

WM'99 CONFERENCE, FEBRUARY 28 – MARCH 1, 1999

**PREVENTING WASTE - SUPPORTING CLEANUP: POLLUTION PREVENTION
USED IN CONJUNCTION WITH CERCLA ACTIVITIES AT BEAR CREEK VALLEY,
OAK RIDGE RESERVATION, OAK RIDGE, TN**

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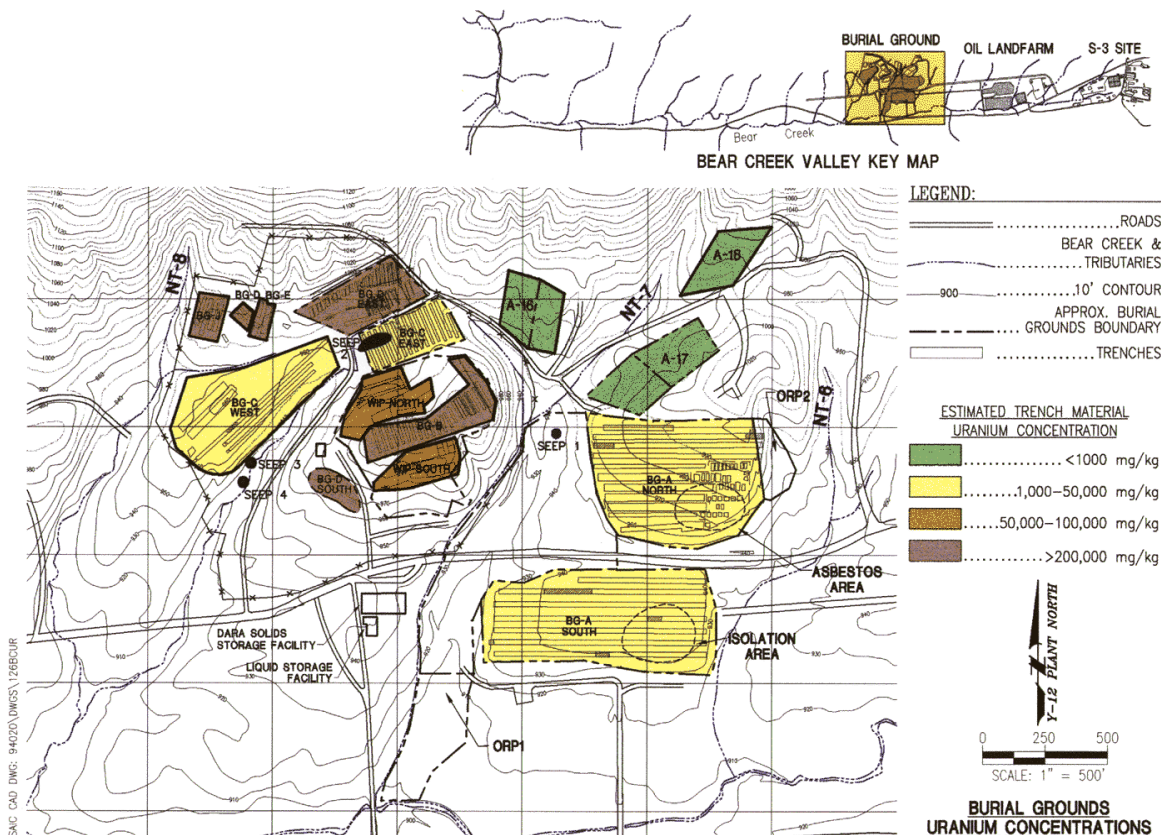
ABSTRACT

A pollution prevention opportunity assessment was conducted on the leachate collection system at the Y-12 Plant Bear Creek Burial Grounds. The Pollution Prevention Opportunity Assessment was developed in conjunction with the CERCLA Feasibility Study being conducted for Bear Creek Valley. This leachate collection system is designed to collect radiologically and chemically contaminated groundwater in Burial Grounds. This system is the largest contributor to wastewater volumes treated at the Y-12 Plant Groundwater Treatment Facility. The Pollution Prevention Opportunity Assessment and CERCLA efforts were integrated and the result is an opportunity to reduce the waste managed by the Groundwater Treatment Facility while contributing to risk reduction in Bear Creek Valley. In the mid 1980's a blanket drain, a leachate collection system, and clay cover were installed over burial ground C-East to collect leachate and shed rainfall. Recent data suggest that degradation of the clay cover has resulted in increased recharge to the blanket drain. In addition, the results of the CERCLA Remedial Investigation determined that waste in burial ground C-East is inundated with groundwater. This has resulted in increased operation and maintenance (O&M) costs at the Groundwater Treatment Facility. To eliminate excessive leachate collection and treatment a geomembrane cover system has been installed to prevent infiltration. Because more permanent action will be implemented under CERCLA, this is an exposed, temporary cover. It is projected that the reduction of O&M costs will equal the capital costs of the project within 2 years. Additionally, the impact of the cap on groundwater levels below the waste area will be assessed for design of the permanent remedy for the Burial Grounds.

Bear Creek Valley is located within the Department of Energy Oak Ridge Reservation which is located in east Tennessee northwest of Knoxville. The valley extends from the eastern end of the Oak Ridge Y-12 Plant to the Clinch River, a distance of approximately 16 km (10 miles) (see



During the operation of the Y-12 Plant since the 1940s, hazardous and radioactive materials were disposed of at the various sites in Bear Creek Valley. Considerable volumes of solid hazardous and radioactive materials, particularly uranium, are known to be buried in trenches located at the Bear Creek Burial Grounds. It is estimated that 40 million pounds of uranium and uranium contaminated debris and 8 million gallons of contaminated liquid were placed in the Bear Creek Burial Grounds.



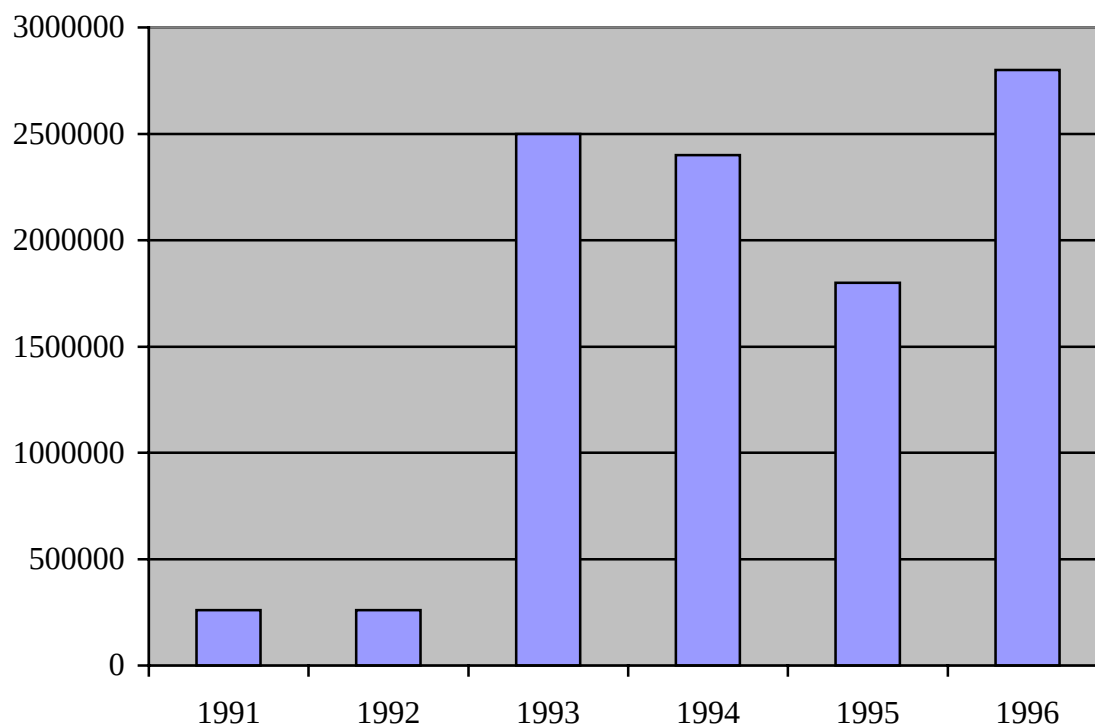


Figure 3. Quantities of leachate (gallons) from the Liquid Storage Facility, fiscal years 1991 – 1996.

In fiscal year 1997 a Pollution Prevention Opportunity Assessment was conducted on the leachate collection system at the Bear Creek Burial Grounds. Because the Bear Creek Valley is on the National Priorities List, findings of the Pollution Prevention Opportunity Assessment were compared to the ongoing Remedial Investigation/Feasibility Study for the Bear Creek Valley. The Pollution Prevention Opportunity Assessment resulted in a recommendation that an exposed geomembrane cover be placed on Burial Ground C-East to eliminate excess rainwater collection. In fiscal year 1998, the Pollution Prevention Program provided funding for the project. A finding of the Remedial Investigation/Feasibility Study is that material in Burial Ground C-East is perennially exposed to groundwater. It is anticipated that the installation of more effective cap would lower the water table beneath the landfill.

As the PPOA proposed, a geomembrane cover system was installed at a cost of \$200,000. The cover system is approximately 0.9 acres in size and extends over the entire blanket drain. It consists of a geotextile cushion layer, an exposed geomembrane barrier, and wind uplift anchorage. The exposed geomembrane can be rolled out of the way for any future CERCLA work on the C-East landfill. Taking into account only the treatment cost of the leachate, it is expected that the cost of the cover will be recovered in less than 3 years. Leachate collection will be monitored to determine the effectiveness of the cap. Additionally, the water table level at

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Burial Ground C-East will be monitored to identify any impacts that can be attributed to the new cover. This information will be considered in the selection of the remedy for the Bear Creek Burial Grounds Proposed Plan.