



United States Department of Energy
Environmental Management Program DOE/OR/01-2648&D3

Final Proposed Plan for Soils in Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee

June 2015

This proposed plan describes:

- Residual contamination in soil at Zone 1 of the East Tennessee Technology Park
- Current and future human health and ecological risks from this media
- Remedial alternatives considered
- The preferred alternative for remedial action
- How to participate in the selection or modification of the preferred alternative
- Where to get more information

YOUR OPINION IS INVITED

The U.S. Department of Energy (DOE) invites you to express your opinion of the presented remedial alternatives and the preferred alternative for the final Zone 1 soil decision at the East Tennessee Technology Park. You are encouraged to read the information in the administrative record, including the Remedial Investigation/Feasibility Study, for background and more detailed technical information. A comment form is attached to this fact sheet, but you are not restricted to this form. Decision makers will consider any comments received before the end of the public comment period.

Community involvement is critical to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 process. DOE has established a 45-day public comment period, during which time local residents and interested parties can express their views and concerns on all aspects of this plan. DOE has scheduled a public meeting to discuss cleanup alternatives and to address questions and concerns the public may have.

This document is approved for public
release per review by:

Teresa Fancher (*signature on file*)

4-23-15

UCOR Classification &
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Date

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INTRODUCTION

This proposed plan presents the U.S. Department of Energy’s (DOE’s) preferred alternative for addressing residual contamination in soil for the protection of human health and the environment at Zone 1 in the East Tennessee Technology Park (ETTP). ETTP, formerly referred to as the Oak Ridge K-25 site or the Oak Ridge Gaseous Diffusion Plant (ORGDP), is located on the Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee (Fig. 1).

This proposed plan documents DOE’s rationale for the preferred alternative within the framework of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 *United States Code* Sect. 96-1 et seq.) and

the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 *Code of Federal Regulations* 300). In accordance with the DOE “Secretarial Policy Statement on the National Environmental Policy Act” (DOE 1994a), National Environmental Policy Act of 1969 (NEPA) values have been incorporated into the CERCLA documentation prepared for this project.

SITE BACKGROUND

ETTP, one of three major facilities located within the ORR, is owned by DOE. The industrial complex is located near the northwest corner of the ORR. ETTP was built by the U.S. Army Corps of Engineers as part of the Manhattan Project beginning in 1942. From 1942 until 1964, the gaseous diffusion technology was used to enrich uranium for use in nuclear weapons. The facility was called the ORGDP and had two primary process buildings where highly enriched uranium was produced. In 1953, an additional three process buildings were added to increase production of the low enriched uranium for power reactors. In 1964, military production of highly enriched uranium was discontinued and the K-25 and K-27 process buildings were shut down.

For the next 20 years, the primary mission of the ORGDP was the production of low enriched uranium for fabrication into fuel elements for commercial and research nuclear reactors. Secondary missions in the mid-1980s included research on new technologies for uranium enrichment, such as gas centrifuge and laser isotope separation. In 1985, because of a decline in the demand for enriched uranium, DOE placed the ORGDP in standby mode. The decision to permanently shut down the facility was made in 1987. Currently, DOE activities at the facility include environmental restoration and waste treatment, storage, and management. The name of the facility has been changed to ETTP to more appropriately reflect the changes in the facility’s mission. Portions of ETTP are being used for non-DOE industrial activities.

ETTP contains both hazardous and mixed waste sites that are subject to regulations promulgated under the Resource Conservation and Recovery Act of 1976 (RCRA) and CERCLA, as amended. Investigations and monitoring of ETTP sites began in the mid-1980s under RCRA requirements from the Tennessee Department of

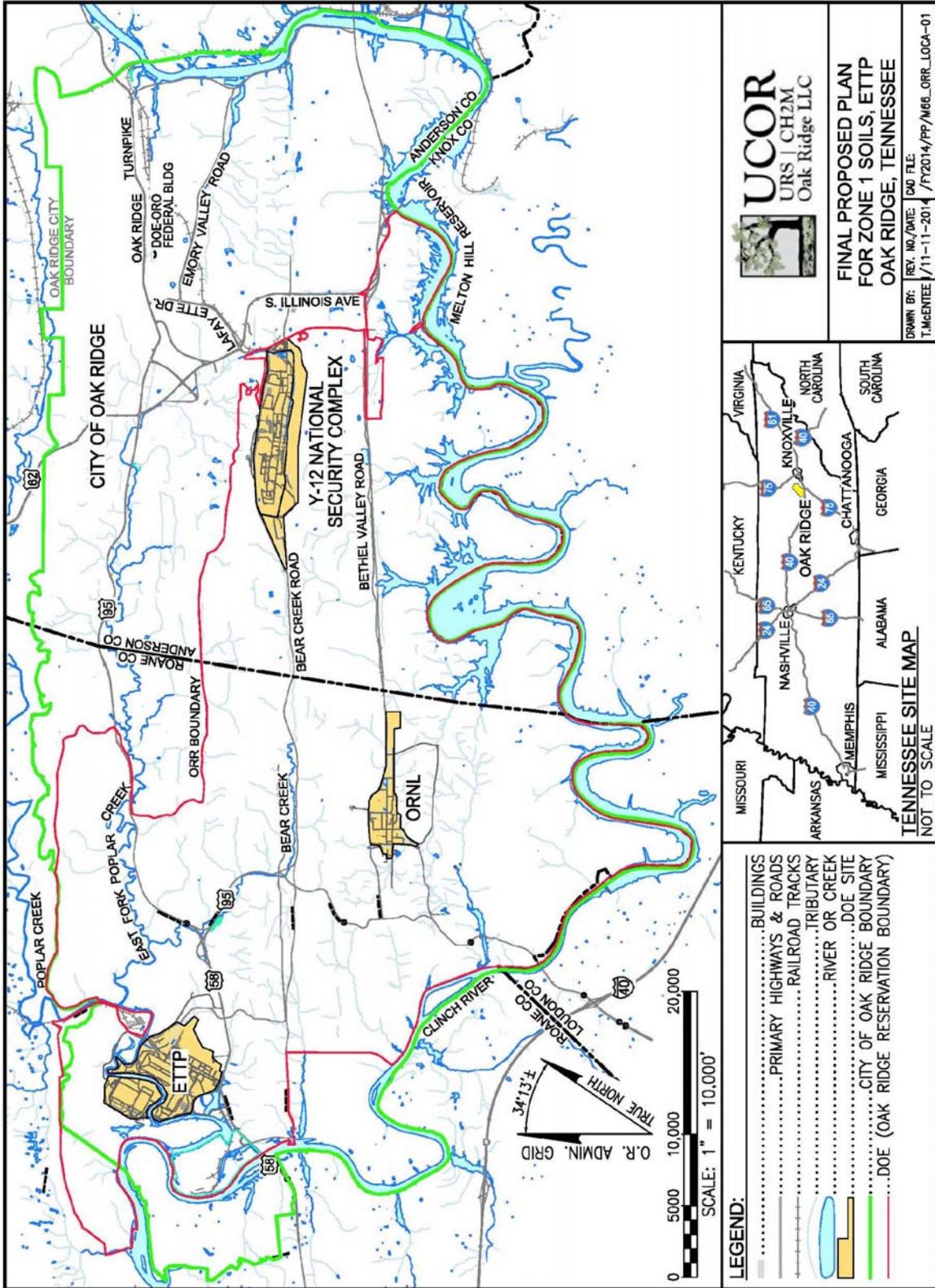


Fig. 1. Location of the Oak Ridge Reservation and East Tennessee Technology Park.

Environment and Conservation (TDEC). In November 1989, the entire ORR was placed on the National Priorities List of CERCLA sites and subsequent work was performed under CERCLA.

Contamination at ETTP exists in soil, groundwater, sediment, and buildings. To address this contamination, several types of CERCLA decisions have been made at ETTP: (1) single-action decisions for sources and media, (2) demolition decisions for buildings, (3) comprehensive remediation decisions for larger areas of ETTP, and (4) final residual contamination decisions. ETTP has been divided into two zones for the comprehensive and final decisions, Zone 1 and Zone 2 (Fig. 2), based on the level of contamination present and the type of activity that occurred historically. Zone 1 is less contaminated and was used for light industrial use or waste management activities. Much of Zone 1 was not impacted. Zone 2 is more contaminated as the major processes occurred within its boundaries and all of Zone 2 had some type of heavy industrial or support activities. The locations of the previous CERCLA single-actions and actions from the comprehensive remediation decisions in Zone 1 are shown on Fig. 3. Most, but not all, of these actions were excavation or removal-type actions. The demolished buildings are not shown on the figure, but were located in the Powerhouse Area. Each of the types of decisions for Zone 1 is discussed below.

SINGLE-ACTION DECISIONS

Single-action projects at ETTP have been performed under both CERCLA removal and remedial action decisions. These single-action projects have generally focused on early mitigation of higher risk threats of release or exposure, such as removing primary sources of contamination. A listing of these projects in Zone 1 and their associated decision documents and dates follows:

- K-901-A Holding Pond fish kill and cylinder removal (Zone 1) (DOE 1997a)
- K-1070-A Old Contaminated Burial Ground excavation (Zone 1) (DOE 2000a)
- K-1085 Old Firehouse Burn Area drum burial site removal (Zone 1) (DOE 2001)

The single-action projects on waste sources and environmental media are now complete and considered final under this decision.

DEMOLITION DECISIONS

Demolition of most buildings at ETTP is occurring under CERCLA removal authority. Historically, some clean buildings in the Powerhouse Area of Zone 1 were demolished after a NEPA review. The two major projects were:

- Demolition of the Powerhouse, cooling towers, and associated buildings with NEPA categorical exclusions (DOE 1994b, 1994c, 1994d)
- Demolition of two buildings in the Powerhouse Area under an action memorandum (DOE 1997b)

Some small remaining buildings were demolished under a CERCLA removal action (DOE 2003). All of the above ground Zone 1 building demolition activities were completed and are considered final. Slabs and any subsurface structures were addressed by the Zone 1 Interim ROD and were remediated if above remediation levels protective of human health.

COMPREHENSIVE REMEDIATION DECISIONS

Two comprehensive decisions (as follows) at ETTP were made that focus on remediation of soil, buried waste, and subsurface structures:

- Zone 1 soil and contaminated areas excavation (DOE 2002)
- Zone 2 soil and subsurface structure excavation (DOE 2005)

All work that is being conducted under the Zone 1 Interim Record of Decision (ROD) is complete; however, the unrestricted industrial use ROD goal was not met in all locations. Those locations are being addressed in this proposed plan and subsequent Record of Decision. The work under the Zone 2 ROD is still underway. The goals of the Zone 1 Interim ROD remedies were to protect human health and limit further contamination of groundwater. The decisions address large portions of ETTP (1400 acres for Zone 1) and set long-term stewardship requirements for all impacted land.

RESIDUAL CONTAMINATION DECISION

Residual soil contamination decisions are separated by zone. The final groundwater and

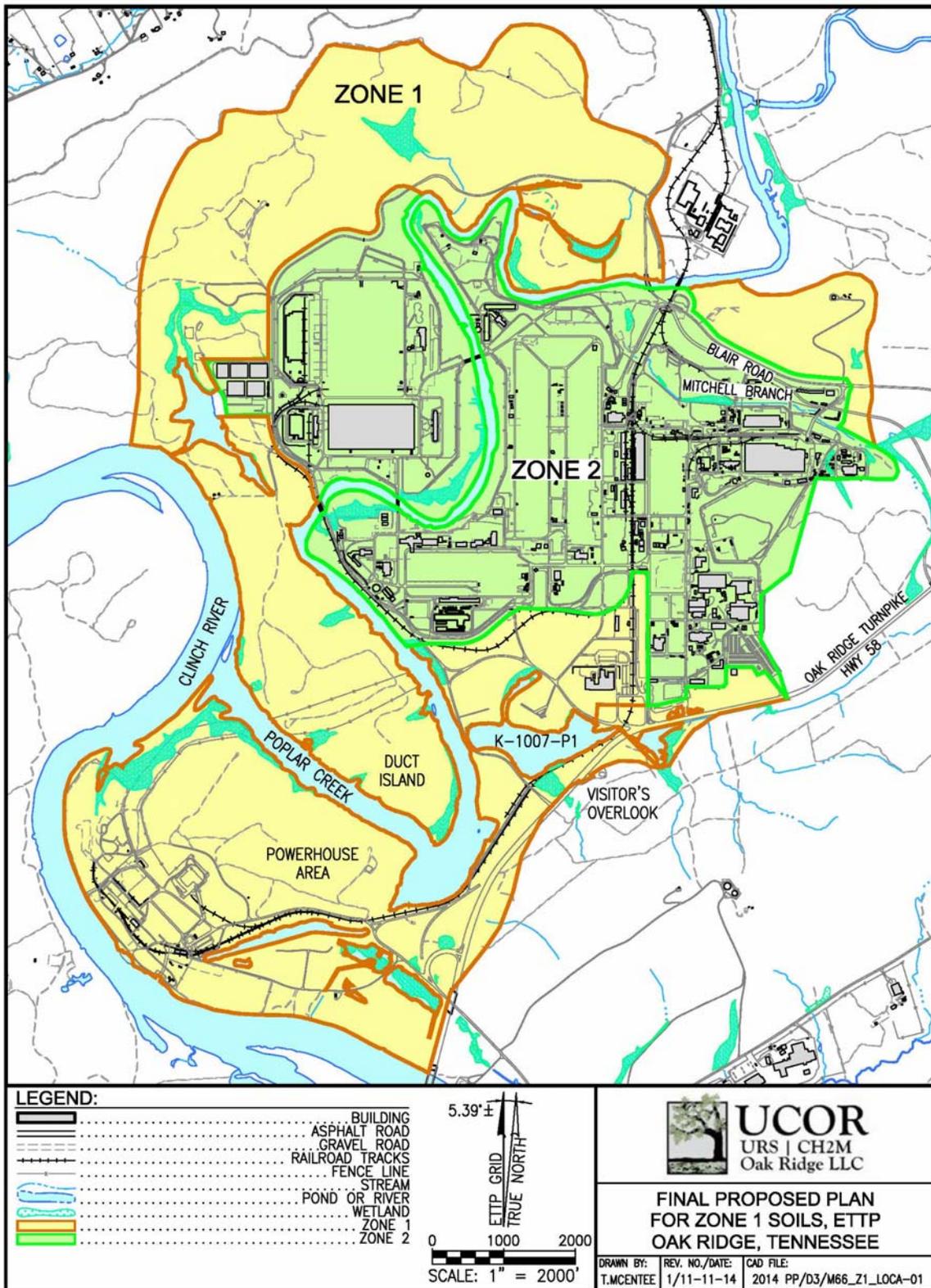


Fig. 2. ETTP Zone 1 and Zone 2 location map.



Fig. 3. Locations of previous actions in Zone 1.

surface water decisions are anticipated to be done for all of ETTP. The soil decisions address any contamination remaining in the soil or as a result of incomplete remediation under the initial Zone 1 and Zone 2 RODs. The portion of the ETTP site outside the boundaries of Zone 1 and Zone 2 has been investigated under a separate program (formerly called the "ETTP footprint reduction program") and determined not to contain soil with unacceptable levels of contamination; these areas are expected to be addressed under separate decisions (e.g., CERCLA Sect. 120 [h] clean parcel determinations).

During the original evaluation of sitewide groundwater and surface water alternatives, remediation of four surface water bodies in Zone 1 (K-901-A Holding Pond, K-1007-P Holding Ponds, K-720 Slough, and the K-770 Embayment) were moved into a parallel removal action decision process. The selected removal actions have been implemented and are ongoing.

SITE CHARACTERISTICS

Zone 1 occupies a total of 1400 acres. Historically, Zone 1 was used for light industrial purposes and some waste disposal. The majority of the area is grassed or forested. As shown in Fig. 4, there are four main areas based on geography and previous land uses (K-1007 Ponds Area, Duct Island Area, Powerhouse Area, and K-901 Area) that served as the basis for evaluating residual soil contamination.

The K-1007 Ponds Area makes up the southeast portion of ETTP. It is bounded to the north by the main plant, to the south and east by State Highway 58, and to the west by Poplar Creek. In the past, the area contained several vehicle maintenance facilities and gas stations. The old buildings have been demolished or transferred for private use as they were uncontaminated and new buildings have been constructed. This area was largely uncontaminated, even before remediation efforts under the Zone 1 Interim ROD, but there have been some small areas of contamination and underground storage tanks that have been removed.

The Duct Island Area is the land area in the west-central portion of ETTP that is bounded on the east, south, and west by Poplar Creek and on the north by the K-901 Area. One area of waste disposal that remains is the K-1070-F Construction Spoil Area. Small areas of soil

contamination have been removed from Duct Island and others have been covered. Currently, this area is covered by grass and woods and there are no industrial activities occurring.

The Powerhouse Area is located on the Powerhouse Peninsula in the southwestern portion of ETTP. It is bounded by the Clinch River to the north, south, and west and by Poplar Creek to the east. The major industrial use for this area was power production with other plant support and storage facilities. The buildings in this area have been demolished and the areas are now grassed. There is an unindustrialized area that has remained wooded and grassy. A covered fly ash pile remains, along with residual asbestos, in one area. Significant quantities of soil have been removed from this area, along with 40,000 tons of scrap metal and debris that was stored on the surface (the K-770 Area).

The K-901 Area is located in the northwest portion of ETTP and extends around the site to the north. The area had very little industrial activity and tended to be used as a disposal area for hazardous waste and construction debris associated with the construction and operation of ETTP. A major hazardous waste burial ground, K-1070-A, and small areas of soil contamination have been removed. Several construction debris landfills remain (K-901-A North Disposal Area, K-901-A South Disposal Area, and Contractor's Spoil Area). The rest of the area is forested or grassed and includes portions of the Black Oak Ridge Conservation Easement.

Table 1 presents more information about the areas of potential residual contamination in Zone 1. The locations of these various areas of interest are presented in Fig. 5.

SCOPE AND ROLE OF DECISION

The geographic area covered by the actions addressed in this proposed plan is Zone 1 at ETTP. Zone 1 is a DOE-developed boundary that encompasses almost all areas impacted by historical operations outside of the original fence. This boundary was used formerly to designate the ETTP area for remediation under the Zone 1 Interim Record of Decision (ROD) (DOE 2002). Exposure units (EUs) 50, 51, and 52, where the K-1066 waste management facilities are located, were originally part of Zone 1. This final Zone 1 decision moves these EUs to Zone 2. The active

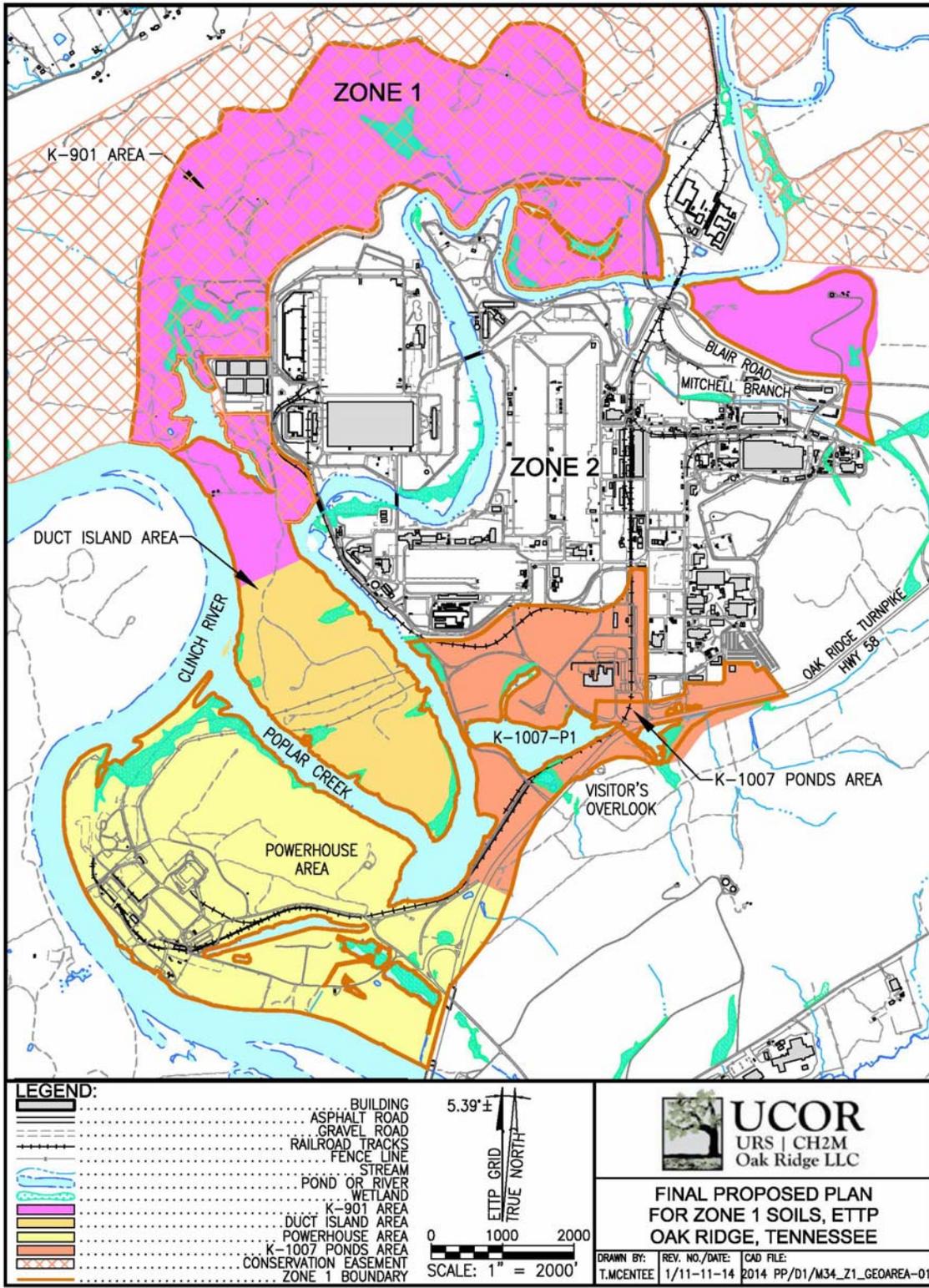


Fig. 4. ETPP geographic areas evaluated for soil remediation.

Table 1. Characteristics of sites/areas with residual contamination

Site	Contamination description
Contractor's Spoil Area (in K-901 Area)	Located in northern portion of the K-901 Area; PAHs, metals, VOCs disposed in area; currently capped
K-770 Area (in Powerhouse Area)	Located along the river in the Powerhouse Area; originally used to store contaminated scrap; scrap and residual soil removed under the Zone 1 Interim ROD; residual contamination is asbestos; all other contaminants removed to meet Zone 1 Interim ROD goals
K-720 Fly Ash Pile (in Powerhouse Area)	Located along the river in the Powerhouse Area, south of the K-770 Area at the southern end of Zone 1; metals in fly ash remain; area is covered
Duct Bank Corridor (in K-1007, Duct Island, and Powerhouse Areas)	Intersects several areas, including the K-1007, Duct Island, and Powerhouse Area; sludges in duct banks were grouted in place; sludges contain metals
K-901 North/South, capped area at Blair Quarry (in K-901 Area) and K-1070-F (in Duct Island Area)	K-901 North and South are located along the banks of the K-901-A Holding Pond (one on the south end, one on the north end); K-1070-F is located in the middle of Duct Island; all are construction debris disposal areas with minor contamination or contaminated material disposed, and been capped under solid waste regulations; also, several areas covered around Blair Quarry on McKinney Ridge as part of voluntary actions to protect terrestrial wildlife
Duct Island East, West capped areas (in Duct Island Area)	Metals and PCBs found in surface soil; areas covered as part of voluntary actions to protect terrestrial wildlife
General K-1007 Area soil	183 shallow (0-2-ft) soil sample results screened against ecological benchmarks showed potential contaminants of ecological concern to be lead, selenium, chromium, antimony, molybdenum, and PAHs, with PAHs levels being the highest and often along railroad tracks or roads
General Duct Island soil	65 shallow (0-2-ft) soil sample results screened against ecological benchmarks showed potential contaminants of ecological concern to be lead, selenium, chromium, and PAHs, but the contamination levels are mostly near the benchmarks
General Powerhouse Area soil	649 shallow (0-2-ft) soil sample results screened against ecological benchmarks showed potential contaminants of ecological concern to be PCBs, PAHs, selenium, arsenic, chromium, lead, and molybdenum; most areas of contamination were small (often represented by only one sample)
General K-901 Area soil	281 shallow (0-2-ft) soil sample results screened against ecological benchmarks showed potential contaminants of ecological concern to be PAHs, selenium, chromium, and lead; most areas of contamination were small (often represented by only one sample); some elevated chromium in a drainage channel leading into the K-901-A Holding Pond

PAH = polyaromatic hydrocarbon
PCB = polychlorinated biphenyl

ROD = record of decision
VOC = volatile organic compound

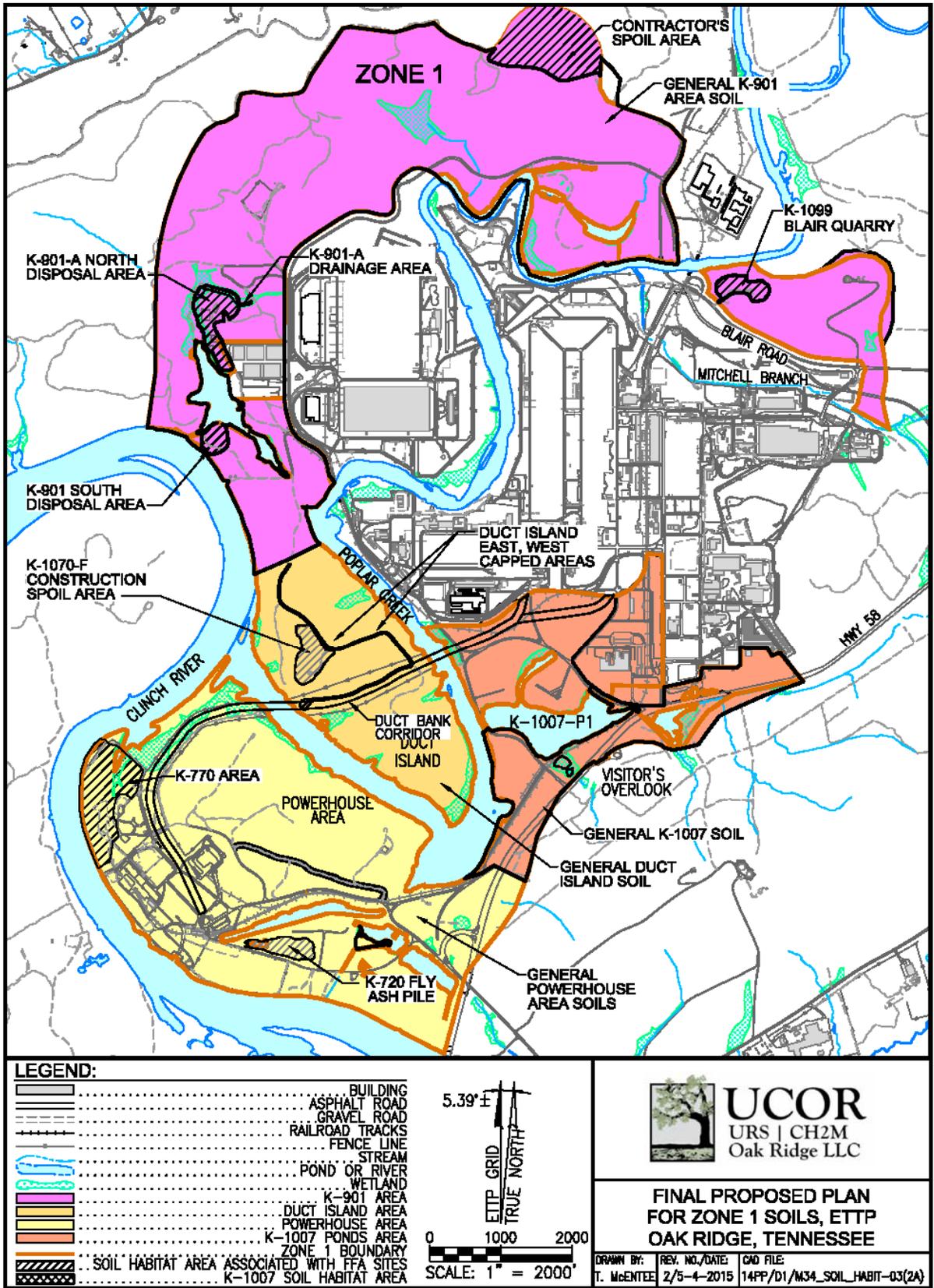


Fig. 5. Location of soil areas of interest.

waste management activities in the EUs prevent this area from undergoing final remediation.

Many remediation activities have occurred over the last 15 years in Zone 1 to remove buildings and structures and to remediate contaminated soil or waste. For the scope addressed, those initial actions are considered final under this Final Zone 1 decision. The remedial investigation/feasibility study (RI/FS) developed to support this proposed plan investigated all residual contamination in Zone 1 and evaluated alternatives for making the final decision on all media in Zone 1 considering the actions that have occurred to date and the extent and impact of residual contamination. Residual contamination in soil, surface water, and groundwater was considered.

The U.S. Environmental Protection Agency (EPA) and TDEC review comments on the Zone 1 RI/FS indicate that they consider a final decision on Zone 1 surface water and groundwater premature due to uncertainties associated with potential migration pathways for groundwater contamination. Comments provided by EPA and TDEC call for further investigations prior to approving all aspects of the RI/FS and making final decisions for groundwater and surface water. Accordingly, DOE, EPA, and TDEC have agreed to defer comprehensive remedial decisions on Zone 1 surface water and groundwater. A final remedy for Zone 1 surface water and groundwater will be selected after completion of future evaluations agreed to by DOE, EPA, and TDEC.

Land use controls (LUCs) established for groundwater by the Zone 1 Interim ROD will continue, including a general prohibition of groundwater use for any purpose. Ongoing data collection activities for Zone 1 surface water, groundwater, and springs will continue as part of ongoing ORR monitoring programs.

The Zone 1 Interim ROD identified remedial actions for potentially contaminated soil, buried waste, and subsurface infrastructure necessary to protect human health and to limit further contamination of the groundwater. These actions are considered final under this decision, but the goals of the interim ROD were not met in four areas of Zone 1—Contractor's Spoil Area, K-770 Area, K-720 Fly Ash Pile, and along the Duct Bank Corridor. The Contractor's Spoil Area was included in the Black Oak Ridge Conservation

Easement after the Zone 1 Interim ROD was signed, which changed the ROD assumption that the area would be used for unrestricted industrial use. Although contamination in the Contractors Spoils Area was above the unrestricted industrial use remediation levels established in the ROD, a supplemental human health risk assessment determined that recreational use of this area is acceptable. K-770 was remediated per the ROD requirements, however, asbestos, a contaminant not addressed in the ROD, was discovered during remediation. Although the asbestos that was discovered was removed, the likely presence of additional asbestos, uncertainties of location, and available options for remediation required additional evaluation. While the K-720 Fly Ash Pile met the human health industrial use remediation levels established in the ROD, it was determined that the cap, established prior to remediation under the Clean Water Act to mitigate runoff from fly ash to adjacent surface waters, was needed to prevent potential releases to adjacent surface waters. The need to maintain the cap precluded the goal of unrestricted industrial use to a depth of 10 ft. Per agreement with the regulators, residual contaminated sludges in the Duct Bank Corridor were solidified and left in place, which precluded unrestricted industrial use to a depth of 10 ft. Therefore, these areas were carried forward for evaluation in the final Zone 1 RI/FS. Additionally, the goals of the interim remediation effort were not developed specifically in support of protecting ecological species. This proposed plan supports a final Zone 1 soil ROD that addresses residual soil contamination remaining after completion of actions conducted under the Zone 1 Interim ROD.

To support the basis for identifying a preferred alternative for the residual soil contamination, this proposed plan serves the following four primary purposes:

1. Summarizes the site characteristics and risks associated with surface soil contamination
2. Develops alternatives and then compares the feasible alternatives against the CERCLA remedy selection criteria and relevant NEPA values
3. Identifies and provides, based on the CERCLA criteria and NEPA value evaluation, DOE's rationale for preferring the proposed alternatives

4. Facilitates public involvement in the remedy selection process

This proposed plan is based on the data and information presented in the *Final Zone 1 Remedial Investigation/Feasibility Study for East Tennessee Technology Park* (DOE 2014) (Final Zone 1 RI/FS) and is being published to solicit public review and comment on all information presented herein, specifically on information pertaining to the preferred remedial actions. DOE (the lead agency for ORR remedial activities) is issuing this proposed plan as part of public participation requirements under Sect. 117(a) of CERCLA and the NCP 300.430(f)(2).

A copy of the Final Zone 1 RI/FS and other site-related information for this decision can be found in the Administrative Record.

DOE has established a 45-day public review and comment period on this proposed plan and will schedule a public meeting to discuss cleanup alternatives and address questions and concerns the public may have about the preferred alternatives.

DOE may modify the preferred alternatives or select a different alternative in response to public input. The public, therefore, is encouraged to review and comment on all information in this proposed plan. After considering public comments, DOE will prepare a ROD that presents the selected remedy. When DOE, EPA, and TDEC approve the ROD, DOE will prepare plans and implement the selected remedial actions at ETPP.

SUMMARY OF SITE RISK

Ecological risks were assessed at the site scale in "habitat areas," within a Geographic Area. These habitat areas (Fig. 5) generally coincide with larger identified FFA sites or with the remaining areas in the Geographic Area.

Earlier assessments for plants and soil invertebrates completed in 2007 (DOE 2007) showed, based on toxicity tests, little to no risk to soil invertebrates or plants. There are uncertainties with the results, but the FFA parties have decided that these species are currently sufficiently protected and there is no evidence that there are sufficient impacts to plants or soil invertebrates to be a threat to wildlife up the food chain.

Potential risks to local wildlife populations form the basis for considering remediation, not potential risks to individuals unless a threatened or endangered species could be impacted. Early ecological risk assessment work performed during the 2007 final sitewide RI/FS effort (DOE 2007) determined that wide ranging wildlife species were protected even before remediation efforts under the Zone 1 Interim ROD were complete, so residual risk to those receptors was not evaluated to support this final decision.

Conclusions of the recent residual soil ecological risk assessment showed no widespread current threat to local wildlife. There were single sampling locations with residual contamination above the evaluated benchmarks, but in most cases, the area was defined as much smaller than even an individual's home range. Therefore, these isolated locations are unlikely to be a threat to ecological populations. There are future potential threats to the environment at areas that contain soil covers protecting against exposure should those covers erode:

- K-720 Fly Ash Pile in the Powerhouse Geographic Area (Fig. 5). Historically, adjacent surface water quality has been impacted from runoff from the uncovered fly ash. A maintained soil cover installed in the past over the fly ash has mitigated that risk.
- Contractors Spoil Area in the northern portion of the K-901 Geographic Area (Fig. 5). Although not quantifiable, it is possible that a future environmental threat could also arise if the existing cover erodes.
- Duct Island Soil Covers (Fig. 5). Two areas totaling about 0.55 acres on Duct Island were covered with 2 ft of soil during a voluntary action to protect terrestrial species from small areas of elevated levels of contamination. Should these covers erode, there is the potential for isolated threats to ecological terrestrial species from the underlying contamination. Five small areas totaling about 0.24 acres in Blair Quarry were also covered during the voluntary action to protect terrestrial species, however, it was determined that there is no appreciable threat to terrestrial species should these covers erode.

There is an area with elevated chromium levels in the K-901 Drainage Area in the 901-A geographic area (Fig. 5) that may threaten local

wildlife populations. This area is identified as a potential threat based on field screening analytical results instead of laboratory analysis and, therefore, was not considered a risk in the formal ecological risk assessment.

Human health risk assessments were also conducted to determine the threat to future industrial users or recreational users in a few areas of Zone 1 where Zone 1 Interim ROD goals were not met. By far, most of the Zone 1 area has been determined to be protective of a future industrial worker under the Zone 1 Interim ROD, but, as previously stated, the goals of the Zone 1 Interim ROD were not met in the Contractor's Spoil Area, K-770 Area, K-720 Fly Ash Pile, and along the Duct Bank Corridor. The risks to humans from contamination in these areas were reassessed in the Final Zone 1 RI/FS. Under current conditions, there is a potential risk from polynuclear aromatic hydrocarbons to future industrial workers in the Contractor's Spoil Area, however, recreational use of the area is acceptable. There is also residual asbestos in the soil at the K-770 Area in the Powerhouse Geographic Area that could cause a threat to future industrial and recreational users of the area. No risk to future industrial or recreational users was found at the K-720 Fly Ash Pile. The final area of concern for future users of Zone 1 is the Duct Bank corridor. Residual contamination was left in the duct banks with depth and grouted in place. Although the risk was not quantified, the presence of contamination means that DOE considers this area a potential threat to a future industrial worker. The corridor would be protective of a controlled industrial user who was prevented from excavating below 2 ft, but not of an unrestricted industrial worker who may excavate to 10 ft below surface.

Table 2 provides a summary of the risk assessment conclusions for the various areas of interest in Zone 1. Conclusions from the Zone 1 Interim ROD efforts as well as the results in the Final RI/FS are also presented.

REMEDIAL ACTION OBJECTIVES AND REMEDIATION LEVELS

The remedial action objectives (RAOs) provide a general description of what the cleanup will accomplish. The RAOs have the general objective of protecting human health and the environment and meeting applicable or relevant and appropriate requirements (ARARs). The RAOs for Zone 1 soils developed in the RI/FS are summarized in Table 3 and discussed below.

The anticipated future use of ETPP land is an important consideration in determining the appropriate extent of remediation. The most aggressive land use anticipated for ETPP is industrial use, with some areas of Zone 1 being returned to ecological habitat. Therefore, the RAO for the cleanup of residual contamination in soil in Zone 1 is to protect a future industrial worker, either through remediation or through access controls, and to protect populations of terrestrial wildlife. The remediation levels set in the Zone 1 Interim ROD have been demonstrated to still be protective of an industrial worker and are more than sufficiently protective of a recreational user. Therefore, recreational use would be considered an acceptable use under this RAO. The Zone 1 Interim ROD remediation levels to protect human health and underlying groundwater are accepted as final remediation levels in this final soils decision. In addition, ecological remediation levels have been identified.

Table 2. Risk summary of sites with residual contamination

Site	Contamination description	Site risk summary
Contractor's Spoil Area	PAHs, metals, VOCs disposed in area; currently capped	Potential risk to industrial users or ecological species from PAHs if cap fails (Final Zone 1 RI/FS); no unacceptable risk to recreational users if cap fails (Final Zone 1 RI/FS); no unacceptable risk to groundwater (Zone 1 Interim ROD closure reports)
K-770 Area	Residual contamination is asbestos; all other contaminants removed to meet Zone 1 Interim ROD goals	Potential risk to industrial and recreational users from asbestos (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users from other contaminants (Zone 1 Interim ROD Closure reports and in Final Zone 1 RI/FS); no unacceptable risk to groundwater (Zone 1 Interim ROD closure reports)

Table 2. Risk summary of sites with residual contamination (cont.)

Site	Contamination description	Site risk summary
K-720 Fly Ash Pile	Metals in fly ash remain	Potential risk to adjacent surface water if existing cap fails (Final Zone 1 RI/FS); minor impacts on groundwater immediately underlying ash, but MCL exceedances do not extend much beyond ash boundary (Zone 1 Interim ROD closure reports and Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users (Zone 1 Interim ROD closure reports and in Final Zone 1 RI/FS)
Duct Bank Corridor	Residual sludges in duct banks were grouted in place; sludges contain metals	Potential risk to unrestricted industrial worker from contamination in the ducts; risk not quantifiable (Final Zone 1 RI/FS); no unacceptable risk to recreational users or ecological species (no way to access contamination) (Final Zone 1 RI/FS); no unacceptable risk to groundwater (Zone 1 Interim ROD closure reports)
K-901 North/South, K-1070-F, capped area at Blair Quarry	Minor construction debris with limited contamination disposed	No risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports); no ecological risk even if caps fail
Duct Island East, West capped areas	Metals and PCBs found in surface soil; areas covered as part of voluntary actions	Potential ecological risk to terrestrial wildlife if existing covers fail (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports)
General K-1007 Area soil	Potential contaminants of ecological concern to be lead, selenium, chromium, antimony, molybdenum and PAHs, with PAHs levels being the highest and often along railroad tracks or roads	Contamination too isolated to be an ecological risk (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports)
General Duct Island soil	K-1070-F remains in the Duct Island Area; potential contaminants of ecological concern to be lead, selenium, chromium, and PAHs, but the contamination levels are mostly near the benchmarks	No unacceptable ecological risk to terrestrial wildlife outside areas discussed above; contamination too isolated to be a risk (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports)
General Powerhouse Area soil	Potential contaminants of ecological concern to be PCBs, PAHs, selenium, arsenic, chromium, lead, and molybdenum; areas of contamination were small (often represented by only one sample)	Contamination too isolated to be an ecological risk (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports) outside of the K-770 Area containing asbestos
General K-901 Area soil	Potential contaminants of ecological concern to be PAHs, selenium, chromium, and lead; most areas of contamination were small (often represented by only one sample); some elevated chromium in a drainage channel leading into the K-901-A Holding Pond	K-901 drainage area has elevated field results of chromium that may be unacceptable for ecological protection; other areas of contamination too isolated to be a risk (Final Zone 1 RI/FS); no unacceptable risk to industrial or recreational users or groundwater (Zone 1 Interim ROD closure reports) outside of the Contractors Spoil Area

MCL = maximum contaminant level
PAH = polyaromatic hydrocarbon
PCB = polychlorinated biphenyl

RI/FS = remedial investigation/feasibility study
ROD = record of decision
VOC = volatile organic compound

Table 3. Remedial action objectives

1	Provide for the use of the majority of Zone 1 as a future industrial site (at a minimum of 10 ft of depth) by protecting future industrial workers from exposure to carcinogenic and non-carcinogenic contaminants in EUs as previously defined. Alternatively, protect a future recreational user from the same exposure pathway in the defined EUs. For either receptor, prevent exposure to residual asbestos in soil.
2	Protect local-level terrestrial wildlife receptor populations from contamination in surface soil as defined by LOAEL exceedances averaged over a habitat area.
3	Protect underlying groundwater and nearby surface water to risk-based levels and ARARs from contamination in soil.

ARAR = applicable or relevant and appropriate requirement
EU = exposure unit

LOAEL = lowest-observed adverse effect level

Remediation levels have been set for soil to protect terrestrial wildlife. The species that served as the basis for setting remediation levels are small, local wildlife such as small mammals and birds. It was determined through toxicity testing and by evaluating the health of the wildlife that there are no significant wide-ranging impacts to vegetation or insects that would cause species that feed on them to be impacted. Additionally, no impacts to wide-ranging species such as foxes or deer were identified in the initial baseline risk assessment conducted in 2007.

The vole, the shrew, and two small bird species that are known to be sensitive to contamination were used as the receptors to select protective remediation levels (the lowest between the species was selected). Additionally, the level at which science has determined there is only a low effect from contamination on these species serves as the basis for which numbers to use. Using a level with no effect was determined to be too low as it does not consider all of the other conservative assumptions that are built into the risk assessment process. Most importantly, the no-effects level is based on impacts to any

single individual whereas the preference of EPA typically is to protect populations of ecological species (unless the species is considered threatened or endangered). For radionuclides, an activity equivalent to a dose rate of 100 mrad/d is used. This dose has been recommended by the International Atomic Energy Agency for protecting terrestrial organisms from radiation. The agency has concluded that a dose rate of this magnitude is unlikely to cause observable changes in terrestrial animal populations.

If the contamination exceeds the remediation level on average over an identified habitat area, remediation is to be considered. The average is used because all wildlife species move throughout their lifetime and are exposed to residual contamination over an area considered to be their home range. To ensure small areas of high contamination are not “averaged away,” a second evaluation is done. Any contaminant that has concentrations exceeding 10 times the remediation level (considered to be the maximum remediation level) would be considered for remediation. The ecological remediation levels are presented in Table 4.

Table 4. Ecological remediation levels

Contaminant	Average RL	Maximum RL	Basis
Arsenic	58.5 mg/kg	585 mg/kg	LOAEL for shrew
Chromium	49.7 mg/kg	497 mg/kg	LOAEL for woodcock
Lead	138.1 mg/kg	1,381 mg/kg	LOAEL for woodcock
Total PCBs	0.84 mg/kg	8.4 mg/kg	LOAEL for shrew
Uranium-234	129.2 pCi/g	1,292 pCi/g	Wildlife dose rate limit of 100 mrad/d
Uranium-238	145.1 pCi/g	1,451 pCi/g	Wildlife dose rate limit of 100 mrad/d

LOAEL = lowest-observed adverse effect level
PCB = polychlorinated biphenyl

RL = remediation level

SUMMARY OF PROPOSED SOIL ACTION ALTERNATIVES

When developing alternatives, problems that need to be addressed are first defined. Based on the risk assessment results and a comparison to remediation levels, the following soil problems should be addressed:

- Potential for eroding cover at the Contractor's Spoil Area, K-720 Fly Ash Pile, and small areas of soil contamination that could cause a threat to the environment (and human health from waste in the Contractor's Spoil Area)
- Asbestos-containing soil at the K-770 Area that could cause a threat to human health
- Residual deeper duct bank contamination in the Duct Bank Corridor that could cause a threat to human health

After defining the problems to be addressed, various technologies are screened for application to the identified problems. Based on the technologies that are shown to be the best balance of effectiveness, implementability, and cost, a range of alternatives is developed to present the most viable ways to combine technologies into complete alternatives that would meet the RAOs and the remediation levels. Four alternatives, including Alternative 1, no action, were developed as presented below:

1. No action
2. Additional LUCs/cover for the K-770, Contractor's Spoil Area, K-720, and Duct Bank areas, and removal of small ecological risk areas
3. Additional LUCs/cover for the Contractor's Spoil Area, K-720, and Duct Bank areas, and removal of K-770 and small ecological risk areas
4. Additional LUCs/cover for the Contractor's Spoil Area and Duct Bank areas, and removal of K-770, K-720, and small ecological risk areas

The alternatives progressively rely more on excavation and less on covers and LUCs. These alternatives are more fully described in the Final Zone 1 RI/FS (DOE 2014).

Alternative 1—no action

Significant remediation efforts have occurred in Zone 1. This alternative accepts the soil actions that have already been completed as final actions. Those interim actions have caused a significant reduction in risk, however, a final no action soil/debris alternative does not accept the long-term use of LUCs that was required under the interim decisions. Instead, LUCs and monitoring required under the interim and removal action decisions are ceased if this alternative is selected in a ROD. Existing caps or covers would erode.

Alternative 2—additional LUCs/cover for the K-770, Contractor's Spoil Area, K-720, and Duct Bank areas, and removal of small ecological risk areas

Excavation and Waste Disposition. There is the potential that there are small areas of residual surface soil contamination that may exceed the ecological remediation levels. Three areas in particular are of concern: that under cover at Duct Island East and Duct Island West, and that in the K-901 Drainage area. These areas were identified as of interest as a result of the ecological risk assessment work. Additional characterization would occur at each area to define the specific boundaries of excavation. The existing caps at Duct Island East and Duct Island West would be removed and contamination exceeding the remediation levels at all three locations would be excavated and disposed at the Environmental Management Waste Management Facility (EMWMF) or the new Environmental Management Disposal Facility (EMDF), if built, until remediation levels are met. The excavated areas would be graded to promote drainage and vegetated. As discussed in the Summary of Site Risks section, the five small existing caps in Blair Quarry will be allowed to erode as the area beneath the caps does not pose an appreciable risk to terrestrial wildlife.

Install Cover. The K-770 Area in the Powerhouse Area is identified on Figs. 5 and 6, showing the area when in operation. The asbestos is found near the oil storage tanks, which are believed to be the source of the material. The asbestos was apparently used as a coating on the storage tanks and associated piping. The oil storage tank farm was constructed

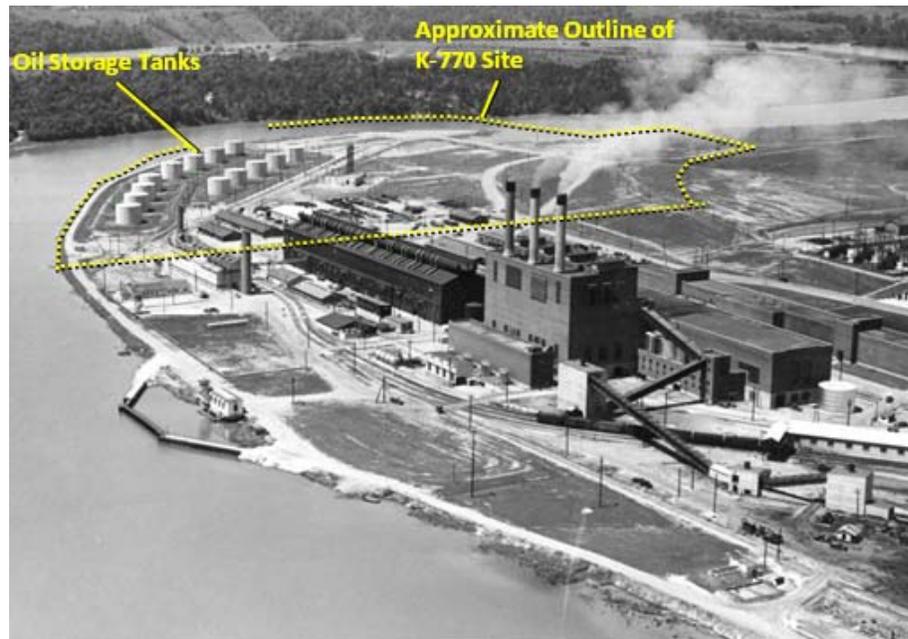


Fig. 6. Location of K-770 Area.

in the 1940s to support power generation activities and was demolished in the early- to mid-1950s. At the time of demolition, the asbestos appears to have been removed from the steel tanks/piping and intentionally buried to a depth of 2 to 6 ft. The deepest asbestos was found adjacent to the circular concrete foundations for the former oil storage tanks.

Alternative 2 includes the placement of a 2-ft-thick soil cover over a 9-acre area (see Fig. 7). The 2-ft-thick soil cover (29,000 cy) would consist of 18 in. of fill and 6 in. of topsoil. The cover would be planted with vegetation following installation.

Cover Maintenance. Three primary covers would be monitored and maintained at the following locations under Alternative 2: Contractor's Spoil Area, K-720 Fly Ash Pile, and the newly installed cover at the K-770 site. A clay cap (1.5 ft deep with 0.5 ft of top soil) was placed on the 7.5-acre Contractor's Spoil Area in 1985 when the site was closed with approval from the State of Tennessee. The K-720 Fly Ash Pile has a 2-ft cover over a 9-acre area. Maintenance at these three areas would include periodic walkovers to evaluate vegetation and erosion, erosion control, and control of runoff (most likely

an issue at K-720). There would need to be vegetation control at all three areas to ensure no growth of large vegetation such as trees that could disturb the covers. Vegetation control would also be needed along the Duct Bank corridor, but much less inspection or repair is anticipated since the contamination of concern is buried below native soil.

LUCs and Monitoring. There are two levels of LUCs required in Zone 1. First, areas that are not candidates for unrestricted use would have controls that would prevent residential use, but would allow industrial use to 10 ft, all types of recreational use, and any trespasser uses. Growing of crops, livestock, or other residential uses is not allowed. The controls would include property record notices and restrictions, zoning requirements, and other land transfer notices. No signs or fences would be necessary.

Another level of LUCs is to control use of areas that rely on covers to provide protection from underlying waste and contamination. For Alternative 2, these areas include the Contractor's Spoil Area and K-720 Fly Ash Pile. In these cases, appropriately placed signs would be added to the LUCs mentioned above that would prohibit

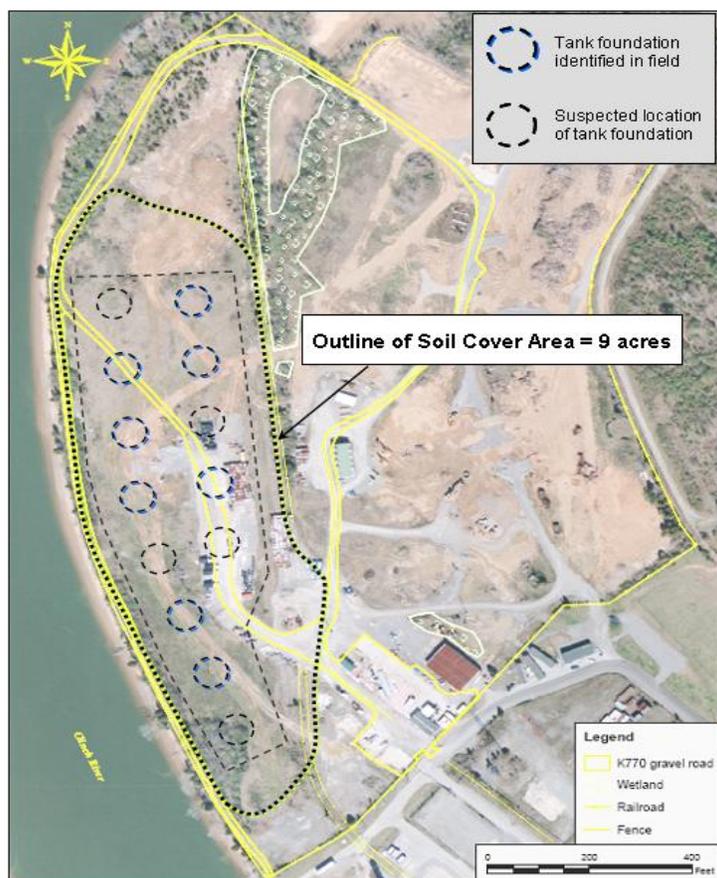


Fig. 7. Soil cover location in K-770.

use of the area for anything that could disturb the usefulness of the cover or the ability to inspect the cover. Legal controls would be put in place to prevent any excavation in the area. No large construction would be allowed that would cause unstable conditions from the underlying waste. The K-770 Area and Duct Bank corridor could have any industrial or lesser use on the surface, but digging below 2 ft without appropriate controls would not be allowed to protect the user against residual soil contamination. Because these are not waste disposal areas, they are safe for surficial use.

Surface water would be monitored downgradient from the Contractor's Spoil Area and at the K-720 Fly Ash Pile.

Alternative 3—additional LUCs/cover for Contractor's Spoil Area, K-720, and Duct Bank areas, and removal of K-770 and small ecological risk areas

Excavation. Excavation of the small ecological risk areas would be the same as

described in Alternative 2. The purpose for removing the soil from the K-770 area is to remove residual asbestos in the soil. The baseline risk assessment, based on sampling efforts after completion of the action under the Zone 1 Interim ROD, shows there is no residual industrial or recreational risk in the area from analyzed chemical and radioactive constituents. However, asbestos is not accounted for quantitatively in the CERCLA risk assessment process. To allow future industrial or recreational use, exposure to the asbestos must be controlled. Although the amount of asbestos present is unknown, the volume of soil in the tank farm area where the asbestos has been found is estimated to be 22,000 cy, assuming an average depth of 3 ft across the 9 acres and only 50 percent of the soil contains asbestos. Special packaging and health and safety precautions are needed when handling the soil to prevent the asbestos from becoming airborne.

Upon completion of the excavation, the area would be backfilled using an off-site borrow source to restore the site and obtain positive

EXPLANATION OF NINE CERCLA EVALUATION CRITERIA

- 1. Overall Protection of Human Health and the Environment** addresses whether a remedial action provides overall protection of human health and the environment. This criterion must be met for a remedial alternative to be eligible for selection.
- 2. Compliance with Applicable or Relevant and Appropriate Requirements** addresses whether a remedial action meets all of the applicable or relevant and appropriate Federal and state environmental requirements, or provides grounds for invoking a waiver of the requirements. This criterion must be met for a remedial alternative to be eligible for selection.
- 3. Long-term Effectiveness and Permanence** considers the ability of an alternative to protect human health and the environment over time.
- 4. Reduction of Toxicity, Mobility, or Volume Through Treatment** evaluates an alternative's use of treatment to reduce harmful effects of contaminants, their ability to move in the environment, and the amount of contamination present.
- 5. Short-term Effectiveness** refers to potential adverse effects on workers, human health, and the environment during the construction and implementation phases of a remedial action.
- 6. Implementability** refers to the technical and administrative feasibility of a remedial action alternative, including the availability of materials and services needed to implement the alternative.
- 7. Cost** refers to an evaluation of the capital, operation and maintenance, and monitoring costs for each alternative, including present-worth costs.
- 8. State Acceptance** indicates whether the state concurs with the preferred alternative.

The following is applied after comments are received on the Proposed Plan.
- 9. Community Acceptance** assesses the general public response to the proposed plan following a review of public comments received during the public comment period. The remedial action is selected only after consideration of this criterion.

drainage. It is assumed that as much backfill is required as waste volume that is sent for disposal. A final layer of soil capable of supporting vegetation also would be placed and seeded.

Waste Disposition. Approximately 22,000 cy of soil containing asbestos would be packaged into supersacks and transported by dump trucks for disposal at EMWMF or EMDF (if built) using the Haul Road.

Cover Maintenance. With K-770 soils removed, the only covers requiring maintenance would be those at the Contractor's Spoil Area and K-720 Fly Ash Pile. Vegetation at the Duct Bank corridor would still need to be controlled. The maintenance requirements for these areas would be the same as for Alternative 2.

LUCs and Monitoring. The LUCs and monitoring would be the same as those for Alternative 2, except the controls to prevent excavation would not be needed at the K-770 Area. Instead, this area would be identified as safe for unrestricted industrial use, but no residential or unrestricted use allowed. The monitoring needs would be the same as for Alternative 2.

Alternative 4—additional LUCs/cover for Contractor's Spoil Area and Duct Bank areas, and removal of K-770, K-720, and small ecological risk areas

Excavation. Removal of the small ecological risk areas and K-770 would be as described for Alternative 3. Removal of the K-720 Fly Ash Pile would be easier than removal of the K-770 asbestos, however, the anticipated volumes are greater. The *Interim Remedial Measures Study for the K-720 Ash Pile at the Oak Ridge K-25 Site, Oak Ridge Tennessee* (DOE 1993) provides an estimate of 130,000 cy of ash in the area. For the 9-acre site, this volume equates to an average height of 9 ft. The 130,000 cy served as the basis for this alternative component.

To remove the ash, excavators would pile the ash and associated soil cover from which trucks would be loaded. The area would be backfilled with native soil to a sufficient depth to allow the area to drain. It is estimated that half the volume

of the excavated material would be required to be replaced for appropriate drainage.

Waste Disposition. The 22,000 cy of asbestos soil would be loaded into supersacks in dump trucks and transported via the Haul Road to EMWMF or EMDF (if built). The 130,000 cy of fly ash would be loaded into lined dump trucks and also transported to EMWMF or EMDF. Because the disposal facilities need soil for co-disposal with debris from demolition activities, no cost for disposal is assumed for this material.

Cover Maintenance. The only cover that would require routine surveillance and maintenance is the cover at the Contractor's Spoil Area. As described in Alternative 2, the 7.5-acre cover at the Contractor's Spoil Area would need periodic soil and vegetation replacement. The cover would be periodically walked to look for evidence of erosion. The Duct Bank corridor vegetation would continue to be controlled.

LUCs and Monitoring. This component is the same as for Alternative 3, except there would be no controls required at the fly ash pile area other than preventing unrestricted use, and no monitoring of the storm drain or slough would be required. Otherwise, the LUCs and monitoring requirements for Alternative 4 are the same as for Alternative 3.

EVALUATION OF ALTERNATIVES

All remediation alternatives must be evaluated against the nine CERCLA evaluation criteria. The first two criteria (overall protection of human health and the environment and compliance with ARARs) must be met by any alternative considered for selection in the ROD. The next five criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost) are the primary balancing criteria that form the basis for the detailed analysis. The last two criteria, state and community acceptance, are considered modifying criteria as the remedy may be modified as a result of input from the state and the community. The evaluation against the first eight criteria results in the identification of the preferred alternative for residual soil contamination in Zone 1 at ETPP. Community acceptance will be evaluated after review and consideration of comments received on this proposed plan.

DOE also evaluated the alternatives against NEPA values in consideration of the DOE *Secretarial Policy Statement on the National Environmental Policy Act of 1969* (DOE 1994a). Additionally, current EPA policy (EPA 542-R-12-002) to incorporate sustainability principles into the remedial decision making process by considering all environmental effects of remedy implementation is consistent with and incorporated into the CERCLA and NEPA evaluation criteria.

The comparative analyses of soil alternatives for this residual contamination Zone 1 decision are summarized in Table 5 and detailed on the following pages.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The no action alternative is not considered protective of human health or the environment. There is residual contamination in Zone 1 that could pose an unacceptable risk to future residential users or industrial users in the K-770 Area. An additional threat is from erosion of existing covers at the Contractor's Spoil Area and K-720 Fly Ash Pile. The erosion of these covers would allow access to waste or materials that may cause an unacceptable risk to humans using the sites and to terrestrial species at the Contractor's Spoil Area. Also, the low pH water that is generated by flowing over uncovered fly ash could be a future threat to the water quality of the K-720 Slough.

Alternatives 2 through 4 are protective of human health and the environment through the use of covers and excavation with LUCs. More permanence is achieved through the increasing excavation efforts of Alternatives 3 and 4, but properly maintained covers and LUCs are as protective. The excavation efforts do require some short-term construction and transportation efforts that have some risks, but the volumes are reasonably low and the history on ORR suggests these are low-risk activities.

COMPLIANCE WITH ARARS

All soil action alternatives meet the required chemical-, location-, and action-specific ARARs.

Table 5. Comparative analysis of soil alternatives

Criteria	Alternative 1: no action	Alternative 2: cover and inst. controls	Alternative 3: remove K-770	Alternative 4: remove K-770 and K-720
Overall protection of human health and the environment	Not protective of human health or the environment	Use of minor excavation, covers, and LUCs to provide protection to both human health and the environment	Similar to Alternative 2, but uses excavation for more permanent solution at K-770; no significant short-term impacts	Similar to Alternative 2, but uses excavation for more permanent solution at K-770 and K-720; no significant short-term impacts
Compliance with ARARs	No action-specific ARARs for no action	Meets all ARARs	Meets all ARARs	Meets all ARARs
Long-term effectiveness and permanence	Not effective	Effective remedy; relies on minor excavation, covers, and LUCs	Improves permanence with removal of the K-770 Area asbestos	Improves permanence with removal of K-770 area asbestos and the K-720 Fly Ash Pile
Reduction of toxicity, mobility, or volume through treatment	No treatment, so no reduction	No treatment, so no reduction	No treatment, so no reduction	No treatment, so no reduction
Short-term effectiveness	No short-term impacts	Only effort is bringing 29,000 cy of backfill and minor excavation; no significant impacts	Would remove 22,000 cy of waste and replace with 22,000 cy of backfill; no significant impacts	Would remove 152,000 cy of waste and replace with 87,000 cy of backfill; no significant impacts
Implementability	Easy to implement	Easy to implement	Greatest challenge is removing asbestos in soil at unknown locations; uses standard construction processes	Unknown locations of asbestos, plus removing 130,000 cy of fly ash, makes this alternative the most difficult; still uses standard processes
Cost (escalated)	None	Capital = \$2.5 million Annual O&M = \$197,000 Present value = \$5.6 million	Capital = \$12 million Annual O&M = \$159,000 Present value = \$14.2 million	Capital = \$29 million Annual O&M = \$112,000 Present value = \$28.6 million
NEPA	Greatest negative socioeconomic impact; uncontrolled residual contamination causes fear, limiting reindustrialization opportunities	Although there are limits to full reindustrialization (and positive socioeconomic benefits) from covered areas, the limitations are not expected to be significant	An increase in 10 acres for reindustrialization over Alternative 2; not a significant difference with Alternative 2	Another increase in 10 acres over Alternative 3; not a significant difference with Alternatives 2 and 3

ARAR = applicable or relevant and appropriate requirement
LUC = land use control

NEPA = National Environmental Policy Act of 1969
O&M = operation and maintenance

No waivers are requested. Appendix A contains a summary of the ARARs for all media contained in this decision.

LONG-TERM EFFECTIVENESS AND PERMANENCE

All of the alternatives (except no action) have effective actions. The degree of permanence increases with each alternative. All alternatives use excavation to protect ecological species from shallow soil contamination. Alternatives 3 and 4 remove the asbestos-contaminated soil at the K-770 Area while Alternative 4 also removes the fly ash at the K-720 Fly Ash Pile. In every alternative, the waste at the Contractor's Spoil Area remains, as does the residual contamination in the Duct Banks. The proper use of LUCs is important in these areas, but every alternative relies on LUCs, as necessary, to prevent unrestricted use through portions of Zone 1 with residual low levels of contamination. The significant difference in these alternatives is the permanence provided by excavating the K-770 soils and K-720 Fly Ash Pile.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

None of the alternatives reduces the toxicity, mobility, or volume of contamination through treatment.

SHORT-TERM EFFECTIVENESS

All of the action alternatives move soil or waste. All alternatives excavate a minor amount of surface contamination to protect ecological receptors. Alternative 2 brings in about 29,000 cy of soil for a cover at the K-770 Area. Alternative 3 removes 22,000 cy of asbestos-contaminated soil at the K-770 Area and replaces it with 22,000 cy of clean fill. Alternative 4 also removes and replaces the asbestos-contaminated soil and removes 130,000 cy of fly ash, replacing it with 65,000 cy of backfill. Although Alternative 4 appears to move significantly more waste and soil, truck accidents statistics predict less than one injury for each of these alternatives (assuming transport on public roads). The fact that the waste is transported on the Haul Road improves these statistics. There is more effort required of Alternative 4, but the impact differences are not significant between the alternatives.

IMPLEMENTABILITY

The greatest challenge of the alternatives is removing the asbestos-contaminated soil at the K-770 Area in Alternatives 3 and 4. The location of the asbestos is unknown. A method for guiding the excavation and an assessment of the balance between overexcavation and slower production would be needed. The cost estimate has assumed a lower production rate to minimize the amount of waste generated, but it may be more cost effective to send more material and improve production. These cost tradeoffs have to be balanced with putting workers in harm's way (near heavy equipment to guide the excavation) and putting more trucks in transit. Nevertheless, the activity of excavating asbestos soil, packaging the waste, and transporting it for disposal has been done successfully and frequently at ETPP. The difference in implementability between the alternatives is associated with excavating and transporting more waste in Alternatives 3 and 4.

COST

All of the action alternatives have LUCs and cover maintenance required for the foreseeable future. The difference between excavating and covering the K-770 Area is about \$7.2 million in capital costs. Excavating the K-720 Fly Ash Pile adds another \$13.5 million to the capital costs and saves \$47,000 in annual operation and maintenance costs. The 30-year present worth costs of Alternatives 2, 3, and 4, respectively, are \$5.6 million, \$14.2 million, and \$28.6 million.

NEPA

There is little difference between the irreversible and irretrievable commitment of resources between alternatives. The soil/fly ash excavation efforts of all three action alternatives really do not commit additional space in the disposal facility since the waste takes the place of clean backfill soil. The soil cover associated with Alternative 2 does commit 29,000 cy of soil permanently to the K-770 Area. The small difference between alternatives with respect to NEPA values is in the added land available for reindustrialization and positive socioeconomic growth resulting from excavating the K-770 Area in Alternatives 3 and 4 and in excavating the K-720 Fly Ash Pile in Alternative 4. Each alternative gains another 10 acres over the other, however, 10 acres is not much of the 2200-acre ETPP site.

PREFERRED ALTERNATIVE AND RATIONALE

Alternative 2—additional LUCs/cover for K-770, Contractor’s Spoil Area, K-720, and Duct Bank areas, and removal of small ecological areas

Table 6 summarizes the risk from the various areas identified in the RI/FS along with the proposed action from Alternative 2, the preferred alternative. The locations of the areas needing action under this decision are shown in Fig. 8.

In addition, all shallow soil data, including field or unvalidated data not used in the risk assessment, were compared to the ecological remediation levels. The comparison found that in addition to the three areas requiring actions to be protective of ecological species (K-901-A

Drainage Area, Duct Island East, and Duct Island West), there were several other areas with sampling results above the maximum ecological remediation levels. In some cases, the data is unvalidated or field data (K-1085 Area) and, in some cases, the exceedance is very isolated (Duct Island South). In both cases, additional sampling is being proposed before any action is considered. Figs. 9 and 10 present the data for the areas that would be remediated (the figures shows several sample locations near one another with sampling results above ecological remediation levels), while Figs. 11 through 15 present the data for the areas that are proposed to be sampled. If, after sampling, the average ecological remediation level in the soil habitat area or the maximum ecological remediation level continues to be exceeded, additional excavation would occur.

Table 6. Proposed action at sites with residual contamination and risk

Site	Contamination description	Site risk summary	Proposed action
Contractor's Spoil Area	PAHs, metals, VOCs disposed in area; currently capped	Potential risk to industrial users or ecological species from PAHs if cap fails; no unacceptable risk to recreational users if cap fails. No unacceptable risk to groundwater	Maintain cap; LUCs forbidding industrial use or any use that would reduce the integrity of the cap
K-770 Area	Residual contamination is asbestos; all other contaminants removed to meet Zone 1 Interim ROD goals	Potential risk to industrial and recreational users from asbestos; no unacceptable risk to industrial or recreational users from other contaminants; no unacceptable risk to groundwater	Place 2 ft cover over the area; LUCs controlling excavation below 2 ft
K-720 Fly Ash Pile	Metals in fly ash remain	Potential risk to adjacent surface water if existing cap fails; no unacceptable impacts to groundwater; no unacceptable risk to industrial or recreational users	Maintain cap; LUCs forbidding any use that would reduce the integrity of the cap
Duct Bank Corridor	Residual sludges in duct banks were grouted in place; sludges contain metals	Potential risk to unrestricted industrial worker from contamination in the ducts; no unacceptable risk to recreational users or ecological species; no unacceptable risk to groundwater	LUCs controlling excavation below 2 ft and forbidding residential or unrestricted use
Duct Island East, West capped areas	Metals and PCBs found in surface soil; areas covered as part of voluntary actions	Potential ecological risk to terrestrial wildlife if existing covers fail; no unacceptable risk to industrial users or groundwater	Excavation; LUCs forbidding residential or unrestricted use unless area proven to be protective of unrestricted use

Table 6. Proposed action at sites with residual contamination and risk (cont.)

Site	Contamination description	Site risk summary	Proposed action
General K-901 Area Soil (K-901-A Drainage Area)	Chromium in drainage way	Potential ecological risk to terrestrial wildlife at K-901 drainage area; no unacceptable risk to industrial or recreational users or groundwater	Excavation; LUCs forbidding residential or unrestricted use unless area proven to be protective of unrestricted use

LUC = land use control

PAH = polyaromatic hydrocarbon

PCB = polychlorinated biphenyl

ROD = record of decision

VOC = volatile organic compound

Alternative 2 provides the best trade off of cost and effort and level of protection and permanence. Alternative 2 effectively controls access to several areas of Zone 1. These areas are sufficiently small in size to have little effect on socioeconomic growth of the area if they remain unavailable. All alternatives have some reliance on long-term LUCs because of residual waste remaining at the Contractor's Spoil Area and K-720 Fly Ash Pile, asbestos in the K-770 area, grouted sludges in the Duct Bank corridor, and residual soil contamination above concentrations acceptable for unrestricted use. The excavation and disposal of large volumes of waste can be very expensive, even with no tipping fee assumed at the disposal location. There is not a significant enough gain in long-term effectiveness to make Alternatives 3 or 4 cost effective.

Excavation of small areas of potential risk to terrestrial wildlife at Duct Island East and West along with K-901 Drainage Area is also cost effective as the initial cost is limited because the excavation is shallow and low volumes of waste are generated. Soil is typically needed at the disposal location to co-dispose with debris so there are additional programmatic cost savings associated with not having to purchase fill at the disposal location. Excavation saves long-term maintenance of the soil covers.

Reliance on LUCs is a major component of the preferred alternative. LUCs are needed to protect public health and would be implemented in accordance with the LUC Assurance Plan requirements for planning the implementation of each selected LUC and annual monitoring.

The same LUCs would be required for all residual soil contamination, however, the duration that LUCs are required would vary by affected area. The Zone 1 Interim ROD established property record restrictions, property record notices, zoning notices, excavation/penetration permit programs, and signs. Surveillance patrols and access controls identified in the Zone 1

Interim ROD are no longer needed. Table 7 presents the proposed LUCs for this preferred remedy.

The alternative cost estimates developed in the RI/FS and presented in the evaluation of alternatives did not include the removal of ecological areas and additional characterization proposed in this alternative as these activities were added to the selected remedy. As the additional costs would have been the same for all alternatives, they do not impact the comparison of alternative costs. Therefore, they were only applied to the preferred alternative. The revised escalated capital cost of the preferred alternative is \$3.9 million, the annual O&M cost is \$207,000 and the present value cost is \$6.7 million.

NATURAL RESOURCE DAMAGES

Hazardous substances known to be above health-based levels based on a residential use would remain in the soil in Zone 1 upon completion of remedial action. It is recognized by DOE, TDEC, and EPA that natural resource damage claims, in accordance with CERCLA, may be applicable. Neither DOE nor TDEC waives any rights or defenses they may have under CERCLA Sect. 107(1)4(c).

COMMITMENT TO LONG-TERM STEWARDSHIP

This proposed remedy will result in leaving hazardous material in Zone 1 soils that may remain hazardous for a long time. DOE is committed to long-term stewardship to protect future users of the site. Consistent with its commitment, DOE has agreed, in a 1999 Memorandum of Understanding with EPA and TDEC, to implement certain facility-wide periodic site inspection, certification, and notification procedures set forth in the ORR Land Use Control Assurance Plan (DOE 1999).

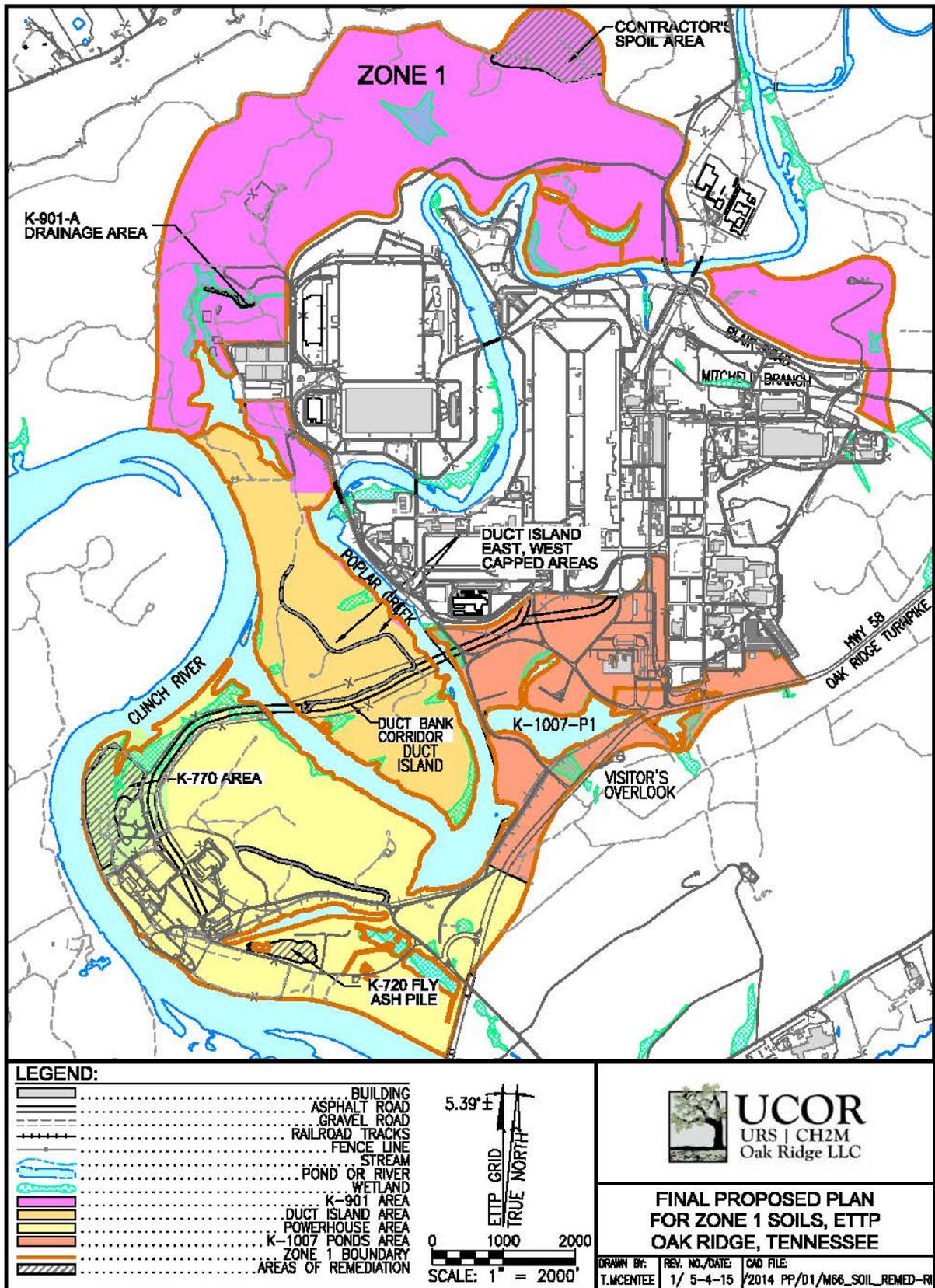


Fig. 8. Areas of soil remediation.

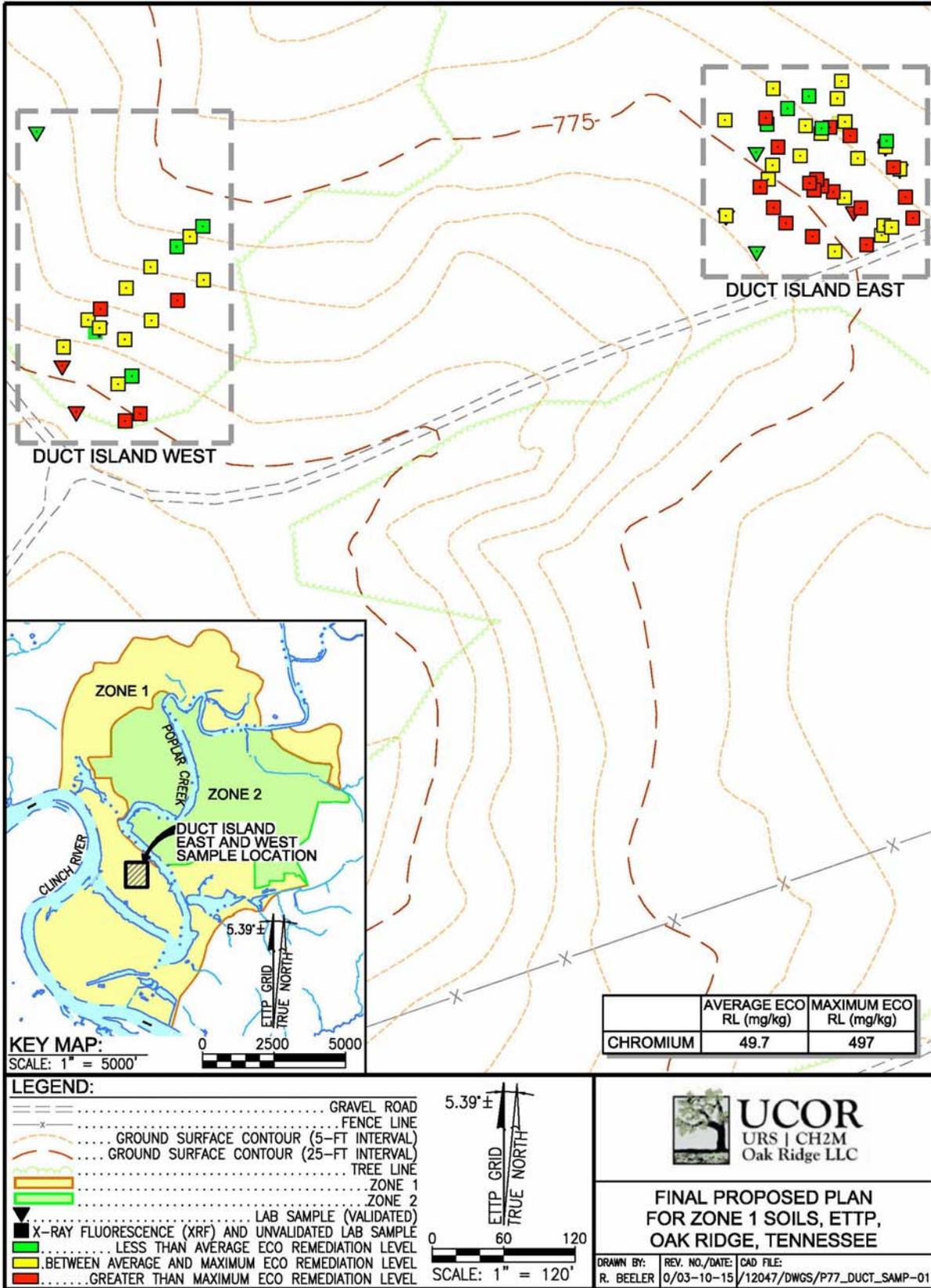


Fig. 9. Duct Island East and West excavation areas.

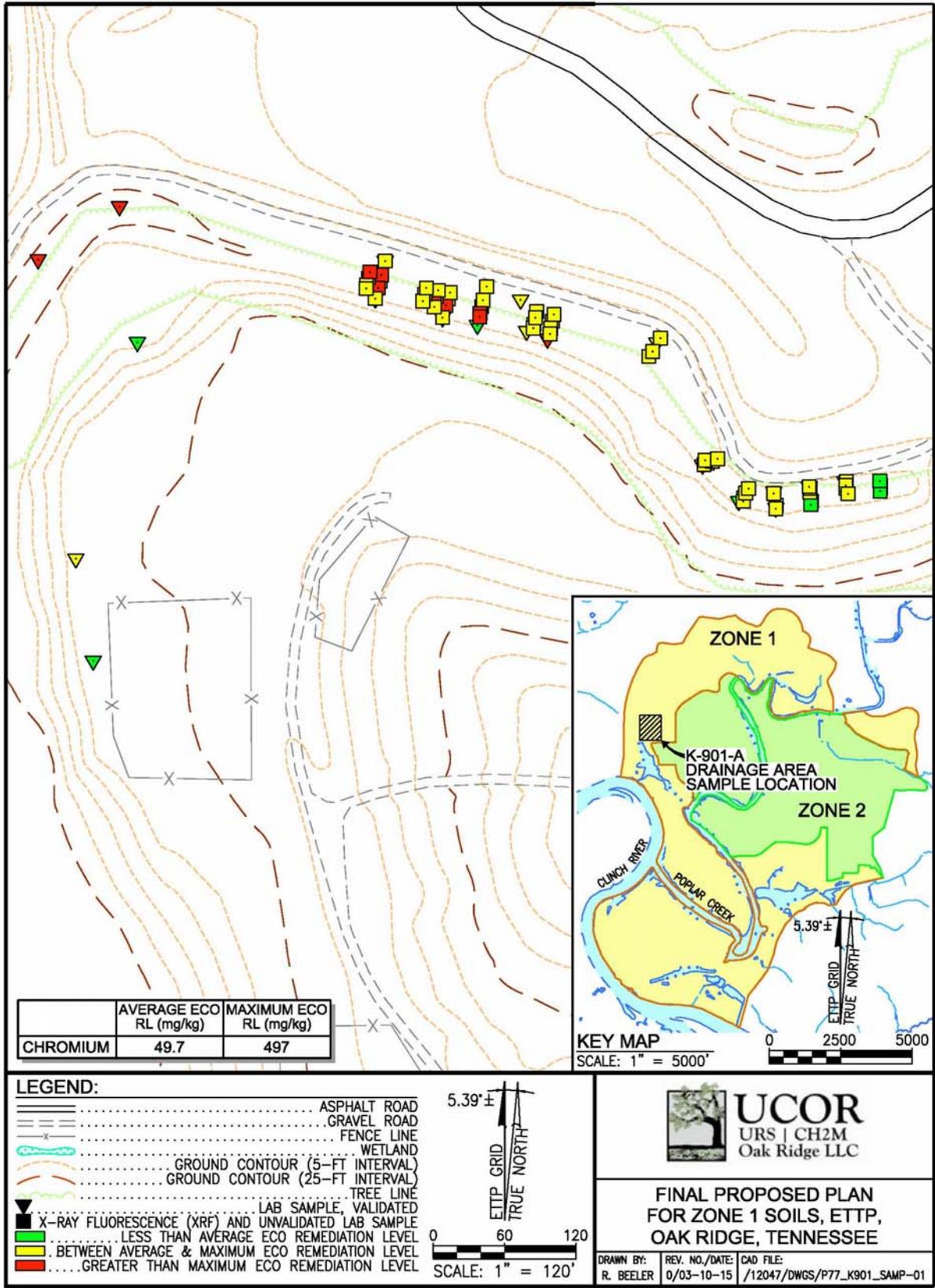


Fig. 10. K-901-A drainage excavation area.

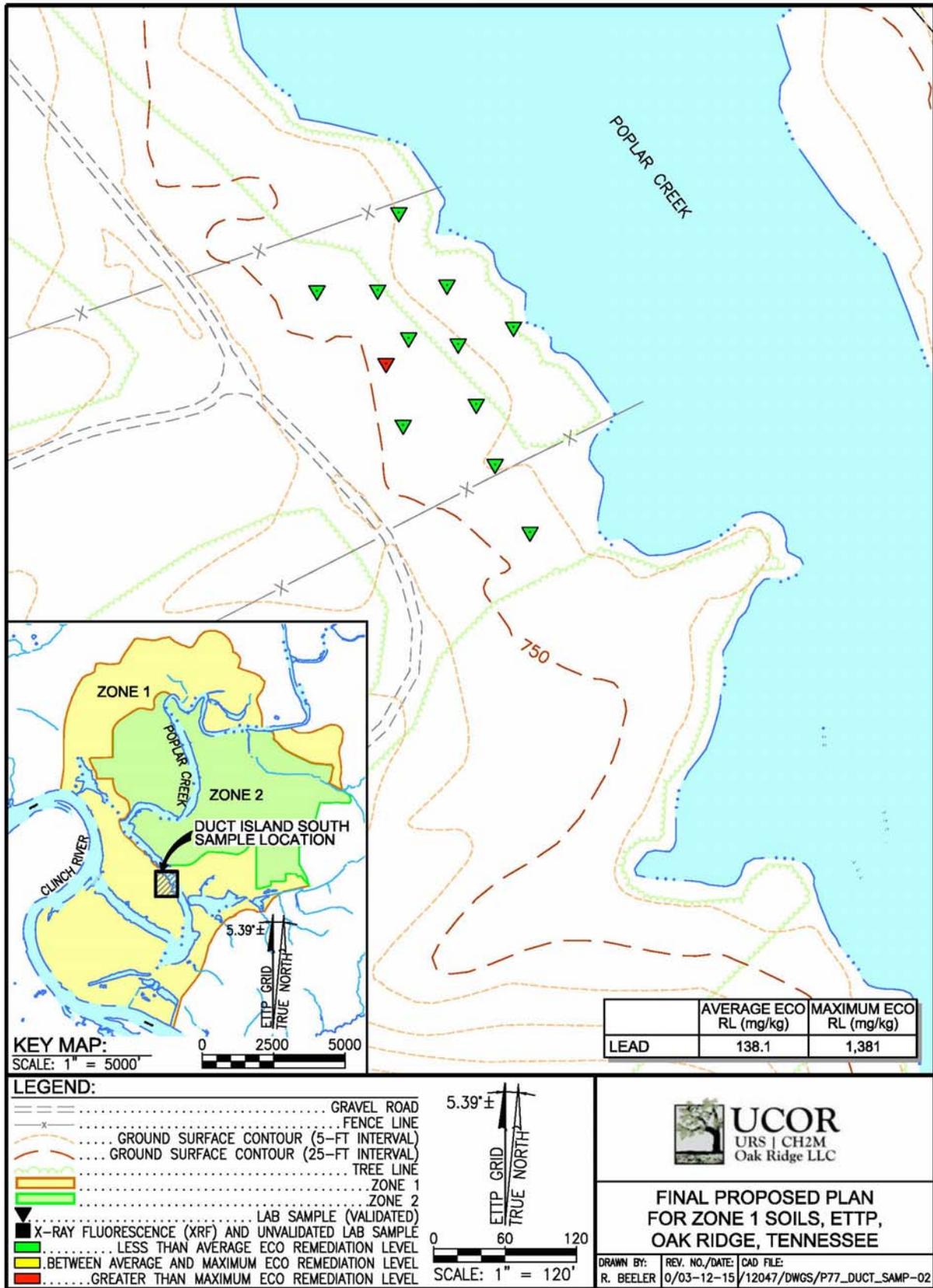


Fig. 11. Duct Island South proposed sampling area.

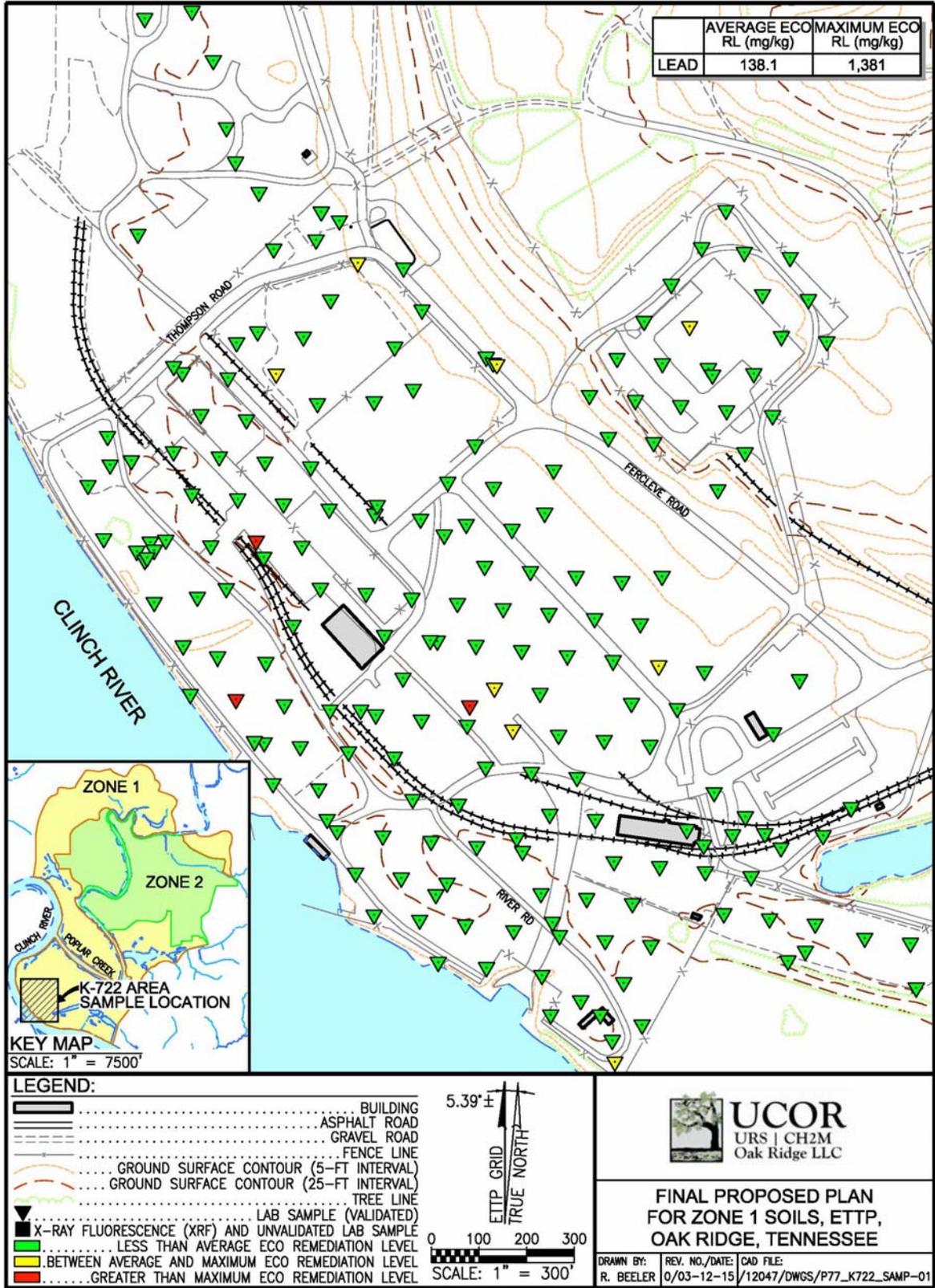


Fig. 12. K-722 proposed sampling area.

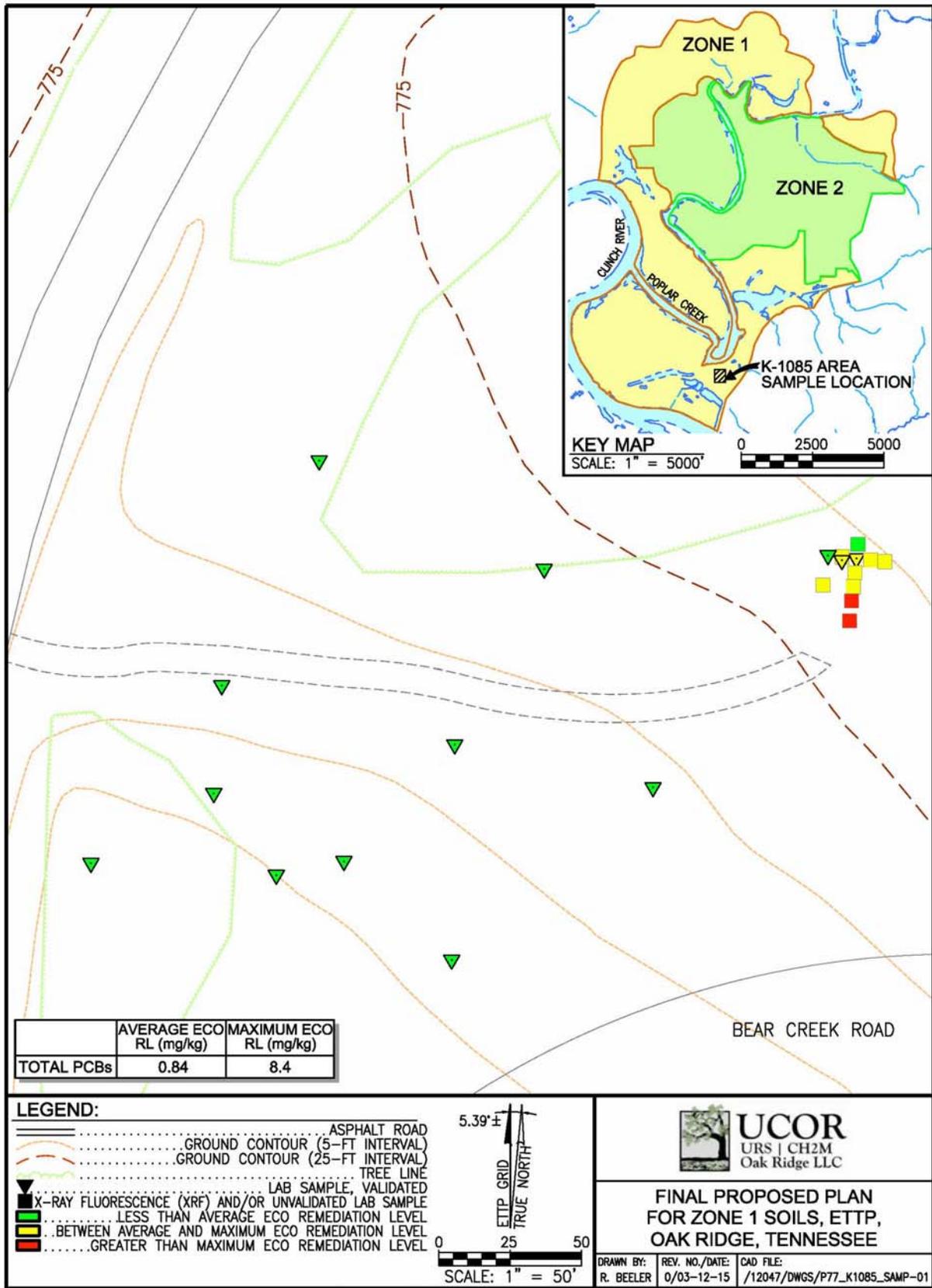


Fig. 13. K-1085 proposed sampling area.

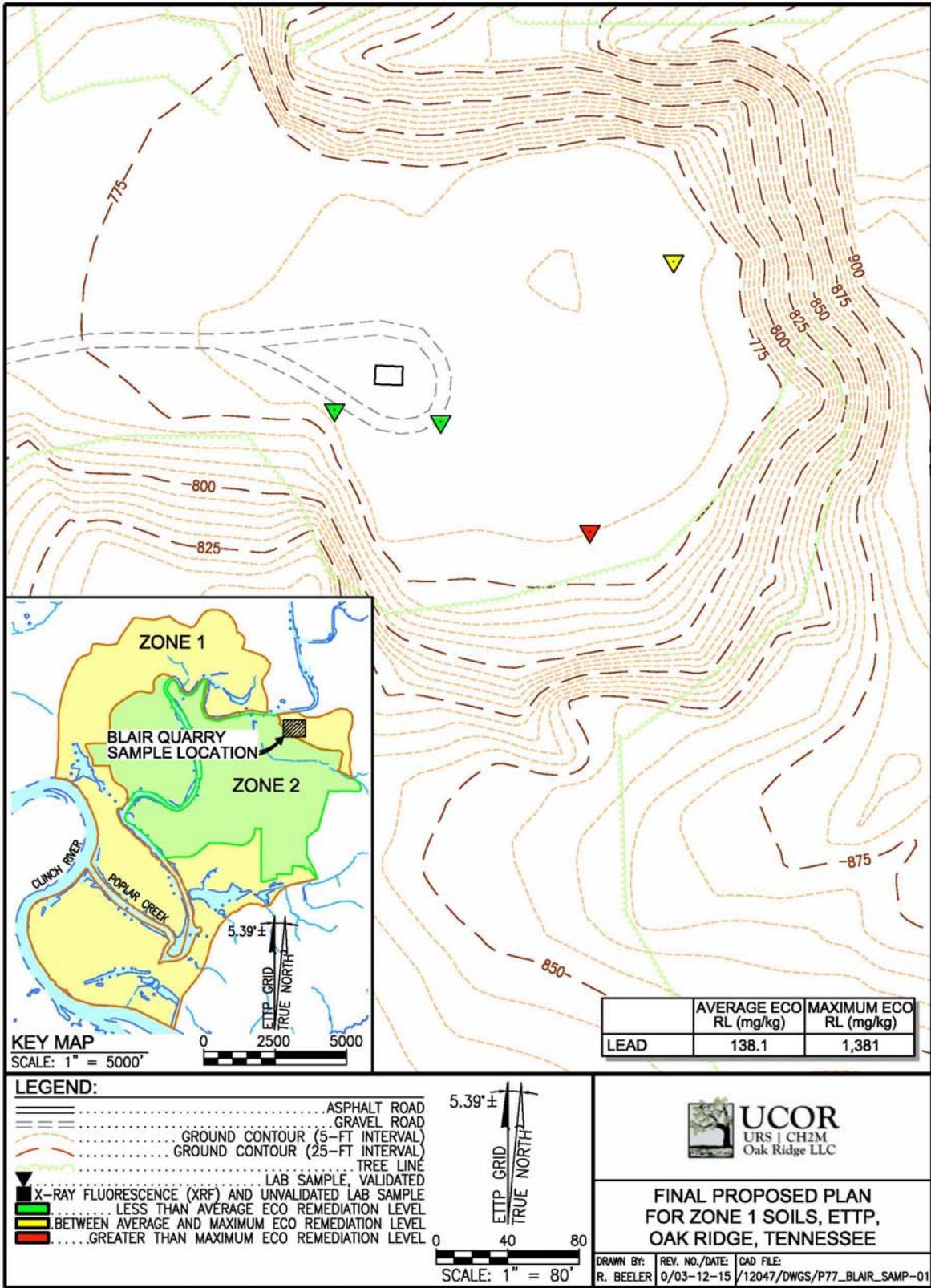


Fig. 14. Blair Quarry proposed sampling area.

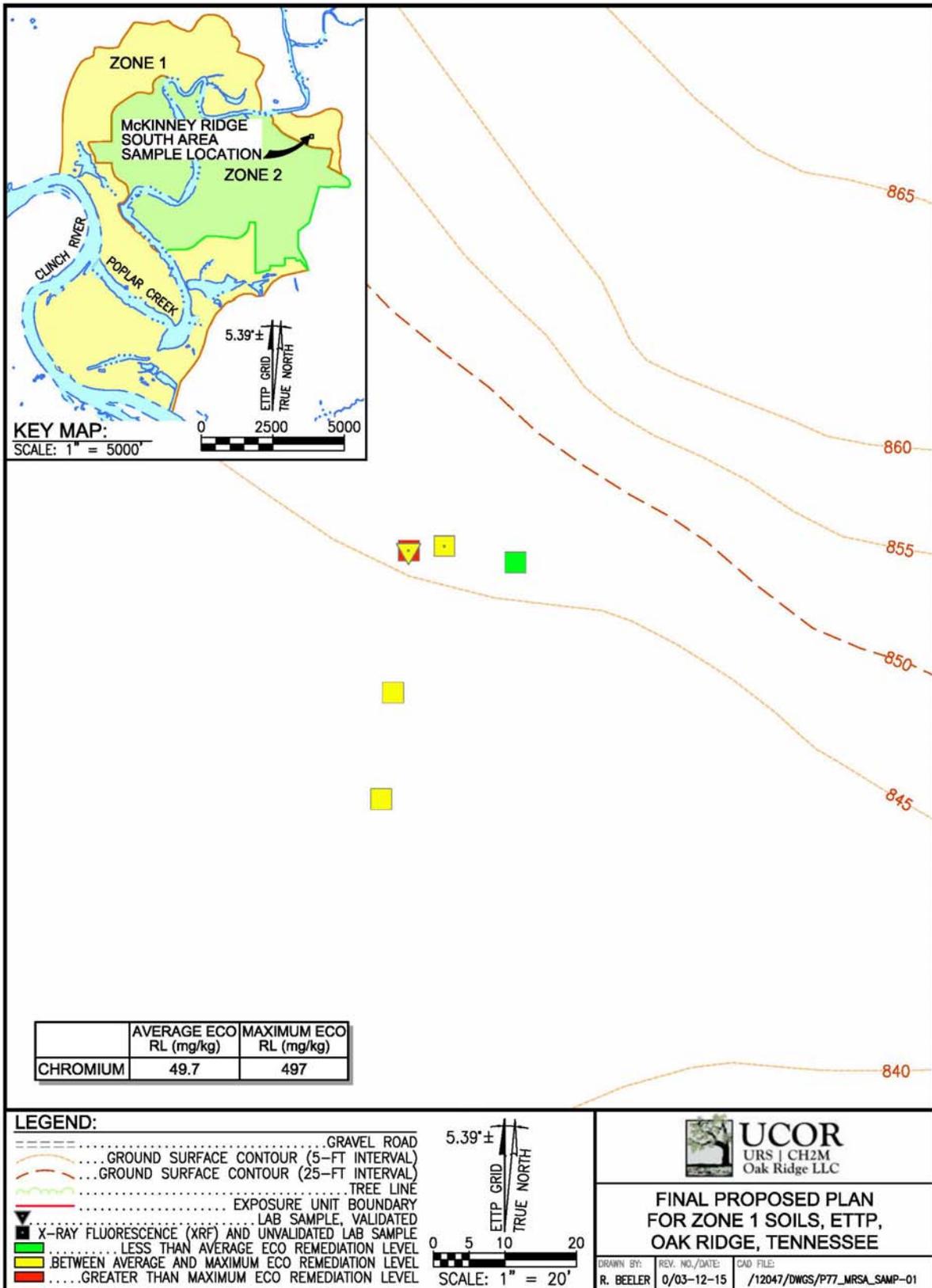


Fig. 15. McKinney Ridge South proposed sampling area.

Table 7. LUCs for ETP Zone 1 final soil decision, Oak Ridge, Tennessee

Type of control	Purposes of control	Duration	Implementation	Affected areas ^a
1. Property Record Restrictions ^b A. Land Use B. Groundwater	Restrict use of certain property by imposing limitations; protect covers Prohibits use of groundwater	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure; groundwater use prohibitions are in place until the final groundwater decision is made	Drafted and implemented by DOE upon transfer of affected areas; recorded by DOE in accordance with state law at Roane County Register of Deeds office	<ul style="list-style-type: none"> • Use compatible with inspecting and maintaining soil cover at CSA and K-720 • Controlled industrial or recreational use at K-770, Duct Bank corridor (controls needed to excavate beneath 2 ft) • Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use • Prohibits groundwater use throughout all of Zone 1
2. Property Record and Other Notices ^c	Provide information to the public about the existence and location of contaminated areas and media and limitations on their use	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Notice of Land Use Restrictions recorded in Roane County Register of Deeds office upon transfer of affected areas	<ul style="list-style-type: none"> • Use compatible with inspecting and maintaining soil cover at CSA and K-720 • Controlled industrial or recreational use at K-770, Duct Bank corridor (controls needed to excavate beneath 2 ft) • Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use
3. Zoning Notices ^d	Provide notice to city and county about the existence and location of waste disposal and residual contamination areas and limitations on their use for zoning/planning purposes	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Zoning notice and survey plat filed with City and County Planning Commissions upon transfer of affected area	<ul style="list-style-type: none"> • Use compatible with inspecting and maintaining soil cover at CSA and K-720 • Controlled industrial or recreational use at K-770, Duct Bank corridor (controls needed to excavate beneath 2 ft) • Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use
4. Excavation/ Penetration Permit Program ^e	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Implemented by DOE and its contractors; initiated by permit request	<ul style="list-style-type: none"> • K-720, CSA, K-770, Duct Bank, (notice of potential contamination below 2 ft) • Elsewhere in Zone 1 where residual contamination remains below 10 ft (notice of potential contamination)

Table 7. LUCs for ETPP Zone 1 final soil decision, Oak Ridge, Tennessee (cont.)

Type of control	Purposes of control	Duration	Implementation	Affected areas^a
5. Signs	Provide notice or warning to prevent unauthorized access	As long as waste remains buried	Signage maintained by DOE	<ul style="list-style-type: none"> At K-720 and CSA where residual waste is covered

^aAffected Areas – Specific locations identified as part of a remedial design report/remedial action work plan.

^bProperty Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recorded along with original property acquisition records of DOE and its predecessor agencies.

^cProperty Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of DOE and its predecessor agencies that alert anyone searching property records to important information about residual contamination/waste disposal areas on the property.

^dZoning Notices – Includes information on the location of waste disposal areas and residual contamination depicted on a survey plat, which is provided to a zoning authority (i.e., City Planning Commission) for consideration in appropriate zoning decisions for non-DOE property.

^eExcavation/Penetration Permit Program – Refers to the internal DOE/DOE contractor administrative program(s) that require the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity for the purpose of ensuring that the proposed activity will not affect underground utilities/structures or will not disturb the affected area without the appropriate precautions and safeguards.

CSA = Contractor's Spoil Area
 DOE = U.S. Department of Energy
 EM = Environmental Management

ETTP = East Tennessee Technology Park
 LUC = land use control

DOE is responsible for maintaining, reporting on, and enforcing the remedy, including the inspection/maintenance of engineered controls such as covers and LUCs. Although DOE may transfer or lease areas of Zone 1, DOE will retain ultimate responsibility for the integrity and protectiveness of the remedy. Monitoring of LUCs is conducted annually and reported in the annual ORR Remediation Effectiveness Reports, which are used in preparation of the ORR Five Year Review to evaluate the effectiveness of the entire remedy.

COMMUNITY PARTICIPATION

DOE, EPA, and TDEC encourage the public to review this document and other relevant documents in the Administrative Record to gain an understanding of the proposed residual contamination cleanup action. A copy of this proposed plan, as well as the entire Administrative Record, is located at the DOE Information Center, at the Office of Scientific and Technical Information, 1 Science.gov Way, Oak Ridge, Tennessee 37830. The Center is open Monday through Friday, 8 a.m. to 5 p.m.; the telephone number is (865) 241-4780 and the website address is <http://www.energy.gov/orem/services/community-engagement/doe-information-center>.

Community involvement is critical to the CERCLA process. DOE has scheduled a public meeting to discuss cleanup alternatives and address questions and concerns the public may have about all alternatives. DOE has established a 45-day public comment period, which allows the public time to review the document and submit comments on the preferred and other alternatives. DOE will document, evaluate, and respond to comments as part of the subsequent ROD. Comments may be addressed to the FFA Project Manager, Oak Ridge Environmental Management, DOE Oak Ridge Operations, P.O. Box 2001, Oak Ridge, Tennessee 37831.

The preferred alternative identified in this proposed plan represents the recommended remedial action for soil in Zone 1 at ETP. This plan provides stakeholders the information necessary to determine if action is warranted and provide comments on the potential alternatives. DOE will select the remedial action after all comments are considered. DOE, EPA, and TDEC will consider all comments and suggestions before the remedial alternative is selected and documented.

REFERENCES

- DOE 1993. *Interim Remedial Measures Study for the K-720 Ash Pile at the Oak Ridge K-25 Site, Oak Ridge TN*, DOE/OR/02-1126&D2, U.S. Department of Energy, Oak Ridge, TN.
- DOE 1994a. *Secretarial Policy Statement on the National Environmental Policy Act of 1969*, U.S. Department of Energy, Washington, D.C.
- DOE 1994b. *Categorical Exclusion for the K-770 Powerhouse Complex Demolition, CX-K25-357*, March 31.
- DOE 1994c. *Categorical Exclusion for the K-25 Site Cooling Tower Superstructure Demolition, CX-K25-019*, April 21.
- DOE 1994d. *Categorical Exclusion for the K-705-A and B, and K-706 Demolition, CX-K25-358*, August 12.
- DOE 1997a. *Action Memorandum for the K-901-A Holding Pond and the K-1007-P1 Pond Removal Action, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/02-1550&D2, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE 1997b. *Action Memorandum for the Group I Auxiliary Facilities, K-25 Site, Oak Ridge, Tennessee*, DOE/OR/02-1507&D2, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE 1999. *Memorandum of Understanding for Implementation of a Land Use Control and Assurance Plan (LUCAP) for the United States Department of Energy Oak Ridge Reservation, Attachment: Land Use Control Assurance Plan for the Oak Ridge Reservation*, U.S. Department of Energy, U.S. Environmental Protection Agency, and Tennessee Department of Environment and Conservation, November.
- DOE 2000a. *Record of Decision for the K-1070-A Burial Ground, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-1734&D3, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
- DOE 2001. *Action Memorandum for the K-1085 Old Firehouse Burn Area Drum Burial Site, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-1938&D1, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.

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DOE 2005. *Record of Decision for Soil, Buried Waste, and Subsurface Structure Actions in Zone 2, East Tennessee Technology Par,*

Oak Ridge, Tennessee, DOE/OR/01-2161&D2, Office of Environmental Management, U.S. Department of Energy, Oak Ridge, TN.

DOE 2007. *Final Sitewide Remedial Investigation and Feasibility Study for East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2279&D3, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.

DOE 2014. *Final Zone 1 Remedial Investigation and Feasibility Study for East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2279&D3, U.S. Department of Energy, Oak Ridge, TN.

GLOSSARY

Applicable or relevant and appropriate requirement (ARAR) – Those cleanup standards and other substantive requirements, criteria, or limitations promulgated under federal or more stringent state environmental or facility siting laws that are either legally “applicable” or “relevant and appropriate” to the hazardous substances, pollutant, contaminant, remedial action, location, or other circumstance found at the CERCLA site.

Baseline risk assessment – An assessment that evaluates the potential threat to human health and the environment in the absence of any remedial action. Provides basis for determining if remedial action is necessary and justification for performing remedial actions.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – The federal law that establishes, among other requirements, a program for parties (including federal agencies) to identify, investigate, and, if determined necessary, remediate inactive site-facilities contaminated with a hazardous substance, pollutant, or contaminant. It is also known as the “Superfund law.”

Ecological receptor – Animals or plants potentially exposed to contaminants in the environment.

Feasibility Study (FS) – The step in the CERCLA process in which alternatives for remediation of a contaminated site are developed and evaluated.

National Environmental Policy Act of 1969 (NEPA) – A federal law that requires federal agencies to consider and evaluate environmental impacts associated with any significant proposed actions or activities. For CERCLA actions undertaken by DOE, any impacts (i.e., NEPA values) associated with the proposed action are considered along with other factors required to be evaluated.

Proposed Plan – The formal document in which the lead agency identifies its preferred alternative for remedial action, explains why this alternative was preferred, and solicits comments from the public.

Record of Decision (ROD) – The formal document in which the lead agency sets forth the selected remedial action and the reasons for its selection.

ACRONYMS

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DOE	U.S. Department of Energy
EMDF	Environmental Management Disposal Facility
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
EU	exposure unit
FFA	Federal Facility Agreement
LUC	land use control
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act of 1969
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORR	Oak Ridge Reservation
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act of 1976
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TDEC	Tennessee Department of Environment and Conservation

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here

**Mr. John Michael Japp, FFA Project Manager
Oak Ridge Environmental Management
DOE Oak Ridge Operations
P.O. Box 2001
Oak Ridge, TN 37831**

**APPENDIX A. EAST TENNESSEE TECHNOLOGY PARK,
FINAL ZONE 1 SOILS PROPOSED PLAN ARARS TABLE**

Table A.1. Applicable or relevant and appropriate requirements and to-be-considered guidance for the preferred alternative, ETPP Zone 1 soils final remedial action, Oak Ridge, Tennessee

Requirements	Citations
Chemical-specific	
Must achieve site-specific risk-based cleanup levels for PCBs	40 <i>CFR</i> 761.61(c) – applicable
Location-specific	
Must protect or avoid adverse impacts in wetlands	10 <i>CFR</i> 1022.3(a-d); 1022.12(a)(3); 1022.13(a)(3); 1022.14(a); 40 <i>CFR</i> 230.10; TDEC 0400-40-07.04(7)(b) – applicable ; TDEC ARAP <i>General Permit for Minor Alterations to Wetlands</i> – TBC guidance
Must protect or avoid adverse impacts and avoid construction in floodplains	10 <i>CFR</i> 1022.3(a-d); 10 <i>CFR</i> 1022.13(a)(3); 1022.14(a) – applicable
Must protect aquatic resources	TCA 69-3-108(l); 16 USC 662(a); 40 <i>CFR</i> 230.10(a-d); 40 <i>CFR</i> 230 Subpart H; TDEC 0400-40-07-.01; TDEC ARAP <i>Program General Requirements</i> – applicable
Must avoid modification of critical habitat and protect endangered or threatened species	TCA 70-8-309; TCA 70-8-104(c); TCA 70-8-106(e); 16 USC 1531 <i>et seq.</i> , Sect. 7(a)(2); 16 USC 703-704 – applicable EO 13186; TWRCP 00-14, Sect. II and 00-15, Sect. II, as amended by Proclamation 00-21; – TBC guidance
Must protect archaeological and cultural resources, if discovered	43 <i>CFR</i> 7.4(a) and 7.5(b)(1); 43 <i>CFR</i> 10.4(b) through (d) and (f); 36 <i>CFR</i> 800.1; 36 <i>CFR</i> 800.3; 36 <i>CFR</i> 800.5(a) and (d); 36 <i>CFR</i> 800.6 – applicable
Must not alter or destroy property in a cemetery	TCA 39-17-311 – applicable
Action-specific	
General construction standards—all land disturbing activities (e.g., site preparation, soil excavation)	
Must control fugitive dust emissions	TDEC 1200-3-8-.01(1) and (2) – applicable
Must comply with NESHAP for radionuclide emissions from DOE facilities	40 <i>CFR</i> 61.92; TDEC 1200-3-11-.08(6) – applicable
Must implement storm water controls during construction	TDEC 0400-40-07-.01; TCA 69-3-108(l) – applicable ; <i>General Permit No. TNR10-0000</i> (effective May 24, 2011) – TBC guidance
Must meet substantive requirements for aquatic resource alterations involving streambed modifications, bank stabilization, or wetlands alterations	TCA-69-3-108(l) – applicable ; TDEC ARAP <i>Program General Requirements</i> – TBC guidance
Waste generation, characterization, segregation, and storage—excavated soil, secondary wastes (e.g., PPE, dewatering fluids)	
Must meet generator requirements for characterization and management of solid, hazardous, and universal waste, and asbestos-containing materials	40 <i>CFR</i> 262.11(a-d); 40 <i>CFR</i> 264.13(a)(1); 40 <i>CFR</i> 268.7(a); 40 <i>CFR</i> 268.9(a); TDEC 0400-12-01-.03(1)(b)(1-4); TDEC 0400-12-01-.06(2)(d); TDEC 0400-12-01-.10(1)(g); TDEC 0400-12-01-.10(1)(i); 40 <i>CFR</i> 273; TDEC 0400-12-01-.12; 40 <i>CFR</i> 61.150(a) and (b); TDEC 1200-3-11-.02(2)(j)(1)(i) and (j) – applicable
Must meet requirements for temporary storage and staging of RCRA waste	40 <i>CFR</i> 268.50; 40 <i>CFR</i> 264.554(d)(1) and (f)(1)-(3); 40 <i>CFR</i> 262.34(a); TDEC 0400-12-01-.06(22)(e)(4) and (6); TDEC 0400-12-01-.10(4)(a); TDEC 0400-12-01-.03(4)(e); 40 <i>CFR</i> 262.34(c)(1); TDEC 0400-12-01-.03(4)(e)(5) – applicable

Table A.1. Applicable or relevant and appropriate requirements and to-be-considered guidance for the preferred alternative, ETP Zone 1 soils final remedial action, Oak Ridge, Tennessee (cont.)

Requirements	Citations
Must meet requirements for use and management of hazardous waste in containers	40 <i>CFR</i> 264.171-172; 40 <i>CFR</i> 164.173(a) and (b); 40 <i>CFR</i> 264.175(a-d); 40 <i>CFR</i> 264.176; 40 <i>CFR</i> 264.177(a-c); TDEC 0400-12-01-.05(9)(b-d); TDEC 00-12-01-.06(9)(f)(1-3); TDEC 0400-12-01-.06(9)(g) and (h) – applicable
Management of PCB-contaminated waste or PCB/radioactive waste must be in accordance with the storage requirements of Subpart D of TSCA	40 <i>CFR</i> 761.50(a) and (b)(7)(i) and (ii); 40 <i>CFR</i> 761.61; 40 <i>CFR</i> 761.40(a)(1); 40 <i>CFR</i> 761.65(a)(1); 40 <i>CFR</i> 761.65(b)(1)(i)–(v); 40 <i>CFR</i> 761.65(c)(1), (3), (5), (6), and (8); 40 <i>CFR</i> 761.65(c)(6)(i)(A)–(C); 40 <i>CFR</i> 761.65(c)(9) and (b)(2) – applicable
Must meet requirements for management and disposal of used oil	40 <i>CFR</i> 279.22(a-d); TDEC 0400-12-01-.11(3)(c)(1-4) – applicable
Treatment and disposal of waste—excavated soil and secondary wastes	
Must meet RCRA land disposal requirements before disposal of hazardous waste	40 <i>CFR</i> 268.3(a); TDEC 0400-12-01-.10(1)(c)(1); 40 <i>CFR</i> 268.40(a) and (e); TDEC 0400-12-01-.10(3)(a); 40 <i>CFR</i> 268.1(c)(4)(iv); TDEC 0400-12-01-.10(1)(a)(3)(iv); 40 <i>CFR</i> 268.44; TDEC 0400-12-01-.10(3)(e); 40 <i>CFR</i> 268.45(a-d); TDEC 0400-12-01-.10(3)(f)(1-4); 40 <i>CFR</i> 268.49(b) and (c); TDEC 0400-12-01-.10(3)(j)(2); 40 <i>CFR</i> 264.601; TDEC 0400-12-01-.06(27)(b); 40 <i>CFR</i> 268.1(c)(4)(i); TDEC 0400-12-01-.10(1)(a)(3)(iv)(l) – applicable
Must meet requirements for disposal of PCB remediation waste, PCB decontamination wastes, etc.	40 <i>CFR</i> 761.60(a)(3)(i) and (ii); 40 <i>CFR</i> 761.79(g); 40 <i>CFR</i> 761.79(b)(1); 40 <i>CFR</i> 761.50(b)(2); 40 <i>CFR</i> 761.61(c); 40 <i>CFR</i> 761.61(b)(1) and (b)(2); 40 <i>CFR</i> 761.62(a)(1) – (6); 40 <i>CFR</i> 761.62(b)(1) – (2); 40 <i>CFR</i> 761.62(c); 40 <i>CFR</i> 761.79(a)(4) – applicable
Must meet requirements for disposal of universal wastes, mercury-added consumer products, and asbestos-containing materials	40 <i>CFR</i> 273.33; TDEC 0400-12-01-.12(3)(d); Tennessee Mercury Product Disposal Act, as amended, TCA 68-211; 40 <i>CFR</i> 61.150(a)(4); 40 <i>CFR</i> 61.150(b)(1) and (2); TDEC 1200-3-11-.02(2)(j)(2) – applicable
Closure requirements	
Must close RCRA, TSCA, solid waste, and asbestos-containing waste storage and disposal units in accordance with applicable requirements	40 <i>CFR</i> 264.111(a-c); TDEC 0400-12-01-.06(7)(b); 40 <i>CFR</i> 264.114; TDEC 0400-12-01-.06(7)(e); 40 <i>CFR</i> 264.178; TDEC 0400-12-01-.06(9)(i); 40 <i>CFR</i> 264.554(j)(1-2) and (k); TDEC 0400-12-01-.06(22)(e)(10) and (11); 40 <i>CFR</i> 761.65(e)(1) and (3); 40 <i>CFR</i> 61.154(g); TDEC 1200-3-11-.02(5)(g) applicable 40 <i>CFR</i> 61.151(a) – (c) and (e); TDEC 1200-3-11-.02(2)(l); TDEC 0400-11-01-.04(8)(a) and (8)(c)(3) – (6) and 8(e)(1) through (3) – relevant and appropriate
Land use controls—all contaminated media left in place	
Must use land use controls for hazardous substances left in place that may pose an unreasonable threat to public or the environment	TDEC 0400-15-01-.08(10) – relevant and appropriate
Must record deed notations for asbestos-containing materials left in place	40 <i>CFR</i> 61.151(e) and 61.154(g); TDEC 1200-3-11-.02(2)(l)(5) – relevant and appropriate
Must file notice of land use restrictions, notify appropriate parties, and enforce the land use restrictions.	§TCA 68-212-225(a), (b), (e) and (f) – applicable

Table A.1. Applicable or relevant and appropriate requirements and to-be-considered guidance for the preferred alternative, ETPP Zone 1 soils final remedial action, Oak Ridge, Tennessee (cont.)

Requirements	Citations
Transport—hazardous materials	
Must comply with packaging and transport requirements for hazardous materials (including radioactive materials), hazardous waste, PCB waste, universal waste, and used oil	40 <i>CFR</i> 262.10(h); 40 <i>CFR</i> 263.10(a); TDEC 0400-12-01-.03(1)(a)(8); TDEC 0400-12-01-.04(1)(a)(l); 49 <i>CFR</i> 171.1(c); 40 <i>CFR</i> 761.207(a); 40 <i>CFR</i> 262.20(f); TDEC 0400-12-01-.03(3)(a)(6); 40 <i>CFR</i> 273.38; TDEC 0400-12-01-.12(3)(i); 40 <i>CFR</i> 279.24; TDEC 0400-12-01-.11(3)(e) – applicable
ALARA = as low as reasonably achievable ARAP = Aquatic Resources Alteration Permit <i>CFR</i> = <i>Code of Federal Regulations</i> Chap. = Chapter EDE = effective dose equivalent EO = Executive Order ETTP = East Tennessee Technology Park NESHAP = National Emission Standards for Hazardous Air Pollutants PCB = polychlorinated biphenyl	PPE = personal protective equipment RCRA = Resource Conservation and Recovery Act of 1976 TBC = to be considered <i>TCA</i> = <i>Tennessee Code Annotated</i> TDEC = Tennessee Department of Environment and Conservation TSCA = Toxic Substances Control Act of 1976 TWRCP = Tennessee Wildlife Resources Commission Proclamation <i>USC</i> = <i>United States Code</i>

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Document Number: DOE/OR/01-2648&D2	Document Title: Final Proposed Plan (PP) for Soils in the Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee		
Name of Reviewer: R. B. Petrie	Organization: Tennessee Department of Environment and Conservation	Date Comments are Due:	Date Comments Transmitted: 12-16-14

Comment Codes:	<p>C = Clarification or additional information needed; response may be in summary of comment responses and/or next version of document</p> <p>D = Deficiency of some type; cite applicable regulation(s)</p> <p>E = Editorial comments will be noted and corrected, but dropped from the summary of comment responses</p>
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Comment No.	Sect/ Page	Comment		Response	Accept/ Reject
		Code			
1	Comment #5		Please explain why the goals of the Interim ROD were not met. Was it a lack of available technology? Was there a poor cost estimate such that money was unavailable?	An explanation of why four areas – the Contractor’s Spoil Area, K-770 Area, K-720 Fly Ash Pile, and the Duct Bank Corridor – did not meet the unrestricted industrial use goal of the Zone 1 Interim ROD has been added to the Scope and Role of the Decision section on page 11. This location is deemed to be more appropriate than the locations identified in TDEC Comments #5 and #9 on the D1 Proposed Plan.	
2	Comment #9		Same as Comment 5 above.	Please see the above response to Comment #1	
3	Comment #12		The State agrees that cost must be evaluated as one of the nine CERCLA criteria. However, the modified sentence in the document is confusing and should be reworded.	The modified sentence in the second paragraph of the Summary of Proposed Soil Action Alternatives, “The major question the FS answered...” has been removed.	
4	Comment #13		Disagree. DOE’s response to Comment 12 is confusing and should be reworded.	Per the above response to Comment #3 the modified sentence has been removed. Per TDEC Comment #13 on the D1 Proposed Plan, the sentence in the third paragraph of the Summary of Proposed Soil Action Alternatives has been modified as requested to “ After defining the problems to be addressed...”	