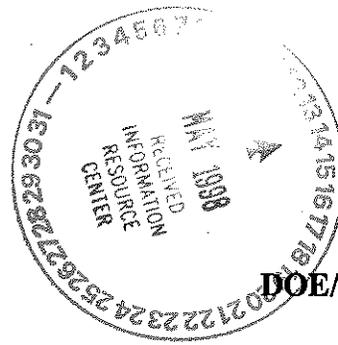


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DOE/OR/01-1726&D1

**Remedial Action Work Plan/Remedial Design Report  
for the Surface Impoundments Operable Unit Stage 1  
at the Oak Ridge National Laboratory,  
Oak Ridge, Tennessee**



CLEARED FOR  
PUBLIC RELEASE *p.c.*

**Remedial Action Work Plan/Remedial Design Report  
for the Surface Impoundments Operable Unit Stage 1  
at the Oak Ridge National Laboratory,  
Oak Ridge, Tennessee**

Date Issued—April 1998

Prepared by  
Jacobs EM Team  
125 Broadway Avenue  
Oak Ridge, Tennessee

Prepared for the  
U.S. Department of Energy  
Office of Environmental Management

Environmental Management Activities at the  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee 37831  
managed by  
Bechtel Jacobs Company LLC  
for the  
U.S. Department of Energy  
under contract DE-AC05-98OR22700

## PREFACE

*This Remedial Action Work Plan/Remedial Design Report for the Surface Impoundments Operable Unit Stage 1, at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/OR/01-1726&D1)* was prepared in accordance with requirements under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. This work was performed under Work Breakdown Structure 1.4.12.6.1.01 (Activity Data Sheet 3322, "Surface Impoundments Design Documents and Design Studies"). This document provides the design information necessary to implement Stage 1 of the selected remedy in the record of decision (DOE/OR/02-1630&D2). This document provides the design specifications for the remediation contractor; defines the schedule for Stage 1 remediation and for submittal of future remedial design and remedial action documentation for regulator review and approval; provides a crosswalk relating the applicable or relevant and appropriate requirements to the design specifications implementing them, if applicable, or to the submittals for future stages where the requirements will be applicable; and discusses the goals to be attained by this stage and the means of measuring those goals.

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## ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
BMP	best management practices
CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
EDE	effective dose equivalent
EPA	U.S. Environmental Protection Agency
ft	foot
gal	gallon
ha	hectare
L	liter
LDR	land disposal restriction
LLW	low-level (radioactive) waste
m	meter
mrem	millirem
mSv	millisievert
NHPA	National Historic Preservation Act of 1966
NPDES	National Pollutant Discharge Elimination System
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations
PCB	polychlorinated biphenyl
ppm	parts per million
RAWP	remedial action work plan
RCRA	Resource Conservation and Recovery Act of 1976
RDR	remedial design report
RDWP	remedial design work plan
ROD	record of decision
SIOU	Surface Impoundments Operable Unit
TBC	to be considered
TDEC	Tennessee Department of Environment and Conservation
USC	<i>United States Code</i>
WAC	waste acceptance criteria



## EXECUTIVE SUMMARY

Surface Impoundments Operable Unit (SIOU) in the Bethel Valley watershed of Oak Ridge National Laboratory consists of four impoundments containing low-level (radioactive) waste. The project is in the south-central part of the laboratory's main plant area, north of White Oak Creek. The purpose of the project is to reduce risk through remediation of the contaminant sources in the four surface impoundments. Media specifically included in the scope are the surface water and sediment in the impoundments that resulted from liquid waste treatment. Residual contamination in groundwater and soils within the boundaries of the project will be addressed separately in the Bethel Valley watershed decision-making process.

Stage 1 of the SIOU project includes relocation of the sediment, surface water, and approximately 0.03 m (0.1 ft) of subimpoundment soil from Impoundments C (3539) and D (3540) to Impoundment B (3513). As an option, the subimpoundment soil could be placed in appropriate containers and stored or disposed of if this would be more cost-effective for Stage 1 and Stage 2 actions (i.e., remediation of Impoundments A and B) combined. After removal of the waste, the small impoundments will be backfilled to provide a staging area for remediation of the larger impoundments.

This remedial action work plan/remedial design report specifies the design and plans for actions to be taken for Stage 1 remediation, illustrates to regulators how those requirements meet the applicable or relevant and appropriate requirements pertinent to the Stage 1 actions, updates the proposed schedule, and specifies goal attainment. Contractor submittals required herein will be transmitted to the regulators for information after U.S. Department of Energy (or designated representative) approval.



# 1. INTRODUCTION

This remedial action work plan (RAWP)/remedial design report (RDR) specifies the design and plans for actions to be taken for Stage 1 remediation of the Surface Impoundments Operable Unit (SIOU) at Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee. The SIOU is in the Bethel Valley watershed and consists of Impoundment A (3524), Impoundment B (3513), and Impoundments C and D (3539 and 3540). The SIOU is in the south-central part of the ORNL main plant area, north of White Oak Creek. The purpose of the SIOU project is to reduce risk to human health and the environment through source remediation in the four surface impoundments. As specified in the September 1997 record of decision (ROD) for SIOU (DOE 1997a), media specifically included in the scope are the surface water and sediment in the impoundments that resulted from liquid waste treatment. Incidental soils that may be encountered during sediment and water remediation will be handled appropriately. Residual contamination in groundwater and soils within the boundaries of SIOU will be addressed under the Bethel Valley watershed ROD.

Stage 1 of the SIOU project includes relocation of the sediment and surface water from Impoundments C and D to Impoundment B and backfilling Impoundments C and D to provide a staging area for remediation of the larger impoundments. To ensure adequate removal of sediment, approximately 0.03 m (0.1 ft) of subimpoundment soil (excluding bedrock and riprap) under Impoundments C and D will be removed and transferred to Impoundment B or containerized and either stored on site or transported to an U.S. Environmental Protection Agency (EPA)-approved treatment, storage, or disposal facility.

## 1.1 PURPOSE OF THE RAWP/RDR

The remedial design process began with approval of the ROD (DOE 1997a) on September 24, 1997. A remedial design work plan (RDWP) (DOE 1998), submitted to regulators with a cover letter dated March 13, 1998, provided a proposed schedule for SIOU remedial design and remedial actions and identified the applicable or relevant and appropriate requirements (ARARs) to be addressed during remediation. The purpose of this RAWP/RDR is to specify the design requirements for the Stage 1 remedial actions, describe how those requirements meet the ARARs pertinent to the Stage 1 actions, update the proposed schedule, and specify goal attainment.

## **1.2 SCOPE OF THE RAWP/RDR**

The following items are included in the scope of this RAWP/RDR:

- an update of the schedule proposed in the RDWP to include all Stage 1 remediation activities and remediation monitoring activities, and future stage design submittals to regulators;
- design requirements (the RDR) for the remediation contractor;
- a crosswalk of each ARAR identified in the ROD that provides the citation(s) and (1) identifies the work instructions that implement that ARAR, if pertinent to Stage 1 actions, (2) defines future submittals (RDR/RAWPs) that will provide specifications implementing ARARs pertinent to future stages of remedial actions, or (3) justifies why an ARAR identified in the ROD is no longer pertinent to this project; and
- a summary level description of how attainment of Stage 1 goals will be demonstrated.

## **2. PROJECT SCHEDULE**

The ROD for SIOU (DOE 1997a) was signed on September 24, 1997. A post-ROD sampling plan for Impoundments C and D was submitted to EPA and Tennessee Department of Environment and Conservation (TDEC) who concurred with the plan November 25, 1997. The D2 RDWP was submitted with a letter dated March 13, 1998. Table 1 lists the scheduled dates for design submittals and reviews for Stage 1 and Stage 2 remedial actions for SIOU. Federal Facility Agreement documentation milestones are shown in bold. Other dates are provided for context, but do not represent firm deliverable dates.

## **3. REMEDIAL DESIGN REPORT**

This RDR defines the remediation contractor requirements that concern compliance with ARARs.

Table 1. Remedial design schedule, SIOU, ORNL, Oak Ridge, Tennessee

Item	Scheduled date
<i>Stage 1--Relocate waste from Impoundments C and D</i>	
Submit RDR and RAWP (this document), D1 <sup>a</sup>	May 4, 1998
EPA and TDEC comments <sup>b</sup>	May 18, 1998
Submit RDR and RAWP, D2 <sup>c</sup>	June 1, 1998
EPA and TDEC approval	June 15, 1998
Procurement	June 22, 1998
Fieldwork <sup>d</sup> (start date-completion date)	July 13, 1998-September 28, 1998
<i>Stage 2--Remediate Impoundments A and B</i>	
Design/build contractor procurement	October 2, 1998
Contractor presentation of design	February 12, 1999
Submit RDR and RAWP, D1 <sup>a</sup>	April 21, 1999
EPA and TDEC comments <sup>b</sup>	July 26, 1999
Submit RDR and RAWP, D2 <sup>c</sup>	September 28, 1999
EPA and TDEC approval	October 27, 1999

<sup>a</sup>Milestone date is August 30, 1998.

<sup>b</sup>FFA protocol would be 90 days for regulator review.

<sup>c</sup>Milestone protocol date would be 60 days after receipt of regulator comments.

<sup>d</sup>Scheduled remediation start date.

EPA = U.S. Environmental Protection Agency  
 FFA = Federal Facility Agreement  
 ORNL = Oak Ridge National Laboratory  
 RAWP = remedial action work plan

RDR = remedial design report  
 SIOU = Surface Impoundments Operable Unit  
 TDEC = Tennessee Department of Environment and Conservation

### 3.1 CONSTRUCTION ACTIVITIES

Remediation of Impoundments C (3539) and D (3540) will be performed in three steps: (1) relocation of sediment and surface water to Impoundment B (3513), (2) removal of 0.03 m (0.1 ft) of subimpoundment soil and transfer to Impoundment B or containerization and on-site storage or shipment of containers to an approved treatment, storage, or disposal facility, and (3) backfilling Impoundments C and D.

### **3.1.1 Step 1—Relocation of Sediment and Surface Water to Impoundment B**

The contractor shall transfer sediment from Impoundments C and D to Impoundment B, which is approximately 15 m (50 ft) west of the respective ponds. Large debris shall be cleared from the surface of the sediment and decontaminated to the extent practical, radiologically surveyed, and if required, containerized for subsequent storage or shipment before initial sediment pumping operations begin. Clearing of large debris will prevent potential blockage of pumping equipment which will help expedite the transfer of sediment. The contractor may relocate sediment using air-operated double diaphragm pumps or other suitable equipment.

Sediment transfer may be performed in sections. Walkboards, as used in past sampling operations, could allow access to each section of the ponds. The intake hose could be modified with a vacuum-type head with a filter screen attached to sweep the pond bottoms.

The contractor shall provide secondary containment for the pumping operations to prevent any spread of transferred materials outside of the containment area in case of failure of equipment or hoses. The discharge of the hose shall be below the water surface in Impoundment B.

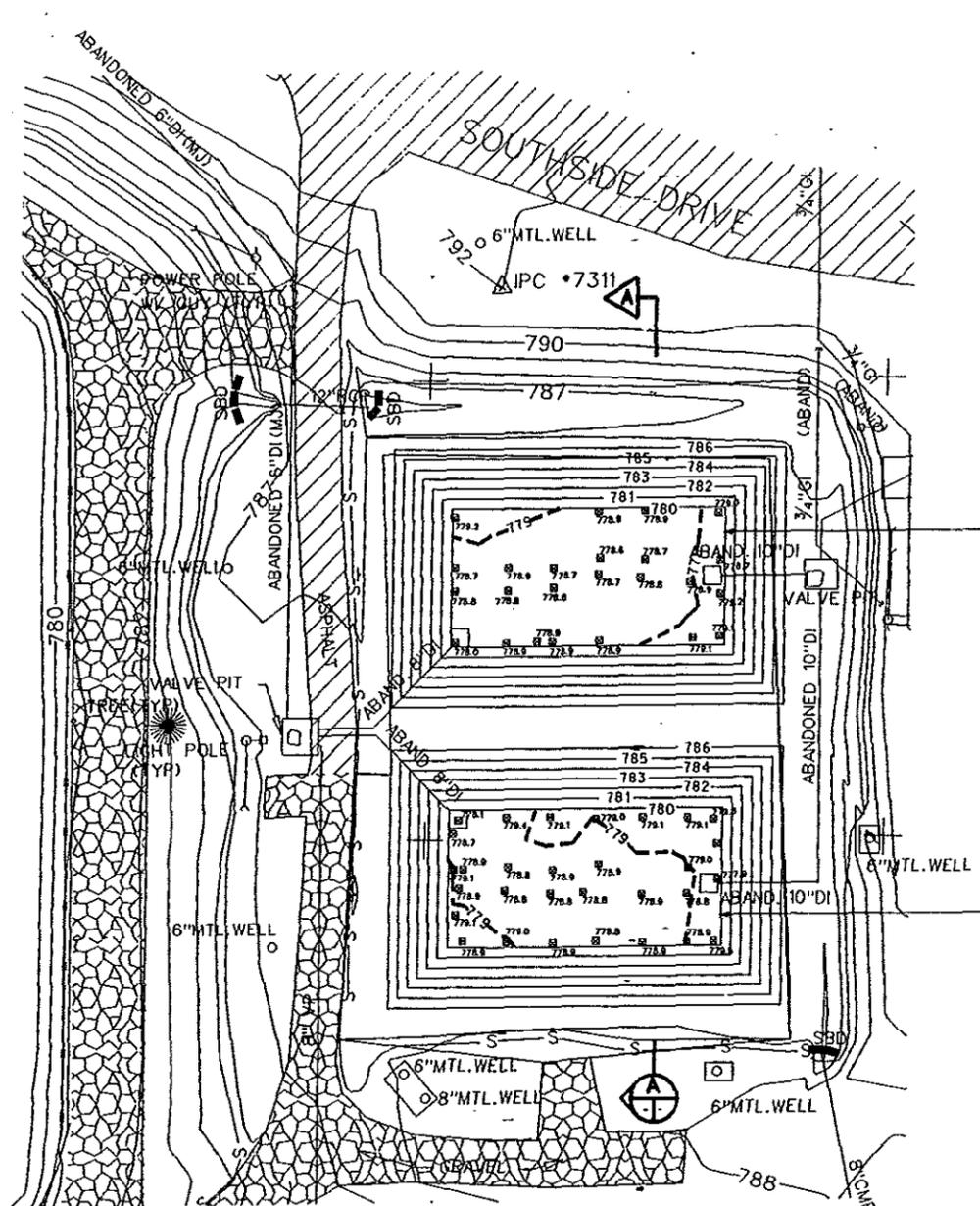
A water supply will be made available to the contractor. The contractor shall rinse/slurice visible sediment materials from the sides of the impoundments and the top of the clay liner toward a pump located in the low point of the impoundment to address sediment not removed in the initial pumping process. At all times, the contractor shall keep the impoundment bottom moist (using a water spray as needed) to prevent airborne releases of dust.

When U.S. Department of Energy (DOE) (or a designated representative) has visually determined that sediment has been removed satisfactorily, the contractor will be authorized to proceed to the next step.

### **3.1.2 Step 2—Removal of Subimpoundment Soil and Transfer to Impoundment B or Containerization and On-Site Storage or Shipment of Containers to an Approved Treatment, Storage, or Disposal Facility**

After completion of sediment removal, subimpoundment soil from the bottom of Impoundments C and D shall be removed to a depth of at least 0.03 m (0.1 ft) below the existing top of clay as presented on Figure 1. The contractor may either transfer the subimpoundment soil to Impoundment B or place the soil into approved storage/transport containers.

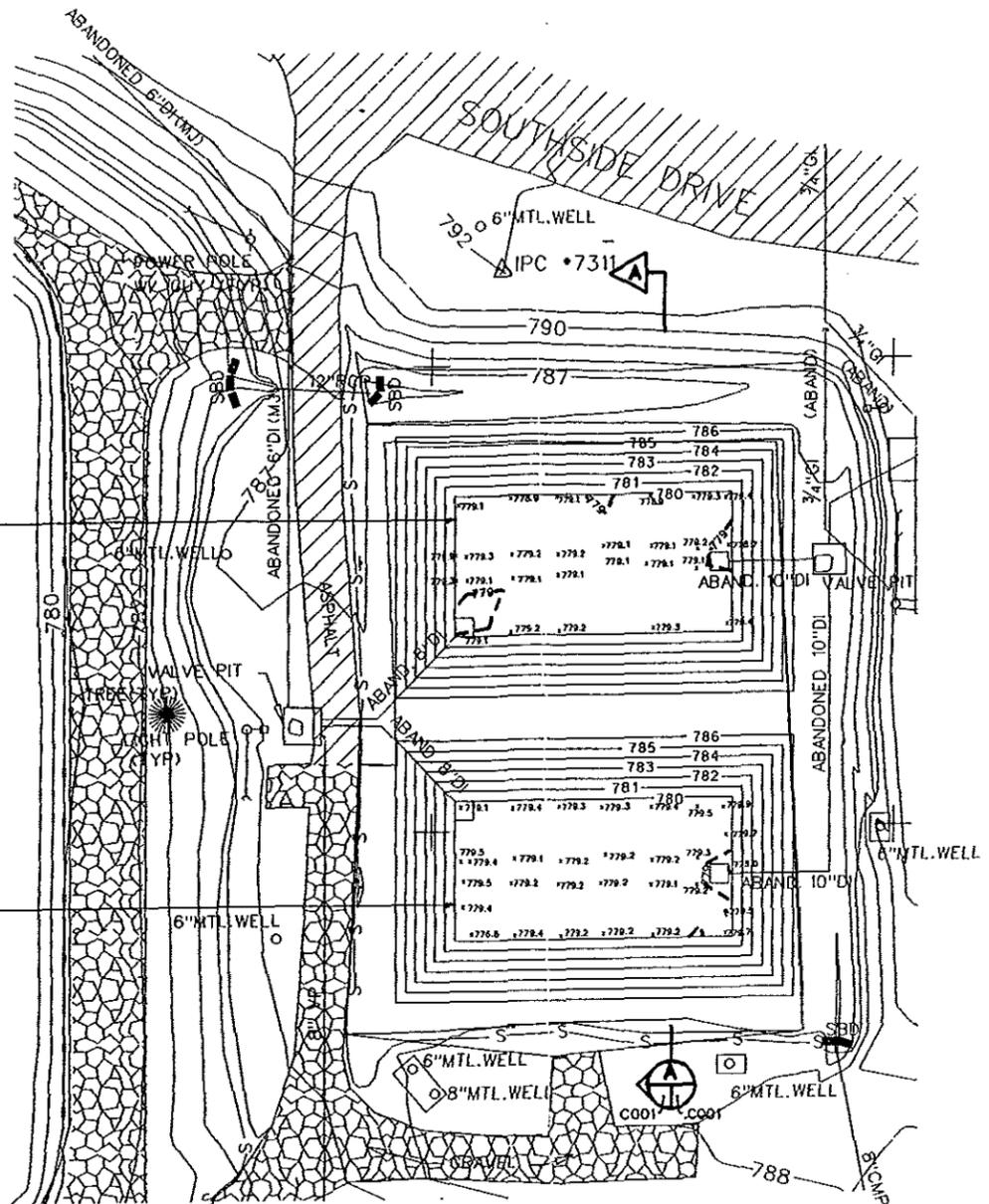
If the soil is transferred to Impoundment B, the contractor shall use methods that ensure no releases of particulate matter to the air and no spills of solid or liquid material. For example, the contractor may transfer the soil in a slurry through hoses or pipelines with secondary



**IMPOUNDMENT C AND D  
TOP OF CLAY ELEVATIONS**

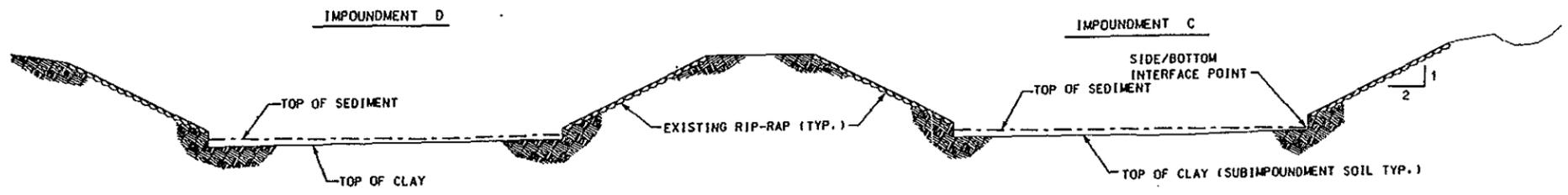
IMPOUNDMENT C (3539)

IMPOUNDMENT D (3540)



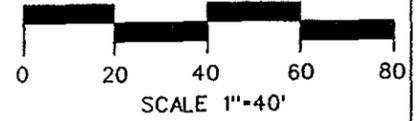
**IMPOUNDMENT C AND D  
TOP OF SEDIMENT ELEVATIONS**

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**SECTION A**  
NOT TO SCALE

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**BECHTEL  
JACOBS**

**SIU REMEDIAL ACTION**

**IMPOUNDMENT C & D  
TOP OF CLAY &  
SEDIMENT ELEVATIONS  
& CONTOURS**

DATE: 4/28/98

FIG. 1

containment, discharging below the Impoundment B water surface in a manner that will prevent releases to the ground. Alternately, the contractor may transfer the soil as moist, solid material in containers or vehicles that provide containment and spill-prevention features. Soil transferred to Impoundment B shall be carefully placed in a manner that minimizes splashing of impoundment water.

If the soil is to be containerized and stored or transported off site, material removed shall be placed into containers that meet packaging, labeling, marking, placarding, and pretransport requirements specified in 49 *Code of Federal Regulations* (CFR) 171, 172, 173, 174, 177, 179, and DOE Order 460.1, "Packaging and Transportation Safety." If waste includes radioactive materials above exempt quantities, the containers must meet packaging requirements based on the maximum activity of radioactive material in a package per 49 CFR 173.431, 49 CFR 173.433, 49 CFR 173.435, and 49 CFR 173.411.

Containerized waste shall either be stored on site or shipped to an approved treatment, storage, or disposal facility as directed by DOE. If waste is stored, storage shall comply with DOE Order 5820.2A, "Radioactive Waste Management." If waste is shipped from one DOE field organization to another, the contractor shall certify that the waste meets the receiving facility's waste acceptance criteria (WAC) according to DOE Order 5820.2A(III). If waste is shipped to a commercial facility, DOE Oak Ridge Operations (ORO) must approve a request for exemption from the on-site disposal requirements of DOE Order 5820.2A, and the shipment must meet DOE Order and implementing procedural requirements for off-site shipments. Before sending any waste to an off-site facility, a copy of EPA's notice that the facility is approved to accept Comprehensive Environmental Response, Compensation, and Liability Act of 1980 waste (40 CFR 300.440) must be obtained.

The contractor shall take precautions to ensure that no materials removed from Impoundments C and D are spilled during transfer. The contractor shall maintain all materials before and during transfer in a moist condition with a water spray as needed. The contractor shall maintain the bottom of the impoundment in a moist condition with a water spray until backfill of the impoundments according to Step 3 is underway.

The contractor shall survey the impoundment bottoms and compare final elevations to the elevations as presented on Figure 1 to ensure that at least 0.03 m (0.1 ft) of subimpoundment soil has been removed. The contractor will notify DOE (or designated representative) at least 48 hours before the site is to be surveyed and will allow 2 days for DOE (or designated representative) sampling and radiological surveys. DOE or their representative will perform a walkover radiation survey and collect archival samples consistent with guidance from the

*Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (EPA 1997) to support the Bethel Valley watershed decision-making process. DOE or their representative will notify EPA and TDEC 24 hours in advance and will allow EPA and TDEC to observe or participate in the sampling and survey activities. When DOE (or designated representative) has determined that all materials have been satisfactorily removed and archival samples are taken, the contractor shall proceed with Step 3.

### **3.1.3 Step 3—Backfilling Impoundments C and D**

The contractor shall backfill Impoundments C and D as shown and described on Figure 2.

## **3.2 SAFETY AND ENVIRONMENTAL PROTECTION REQUIREMENTS**

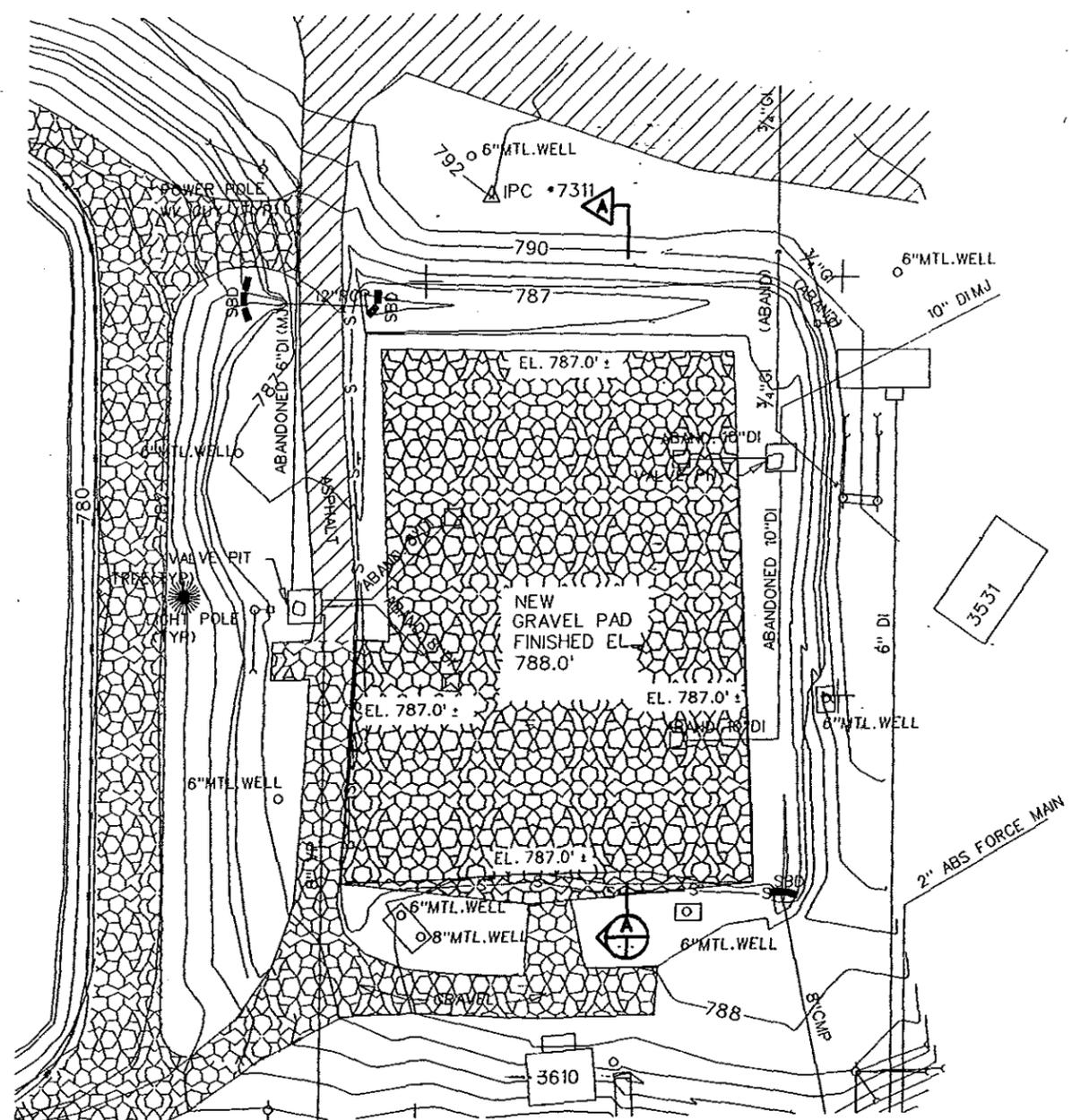
### **3.2.1 Control of Releases of Contamination**

All contaminated solid materials (sediment and subimpoundment soil) shall be maintained in a moist condition to prevent any releases to the atmosphere. This applies to all materials during removal and on-site transportation or transfer. This also applies to the bottom and sides of Impoundments C and D after removal of sediment and 0.03 m (0.1 ft) of subimpoundment soil, before backfilling the impoundments.

The contractor shall develop for DOE (or a designated representative) approval, and implement subject to DOE (or designated representative) oversight, a spill prevention, control, containment, and cleanup plan for any contaminated material being transferred through pipelines or transported in vehicles. The site shall be controlled as a Hazardous Waste Operations and Emergency Response site per 29 CFR 1910.120 with appropriate control boundaries between the exclusion zone (contaminated work area), the contamination reduction zone (decontamination and monitoring area), and the support zone. No personnel, equipment, or materials may pass from the contamination reduction zone to the support zone before monitoring by appropriately trained personnel and confirmation that no uncontrolled or uncontained contamination leaves the site.

### **3.2.2 As Low As Reasonably Achievable Plan**

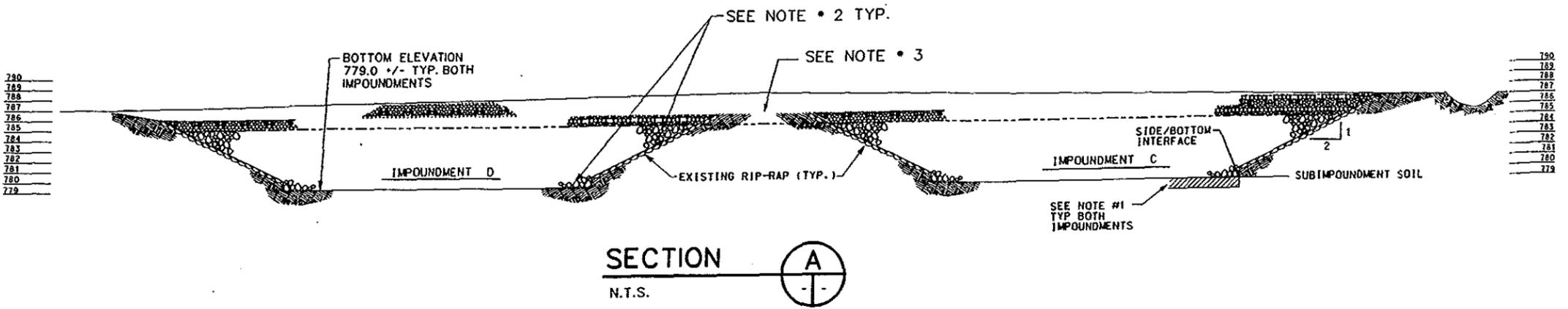
The contractor shall develop for DOE (or a designated representative) approval and implement subject to DOE (or designated representative) oversight a plan to ensure that exposures to all employees and to the public are maintained as low as reasonably achievable (ALARA). The plan shall include, as appropriate, training, radiation monitoring, supervision by radiation protection personnel, site access restrictions, elimination of unnecessary personnel from exclusion areas, time limitations for employee access to radiation areas, shielding provisions (including maintaining the water shielding on Impoundments A and B), prevention of releases to the



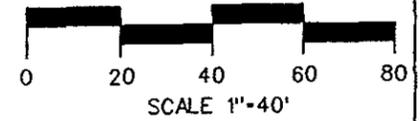
PLAN

NOTES

1. REMOVE BETWEEN A MINIMUM OF 0.1' AND MAXIMUM 0.2' OF CLAY FROM BOTTOM OF IMPOUNDMENTS C & D AND TRANSFER TO IMPOUNDMENT B.
2. PLACE A FREE DRAINING, DURABLE ROCK FILL OF APPROXIMATE UNIFORM SIZE SUCH THAT THE DIAMETER DOES NOT EXCEED 30 INCHES. ROCK FILL SHALL CONTAIN LESS THAN 5% OF FINES. ROCK FILL SHALL BE PLACED TO APPROXIMATELY 18 IN. BELOW FINAL ELEVATION. FILL IMPOUNDMENT WITH FLOWABLE FILL TO APPROXIMATELY 12 IN. BELOW FINAL ELEVATION.
3. CROWN ENTIRE SITE WITH COMPACTED AGGREGATE BASE TO THE ELEVATIONS SHOWN TO ENSURE POSITIVE DRAINAGE. AGGREGATE SHALL BE CLASS A, GRADATION D, IN ACCORDANCE WITH TDOT.



SECTION A-A  
N.T.S.



<b>SIOU REMEDIAL ACTION</b>	
<b>EXISTING GRADE AND IMPOUNDMENT C &amp; D RESTORATION PLAN</b>	
DATE: 4/28/98	FIG. 2

environment, and other provisions needed to meet the intent of DOE Order 5400.5, "Radiation Protection of the Public and the Environment" [Sect. (I.4)].

### **3.2.3 Control of Stormwater Discharges**

The contractor shall develop for DOE (or a designated representative) approval and implement subject to DOE (or designated representative) oversight a plan to control stormwater discharges including:

- documentation of best management practices (BMP) in a stormwater control plan or equivalent,
- minimal clearing for grading,
- removal of vegetation cover only within 20 days of construction,
- weekly erosion control inspections and maintenance,
- control measures to detain runoff, and
- discharges that do not cause erosion.

### **3.2.4 Control of Nonpoint-Source Air Emissions**

The contractor shall develop for DOE (or a designated representative) approval and implement subject to DOE (or designated representative) oversight a plan to prevent particulate matter from becoming airborne to the extent reasonable. No visible emissions of fugitive dust (e.g., from construction traffic on uncontaminated dirt roads) are permitted beyond ORNL boundary lines for more than 5 minutes/hour or 20 minutes/day.

Compliance with National Emission Standards for Hazardous Air Pollutants (40 CFR 61.92 and 40 CFR 61.93) and with DOE ALARA requirements will be ensured by monitoring ambient air near the boundary of the SIOU project for radionuclide emissions.

## **3.3 MANAGEMENT OF LOW-LEVEL (RADIOACTIVE) WASTE**

The contractor shall develop for DOE (or designated representative) approval and implement subject to DOE (or designated representative) oversight a plan to characterize and segregate low-level (radioactive) waste (LLW) from uncontaminated waste and otherwise minimize the amount of LLW generated per DOE Order 5820.2A. DOE (or a designated

representative) will survey any material designated by the contractor as uncontaminated. If the material meets current free-release requirements, the material may be removed from the site and handled as nonhazardous, nonradioactive material. Subsequent management of LLW must also be in accordance with DOE Order 5820.2A(III.3).

#### **4. GOAL ATTAINMENT**

The goal of Stage 1 of this remedial action for SIOU is removal of potential contamination sources (i.e., the sediment and surface water) from Impoundments C and D. The SIOU ROD selected a final action for the sources included in the scope of the operable unit. However, the Bethel Valley watershed ROD will determine the final land use designation for the entire watershed including this site and define additional actions for surrounding residual contamination as needed to ensure protectiveness for that land use.

Section 3.1 specifies construction activities that will meet these goals. Sections 3.1.1 and 3.1.2 define the removal methods. Section 3.1.2 also defines the method used to verify that removal of contaminated media is adequate. Specifically, the bottoms of Impoundments C and D will be surveyed and compared to the as-built elevations of the top of the clay liner to ensure that 0.03 m (0.1 ft) of subimpoundment soil has been removed. This physical survey will be sufficient to verify that the remediation goal for these two impoundments have been met. In addition, a walkover radiation survey and archival soil samples will be collected for support of the Bethel Valley watershed decision-making process. EPA and TDEC will be provided the opportunity to observe or participate in survey and sampling activities.

#### **5. ARAR CROSSWALK**

This section lists each requirement identified in the SIOU ROD; specifies whether the requirement was determined to be applicable, relevant and appropriate, or to be considered (TBC) in the ROD; and states the citation that drives the requirement. The ARARs are listed in two sections: (1) ARARs pertinent to Stage 1 actions (this section identifies the work instructions in Section 3 or other actions that implement the ARARs and, if appropriate, defines submittals for future stages that will provide specifications implementing the ARARs) and (2) ARARs identified in the ROD no longer pertinent to this project (this section provides a justification why the ARAR is no longer pertinent).

## 5.1 ARARs PERTINENT TO STAGE 1 ACTIONS

**ARAR—Actions Impacting Historic or Archaeologic Resources (ROD Determination—Applicable):** Action(s) that will affect such resources must adhere to the DOE/ORO Programmatic Agreement (May 6, 1994). When alteration or destruction of the resource is unavoidable, steps must be taken to minimize or mitigate the impacts and to preserve data and records of the resource.

**Citation:** National Historic Preservation Act of 1966 (NHPA) [16 *United States Code* (USC) 470a-w], Executive Order 11593, 36 CFR 800, and DOE/ORO Programmatic Agreement (May 6, 1994) (TBC).

**Requirement Met:** DOE issued a mitigation package (Moore 1995) February 1995 to the Tennessee State Historic Preservation Office providing historical documentation of the SIOU site pursuant to Section 110(b) of the NHPA, 16 USC Section 470h-2(b). DOE and the Tennessee State Historic Preservation Office executed a Memorandum of Agreement, April 20, 1995, (Klima 1995) agreeing that DOE can proceed with remediation of SIOU. The April 25, 1995, cover letter from the advisory council on historic preservation (Klima 1995) verifies that DOE has fulfilled their responsibilities under Section 106 of the NHPA and the council's regulations.

**ARAR—Point-Source Discharge of Radionuclides into the Ambient Air from a DOE Facility (ROD Determination—Applicable):** Exposures to members of the public from all radiation sources released into the atmosphere shall not cause an effective dose equivalent (EDE) to be > 10 mrem (0.1 mSv)/year.

**Citation:** 40 CFR 61.92 and *Rules of the Tennessee Department of Environment and Conservation*, Chapter 1200-3-11-.08.

**Applicability:** The ROD considered this ARAR applicable at the facility boundary based on the potential for emissions associated with a treatment unit for remediation of Impoundments C and D (if needed) or Impoundments A and B. The regulation is considered relevant and appropriate to the SIOU and adjacent areas required to implement this action.

**Addressed In:** Section 3.2.1. Requirement to keep all material in a moist condition will prevent airborne releases. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Point-Source Discharge of Radionuclides into the Ambient Air from a DOE Facility (ROD Determination—Applicable):** Radiological emission measurements must be

performed at all release points with a potential to discharge radionuclides into the air in quantities that could cause an EDE in excess of 1 percent of the standard (0.1 mrem/year) as measured at the facility boundary. All radionuclides that could contribute > 10 percent of the standard (1 mrem/year) for the release point shall be measured.

**Citation:** 40 CFR 61.93 and Rules of the TDEC 1200-3-11-.08.

**Applicability:** No treatment plant is needed for the Stage 1 actions for Impoundments C and D; therefore, there are no point-source discharges and this ARAR is not applicable. However, the requirement is considered relevant and appropriate and will view the SIOU site as the facility boundary for radiological monitoring purposes.

**Addressed In:** Section 3.2.1. Monitoring of radionuclide emissions will be conducted near the SIOU site boundary. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Release of Radionuclides into the Environment (ROD Determination—TBC):** DOE will carry out all DOE activities to ensure that radiation doses to individuals are ALARA.

**Citation:** DOE Order 5400.5(I.4) and 10 CFR 834 (proposed).

**Addressed In:** Section 3.2.2. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Release of Radionuclides into the Environment (ROD Determination—TBC):** Exposures to members of the public from all radiation sources shall not cause an EDE to be > 100 mrem (1 mSv)/year.

**Citation:** DOE Order 5400.5(II.1a) and 10 CFR 834 (proposed).

**Addressed In:** Section 3.2.1. Requirements to keep all material moist will prevent exposure from airborne releases. Requirements for spill prevention and control addresses potential releases to the ground. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Control of Stormwater Discharges Associated with Construction Activities at Industrial Sites [ROD Determination—Relevant and Appropriate for Site with < 2 ha (5 acres) Affected]:** Implement good site planning and BMP to control stormwater discharges including:

- documentation of BMP in a stormwater control plan or equivalent,

- minimal clearing for grading,
- removal of vegetation cover only within 20 days of construction,
- weekly erosion control inspections and maintenance,
- control measures to detain runoff, and
- discharges that do not cause erosion.

**Citation:** 40 CFR 122 and Rules of the TDEC 1200-4-10-.05

**Addressed In:** Section 3.2.3. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Nonpoint-Source Air Emissions (ROD Determination—Applicable):** Take reasonable precautions to prevent particulate matter from becoming airborne; no visible emissions are permitted beyond property boundary lines for more than 5 minutes/hour or 20 minutes/day. Potential nonpoint-sources of fugitive emissions are included in the plantwide fugitive emissions plan.

**Citation:** Rules of the TDEC 1200-3-8-.01.

**Addressed In:** Section 3.2.4. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Generators of LLW (ROD Determination—TBC):** LLW generators must characterize and segregate LLW from uncontaminated waste and otherwise minimize the amount of LLW generated. Subsequent management of LLW must be in accordance with DOE Order 5820.2A.

**Citation:** DOE Order 5820.2A(III.3).

**Addressed In:** Section 3.2.5. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Transportation of Hazardous and Radioactive Materials Above Exempt Quantities (ROD Determination—Applicable):** The waste must meet packaging, labeling, marking, placarding, and pretransport requirements in accordance with U.S. Department of Transportation regulations.

**Citation:** 49 CFR 171, 172, 173, 174, 177, 178, and 179 and DOE Order 460.1 (TBC).

**Addressed In:** Section 3.1.2. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Packaging of Radioactive Materials Above Exempt Quantities for Public Transport (ROD Determination—Applicable):** Waste must meet packaging requirements based on the maximum activity of radioactive material in a package.

**Citation:** 49 CFR 173.431, 49 CFR 173.433, 49 CFR 173.435, and 49 CFR 173.411.

**Addressed In:** Section 3.1.2. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Waste Shipped from One Field Organization to Another for Disposal (ROD Determination—TBC):** Generators must certify before shipment that the waste meets the WAC of the receiving facility.

**Citation:** DOE Order 5820.2A(III).

**Addressed In:** Section 3.1.2. Will also be addressed in Stage 2 RAWP/RDR.

**ARAR—Shipments of LLW (ROD Determination—TBC):** LLW must be disposed of on site; if off-site disposal is required because of lack of capacity, disposal must be to a DOE facility. Off-site disposal of LLW to a commercial facility requires an exemption from the on-site disposal requirements of DOE Order 5820.2A; requests for exemption must be approved by the DOE ORO. Must meet DOE Order and implementing procedural requirements for off-site shipments.

**Citation:** DOE Order 5820.2A.

**Addressed In:** Section 3.1.2. Will also be addressed in Stage 2 RAWP/RDR.

## **5.2 ARARs NO LONGER PERTINENT TO THIS PROJECT**

**ARAR—Characterization/Management of Excavated Wastes, Personal Protective Equipment and Other Secondary Waste Streams Generated During Remediation Activities That Are Potentially Contaminated with Resource Conservation and Recovery Act of 1976 (RCRA)-Characteristic Waste (ROD Determination—Applicable to Secondary Wastes from Remediation of Impoundments C and D If Further Sampling Indicates Wastes Are RCRA-Characteristic):** A person who generates solid waste must determine whether that waste is hazardous using various methods, including application of knowledge of hazardous

characteristics of the waste based on information about the materials or processes used. All RCRA-restricted waste generated during remedial activities must be treated to meet land disposal restriction (LDR) before land disposal.

**Citation:** 40 CFR 262.11, Rules of the TDEC 1200-1-11-.03(1)(b), 40 CFR 268.40, and Rules of the TDEC 1200-1-11-.10(3)(a).

**Applicability:** No longer pertinent. The *Results of the Radiological and Chemical Characterization of Surface Impoundments 3539 and 3540 at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Rose et al. 1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

**ARAR—Treatment of Wastes That Are Determined To Be RCRA-Characteristic (ROD Determination—Applicable to Remediation of Impoundments C and D If Further Sampling Indicates Wastes Are RCRA-Characteristic):** Must treat to meet LDRs for those RCRA-characteristic wastes.

**Citation:** 40 CFR 268.

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

**ARAR—Treatment of Hazardous Wastes (Soils) for Which the Technology Specified in 40 CFR 268 Is Inappropriate (ROD Determination—Applicable to Remediation of Impoundments C and D If Further Sampling Indicates Wastes Are RCRA-Characteristic):** Where a treatment technology specified in 40 CFR 268 is not appropriate to the waste, the generator may apply for a treatability variance to comply with LDRs.

**Citation:** 40 CFR 268.44.

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

**ARAR—Treatment of Contaminated Soil and Sediment to Meet the Polychlorinated Biphenyl (PCB)-Contaminated Soil and Sediment Disposal Requirements of 40 CFR 761.60(a)(4) (ROD Determination—Applicable to Remediation of Impoundments C and D If Further Sampling Indicates Wastes Contain PCBs Above 50 ppm):** The regional

administrator may approve an alternate disposal method that can achieve a level of performance equivalent to incineration or high-efficiency boilers.

**Citation:** 40 CFR 761.60(e).

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D do not contain PCBs at concentrations > 50 ppm.

**ARAR—Requirements for Storage or Treatment of RCRA-Characteristic Waste in a Tank (ROD Determination—Applicable to Treatment of Impoundments C and D Wastes If Further Sampling Indicates Wastes Are RCRA-Characteristic):** Ensure that existing and new tanks have sufficient structural strength and are compatible with the waste to prevent collapse or rupture. Ensure that waste is compatible with the tank material unless the tank is protected by a liner or by other means. Provide tanks with secondary containment and controls to prevent overfilling and maintain sufficient freeboard in open tanks to prevent overtopping by wave action or precipitation. Inspect the following: overfilling control, control equipment, monitoring data, waste level (for uncovered tanks), tank condition, aboveground portions of tanks (to assess their structural integrity), and the area surrounding the tank (to identify signs of leakage). Repair any corrosion, crack, or leak. At closure, remove all hazardous waste and hazardous waste residues from tanks, discharge control equipment, and discharge confinement structures.

**Citation:** 40 CFR 264.191–192, Rules of the TDEC 1200-1-11-.06(10)(b)-(c), 40 CFR 264.191, Rules of the TDEC 1200-1-11-.06(10)(b), 40 CFR 264.193–194, Rules of the TDEC 1200-1-11-.06(10)(d)-(e), 40 CFR 264.195, Rules of the TDEC 1200-1-11-.06(10)(f), 40 CFR 264.196, Rules of the TDEC 1200-1-11-.06(10)(g), 40 CFR 264.197(a), and Rules of the TDEC 1200-1-11-.06(10)(h).

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

**ARAR—Closure of Surface Impoundments (ROD Determination—Relevant and Appropriate to Closure of Impoundments C and D If Further Sampling Indicates Wastes Are RCRA-Characteristic):** Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and manage them as hazardous wastes.

**Citation:** 40 CFR 264.228(a)(1) and Rules of the TDEC 1200-1-11-.06(11).

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic. Even if the impoundments were classified as RCRA-hazardous, they would have been closed under EPA's less restrictive hybrid clean-closure policy (Office of Solid Waste and Emergency Response Directive 9234.2-04 FS). In addition, residual contamination will be addressed in the Bethel Valley watershed ROD.

**ARAR—Transportation of Hazardous Waste in Containers of 416 L (110 gal) or Less (ROD Determination—Applicable to Transport of Impoundments C and D Wastes If Further Sampling Indicates Wastes are RCRA-Characteristic):** Waste must be marked with hazardous waste marking, generator's name and address, and the manifest docket number.

**Citation:** 40 CFR 262.32(b) and Rules of the TDEC 1200-1-11-.03(4).

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

**ARAR—Transportation of Hazardous Waste for Off-Site Treatment, Storage, or Disposal (ROD Determination—Applicable to Transport of Impoundments C and D Wastes If Further Sampling Indicates Wastes Are RCRA-Characteristic):** Shipment must be manifested according to 40 CFR 262 and 40 CFR 263.

**Citation:** 40 CFR 262 Subpart B, 40 CFR 263 Subpart B, Rules of the TDEC 1200-1-11-.03, and Rules of the TDEC 1200-1-11-.04.

**Applicability:** No longer pertinent. Rose et al. (1998) verifies that wastes from Impoundments C and D are not RCRA-characteristic.

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