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# Remedial Design Report/Remedial Action Work Plan for Scrap Metal at the Y-12 Old Salvage Yard at the Y-12 National Security Complex, Oak Ridge, Tennessee


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# REMEDIAL DESIGN REPORT/REMEDIAL ACTION WORK PLAN FOR SCRAP METAL AT THE Y-12 OLD SALVAGE YARD AT THE Y-12 NATIONAL SECURITY COMPLEX, OAK RIDGE, TENNESSEE

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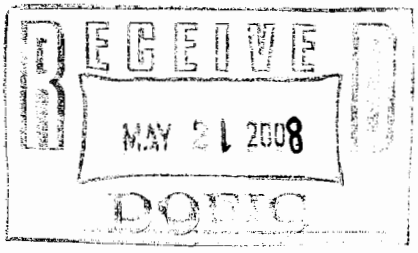

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# ACRONYMS

| | |
|---|---|
| ARAR | applicable or relevant and appropriate requirement |
| BJC | Bechtel Jacobs Company LLC |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CFR | Code of Federal Regulations |
| DOE | U.S. Department of Energy |
| DOT | U.S. Department of Transportation |
| EMWMF | Environmental Management Waste Management Facility |
| EPA | U.S. Environmental Protection Agency |
| ES&H | Environment, Safety and Health |
| HI | hazard index |
| LLW | low level waste |
| LUC | land use control |
| M&O | Management and Operations |
| NNSA | National Nuclear Security Administration |
| ORO | Oak Ridge Office |
| ORR | Oak Ridge Reservation |
| OSY | Old Salvage Yard |
| PCB | polychlorinated biphenyl |
| PIDAS | Perimeter Intrusion Detection and Assessment System |
| QA | quality assurance |
| RadCon | Radiation Control |
| RAO | remedial action objective |
| RAWP | Remedial Action Work Plan |
| RCRA | Resource Conservation and Recovery Act of 1976 |
| RDR | Remedial Design Report |
| ROD | record of decision |
| RPP | Radiation Protection Program |
| SAD | Safety Analysis Document |
| SWMU | Solid Waste Management Unit |
| TDEC | Tennessee Department of Environment and Conservation |
| TSCA | Toxic Substances Control Act of 1976 |
| UEFPC | Upper East Fork Poplar Creek |
| WAC | waste acceptance criteria |
| WHP | Waste Handling Plan |

# ABBREVIATIONS

| | |
|---|---|
| AL | aluminum |
| CU | copper |
| FE | carbon steel |
| $ft^2$ | square foot |
| g | gram |
| ppm | parts per million |
| SS | stainless steel |
| $yd^3$ | cubic yard |
| µg/g | microgram per gram |
| $^{235}U$ | uranium-235 |

# EXECUTIVE SUMMARY

This Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) describes the conceptual design for removal and disposition of scrap metal from the Y-12 Old Salvage Yard (OSY) in the Upper East Fork Poplar Creek Watershed at the Y-12 National Security Complex located on the U.S. Department of Energy's (DOE) Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. This action will be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to meet remedial action objectives (RAO) of the industrial worker established in the *Record of Decision for Phase II Interim Remedial Actions for Contaminated Soils and Scrapyard in Upper East Fork Poplar Creek, Oak Ridge, Tennessee* (BJC 2006) (ROD) in accordance with the selected remedy for the scrap metal at the Y-12 OSY. Other actions including soil cleanup and implementation of Land Use Controls will be necessary but are out of the scope of this RAWP. The overall cleanup strategy of the Y-12 OSY in the ROD is scrap metal removal, which is designed to protect industrial workers from exposure to hazardous substances through elimination or reduction of contaminated materials to below unacceptable risk-based levels for workers onsite. Proper implementation of actions described in this RDR/RAWP will address the selected remedy, RAOs, and performance goals specified in the ROD for interim remedial actions at the Y-12 OSY. The remedial actions in the ROD are considered interim actions to protect future workers based upon an anticipated DOE-controlled land use. The remedial actions implemented under the ROD will be completed, evaluated, and used as the basis for determining what, if any, additional remedial actions may be necessary to meet final goals.

The remedial action for the scrap metal at the Y-12 OSY is to remove all scrap metal regardless of contamination levels. Characterization and size reduction, as needed, will be performed to meet disposal facility waste acceptance criteria (WAC).

Scrap metal from the Y-12 OSY that meets the WAC of the on-site CERCLA Waste Facility (Environmental Management Waste Management Facility) or another ORR disposal facility will be disposed at these facilities. If the scrap does not meet the ORR WAC, it will be sent offsite for disposal. Special handling and size reduction of large pieces of equipment will be required to meet WAC disposal requirements. Anomalous waste discovered during scrap removal will be segregated, managed, characterized, and disposed of accordingly. Security measures, including coordination with the Y-12 Security Organization, will need to be enacted during removal and staging of waste because of work being performed inside the Perimeter Intrusion Detection and Assessment System, and security access controls will be maintained to prevent unauthorized access to the Y-12 OSY.

# 1. INTRODUCTION

This Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) presents a conceptual design for removal and disposition of scrap metal at the Y-12 Old Salvage Yard (OSY) in the Upper East Fork Poplar Creek (UEFPC) watershed at the Y-12 National Security Complex located on the U.S. Department of Energy (DOE) Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee (see Figure 1). This is part of the selected remedy in the *Record of Decision for Phase II Interim Remedial Actions for Contaminated Soils and Scrapyard in Upper East Fork Poplar Creek, Oak Ridge, Tennessee* (BJC 2006) (ROD). The selected remedy is scrap metal removal, which is designed to protect industrial workers from exposure to hazardous substances through elimination or reduction of contaminated materials to below unacceptable risk-based levels for workers onsite. The remedial action at the Y-12 OSY is to remove all scrap, regardless of contamination, and dispose in the appropriate facility. Other actions including soil cleanup and implementation of Land Use Controls (LUC) will be necessary but are out of the scope of this RAWP. Previous watershed-level decisions identified interim remediation levels for surface water and selected actions for principal-threat wastes in the UEFPC watershed.

This remedial action for residual material (scrap) remaining at Y-12 in the OSY will be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to assist in meeting remedial action objectives (RAO) of the industrial workers' protection established in the ROD in accordance with the selected remedy for the scrap metal at the Y-12 OSY. This report also addresses attainment of performance goals as well as compliance with applicable or relevant and appropriate requirements (ARAR) identified in the ROD, and provided in Appendix A. Future decisions will address final remediation levels for groundwater and surface water for the UEFPC watershed and any additional action that might be needed to meet those levels, including any final LUCs (BJC 2004).

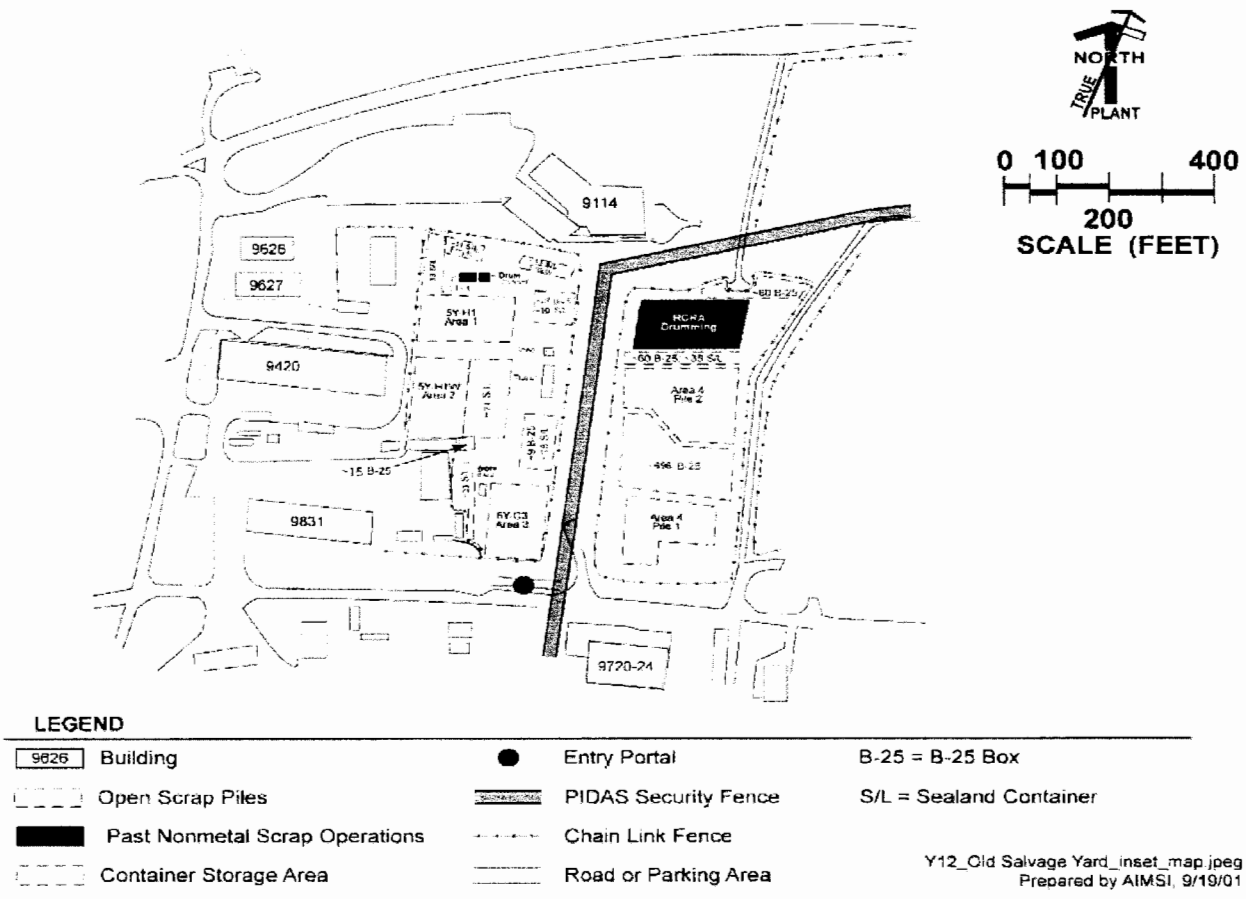


Figure 1. Y-12 Old Salvage Yard Site Map

# 2. SITE DESCRIPTION

## 2.1 OPERATIONAL HISTORY

The following sections provide an overview of the operations, site dimensions, and layout of the Y-12 OSY.

The Y-12 Plant is an active manufacturing and developmental engineering facility, occupying approximately 600 acres within Bear Creek Valley near the northeastern corner of the ORR. Y-12's original mission was to separate fissile uranium-235 ($^{235}U$) from uranium and to manufacture weapons components as part of the national effort to produce the atomic bomb. As other uranium enrichment processes were developed and implemented at other installations, the role of Y-12 expanded to include weapons components manufacturing and precision machining, research and development, lithium isotope separation, and special nuclear materials storage and management. The current mission of the installation is multifaceted and includes National Nuclear Security Administration (NNSA) assignments. The NNSA is embarking on a significant facility and infrastructure modernization program at Y-12, resulting in numerous construction projects; therefore, remediation activities, including remediation of the OSY, must be closely coordinated to minimize impact on Y-12's mission and modernization program.

The Y-12 OSY is located at the west end of the Y-12 Plant and lies within the approximately 600-acre industrialized area of Y-12 (see Figure 2). It was used since the early 1970s to receive scrap metal from plant operations, for the storage of liquid hazardous wastes, and for the deheading and crushing of drums. When the OSY was in operation, it handled both radioactively contaminated (principally depleted uranium and uranium-enriched $^{235}U$) and non-radioactively contaminated scrap metals. The metal was considered non-classified, and non-Resource Conservation and Recovery Act of 1976 (RCRA) regulated (BJC 2007). Radioactively contaminated scrap metal was shipped offsite on a daily basis, with the OSY Controller assuring the material picked up by the buyer was weighed before removal from the Y-12 Plant. Approximately 30,000 pounds of radioactively contaminated scrap metal were handled on a weekly basis. Non-radioactively contaminated scrap metal was shipped out every few days, as determined by the buyer's needs. Approximately 50,000 pounds of non-radioactively contaminated scrap metal were handled per week. Currently, roughly 31,000 cubic yards ($yd^3$) of scrap on the surface require removal and disposal in an approved location (BJC 2007).

Past operations at the OSY also included crushing oil drums and refilling drums containing RCRA waste. The refilling of drums was stopped and the area referred to as the Salvage Yard Oil/Solvent Drum Storage Area was closed and capped under RCRA in 1986. In the late 1980s, the Perimeter Detection Intrusion and Assessment System (PIDAS) was constructed, which split the OSY into two segments. This oil/solvent drum storage area is located in the northern part of the protected area of the OSY; however, it is not part of the scope of this RDR/RAWP.

Prior to 1995, the OSY received scrap into open piles. Since 1995, and prior to shutdown, procedures required that all scrap metal be placed inside containers. On October 12, 1999, the Y-12 OSY ceased operations within the facility pending corrective action to determine the hazard categorization per DOE Standard 1027-92 (DOE 1997). The Y-12 OSY is categorized as a radiological facility.

**Figure 2. Y-12 Old Salvage Yard**

The ROD delineates the Y-12 OSY into five RCRA Solid Waste Management Units (SWMU) as follows:

- The oil storage tanks,
- The oil/solvent drum storage area,
- The drum deheader,
- The scrap metal storage area, and
- Tank 2063-U.

These five SWMUs correspond to the Federal Facility Agreement, Appendix C, Y-12 sites. This RDR/RAWP only pertains to the scrap metal storage area SWMU listed above. The scrap metal storage area has been further subcategorized into the non-PIDAS and PIDAS areas, described as follows, which correspond to areas defined by previous characterization studies (Figure 3). Various reports on the Y-12 OSY provide differing information on the number of waste containers stored in both the non-PIDAS and PIDAS areas. The numbers of waste containers reported in this RDR/RAWP are those presented in the most recently published document, the Safety Analysis Document (SAD) for the OSY (BJC 2007).

Non-PIDAS Area

The three piles of scrap in the non-PIDAS area were partially characterized in 1993, and it was concluded that the primary contaminant is depleted uranium (MMES 1993). Per the 1993 characterization report of Areas 1 through 3, approximately 58 percent of the scrap metal is not suitable for free release without decontamination. The three areas are denoted as follows:

- SY-HW/Area 1, containing approximately 2,300 tons of metal,
- SY-H1W/Area 2, containing approximately 730 tons of metal, and
- SY-C3/Area 3, containing approximately 2,000 tons of metal.

In addition to these three areas of scrap metal piles, there are approximately 250 sea land waste containers and B-25 boxes, all with scrap metal in them and stacked two-high, and approximately nine empty 55-gallon plastic and metal drums in the non-PIDAS area (BJC 2007). The western section of the OSY is located outside the PIDAS but is still confined by chain link fencing, and it is approximately 160,000 square feet ($ft^2$) with a trailer, three modular buildings, and a drum shed located within. The average area of each of the three scrap metal piles is approximately 17,000 $ft^2$. The non-PIDAS area also has a large roped-off area containing low-level contaminated scrap metal with signs posted to designate the area as a radiation control zone. The remainder of the western section is used for the storage of non-contaminated scrap metal.

PIDAS Area

The two piles of scrap in the PIDAS area (Area 4) were partially characterized and results documented in a 1998 characterization report (EET 1998). This report concluded that essentially all the scrap in Area 4 is not suitable for free release without decontamination. The two areas are denoted as follows:

- SY-H1 Pile 1/Area 4, containing approximately 1,830 tons of metal, and
- SY-H1 Pile 2/Area 4, containing approximately 1,840 tons of metal.

In addition to these two areas of scrap metal piles, there are approximately 850 waste containers stacked two-high, all with scrap metal in them (BJC 2007). The eastern section of the OSY is located inside the PIDAS as is approximately 160,000 $ft^2$. The entire eastern section, or PIDAS area, is a radiation control zone.

Additionally, there are forklifts, shears, an abandoned crane, and other equipment stored within Areas 1 through 4 that require disposition. All the containers and the scrap metal piles are located on bare earth.

*(NOT TO SCALE)*

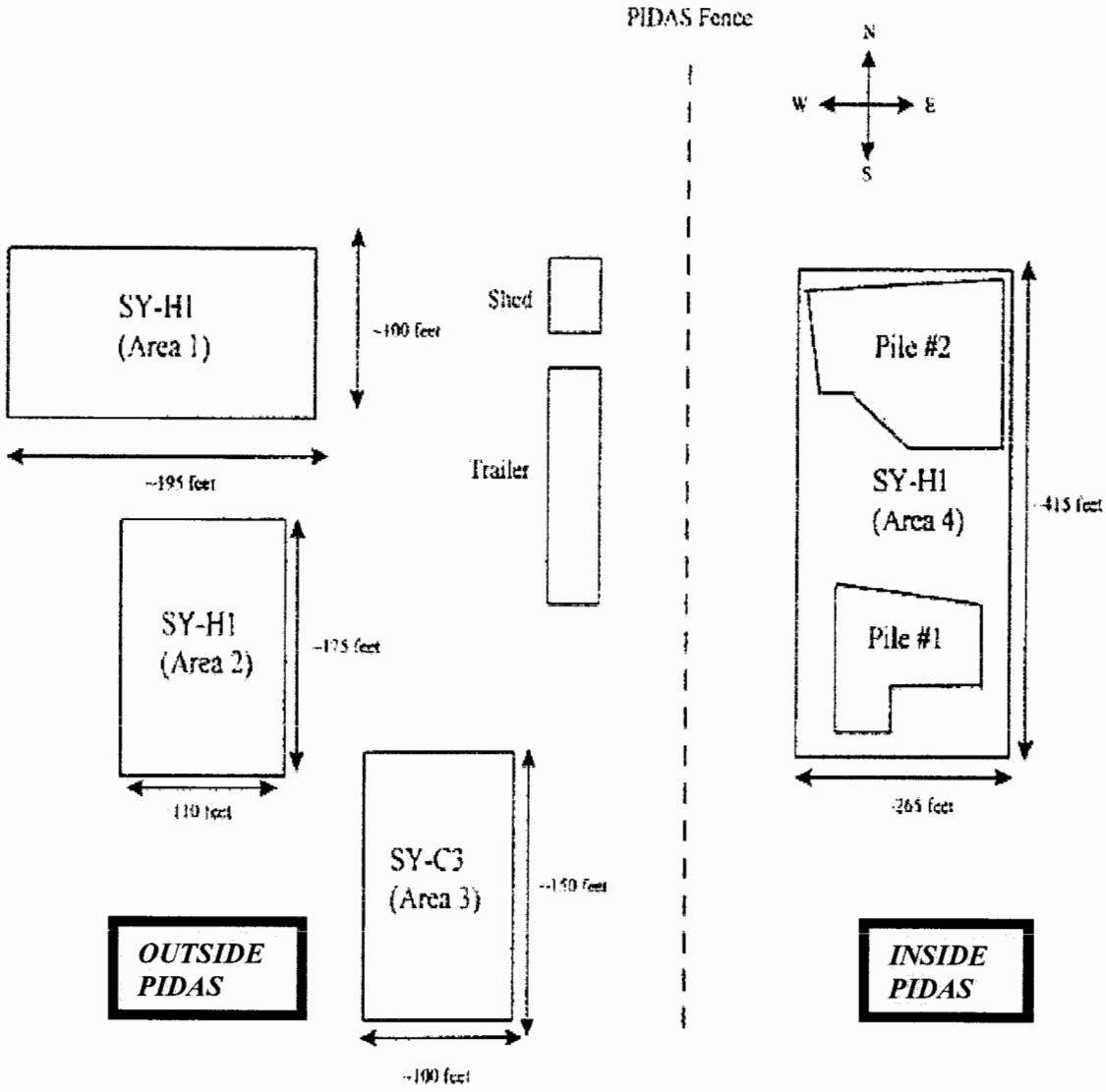


**Figure 3. Y-12 Old Salvage Yard Physical Layout of PIDAS and Non-PIDAS Areas**

Table 1 presents a compilation of materials disposed in the Y-12 OSY, as determined from the scrap metal inventory report prepared in 1995 (DOE 1995). This inventory report was prepared to document an evaluation of the scrap metal inventory and economic value of the metal stored at 10 sites across the DOE complex, with Y-12 being one of those sites.

**Table 1. Materials Disposed in the Y-12 Old Salvage Yard**

| Area | Waste description |
|---|---|
| SY-HW, Area 1 | Carbon steel (FE), stainless steel (SS), and aluminum (AL)/copper (CU) radiators; empty storage box |
| SY-H1W, Area 2 | Tanks, crane body, hopper, mixed FE, SS, AL, and CU scrap; B-25 boxes; and equipment, including equipment parts |
| SY-C3, Area 3 | Mixed FE, SS, AL, & CU scrap; one transformer |
| SY-H1, Area 4 | One pile mixed scrap with machine tools; one pile mixed scrap; and B-25 boxes |

## 2.2 NATURE AND EXTENT OF POLLUTANTS OF CONCERN

The nature and extent of contamination is based upon process knowledge, historical records, and analytical data from previous investigations. In development of the SAD for the Y-12 OSY, available information on the containers was compiled from Requests for Disposal forms and the Waste Information Management System database. According to the SAD, records show that the Y-12 OSY should not contain classified materials or hazardous waste defined by the U.S Environmental Protection Agency (EPA) under 40 *Code of Federal Regulation* (CFR) 261 or Toxic Substances Control Act (TSCA) regulated waste as defined in 40 CFR 761, 763, and 766 above the regulated threshold limits. These include polychlorinated biphenyls (PCB) greater than 50 parts per million (ppm), free liquids, oil, hydraulic fluid, and halogenated materials such as freon. It is suspected however, that some legacy items containing such prohibited items may have been introduced in the past (i.e., there are PCB postings in the OSY) and because of this, verification measures will be taken during remediation to confirm the presence or absence of these items. If any are encountered, they will be managed appropriately.

With regards to radiological material, the Y-12 OSY generally accepted only metal or metal-containing materials contaminated with low levels of uranium and trace amounts of its daughter products; however some thorium contaminated waste may also be present. Materials from enriched uranium processes at Y-12 were screened to ensure that no enriched uranium that could be economically recovered was discarded. Additionally, the Nuclear Criticality Safety Program of the Y-12 Plant Contractor required the $^{235}U$ content of all waste containers from enriched uranium buildings to be reliably measured, documented, and verified. For these reasons, items at the OSY are not expected to contain large quantities of enriched uranium.

The purpose of the 1993 characterization study of the non-PIDAS scrap metal piles was to make conservative estimates of the quantities of total uranium and weight percent $^{235}U$ in the scrap metal. The original characterization scope included estimates of thorium, but due to the insignificant quantities found in the scrap metal samples, thorium was excluded from further analysis. Seventy one samples were collected from the three scrap metal piles, based upon elevated field-detected alpha and beta/gamma results identifying contaminated scrap. Results for total uranium ranged from 0.3 to 863,501 micrograms per gram (µg/g) and the weight percent $^{235}U$ ranged from 0.18 to 78, where 78 was subsequently determined to be an outlier. The study concluded that the scrap metal piles in Areas 1 through 3 have been fairly well segregated and consist mainly of depleted uranium with some lower enriched material. Sample results from Area 3 varied significantly from those from Areas 1 and 2, with total uranium

averaging 231 μg/g in Area 3. Calculations representing an upper bound of uranium that is present in a typical 20,000 pound scrap metal shipment from the non-PIDAS area show total grams of uranium at 1,777 g. The grams $^{235}U$ contained in this typical shipment were calculated at 10.3 g (MMES 1993).

The purpose of the 1998 documented characterization study of the PIDAS area scrap metal piles was to provide a summary of radiological data for the two piles of scrap and provide recommendations for characterization requirements that may be necessary to process the scrap metal. These two scrap metal piles were actually characterized in 1994; however, it appears the results were not captured until this 1998 report was published. Seventy samples were collected using the same biased sampling approach as was used for sampling the three piles in the non-PIDAS area. Calculations demonstrate that a typical 20,000 pound shipment of scrap metal from the two piles in the PIDAS area would contain 2,200 g total uranium, and the grams $^{235}U$ in this typical shipment equals 26.4 g. This report also determined that if the results from the elevated contaminated surfaces characterization are generalized to the entire PIDAS area piles, this implies that of the 3,670 tons of scrap metal from Area 4, up to 3,480 tons are unsuitable for free release, and concludes that 58 percent of the scrap metal from the three piles in the non-PIDAS area are unsuitable for free release. Additionally, this report concludes that less than 10 percent of the scrap metal from Area 4 is contaminated with enriched material (EET 1998). However, a review of the data associated with B-25 boxes with up to approximately 1,000 pounds of scrap and sea land containers with up to approximately 40,000 pounds of scrap indicates numerous containers with tens of grams of enriched uranium, with the highest amount being approximately 1,000 g in a sea land container (BJC 2003).

The total extent of contamination is basically unknown for the Y-12 OSY scrap metal. The two characterization studies focus on the scrap metal piles and not any of the containerized waste material, and these two studies only collected samples for analysis from biased, elevated radiological contamination areas based on field instrumentation. Additionally, these characterization studies did not characterize for other contaminants, only uranium, even though both reports acknowledge that there is the potential of other contaminants. During remediation, visual assessments, radiological surveys, field screening techniques, and analytical results will be used to delineate the nature and extent of contamination to ensure all contaminated scrap metal is disposed appropriately.

# 3. PROJECT DESCRIPTION

The overall cleanup strategy for this remedial action is scrap metal removal, which is designed to protect industrial workers. Completion of the remedial action, in accordance with the design presented in this RDR/RAWP, is expected to meet the RAO. The following paragraphs describe the RAO, which addresses the protection of the industrial worker from contaminated scrap at the Y-12 OSY. This RAO is consistent with National Contingency Plan requirements [40 CFR 300.430(e)(2)(I)(A)] for protective remediation goals.

The anticipated future land use of the OSY is industrial. The ORR Site-Specific Advisory Board recommended that the future land use of Y-12 be controlled industrial use within the western and south-central areas and unrestricted industrial in the eastern and north-central areas. Since that time, the NNSA has recommended that because of security concerns and the current modernization program, the anticipated land use for the foreseeable future will be controlled industrial throughout the entire complex.

The RAO specified in the ROD is:

- Human health of the worker under future industrial land use is to be protected by achieving excess lifetime cancer risk levels within the target risk range of $1 \times 10^{-4}$ to $1 \times 10^{-6}$ and noncancer risk levels below a hazard index (HI) of 3.

The scope of this RDR/RAWP focuses on the removal of all scrap metal from the Y-12 OSY. There are no performance standards for this remedial action. The demonstration of effectiveness of this action is all scrap metal having been removed from the site.

## 3.1 WORKER PROTECTION

RAOs will be revisited at the time that final land use is determined and final surface water and groundwater decisions are made. The intent of the scrap metal removal is to remediate the material above the ground surface to support the stated RAO of achieving risk levels within the target range and below a HI of 3. There are no performance standards for the scrap removal as there are for soil remediation. The protection goal is for the site-specific industrial worker through the removal of all scrap.

Proper precautions in accordance with task-specific environmental compliance and safety and health plans are required for the removal of the scrap metal. Contaminated areas will be physically demarcated as well as waste staging and storage areas. A working surface will be placed as needed to prevent exposure to, or spread of, contamination outside of the OSY prior to removal activities.

Radiological control (RadCon) and industrial hygiene technicians will monitor site conditions for early detection prior to and during remediation activities to ensure worker personal protective requirements are met and potential releases are minimized to meet regulatory limits.

# 4. REMEDIAL DESIGN REPORT

This RDR/RAWP focuses primarily on the methods of accomplishment (scrap removal, size reduction, and disposal). The design establishes the various requirements (e.g., radiological protection) necessary to complete the work in a safe and compliant manner. Testing, which consists of field screening augmented with confirmation sampling, will occur during the removal efforts to verify the scrap is disposed appropriately, meeting the ROD cleanup goals.

For remedy components summarized in Section 4.3, this chapter presents general design parameters, functional and technical requirements, and design objectives. The primary objectives of this RDR/RAWP are to define the scope of remediation work to be performed, identify the controls that will be implemented to protect remediation workers and the environment, and describe the methods of accomplishment that will be used to execute the work. Attainment of these objectives is detailed in the following sections.

## 4.1 SITE ACCESS REQUIREMENTS

This scope of work requires remediation of scrap metal from protected areas at Y-12 (inside the PIDAS). Subsequently, access to these areas will require a Q-clearance for all personnel performing removal, segregation, loading, and disposing of scrap metal. Uncleared workers under the purview of authorized security escorts may be permitted after approval of a security escort agreement, consistent with the site's security plan.

All remediation areas will be controlled by the remediation contractor during normal working hours. The remediation contractor will monitor all points of entrance and verify that personnel possess Q clearances for the PIDAS areas. The remediation contractor will also ensure personnel entering these areas do not possess unapproved communication devices.

Site access requirements may include but are not be limited to General Employee Training, Radiological Worker II, Respirator Fit, Bioassay, and acknowledgement of site-specific Activity Hazards Analysis. Not only will the administrative/security controls limit access to the Y-12 OSY, this remedial design provides for physical controls such as security fences to prevent inadvertent access to these areas. Additionally, since this RDR/RAWP addresses working inside and in close proximity to the PIDAS fence, requirements to safely conduct work within the PIDAS distance requirements must be enforced and there must be coordination with Y-12 Security Forces. For example, heavy equipment must be maintained at a distance to preclude inadvertent breaching of the PIDAS.

## 4.2 SITE PREPARATION

All site preparation actions described below are subject to general requirements (e.g., erosion and sediment control, dust control, worker protection) provided in the plans described in Section 7.

### 4.2.1 Access Roads

Existing roads will be used and maintained as required throughout the duration of the project to provide safe access for transporting materials, equipment, and waste from the remediation site. New staging areas will be established inside the OSY to support scrap metal segregation and surveying, packaging, and transport.

### 4.2.2 Access Control

Existing fences and gates will be used to control access to the OSY. Signs will be placed at all access points to the OSY, indicating access controls. Visual access controls are not required since there are no classified components to be removed from the OSY.

### 4.2.3 Temporary Facilities

Areas will be designated on the work plans submitted for approval by the remediation contractor for parking and other temporary facilities. These facilities will be removed at the conclusion of the remedial action and affected areas will be restored to their prior condition.

### 4.2.4 Clearing and Grubbing

Any vegetation, which must be removed for access to the scrap, not meeting the WAC of the Y-12 land fill or free release criteria will be transported to the Environmental Management Waste Management Facility (EMWMF) for disposal following acceptance of the OSY waste profiles. Trees and shrubs/brush will be cut as close to existing grade as practical. Roots may be left in place in some areas.

### 4.2.5 Decontamination Area

The OSY is a controlled area that contains uncontaminated, contaminated, and highly contaminated areas. Scrap removal activities, including decontamination activities associated with equipment, may result in some uncontaminated areas becoming contaminated. These areas will be addressed as part of the remediation of contaminated soil below the existing scrap piles. Controlled areas delineating all radiologically contaminated areas will be established by RadCon. Details associated with decontamination will be provided in the contractor's proposal and plans that will be required to meet all applicable ARARs. It is anticipated that personnel and small items will exit the OSY through a monitoring/decontamination station adjacent to the OSY boundary fences. Equipment to be removed from the site is anticipated to be decontaminated within the boundaries of the OSY fences. Final radiation surveys and minor decontamination that may be needed as a result of these surveys may be conducted outside of these boundaries. A proposal by the contractor to decontaminate equipment at an off-site facility in accordance with regulations would also be acceptable.

## 4.3 SCRAP METAL REMOVAL AND SEGREGATION

Scrap metal will be removed, segregated, and sorted according to the remediation contractor's approved work plan and disposed at the appropriate facility in accordance with the associated WAC of the facility. The remediation contractor, in project-specific work plans submitted for approval, will specify the types of equipment proposed for scrap removal as well as equipment proposed for size reduction.

All scrap will be removed from the Y-12 OSY regardless of contamination levels. The scrap will be removed to achieve industrial worker protection levels. A volume of approximately 31,000 $yd^3$ of scrap is anticipated for removal and disposal. No excavation of soils beneath the existing scrap metal piles and containerized scrap will occur as part of this RDR/RAWP scope of work.

The scrap is setting on top of bare earth, which will be stabilized as necessary after scrap removal to support site restoration. Stabilization methods, which may include placement of gravel, will be provided in the remediation contractor's work plans and will serve to meet the current stormwater management requirements per the site permit. After remediation, special access controls will remain in place as they currently are for the Y-12 Plant, including the PIDAS area. The soils beneath the OSY will be addressed as part of a future remedial action, and access to these soils will remain restricted until such time.

Scrap removal activities most likely will reveal anomalous or physically unacceptable waste such as gas cylinders, TSCA waste, and large pieces of equipment. These will require special handling,

segregation, management, characterization as necessary, size reduction or special treatment and packaging as necessary for transport and disposal. These wastes will potentially be disposed as a different waste stream from the bulk of the scrap metal. Waste will be characterized, managed, and stored in accordance with the ARARs listed in Appendix A. Waste management of low level waste (LLW), RCRA, TSCA, and mixed waste are also addressed in Appendix A. See Section 4.4.2 for guidelines on debris-size reduction.

## 4.4 WASTE TRANSPORTATION/DISPOSAL

Generally, the scrap disposal order of preferences is Y-12 landfill, EMWMF, and off-site. Size reduction may be necessary to meet the disposal facility WAC; however, the lack of feasibility or lack of cost effectiveness of certifying material for the Y-12 landfill may result in much of the scrap being disposed in the EMWMF. (Based on historical records, there is an indication that much of SY-C3, Area 3 scrap metal is uncontaminated from a radiological standpoint, whereas the remaining piles of scrap are considered radiologically contaminated).

Scrap metal not meeting the WAC of the Y-12 landfill will be transported to the EMWMF for disposal, following acceptance of the OSY waste profiles. The majority of the contaminated waste material is expected to meet either the landfill or EMWMF WAC. If any waste does not meet the WAC, it will be shipped offsite for disposal at an approved facility or treated to meet the EMWMF WAC.

Hazardous materials may include freon, oils, mercury switches, PCB and non-PCB ballasts, circuit boards, PCB and lead based painted metal, as some examples. Most of these hazardous materials have waste disposition pathways that involve correctly removing and packaging the wastes and then delivering them to a specified location for recycling and/or disposal. Mercury containing switches and materials will be containerized into drums and staged for delivery to the Y-12 90-Day Yard for recycle and/or disposal.

Freon containing items will be dispositioned as construction debris once all freon has been removed, provided the items do not exhibit radiological contamination. Oils and other liquid materials will be containerized and sampled to determine the appropriate disposition pathway. All sampling and analysis will be documented in the Sampling and Analysis Plan that will be developed and submitted for approval as a pre-mobilization submittal from the remediation contractor.

Waste will be classified through visual observation and sampling/analysis as appropriate. Wastes will be segregated at the point of removal from the piles and containers to ensure incompatible wastes are not co-mingled; to avoid creating "mixed" wastes; to reduce sampling and analysis that must be performed and simplify the sampling process; to minimize the opportunity for nonconforming wastes to be added to a waste stream; to eliminate the need for sorting; and to facilitate transfer of wastes to the appropriate receiving facility.

### 4.4.1 Transport of Waste

Subsequent to proper packaging and completion of the required shipping documentation, project personnel will load the regulated materials onto the appropriate transport vehicle. The transportation method is dependent on the quantity of waste generated, the destination of the waste, and the type of waste. The loaded containers will be visually inspected to ensure that no damage has occurred and the packages are secured and suitable for transport. Waste shipments will be closely coordinated with the receiving disposal facility to allow for careful management of the required waste forms. Authorization will be received from the receiving facility prior to waste being shipped offsite.

The tare weight of trucks will be determined prior to use for transporting to the disposal facility. Loaded trucks will be weighed and the net weight, waste type, source location, and other required data will be recorded for compliance with U.S. Department of Transportation (DOT) requirements and

recordkeeping purposes at the EMWMF. A copy of each shipping document will be retained with the project records.

Sanitary trash and waste will be collected in a dedicated sanitary waste container and transported for disposal as needed. Used oil and coolants will be placed into drums. All generated waste will be packaged, labeled, and marked according to DOT regulations (49 CFR 172–178) and RCRA 40 CFR 262, "Pre-Transport Requirements," where applicable. For waste that is generated for disposal in the onsite Industrial Landfill V, Form 2109 will be completed before the waste is removed from the work site. This form will be submitted prior to the waste being shipped/transported in order for landfill personnel to approve the disposal of the waste in an onsite disposal area. There will be notification to the landfill operators in advance of shipments of wastes, and adherence to the disposal hours at the disposal sites is required.

### 4.4.2 Debris Reduction

Large pieces of metal found during the removal process that violate the receiving disposal facility WAC will require a reduction in size before disposal. Reduction methods will be specific to the size, material, and contamination-level of the debris. Lesser contaminated materials could be disassembled. Another option for size reduction of large debris is shearing or compacting. The remediation contractor may also inquire about a size variance for the waste through the receiving disposal facility.

## 4.5 PERFORMANCE MEASUREMENT AND CONSTRUCTION QUALITY CONTROL

Contractor-approved work control documents will include provisions for construction quality control during remediation. A primary focus of the quality control program is to ensure remediation is conducted in accordance with the documented extent of remediation, which for this project is removal of all scrap metal, and wastes are properly identified, characterized, and disposed at the proper facility.

## 4.6 SITE RESTORATION

Recontouring of the Y-12 OSY is not anticipated; however, restoration will include stabilization following scrap metal removal to meet the stormwater management requirements per the site permit that is currently in place. Erosion and sediment controls will be implemented according to the contractor's approved work plan, which may include placement of gravel to prevent runoff. Placement of top soils, seeding, and mulching will not be performed as part of site restoration activities since subsurface soils will be addressed as part of future site work.

# 5. PLANS

The remediation contractor will prepare project and programmatic plans to meet the requirements of the selected remedy for the Y-12 OSY specified in the ROD. These plans are also supplemented by the contractor's proposal and documented programs to assure a safe and cost effective completion of the project. The following plans will not be required for the scrap metal removal action since they are not applicable to this project:

- Verification Plan,
- Monitoring Plan, and
- Operation and Maintenance Plan.

After removal of the scrap and before soil remediation, the OSY will continue in the ORO Environmental Management Surveillance and Maintenance program, which will include access control, posting, and vegetation control.

This project will have the following plans prepared by the selected remediation contractor:

- Environment, Safety and Health (ES&H) Plan,
- Quality Assurance (QA) Project Plan,
- Waste Management Plan,
- Waste Transportation Plan, and
- Comprehensive Work Plan.

DOE, its prime contractor, and all subcontractors are required to comply with 10 CFR 830.120, QA Requirements, which are mandatory requirements, and flow down to all contractors and subcontractors. The prime contractor and subcontractor QA programs identify company policies and plans or procedures that implement the business processes of each company. The programs are administered by QA organizations in each company that report to company management and are independent of project management. The QA Plan addresses the quality requirements for the project and will include requirements for compliance with plans and procedures for the project, including inspections, assessments, and training. The ES&H Plan of the prime contractor, which addresses hazards specific to work elements, will be adhered to during execution of this project. Each contractor and subcontractor will develop a project-specific QA Program Plan for the project. Each company must conduct management and independent audits and/or assessments of its implementation of quality. Correspondingly, each higher-tiered contractor is required to conduct audits or assessments of the work processes and products or services provided by its suppliers.

All contractors and subcontractors involved in the scrap removal effort will be required to follow 10 CFR 851 and the applicable Occupational Safety and Health Administration standards from 10 CFR 1910 and 10 CFR 1926. This will be accomplished through both corporate and project specific Safety and Health Plans. The Site Safety and Health Officer for the project will have independent reporting relationships to corporate management to assure that all safety issues are properly addressed during project execution.

In addition, all work will be performed under a Radiological Protection Program (RPP), and its implementing procedures. The RPP will be prepared by the remedial action contractor to meet the

requirements of 10 CFR 835. As an alternative, DOE may authorize the contractor to work under the requirements of the Y-12 Management and Operations (M&O) contractor's RPP, and the Y-12 M&O may perform some of the radiological control duties.

For the QA Program, Safety and Health Program, and RadCon Program, DOE may elect to direct the remedial action contractor to perform all work consistent with existing federal documents. Additionally, no characterization or remedial action work will begin until DOE requirements associated with safety analysis for the Y-12 OSY have been prepared and approved.

The Waste Management Plan will delineate the remediation contractor's requirements for managing LLW, mixed waste, TSCA, and sanitary waste. It will also provide the methodology for assuring WAC compliance. An approved Transportation Plan will identify items such as packaging, labeling, marking, manifesting, transportation routes, spill prevention, and compliance with DOT requirements. The method for waste management, waste minimization, packaging, transportation, and disposal will be part of the Waste Management Plan and Transportation Plan. Contaminated material removed during the project is destined for disposal at the EMWMF or other applicable, approved disposal facility. Large items may require size reduction by the contractor to meet disposal facility WAC requirements. Waste characterization, sampling, analysis, and waste profiling will be performed by the DOE prime contractor or a designated subcontractor to ensure the waste meets the WAC of the applicable disposal facility. An overall Waste Handling Plan (WHP) will address the management of all other wastes from generation to disposal in accordance with the guidelines outlined in Section 4.4. This WHP will be approved by EPA Region IV and the Tennessee Department of Environment and Conservation (TDEC) prior to initiation of fieldwork.

The Comprehensive Work Plan will address, at a minimum, site preparation, site security, waste characterization and segregation, waste removal and loading, and other onsite operations. The Comprehensive Work Plan will include mobilization, staffing, work control processes, waste management methodology, packaging, size reduction, treatment and disposal of waste, air and noise monitoring, readiness evaluation, site restoration, and demobilization.

# 6. LAND USE CONTROLS

DOE agreed in a Memorandum of Understanding with EPA and TDEC to comply with the ORR Land Use Control Assurance Plan whenever LUCs, including institutional controls, are selected as part of a remedial action (DOE, EPA, and TDEC 1999). No specific LUCs, beyond DOE orders and requirements, are required to complete the OSY scrap removal.

# 7. PROJECT ORGANIZATION AND SCHEDULE

The following (Figure 4) represents programmatic, project, and field implementation integration, and serves as an organization chart providing the relationships among key organizations involved in the Y-12 OSY remedial action.

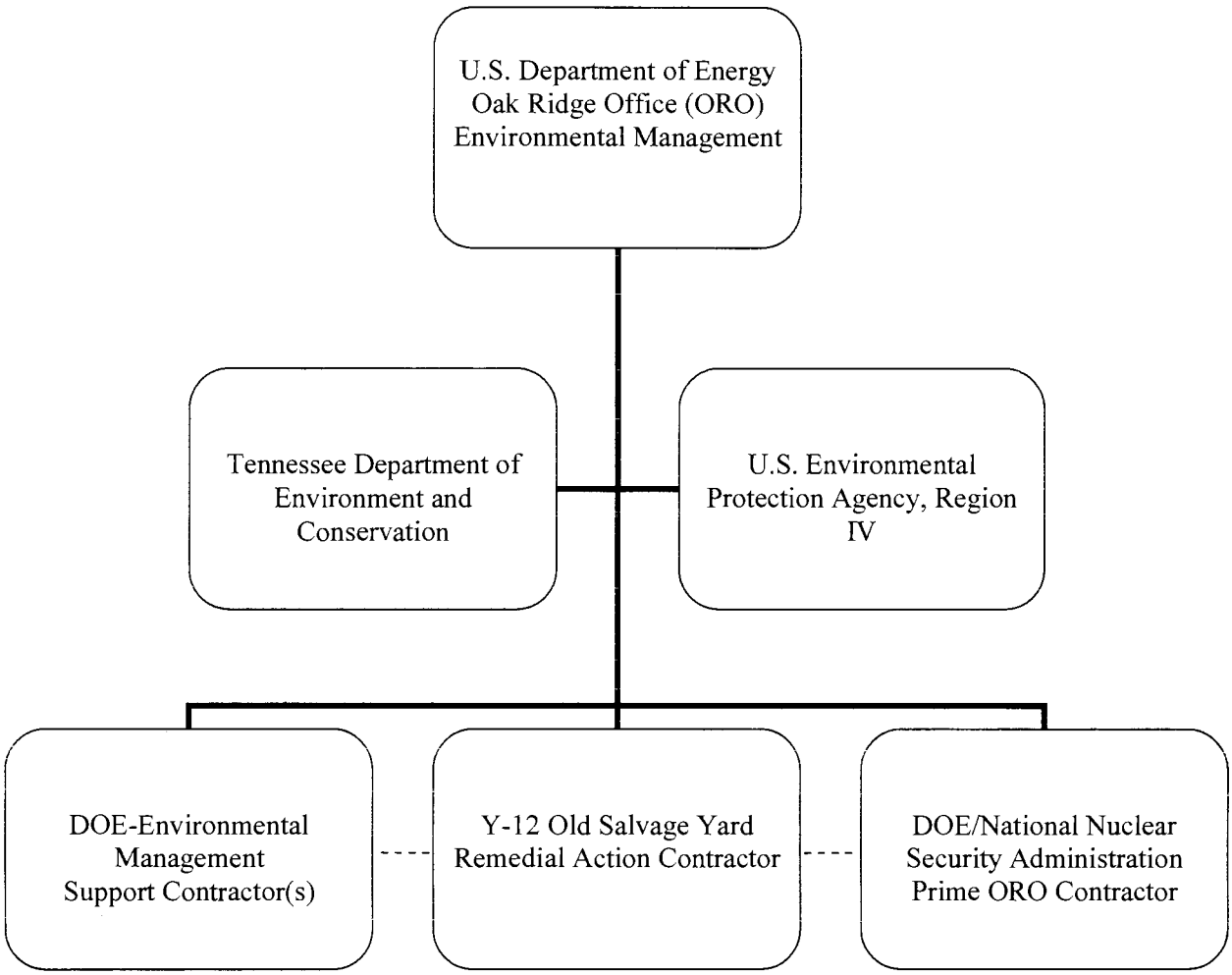


**Figure 4. Organization Chart for Remedial Action of Y-12 Old Salvage Yard**

The Remedial Action Core Team provides programmatic decisions and direction to the remedial action contractor(s). DOE's prime contractor(s) ensures implementation on the project level and is responsible for field implementation. DOE, EPA, and TDEC comprise the Remedial Action Core Team. DOE contractor(s) may participate in core team activities if appropriate and as necessary. The DOE prime contractor(s) is responsible for ensuring the remedial action is performed in accordance with specifications set forth in the ROD.

Remedial actions will be conducted in accordance with this RDR/RAWP after approval by EPA and TDEC. In addition, any lower-tier subcontractors must meet the DOE prime contractor requirements for developing and complying with the approved site-specific work plan, transportation plan, waste management plan, work control packages, and all applicable permits and procedures, to name a few. The remedial action contractor will meet all applicable DOE orders/requirements during the execution of remediation of the Y-12 OSY.

Key milestone dates for the scrap metal removal at the Y-12 OSY project are shown in Table 2. The table includes enforceable and other key milestones for performance of this remedial action. The remedial action contractor will be required to develop a comprehensive schedule for the overall effort, including all activities required to accomplish the scrap removal. This schedule will be resource loaded and will identify key milestones. Project progress will be tracked to this detailed schedule.

**Table 2. Project Schedule**

| Major activity | Forecast date |
|---|---|
| RDR/RAWP submitted to regulators for review and approval (D1) | May 13, 2008 |
| Waste Handling Plan submitted to regulators for review and approval (D1) | Sept. 30, 2008 |
| Y-12 OSY field activities initiated | Sept. 30, 2010 |
| Complete Y-12 OSY scrap removal | Fiscal Year 2015 |
| Submit project completion reporting Phased Construction Completion Report | Fiscal Year 2015 |
| Issue final Remedial Action Report and project complete | Fiscal Year 2016 |

# 8. REFERENCES


BJC (Bechtel Jacobs company, LLC) 2003. Letter from Paul F. Clay to Gerald G. Boyd (DOE), *Re-Categorization of the Old Salvage Yard*, April 9.

BJC (Bechtel Jacobs Company, LLC) 2004. *Upper East Fork Poplar Creek Soil and Scrapyard Focused Feasibility Study*, DOE/OR/01-2083&D2, May.

BJC 2006. *Record of Decision for Phase II Interim Remedial Actions of Contaminated Soils and Scrapyard in Upper East Fork Poplar Creek, Oak Ridge, Tennessee*, BJC/OR/01-2229&D3, March.

BJC 2007. *Safety Analysis Document, Old Salvage Yard at the Y-12 National Security Complex*, SAD-YT-OSY-0016, Rev. 1, November.

DOE (U.S. Department of Energy) 1992. *Federal Facility Agreement for the Oak Ridge Reservation*, DOE/OR-1014, EPA-Region 4, DOE and TDEC, Washington, D.C.

DOE 1995. *U.S Department of Energy Scrap Metal Inventory Report for the Office of Technology Development, Office of Environmental Management*, DOE/HWP-167, March.

DOE 1997. *Hazard Categorization and Accident Analysis Techniques for Compliance with 5480.23, Nuclear Safety Analysis Reports*, Change Notice 1, September.

DOE, EPA, and TDEC (U.S. Department of Energy, U.S. Environmental Protection Agency, and Tennessee Department of Environment and Conservation) 1999. *Memorandum of Understanding for Implementation of a Land Use Control Assurance Plan (LUCAP) for the United States Department of Energy Oak Ridge Reservation*, Attachment: Land Use Control Assurance Plan for the Oak Ridge Reservation, November.

EET (EET TN Corporation) 1998. *Characterization Study for Scrap Metal Stored in Area 4 of the Oak Ridge Y-12 Plan Old Salvage Yard, Oak Ridge, Tennessee*, BJC/OR-50, June.

MMES (Martin Marietta Energy Systems, Inc.) 1993. *Old Salvage Yard Scrap Metal Characterization Study*, Y/WM-169, November.

# APPENDIX A

# APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | | **Chemical-specific** | |
| Radionuclides in the environment | Exposure to individual members of the public from radiation shall not exceed a total EDE of 0.1 rem/year (100 mrem/year), exclusive of the dose contributions from background radiation, any medical administration the individual has received, or voluntary participation in medical/research programs. | Activities causing the release of radionuclides into the environment— **relevant and appropriate** | 10 *CFR* 20.1301(a)(1) |
| | Shall use, to the extent practicable, procedures and engineering controls based on sound radiation protection principles to achieve doses to members of the public that are ALARA. | | 10 *CFR* 20.1101(b) |
| Residual radioactively contaminated soil | Must achieve cleanup levels of equal to or less than 5 pCi/gm above background for radium-226 and thorium-232 (and their daughter products) averaged over the first 15 cm of soil and 15 pCi/g averaged over 15-cm-thick layers of soil below the first 15 cm. | Residual radioactive material in soil— **not applicable** | 40 *CFR* 192.12 |
| | Guidelines for residual concentrations of radionuclides in soil shall be derived from the basic dose limit using an environmental pathway analysis. | Residual radioactive material in soil— **not applicable** | DOE Order 5400.5(IV)(4)(a) |
| | Must achieve cleanup levels of equal to or less than 5 pCi/gm above background for radium-226, radium-228, thorium-230, and thorim-232 averaged over the first 15 cm of soil and 15 pCi/g averaged over 15-cm-thick layers of soil below the first 15 cm. | | DOE Order 5400.5(IV)(4)(a)(2) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | | **Action-specific** | |
| | | ***General construction standards–site preparation, excavation, etc. activities*** | |
| Activities causing fugitive dust emissions | Shall take reasonable precautions to prevent particulate matter from becoming airborne; reasonable precautions shall include, but are not limited to, the following: | Fugitive emissions from demolition of existing buildings or structures, construction operations, grading of roads, or clearing of land—**applicable** | Rules of the TDEC Chap. 1200-3-8-.01(1) |
| | • use, where possible, of water or chemicals for control of dust; and | | Rules of the TDEC Chap. 1200-3-8-.01(1)(a) |
| | • application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces that can create airborne dusts. | | Rules of the TDEC Chap. 1200-3-8-.01(1)(b) |
| | Shall not cause or allow fugitive dust to be emitted in such a manner as to exceed 5 min/h or 20 min/d beyond property boundary lines on which emission originates. | | Rules of the TDEC Chap. 1200-3-8-.01(2) |
| Activities causing radionuclide emissions | Shall not exceed those amounts that would cause any member of the public to receive an EDE of 10 mrem/year. | Radionuclide emissions from point sources, as well as diffuse or fugitive emissions, at a DOE facility—**applicable** | 40 *CFR* 61.92;<br>Rules of the TDEC Chap. 1200-3-11-.08(6) |
| Activities causing storm water runoff (e.g., clearing, grading, and excavation) | Implement good construction management techniques (including sediment and erosion controls, vegetative controls, and structural controls) in accordance with the substantive requirements of General Permit No. TNR10-0000, Appendix F, to ensure that storm water discharge | Dewatering or storm water runoff discharges from land disturbed by construction activity— disturbance of ≥1 acre total—**applicable** | TCA 69-3-108(j)<br>Rules of the TDEC Chap. 1200-4-10-.03(2) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | | ***Removal of contaminated soil (cont.)*** | |
| | Must achieve soil cleanup levels of equal to or less than 5 pCi/gm above background for radium$^{226}$ and thorium$^{232}$ (and their daughter products) averaged over the first 15 cm of soil and 15 pCi/g averaged over 15-cm-thick layers of soil below the first 15 cm. | Residual radioactive material in soil— **not applicable** | 40 *CFR* 192.12 |
| Remediation of PCB-contaminated soil | Must achieve cleanup levels, as approved in writing by EPA, which will not pose an unreasonable risk of injury to human health or the environment. | Disposal of PCB remediation waste— **not applicable** | 40 *CFR* 761.61(c) |
| | | ***Water treatment—on-site transfer and treatment of collected dewatering and decontamination fluids*** | |
| Transport to Y-12 wastewater treatment facility | All tank systems, conveyance systems, and ancillary equipment used to store or transport waste to an on-site, NPDES-permitted wastewater treatment facility are exempt from the requirements of RCRA Subtitle C standards. | On-site wastewater treatment units that are subject to regulation under Sect. 402 or Sect. 307(b) of CWA (NPDES-permitted)—**applicable** | 40 *CFR* 270.1(c)(2)(v); Rules of the TDEC Chap. 1200-1-11-.07(1)(b)(4)(iv) |
| | Are not prohibited from land disposal if such wastes are managed in a treatment system that subsequently discharges to Waters of the United States pursuant to a permit issued under Sect. 402 of the CWA, unless the wastes are subject to a specified method of treatment other than DEACT in 40 *CFR* 268.40 or are D003 reactive cyanide. | Restricted RCRA characteristically hazardous waste intended for disposal—**applicable** | 40 *CFR* 268.1(c)(4)(i); Rules of the TDEC Chap. 1200-1-11-.10(1)(a)(3)(iv)(I) |
| | | ***Waste generation, characterization, segregation, and storage—excavated soil, scrap metal, secondary wastes*** | |
| Characterization of solid waste (***all primary and secondary wastes***) | Must determine if solid waste is hazardous waste or if waste is excluded under 40 *CFR* 261.4(b) *AND* | Generation of solid waste as defined in 40 *CFR* 261.2 and which is not excluded under 40 *CFR* 261.4(a)—**applicable** | 40 *CFR* 262.11(a); Rules of the TDEC Chap. 1200-1-11-.03(1)(b)(1) |

**ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.)**

| Medium/action | Requirements | Prerequisite | Citation(s) |
|---|---|---|---|
| ***Waste generation, characterization, segregation, and storage—excavated soil, scrap metal, secondary wastes (cont.)*** | | | |
| | must determine if waste is listed under 40 *CFR* Part 261<br>*OR*<br>must characterize waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used. | | 40 *CFR* 262.11(b); Rules of the TDEC Chap. 1200-1-11-.03(1)(b)(2)<br>40 *CFR* 262.11(c); Rules of the TDEC Chap. 1200-1-11-.03(1)(b)(3) |
| Characterization of hazardous waste (***all primary and secondary wastes***) | Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Title 40 for possible exclusions or restrictions pertaining to management of the specific waste. | Generation of solid waste which is determined to be hazardous—**applicable** | 40 *CFR* 262.11(d); Rules of the TDEC Chap. 1200-1-11-.03(1)(b)(4) |
| | Must obtain detailed chemical and physical analyses on a representative sample of the waste(s) that, at a minimum, contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 *CFR* 264–268. | Generation of RCRA-hazardous waste for storage, treatment, or disposal—**applicable** | 40 *CFR* 264.13(a)(1); Rules of the TDEC Chap. 1200-1-11-.06(2)(d)(1) |
| | Must determine the underlying hazardous constituents [as defined in 40 *CFR* 268.2(i)] in the waste. | Generation of RCRA-characteristic hazardous waste (and is not D001 non-wastewater treated by CMBST, RORGS, or POLYM of Sect. 268.42, Table 1) for storage, treatment or disposal—**applicable** | 40 *CFR* 268.9(a); Rules of the TDEC Chap. 1200-1-11-.10(1)(i)(1) |
| | Must determine if the waste is restricted from land disposal under 40 *CFR* 268 et seq. by testing in accordance with prescribed methods or use of generator knowledge of waste. | | 40 *CFR* 268.7; Rules of the TDEC Chap. 1200-1-11-.10(1)(g)(1)(i) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| ***Waste generation, characterization, segregation, and storage—excavated soil, scrap metal, secondary wastes (cont.)*** | | | |
| | Must determine each EPA Hazardous Waste Number (Waste Code) to determine the applicable treatment standards under 40 *CFR* 268.40 et seq. | | 40 *CFR* 268.9(a);<br>Rules of the TDEC Chap. 1200-1-11-.10(1)(i)(1) |
| Characterization of LLW (*e.g., contaminated PPE, scrap metal, soil*) | Shall be characterized using direct or indirect methods and the characterization documented in sufficient detail to ensure safe management and compliance with the WAC of the receiving facility. | Generation of LLW for storage or disposal at a DOE facility—**TBC** | DOE M 435.1-1(IV)(I) |
| | Characterization data shall, at a minimum, include the following information relevant to the management of the waste: | | DOE M 435.1-1(IV)(I)(2)(a) |
| | • physical and chemical characteristics; | | DOE M 435.1-1(IV)(I)(2)(a) |
| | • volume, including the waste and any stabilization or absorbent media; | | DOE M 435.1-1(IV)(I)(2)(b) |
| | • weight of the container and contents; | | DOE M 435.1-1(IV)(I)(2)(c) |
| | • identities, activities, and concentrations of major radionuclides; | | DOE M 435.1-1(IV)(I)(2)(d) |
| | • characterization date; | | DOE M 435.1-1(IV)(I)(2)(e) |
| | • generating source; and | | DOE M 435.1-1(IV)(I)(2)(f) |
| | • any other information that might be needed to prepare and maintain the disposal facility performance assessment or demonstrate compliance with performance objectives. | | DOE M 435.1-1(IV)(I)(2)(g) |

**ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.)**

| Medium/action | Requirements | Prerequisite | Citation(s) |
|---|---|---|---|
| ***Waste generation, characterization, segregation, and storage—excavated soil, scrap metal, secondary wastes (cont.)*** | | | |
| Temporary storage of LLW (*e.g., contaminated PPE, scrap metal, soil*) | Shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. | Management of LLW at a DOE facility—**TBC** | DOE M 435.1-1 (IV)(N)(1) |
| | Shall be stored in a location and manner that protects the integrity of waste for the expected time of storage. | | DOE M 435.1-1 (IV)(N)(3) |
| | Shall be managed to identify and segregate LLW from mixed waste. | | DOE M 435.1-1 (IV)(N)(6) |
| Packaging of solid LLW (*e.g., contaminated PPE, scrap metal, debris*) | Shall be packaged in a manner that provides containment and protection for the duration of the expected storage period and until disposal is achieved or until the waste has been removed from the container. | Storage of LLW in containers at a DOE facility—**TBC** | DOE M 435.1-1(IV)(L)(1)(a) |
| | Vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container. | | DOE M 435.1-1(IV)(L)(1)(b) |
| | Containers shall be marked such that their contents can be identified. | | DOE M 435.1-1(IV)(L)(1)(c) |
| Management of PCB waste (*e.g., contaminated PPE, scrap metal, soil, debris*) | Any person storing or disposing of PCB waste must do so in accordance with 40 *CFR* 761, Subpart D. | Generation of waste containing PCBs at concentrations ≥50 ppm—**applicable** | 40 *CFR* 761.50(a) |
| | Any person cleaning up and disposing of PCBs shall do so based on the concentration at which PCBs are found. | Generation of PCB remediation waste as defined in 40 *CFR* 761.3—**applicable** | 40 *CFR* 761.61 |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| ***Waste generation, characterization, segregation, and storage--excavated soil, scrap metal, secondary wastes (cont.)*** | | | |
| Management of PCB/radioactive waste (*e.g., contaminated PPE, scrap metal, soil, debris*) | Any person storing such waste must do so taking into account both its PCB concentration and radioactive properties, except as provided in 40 *CFR* 761.65(a)(1), (b)(1)(ii) and (c)(6)(i). | Generation for disposal of PCB/ radioactive waste with ≥ 50 ppm PCBs—**applicable** | 40 *CFR* 761.50(b)(7)(i) |
| | Any person disposing of such waste must do so taking into account both its PCB concentration and its radioactive properties. | | 40 *CFR* 761.50(b)(7)(ii) |
| | If, after taking into account only the PCB properties in the waste, it meets requirements for disposal in a facility permitted, licensed, or registered by a state as a municipal or nonmunicipal nonhazardous waste landfill, the person may dispose of such waste without regard to the PCBs, based on its radioactive properties alone, in accordance with applicable requirements. | | |
| Temporary storage of PCB waste (*e.g., contaminated PPE, debris, soil*) | Container(s) shall be marked as illustrated in 40 *CFR* 761.45(a). | Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal—**applicable** | 40 *CFR* 761.65(a)(1) |
| | Storage area must be properly marked as required by 40 *CFR* 761.40(a)(10). | | 40 *CFR* 761.65(c)(3) |
| | Any leaking PCB items and their contents shall be transferred immediately to a properly marked non-leaking container(s). | | 40 *CFR* 761.65(c)(5) |
| | Container(s) shall be in accordance with requirements set forth in DOT HMR at 49 I 171–180. | | 40 *CFR* 761.65(c)(6) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| ***Waste generation, characterization, segregation, and storage—excavated soil, scrap metal, secondary wastes (cont.)*** | | | |
| | The date shall be recorded when PCB items are removed from service, and the storage shall be managed such that PCB items can be located by this date. (*Note:* Date should be marked on the container) | PCB items (includes PCB wastes) removed from service for disposal—**applicable** | 40 *CFR* 761.65(c)(8) |
| ***Treatment/disposal of waste—excavated soils, debris, scrap metal, secondary wastes*** | | | |
| Disposal of RCRA hazardous waste in a land-based unit (*e.g., debris coated with lead-based paint*) | May be land-disposed if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at 40 *CFR* 268.40 before land disposal. | Land disposal, as defined in 40 *CFR* 268.2, of restricted RCRA waste—**applicable** | 40 *CFR* 268.40(a); Rules of the TDEC Chap. 1200-1-11-.10(3)(a) |
| | May be land-disposed if meets requirements in the table "Alternative Treatment Standards for Hazardous Debris" at 40 *CFR* 268.45 before land disposal or debris is treated to waste-specific treatment standard provided in 40 *CFR* 268.40 for waste contaminating the debris. | Land disposal, as defined in 40 *CFR* 268.2, of restricted RCRA-hazardous debris—**applicable** | 40 *CFR* 268.45(a); Rules of the TDEC Chap. 1200-1-11-.10(3) (f)(1) |
| | Must be treated in accordance with the alternative treatment standards of 40 *CFR* 268.49(c) or according to the UTSs specified in 40 *CFR* 268.48 applicable to the listed and/or characteristic waste contaminating the soil before land disposal. | Land disposal, as defined in 40 *CFR* 268.2, of restricted hazardous soil—**applicable** | 40 *CFR* 268.49(b); Rules of the TDEC Chap. 1200-1-11-10(3)(J)(2) |
| | Are not prohibited if the wastes no longer exhibit a characteristic at the point of land disposal, unless the wastes are subject to a specified method of treatment other than DEACT in 40 *CFR* 268.40 or are D003 reactive cyanide. | Land disposal of restricted RCRA characteristically hazardous wastes—**applicable** | 40 *CFR* 268.1(c)(4)(iv); Rules of the TDEC Chap. 1200-1-11-.10(1) (a)(3)(iv)(IV) |

**ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.)**

| Medium/action | Requirements | Prerequisite | Citation(s) |
|---|---|---|---|
| | ***Treatment/disposal of waste—excavated soils, debris, scrap metal, secondary wastes (cont.)*** | | |
| Packaging of LLW for disposal (*e.g., contaminated PPE, scrap metal*) | Must have structural stability either by processing the waste or placing it in a container or structure that provides stability after disposal. | Generation of LLW for disposal at an LLW disposal facility—**relevant and appropriate** | Rules of the TDEC Chap. 1200-2-11-.17(7)(b)(1) |
| | Void spaces within the waste and between the waste and its package must be reduced to the extent practicable. | | Rules of the TDEC Chap. 1200-2-11-.17(7)(b)(3) |
| Treatment of LLW | Treatment to provide more stable waste forms and to improve the long-term performance of an LLW disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility. | Generation of LLW for disposal at an LLW disposal facility—**TBC** | DOE M 435.1-1(IV)(O) |
| Disposal of solid LLW (*e.g., debris, scrap metal, soil*) | LLW shall be certified as meeting waste acceptance requirements before it is transferred to the receiving facility. | Generation of LLW for disposal at a DOE facility—**TBC** | DOE M 435.1-1(IV)(J)(2) |
| Disposal of PCB cleanup wastes (*e.g., contaminated PPE, nonliquid cleaning materials*) | Shall be disposed of in one of the following methods:<br>• in a facility permitted, licensed, or registered by a state to manage municipal solid waste under 40 *CFR* 258 or nonmunicipal, nonhazardous waste subject to 40 *CFR* 257.5–257.30;<br>• in a RCRA Subtitle C landfill permitted by a state to accept PCB waste;<br>• in an approved PCB disposal facility; or<br>• through decontamination under 40 *CFR* 761.79(b) or (c). | Generation of nonliquid PCBs at any concentration during and from the cleanup of PCB remediation waste—**applicable** | 40 *CFR* 761.61(a)(5)(v)(A) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | ***Treatment/disposal of waste—excavated soils, debris, scrap metal, secondary wastes (cont.)*** | | |
| Disposal of PCB cleaning solvents, abrasives, and equipment | May be reused after decontamination in accordance with 40 *CFR* 761.79. | Generation of PCB wastes from the cleanup of PCB remediation waste—**applicable** | 40 *CFR* 761.61(a)(5)(v)(B) |
| Disposal of PCB remediation waste (*e.g., soil*) | May be disposed of by one of the following methods:<br>• in a high-temperature incinerator approved under 40 *CFR* 761.70(b),<br>• by an alternate disposal method approved under 40 *CFR* 761.60(e),<br>• in a chemical waste landfill approved under 40 *CFR* 761.75,<br>• in a facility with a coordinated approval issued under 40 *CFR* 761.77, or<br>• through decontamination in accordance with under 40 *CFR* 761.79. | Disposal of nonliquid PCB remediation waste as defined in 40 *CFR* 761.3—**not applicable** | 40 *CFR* 761.61(b)(2)<br>40 *CFR* 761.61(b)(2)(i)<br>40 *CFR* 761.61(b)(2)(ii) |

**ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.)**

| Medium/action | Requirements | Prerequisite | Citation(s) |
|---|---|---|---|
| | ***Treatment/disposal of waste—excavated soils, debris, scrap metal, secondary wastes (cont.)*** | | |
| Disposal of PCB bulk product waste (*e.g., debris or scrap metal with PCB painted surfaces*) | May be disposed of by one of the following methods:<br>• in an incinerator approved under 40 *CFR* 761.70,<br>• in a chemical waste landfill approved under 40 *CFR* 761.75,<br>• in a hazardous waste landfill permitted by EPA under RCRA Sect. 3004 or by authorized state under RCRA Sect. 3006,<br>• under alternate disposal approved under 40 *CFR* 761.60(e),<br>• in accordance with decontamination provisions of 40 *CFR* 761.79, or<br>• in accordance with thermal decontamination provisions of 40 *CFR* 761.79(e)(6) for metal surfaces in contact with PCBs. | Disposal of PCB bulk product waste as defined in 40 *CFR* 761.3—**applicable** | 40 *CFR* 761.62(a)<br>• 40 *CFR* 761.62(a)(1)<br>• 40 *CFR* 761.62(a)(2)<br>• 40 *CFR* 761.62(a)(3)<br>• 40 *CFR* 761.62(a)(4)<br>• 40 *CFR* 761.62(a)(5)<br>• 40 *CFR* 761.62(a)(6) |
| | ***Institutional controls—all contaminated soil left in place*** | | |
| Waste left in place | Institutional controls are required and shall include, at a minimum, administrative restrictions for sale and use of property and securing area to prevent human contact with hazardous substances. | Hazardous substances left in place that might pose an unreasonable threat to public health, safety, or the environment—**relevant and appropriate** | Rules of the TDEC Chap. 1200-1-13-.08(10) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | ***Institutional controls—all contaminated soil left in place (cont.)*** | | |
| Radioactive material left in place | A property may be maintained under interim-management-provided administrative controls established to protect members of the public. | Residual radioactive material above guidelines in inaccessible locations that would be unreasonably costly to remove—**TBC** | DOE Order 5400.5(IV)(6)(c)(1) |
| | Controls include, but are not limited to, periodic monitoring as appropriate; appropriate shielding; physical barriers (i.e., fences, warning signs) to prevent access; appropriate radiological safety measures during maintenance, renovation, demolition, or other activities that might disturb the residual radioactive material or cause it to migrate. | | DOE Order 5400.5(IV)(6)(c)(2) |
| | ***Transportation*** | | |
| Transportation of hazardous materials | Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 *CFR* 171–180. | Any person who, under contract with a department or agency of the federal government, transports "in commerce," or causes to be transported or shipped, a hazardous material—**applicable** | 49 *CFR* 171.1(c) |
| Transportation of radioactive waste | Shall be packaged and transported in accordance with DOE Order 460.1A and DOE Order 460.2. | Shipment of LLW off-site—**TBC** | DOE M435.1-(I)(1)(E)(11) |

| ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee (cont.) | | | |
|---|---|---|---|
| **Medium/action** | **Requirements** | **Prerequisite** | **Citation(s)** |
| | | ***Transportation (cont.)*** | |
| Transportation of LLW | To the extent practical, the volume of the waste and the number of the shipments shall be minimized. | Shipment of LLW off-site—**TBC** | DOE M 435.1-1(IV)(L)(2); DOE M 435.1-1(III)(L)(2) |
| Transportation of PCB wastes | Must comply with the manifesting provisions at 40 *CFR* 761.207 through 40 *CFR* 761.218. | Relinquishment of control over PCB wastes by transporting or offering for transport—**applicable** | 40 *CFR* 761.207 (a) |
| Transportation of hazardous waste off site | Must comply with the generator requirements of 40 *CFR* 262.20–23 for manifesting, Sect. 262.30 for packaging, Sect. 262.31 for labeling, Sect. 262.32 for marking, Sect. 262.33 for placarding, Sect. 262.40, 262.41(a) for record keeping, and Sect. 262.12 to obtain EPA ID number. | Off-site transportation of RCRA hazardous waste—**applicable** | 40 *CFR* 262.10(h); Rules of the TDEC Chap. 1200-1-11-.03(1)(a)(8) |
| | Must comply with the requirements of 40 *CFR* 263.11–263.31. | Transportation of hazardous waste within the United States requiring a manifest—**applicable** | 40 *CFR* 263.10(a); Rules of the TDEC Chap. 1200-1-11-.04(1)(a)(1) |
| | A transporter who meets all applicable requirements of 49 *CFR* 171–179 and 40 *CFR* 263.11 and 263.31 will be deemed in compliance with 40 *CFR* 263. | | |
| Transportation of hazardous waste on site | The generator manifesting requirements of 40 *CFR* 262.20–262.32(b) do not apply. Generator or transporter must comply with the requirements set forth in 40 *CFR* 263.30 and 263.31 in the event of a discharge of hazardous waste on a private or public right-of-way. | Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way—**applicable** | 40 *CFR* 262.20(f); Rules of the TDEC Chap. 1200-1-11-.03(3)(a)(6) |

**ARARs and TBC guidance for scrap metal at the Y-12 Old Salvage Yard, Oak Ridge, Tennessee**

ALARA = as low as reasonably achievable
ARAR = applicable or relevant and appropriate requirement
*CFR* = *Code of Federal Regulations*
CWA = Clean Water Act of 1972
DEACT = deactivation
DOE = U.S. Department of Energy
DOE M = *Radioactive Waste Management Manual*
DOT = U.S. Department of Transportation
EDE = effective dose equivalent
EPA = U.S. Environmental Protection Agency
HMR = Hazardous Materials Regulations
HMTA = Hazardous Materials Transportation Act
ID = identification
LLW = low-level (radioactive) waste
NPDES = National Pollutant Discharge Elimination System
PCB = polychlorinated biphenyl
PPE = personal protective equipment
RCRA = Resource Conservation and Recovery Act of 1976
TBC = to be considered (guidance)
*TCA* = *Tennessee Code Annotated*
TDEC = Tennessee Department of Environment and Conservation
UEFPC = Upper East Fork Poplar Creek
UTS = universal treatment standard
WAC = waste acceptance criteria