LOCKHEED MARTIN

Y/ER-289/R1

**ENVIRONMENTAL
RESTORATION
PROGRAM**

**Waste Management Plan for Phase II
of the Bear Creek Valley
Treatability Study,
Oak Ridge Y-12 Plant,
Oak Ridge, Tennessee**

MASTER

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MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

**Science Applications International Corporation
and ENTECH, Inc.,**

contributed to the preparation of this document and should not be
considered eligible contractors for its review.

**Waste Management Plan for Phase II
of the Bear Creek Valley
Treatability Study
Oak Ridge Y-12 Plant,
Oak Ridge, Tennessee**

Date Issued—September 1997

Prepared by
Science Applications International Corporation
Oak Ridge, Tennessee
under subcontract 78B-99069C
and
ENTECH, Inc.
Oak Ridge, Tennessee
under subcontract ICK-AEN02V

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Environmental Management Activities at the
OAK RIDGE Y-12 PLANT
Oak Ridge, Tennessee 37831
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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PREFACE

The *Waste Management Plan for Phase II of the Bear Creek Valley Treatability Study, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (Y/ER-289/R1) was prepared under the Environmental Restoration Program to support the investigation of the practicality of the use of passive, in situ treatment systems to remove contaminants from the Bear Creek Valley Characterization Area. This work was performed under Work Breakdown Structure 1.1.02.41.10.34.20 (Activity Data Sheet 2302, "Bear Creek Valley Operable Unit"). This report will be used to direct investigations during Phase II.

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ABBREVIATIONS

DOE	U.S. Department of Energy
EMEF	Environmental Management and Enrichment Facilities
HASP	Health and Safety Plan
IDW	investigation-derived waste
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
Trench	Treatability Study Trench
WMP	Waste Management Plan

1. INTRODUCTION

This Waste Management Plant (WMP) for the Bear Creek Valley Treatability Study addresses waste management requirements for the Oak Ridge Y-12 Plant. The study is intended to produce treatment performance data required to design a treatment system for contaminated groundwater. The treatability study will consist of an evaluation of various treatment media including continuous column tests, with up to six columns being employed to evaluate the performance of different media in the treatment of groundwater; an evaluation of the denitrifying capacity and metal uptake capacity of a wetland system; and the long-term denitrifying capacity and metal uptake capacity of algal mats.

Additionally, the treatability study involves installation of a trench and incline well to evaluate and assess hydraulic impacts of pumping groundwater (refer to Sect. 2.3 for additional details).

The Sampling and Analysis Plan (SAP) covers the project description, technical objectives, procedures, and planned work activities in greater detail. The Health and Safety Plan (HASP) addresses the health and safety concerns and requirements for the proposed sampling activities.

This WMP identifies the types and estimates the volumes of various wastes that may be generated during the proposed treatability studies. The approach to managing waste outlined in this WMP emphasizes the following points:

- management of the waste generated in a manner that is protective of human health and the environment;
- minimization of waste generation, thereby reducing unnecessary costs and usage of limited permitted storage and disposal capacities; and
- compliance with federal, state, and site requirements.

Prior sampling at the site has detected organic, radioactive, and metals contamination in groundwater and surface water. Proposed field operations are not expected to result in worker exposures greater than applicable exposure or action limits.

2. WASTE MANAGEMENT PLAN CHECKLIST

The strategies and methodologies to be used in the management of wastes generated during the Bear Creek Valley Treatability Study are documented in the Environmental Management and Enrichment Facilities (EMEF) Program Waste Management Plan checklist for the Y-12 Plant, given in Appendix A. The WMP checklist will be used in conjunction with site-specific waste management/waste certification plans and procedures to describe the strategy for minimizing, handling, packaging, treating, transporting, characterizing, sorting, or disposing of waste produced as a part of project activities. The WMP checklist provides guidance and recommendations to be used for ensuring the protection of the worker, the environment, and the public.

The checklist will be used in conjunction with Procedure EMEF/EM-P2109, Environmental Restoration and Waste Management Organization Waste Certification Procedure, and the site-specific

waste management procedures identified in the checklist. Furthermore, project waste management/waste certification activities will conform to the requirements of "Oak Ridge Reservation Waste Certification Requirements Procedure," EP-710, and "Waste Acceptance Criteria for the Oak Ridge Reservation," ES-WM-10.

The following sections explain entries provided in the checklist concerning waste management issues. The information is presented as it corresponds to the EMEF WMP checklist.

2.1 KEY PROJECT PERSONNEL

Individuals involved in the management of waste generated by this project include the Project Manager, EMEF Generator Interface, Facility Manager, Waste Generator, Waste Packager, Site Safety and Health Officer, and the EMEF Waste Management Coordinator. The names, addresses, and telephone numbers of these individuals are identified in Sect. 1.0 of the checklist. The waste management responsibilities for these roles are described in the EO-710, ES-WM-10, and procedures identified in the WMP checklist.

2.2 PROJECT DESCRIPTION

A brief description of the scope of the EMEF project generating the waste is provided in Sect 2.0 of the WMP checklist. A brief history of the Y-12 Plant is also presented. Additionally, reports applicable to this project and waste management activities associated with this project are identified in this section.

2.3 WASTE GENERATION ACTIVITIES

Activities associated with the conduct of this study will result in the generation of solid and liquid wastes at the site. These activities are identified in Sect. 3.0 of the WMP checklist and are briefly discussed below.

2.3.1 Continuous Column Tests

A series of four continuous flow column tests of various treatment media will be carried out sequentially. Each panel of columns will contain up to six columns. Groundwater will be continuously pumped from temporary wells GW-837 and GW-835 to provide test water. Effluent will be allowed to infiltrate the ground surface in the vicinity of the temporary wells. Hay bales and impermeable plastic layers will be used to ensure that no overland flow into Bear Creek takes place. Waste generated during these tests will include personal protective equipment (PPE) used during sample collection, disposable sampling equipment, and the columns themselves at the conclusion of each series of tests.

2.3.2 Wetlands Capacity Testing

Flow from spring SS-4 through the wetland cells will be re-established and water samples obtained periodically. The only wastes generated as a result of this activity will be PPE and disposable sampling equipment.

2.3.3 Algal Mat Testing

Groundwater from the temporary wells will also be continuously pumped to an algal mat reactor, with influent and effluent water being periodically monitored. Effluent water will be released to reinfiltrate the ground surface as with the column effluent. Wastes generated will include PPE and disposable sampling equipment.

The waste will be generated in the Bear Creek Valley watershed, as identified in Sect. 3.1 of the WMP checklist.

2.3.4 Installation of Hydraulic Test Trench

A narrow trench will be installed parallel to Bear Creek as shown in Fig. 1. The location of the trench was selected to facilitate hydraulic testing of an interception trench to determine the applicability of in situ treatment for remediation of contaminated sites in BCV. The trench will be installed across the pre-1940s location of Bear Creek. Well data indicates that the old stream bed is a preferential flow path for local groundwater. The trench will be filled with relatively high conductivity backfill, creating a new preferential flow path along the trench. In addition, a section of the trench will be filled with iron filings treatment media to evaluate the hydraulic and treatment performance of an in situ installation.

The trench will be constructed as follows. An initial bench approximately 30 ft wide, 4 ft deep, and 225 ft long will be excavated in relatively uncontaminated surface soil. Approximately half of the clean excavated soil will be disposed of in an on-site ravine west of the trench location, and the remaining soil will be stockpiled for refilling the excavated bench. The bench will serve as a location for stockpiling and eventually disposing of potentially contaminated soils from the trench excavation. A trench 2 ft wide, 225 ft long, and approximately 22 ft deep (excavated to the top of bedrock) will be excavated along the length of the bench. Material excavated from the trench will be placed on the bench south of the trench. Backfill material, coarse silica sand and iron filings, will be placed in the trench to the bottom of the bench. The backfilled trench will be covered with a geotextile to prevent cover soil from migrating into the backfill from above. The soil excavated from the trench will then be spread across the bench along with stockpiled soil that was originally excavated from the bench. Finally, the gravel surface will be replaced and the site restored to its initial contours.

A vertical extraction well with 6-in. polyvinyl chloride casing and well screen will be installed at the west end of the trench. The extraction well will serve as a dewatering sump during construction and later as the extraction well for trench pump testing. Additional monitoring wells will be installed in the trench backfill and surrounding the trench. The monitoring wells will be used to provide water level data to assess the hydraulic performance of the trench under both active and passive (pumped and ambient) modes of operation. Water from trench dewatering during construction and pump testing will be filtered and discharged overland to Bear Creek.

2.3.5 Well Installation

Fifteen new monitoring wells and two pumping wells will be installed for evaluating the hydraulic performance of the Treatability Study Trench (Trench) under ambient and pumping operating conditions (Fig. 1). The locations of the wells have been selected to provide the maximum utility of data collected given the number of wells allowed and the effective area of the tests to be performed. All shallow monitoring wells will be installed by using a hollow-stem auger drilling method. The bedrock wells (>40 ft total depth) are to be installed by using an air rotary drilling method.

Fig. 1. Hydraulic test trench site plan.

2.3.6 Hydraulic Testing

Monitoring wells around the proposed Trench will be installed before the installation of the Trench so that a preliminary period of groundwater level monitoring may be performed. The goal of this period of data collection will be to monitor the background groundwater level fluxuations over a period of 3–5 weeks (schedule permitting), with a minimum of two storm events occurring within the time period. Precipitation data and barometric pressure data will be collected during all phases of the investigation and will act as the marker for transition from Phase I background monitoring to Phase II ambient condition Trench operation monitoring.

2.3.7 Pumping Tests

A pump test involves continuously pumping water from a well and observing water level changes within the pumping well and a series of observation piezometers. The water level data is recorded with transducers and automated data recorders. The duration of the test depends on the hydraulic properties of the porous media and the pumping rate(s) used during the test.

A total of four pumping tests will be performed as part of the BCV Treatability Study Phase II for the Treatability Study Trench and NT-1 sites to approximate production capabilities of the Trench and NT-1 wells. One stepped and one constant rate pumping test will be performed at each of the two sites: the Trench and the NT-1 Site. In addition to the active pumping tests, an ambient flow test will be conducted at the Trench Site. These pumping tests are intended to provide information on the capability of the underlying formation to produce groundwater during pumping conditions within the Trench and NT-1 inclined wells.

2.4 WASTE CHARACTERIZATION

2.4.1 Waste Types and Volumes

Proposed field operations will result in the generation of sanitary/industrial waste (PPE and disposable sampling equipment) and potential Resource Conservation and Recovery Act (RCRA) waste (columns and associated media). As discussed previously, effluent water from the column tests and algal mat reactor will be released to infiltrate the ground surface.

Information on the method of characterization, estimated contaminant concentrations, and waste destination is also included in Sect. 4.1 of the checklist.

Proposed field operations will result in the generation of surplus uncontaminated soil, saturated soil, investigation-derived waste (IDW), construction dewatering water, well purge water, and pump test water. The table in Sect 4.1 of the checklist lists the type and quantity of waste and the waste handling method for waste created by well installation and pump testing.

2.4.1.1 Solid waste

A bench 31 ft wide, 225 ft long and 4 ft deep will be excavated in clean surface soils to create a place to store and eventually dispose of potentially contaminated soils from trench excavation below the water table. The soil excavated to create the bench will be stockpiled on-site, and approximately half of it will be returned to the bench as backfill and half will be disposed of in a ravine west of the bench. Most other solid wastes generated by well installation will be handled by accumulating materials

in stockpiles and disposing on-site either as fill in the bench or as surplus soil in a ravine west of the bench and trench location.

2.4.1.2 Well auger cuttings and rock cuttings

Volume: 17.3 cubic yards

- Install wells, stockpile accumulated auger cuttings adjacent to trench.
- Temporarily cover with plastic sheet.
- After trench excavation, place auger cuttings on bench with other contaminated soil.
- Mostly dry air rotary rock cuttings shall be handled like auger cuttings.
- Wet rock cuttings accumulated in lined pit shall be sampled and if clean, covered in place; if contaminated, dispose of in the landfill.

2.4.1.3 Bench excavation

Volume: 830 cubic yards

- Assumed clean (or only trace contaminated), all soil to remain on-site.
- Stockpile half of excavated soil for reuse as backfill of the bench.
- At conclusion of project, dispose of remaining excavated soil in ravine west of trench.

2.4.1.4 Trench excavation

Volume: 350 cubic yards

- Assumed contaminated.
- Windrow on excavated bench during trench construction.
- At conclusion of trench excavation and backfill, spread across excavated bench.
- Cover with stockpiled bench excavation.

2.4.2 Liquid Waste

Information on the waste characterization plans and supporting documentation is provided in Sect. 4.2 of the checklist. Organizations involved in waste characterization and waste acceptance activities have been designated and are identified in this section.

Generally, the approach to handling all sources of water will be to pump to a lined settling pit, allow it to overflow through a sediment removal swale, and discharge the water onto ground surface. Most of the liquid waste volumes described herein are approximations, dependent on the availability and contribution of groundwater.

2.4.2.1 Well construction formation water, well development and pump test water, Trench construction dewatering, and Trench pump test water

Volume: 60,000 gal

- Create lined and unlined swales per plans near angled well.
- Temporarily contain well development water in polytanks or dispose of in settling pit/swale.
- Pump polytanks or pump directly to lined swales.
- Create lined and unlined swales per plans near trench.
- Discharge all water to inlet end of lined swale.
- Allow water to flow from settling pit through a series of filter fabrics to trap sediment.
- Filter out solids; discharge filtered water onto ground surface.

2.4.2.2 Decontamination wash water

- A temporary decontamination wash area is to be constructed adjacent to the sediment removal swale.
- Tools and equipment shall be washed and rinsed onto a lined decontamination area that drains to the lined section of the sediment removal swale.

2.4.2.3 Temporary settling pits and decontamination area

At the conclusion of the project, dispose of waste sediment accumulated in the lined settlement pits in place by perforating liners, allowing standing water to percolate into the ground, and covering pits with stockpiled clean soil.

2.5 HANDLING AND STORAGE REQUIREMENTS

Section 5.0 of the checklist provides the necessary handling and storage requirements for the waste and the volumes that will be generated by the project. Applicable waste storage areas to be managed by the EMEF Program are identified. Special waste/waste container handling procedures are described, along with methods to be utilized to protect the integrity of the containers.

Section 5.3 of the checklist identifies applicable waste storage areas. The Satellite Accumulation Area will be established near the designated decontamination area.

This section of the WMP checklist also includes a brief description of project waste management practices that will be implemented to protect the environment and human health. This will be accomplished by keeping radiation and chemical exposure as low as reasonably achievable. To ensure these waste management practices are implemented, project personnel will be required to participate in the training identified by Sect. 5.0.

2.6 WASTE MINIMIZATION

Section 6.0 of the WMP checklist identifies techniques that minimize waste generation consistent with policies established by the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency. These techniques will include treatment, segregation, decontamination, low-flow purging and sampling, and training. Decontamination efforts will be conducted so as to prevent the spread of contamination and minimize the amount of waste generated. Uncontaminated waste will be segregated from potentially contaminated waste. Low flow purging of groundwater wells will be performed to minimize the volume of purge water generated. Training will emphasize waste reduction philosophies, techniques, and improved methods.

2.7 TREATMENT, STORAGE, AND DISPOSAL OPTIONS

As documented by Sect. 7.1 of the WMP checklist, waste generated from field activities (identified in Sect. 4.0 of the WMP checklist) will be transferred to the Waste Management Organization for disposition. Before transfer of waste to the Waste Management Organization, the appropriate waste management forms will be completed and signed. Section 7.3 of the WMP checklist identifies the waste

management forms that apply to the subject wastes. The waste certifier and the waste coordinator are responsible for completing and signing these forms.

2.8 TRANSPORTATION

The Waste Management Organization will be responsible for transporting waste to the treatment, storage, or disposal areas. Expected routes of transportation are identified in Sect. 8.0 of the WMP checklist. Waste generated will be transported in accordance with all applicable federal and state regulations; DOE Orders; and Lockheed Martin Energy Systems, Inc., policies and procedures.

2.9 SAFETY AND HEALTH PLAN

Section 9.0 identifies the HASP as the appropriate Environmental Safety and Health documentation associated with this project. The cited documentation includes requirements for the safe management and handling of waste containers, site communication, sanitation, emergency actions, spill containment and contamination control.

APPENDIX

**EMEF PROGRAM WASTE MANAGEMENT
PLAN CHECKLIST**

Original Issue Date:	
Revision Date:	
WMO # (if applicable):	

EMEF PROGRAM WASTE MANAGEMENT PLAN CHECKLIST

Bear Creek Valley
Treatability Study
PROJECT NAME

Y-12 PLANT

ER WM PLAN CHECKLIST #

ER Project Manager	Date
John Vanderlan <i>John Vanderlan</i>	6/9/97
ER Waste Management Manager	Date
Jeff Henderson <i>Jeffery C. Henderson</i>	6-6-97
ER Waste Management Certification Official	Date
Jeff Henderson <i>Jeffery C. Henderson</i>	6-6-97
Waste Management Organization	Date
Mary Wiginton <i>Mary Wiginton</i>	6-6-97

The ER WM Plan checklist number will be assigned by the Oak Ridge National Laboratory Environment Restoration Document Management Center Manager.

ER PROJECT WASTE MANAGEMENT PLAN CHECKLIST

Project Name:	Bear Creek Valley Treatability Study	Est. End Date:	January 1998
Location:	Bear Creek Valley	ER WM Plan Checklist #:	
Est. Start Date:	May 1997	Charge # for WM:	

1.0 KEY PROJECT PERSONNEL

ER Project Manager:	John Vanderlan	ER Waste Certifier:	Jeff Henderson
Address:	Bldg. 9734, MS-8130	Address:	Bldg. K-1037, MS-736
Phone:	576-2745	Phone:	241-2410

Facility Manager:	N/A	Waste Generator:	Jeff Henderson
Address:		Address:	Bldg. K-1037, MS-736
Phone:		Phone:	241-2410

Packager:	SAIC/Dan Thompson	Site Safety & Health Officer:(if applicable):	SAIC/Mike Crenshaw
Address:	800 Oak Ridge Turnpike	Address:	800 Oak Ridge Turnpike
Phone:	481-4750	Phone:	481-4767

ER WM Coordinator:	Jeff Henderson	Construction Engineer (if applicable):	N/A
Address:	Bldg. K-1037, MS-36	Address:	
Phone:	241-2410	Phone:	

2.0 INTRODUCTION

2.1 Project Description:

The Bear Creek Valley Treatability Study is intended to produce treatment performance data required to design a treatment system for contaminated groundwater. The treatability study will consist of the continuous column tests, an evaluation of the denitrifying and metal uptake capacity of a mature natural wetland, and the denitrifying and metal uptake capacity of algal mats.

The Bear Creek Valley Treatability Study will take place at the Y-12 Plant, in Bear Creek Valley.

2.2 Brief Site History:

The Bear Creek watershed is located within Bear Creek Valley and contains most of the waste disposal units at the Y-12 Plant. The Y-12 Plant site occupies the upper basin of UEFPC. The UEFPC and its former tributaries are routed through storm drains that discharge to a concrete-lined channel along the southern plant boundary. Chestnut Ridge is included as a separate "watershed", although the ridge forms the headwaters for five separate north-south trending drainage basins, which ultimately discharge to the Clinch River.

Y-12 Plant operations salvage and disposal facilities are considered to be the primary sources of contamination in the surface water and groundwater. Operations included the recovery of mercury from plant materials. Salvage areas were used for storing scrap metal and liquid hazardous wastes and for the deheading and crushing of used drums. Disposal areas include construction spoil areas, liquid-waste percolation ponds, a sanitary landfill an oil landfarm, a hazardous-chemical disposal/storage area, and a solid waste burial area.

2.3 Reference Documents

Environmental Restoration Integrated Water Quality Program Plan, Oak Ridge, Tennessee, ES/ER/TM-205; Procedure ER/C-P2101, *Preparation of Environmental Task/project-Specific Waste Management Plans*; Procedure EMEF/EM-P2109, *Environmental Restoration and Waste Management Organization Waste Certification*.

3.0 WASTE GENERATION ACTIVITIES

	Coring	X	PPE		Geophysical Survey		Remedial
	Drilling		Excavating		D&D Activities		UST Activity
X	Deconning		Renovations		Well Installation/Maint.		ISV
X	Water Sampling		Soil Sampling		Scoping Surveys	X	Other _____

Explain Other

Column tests: continuous column tests will result in the generation of effluent water and solid waste (the columns themselves). At the conclusion of each test, the columns and media will be evaluated for disposal alternatives. For volume estimates, it is assumed they will be disposed as RCRA wastes.

Algal mats: at the completion of the treatment period, the algal mats will be evaluated for disposal alternatives. For volume estimates, it is assumed they will be disposed as RCRA wastes.

3.1 Waste Generating Area(s)

Bear Creek Valley watershed

Location or Building Number(s)

Near groundwater wells GW-835 and GW-837.

4.0 WASTE CHARACTERIZATION

4.1 Waste Types and Volume

Category ^a	Sanitary/ industrial waste ^b	RCRA ^b	IDW: Well Auger Cuttings and Rock Cuttings	IDW: Bench Excavation	IDW: Trench Excavation	IDW: Well Construction Formation Water, Well Development and Pump Test Water, Trench Construction Dewatering and Trench Pump Test Water	IDW: Decontamination Wash Water	IDW: Decontamination sediment
Type ^b	Solid	Solid	Solid	Solid	Solid	Liquid	Liquid	Solid
Description of Waste stream/source ^c	PPE, plastic, paper	discarded columns, algal mats	soil and rock auger cuttings	soil from bench excavation	soil from trench excavation	groundwater extracted during pump testing and dewatering	wash water from tool and equipment decontamination	sediment and liners from decon. / water settling pit
Suspected contaminants (radiological and chemical) ^d	N/A	metals	Nitrates, VOCs, Metals, Uranium, Technetium	None	Nitrates, VOCs, Metals, Uranium, Technetium	Nitrates, VOCs, Metals, Uranium, Technetium	Nitrates, VOCs, Metals, Uranium, Technetium	Nitrates, VOCs, Metals, Uranium, Technetium
Characterization of contaminant by sampling and analysis (Yes/No)	No	see footnote i below	No	No	No	No	No	No
Characterization of contaminant determined by process knowledge ^e (Yes/No)	N/A	Yes	Yes, No (for wet rock cuttings, if any)	Yes, prior characteriz ation	Yes, prior characteriz ation	Yes	Yes	Yes
solids/ (ft ³)	35 ft ³	35 ft ³	467.1 ft ³	22410 ft ³	9450 ft ³	N/A	N/A	250 ft ³
Liquids (gallons)	N/A	N/A	N/A	N/A	N/A	Approx. 60,000 gallons	Approx. 5,000 gallons	N/A

Category ^a	Sanitary/ industrial waste ^b	RCRA ^c	IDW: Well Auger Cuttings and Rock Cuttings	IDW: Bench Excavation	IDW: Trench Excavation	IDW: Well Construction Formation Water, Well Development and Pump Test Water, Trench Construction Dewatering and Trench Pump Test Water	IDW: Decontamination Wash Water	IDW: Decontamination sediment
Volume that WMO may receive (solids and liquids)	35 ft ³	35 ft ³	None, to be disposed of on site.	None, to be disposed of on site.	None, to be disposed of on site.	None, to be disposed of on site.	None, to be disposed of on site.	None, to be disposed of on site.
Volume that will be handled as Investigation Derived Waste (IDW) (solids and liquids)	N/A	N/A	467.1 ft ³	22410 ft ³	9450 ft ³	Approx. 60,000 gallons	Approx. 5,000 gallons	250 ft ³
IDW Type ^b	N/A	N/A	solid	solid	solid	liquid	liquid	liquid and solid
Destination ^e	WMO	WMO	place in excavated bench beneath clean fill	ravine west of trench and bench backfill	place in excavated bench beneath clean fill	return to aquifer through infiltration or overland to surface stream	return to aquifer through infiltration or overland to surface stream	perforate liner to dewater and cover sediment in place

^a RCRA, TSCA, LLLW, TRU, LLW/RCRA, LLW/TSCA, TRU/RCRA, TRU/TSCA, TRU/RCRA/TSCA, LLW/RCRA/TSCA, RCRA/TSCA, sanitary waste/industrial waste, liquid waste to be treated at K-25 Site, liquid waste to be treated at ORNL, liquid waste to be treated at Y-12 Plant.

^b Liquid, sludge, solid, gas (compressed), etc

^c Floor tiles, duct work, concrete, metal, plastic, soil, glass, cylinders, etc.

^d This is not to include trace or naturally occurring chemicals or radionuclides found in nature

^e Documents that defend process knowledge should be listed in Sect. 2

^f See Methodology for Generating Waste Volumes Estimates (ORNL/ER-148). It is imperative that waste volumes be given the appropriate units (i.e., solids in cubic feet, liquids in gallons, etc.)

^g Tumulus pads, waste treatment pads, SWSA 6, etc.

^h There is no RAD contact- or remote-handled wastes associated with these categories.

ⁱ Characterization of contaminant by sampling and analysis will be conducted only if characterization can not be determined by process knowledge. Section 4.2 defines organizations responsible for sampling and analysis of waste, if necessary.

What Methodology was used to estimate waste volumes?

With reference to media evaluation, estimates were determined based upon frequency of monitoring, size of work crew, and size of column panels and algal mat reactor.

4.2 Waste Characterization Plan

All waste will be characterized in accordance with *Waste Acceptance Criteria for Oak Ridge, ES/WM-10*.

Has the organization or person responsible for obtaining samples been designated?

X	Yes		No		NA
---	-----	--	----	--	----

List name WMO-Sampling Crew Date

Has the organization responsible for analyzing samples been identified?

X	Yes		No		NA
---	-----	--	----	--	----

List name Analytical Services Organization Date

Can WMO take control of the hazardous or mixed waste generated?

X	Yes		No		NA
---	-----	--	----	--	----

Person Contacted Mary Wiginton Date

Can WMO accept the volume of radiological waste to be generated?

	Yes		No	X	NA
--	-----	--	----	---	----

Person Contacted _____ Date

Can the WMO accept the liquid that will be generated?

X	Yes		No		NA
---	-----	--	----	--	----

Person Contacted Tim Foust Date

Will TRU or mixed waste be generated?

	Yes	X	No		NA
--	-----	---	----	--	----

If any TRU or TRU Mixed Waste is to be generated contact the Waste Certification Official before project starts.

Person Contacted _____ Date

Will any of the waste generated be handled as IDW?

X	Yes		No		NA
---	-----	--	----	--	----

List any specific requirements as requested by any of the above organizations or compliance.

Waste Acceptance Criteria for Oak Ridge Reservation, ES/WM-10; Waste Certification Requirements for Energy Systems, EP-710; Environmental Restoration and Waste Management Organization Waste Certification, EMEF/EM-P2109; Procedure Y-70-903; Transfer of Waste to Y-12 ESWMO; Procedure Y-70-301, Waste Container Labeling

Who will be responsible for completing the weekly ER Waste Management Program Total Waste Generated Waste form?

Name: Jeff Henderson

Phone: 241-2410

5.0 HANDLING AND STORAGE REQUIREMENTS

5.1 List Special Handling Procedures For Waste or Waste Containers

Entech to provide discussion for waste generated during trenching, well installation and monitoring.

5.2 List What Will Be Used To Protect The Integrity Of Waste Containers From Environmental Elements. (Examples: Lid Tops, Plastic Covering, Epoxy, Storage Shelter)

Appropriate lid tops for the type of containers used to package waste. All containers will be kept closed unless waste is being added or removed.

5.3 Applicable Waste Storage Area(s)

X	Waste Staging Area	X	Satellite Accumulation Area		Waste Consolidation Area
	90-d Storage Facility		Area of Contamination		Other _____

Describe location of above areas (attach sketch)

The location of the waste staging area will be determined in cooperation with WMO and the ER Waste Management Manager prior to the start of the project. The Satellite Accumulation Area will be located near the decontamination area which will be designated by the ER Waste Management Manager.

5.4 Explain how waste will be managed to assure that personal safety and the environment will be protected.

Treatment systems have been designed to minimize exposure and contact with waste during normal operation. To further assure protection of personal safety, the project Health & Safety Plan will be adhered to.

Name of ER Waste Storage Area Supervisor: Jeff Henderson

Does supervisor and staff have the appropriate training required?

X	Yes		No		NA
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List training requirements:

GET, Storm Water Pollution Prevention (module #16987)

Will a spill control kit be required on-site?

X	Yes		No		NA
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List items:

Absorbent materials, plastic sheeting, tyvek gloves, absorbent pads or pillows.

6.0 WASTE MINIMIZATION

6.1 Waste Minimization Techniques To Be Implemented

X	Segregation		IDW Concept
X	Decontamination		Material Recycle (Solvents, Decon Waters)
	Compaction		Cutting Fluids Recovery
	Solvent Substitution		Selection of Equipment
	Sludge Dewatering		Solidification
	Selection of PPE	X	Other

Explain specific techniques not listed above

7.0 TREATMENT, STORAGE, AND DISPOSAL OPTIONS**7.1 Potential Treatment, Storage or Disposal Options (If Applicable)**

Option	Waste Capacity	Responsible Organization
Disposal	PPE, sanitary waste: 35 ft ³	WMO
Disposal	columns, algal mat: 35 ft ³	WMO

7.2 Special Requirements of the Waste Acceptance Criteria To Meet

None

7.3 Applicable Waste Management Forms:*

	UCN-2822		UCN-1457	X	UCN-2109		TX-5352A
	UCN-16114	X	UCN-20-116		UCN-20117		Other
	UCN-16114A	X	UCN-19611	X	UCN-20118		

***List Persons(s) that will be responsible for completing and signing Waste Management form(s):**

Waste Certifier, Waste Coordinator

8.0 TRANSPORTATION**8.1 Transportation Requirements**

A. Who or what organization will transport waste to the WMO facility?

Waste Management Organization

B. List specific issues for transporting waste and their resolutions.

WMO will provide transportation to the waste staging area. All applicable federal and state regulations, DOE Orders, and LMER/LMES policies and procedures will be adhered to when transporting waste.
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9.0 SAFETY AND HEALTH PLAN

9.1 List name of appropriate Environmental Safety & Health documentation associated with this project.

Health and Safety Plan for the Bear Creek Valley Treatability Study

9.2 Name of the plan.

Sampling and Analysis Plan for the Bear Creek Valley Treatability Study

9.3 Date approved **or Expected date of approval** April 1997

10.0 Additional information to further define waste management activities may be provided in this section.

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- 19-22. R. Adkisson, ENTECH, Inc., 560 Oak Ridge Turnpike, Suite 2, Oak Ridge, TN 37830
23. P. Salpas, Science Applications International Corporation, 800 Oak Ridge Turnpike, P.O. Box 2502, Oak Ridge, TN 37830
24. D. Moss, Science Applications International Corporation, 800 Oak Ridge Turnpike, P.O. Box 2502, Oak Ridge, TN 37830
25. B. Sams, Jacobs Engineering Group, Inc., 125 Broadway Avenue, Oak Ridge, TN 37830