EXECUTIVE SUMMARY

The Dead Creek Project sites, or Sauget Sites, are located in west-central St. Clair County, Illinois, directly across the Mississippi River from St. Louis, Missouri. The project area consists of 12 suspected uncontrolled hazardous waste sites, and six segments of Dead Creek, which is an intermittent stream flowing southerly in the eastern portion of the project area. The project sites consist of former municipal and industrial waste landfills; surface impoundments or lagoons; surface disposal areas; and past excavations thought to be filled or partially filled with unknown industrial wastes. Waste disposal activities in the area apparently began sometime prior to 1940, and continued until approximately 1983, which marks the most recent available file information concerning active waste disposal at the project sites.

To avoid confusion stemming from various file designations or aliases for the various sites or creek sectors, each site or creek sector has been assigned an alphabetical designation. Additionally, sites were grouped into areas based on geographical relationship, common ownership or operation, and similar waste types and exposure pathways.

Several of the project sites have previously been investigated by the Illinois Environmental Protection Agency (IEPA), the United States Environmental Protection Agency (USEPA), and various consultants for the agencies or for area industries. These investigations focused, for the most part, on environmental problems in Dead Creek and the surrounding area, and on the disposal sites adjacent to the Mississippi River. The investigations indicated that significant and widespread contamination

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existed in the project area, and raised concern that additional unidentified source areas may be contributing to the general degradation of air, surface water, and groundwater quality in the area.

Based on the findings of the initial investigations and media sampling, IEPA attempted to obtain federal funding for remedial action at two of the project sites through the Hazard Ranking System (HRS) scoring process, which employs a numerical model to prioritize uncontrolled waste sites across the country. In this process, sites that score above a designated cutoff point are placed on the National Priorities List (NPL), and become eligible for federal funding for cleanup under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. Sites that qualify for the NPL proceed to the remedial process, which, in short, includes a remedial investigation/feasibility study (RI/FS), remedial design, and remedial action. The purpose of the RI/FS is to define the extent of contamination and the risks associated with the migration of contaminants, and to screen alternatives for cleanup. The most appropriate alternatives are typically tested on a small scale, and the most cost-efficient and effective alternative is selected to be designed for full-scale operation at the site. The process culminates with the implementation of the remedial option in the field.

The initial attempts to qualify the Dead Creek Project sites for the NPL were unsuccessful because sufficient background information and analytical data were not available to address several specific elements of the HRS model. IEPA subsequently determined that the best available option for funding site remediation was to conduct more detailed site investigations designed to develop a sufficient data base for HRS scoring. In 1985, IEPA authorized an expanded site investigation (SI) to accomplish these objectives.

Preliminary SI activities began in October 1985, and field investigations were conducted during the period from November 1986 to July 1987. Geophysical investigations, consisting of magnetometry and electromagnetic induction surveys, were conducted at project sites in the vicinity of Dead Creek. A semiquantitative soil gas monitoring survey was conducted to enable more efficient placement of soil borings and monitoring wells. A total of 96 sample locations were analyzed

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during the soil gas survey. Surface soils were sampled at 43 locations at two of the project sites. Thirteen surface water and 33 sediment samples were collected across four segments of Dead Creek. A total of 75 subsurface soil samples were collected from 51 borehole locations across the project area. Shallow monitoring wells were installed at 35 locations, and hydraulic conductivity tests were conducted at 15 of the wells. A total of 56 groundwater samples were collected from new and existing monitoring wells and from five private wells. Air sampling was conducted over a two-day period at six locations near Dead Creek and six locations around the sites adjacent to the Mississippi River.

The geophysical investigations indicated the presence of large quantities of buried ferrous metal objects (possibly drums) at two of the four sites surveyed. The areas indicated as anomalous in the surveys at these two sites correspond to the boundaries of large excavated areas seen in historical aerial photographs. Survey results from the remaining two sites did not indicate any significant differences between on-site and background conditions.

The soil gas test results identified several locations with high volatile organic concentrations at depths ranging from 3 to 5 feet below ground surface. The locations that showed the highest concentrations corresponded to the excavated areas identified in historical aerial photographs. The results of the soil gas survey provided a basis for locating the soil borings and monitoring wells.

Analysis of the surface soil samples revealed high concentrations of organic contaminants over the entire surface of a site adjacent to Dead Creek. Based upon the sample results for this site, a fence was constructed and warning signs were posted in order to restrict access to the general public. No organic contaminants were detected in surface soil samples from the second site tested.

Analysis of sediment samples from Dead Creek revealed the presence of organic and inorganic contaminants in each creek segment sampled. The highest concentrations of contaminants were detected in the northern portion of the creek, in areas reported to have received discharges from area industries in the past. Eight sediment samples were analyzed specifically for dioxin. This compound was not detected in any of the samples analyzed. Organic contaminants were detected only in surface

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water samples from the two northern segments of Dead Creek. These two segments of the creek are, in effect, impoundments due to the blockage of culverts at each end of the segments. Because Dead Creek originates in an industrial area where the highest contaminant concentrations were detected, no upstream, or background, data could be collected for the creek.

Analysis of the subsurface soil samples revealed widespread contamination across each of the sites sampled. Several samples collected from sites adjacent to the northern portion of Dead Creek contained total organic contaminant concentrations in excess of 10,000 parts per million (ppm). Contaminants were detected in samples collected to a maximum depth of 50 feet at these sites. Although the most significant subsurface contamination was detected at the sites adjacent to Dead Creek, a variety of organic contaminants was also detected at each of the other project sites at which subsurface samples were collected. These analytical results indicate that the disposal of chemical wastes occurred at most of the former excavations identified in historical aerial photographs.

Analysis of groundwater samples from the various project sites revealed the presence of organic contaminants in groundwater at each of the sites sampled. The hydrogeological investigation confirmed that contaminants are migrating in groundwater in a westward direction toward the Mississippi River. The analytical and physical results of the hydrogeological investigation indicate that each of the project sites is contributing, to some degree, to the general degradation of groundwater quality in the area.

The analytical results from the air sampling investigation indicate a release of several organic contaminants from the sites sampled. Downwind air samples contained low levels of PCBs and several semivolatile compounds. Background, or upwind, samples did not contain these compounds, providing documentable evidence of a release of airborne contaminants resulting from conditions at the sites sampled.

Based on all of the data developed during this investigation, substantial and widespread contamination of various media (groundwater, soils, surface water, sediment) exists in the project area. The most significant contamination is found at the sites adjacent to Dead Creek

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and the sites adjacent to the Mississippi River. Although source areas have been identified, and, to a certain degree, defined, the complete extent of contamination resulting from past waste disposal activities in the project area has not yet been determined.

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