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REGULATORY COMPLIANCE ISSUES RELATED TO THE WHITE OAK CREEK EMBAYMENT TIME-CRITICAL REMOVAL ACTION*

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INTRODUCTION

In September 1990, Martin Marietta Energy Systems (Energy Systems) discovered high levels of Cesium-137 (^{137}Cs) in surface sediments near the mouth of White Oak Creek Embayment (WOCE). White Oak Creek (WOC) receives surface water drainage from Oak Ridge National Laboratory. Since this discovery, the Department of Energy (DOE) and Energy Systems have pursued actions designed to stabilize the contaminated WOCE sediments under provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the implementing regulations in the National Contingency Plan (NCP) (40 CFR Part 300), as a time-critical removal action. By definition, a time-critical removal is an action where onsite activities are initiated within six months of the determination that a removal action is appropriate. Time-critical removal actions allow comparatively rapid mobilization to protect human health and the environment without going through the lengthy and extensive CERCLA Remedial Investigation/Feasibility Study/Record of Decision process.

PROBLEM STATEMENT

In fulfilling the requirements of the Clinch River Remedial Investigation (RI) Phase-1 sampling plan, a sediment core was collected in late June 1990 by Energy Systems personnel from the lower portion of WOCE approximately 50 yards upstream from the mouth of White Oak Creek. Examination of the analytical data revealed that this core sample contained 45,000 picocuries per gram (dry weight) of ^{137}Cs at the sediment surface. This level of activity was rechecked to verify its accuracy. Subsequently, 31 surface sediment samples were collected and analyzed for ^{137}Cs

activity to determine the spatial extent of the contamination in lower WOCE. Results of these analyses confirmed that relatively high levels of ^{137}Cs activity exist in the surface sediments of the lower embayment (Energy Systems, 1990).

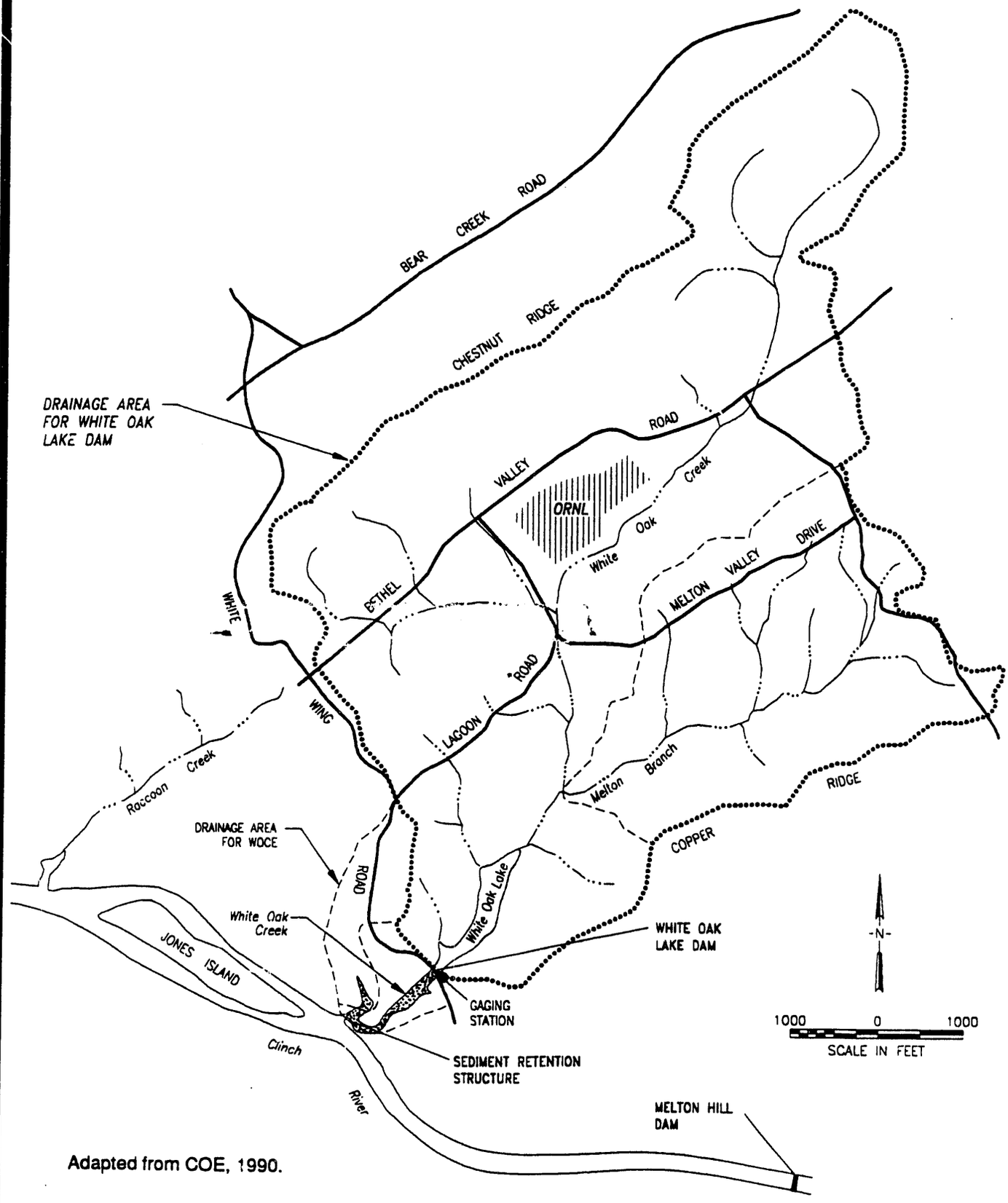
The Department of Energy (DOE) originally notified the Environmental Protection Agency Region IV (EPA-IV) of the historical release of contaminants, including ^{137}Cs, to White Oak Lake under CERCLA Section 103(c) in 1982. White Oak Lake (WOL), a small impoundment on lower White Oak Creek, has served as the final settling basin for low-level radioactive effluents from ORNL since 1943. **Figure 1** shows the WOC watershed and associated surface water features. The contaminated sediment layer that occurs in WOCE, in the Clinch River and in Watts Bar Reservoir, is the result of large releases of ^{137}Cs-contaminated sediments from WOL that occurred in the mid-to-late 1950s. The presence of contaminants in the sediments is not a new area of concern. It is the changed distribution of contaminants in the sediments from a relatively stable (deeply buried) setting to a readily transportable (near surface) setting that is the focus of concern.

High levels of ^{137}Cs activity at the sediment surface produced immediate concern because surface sediments in the WOCE are uncontrolled, i.e., surface sediments can be readily eroded from the embayment and transported downstream into the Clinch River. The available data indicate that the layer of less contaminated sediment, which had previously overlain the highly contaminated stratum, has been gradually removed by erosion and transport. In this case, normal erosion and sediment transport may have been accelerated by the cyclic surging of flow that occurs twice daily in the lower WOCE as a result of hydropower generation at the Melton Hill Dam.

PROBLEM SOLUTION

Following discovery of the problem at WOCE, an interagency working group determined that the best approach to stabilize the sediments in a short timeframe was to pursue conducting a time-critical removal action under CERCLA. This interagency group included EPA-IV, the Tennessee Department of Environment and Conservation (TDEC), the Tennessee Valley Authority (TVA), the U.S. Army Corps of Engineers (COE), DOE, and Energy Systems. Energy Systems and DOE are currently in the process of constructing a coffer cell sediment retention structure across the mouth of WOCE to contain surface sediments contaminated with high levels of ^{137}Cs. The COE performed a detailed analysis of alternatives for sediment control in WOCE, including the no-action alternative. Based on the alternatives analysis and site-specific constraints of this project, the coffer cell structure was clearly the best alternative for the proposed action (COE, 1991).

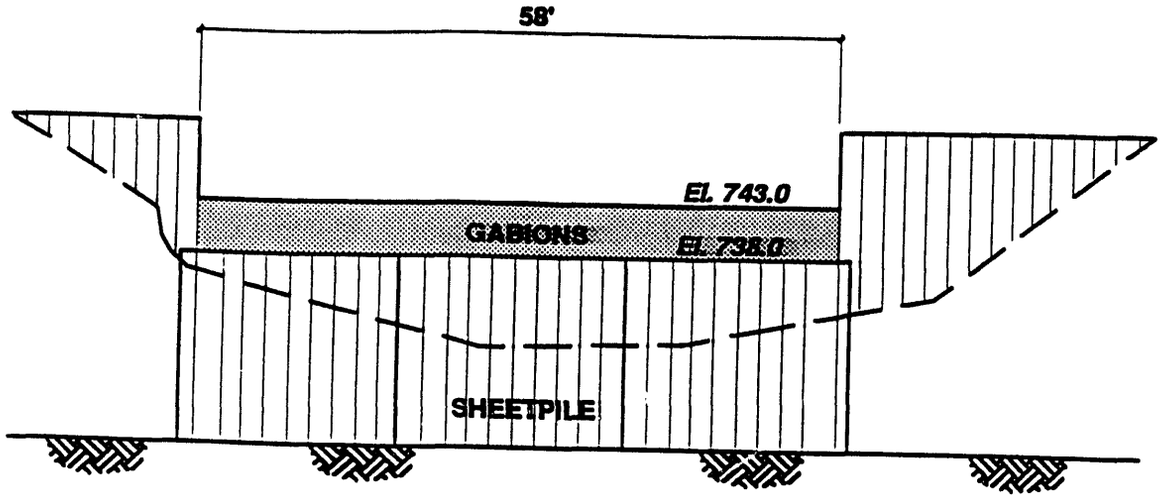
The sediment retention structure was designed by the COE under an Interagency Agreement. **Figure 2** shows a cross-section of the



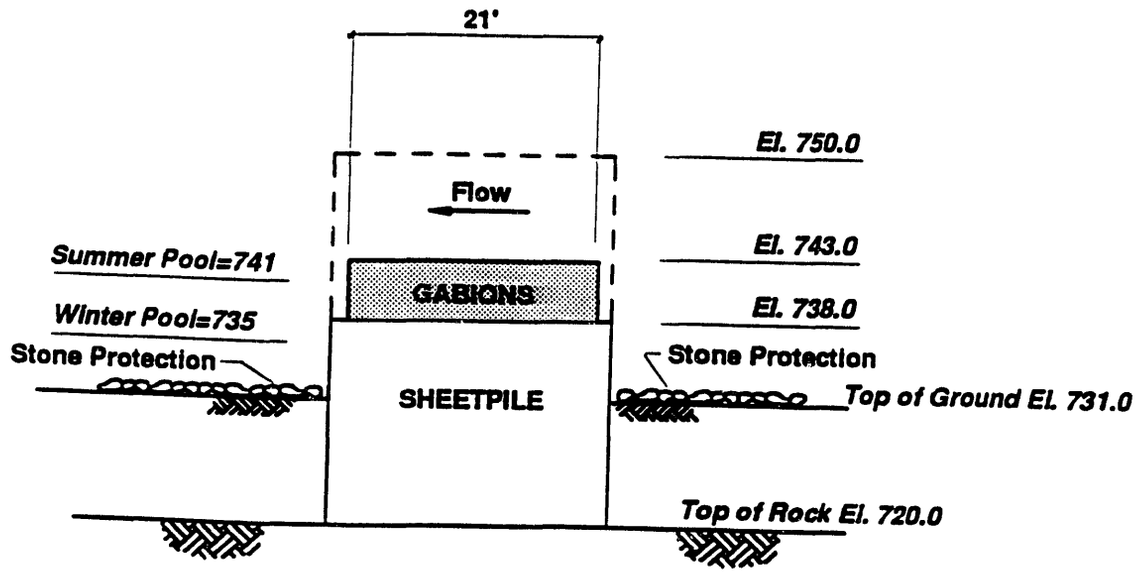
Adapted from COE, 1990.

Figure 1

WHITE OAK CREEK WATERSHED



ELEVATION
Not to Scale



SECTION
Not to Scale

Adapted from COE, 1990.

Figure 2
CROSS-SECTION OF SEDIMENT RETENTION STRUCTURE

sediment retention structure. Several aspects of design and construction of the structure will mitigate adverse effects of actions in the floodplain and wetlands of WOCE and in downstream surface waters. Specifically, the height of the structure was designed to minimize the increase in the area of inundation in the floodplain, thereby minimizing impacts to the floodplain and wetlands. The construction method selected creates minimal sediment disturbance during construction, and therefore minimizes off-site migration of contaminated sediment. Finally, the overall approach minimizes the alteration of the ecosystem and potential off-site impacts associated with contaminated sediment transport downstream. Construction of the sediment retention structure was initiated in late June 1991 and is scheduled for completion by early 1992.

Two key issues related to conducting a time-critical removal action had to be addressed before pursuing the action: (1) verification of statutory authority and (2) concurrence of regulatory agencies. Statutory authority under CERCLA for remedial actions at Federal facilities is vested in the President of the United States. According to provisions contained in Executive Order (E.O.) 12580 (Superfund Implementation), Section (2)(d), the President has delegated authority vested in him by Section 115 of CERCLA, as amended, and by Section 301 of Title 3 of the United States Code to the Secretary of Energy. This authority covers functions vested in the President by CERCLA Sections 104(a),(b) and (c)(4), 113(k), 121 and others, and is specific with respect to releases or threatened releases on DOE facilities. DOE has been delegated authority to conduct "emergency" and "non-emergency" removal actions at facilities under its jurisdiction. In accordance with E.O. 12580, Federal agencies are also responsible for funding response actions taken at facilities under their jurisdiction.

To obtain the concurrence of appropriate regulatory agencies, Energy Systems and DOE initiated discussions about conducting a time-critical removal action with the TDEC and EPA-IV within two weeks of confirmation of the analytical data. Shortly thereafter, representatives of EPA-IV, TDEC, COE, TVA, DOE, and Energy Systems met and all parties concurred that the project should be conducted as a time-critical removal action. These agencies were continually updated throughout project execution to insure continued regulatory agency support.

REGULATORY COMPLIANCE ISSUES

Identification and resolution of key issues allowed determination that a time-critical removal action could and would be conducted. At this point, Energy Systems initiated a regulatory compliance review to insure that all regulatory issues were identified and properly addressed. This regulatory compliance review focused on applicable provisions of the NCP, and applicable or relevant and appropriate requirements (ARARs).

The National Contingency Plan

The NCP applies to all Federal agencies for releases or substantial threat of releases of hazardous substances, pollutants, and contaminants from Federal facilities that may present an imminent and substantial danger to public health and welfare. The NCP specifically provides procedures for undertaking response operations under CERCLA. Although the NCP applies to all Federal agencies, it is written primarily to address procedural requirements for conducting EPA-lead, Superfund-financed response actions, and therefore, includes many procedures and requirements related specifically to use of Superfund monies. Subpart K of the NCP is currently reserved for Federal facilities, but a draft version of the Subpart K regulations is not due to be available for public comment until October 1, 1991.

In the absence of the Subpart K regulations, it was necessary to look elsewhere for guidance on implementation of the NCP specific to this project. Some limited guidance was found in EPA's Superfund Removal Procedures Manual (EPA, 1988). This document is a manual used specifically by EPA On-Scene Coordinators (OSCs) who are conducting removal actions. The section on removals at Federal facilities (Section VI) essentially states that Federal agencies must comply with all of the substantive and procedural requirements under Sections 107(g) and 120 of CERCLA and the NCP. A proactive approach was taken to identify and address each substantive requirement, and to the extent practicable, comply with each requirement.

Two of the most important substantive requirements of the NCP are the limits on the cost and duration of Fund-financed removals. According to Section 300.415 (b) (5) of the NCP, Fund-financed removal actions must be terminated after obligation of $2 million dollars, or after 12 months have elapsed from the date that removal activities began onsite, unless (i) there is an immediate risk to the public health or welfare, or (ii) continued response is otherwise appropriate and consistent with the remedial action to be taken. With regard to removals at Federal facilities, "even in instances where NCP requirements are not strictly applicable, such as the statutory time and dollar limits for removal actions, Federal agencies should consider the intent of, and reasoning behind the NCP provisions when conducting response actions at their own facilities." Regarding the statutory limits, Congress intended that removal actions continue to be limited in scope, "Federal agencies should comply with the removal statutory limits or meet the requirements for one of the two statutory exemptions from the limits" (EPA, 1988).

In this case, the project will be completed within 12 months of the date that construction was initiated, but the estimated cost of the project is $5 million dollars. This project does, however, specifically meet the requirements for continued response under Section 300.415 (b)(5)(i) and (ii) described above. Construction of the sediment retention structure is being conducted to control

downstream migration of contaminated sediments and thereby prevent risk to the public health and welfare. Further, sediment control will be required to finally remediate contaminated sediments in WOCE and is consistent with the remedial action to be taken. In addition, the sediment retention structure will provide for containment of both inplace contaminated sediments and contaminated sediments that may be mobilized from the watershed during future remediation of other solid waste management units.

Other portions of the NCP potentially applicable to this time-critical removal action include:

- Discovery
- Notification requirements
- Emergency Planning and Community Right-to-Know Act (EPCRA) requirements
- Removal tracking systems reporting
- Conducting a removal site evaluation
- Establishing the administrative record
- Conducting community relations activities
- Designation of an OSC
- Preparation of OSC Reports.

Many of these requirements are straightforward and were directly applicable to this project. Only those portions that required research or extensive extrapolation are discussed herein.

Notification. Following discovery of a release of hazardous substances, notification requirements ensue. The NCP contains language throughout (too numerous to cite) concerning requirements for notification of the National Response Center (NRC), EPA, U.S. Coast Guard (USCG), National Response Team (NRT), Regional Response Team (RRT), and in cases involving releases of radioactive materials, the Radiological Assistance Team (RAT) and Federal Emergency Management Agency (FEMA) under the Federal Radiological Emergency Response Plan (FRERP) (NCP Section 300.130(f)). On the other hand, Section 300.170(d) states that Federal agencies are "encouraged" to report releases to the NRC, indicating this is not a requirement but rather a discretionary action. DOE/Energy Systems did prepare and file an Occurrence Report of the discovery and subsequently notified EPA-IV, TDEC and TVA.

EPCRA. According to Section 300.405(g), Federal agencies are not legally obligated to comply with EPCRA requirements. DOE did notify the Tennessee Emergency Management Agency (TEMA) in writing in advance of initiating onsite activities.

Removal Tracking Systems. EPA maintains several data bases of information on removal actions; in particular, the Emergency Response Notification System (ERNS). There are no specific procedures for reporting actions at Federal facilities for inclusion in this data base. It is anticipated that the EPA-IV DOE Coordinator will provide information on this response action as appropriate.

Designation of OSC. Although there is no statutory requirement for DOE to designate an On-Scene Coordinator (OSC), several of the regulators involved expressed a desire to have someone onsite at all times during construction to document the activity in some detail. Energy Systems has designated a person to be onsite at all times during construction activities.

OSC Reports. NCP Section 300.165, OSC Reports, also does not appear to be applicable to this proposed action. However, Energy Systems plans to prepare a report following completion of construction that summarizes the site history and background information, and daily activities during construction, including monitoring results. This report will be circulated to the regulatory agencies cooperating in this effort (TVA, TDEC, COE, and EPA-IV) and also will be made available to the public.

Applicable or Relevant and Appropriate Requirements

The NCP requires compliance with ARARs during removal actions "to the extent practicable." A project of this nature would normally require obtaining a number of Federal and state permits under the ARARS. However, according to provisions described in CERCLA Section 121(e)(1), and NCP Section 300.400(e), Federal, state, and local permits are not required for onsite response actions conducted under CERCLA Section 104 and other sections. The Oak Ridge Reservation (ORR), which is owned and operated by DOE, includes the submerged land in WOL, WOC, and WOCE; surface waters are considered waters of the state. There is regulatory agency consensus that the proposed action in WOCE is an "onsite" response action. Although permits are not required for this action, the approach for this removal action has been to identify and address all regulatory requirements that would be applicable if permits for construction were required.

An extensive list of ARARs was initially reviewed for applicability to this project. Through close communication and coordination with the regulatory agencies, it was possible to dismiss a majority of the ARARs and focus on the substantive requirements of only a few laws and regulations, primarily those with permitting requirements. The primary ARARs evaluated include dredge and fill requirements under the Clean Water Act (CWA), compliance with TVA regulations, and compliance with the National Environmental Policy Act (NEPA).

A project involving construction in a surface water would normally require a dredge and fill permit issued by the COE under the CWA, Section 404, and state water quality certification under CWA Section 401. The COE and TDEC waived permitting requirements under the CWA. However, the state did request that Energy Systems and DOE:

1) include a best management practices (BMP) plan for control of sediments disturbed during construction in the construction contract documents

2) prepare a water quality monitoring plan and conduct water quality monitoring during construction

3) prepare an operation and maintenance manual for the sediment control structure and conduct post-construction monitoring activities.

Completion of these documents and activities constitutes compliance with the substantive requirements of the regulations in lieu of permitting.

The TVA has permitting and approval authority for dam construction or conduct of other activities that may impact TVA's development or regulation of the Tennessee River System. TVA also agreed to waive permit requirements for this project. However, DOE will be subject to power loss and flood storage loss assessments under TVA land rights. The assessments are based on replacement cost of power facilities, interest rates and dam spill frequency. At this time, it is unclear whether or not TVA will levy these assessments.

NEPA establishes a national policy to ensure that consideration is given to environmental values and factors in Federal planning and decisionmaking. The DOE policy is to comply fully with the letter and spirit of NEPA. To ensure that environmental factors are considered in the decisionmaking process and to promote environmentally responsible decisions, DOE incorporates NEPA requirements early in the planning process for proposed actions. DOE also coordinates its NEPA actions with the states that host DOE facilities. DOE complied with the timely planning and NEPA review requirements described by 10 CFR Part 1021.100 through submission of a categorical exclusion (CX) in November 1990.

The project meets the criteria for eligibility for categorical exclusions (10 CFR Part 1021.412) that require documentation, and in particular, Part 1021.412 (a)(3), "An action may be categorically excluded if although sensitive areas are present on a site (i.e., floodplain and wetlands), the action would not adversely affect those areas." Under Section 1021.413 (f) - Categorical Exclusions Applicable to Environmental Restoration and Waste Management, removal actions under CERCLA are excluded. Notwithstanding the applicability of the categorical exclusion, Energy Systems prepared a floodplain and wetlands assessment to provide further documentation of the project and support DOE Headquarters' approval of the categorical exclusion.

SUMMARY AND LESSONS LEARNED

Following discovery of high levels of ^{137}Cs in surface sediments at the mouth of White Oak Creek Embayment, Energy Systems initiated and aggressively pursued conducting a time-critical removal action in the form of construction of a sediment retention structure to prevent offsite migration of contaminated sediments. A proactive approach was taken to identify issues and involve appropriate

Federal and state regulatory agencies. Unraveling the regulatory framework for conducting this action in terms of identifying applicable requirements of the NCP and issues related to compliance with the ARARs was an essential element of determining regulatory compliance requirements.

This project has been large and complex and has proceeded on an aggressive schedule to meet the requirements of a time-critical removal action. Many aspects of the project, in terms of compliance with the substantive requirements of the NCP and ARARs, have exceeded the regulatory requirements, despite the fact that there is no apparent authority on conducting removal actions at Federal facilities. Much of the interpretation of the NCP was groundbreaking in nature for both EPA and DOE. Key lessons learned from this project that are also critical success factors are:

- unraveling the ARARs early on to identify the key regulatory players, to involve them in the initial decisionmaking process, and to gain full consensus on the approach

- completion of NEPA documentation early on and close coordination with DOE Headquarters are required to gain timely approval.

When the NCP Subpart K regulations governing removal and remedial actions at Federal facilities are promulgated, specific details concerning the substantive requirements of the NCP should be available, thereby eliminating the need for the extensive research and extrapolation required for this project. Regardless of the content of Subpart K, the two critical success factors identified for this project are likely to be directly applicable to any time-critical removal action conducted at ORR or other Federal facilities.

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