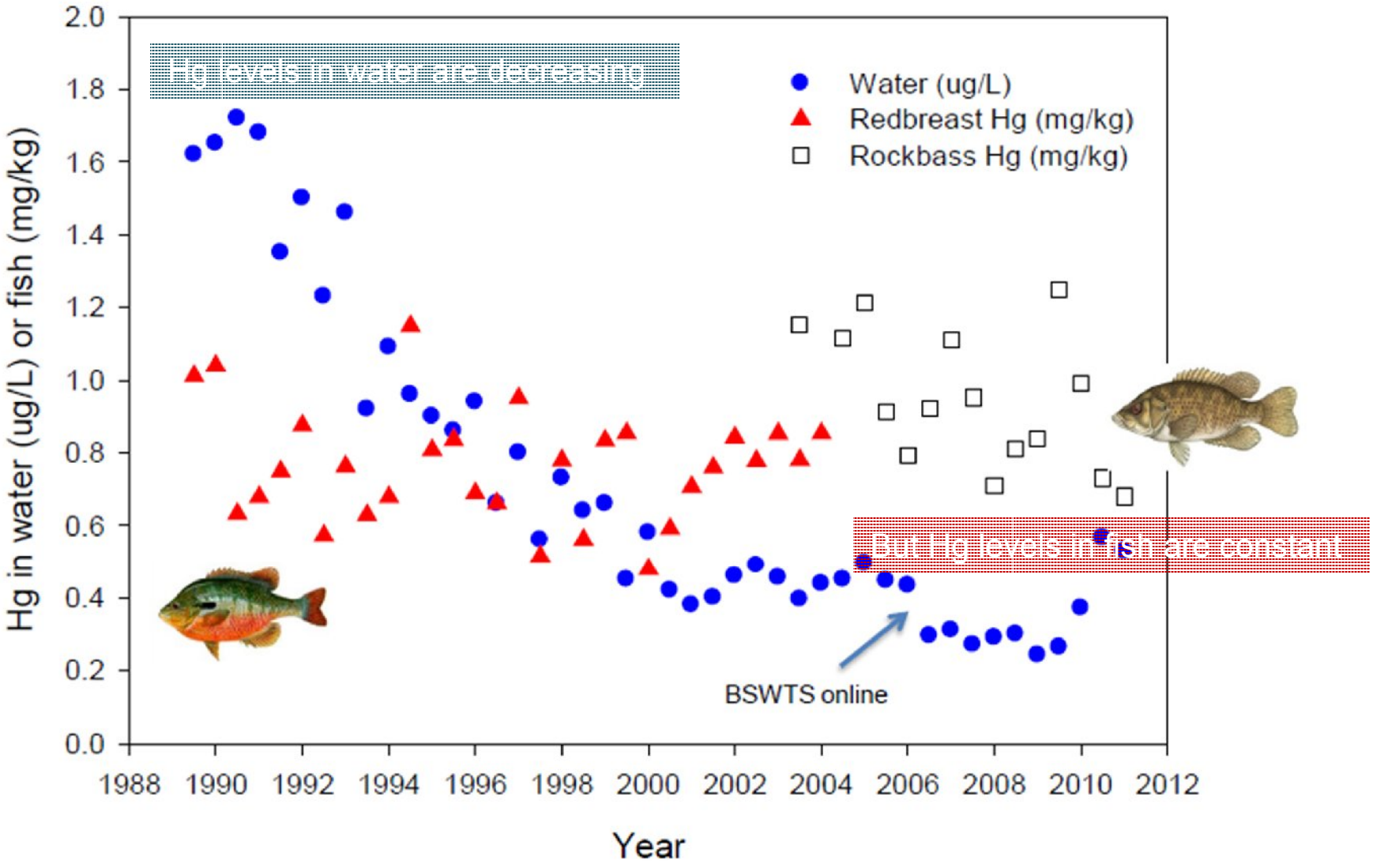


Mercury Levels In Surface Water Still Exceed Regulatory Standards



Current Record of Decision (ROD) goal is 200 ppt

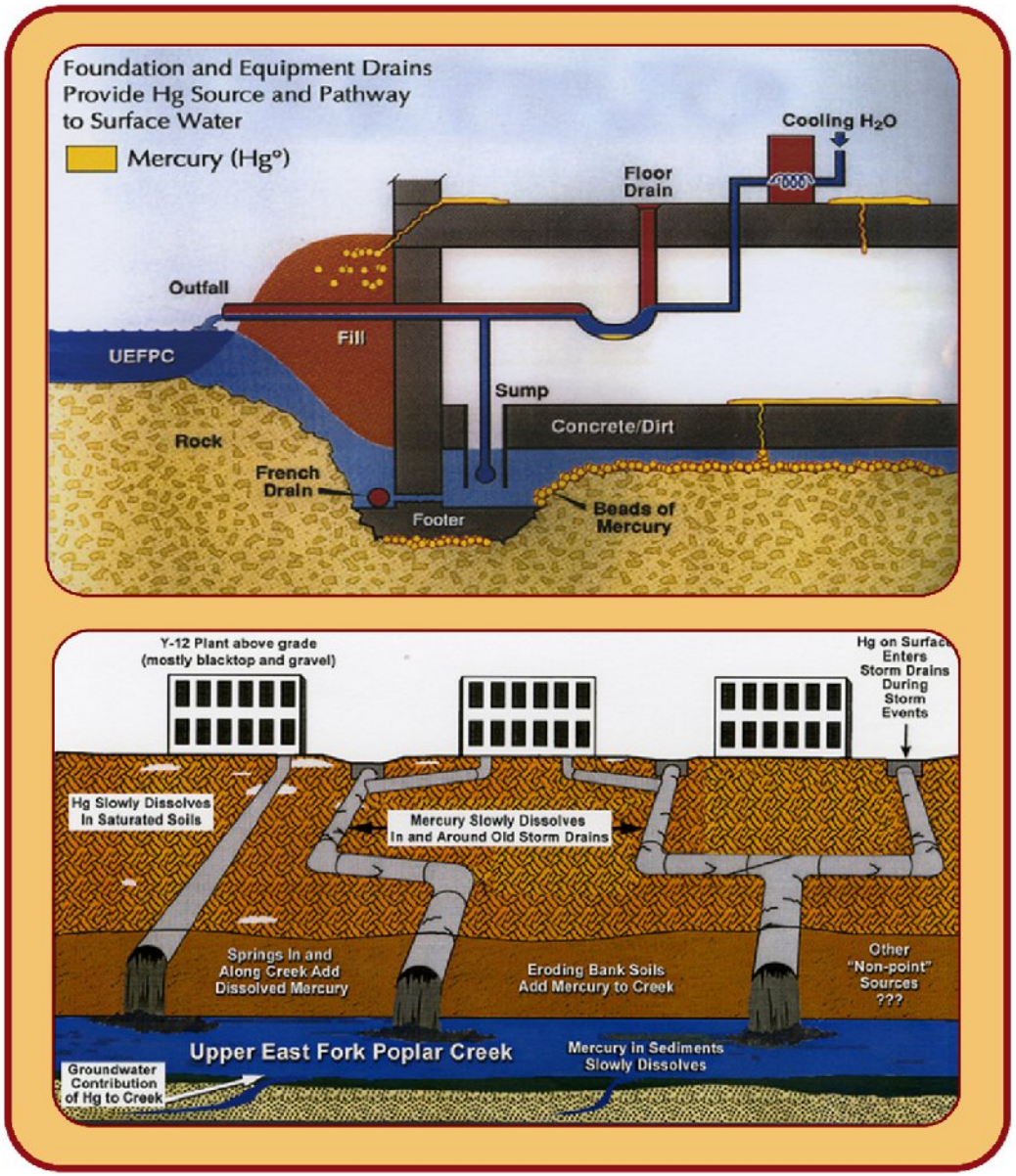
Mercury Levels in Fish Exceed EPA Criteria



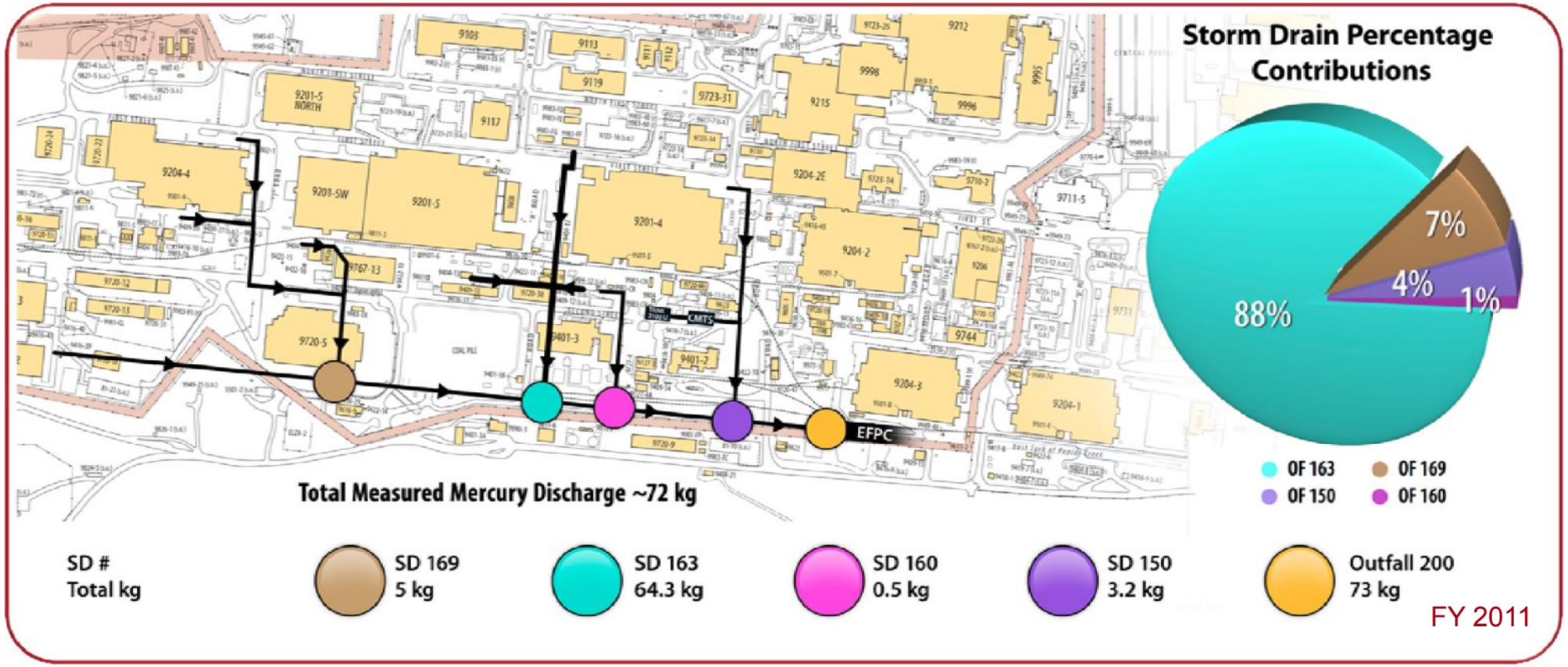
EPA limit for fish tissue is 0.3 ug/g

Mercury Migration Mechanisms

- Mercury-contaminated facilities through storm drains
- Surface waters and groundwater
  - Contaminated soil released through storm events
  - Contaminated soil released via damaged storm pipes
  - Other surface runoff released through storm drains
- Geologic conditions (i.e., Karst solution cavities)
- Stream sediments



Mercury Discharges Through Storm Drains



Significant Remedial Actions have Been Implemented

Year(s)	Action
1986 - 1987	Storm drain lining
1993 – 1995	Pipe rerouting
1996	Central Mercury Treatment System
1996 – 1997	LEFPC floodplain soil removal
2001	Bank stabilization
2005 – 2006	Big Spring Water Treatment System at Alpha 2
2010 – 2011	ARRA – WEMA Storm Sewers, OSY Soils, Legacy Material Removal

Bank Stabilization

Big Springs

WEMA Storm Drain Effort

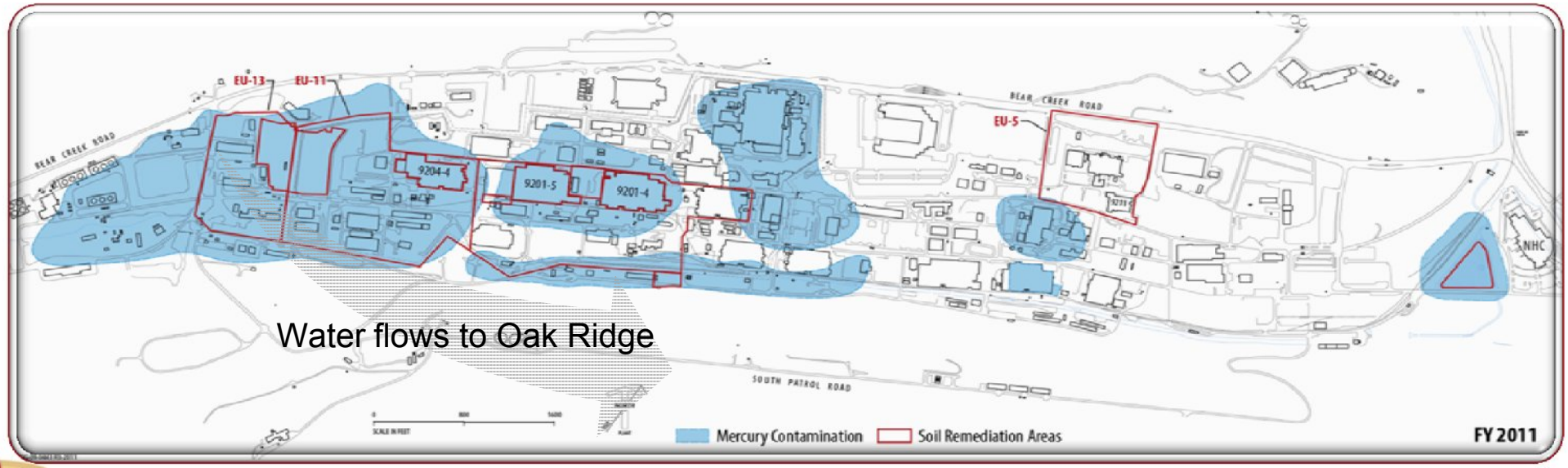
Future Plans are in Place to Address Mercury

Near Term:

- Reduction of mercury flux
  - ✓ Continuation and expansion of elemental mercury recovery operations
  - ✓ Installation of mercury collection traps
  - ✓ Treatment of storm sewer outfall discharges
  - ✓ Hot spot remediation
- Characterization and waste disposal planning
- Preparation of facilities for D&D

Long term:

- Sources of contamination must be removed or stabilized
- DOE's strategy is to address the sources in a "West to East Approach"



In Conclusion

- Mercury contamination is the highest environmental risk on the Oak Ridge Reservation due to ongoing releases to offsite surface waters
- DOE has completed a number of actions during the past two decades to address mercury contamination
- Significant reduction in mercury release levels has been achieved, but regulatory limits are not being met
- Our goal is to get to the source of the problem, which lies beneath the large process facilities at the site
- In the meantime, DOE is implementing interim actions to reduce mercury discharges