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DECISION DOCUMENT

ENGINEERING EVALUATION/COST ANALYSIS FOR THE PROPOSED REMOVAL ACTION AT THE SOUTHEAST DRAINAGE NEAR THE WELDON SPRING SITE, MISSOURI

November 1996

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STATEMENT AND BASIS OF PURPOSE

The purpose of this decision document is to describe a specific removal action proposed for contaminated sediments in the Southeast Drainage near the Weldon Spring site, located in St. Charles County, Missouri. Cleanup activities at the Weldon Spring site are conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, incorporating values of the National Environmental Policy Act (NEPA). This decision document completes the CERCLA compliance process for the proposed action.

BACKGROUND

The Weldon Spring site is located near the town of Weldon Spring, about 48 km (30 mi) west of St. Louis. It consists of two noncontiguous areas: the chemical plant area and a limestone quarry about 6.4 km (4 mi) south-southwest of the chemical plant area. The Southeast Drainage is a natural channel, 2.4-km (1.5-mi) long, that carries surface runoff to the Missouri River from the southern portion of the chemical plant area and a small portion of the adjacent ordnance works area south of the groundwater divide. The drainage became contaminated as a result of past activities of the U.S. Department of the Army and the U.S. Department of Energy (DOE) and its predecessors.

ASSESSMENT OF CONTAMINATED SEDIMENT AND SURFACE WATER

Analytical data for sediment and surface water were compiled and analyzed to perform a risk assessment to support a decision regarding remediation of the Southeast Drainage. For planning purposes, the drainage was delineated into four segments: A, B, C, and D (see Figure 1). Factors considered in segmentation of the drainage into these four elements included accessibility by standard excavation and hauling equipment, main channel slope, side slope, channel width, vegetation characteristics, and safety and public access. Characterization data were collected from each segment, including radiological and chemical surface and subsurface sediment samples and a comprehensive gamma walkover survey. The number of samples collected in each segment was determined to be statistically adequate to support risk conclusions. Surface water samples were collected at four springs along the drainage as part of the ongoing environmental monitoring program, and these data were used to assess potential human health risks from surface water in the

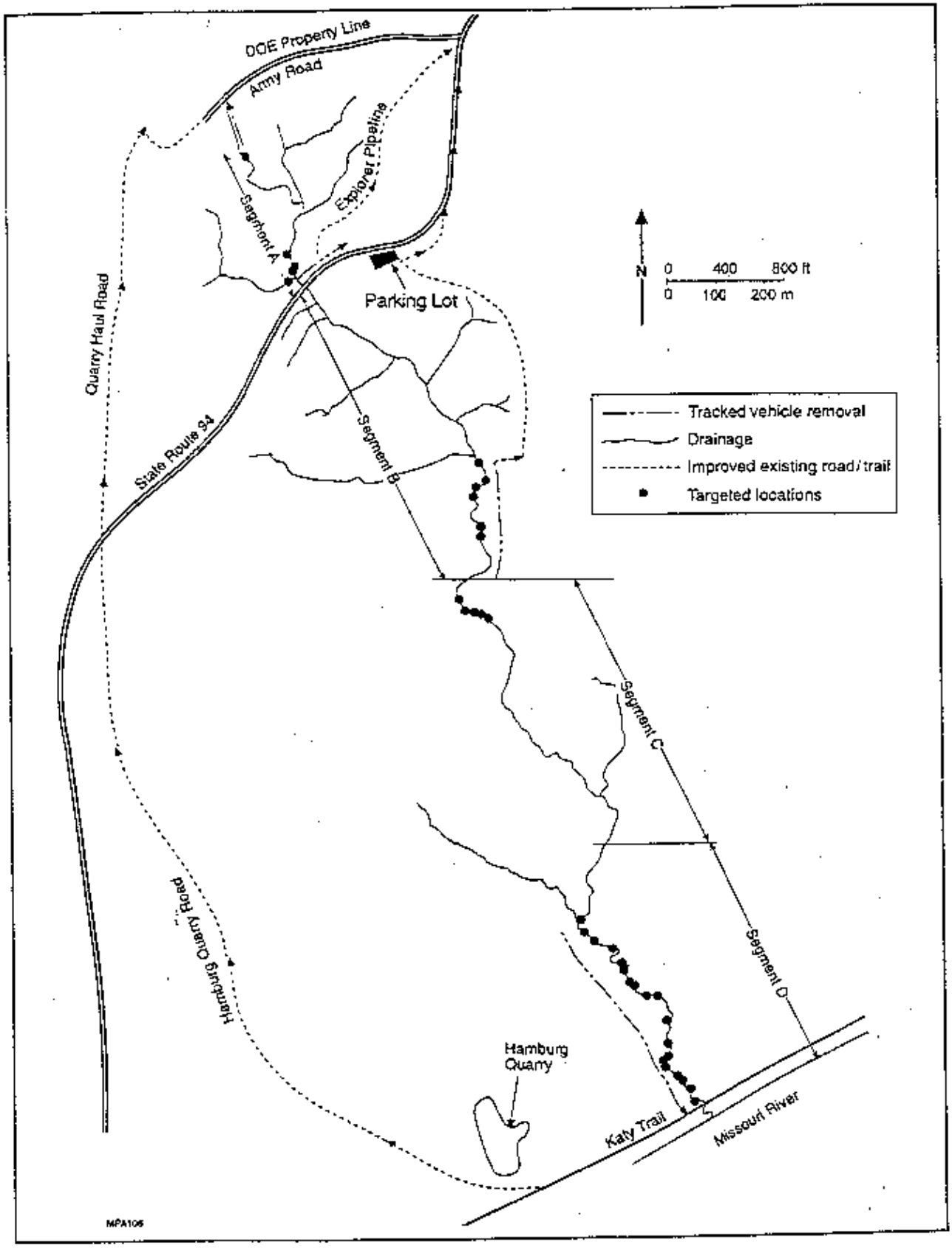

FIGURE 1 Proposed Excavation Locations and Haul Route

drainage. Sediment and surface water samples were also collected to support an ecological risk assessment of the drainage.

Human health risk evaluations were performed for current and hypothetical maximum future use conditions to assess hazards associated with potential exposure to contaminants in the drainage. The current land-use scenario assumed that a hunter would regularly hunt in the vicinity of the drainage. The future land-use scenario assumed that a home would be built in the vicinity of the drainage, allowing a child to access the drainage for use as a play area. In addition, an ecological risk evaluation was performed for current conditions, and this assessment indicated that surface water and sediment contamination in the drainage poses little risk to biota.

The human health risk analysis indicated that under current land-use conditions, contamination in the drainage does not pose an unacceptable risk to human health. For the future land-use scenario, the estimated risks for each segment are higher than those for the hunter scenario (current land use) but still within the acceptable risk range of 10^{-6} to 10^{-4} identified by the U.S. Environmental Protection Agency (EPA). The estimated risk is almost exclusively from radioactive contamination in sediment; the higher risks were calculated for Segments B and C.

Although a response action on the basis of risk is not strictly mandated by the National Contingency Plan, discretionary actions will be taken in the interest of minimizing total site risks in accordance with DOE's policy of reducing radiation exposures to levels "as low as reasonably achievable." The heterogeneous distribution of radioactive contamination in the drainage indicates that selective removal of contaminated areas will effectively reduce the risk to potential human and ecological receptors.

REMOVAL ACTION

On the basis of the analysis presented in the engineering evaluation/cost analysis (EE/CA), Subalternative 2.1 was selected as the proposed action for remediation of the Southeast Drainage. Under this alternative, selected contaminated sediment in accessible areas of the drainage will be removed with track-mounted equipment and transported on four minimal-access routes capable of supporting off-road haul trucks at slow speed. Representative routes that can be used were identified in the EE/CA and are described below. Use of these routes (Figure 1) will result in minimal disruption of the mature, high-quality forest community that exists in the drainage. The objective of this removal action will be to remove as much contaminated material as possible with no or minimal additional clearing.

Materials removed from the drainage will be managed through staging and decontamination areas. A variety of existing access routes and cleared areas will be utilized for transportation onto the chemical plant storage areas. Upper reaches of the drainage (Segment A) can be accessed overland from the Army road and along the Explorer Pipeline Company's access road and easement corridor. Lower reaches of the drainage (Segments B, C, and D) can be accessed through a cleared Union Electric power line right-of-way, through abandoned roadways within the Missouri

Department of Conservation area, and through Katy Trail (which will include a section of the Hamburg Quarry road, crossing State Route 94 to the quarry haul road). Segments of the granular alluvium within the drainage will be graded and utilized for transport within the drainage itself. A total of about 1,950 m^3 (2,550 yd^3) of materials are expected to be removed from the drainage. The excavated materials will be stored temporarily at a storage area on the Weldon Spring site (e.g., Ash Pond storage area or material staging area), with final disposal in the engineered disposal cell at the chemical plant area of the site.

Risk-based cleanup criteria were derived for the principal radioactive contaminants that correspond to a risk level of 1×10^{-5} for the hypothetical child scenario. The calculated risk-based concentrations are 13 pCi/g for radium-226, 13 pCi/g for radium-228, 350 pCi/g for thorium-230, and 290 pCi/g for uranium-238. The cleanup design will include sampling to determine residual concentrations at remediated locations. Efforts will be made to achieve the cleanup criteria in balance with the objective of minimizing environmental damage to the extent possible. It is expected that risk reduction will occur throughout the drainage such that following cleanup, the risk level for the hypothetical child scenario will be at or near 1×10^{-5}.

Standard worker practices and engineering controls will be in place during the removal action, including maintenance of haul roads, spraying of haul roads to minimize airborne dust, implementation of traffic controls, and temporary berming in certain areas to prevent storm-water runoff from flowing in the channel. During the removal action, erosion controls will be installed downgradient of all excavation areas to prevent the transport of silt down the drainage by minor storm-water runoff flowing out of the excavations. Restoration of the drainage will include grading, with minimal backfilling in excavated areas within the drainage, and reshaping, mulching, and reseeding of access routes and staging areas.

Air quality and noise impacts associated with the removal action could disturb ecological resources and recreational activities in the vicinity of the excavation activities and along haul routes. However, these impacts would be minor and temporary. Long-term positive environmental impacts will result from a reduction in contaminant levels in the drainage.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

An EE/CA report was prepared to analyze alternatives for removal of contaminated sediment in the Southeast Drainage. This EE/CA was issued for public review and comment on August 23, 1996, and a notice of availability was published in the *St. Charles Journal* on the same day. Prior to issuance of the EE/CA document, meetings to discuss the proposed action were held with the Missouri Department of Conservation, Missouri Department of Natural Resources, EPA, and Weldon Spring Citizens Commission. The public comment period extended from August 23 to September 23, 1996, and included a public meeting on August 29, 1996.

At the public meeting, the EPA noted a need to balance human health risk reduction with potential ecological damage and supported DOE's selection of Subalternative 2.1 as the proposed

action. The Missouri Department of Natural Resources expressed preference for Subalternative 2.2, in which additional areas of contamination would be removed from the drainage. No additional comments were provided at the public meeting. Written comments were subsequently received from the Weldon Spring Citizens Commission stating their concurrence with DOE's proposed action.

On the basis of comments received, Subalternative 2.1 was selected for implementation. Subalternative 2.2, which was preferred by the Missouri Department of Natural Resources, was not selected because the increased ecological damage resulting from removal of sediments from these additional areas (which would be significant) would not be balanced by the net risk reduction (which would be small). The DOE will coordinate with the state agencies and the EPA during implementation of the action to ensure that as much contaminated sediment as possible is removed from the drainage without causing extensive ecological drainage.

DECLARATION OF STATUTORY DETERMINATIONS

The removal action selected for the Southeast Drainage is protective of human health and the environment. In addition, the action can be implemented with standard technologies, it is cost-effective, and it is consistent with and will contribute to the efficient performance of the overall remedial action for the Weldon Spring site. In accordance with CERCLA, the action complies with federal and state requirements that are legally applicable or relevant and appropriate to the removal action. This action utilizes permanent solutions and resource recovery technologies to the maximum extent practicable, given its limited scope. The statutory preference for treatment as a principal element of the remedy is not practicable to this action because no methods are available that would significantly or effectively reduce toxicity, mobility, or volume and because the excavated materials are expected to be in a form that will allow for direct (untreated) disposal in the on-site cell.

Following remedial action of the Weldon Spring site, hazardous substances will remain on the site (within an engineered disposal facility) at concentrations higher than health-based levels; therefore, 5-year reviews of the Weldon Spring site will be required. Following removal activities, the Southeast Drainage will continue to be monitored within the scope of these comprehensive 5-year reviews.