

ABSTRACT

The response by the Tennessee Valley Authority (TVA) to the December 22, 2008, release of ash from a holding cell into the Emory River included an immediate assessment of the surface water quality effects and the extent of ash deposits that entered the river system. The surface water quality monitoring response initially necessitated a coordinated and multidisciplinary effort for sample collection, analytical support and data management, with on-site input from regulatory agencies. Although this early and immediate effort was a significant challenge, the water quality monitoring program implemented during the first week has continued with relatively few changes. Since that time, other sampling and analytical programs have been implemented for a variety of purposes (e.g., human health and ecological risk-assessment and disposal purposes).

Briefly, the collective programs include air monitoring, ash and sediments, waste disposal monitoring, and an array of aquatic and terrestrial biota monitoring. Each of these programs required objective formulation, documented rationale and planning, and execution by TVA and consulting environmental experts, analytical service providers, and data management professionals.

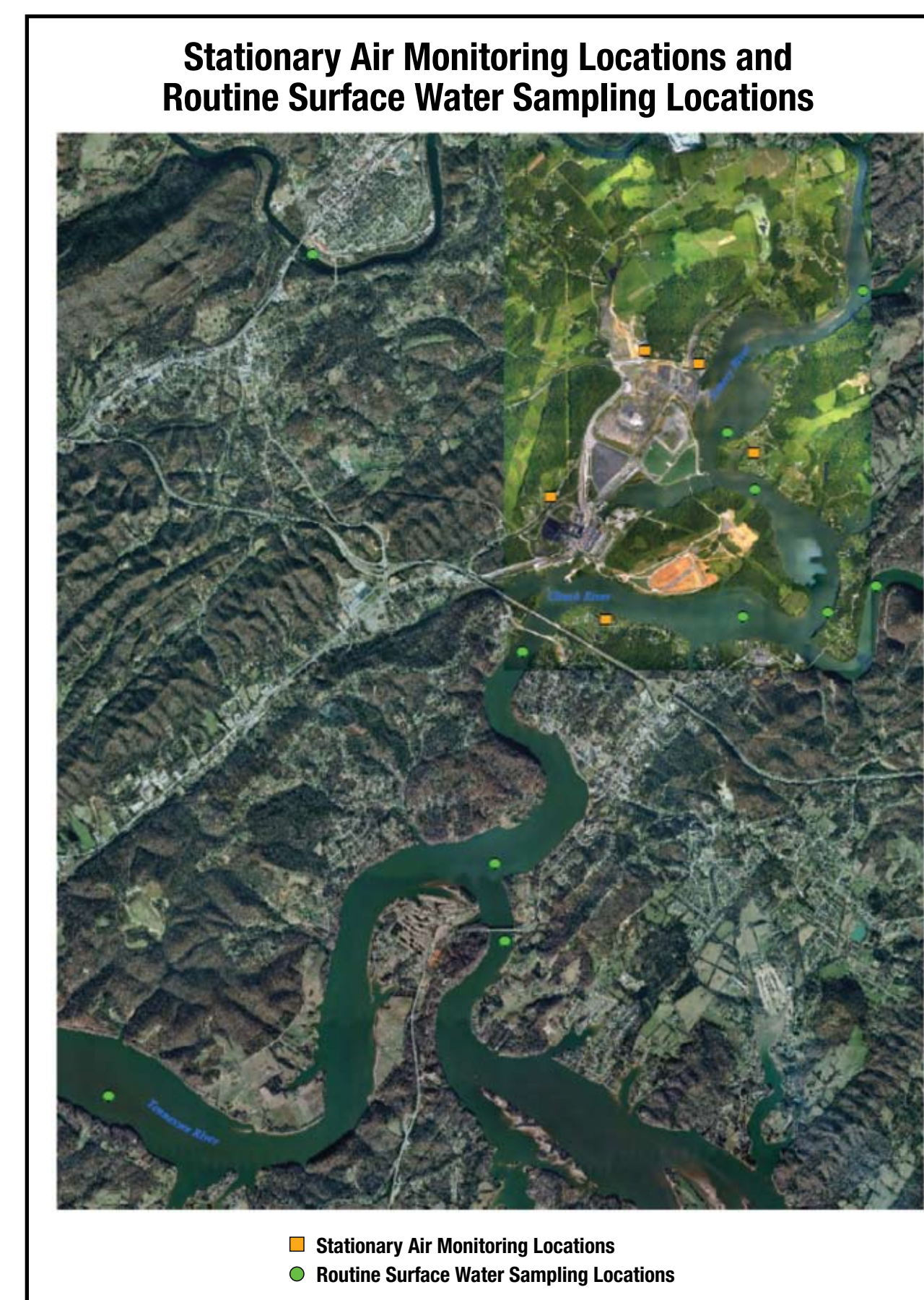
Of particular challenge was the ash and sediment monitoring, since it required a more dynamic approach to evaluate redistribution by high flow events and mixing of ash with native sediments. Further complicating the ash and sediment program was the objective to separate the effects of the recent spill from effects of legacy pollutants in the system.

SURFACE WATER

Routine fixed-station surface water monitoring includes:

- Five sampling locations on the Emory River
- Four sampling locations on the Clinch River
- Two sampling locations on the Tennessee River.

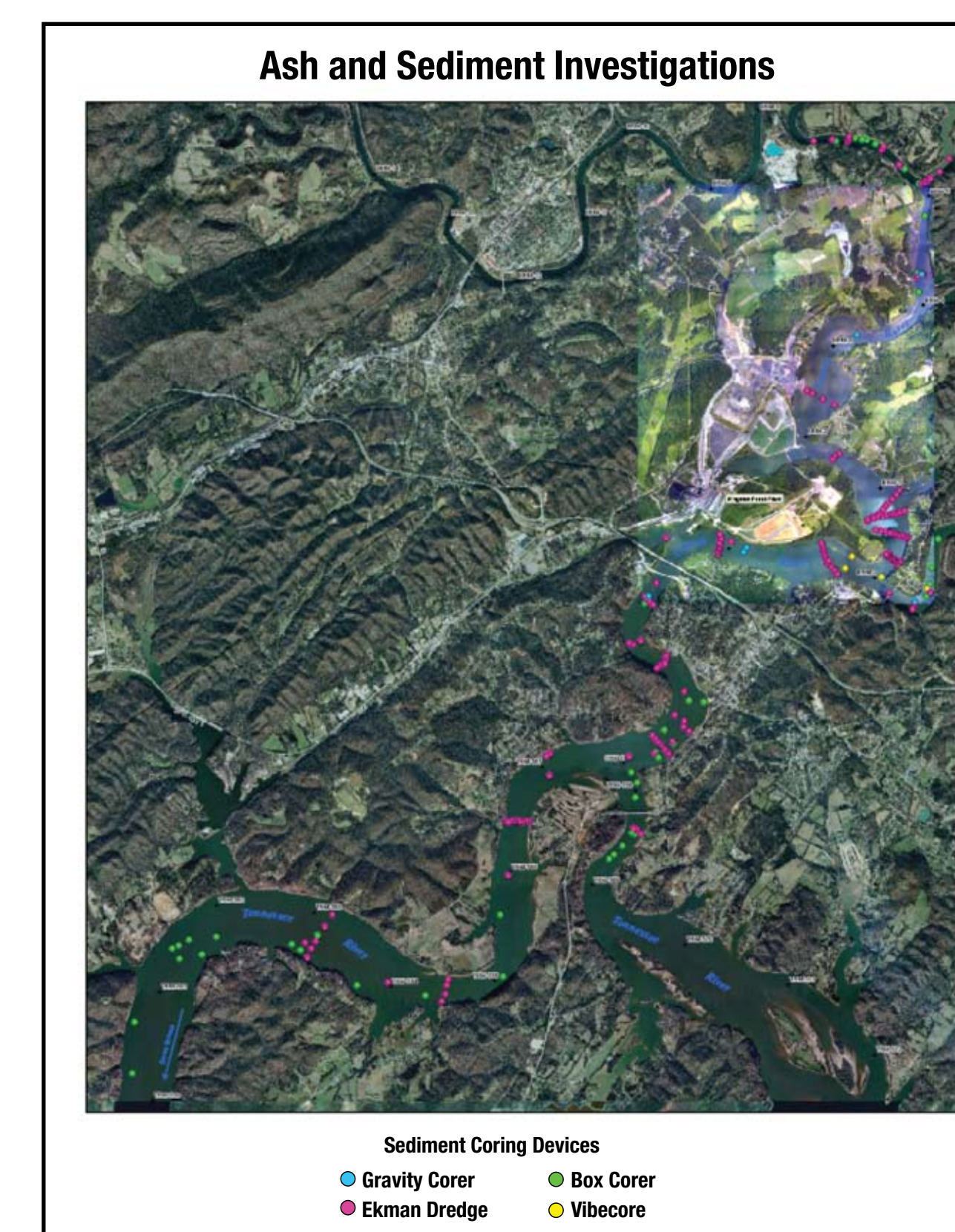
The locations were established to assess the impacts of the fly ash release on the local river system and to detect any changes to surface water quality associated with the continued presence of a large volume of ash in the Emory River.



SEDIMENT AND ASH SAMPLING

The objectives of the sediment and ash sampling are to characterize the chemical nature of the ash, determine if the released ash resulted in residual impacts to native soil, and evaluate the potential threat of the released ash to human health and the environment. Ash sampling has focused on determining the long-term and short-term potential toxicological ecological impacts from the released ash.

Since the ash release, TVA has collected samples of river sediments upstream of the impacted area, of land-based ash, and of subaqueous ash from the Emory River. Sediment and ash samples have been analyzed for metals; in addition, ash samples are used for toxicological evaluations.



AMBIENT AIR MONITORING

The ambient air monitoring program includes mobile and stationary monitoring for airborne particulate matter. The primary objective of the ambient air monitoring program is to monitor air quality in the vicinity of fly ash release remediation in real time. The primary analytes of concern are particulate matter (≤ 2.5 microns and ≤ 10 microns), silica and metals.

Fixed locations were selected to represent areas closely associated with and proximal to the released fly ash. These areas were selected to characterize ambient concentrations of particles and target compounds potentially associated with fly ash in community-based locations near the fly ash. Prevailing wind direction near the plant is strongly influenced by ridge and valley topography oriented along the southwest-to-northeast axis of the Tennessee River Valley.

The stationary monitoring locations include:

- One background sampling location upwind, but not impacted by the ash release
- Two monitoring locations to the northeast of the plant and one to the southwest representing upwind and downwind conditions for most days
- A pair of monitoring locations on a line roughly northwest-southeast, perpendicular to the upwind and downwind locations.