SRA-00-0001

BECHTEL JACOBS
Bechtel Jacobs Company LLC

DOE Contract No. DE-AC05-98OR22700
Job No. 23900
January 21, 2000

U.S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831-8541

Attention: P.J. Halsey, Project Manager
Environmental Science Group
Environmental Management Division

Subject: **Oak Ridge Reservation (ORR) Federal Facility Agreement (FFA) Annual Progress Report for Fiscal Year 1999**

Dear Ms. Halsey:

In accordance with the ORR FFA , Section XXIV "*Reporting*", please find attached five (5) copies of the subject progress report for your submittal to the regulatory agencies. In addition, attached are five (5) bound copies of the FY 1999 annual S&M reports for each of the three plants at ORR.

If you should have any questions or comments, please contact me at 241-1260.

Sincerely,

Nelson Lingle

Nelson Lingle, Manager
Regulatory Analysis Group

WNL:bl

SRA-00-BL-0001

Attachments (2)

cc: M. Allen
J. Blair
K.W. Cook
G. Eidam
R. Ferguson
S. Houser
M. Moliassa
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Federal Facility Agreement Annual Progress Report for Fiscal Year 1999 Oak Ridge, Tennessee

This document has received the appropriate reviews for release to the public.1/19/00

DOE/OR/01-1855&D1

Federal Facility Agreement Annual Progress Report for Fiscal Year 1999 Oak Ridge, Tennessee

Date Issued– January 2000

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

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
East Tennessee Technology Park
Oak Ridge Y-12 Plant Oak Ridge National Laboratory
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

CONTENTS

TABLES

ABBREVIATIONS

ACB	Auxiliary Charcoal Bed
AM	Action Memorandum
ATG	Allied Technology Group, Inc.
BCBG	Bear Creek Burial Grounds
BCV	Bear Creek Valley
BY/BY	Boneyard/Burnyard
BV	Bethel Valley
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNF	Central Neutralization Facility
COC	contaminants of concern
CY	cubic yards
D&D	decontamination and decommissioning
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOE-ORO	DOE-Oak Ridge Operations
EE/CA	Engineering Evaluation/Cost Analysis
EM	Environmental Management
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FETC	Federal Energy Technology Centers
FFA	Federal Facility Agreement
FS	Feasibility Study
FY	fiscal year
GAAT	Gunite and Associated Tanks
HMA	Hose Management Arm
ITRD	Innovative Treatment Remediation Demonstration
IWQP	Integrated Water Quality Program
KAFaD	K-25 Auxiliary Facilities Area Demolition
LEFPC	Lower East Fork Poplar Creek
LLW	low-level waste
LLLW	liquid low-level (radioactive) waste
LWBIWG	Lower Watts Bar Interagency Working Group
MLDUA	modified light-duty utility arm
MPI	Multi-Point-Injection
MSRE	Molten Salt Reactor Experiment
MV	Melton Valley
MVST	Melton Valley Storage Tanks
NFI/NFA	no further investigation/no further assessment
NMFS	Nuclear Material and Facility Stabilization
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTP	Notice to Proceed
NTS	Nevada Test Site
OCAW	Oil, Chemical, and Atomic Workers International Union
OHF	Old Hydrofracture Facility
OLF	Oil Land Farm

ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PCB	polychlorinated biphenyl
PP	Proposed Plan
RA	remedial action
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDR	Remedial Design Report
RDWP	Remedial Design Work Plan
RFP	Request for Proposal
RGRS	Reactive Gas Removal System
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RIWP	Remedial Investigation Work Plan
RmA	Removal Action
RmAR	Removal Action Report
RmAWP	Removal Action Work Plan
RMPE	Reduction of Mercury in Plant Effluents
ROD	Record of Decision
RSE	Remedial Site Evaluation
SAP	Sampling and Analysis Plan
S&M	surveillance and maintenance
SIOU	Surface Impoundments Operable Unit
SMTL	Slurry Monitoring Test Loop (System)
SNF	spent nuclear fuel
SOW	scope of work
SSAB	Site Specific Advisory Board
TDEC	Tennessee Department of Environment and Conservation
TSCA	Toxic Substances Control Act
TSF	Tower Shielding Facility
UEFPC	Upper East Fork Poplar Creek
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area grouping
WOC	White Oak Creek
WRRP	Water Resources Restoration Program

1. INTRODUCTION

This Annual Progress Report for Fiscal Year (FY) 1999 satisfies the requirements for the Environmental Management (EM) Program specified in Sects. VII, *Parties*; XIII.B, *Removal Actions*; and XXIV, *Reporting* of the Oak Ridge Reservation (ORR) Federal Facility Agreement (FFA). This agreement was established between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation (TDEC). The FFA was established to ensure that environmental impacts associated with ORR are thoroughly investigated and remediated as necessary to protect the public health and welfare and the environment.

The specific reporting requirements in the FFA include the FFA Annual Progress Report and the annual FFA Removal Action Report (RmAR). This report satisfies both of these reporting requirements. The reporting period covered in this report is October 1998 through September 1999. As required by the FFA, this document contains project descriptions, progress report data, document delivery status, and current contractor lists. The FY 1999 Surveillance and Maintenance Reports have been issued concurrently with this report as required in the FFA Appendix I-9.

2. FISCAL YEAR 1999 OAK RIDGE RESERVATION FFA ACTIVITIES SUMMARY

The U.S. Department of Energy-Oak Ridge Operations (DOE-ORO) EM Program adopted a watershed approach for performing Remedial Investigations (RIs) and characterizations for ORR because it is an effective system for determining the best methods for protecting and restoring aquatic ecosystems and protecting human health. The basic concept is that water quality and ecosystem problems are best solved at the watershed level rather than at the individual water-body or discharger level. The watershed approach requires consideration of all environmental concerns, including needs to protect public health, critical habitats such as wetlands, biological integrity, and surface and ground waters. The watershed approach provides an improved basis for management decisions concerning contaminant sources and containment. It allows more direct focus by stakeholders on achieving ecological goals and water quality standards rather than a measurement of program activities based on numbers of permits or samples. The watershed approach allows better management strategies for investigations, therefore maximizing the utilization of scarce resources.

Feasibility studies (FSs) evaluate various alternatives in terms of environmental standards, the protection of human health and the environment, and the costs of implementation to find the optimum solution among them. Society has to decide how much it is willing to spend to meet the standards and to be protective. Conducting FSs is the process of trading off those criteria to pick that optimum point that society wants to achieve. Performing this analysis at the watershed scale allows those trade-offs to be made meaningfully.

In addition, a Land Use Control Assurance Plan for the ORR was prepared to identify the strategy for assuring the long-term effectiveness of land use controls. These land use controls will be relied upon to protect human health and the environment at areas of the ORR undergoing remediation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act and/or the Resource Conservation and Recovery Act. This plan will be implemented by means of a Memorandum of Understanding (MOU) incorporating its terms with the United States EPA and TDEC.

The majority of projects described in this report are grouped into five watersheds. They are the East Tennessee Technical Park (ETTP) Watershed (formerly the K-25 Site), the Melton Valley (MV) and Bethel Valley (BV) Watersheds at the Oak Ridge National Laboratory (ORNL), and the Bear Creek Valley (BCV) and Upper East Fork Poplar Creek (UEFPC) Watersheds at the Y-12 Plant.

2.1 DOCUMENT STATUS FOR FY 1999

Table 2.1 contains information detailing document delivery during FY 1999. It provides the document description, revision number, dates of delivery, and comment/approval status. It is a comprehensive review of the ORR FFA deliverables for the FY.

Table 2.1 Document status for FY 1999

Plant	Subproject/Document Title	Document ID	Rev.	Milestone	Submitted	EPA Comments	Type	TDEC Comments	Type
ETTP	**ETTP Ponds**								
	RmA Report	DOE/OR/01-1767	D1	05/17/1999 DOE requested change from 05/15/1999	05/18/1999	08/06/1999	C	06/15/1999	C
ETTP	**ETTP Sitewide Record of Decision (ROD)**								
	RSE of Lambert Quarry	DOE/OR/02-1606	D1	06/13/1997	06/13/1997	09/11/1997		09/11/1997	
	RSE of Lambert Quarry	DOE/OR/02-1606	D2		12/17/1997	02/20/1998	C	01/15/1998	C
	RSE of Lambert Quarry	DOE/OR/02-1606	D3		01/28/1999	02/10/1999	A	02/16/1999	A
	RI Report	DOE/OR/01-1778	D1	01/29/1999 DOE requested change from 01/31/1999	01/27/1999	07/14/1999	C	06/28/1999	C
	FS	TBD	D1	03/30/2000 DOE requested change from 01/31/1999		06/28/2000		06/28/2000	
	Proposed Plan (PP)	TBD	D1	10/31/2000 DOE requested change from 08/31/1999					
ETTP	**K-1070 C/D & Mitchell Branch Plumes**								
	RmA Report	DOE/OR/01-1728	D1	07/15/1998	07/15/1998	07/27/1998	C	08/06/1998	C
	RmA Report	DOE/OR/01-1728	D2		09/14/1998	10/21/1998	C	10/22/1998	C
	RmA Report	DOE/OR/01-1728	D3		11/13/1998	02/25/1999	A	03/02/1999	A
ETTP	**K-1070 C/D G Pit and Concrete Pad**								
	RA Report	TBD	D1	07/16/2001 DOE requested change from 07/01/1999					
ETTP	**K-1070-A Contaminated Burial Ground**								
	ROD	DOE/OR/01-1734	D1	09/15/1998	09/08/1998	11/18/1998	C	11/10/1998	C
	ROD	DOE/OR/01-1734	D2		01/19/1999	02/19/1999	C	02/19/1999	C
	RD Work Plan	DOE/OR/01-1779	D1	02/15/1999	01/28/1999	04/28/1999		04/28/1999	
ETTP	**K-1401/K-1420 Sumps**								
	RmA Report	DOE/OR/01-1754	D1	09/15/1998	09/15/1998	10/14/1998	C	10/14/1998	C
	RmA Report	DOE/OR/01-1754	D2		12/01/1998	02/01/1999	A	01/13/1999	A
ETTP	**KAFaD Group I Buildings D&D**								
	Group II Bldgs. EE/CA	DOE/OR/01-1765	D1	05/28/1999 Milestone added during FY99	05/20/1999	07/02/1999	C	06/21/1999	C
	Group II Bldgs. EE/CA	DOE/OR/01-1765	D2		07/29/1999	10/29/1999	C	10/18/1999	C
	RmA Report	DOE/OR/01-1829	D1	08/30/1999 DOE requested change from 09/30/2000	08/25/1999	10/26/1999	C	10/19/1999	C
	AM	TBD	D1	TBD					

(Table 2.1 continued)

Plant	Subproject/Document Title	Document ID	Rev.	Milestone	Submitted	EPA Comments	Type	TDEC Comments	Type
ORNL	**BV Core Hole 8 Plume Source**								
	Action Memo Amendment (GW Well 4411)	DOE/OR/01-1831	D1	08/30/1999	08/31/1999	09/08/1999	C	09/08/1999	A
		DOE/OR/01-1831	D2		11/02/99				
	Ph. I Ops Letter Report (GW Well 4411)	DOE/OR/01-1832	D1	08/30/1999	08/31/1999	09/08/1999	C	11/29/1999	
		DOE/OR/01-1832	D2		11/02/99				
	RmA Work Plan	DOE/OR/01-1800	D1	02/28/1999	02/24/1999	03/02/1999	A	03/12/1999	A
ORNL	**BV FFA Tanks Project**								
	EE/CA	DOE/OR/01-1721	D1	06/30/1998	06/30/1998	07/27/1998	C	07/31/1998	C
	EE/CA	DOE/OR/01-1721	D2		03/10/1999	03/11/1999	A	03/11/1999	A
	Action Memorandum	DOE/OR/01-1813	D1	05/14/1999	04/29/1999	05/14/1999	A	05/11/1999	A
	RmA Work Plan	DOE/OR/01-1821	D1	07/01/1999 DOE requested change from 03/31/1999	07/01/1999	07/07/1999	A	07/27/1999	A
	Action Memo Addendum	DOE/OR/01-1833	D1	08/26/1999	08/26/1999	09/02/1999	A	09/08/1999	A
	Action Memo Addendum	DOE/OR/01-1833	D2		10/01/1999				
	RmA Report	TBD	D1	06/30/2000 DOE requested change from 09/30/1999					
ORNL	**BV Inactive Tanks and Pipelines**								
	WC-14 RmA Report	DOE/OR/01-1738	D1	09/30/1998	09/25/1998	10/05/1998	A	10/08/1998	C
	WC-14 RmA Report	DOE/OR/01-1738	D2		11/30/1998	10/05/1998	A	12/15/1998	A
ORNL	**BV ROD**								
	RI/FS	DOE/OR/01-1748	D1	10/15/1998 DOE requested change from 04/15/1999	09/24/1998	01/08/1999	C	12/17/1998	C
	RI/FS	DOE/OR/01-1748	D2		05/18/1999	07/01/1999	C	07/01/1999	C
	RI/FS	DOE/OR/01-1748	D2 Errata		07/23/1999	07/28/1999	A	08/02/1999	A
	PP	DOE/OR/01-1795	D1	01/15/2000	08/05/1999			11/04/1999	C
ORNL	**MSRE D&D**								
	RD Work Plan (Fuel Salt)	DOE/OR/01-1722	D1	06/30/1998	06/30/1998	07/08/1998	A	08/21/1998	C
	RD Work Plan (Fuel Salt)	DOE/OR/01-1722	D2		11/17/1998	07/08/1998	A	02/03/1999	A
	RD Report/RA Work Plan (Fuel Salt)	DOE/OR/01-1810	D1	06/30/1999 DOE requested change from 03/01/1999	06/16/1999	07/21/1999	C	07/21/1999	C
	RD Report/RA Work Plan (Fuel Salt)	DOE/OR/01-1810	D2		09/20/1999	10/05/1999	A	09/29/1999	A
	RmA Work Plan (Uranium Deposit Removal)	DOE/OR/01-1735	D1	07/30/1998	07/07/1998	07/17/1998	A	07/31/1998	C
	RmA Work Plan (Uranium Deposit Removal)	DOE/OR/01-1735	D2		10/26/1998	07/17/1998	A	11/17/1998	A
	RmA Work Plan (Uranium Deposit Removal)	DOE/OR/01-1735	D3	03/31/00					
	RmA Report(Uranium Deposit Removal)	TBD	D1	05/15/2001 DOE requested change from 07/30/1999					

(Table 2.1 continued)

Plant	Subproject/Document Title	Document ID	Rev.	Milestone	Submitted	EPA Comments	Type	TDEC Comments	Type
ORNL	**Melton Valley ROD**								
	PP	DOE/OR/01-1724	D1	07/30/1998	07/30/1998	12/29/1998	C	09/30/1998	C
	PP	DOE/OR/01-1724	D2		04/15/1999	05/17/1999	C	05/13/1999	C
	PP	DOE/OR/01-1724	D3		05/21/1999	05/17/99	A	05/21/1999	A
	ROD	DOE/OR/01-1826	D1	09/01/1999 DOE requested change from 07/15/1999	08/31/1999	10/28/1999	C	11/15/1999	C
ORNL	**BV Metal Recovery Facility**								
	EE/CA (Formerly FPPP)	DOE/OR/01-1838	D1	10/01/1999 DOE requested change from 06/30/1999	10/01/1999	10/25/99	C	10/29/99	C
ORNL	**OHF Tank Sludge Removal**								
	RmA Report	DOE/OR/01-1759	D1	09/30/1998	09/30/1998	10/05/1998	A	12/15/1998	A
ORNL	**ORNL Main Plant Surface Impoundments**								
	RD Report/RA Work Plan (A&B)	DOE/OR/01-1816	D1	07/30/1999	07/29/1999	08/17/1999	C	09/15/1999	C
	RA Report (C&D)	DOE/OR/01-1784	D1	12/22/1998	12/15/1998	01/29/1999	C	01/14/1999	C
	RA Report (C&D)	DOE/OR/01-1784	D2		04/06/1999	04/19/1999	A	04/14/1999	A
ORNL	**OHF Pond/Tank Remediation**								
	EE/CA	DOE/OR/02-1706	D1	09/30/1998	05/04/1998	05/26/1998	C	05/26/1998	C
	EE/CA	DOE/OR/02-1706	D2		08/27/1998	10/01/1998	A	10/01/1998	A
	Action Memorandum	DOE/OR/01-1751	D1	01/29/1999	01/19/1999	01/28/1999	C	02/03/1999	C
	Action Memorandum	DOE/OR/01-1751	D2		04/08/1999	04/13/1999	A	04/28/1999	A
	RmA Work Plan	DOE/OR/01-1834	D1	09/28/1999	09/28/1999	10/20/1999	C	10/20/1999	C
ORR	**Clinch River/Poplar Creek (CR/PC)**								
	RA Report	DOE/OR/02-1627	D1	10/17/1997	10/17/1997	11/14/1997	A	11/26/1997	C
	RA Report	DOE/OR/02-1627	D2		01/16/1998	11/14/1997	A	02/05/1998	A
	RA Report	DOE/OR/02-1627	D3		05/19/1999	05/27/1999	A	06/14/1999	A
ORR	**LEFPC Watershed ROD**								
	RA Report	DOE/OR/01-1680	D1	04/30/1998	04/01/1998	06/01/1998	C	05/13/1998	C
	RA Report	DOE/OR/01-1680	D2		07/30/1998	09/29/1998	C	09/30/1998	C
	RA Report	DOE/OR/01-1680	D3		06/15/1999	06/15/1999	A	06/14/1999	A
ORR	**ORR Water Resources Restoration Program**								
	Post-ROD Monitoring Plan for LWBR & CR/PC	DOE/OR/01-1820	D1	05/28/1999 Milestone added during FY 1999	05/28/1999	06/29/1999	C	07/08/1999	C
	Post-ROD Monitoring Plan for LWBR & CR/PC	DOE/OR/01-1820	D2		10/05/1999	10/15/1999	A	10/15/1999	A
	Remediation Effectiveness Report	DOE/OR/01-1790	D1	02/28/1999	02/26/1999	03/29/1999	C	05/10/1999	C
	Remediation Effectiveness Report	DOE/OR/01-1790	D2		07/15/1999	07/26/1999	A	08/13/1999	A
Y-12	**BCV Boneyard/Burnyard**								
	RDR/RAWP	DOE/OR/01-1775	D1	06/01/1999 DOE requested change from 02/09/2000	11/05/1998	11/13/1998	C	12/02/1998	
	RDR/RAWP (Oil Land Farm Storage Facility)	DOE/OR/01-1783	D1	06/01/1999	01/15/1999				

(Table 2.1 continued)

Plant	Subproject/Document Title	Document ID	Rev.	Milestone	Submitted	EPA Comments	Type	TDEC Comments	Type
Y-12	**BCV ROD - Phase 1**								
	RD Work Plan	DOE/OR/01-1760	D1	10/30/1998 DOE requested change from 04/07/1999	10/26/1998	11/13/1998	C	11/03/1998	C
	ROD	DOE/OR/01-1750	D1	10/01/1998	08/28/1998	11/04/1998	C	10/19/1998	C
	ROD	DOE/OR/01-1750	D2		03/11/1999	04/27/1999	C	04/14/1999	C
Y-12	**BCV S-3 Ponds**								
	RmA Report	DOE/OR/01-1836	D1	08/30/1999	08/31/1999	11/29/1999	C	11/29/1999	C
Y-12	**Basin 9822 Cleanout**								
	RmA Report for 9822 Sediment Basin	DOE/OR/01-1763	D1	10/30/1998 DOE requested change from 03/15/1999	10/28/1998	11/23/1998	C	11/13/1998	C
	RmA Report for 9822 Sediment Basin	DOE/OR/01-1763	D2		02/04/1999	02/23/1999	A	02/24/1999	A
Y-12	**EMWMF - Integration, Assessment, & Operations**								
	RI/FS	DOE/OR/02-1637	D1	08/30/1997	08/30/1997	11/04/1997	C	11/12/1997	C
	RI/FS	DOE/OR/02-1637	D2		01/12/1998	03/09/1998	C	11/16/1998	A
	Addendum to RI/FS	DOE/OR/02-1637/A1	D1	09/17/1998	09/17/1998	11/17/1998	A	11/16/1998	A
	PP	DOE/OR/01-1761	D1	09/17/1998	09/17/1998	11/17/1998	C	12/17/1998	C
	PP	DOE/OR/01-1761	D2		12/14/1998			01/07/1999	C
	PP	DOE/OR/01-1761	D3		01/15/1999	01/20/1999	A	01/20/1999	A
	ROD	DOE/OR/01-1791	D1	05/06/1999 DOE requested change from 03/15/1999	05/06/1999	07/12/1999	C	07/06/1999	C
	ROD	DOE/OR/01-1791	D2	08/11/1999		09/13/1999	A	10/25/1999	C
	ROD	DOE/OR/01-1791	D3	11/2/1999	11/2/1999	11/2/1999	A	11/2/1999	A
	RD Work Plan	TBD	D1	12/2/1999 DOE requested change from 07/15/1999					
	RD Report/RA Work Plan	TBD	D1	05/09/2000 DOE requested change from 08/30/1999					
Y-12	**Off-site Program Site Evaluations**								
	Evaluation of Copper Ridge Study Area	DOE/OR/01-1697	D1	09/09/1998	09/09/1998	11/20/1998	C	12/08/1998	C
	Evaluation of Copper Ridge Study Area	DOE/OR/01-1697	D2		02/24/1999	03/29/1999	A	03/22/1999	A
	Evaluation of West Chestnut Ridge/West Bethel Valley Study Area	DOE/OR/01-1723	D1	09/09/1998	09/09/1998	11/20/1998	C	12/08/1998	C
	Evaluation of West Chestnut Ridge/West Bethel Valley Study Area	DOE/OR/01-1723	D2		02/24/1999	03/29/1999	A	03/22/1999	A
	Evaluation of West Haw Ridge/Bearden Creek Watershed Study Area	DOE/OR/01-1758	D1	02/01/1999	02/01/1999	03/03/1999	A	02/16/1999	A

(Table 2.1 continued)

Plant	Subproject/Document Title	Document ID	Rev.	Milestone	Submitted	EPA Comments	Type	TDEC Comments	Type
Y-12	**UEFPC East End VOC Plumes**								
	EE/CA	DOE/OR/01-1764	D1	10/30/1998	10/29/1998	01/27/1999	C	11/25/1998	C
	EE/CA	DOE/OR/01-1764	D2		02/19/1999	03/23/1999	C	02/25/1999	C
	EE/CA	DOE/OR/01-1764	D3		03/30/1999	04/22/1999	C	04/22/1999	C
	EE/CA	DOE/OR/01-1764	D4		04/26/1999	05/03/1999	A	04/30/1999	A
	Action Memorandum	DOE/OR/01-1819	D1	06/15/1999 DOE requested change from 02/26/1999	06/15/1999	06/25/1999	A	06/28/1999	A
	Action Memorandum	DOE/OR/01-1819	D2		08/24/1999				
	RmA Work Plan	DOE/OR/01-1825	D1	06/30/1999 DOE requested change from 03/15/1999	07/01/1999	07/09/1999	A	07/09/1999	A
Y-12	**UEFPC Firing Range**								
	RmA Report	DOE/OR/01-1774	D1	10/30/1998	10/28/1998	11/23/1998	C	11/13/1998	C
	RmA Report	DOE/OR/01-1774	D2		02/04/1999	02/23/1999	A	02/24/1999	A
Y-12	**UEFPC ROD - Phase I**								
	FS	DOE/OR/01-1747	D1	08/15/1998	08/14/1998	02/01/1999	C	11/12/1998	C
	FS	DOE/OR/01-1747	D2		06/02/1999	07/29/1999	C	11/22/1999	C
	RI Report	DOE/OR/01-1641, V1-V6	D1	03/05/1998	03/05/1998	06/15/1998	C	06/02/1998	C
	RI Report	DOE/OR/01-1641, V1-V6	D2		05/04/1998	10/07/1998	A	09/15/1998	A
	PP	TBD	D1	11/30/1999 DOE requested change from 04/15/1999					
Y-12	**UEFPC Soils - Phase I**								
	Treatability Study Work Plan (Bank Stabilization)	DOE/OR/1827	D1	08/04/1999	08/04/1999	09/03/1999	C	09/01/1999	C
	Treatability Study Work Plan (Bank Stabilization)	DOE/OR/1827	D2		09/22/1999	09/27/1999	A	09/24/1999	A
Y-12	**Y-12 D&D S&M**								
	RmA Report	DOE/OR/02-1650	D1	12/30/1997	11/25/1997	12/05/1997	A	09/30/1999	A

Rev.: D = Document.
Regulator review status: A = Approved; C = Commented.
BCV = Bear Creek Valley.
BV = Bethel Valley.
D&D = decontamination and decommissioning.
DOE = U.S. Department of Energy.
EE/CA = Engineering Evaluation/Cost Analysis.
EMWMF = Environmental Management Waste Management Facility.
EPA = U.S. Environmental Protection Agency.
ETTP = East Tennessee Technology Park.
FFA = Federal Facility Agreement.
FS = Feasibility Study.
FY = Fiscal Year.
GW = Groundwater.
LEFPC = Lower East Fork Poplar Creek.
LLW = low-level waste.
LWBR = Lower Watts Bar Reservoir.
MSRE = Molten Salt Reactor Experiment.
OHF = Old Hydrofracture Facility.
ORNL = Oak Ridge National Laboratory.
RA = remedial action.
RAWP = Remedial Action Work Plan.
RD = Remedial Design.
RDR = Remedial Design Report.
RI = Remedial Investigation.
RmA = Removal Action.
RSE = Remedial Site Evaluation.
S&M = surveillance and maintenance.
TBD = to be determined.
TDEC = Tennessee Department of Environment and Conservation.
UEFPC = Upper East Fork Poplar Creek.
VOC = volatile organic compound.

2.2 EAST TENNESSEE TECHNOLOGY PARK

The 4,689-acre ETTP is an inactive DOE uranium enrichment facility occupying the northwest portion of DOE's ORR. ETTP, formerly known as the Oak Ridge K-25 Site, is located in the East Fork Valley along the Clinch River at the confluence of Poplar Creek, and is bounded by Black Oak Ridge in the north, Pine Ridge in the south, and McKinney Ridge in the east.

ETTP was built as part of the Manhattan Project during World War II to supply enriched uranium for nuclear weapons production. Construction of the site started in 1943. The K-25 Building, the first diffusion facility built for large-scale separation of U^{235}, was fully operable by August 1945. In response to the national postwar nuclear emphasis, plant operations were modified to include the production of uranium compatible with reactors used to generate electric power. Enriched uranium production was eventually shut down in the mid-1980s. The site is currently the focus of a reindustrialization effort intended to use existing resources for new industries at the former uranium enrichment facility.

ETTP is being dealt with as one watershed because of its location near the confluence of Poplar Creek and Clinch River and because of the large areas of cut and fill that were excavated during the construction of the plant. Specific sources or groups of sources within this watershed are the subject of proposed and ongoing environmental cleanup projects.

2.2.1 ETTP Site-wide Record of Decision

Description

The purpose of the ETTP Site-wide Record of Decision (ROD) Project is to produce a decision document that defines the remedial strategy for ETTP. The project will include evaluating data from all potential contaminant sources at ETTP to determine where remedial actions (RAs) are required and which are the most effective RAs at specific sites. This project is also expected to identify areas where contaminants are not present above action levels or where existing conditions do not pose risks sufficient to justify RAs.

The ETTP Site-wide RI is designed to define the nature and extent of contamination in the soils and sediments and to identify the areas that pose a risk to human health and the environment at ETTP. The ETTP Site-wide ROD RI Report was submitted in FY 1999. The information obtained from the RI will be used to develop, screen, and evaluate potential RA alternatives.

FY 1999 Accomplishments

- submitted the D1 RI Report to EPA and TDEC on January 29, 1999. Received comments from the EPA and TDEC on July 14, 1999, and June 28, 1999, respectively;
- initiated work on the FS; and
- submitted a D3 version of a remedial site evaluation (RSE) for Lambert Quarry that was approved by EPA and TDEC.

Concerns and Issues

Both EPA and TDEC have expressed concerns on whether sufficient data exist in some geographic areas to make RA decisions based on the information in the RI Report. Consequently, the approach and strategy are being reviewed to redefine the ETTP Site-wide ROD project.

Plans for FY 2000

- negotiate and prepare RI and FS documents.

2.2.2 K-1070-A Burial Ground

Description

The K-1070-A Burial Ground, located in the northwest corner of ETTP, was used for the disposal of several types of waste from the 1950s through the mid-1980s. The burial ground contains largely uranium-contaminated waste from ETTP and other operations buried in unlined trenches and pits. Thorium-contaminated and pyrophoric waste and UF_6 cylinders are also included in records of burials at the site. Investigations have concluded that groundwater underlying the burial ground is contaminated with dense nonaqueous-phase liquids and that the plume is migrating southward toward the K-901-A Holding Pond.

This project includes the excavation of the waste deposited in the trenches and pits. Groundwater and adjacent soils will be addressed in the Site-wide ROD. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 15-month requirement for substantial, continuous, physical on-site action to implement the ROD will be met by the combined activities of starting construction on the EMWMF and awarding the implementation subcontract for the K-1070-A Burial Ground ROD.

FY 1999 Accomplishments

- submitted the D1 Remedial Design Work Plan (RDWP); and
- completed the D2 and D3 RODs.

Concerns and Issues

The ROD was not signed in FY 1999 as anticipated. Delay in signing the ROD may cause schedule slippage in the RDWP schedule. Additionally, until the ROD is signed, the Request for Proposal (RFP) for Excavation, Segregation, Loading, and Transportation for Disposal of K-1070-A Burial Ground Waste cannot be issued for bids.

Plans for FY 2000

- complete the approval process for the ROD and RDWP;
- issue an RFP and award a lump-sum subcontract for the excavation, segregation, loading, and transportation for disposal of buried source material; and
- complete the disposition of remaining Investigation Derived Waste from the burial ground.

2.2.3 K-1070-C/D G-Pit and Concrete Pad

Description

The K-1070-C/D Classified Burial Ground is located on a hill at the eastern edge of ETTP. The burial ground is composed of several disposal areas: large trenches, small pits, three earthen dike areas, a land farm, and a concrete pad. Both low-level radioactive and nonradioactive, nonhazardous waste materials and equipment were buried in the large trenches. The small pits were used for the disposal of segregated liquid and glass wastes, including some hazardous and radioactive wastes. One of the pits, G-Pit, is considered to be a continuing source of contamination to groundwater. The K-1071 Concrete Pad was used for the compaction of metal drums before burial and has been identified as a source of radiological contamination. Contaminants of concern (COCs) at the burial ground are volatile and semivolatile organics, uranium-contaminated scrap metal, uranium compounds, lead, and other metals.

An RI/FS was performed for the K-1070-C/D area. The results of RI/FS indicated the need for remediation of two sites in the K-1070-C/D Classified Burial Ground: the K-1071 Concrete Pad and the G-Pit.

The ROD for the K-1070-C/D Operable Unit was approved in January 1998. It mandates the excavation and temporary storage of wastes from the G-Pit at ETTP and the placement of a soil cover over the concrete pad area.

FY 1999 Accomplishments

- completed the capping of the concrete pad at Bldg. K-1071 on April 12, 1999; and
- awarded a contract on September 30, 1999 for excavation, segregation, characterization, treatment and disposal of the waste.

Concerns and Issues

None.

Plans for FY 2000

- begin and continue the power and surveying activities;
- Begin excavation, characterization and segregation of waste;
- submit Letter Report to the regulators to report progress of removal action activities; and
- continue the K-1070-C/D Plume project groundwater collection.

2.2.4 K-1070-C/D and Mitchell Branch Plumes

Description

The K-1070-C/D and Mitchell Branch Plumes Removal Action is a non-time-critical removal action designed to capture and treat contaminated groundwater from the K-1070-C/D and Mitchell Branch areas at ETTP. The removal action involves collecting contaminated groundwater in trenches and installing the

groundwater collection system to transport contaminated groundwater to the Central Neutralization Facility (CNF) for treatment and discharge under CNF's National Pollutant Discharge Elimination System (NPDES) permit.

The groundwater collection system in the K-1070-C/D area consisted of 600 linear ft of interceptor trench installed to the top of bedrock. Groundwater is collected and pumped from the trench to the existing SW-31 Spring sump. The groundwater is then transferred by existing pipeline to CNF for treatment and discharge. The Mitchell Branch collection system consisted of approximately 1,200 linear ft of interceptor trench and an estimated 29 extraction wells. A subsurface vertical barrier was installed between the interceptor trench and Mitchell Branch to prevent dewatering of the system. A stream liner system was installed along an approximate 700-linear-ft section of Mitchell Branch where the extraction wells were installed to prevent dewatering of this section of the stream. Groundwater is routed to a central collection point and then transferred by pipeline to CNF for treatment and discharge.

Because this project is an interim action, the ETTP Site-wide ROD will determine the final RA.

FY 1999 Accomplishments

- submitted the RmAR and received approval from EPA and TDEC; and
- closed the project in FY 1999.

Concerns and Issues

None.

Plans for FY 2000

Since the project was closed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.2.5 K-1070-C/D and Mitchell Branch Plumes Long-term Operations and Maintenance

Description

The K-1070-C/D and Mitchell Branch Plumes Long-term Operations and Maintenance Project existed to perform any repairs that were needed to the groundwater collection systems and to perform the initial optimization on the groundwater collection systems.

FY 1999 Accomplishments

- evaluated the efficiency of the groundwater collection systems at K-1070-C/D and Mitchell Branch;
- performed well repair and pumping system optimization to ensure the efficient operation of the K-1070-C/D and Mitchell Branch groundwater collection systems; and
- closed the project in FY 1999.

Concerns and Issues

None.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

In FY 2000 and beyond, the ETTP Water Quality Program will perform groundwater monitoring, the groundwater collection system evaluation will be performed by the Facility, Maintenance, Surveillance, Inspection and Testing subcontractor, and the optimization of the groundwater collection systems will be performed by the CNF.

2.2.6 K-25 Auxiliary Facilities Area Demolition Group I Building Demolition

Description

The five facilities included in the K-25 Auxiliary Facilities Area Demolition (KAFaD) Group I Building Demolition are Bldgs. K-724, K-725, K-1031, K-1131, and K-1410.

The K-725 facility is a small (21,600-ft^2) building in the powerhouse area for which there are limited access controls. This building, along with the nearby K-724 Warehouse Building (8,600 ft^2, is known to be contaminated with beryllium and radioactivity in excess of release limits and are structurally deteriorated.

Building K-1031 (2,900 ft^2) was a maintenance and storage facility in support of the decontamination operations in nearby K-1410. Building K-1131 (55,700 ft^2) was used to support the gaseous diffusion process. Building K-1410 (9,000 ft^2) was originally used for decontaminating equipment with uranium contamination and later for nickel plating the metal parts of uranium enrichment equipment. These facilities all contain high levels of radioactive contamination that exceed release limits and are in a deteriorated condition from roof leaks.

Decontamination and decommissioning (D&D) of these facilities is being performed as a CERCLA non-time-critical removal action under the guidelines of the May 22, 1995, joint DOE and EPA *Policy on Decommissioning of Department of Energy Facilities under CERCLA*. The Engineering Evaluation/Cost Analysis (EE/CA) was submitted in April 1996. The D1 Action Memorandum (AM) was submitted in September 1996; the D2 AM was approved in March 1997. The actions completed during the year include the decontamination and demolition of all structures to ground level. The decontamination of components was performed as needed to protect workers and to facilitate the recycling or reuse of recovered materials. Mixed wastes and low-level wastes (LLW) are being disposed using approved facilities with selected materials (primarily structural steel) being stored for eventual decontamination and recycle under a future project.

After demolition, the building concrete slabs were scabbled in an attempt to remove fixed contamination. The K-724 slab and a large portion of the K-725 slab were successfully cleaned to unrestricted use levels. After two passes with scabbling equipment, contamination was still present on the K-1031, K-1131, and K-1410 concrete slabs. The exposed concrete slabs from K-1031, K-1131, and K-1410 had the potential to weather and create mobile, transferable contamination in close proximity to surface waters and storm drains. A 2-in. layer of asphalt was applied to cover the concrete slabs to stop

the weathering of the fixed contamination and, therefore, help reduce the potential for the spread of radioactive contamination. Because the Group I Auxiliary Facilities removal action is an interim action, the ETTP Site-wide ROD will determine the final remedy for the contaminated slabs, soils, and below-grade structures.

Also included in this project is a removal action for the KAFaD Group II buildings. This effort has thus far consisted of preparation of a broad scope EE/CA for a large group of auxiliary buildings at ETTP.

FY 1999 Accomplishments

- submitted the D1 RmAR to the regulators on August 25, 1999, seven months ahead of the schedule of April 1, 2000, that was originally established in the AM;
- completed the D&D activities of this removal action, including the characterization, decontamination, demolition, material and waste packaging, and site restoration to a maintainable condition;
- disposed of more than 80,000 ft^3 of LLW at Envirocare of Utah;
- recycled over 1.2 million pounds of scrap metal after radiological surveys showed the material met unrestricted use standards;
- achieved a successful safety record for the project;
- successfully used a radiological dose-based approach for on-site disposition of more than 55,000 ft^3 of earthen materials (i.e., crushed concrete and masonry); and
- developed a broad scope D1 EE/CA for the KAFaD Group II buildings. (Regulator comments were incorporated into a D2 revision of the EE/CA, and D2 comments have also been received.)

Concerns and Issues

The Group II Buildings EE/CA continues to undergo revisions and review cycles due to clarification of scope under the EE/CA. As a result, demolition of the Group II buildings has been delayed.

Plans for FY 2000

- complete the disposition of 40,000 ft^3 of LLW; and
- issue the D2 RmAR for the KAFaD Group I buildings.

2.2.7 Process Equipment Decontamination and Decommissioning (Bldgs. K-29/K-31/K-33)

Description

This removal action addresses the decontamination and removal of process equipment and the decontamination of Bldgs. K-29, K-31, and K-33. These buildings were originally designed and built to house the low-enrichment operations of the gaseous diffusion plant. The process buildings were constructed in the early 1950s, placed in stand-by in 1985, and placed in permanent shutdown status in 1987. The condition of the buildings (three of the largest process buildings at ETTP) presents a threat of

potential release of contaminants to the environment. The equipment in these three buildings totals over 126,000 tons of material.

Equipment removal and decontamination of the three process buildings will be performed as a non-time-critical removal action. The scope of activities to be performed includes the preparation of endpoint specifications for the decontamination tasks followed by the decontamination and recycling of process equipment.

FY 1999 Accomplishments

Material dispositioned (total to date) includes:

- K-33 material surveyed/released for unrestricted use 1,804 tons
- K-33 process gas pipe sent to MSC for decontamination/release 1,239 tons
- switchyard material released for unrestricted use 4,500 tons
- LLW shipped to Envirocare 860 tons
- mixed waste (stabilized pond) shipped to Envirocare 10,744 drums
- polychlorinated biphenyl (PCB) transformers shipped for disposal in Alabama 642 tons

In addition to the above material dispositions, the following tasks were accomplished in FY 1999:

- completed 20% of the overall cleanup of Bldg. K-33 versus 25% which was scheduled;
- completed Contract Milestone Nos. 2 and 4, *First Cascade Unit (Unit 8) Dismantlement* on June 2, 1999;
- completed Contract Milestone No. 2C, *MSC Off-site Facility Decontamination Upgrades* on March 29, 1999, on schedule;
- completed Contract Milestone No. 3, *Disassembly and Size Reduction Workshop Operational* on September 27, 1999, versus the original schedule of March 31, 1999;
- completed Contract Milestone No. 5, *Complete Unit-7 Removal* in K-33, for dismantlement on September 30, 1999, versus the scheduled completion of August 1, 1999;
- completed 85% of Option-I, *K-31 and K-33 Switchyard Demolition,* versus 100% scheduled completion. Completion will slip from 05/99 to 06/2000; and
- completed Option-II, *Pond Waste and Portsmouth Soils Containers Removal and Shipment,* which shipped 10,744 of 20,000 drums

Concerns and Issues

Nevada Test Site (NTS) disposal availability:

- BNFL will be ready to ship classified LLW on February 1, 2000; and

- The project will have to pay extra for disposal and ultimately hand over to DOE-ORO Waste Management if NTS is not available.

BNFL rebaselining internal project schedule:
- BNFL claims material quantities are exceeding the contract by 15%;
- BNFL is tentatively projecting a K-33 turnover date delay up to 1 year; and
- BNFL is projecting K-31 and K-29 turnover dates maintained per the existing schedule.

Oil, Chemical, and Atomic Workers International Union (OCAW) lawsuit:
- The judge ruled in DOE's favor on all issues; and
- PACE/OCAW filed notice that they intend to appeal.

Congressional legislation limiting recycle of metals.

Plans for FY 2000

- complete Contract Milestone No. 6, *Complete Unit-6 Dismantlement and Removal in K-33* scheduled for December 20, 1999;

- complete Contract Milestone No. 7, *Complete Unit-5 Dismantlement and Removal in K-33* scheduled for March 20, 2000;

- complete Contract Milestone No. 8, *Complete Unit-4 Dismantlement and Removal in K-33* scheduled for July 20, 2000;

- complete Option-I, *K-31 and K-33 Switchyard Demolition* by June 20, 2000;

- complete Option-II, *Pond Waste and Portsmouth Soils Containers Removal and Shipment* by February 1, 2000;

- BNFL/MSC Nickel Electro-refining Facility Operational in August 2000; and

- BNFL Supercompactor Operational in September 2000.

2.2.8 K-1401/K-1420 Sumps

Description

Buildings K-1401 and K-1420 are located on the northeastern side of ETTP. Both buildings are equipped with basement sumps situated below the seasonal water table. Contaminated groundwater collects in these sumps and is transferred to storm drains that discharge directly to Mitchell Branch; this discharge water then flows to Poplar Creek and eventually to the Clinch River. This time-critical removal action consists of collecting and piping contaminated groundwater from the sumps to the ETTP CNF; the treated wastewater is then discharged directly to the Clinch River.

Building K-1401 was built in 1944 as a maintenance facility supporting the gaseous diffusion process. It is a large, steel-framed structure with brick and fiberglass siding and a built-up roof. The building housed tanks of trichloroethylene and hydrochloric acid used to clean equipment (e.g., pumps, piping, coolers, etc.).

Building K-1420 was built in 1954 as a decontamination and uranium recovery facility. It is a two-story, three-bay, noncombustible building with concrete floors. Equipment from every process building, including equipment used to produce highly enriched uranium, has been decontaminated and serviced in Bldg. K-1420. Solvents were used extensively in the cleaning and decontamination of various parts, an operation conducted primarily in the basement.

An AM was submitted and approved in June 1997. The selected action consists of capturing the discharge water from the basement sumps in Bldgs. K-1401 and K-1420 and installing piping to route this water to CNF. Work at Bldg. K-1401 involved the installation of sump pumps and transfer pumps to transfer groundwater collected in the sumps via a new pipeline to CNF. Work at Bldg. K-1420 involved routing the discharge from the east sump to the west sump. New pumps were installed in the west sump. Discharge from these pumps is routed directly to CNF.

FY 1999 Accomplishments

- submitted the D2 RmAR and received approval from EPA and TDEC; and
- completed the project.

Concerns and Issues

None.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.2.9 ETTP Ponds

Description

The K-901-A Holding Pond at ETTP received chromated cooling tower water blowdown and a variety of other wastes from cylinders breached ballistically over the pond in the late 1950s. Three previous investigations at the K-901-A Holding Pond concluded that there is sediment contamination, unacceptable risk to human health, and potential risk to ecological receptors. The result of the sediment investigation conducted in 1986 indicated that elevated levels of contamination existed from chromium, selenium, and zinc. The results of the K-901-A Holding Pond ecological risk assessment conducted in 1994 indicated that contaminant levels in the fish presented a risk to piscivorous predators. In 1994, an RSE was conducted. The RSE reported that unacceptable human health risk existed from the ingestion of PCB-contaminated fish and that a potential risk existed to ecological receptors, such as herons, minks, and kingfishers. The site evaluation also confirmed the existence of sediment contamination.

The K-1007-P1 Pond, formerly known as the K-1007-B Pond, is located outside Portal 2 on the southwestern boundary of ETTP. The K-1007-P1 Pond has historically received discharges from the laboratory complex and from process building storm drains around ETTP. The pond currently receives discharges from five storm drains. Previous sampling activities in the late 1980s and the 1990s revealed high levels of PCBs in largemouth bass in the K-1007-P1 Pond and in sediment. If ingested by humans, the levels of PCB in the fish present an unacceptable health risk. As a result of the elevated levels of PCBs found in the fish, warning signs were placed around the boundary of the pond, and guard patrols were increased.

FY 1999 Accomplishments

- disposed of the 10 unbreached cylinders discovered in the K-901 Pond; and
- submitted the RmAR to the regulators which completed the project.

Concerns and Issues

The work on the K-1007 Pond required by an AM was not accomplished because the additional sampling done during the field investigation, and a thorough review of the maintenance history, determined that draining the pond was not required. It has been agreed by the regulators to address the pond sediments under the Site-wide ROD.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.3 OAK RIDGE NATIONAL LABORATORY

ORNL occupies approximately 3,560 acres in MV and BV, 10 miles southwest of downtown Oak Ridge, Tennessee. ORNL's missions are to conduct applied research and engineering development in support of DOE programs in nuclear fusion and fission, energy conservation, fossil fuels, and other energy technologies, and to perform basic scientific research in selected areas of the physical, life, and environmental sciences. The laboratory was built in 1943 as part of the World War II Manhattan Project. Its original mission was to produce and chemically separate the first gram quantities of plutonium as part of the national effort to produce the atomic bomb.

The cleanup strategy for ORNL, for the most part, integrates the numerous applicable federal and state regulations for efficient compliance and approaches for both investigative and remedial efforts on a watershed basis. Two watersheds, or hydrogeologic regimes, have been identified at the ORNL facility: White Oak Creek (WOC)/BV and WOC/MV.

The subprojects discussed in Sections 2.3.1 through 2.3.6 are associated with the MV Watershed. The MV Watershed occupies approximately 1,000 acres in the southern portion of ORNL, located on DOE-ORR. The watershed consists of 35 separate areas, or sub-basins, which drain together into WOC, flow into White Oak Lake, and then over White Oak Dam to the Clinch River. Portions of some of these sub-basins have been contaminated with a variety of wastes, including low-level radioactive, both liquid and solid, through historic waste disposal practices. Strontium-90, tritium, and cesium-137 are the primary COCs in surface water leaving the MV Watershed because of their potential adverse impact on human health and the environment.

The subprojects discussed in Sections 2.3.7 through 2.3.11 are associated with the BV Watershed. The geographic area of the BV Watershed is divided into two major categories: land area covered under the BV Watershed ROD, and land categorized as study areas for the purpose of footprint reduction efforts. The 1,700-acre land area covered by the BV ROD is a relatively long, narrow strip of valley floor that lies to the north of Melton Valley. A large portion of this strip of valley is drained by White Oak Creek that eventually turns southward through a water gap in Haw Ridge into Melton Valley. The eastern portion of the valley strip is drained by Racoon Creek. The Bethel Valley watershed includes the ORNL Main Plant

Area, which consists of active and inactive buildings, former burial grounds, underground tanks and pipelines, and associated utilities. The predominant contaminants of concern are mercury in the surface water; various radionuclides in the soil; and a mixture of radionuclides, metal, and organics in the groundwater.

2.3.1 Melton Valley Watershed Record of Decision

Description

CERCLA Areas located in the MV portion of the WOC Watershed at ORNL will be addressed under this project. The project is utilizing existing data, supplemented by a small amount of new data, to prepare a ROD for the MV area of ORNL. This watershed encompasses the contaminated areas within the MV area of ORNL. Groundwater, surface water, floodplain soils, and source units in the watershed are being evaluated as a single entity (i.e., watershed) to ensure that (1) a consistent approach to remediation is implemented across the valley and (2) RA's at specific sites are prioritized to achieve the greatest risk reduction. Selection of the preferred alternative for the remediation of the MV area of ORNL will lead to the establishment of remediation goals and identification of the sequence of actions to be taken during remediation of the watershed.

FY 1999 Accomplishments

- completed successful review of the MV Watershed Proposed Plan (PP) by the National Remedy Review Board (NRRB) in November 1998. The D3 was approved for public review by the regulators on May 21, 1999. A Public Meeting was held for the MV PP on June 24, 1999, midway through the public review period which extended from June 1, 1999, to July 30, 1999; and

- submitted the MV D1 ROD to the regulators on August 31, 1999, for review and comment.

Several factors led to the need for extensions during this period. Extensions included:

- on September 24, 1998, EPA requested an extension of the PP D1 regulator comment period to allow for NRRB review;

- DOE initiated a Request for Extension of the D2 PP, allowing DOE additional time to incorporate regulator comments into the document. The regulatory agencies had requested additional information and meetings with DOE to resolve key issues before agreeing on a proposed set of cleanup actions to be presented in the PP. A meeting to resolve remaining issues was held on March 25, 1999. The schedule extension provided time for DOE to modify the PP to reflect agreements reached in that meeting (D2 delivery was extended from 3-31-99 to 4-15-99). A final DOE Request for Extension was made for the PP to allow for a D3 version to be prepared incorporating final TDEC comments. The resulting submission date for the D3 PP was May 21, 1999;

- the regulators requested an extended Public Comment Period for the PP (60 days) to increase opportunity for public input. The extended PP review period expired on July 30, 1999; and

- DOE initiated a Request for Modification for preparation of the D1 ROD from July 15, 1999, to September 1, 1999 based on the extended public review period.

Concerns and Issues

Extended review and comment periods have been necessary to allow for the resolution of several important issues. These extensions have delayed the PP and ROD milestones. It is now anticipated that the ROD will be approved in FY 2000.

Plans for FY 2000

Based upon the current schedule, it is anticipated that two CERCLA documents will be approved as part of this project in FY 2000. These include the MV ROD and the MV RDWP. Design will also be initiated on the first action following ROD approval. This action will be identified and reported as a separate project in the next annual report.

2.3.2 Molten Salt Reactor Experiment Reactive Gas Removal

Description

The Molten Salt Reactor Experiment (MSRE) Reactor Building (7503) is located at ORNL in MV. MSRE was part of the Atomic Energy Commission's Molten Salt Reactor Program, and was shut down on December 12, 1969. A surveillance and maintenance (S&M) program was initiated and continues on the shut-down facility. Elevated radiation readings indicated the potential migration of radioactive contamination outside the fuel drain tank cell. Subsequent analyses and tests in 1994 showed evidence of ^{233}U in the Auxiliary Charcoal Bed (ACB), located in the Charcoal Bed Cell, and reactive gases (UF_6 and fluorine) in the off-gas system.

A time-critical removal action was initiated in July 1994 to mitigate risks posed by this situation. In October and November 1994, water was removed from the ACB, and several other stabilization measures were performed in advance of the submittal of an AM in June 1995. Stabilization measures included installing a criticality accident alarm system, grouting the cell overflow line, installing an isolation valve in the cell ventilation line, isolating the cell drain line, installing seal plugs into penetrations in the cell shield plug, and inerting the cell atmosphere by filling it with carbon dioxide.

The AM also describes the removal of the reactive gases in a chemical trapping system that began operation in November 1996. In the Reactive Gas Removal System (RGRS), the gases are chemically adsorbed onto reactive pellets as solids, with the fluorine managed as an aluminum trifluoride waste material and the UF_6 managed as a product in a storage facility at ORNL. The stored UF_6 must be processed and converted to a uranium oxide to ensure long-term storage stability. In addition, actions to mitigate immediate potential hazards at MSRE were tracked as a milestone in response to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-1.

FY 1999 Accomplishments

- continued RGRS operation and removed a total of approximately 22.6 kg of ^{233}U, to date, from the MSRE off-gas system with RGRS;

- reduced the gas pressure in the fuel and flush salt tanks and majority of the off-gas system to less than atmospheric pressure and purged the tanks and off-gas system so that they contain less than 100 ppm of reactive gases; and

- completed sampling of the reactor side of the off-gas system, and no indication of UF_6 presence was identified.

Concerns and Issues

Some additional lines (helium gas lines section of the off-gas system) were sampled, and lines were found to be slightly pressurized (1 to 3 psi). Results of sample analysis indicated the presence of F_2 and UF_6.

Plans for FY 2000

- continue periodic RGRS operations on an as-needed basis to maintain stable conditions;
- operate the RGRS to purge newly identified sections of the off-gas system from UF_6 and reduce pressure to below atmospheric pressure;
- anneal one of the three drain tanks to determine if more of the UF_6 can be driven out of the salt and captured by RGRS. This process may also explain the migration of plutonium from salt in the form of PuF_6.

2.3.3 Molten Salt Reactor Experiment Uranium Deposit Removal

Description

This non-time-critical removal action consists of the recovery of ^{233}U from ACB. An AM for Uranium Deposit Removal at MSRE was submitted to EPA and TDEC in August 1996. The recommended alternative is the removal of uranium-coated charcoal filter media from the charcoal bed cell such that the amount of fissile uranium is reduced to a level lower than the critical mass (so that an uncontrolled chain reaction cannot occur). To address concerns over the possibility of a carbon-fluorine deflagration/explosion (a chemical reaction that would cause ignition of the charcoal in the charcoal bed cell), additional removal of ^{233}U over and above the amount needed to eliminate the possibility of a critical mass is proposed. In addition, the removal of the uranium from the charcoal bed is being tracked as a milestone in response to the DNFSB Recommendation 94-1.

FY 1999 Accomplishments

- submitted a D2 RmA Work Plan and received approval from EPA and TDEC.

- successfully entered the ACB and accessed the uranium-laden charcoal via drilling through the ACB thermocouple well, the ACB upper and lower diffuser plates, and steel wool between the two ACB diffuser plates;

- completed probing of the charcoal and visual examination of the ACB upper internals (two ACB diffuser plates and steel wool) using a borescope. It was identified that the charcoal is non-granular, and a new removal approach/method was required;

- completed sampling and analysis of the ACB charcoal material;

- developed alternative approaches for removing charcoal from the ACB. One was selected based on feasibility, safety, cost, and schedule duration;

- completed the preliminary design activity for the new charcoal removal approach; and

Concerns and Issues

The ACB activities were planned on the assumption that the charcoal was in the original granular form and could be removed by a vacuuming operation. However, it was identified that the charcoal was non-granular, and a new removal approach/method was required. This discovery resulted in missing both FFA and DNFSB FY 1999 milestones. New milestones have been set for this activity and have been approved by the regulators. A charcoal removal date of December 30, 2000, for the DNFSB milestone has been proposed and is awaiting approval by DNFSB.

Plans for FY 2000

- complete the design activities for the new charcoal removal approach, and fabricate the necessary equipment;
- install all the equipment for the new removal approach and field test;
- conduct a second round of hot denaturing of the ACB content. This is to convert the potentially explosive compounds (CxF) in the ACB, to stabilize the chemicals by the controlled addition of ammonia to the system and heating the ACB; and
- start the uranium deposit removal field activities.

2.3.4 Molten Salt Reactor Experiment Fuel and Flush Salt Removal

Description

The molten salt that circulated in MSRE as fuel consisted of a mixture of lithium fluoride, beryllium fluoride, zirconium fluoride, and uranium fluoride. A small amount of plutonium fluoride was added to the salt. When the reactor was shut down in December 1969, the molten salt fuel, containing approximately 37 kg (81.7 lb) of total uranium (84% ^{233}U) was drained into two MSRE salt storage tanks, where it solidified. A flush salt, similar in composition to the fuel salt but without the uranium, was recirculated through the reactor and drained into a third storage tank and solidified. All three storage tanks are located in the below-grade, concrete-shielded drain tank cell adjacent to the reactor cell.

Since shutdown, the facility has been under an S&M program awaiting final disposition of the fuel and flush salts and decommissioning of the facility. In 1987, surveillance activities detected elevated radiation levels in off-gas lines connected to the three drain tanks. Samples of the off-gas taken in March 1994 revealed the presence of fluorine and uranium hexafluoride (UF_6) gas formed by the interaction of radiation and salt. After these gases were detected, actions were taken to reduce the risk and safely manage the fuel and flush salts in their respective drain tanks. In addition, the removal of the uranium from the tanks is being tracked as a milestone in response to the DNFSB Recommendation 94-1.

As part of the CERCLA process, a FS was conducted to evaluate the potential human health and ecological risks and to propose remediation alternatives to prevent and/or mitigate the risks. A ROD has been approved documenting the proposed remedy.

FY 1999 Accomplishments

- removed the second steam dome from the fuel salt tank and completed inspections. The inspections provided confidence that the tank had not deteriorated and that future in-tank melting of the salt and in-tank chemical processing would be possible;

- successfully completed melting and transfer of the coolant salt from the coolant drain tank to the coolant salt vessels. One of the vessels was designed to be used in the pool melt test activities;

- successfully conducted fluorination tests, and the results were documented and used for fuel salt removal process equipment design;

- fabricated the prototype pool melt probe and completed the pool melt tests;

- completed the installation of all three 3-in. access valves on the fuel drain tanks 1 and 2, and fuel flush tank, and gained access to the tanks;

- completed visual (external and internal) and ultrasonic inspections of all three tanks. The inspections provided confidence that the tanks had not deteriorated and that future in-tank melting of the salt and in-tank chemical processing would be possible;

- submitted the D2 RDWP to the regulators on November 17, 1998, and it was approved by EPA on December 8, 1998, and TDEC on February 3, 1999;

- completed 60% design packages for the salt removal process equipment; and

- submitted the D1 RDR/RAWP to the regulators for review and comment. Received conditional approval from EPA. The Plan was revised and the D2 version of the RDR/RAWP was issued to the regulators. EPA and TDEC approved the D2.

Concerns and Issues

During the installation of the access valves on the three drain tanks, white-colored deposits were discovered on the surfaces of the tank's standpipe and its flange. Samples of the white deposits from one of the tanks and one of the flanges were analyzed. Results of the analysis indicated that the plutonium has migrated outside of the fuel salt.

Plans for FY 2000

- continue the process equipment design for fuel and flush salt removal activities;

- prepare procurement packages for the purchase of fuel and flush salt removal equipment; and

- complete the line cutting and capping in support of the fuel and flush salts transfer equipment and activities.

2.3.5 Old Hydrofracture Facility Tanks Sludge Removal

Description

Between 1964 and 1980, waste liquid and suspended solids from the ORNL main plant liquid low-level waste (LLLW) system were decanted and pumped to five Old Hydrofracture Facility (OHF) LLLW tanks. At the OHF, the liquid radioactive mixed waste was blended with grout and injected approximately 300 m (1,000 ft) into shale bedrock under high pressure. Although the OHF facility has been inactive since 1980, the five storage tanks were left in place and contained residual waste material categorized as hazardous and radioactive. In the unlikely event of a leak, the radioactivity content and close proximity of the tanks to Melton Branch and WOC made continued storage of this waste unacceptable. Thus, DOE, TDEC, and EPA agreed in 1995 to initiate a non-time-critical removal action to reduce the risk of such a release by removing the residual sludge from the tanks. An EE/CA was prepared in 1996, and an AM was issued in September 1996. Sludge removal was performed in July 1998.

FY 1999 Accomplishments

- Received approval of the D1 RmAR by EPA on October 5, 1998, and by TDEC (with cost addendum) on December 15, 1998.

Concerns and Issues

None.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.3.6 Old Hydrofracture Facility Tanks and Impoundment

Description

The OHF Impoundment is a riprap-lined pond used between 1965 and 1979 to receive various types of wastes from the OHF operations. The pond contains surface water contaminated with ^{90}Sr, ^{137}Cs, ^{60}Co, ^{99}Tc, and ^{233}U, and approximately 54 m^3 of sediments contaminated with ^{137}Cs, ^{90}Sr, and ^{244}Cm. A total of 522 Ci of residual radioactivity remains in the OHF LLLW tanks following sludge removal (see "Old Hydrofracture Tanks Sludge Removal," Sect. 2.3.5 above).).

The Process Waste Sludge Basin (PWSB) is a PVC lined pond that was used between 1976 and 1981 to contain and settle sludge produced by the ORNL Process Waste Treatment Plant. Sediment constituents are primarily ferrous sulfate and ferric hydroxide with some radionuclides (Cs-137, Sr-90, Co-60, U, Am, Cm, Pu). A non-time-critical removal action has been proposed to relocate the PWSB sediment to the OHF Impoundment and stabilize the pond sediments, the tank shells, and the residual radioactivity with grout. PWSB sediment removal and stabilization in the OHF Impoundment is being added to the scope of the OHF removal action to cost effectively implement a portion of the remedy delineated in the approved Melton Valley Watershed Proposed Plan for this unit.

FY 1999 Accomplishments

- received approval of the D2 EE/CA from EPA and TDEC on October 1, 1998;
- submitted the approved D3 AM on May 18, 1999; and
- submitted the D1 Removal Action Work Plan (RmAWP) to EPA and TDEC on September 28, 1999.

Concerns and Issues

FY 1999 FFA milestones were extended as this project awaited approved of reprogramming funds prior to initiating the field work.

Plans for FY 2000

- respond to EPA and TDEC comments on the RmAWP and receive approval on the document;
- submit an addendum to the AM to include removal of Process Waste Sludge Basin sediments and consolidation/stabilization of those sediments with OHF Pond sediments. The actions associated with this removal action are consistent with remedies presented in the approved Melton Valley Watershed Proposed Plan and the draft (D1) Melton Valley Watershed Record of Decision currently being reviewed by the regulatory agencies;
- award the contract to remediate the OHF pond and stabilize (i.e., grout) the tanks in place; and
- submit the RmAR to EPA and TDEC.

2.3.7 Bethel Valley Watershed Record of Decision

Description

CERCLA Areas located in the BV portion of the WOC Watershed area at ORNL will be addressed under this subproject. The project has used existing data to prepare a combined RI/FS for the BV area of ORNL. This watershed encompasses the contaminated areas within the BV area of ORNL. Groundwater, surface water, flood plain soils, and source units are being evaluated as a single entity (i.e., watershed) to ensure that a consistent approach to remediation is implemented across the valley. Final groundwater decisions are being deferred. Selection of the preferred alternative for the remediation of the BV area of ORNL in a ROD will lead to the establishment of remediation goals and identification of the sequence of actions to be taken during remediation of the watershed.

FY 1999 Accomplishments

- submitted the D2 and the Errata to the D2 RI/FS to the regulators. The RI/FS was approved by the regulators at the beginning of August of 1999; and
- submitted the D1 PP to the regulators on August 3, 1999.

Concerns and Issues

None.

Plans for FY 2000

- submit the PP to the regulators and to the public for comment; and
- submit the D1 ROD to the regulators.

2.3.8 Gunite and Associated Tanks

Description

The Gunite and Associated Tanks (GAAT) project consists of the eight underground gunite tanks associated with two tank farms located in the center of the ORNL main plant area. Tanks W-3 and W-4 are in the North Tank Farm, and W-5, W-6, W-7, W-8, W-9, and W-10 are located in the South Tank Farm. These inactive tanks (installed in 1943 to store liquid wastes) were used as the main holding tanks for the LLLW system at ORNL.

The treatability studies to determine the most effective way to remediate sludges remaining in the tanks have been completed. The studies included testing methods for removing and/or treating tank sludges. After the treatability studies were complete in the North Tank Farm operations (which include equipment and platforms), activities were relocated to the south tank.

The GAAT project is separated into two components: (1) removal of tank contents as part of an Interim Action ROD, and (2) closure of the tanks and site as an element of the BV Watershed ROD.

FY 1999 Accomplishments

- completed the waste removal activities in Tank W-5 using a Flygt mixer system;
- completed the Houdini II system (remote-operated vehicle) cold testing activities;
- deployed and operated the PulsAir mixer in Tank W-9;
- performed the cold test of the Ultra High Pressure Pump System and the Slurry Monitoring Test Loop System (SMTL);
- deployed and operated the Ultra High Pressure Pump System, pipe cutting and plugging end-effector, and SMTL in Tank W-7;
- deployed, tested, and operated the disc-flow pump on Tank W-9;
- completed the waste removal activities in Tank W-7 using the Modified Light-Duty Utility Arm (MLDUA), Hose Management Arm (HMA), and Houdini II systems;
- completed the readiness determination for sludge transfer from the GAAT consolidation Tank W-9 to the Melton Valley Storage Tanks (MVST);
- relocated the MLDUA and HMA from Tank W-7 to Tank W-10;

- completed 8 waste transfers from GAAT consolidation Tank W-9 to the MVST, 192,728 gallons of slurry containing 32,309 gallons of sludge; and

- completed wall cleaning and bulk sludge removal from Tank W-10.

Concerns and Issues

None.

Plans for FY 2000

- complete waste removal operations at Tanks W-10, W-8, and W-9 in accordance with the Interim Action ROD; and

- complete all waste transfers to MVST.

2.3.9 ORNL Main Plant Surface Impoundments

Description

The Main Plant Surface Impoundments originally consisted of four surface impoundments located in the south-central portion of the ORNL main plant area. Impoundments C & D (3539 and 3540) were remediated in 1998. A brief description of the remaining two impoundments follows:

Basin 3524 A. This impoundment was constructed in 1943 to serve as an intermediate storage, collection, and mixing basin for the process waste treatment system located in Bldg. 3544. This impoundment is no longer used, but water levels are maintained to provide shielding for radioactive sediments.

Basin 3513 B. This impoundment was constructed in 1944 to serve as a settling basin for untreated wastewater's before their discharge into the adjacent WOC. This impoundment is no longer used, but water levels are maintained to provide shielding for radioactive sediments.

The principal risk posed by the impoundments is the exposure of the impoundment sediments to windborne transport or for direct human contact with impoundment sediment. Alternatives considered to address conditions at the site included several methods for on-site and off-site management and consolidation of the sediments in a secure facility. The PP recommended the design and construction of an on-site consolidation cell that would store the waste sediment from each of the impoundments in a single location. The impoundment would be equipped with a liner system, a protective surface cover, and a leachate collection system to recover free-draining liquids from the cell. EPA concurred with this recommendation, while TDEC maintained that the construction of a new waste consolidation cell, while a vast improvement over the existing condition, would leave a new waste management area requiring long-term care.

Based on regulator and stakeholder comments, a new preferred remedial alternative was chosen. The preferred alternative is off-site disposal after suitable treatment of sediments.

Signature approval of the ROD was received on September 24, 1997.

FY 1999 Accomplishments

- submitted the D1 RAR for the remediation of impoundments C and D in December 1998 and D2 in March 1999. Received approval for the D2 RAR for the remediation of impoundments C and D in April 1999; and

- submitted the D1 RDR/RAWP to the regulators in July 1999 for Impoundments A and B.

Concerns and Issues

No disposal facility is open that can accept the treated SIOU sediments. The path forward for securing concurrence to use Hanford, Washington, as the disposal facility of choice for the SIOU waste was revised to the NTS. This was done because NTS received approval from EPA Region IX to receive CERCLA waste. Recently information has been made available that would suggest that the new WAC will allow the waste to go there at approximately the same cost. This possibility is currently under investigation and will be considered as an alternative disposal site for the waste if the information is determined to be factual.

The seeps from SIOU are currently monitored and controlled under the ORNL Surveillance & Maintenance Project. Methods have been developed to control the seeps during the remediation and monitoring will take place as well.

Plans for FY 2000

- complete and obtain approval for the D2 RDR/RAWP for SIOU A and B;

- transfer sediments from Impoundment A to Impoundment B;

- fill Impoundment A and install a gravel pad for use as a project laydown/staging area; and

- construct and test the sediment treatment facility.

2.3.10 Federal Facility Agreement Tanks Remediation Project

Description

ORNL has a comprehensive program under way to upgrade the LLLW system to meet the FFA requirements. Those tank systems that do not meet the FFA requirements are required to be removed from service, characterized, and remediated. The FFA Tanks Remediation Project is responsible for sampling and analyzing the inactive tanks' contents, submitting these results in the Waste and Risk Characterization Data Manuals, maintaining the tanks in safe inactive condition, and remediating the tanks. As of the end of FY 98, all LLLW tanks not meeting the FFA requirements for active service have been removed from service. The inactive tanks are remediated within the CERCLA framework: tanks with little associated risk are remediated as maintenance actions with regulatory concurrence; tanks with more associated risk are remediated via approved Engineering Evaluation/Cost Analysis and Action Memorandum documents; finally, tanks which require more regulatory and other stakeholder involvement and for tanks which final action is sought will be remediated in accordance with the Bethel Valley Record of Decision. Table 2.3.10 illustrates these different remedial approaches.

Table 2.3.10 FFA Tanks Remediation Approach

Decision Factor	Maintenance Action	EE/CA & AM	ROD
Low Risk	W-16		
Moderate Risk		WC-1, WC-4, WC-10, WC-11, WC-12, WC-13, WC-15, WC-17, 2026-A, W-19, W-20, W-17, W-18, WC-3, WC-9, W1-I, F-501, T-1, T-2, WC-20, HFIR tank, T-14, 3003-A, TH-4, W-1, W-2, W-11	
Final Action			WC-1, WC-4, WC-10, WC-11, WC-12, WC-13, WC-15, WC-17, 2026-A, W-19, W-20, W-17, W-18, WC-3, WC-9, W1-I, F-501, T-1, T-2, WC-20, HFIR tank, T-14, 3003-A, TH-4, W-1, W-2, W-11, W-16

FY 1999 Accomplishments

- completed sampling and analysis of all Category D liquid low-level tanks as required by the FFA for all tanks after removal from service. The contents of the following tanks were sampled and analyzed in FY 99: F-501, W-16, W-17, W-18, W-19, W-20, WC-3, WC-9, WC-10, T-1, T-2, WC-20, T-14, and the HFIR tank. As part of the sampling and analytical efforts, the Risk Characterization Data Manual and Waste Characterization Data Manuals for the ORNL Inactive Tanks were updated and submitted to the EPA and TDEC;

- completed a video inspection of Tanks W-1, W-2, and W-11 to prepare for remediation activities. Previous characterization activities for these tanks included analysis of liquid contents. However, the sampling tools used at the time were not capable of determining if thin layers of sediments were present. Small amounts of solids were detected and samples were sent for analysis.

- completed the successful demonstration of Scarab III, an EM-50 funded remotely operated vehicle used for sampling activities. Scarab III was cold tested on-site and deployed in tank T-14 in May 1999. Samples from nine locations were composited and analyzed.

- completed the installation of access risers at tanks T-1, T-2, and WC-20. This included the preparation of a performance-based RFP, completion of a readiness determination, and successful implementation of the work package in the field. The access risers allowed for traditional sampling of the tanks' contents and will permit sludge removal and stabilization.

- completed a maintenance action on tank W-16 in July 1999. The maintenance action involved isolating and stabilizing tank W-16 by filling the tank with a flowable fill. A Notification of Completion letter was submitted to the EPA and TDEC following completion of field activities.

- received DOE approval of the Auditable Safety Analysis for S&M and sampling of all inactive tanks;

- submitted the WC-14 RmAR (D2) and received comments from EPA;

- submitted the FY 1998 Completion Report to the EPA and TDEC;

- issued the D2 and D3 ORNL Main Plant Inactive Tanks EE/CA. The public review period was held and the D1 AM approved May 14, 1999.

- issued the D1 RmAWP for the ORNL Main Plant Inactive Tanks. The RmAWP was approved as D1;

- submitted the D1 AM Addendum for 16 additional Category D ORNL Main Plant Inactive Tanks. The AM Addendum was approved as D1;

- awarded and issued notice to proceed to Allied Technology Group, Inc. (ATG) for Phase I of the ORNL Main Plant Inactive Tanks Remediation Project;

- awarded/modified the subcontract with ATG for Deployment of the AEA Pulse Jet Mixer into Tanks WC-9 and 3003-A; and

- issued the RFP for the remediation of the remaining ORNL FFA Inactive Tanks;

Concerns and Issues

In July 1999, the Main Plant Inactive Tanks Project was assessed a $100,000 penalty by the TDEC and the EPA in connection with a missed FFA milestone. DOE disputed that assessment based on the belief that such a penalty was inconsistent with the FFA. As part of that informal dispute process, DOE put forth two proposals for settlement. Both of these proposals involved committing to the completion of additional work in FY 2000 in lieu of payment of the penalty. Several projects were offered, with work scopes ranging from $500,000 to $1M. Both proposals were recently rejected. DOE has decided against further dispute on this assessment in order to avoid the use of additional resources on this matter. Therefore, DOE will submit a request for funding to cover this penalty as part of the FY 2002 EM budget request.

Plans for FY 2000

- complete the waste removal and stabilization activities as indicated in the AM for the 11 EE/CA Tanks, and deploy the AEA Plus Jet Mixer at two additional tanks for waste removal; and

- award an RFP for remediation of the remaining ORNL FFA Inactive Tanks.

2.3.11 Corehole 8 Plume Source

Description

During rock coring activities in 1991, high concentrations of radiological contamination were detected in groundwater in the central main plant area of ORNL. Subsequent groundwater sampling in 1995 indicated significant gross beta and alpha contamination in the vicinity of Tank W-1A in the North Tank Farm.

The liquid radioactive waste collection/storage Tank W-1A was commissioned in 1951 and remained in service for 35 years, until 1986. Tank W-1A was used as a storage tank for wastes from the high-radiation analytical facilities: Bldgs. 2026, 3019, and 3019-B.

This project is focussed on the removal of Tank W-1A and the surrounding soils suspected of being a primary source of contamination to groundwater, referred to as the Core Hole 8 Plume. The source removal action is being handled as a non-time-critical removal action under CERCLA.

FY 1999 Accomplishments

- submitted the RmAWP in February 1999 and received concurrence from the regulators in March 1999;
- issued the RFP in March 1999 and awarded the subcontract in May 1999; and
- initiated the removal action in August 1999.

Concerns and Issues

The potential for the presence of unknown subsurface piping is a concern. Probing is being performed in an attempt to detect any lines not shown on drawings.

Initial analyses by the subcontractor indicate that the presumed 1:1 blending needed for cesium to meet the waste acceptance criteria (WAC) for Envirocare may be higher than presumed.

Plans for FY 2000

- complete removal action by February 2000; and
- submit the D1 RmAR by April 2000.

2.3.12 Environmental Restoration Footprint Reduction and Site Evaluations

Description

DOE is identifying lands and buildings at ORR for which it can be determined (to the satisfaction of EPA and TDEC) that no action at these lands and buildings is required, and that the lands and buildings can, therefore, be conditionally released from CERCLA requirements. This activity is called the "footprint reduction" task in reference to the goal of reducing the size and configuration of the area of the ORR designated as part of the NPL site.

A review process was developed and conducted with the participation of TDEC and EPA for the purpose of identifying areas on ORR that have no indication of previous waste disposal activities and that are not otherwise known or suspected of being contaminated. The process uses information from previous, ongoing, and future site evaluations; historic and current aerial photographs and specialized surveys; other historic and current records; personal recollections; and ground verification. Information gathered in the review process is used to identify areas and facilities with no present or future funded use by DOE and that may qualify to be considered outside the boundary of the NPL. Assistance by TDEC in conducting group surveys has been very beneficial.

Candidate sites are evaluated for deletion using the CERCLA review process described in Sect. 120(4)(A) of the CERCLA statutes.

FY 1999 Accomplishments

- received approval from EPA and TDEC on the evaluation report for the West Haw Ridge/Bearden Creek Watershed Study Area (#13/19) that recommended an NFI determination;

- received approval from EPA and TDEC on the evaluation report for West Chestnut Ridge/West Bethel Valley that recommended an NFI determination for the West Bethel Valley Study Area (#18) and West Chestnut Ridge Study Area (#7); and

- received approval from EPA and TDEC on the evaluation report for the Copper Ridge Study Area that recommended an NFI determination for the Copper Ridge Study Area (#10/11) and Watts Bar Study Area (#10).

Concerns and Issues

None.

Plans for FY 2000

This project has been placed on hold to support funding of cleanup activities with higher priority.

2.3.13 Nuclear Material and Facility Stabilization Project

Description

The purpose of the Nuclear Material and Facility Stabilization (NMFS) Program is to place surplus facilities and spent nuclear fuel (SNF) at ORNL in a safe and stable condition as quickly as possible. These facilities will be prepared for an extended period of minimal life cycle S&M pending eventual transfer to the ER Program. S&M for these facilities will be performed by this project during the period of deactivation and for one year after deactivation has been completed. SNF on the ORR will be repackaged, certified, and placed in interim storage until it can be shipped to the Idaho National Engineering and Environmental Laboratory (INEEL). The scope of work (SOW) for the ORNL NMFS Program includes the following projects: High Ranking Facilities Deactivation Project (HRFDP), Isotopes Facilities Deactivation Project (IFDP), and SNF Project.

The HRFDP facilities are Bldg. 3010–Bulk Shielding Reactor and Bldg. 7700–Tower Shielding Facility. The IFDP facilities are Bldg. 3026-C–Krypton-85 Enrichment Facility; Bldg. 3026-D–Metal Segmenting Facility; Bldgs. 3038-A, -E, and -M–Alpha Handling Facility, Isotopes Materials Laboratory,

and Radioactive Packaging and Shipping Facility, respectively; and Bldg. 3517–Fission Product Development Laboratory.

FY 1999 Accomplishments

HRFDP

- removed from service gamma monitoring instrumentation, friskers, and continuous air monitors at the Bulk Shielding Facility (BSF);
- reduced the radiological boundary and reposted the BSF high bay so it no longer requires frisking on exit;
- dispositioned the heavy water inventory from the BSF and transferred it to Y-12 for reuse;
- completed cleanup of the boneyard at the Tower Shielding Facility (TSF) and reduced the radiological boundaries;
- reduced the BSF facility management position from 0.5 full-time equivalent (FTE) to 0.33 FTE;
- realized cost savings by changing the BSF demineralized water metered tank system (which had a minimum monthly usage fee) to a tank lease system;
- installed an automatic badge reader gate at the TSF; and
- reduced radiological surveillance's at the BSF and TSF.

IFDP

- deactivated the wet-pipe fire protection systems and converted to dry systems or heat detection devices to eliminate potable water and steam services in Bldgs. 3026 C & D, 3028, 3029, 3030, 3031, 3032, and 3033;
- remote monitored the instruments in Bldg. 3029 in lieu of personnel to do visual inspection of gauges;
- reduced the radiological surveys in Bldg. 3517;
- vacated all personnel/occupants of Bldg. 3517 to reduce surveillance's and utilities; and
- transferred Bldg. 3034 back to ORNL.

SNF

- removed the sand from Facility 7823A, transferred eight SNF packages to the hot cell, and resolved the 7823A vulnerability;
- retrieved 17 SNF packages from below-grade storage positions in Facilities 7827 and 7829 (the packages were transferred to the hot cell for examination and repackaging);

- decontaminated 12 storage positions and installed liners in them to resolve the vulnerability for known failed storage positions;
- in the hot cell, opened and examined 25 SNF packages and closed 8 more SNF canisters for interim storage;
- transferred 10 SNF canisters from the hot cell to Facility 7827 for interim storage until eventual shipment to the INEEL; and
- awarded a contract for designing, licensing, and fabricating a shipping cask basket for transporting SNF to INEEL.

Concerns and Issues

None.

Plans for FY 2000

HRFDP

- perform the minimum S&M on all HRFDP facilities;
- characterize the activated material in the BSR pool;
- repair the roof of the BSF; and
- repackage lithium sources from the TSF.

IFDP

- perform the minimum S&M on all IFDP facilities;
- package cesium sources at Bldg. 3517 for transfer to Lockheed Martin Energy Research Corp.;
- characterize the laboratory bottles in the carousel at Bldg. 3038-M; and
- remove the deteriorated ductwork from the exterior of Bldg. 3026.

SNF

- retrieve 15 SNF packages and transfer them to the hot cell for repackaging;
- complete SNF Vulnerability Resolution for Facility 7827;
- open, examine, and repackage SNF packages as they are retrieved; repackage and transfer a total of 30 SNF canisters from Bldg. 3525 to Facility 7827 for interim storage before shipment to INEEL;
- transfer nine intact Peach Bottom spent fuel elements from SWSA 5N storage positions to the newly lined storage Position 2 in Facility 7827;

- receive Certification of Compliance from the Nuclear Regulatory Commission; initiate fabrication of a cask basket; and

- construct a loading station for shipments of SNF to INEEL.

2.3.14 Demolition of the Metal Recovery Facility (3505)

Description

The Metal Recovery Facility (MRF) is a one-story, metal-sided building used as a pilot and small-scale nuclear fuel reprocessing plant between 1952 and 1960. Associated with the MRF are an exterior concrete canal; a small storage facility; and, interior to the facility, a dissolver pit and seven hot cells. The MRF was used primarily to recover fuel and other nuclear materials. The fuel reprocessing occurred in the building's seven hot cells; fission products were also separated out. The scope of this project is to remove the surface structure of the facility to the finish floor elevation. The walls of the dissolver pit, small storage building, and canal will also be removed to the finish floor elevation of the facility. The dissolver pit will be drained and decontaminated using a process-based approach. The remaining subsurface structures of the canal and dissolver pit will be filled with a low-strength cement and gravel mixture. The waste generated by this project will be dispositioned at an approved facility.

FY 1999 Accomplishments

- The MRF Project was substituted for the Fission Product Pilot Plant Project by agreement of the DOE, TDEC, and EPA. New milestone dates were agreed upon for the delivery of the regulatory documents associated with this project; and

- The deployment of regulatory documentation began the first of September 1999.

Concerns and Issues

None.

Plans for FY 2000:

- complete the EE/CA and the AM;

- develop the RmAWP;

- award a fixed-price subcontract to perform the work;

- complete the characterization activities required to support the development of the health and safety plans and the RmAWP; and

- mobilize to the field to start the D&D of the facility.

2.3.15 Bethel Valley Groundwater Action: Well 4411

Description

Well 4411 is located in the southwest corner of the North Tank Farm in the ORNL main plant area. Well 4411 is downgradient of Tank W-1A (Corehole 8 Plume Source) and intersects the Corehole 8 plume. The total depth of Well 4411 is approximately 90 ft. Well 4411 is outfitted with an electric, submersible pump and plumbing that routes extracted water to Process Manhole #24 at the North Tank Farm. Process Manhole #24 routes extracted water to the ORNL Process Waste Treatment Plant. At the completion of the Corehole 8 Source Removal Action (removal of Tank W-1A), groundwater extraction is scheduled to be initiated at Well 4411. Pump tests conducted at Well 4411 will aid in determining optimum extraction rates as well as treatment requirements for extracted groundwater. In conjunction with plume collection actions already being taken, this Well 4411 project will enhance containment of the Corehole 8 plume in the ORNL main plant area.

FY 1999 Accomplishments

- submitted the D1 AM Addendum and Phase I Operations Report to EPA and TDEC on August 30, 1999; and

- incorporated EPA comments received on September 8, 1999, to the D1 AM Addendum and Phase I Operations Report. TDEC had no comments on the D1 AM Addendum or Phase I Operations Report.

Concerns and Issues

None.

Plans for FY 2000

- complete a pre-treatment pump test at Well 4411 to determine if extracted groundwater can be discharged directly to the ORNL Process Waste Treatment Plant without first pre-treating the groundwater with an onsite pre-treatment unit;

- design and construct a groundwater pre-treatment system at Well 4411 if required, based on results of the pre-treatment pump test;

- initiate groundwater extraction at Well 4411 following completion of the Corehole 8 Source Removal Action Project; and

- complete a Phase II Operations report by May 30, 2000, discussing the progress of groundwater extraction activities at Well 4411.

2.4 OAK RIDGE Y-12 PLANT

The Oak Ridge Y-12 Plant was built in 1943 as part of the Manhattan Project. The original purpose of the Y-12 Plant was uranium enrichment and nuclear weapons production. Uranium enrichment was discontinued in 1947, but other aspects of weapons production continued until 1993. The Y-12 Plant's role has evolved into supporting highly sophisticated manufacturing; development engineering associated

with producing, fabricating, and dismantling nuclear weapons components; and serving as the national repository for enriched uranium.

The subprojects discussed in Sections 2.4.1 through 2.4.5 are associated with the BCV Watershed. BCV extends from the west end of the Y-12 Plant approximately 10.2 miles to the Clinch River. A 2-mile section of BCV immediately west of the Y-12 Plant contains numerous waste disposal sites that have been used since 1943. The three main disposal areas are as follows: (1) the S-3 Ponds, (2) the Oil Land Farm (OLF)/Boneyard/Burnyard (BY/BY) area, and (3) the Bear Creek Burial Grounds (BCBG). Several auxiliary areas were used for the disposal of various liquid and solid wastes contaminated with both radionuclides and chemicals. The major contaminant to surface water and groundwater in the BCV Watershed is uranium.

The subprojects discussed in Sections 2.4.6 through 2.4.10 are associated with the UEFPC Watershed. The UEFPC Watershed occupies part of the northeastern ORR. The developed portions of the city of Oak Ridge lie immediately adjacent to, and north of, the watershed. UEFPC begins in the western portion of the Y-12 Plant as an underground storm drain system that collects groundwater and stormwater. Water in the storm drain system surfaces in the south-central area of the plant, initially flowing northeast along the southern boundary of the plant, then turning to the northwest as it passes through a gap in Pine Ridge, exiting UEFPC as Lower East Fork Poplar Creek (LEFPC). The creek drains portions of ORR and privately held lands to the northeast. Groundwater flow in the underlying interbedded limestone and shale bedrock generally parallels the valley axis (along the geologic strike), with the majority of the groundwater flowing through limestone layers. Portions of these limestone layers along bedding planes and fractures slowly dissolve in groundwater, leaving interconnected systems of cavities and enlarged fractures that carry groundwater and contaminants along the valley.

UEFPC encompasses the developed Y-12 Plant industrial area, including certain solid waste management units included in the Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments permit and other dispersed areas of contamination resulting from past operations. UEFPC is bounded by the base of Pine Ridge to the north, the base of Chestnut Ridge to the south, and the Bear Creek Watershed to the west. To the east, UEFPC extends to the DOE-ORO boundary at Scarboro Road and includes a contaminated groundwater plume, the East End Volatile Organic Compound (VOC) Plume, which extends eastward past the boundary to a spring at the intersection of Union Valley Road and Illinois Avenue.

2.4.1 Bear Creek Valley Phase 1 Record of Decision

Description

This subproject captures actions that crosscut the watershed including the Boneyard/Burnyard (which is discussed below in section 2.4.3), the S-3 Ponds (discussed below in section 2.4.2), and the BCV Disposal Area Remedial Action (DARA) Solid Storage Facility (SSF).

CERCLA actions in the BCV Burial Grounds and groundwater were delayed to a Phase 2 ROD. Part of the decision to delay actions in the BCV Burial Grounds was based on the need for a cost-effective technology to manage the waste if left in place. A portion of this subproject will support the demonstration of a subsurface barrier system to isolate the waste to be funded by DOE Federal Energy Technology Centers (FETC).

Following signing of the BCV Phase 1 Watershed and EMWMF RODs, remedial activities will begin. Construction activities at a number of sites throughout the watershed will impact wetlands. These wetlands will be restored on a watershed basis, in a central location, as opposed to mitigation during each

individual construction activity. This subproject will design and construct mitigation wetlands associated with CERCLA actions throughout the watershed.

FY 1999 Accomplishments

- submitted the D1 and D2 BCV Watershed ROD to regulators on October 23, 1998 and March 12, 1999, respectively;
- hosted, on March 16 through 18, 1999, a combined DOE and contractor technical review team evaluation of Bottom Barrier proposals in response to the FETC RFP;
- awarded a subcontract for design of the BCV and EMWMF mitigation wetlands on May 25, 1999; and
- mobilized to the field on July 6, 1999 for wetlands delineation activities and completed vegetation community and soil surveys, delineation of existing wetlands, and topographical survey in the area surrounding the site proposed for construction of the replacement wetlands.

Concerns and Issues

Delays in receiving EPA's comments on the ROD and the significant nature of these comments will force slippage in the ROD and follow on project schedules. EPA has also indicated the potential need for a D3 version of the ROD prior to approval. The incorporation of EPA comments is under way.

Plans for FY 2000

- complete design of the replacement wetlands associated with the EMWMF and BCV remedial actions;
- start construction of the replacement wetlands associated with the EMWMF and BCV remedial actions; and
- support the FETC Bottom Barrier Demonstration.

2.4.2 Bear Creek Valley S-3 Ponds Remediation

Description

The S-3 Ponds have been closed with a RCRA cap and are now under RCRA post-closure care and monitoring. Capping of the old ponds has lessened the impacts of contamination. However, the RI Report for the BCV Characterization Area estimates that approximately 5,740 acre-feet of groundwater downgradient of the S-3 Ponds have been contaminated as a result of the waste leachate production prior to closure of the ponds. The contaminated groundwater acts as a secondary source of contamination as it discharges into Bear Creek and the creek's associated tributaries. The primary contaminants in the surface water are uranium, nitrate, cadmium, and ^{99}Tc. The S-3 site currently contributes approximately 26% of the risk at the BCV Watershed Integration Point through releases of uranium. In addition, discharges of contaminated groundwater to surface water at the S-3 Site are the primary causes of current impacts on the aquatic ecology of Bear Creek.

Because the S-3 Ponds were located on a shallow groundwater and surface water divide, contaminated groundwater plumes emanate from the site and extend in both easterly and westerly directions. This subproject addresses the western plume and includes the design and implementation of treatment systems for contaminated shallow groundwater discharging to Bear Creek and its tributaries.

The western plume consists of three primary pathways of groundwater flow. Two of the pathways (Pathway 1 and Pathway 2) are shallow-flow regimes that discharge to the main stem of Bear Creek. Both pathways are contaminated primarily with uranium. Pathway 3 is deeper and travels through the bedrock along a strike, discharging nitrate and cadmium-contaminated groundwater to two tributaries of Bear Creek (NT-1 and NT-2).

The objective of this subproject is to capture and treat contaminated groundwater so that risk to human health and the environment may be reduced to levels consistent with the goals of the BCV Phase I ROD.

FY 1999 Accomplishments

- awarded the BCV S-3 Ponds, Pathway 2, removal action subcontract. Removal action construction started on May 7, 1999;
- completed BCV S-3 Ponds, Pathway 2, removal action. Construction activities included mobilization, trench excavation, 750 ft of interceptor drainage line installation, backfill, treatment system and drain field installation (horizontal drain line installation, vertical wall and siphon construction), and system hookup; and
- submitted the S-3 Ponds, Pathway 2, D1 RmAR to regulators for review on August 30, 1999.

Concerns and Issues

The S-3 Ponds, Pathway 2, removal action siphon system was started when it was initially installed. However, after several days, the siphon ceased. During an unsuccessful attempt to restart the siphon system, it was discovered that the flow meters were no longer operating. The subcontractor returned to the site in early September to replace the meters, and the siphon was restarted. Again, the siphon only operated for two days. DOE requested and received permission from the regulators to resubmit this document once the system was operational.

Plans for FY 2000

- complete development of the extraction well at Pathway 2, and complete startup of the siphon system;
- reschedule and submit the BCV S-3 Ponds Pathways 1 and 2 RmAR;
- complete the BCV S-3 Ponds, Pathway 3, Pre-Design Studies, which include groundwater modeling, anoxic bacteria, and phytoremediation; and
- start the BCV S-3 Ponds, Pathway 3, RDR/RAWP.

2.4.3 Bear Creek Valley Boneyard/Burnyard

Description

There are three release sites associated with the BY/BY RA: (1) Hazardous Chemical Disposal Area (HCDA), (2) BY/BY including Bear Creek Tributary 3 Floodplain Soils, and (3) OLF Soils Containment Pad. These sites are located north of Bear Creek Road approximately 1 mile west of the main Y-12 Plant.

At the BY/BY, combustible wastes, including uranium turnings, were placed either on the surface, or in trenches, and set on fire. The area was also used for abandoned equipment laydown, which resulted in surface contamination. This waste is now leaching to shallow groundwater that discharges to surface water. The site is the major contributor to risk levels in the valley.

The HCDA was historically used to dispose of chemicals that were deemed to be hazardous to plant workers including acids, bases, and miscellaneous liquids. The area was capped with a RCRA-like cap in the 1980s.

The OLF Soils Containment Pad is a below-grade storage pad covered with a Rubb temporary structure. The pad contains 570 cy of PCB-contaminated soils excavated during the RCRA closure of the OLF.

The objective for the BY/BY is to implement a series of hydraulic isolation measures that are designed to substantially reduce the uranium flux entering Bear Creek from this site and to "dry" the site out in preparation for excavation of the waste in FY 2001. Additionally, the objective for the OLF Soil Containment Pad involves final disposition of the soils stored at the facility and demolition of the temporary storage building and concrete pad.

FY 1999 Accomplishments

- submitted the BCV BY/BY D1 RDR/RAWP, for HCDA and NT3, to regulators for review on October 30, 1998;
- submitted the BCV BY/BY D1 RDR/RAWP, for the OLF Soil Containment Pad, to regulators for review on December 31, 1998; and
- awarded the BCV BY/BY design/build RA subcontract

Concerns and Issues

The soils in the OLF Soil Containment Pad are RCRA F004 contaminated. An effort is being made to determine, through the examination of background data, the origin of the COCs. If the F004 listing remains in place, the resulting requirement for treatment/disposal may change from the baseline. Additional treatment may be required in order to meet RCRA Land Disposal Restrictions that would result in increased cost.

In a letter dated March 17, 1999, EPA rejected the proposal to temporarily store excavated material at the Sanitary Landfill 1 site. As a result of EPA's letter and the delay of signing the BCV ROD until the EMWMF ROD was signed, the BCV BY/BY Phase III work (i.e., waste excavation) has been delayed until FY 2001. The excavation of waste will now coincide with the start of operations for the EMWMF, thus eliminating the need for temporary storage.

Plans for FY 2000

- complete the BCV BY/BY OLF RA, which includes clearing and grubbing, hydraulic control, OLF soils containment pad remediation, off-site disposal, borrow area operation and maintenance, and site restoration; and

- issue the BCV BY/BY OLF draft RAR to regulators for review.

2.4.4 Environmental Management Waste Management Facility

Description

The EMWM Facility project is intended to build a CERCLA mixed waste disposal facility for the Oak Ridge Reservation. More specifically, the objective of the project encompasses the design, construction, operation and closure of two 400,000 cubic yard capacity cells, as well as preparation of the associated CERCLA documentation.

FY 1999 Accomplishments

- received approval on the EMWMF RI/FS from EPA and TDEC;

- submitted the D2 and D3 EMWMF PPs and received approval from EPA and TDEC. Received final public comments on the EMWMF PP on April 9, 1999;

- submitted the D1 EMWMF draft ROD to regulators for review on May 6, 1999;

- submitted the D2 EMWMF ROD to regulators for approval on August 11, 1999;

- evaluated whether to include classified waste in the scope of the EMWMF. This is still being evaluated;

- awarded the EMWMF design and construction on August 31, 1999; and

- submitted to Congress the *Environmental Management Waste Management Facility Project, Oak Ridge, Tennessee: Report to Congress* for the 30-day review.

Concerns and Issues

None.

Plans for FY 2000

- complete resolution of the perpetual care issue;

- award the subcontract for design and construction;

- complete the EMWMF ROD;

- complete the EMWMF RDWP and RDR/RAWP;

- start the EMWMF WAC Attainment Plan;
- complete timber removal at the EMWMF site;
- complete the OLF Class III Permit Modification;
- complete the EMWMF Phase IV site characterization; and
- start EMWMF pre-construction activities.

2.4.5 Upper East Fork Poplar Creek Record of Decision - Phase 1

Description

The objective of this project is to complete remedy selection and documentation of the selected remedy pursuant to CERCLA for Phase 1 remedial actions in the UEFPC Characterization Area. The Phase 1 ROD focuses on mercury source control actions and natural attenuation of groundwater. The Phase 2 ROD, the final ROD, addresses soil remedial actions for worker protection; surface water actions including monitoring and other mercury source actions, as necessary; additional UEFPC sediment removal; building D&D; and additional groundwater actions.

FY 1999 Accomplishments

- received approval on the D2 RI from EPA. TDEC approved the RI during FY 1998;
- reached general agreement, in March, with the regulators on the UEFPC Watershed ROD proposed interim goals for groundwater and surface water and the long-term goal for soil, which facilitated preparation of the D2 FS; and
- submitted the UEFPC Watershed ROD D2 FS to regulators for approval on June 2, 1999.

Concerns and Issues

Issuance of the D2 FS was delayed because of the extensive comments and the time required to formulate a path forward. A 60-day extension was approved, and the PP and ROD milestones have also been extended 60 days.

Lack of agreement with regulators on the preferred alternative has delayed the preparation of the PP and may require reengineering/cost estimating of alternatives.

Complete specific comments on the D2 FS have not been received from EPA.

Plans for FY 2000

- complete the UEFPC ROD - Phase 1 PP, including the public comment period;
- issue the UEFPC ROD - Phase 1 draft ROD to regulators for review;
- start the UEFPC ROD - Phase 1 RDWP; and

- start the UEFPC - ROD Phase 1 LUCIP.

2.4.6 East End Volatile Organic Compound Plumes

Description

The purpose of this project is to complete the non-time-critical Removal Action by implementing a cost-effective, near-term action for mitigating off-site migration of the Y-12 East End Volatile Organic Compound (VOC) Plume as defined in the approved AM. The project scope includes installation of the treatment system, preparation of the RmAR, and startup of the treatment system.

The technical objectives of this project are to install a pump and treatment system to mitigate the migration of the plume offsite, perform test and checkout of the system; and complete the RmAR.

FY 1999 Accomplishments

- submitted the East End VOC Plumes D1, D2, D3 and D4 EE/CA to regulators on October 29, 1998, February 19, April 6, and April 23,1999, respectively. The EE/CA was presented for public review in April;

- submitted the East End VOC Plumes D1 and D2 AM to regulators on June 15, and August 23, 1999, respectively. The AM was signed August 23, 1999; and

- submitted the East End VOC Plumes D1 RmAWP to regulators for review on June 30, 1999.

Concerns and Issues

While the EPA technically agreed with the responses to comments in the D2 EE/CA, they could not approve the EE/CA from a procedural standpoint. It was agreed that a D3 EE/CA would be prepared. In the D3 EE/CA, the alternatives that included in situ bioremediation were removed. The inclusion of the D3 EE/CA in the schedule caused a delay in the milestones for the AM and the RmAWP.

The preparation of a D3 and D4 EE/CA delayed the public review period and impacted the schedule for the AM. The public review period ended on June 11, 1999, while the AM milestone was June 15, 1999. Agreement with DOE, EPA, and TDEC was reached to abandon standard protocol and continue preparation of the AM with an assumption that minor or no comments would be received from the public.

Plans for FY 2000

- complete the UEFPC East End VOC Plumes RmAWP;

- complete the UEFPC East End VOC Plumes Removal Action, which includes installation and startup of a pump and treatment system;

- issue the UEFPC East End VOC Plumes draft RmAR to regulators for review;

- support the Innovative Treatment Remediation Demonstration (ITRD). The ITRD will conduct treatability studies and provide technical input to the conceptualization of in situ and bioremediation for the East End VOC Plume. ITRD is funded by EM-50.

2.4.7 Upper East Fork Poplar Creek Firing Range

Description

The scope of the UEFPC Firing Range Soil Remediation is to evaluate and implement a cost-effective, near-term action for excavating lead-contaminated soils from the Y-12 Plant Firing Ranges, outside the Y-12 Plant fence line at the eastern end of the plant, as a non-time-critical RA under CERCLA. The removal action consists of excavation of lead-contaminated soils from two target berms, transportation offsite, and disposal of soil to a RCRA-permitted facility.

FY 1999 Accomplishments

- submitted the UEFPC Firing Range D1 and D2 RmAR to regulators on October 28, 1998 and February 9, 1999, respectively.

Concerns and Issues

None.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.4.8 Basin 9822 Cleanout

Description

The scope of the Basin 9822 Cleanout is to remove and dispose of liquid and sediment waste and to prevent recontamination of Basin 9822 and the Building 81-10 Sump as a non-time-critical RA under CERCLA. This project includes preparation of an EE/CA, AM, and RmAWP; completion of RA; and preparation of a RmAR.

FY 1999 Accomplishments

- submitted the UEFPC Basin 9822 Cleanout D1 and D2 RmAR to regulators on October 28, 1998 and February 9, 1999, respectively.

Concerns and Issues

None.

Plans for FY 2000

Since the project was completed in FY 1999, there are no FY 2000 plans for the project. No further reporting of this project will be included in future Annual Progress Reports.

2.4.9 Reduction of Mercury in Plant Effluents

Description

The purpose of this project is to comply with the limits for mercury concentrations in UEFPC required by the Y-12 NPDES permit by eliminating, mitigating, or capturing for treatment mercury-contaminated effluent. The two specific actions currently identified are Mercury in Soils and Bank Stabilization. Reduction of Mercury in Plant Effluents (RMPE) is also responsible for monitoring the response of corrective actions, evaluating the technical practicability of meeting water quality standards in UEFPC, and preparing the annual Mercury Abatement Report.

The technical objectives of this project include the completion of the non-invasive characterization technology demonstration and verification sampling and analysis; the completion of the Bank Stabilization and verification sampling; the continuation of monthly and quarterly sampling; and the preparation of the annual Mercury Abatement Report.

FY 1999 Accomplishments

- held a Mercury Forum on May 18, 19, and 20, 1999. The forum brought together more that 130 participants from federal agencies, regulatory agencies, site contractors, vendors, and experts from industry and academia. Twenty-six vendors made presentations on their technologies with an emphasis placed on previous operational experience with mercury. The forum resulted in significant interaction between the participants and identification of several viable characterization and remediation technologies to be considered for the planned demonstrational;

- reached a new low in August 1999 for the average mercury concentration at Station 17. The August average was 320 parts per trillion (ppt). The average for the period October through August has been 520 ppt. The average for FY 1998 was 650 ppt. The reduction is primarily a consequence of the Lake Reality Bypass completed in July 1998;

- received a signed consent order from DOE and TDEC that resolved the NPDES permit appeal and assigned the responsibility for mercury remediation to the CERCLA process; and

- submitted the UEFPC Bank Stabilization D1 and D2 Treatability Study Work Plan to regulators for review on August 5, 1999 and September 24, 1999, respectively.

Concerns and Issues

None

Plans for FY 2000

- complete the RMPE FY 1999 Abatement Report;

- prepare the draft RMPE FY 2000 Abatement Report;

- complete the non-invasive characterization technology demonstration; and

- complete bank stabilization along the UEFPC.

2.4.10 Oak Ridge Reservation Water Resources Restoration Program

Description

The ORR Water Resources Restoration Program (WRRP) (used to be named the Integrated Water Quality Program (IWQP)) was established by DOE in 1996 to conduct long-term environmental monitoring and reporting throughout the ORR. The goals of the WRRP are threefold: (1) to provide data and technical analysis necessary for groundwater and surface water management decisions and to gauge the effectiveness of RA's; (2) to ensure compliance with all CERCLA-mandated requirements pertaining to environmental monitoring; and (3) to provide technical support for a reservation-wide groundwater restoration approach.

There is a Water Quality Program (WQP) for each of the three facilities on the ORR (ETTP, ORNL, and the Y-12 Plant). The WRRP provides a central administrative and reporting function that integrates and coordinates the activities of the facility-specific WQPs. The responsibility for scope, schedule, funding, and implementation of environmental monitoring (i.e., planning, sampling, and analysis) within the region managed by a specific facility project is assigned to the WQP for that facility. The WRRP manages environmental data collected by the facility WQPs and reports monitoring results and interpretations on an integrated ORR-wide basis.

FY 1999 Accomplishments

- submitted the D1 1999 *Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-1790&1), to regulators for review on February 26, 1999;

- submitted the D2 1999 *Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-1790&1), to regulators for approval on July 16, 1999;

- submitted the D1and D2 *Combined Monitoring Plan for the Lower Watts Bar Reservoir and Clinch River/Poplar Creek Operable Units* to the regulators on May 28 and September 30, 1999, respectively; and

- submitted the D3 RA Report for Clinch River/Poplar Creek (CR/PC); and

- conducted a series of meetings and teleconferences to determine the scope of the ORR CERCLA 5-year review requirements.

Concerns and Issues

FY 1999 monitoring in the Lower Watts Bar Reservoir (LWBR) and the CR/PC Operable Units needs to be changed; however, the monitoring plan should be approved prior to these changes. A path forward to address regulator concerns was developed during a conference call between the regulators, DOE, and Bechtel Jacobs on April 16, 1999. A D1 version of a combined LWBR and CR/PC monitoring plan, that addressed regulator concerns, was issued for regulator review on May 28, 1999.

Plans for FY 2000

- complete the FY 2001 Sampling and Analysis Plan (SAP) for the ORR;

- perform data validation and data management for the ORR; and
- complete the FY 2000 Remediation Effectiveness Report (RER) for the ORR; and
- continue planning and data collection activities to support reservation-wide CERCLA 5-yaer review in 2001.

2.4.11 Y-12 Water Quality Program

Description

The planning and implementation of surface water, groundwater, sediment, and biological monitoring within the Y-12 watersheds (BCV and UEFPC) and at various off-site locations surrounding the ORR that are included within the Y-12 Project are accomplished under this task. The SOW for this task includes the following interrelated activities: sample planning, collection, transport, shipment, and tracking; laboratory analysis of samples; and project administration. The task also includes annual inspection and maintenance, as needed, of monitoring wells and other permanent monitoring stations within Y-12, water level measurements, recordkeeping, and project-specific training.

During FY 1999, the scope and objectives of the Y-12 WQP for BCV was contained in the BCV WQP, and for UEFPC and offsite in the WRRP. Starting with FY 2000 all monitoring will be contained in the Y-12 WQP.

The Y-12 WQP technical objectives are to:

- establish a baseline of water quality for the Y-12 watersheds so that the effectiveness of planned RA's can be determined;
- monitor groundwater and/or surface water pathways to gauge the effect of RAs that have been implemented within the watersheds;
- obtain environmental monitoring and performance assessment data on completed RAs within the Y-12 project to support the CERCLA 5-year review scheduled for FY 2001;
- evaluate monitoring data to support additional RA decisions within the watersheds and to assure that assertions regarding hydrologic and contaminant conditions in site conceptual models remain valid; and
- provide technical support to the Lower Watts Bar Interagency Working Group (LWBIWG)

FY 1999 Accomplishments

- completed groundwater, surface water and biological sampling and analysis for BCV, UEFPC, and off-site areas;
- completed sediment sampling for off-site areas; and
- provided support to LWBIWG for proposed marina and U. S. Coast Guard bouy maintenance

Concerns and Issues

None.

Plans for FY 2000

- perform groundwater, surface water and biological sampling and analysis for BCV, UEFPC, and off-site areas;
- perform sediment sampling, stream channel survey, and land use survey for off-site areas; and
- provide support to LWBIWG.

3. PUBLIC INVOLVEMENT IN FY 1999

3.1 PUBLIC INVOLVEMENT IN CERCLA DECISION DOCUMENTS

A number of public comment periods, several of which included public meetings, were conducted in conjunction with CERCLA decision documents:

- Public comment period and public meeting for the proposed on-site CERCLA waste management facility (*Proposed Plan for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste*—DOE/OR/01-1761&D3). This public comment period ran from January 25 to March 11, 1999;

- Public comment period for an EE/CA for inactive waste tanks in BV (*Engineering Evaluation and Cost Analysis (EE/CA) for the Bethel Valley Main Plant Inactive Liquid Low-Level Radioactive Waste Tanks, Oak Ridge National Laboratory, Oak Ridge, Tennessee*—DOE/OR/01-1721&D2);

- Public comment period for an EE/CA for the East End VOC plume at Y-12 (*Engineering Evaluation and Cost Analysis (EE/CA) for the Oak Ridge Y-12 Plant East End Volatile Organic Compound Plume, Oak Ridge, Tennessee*—DOE/OR/01-1764&D4;

- Public comment period and public meeting for *Proposed Plan for the Melton Valley Watershed, Oak Ridge, Tennessee* (DOE/OR/01-1724&D3). The Melton Valley Proposed Plan had a 60-day public comment period from the beginning, which is twice what CERCLA requires and 15-days more than the 45 days the state usually insists upon for such documents; and

- Public comment period for the OHF Tanks and Impoundment Project at ORNL (*Engineering Evaluation/Cost Analysis for the Old Hydrofracture Facility Tanks and Impoundment, Oak Ridge National Laboratory, Oak Ridge, Tennessee*—DOE/OR/02-1706&D2).

In addition, several comment periods and public meetings were conducted in support of RCRA permit modifications:

- Public meeting for Notice of Class 2 Modification Requests and Temporary Authorization Requests for the Tennessee Hazardous Waste Management Act Permits TNHW-056, TNHW-015, and TNHW-015A at the East Tennessee Technology Park (ETTP);

- Public comment period for Notice of Submittal of Class 11 Modification Requests for the Tennessee Hazardous Waste Management Act Operating Permits TNH@-032, TNH@-083, and TNHW-092 for the Oak Ridge Y-12 Plant;

- Public comment period for Notice of Submittal of Class 1 Modification Requests for the Tennessee Hazardous Waste Management Act Operating Permits TNHW-010A, TNHW-027, and the TNHW-097 for the Oak Ridge National Laboratory; and

- Public meeting for Notice of Submittal of Class 2 Modification Request for the Tennessee Hazardous Waste Management Act Operating Permits TNHW-010A and TNHW-097 for the Oak Ridge National Laboratory.

3.2 OTHER PUBLIC INVOLVEMENT

- The Fourteenth Annual Oak Ridge Environmental Conference, December 7-9, drew more than 800 participants to Pollard Auditorium. Public Affairs personnel from Oak Ridge, Paducah, and Portsmouth staffed exhibits and posters that summarized work at the sites.

- The public was involved in developing the permanent EM exhibit at the American Museum of Science and Energy;

- DOE-ORO sponsored a "Waste Triad: Deployment of Innovative Modular Waste Reduction Systems at the Oak Ridge National Laboratory" in August. Three technologies recently deployed as integral elements of the ORNL integrated tank waste management strategy were showcased;

- The DOE-ORO EM Science Program sponsored a workshop for principal investigators and major stakeholders in September 1999, discussing new technology initiatives;

- Expanded the capabilities of the toll-free 1-800 public information line to expedite call routing for stakeholder environmental management inquiries;

- The DOE-ORO Reindustrialization Program held a public meeting for proposed land use of Parcel ED-3 at the ETTP on September 29, 1999; and

- DOE EM is supporting a Stewardship Working Group, which was formed by the Oak Ridge Site-Specific Advisory Board (ORSSAB), in developing and producing the *Stakeholder Report on Stewardship, Vol. 2*, scheduled for publication by the end of the calendar year. The group and its subcommittees have met monthly since February.

3.3 OAK RIDGE SITE-SPECIFIC ADVISORY BOARD

The ORSSAB is a federally appointed citizens' panel that provides advice and recommendations to DOE on its Oak Ridge EM Program. The group was formed in 1995 and is chartered under the Federal Advisory Committee Act.

In FY 1999, the Board shortened its name from Oak Ridge Reservation Environmental Management Site-Specific Advisory Board to Oak Ridge Site-Specific Advisory Board. Six members retired from the Board this year when their terms of service expired, and six new members were installed to replace them. The Board also seated a non-voting student representative from Oak Ridge High School. At the start of FY 1999, the Board established standing project teams to review issues concerning four topic areas: Budget and Prioritization, Public Outreach, Waste Management, and Watershed Cleanup. Four special teams were formed to address other issues: Board Process, Health and Safety, Stewardship, and On-Site CERCLA Waste Disposal Facility.

Significant accomplishments for FY 1999 include the following:

- issued 15 recommendations and comments to DOE-ORO and other organizations;

- sponsored the Stewardship Working Group, a broad-based, independent citizens' group formed to begin work on the goal of ensuring that DOE develops a stewardship program for contaminated areas of the ORR;

- presented a paper on stewardship at the Waste Management '99 conference and made presentations on stewardship at the Site-Specific Advisory Board Chairs' Meeting in Augusta, Georgia, and at the INEEL Citizens' Advisory Board meeting;

- received appointment of Board member Lorene Sigal to the Environmental Management Advisory Board Stewardship Committee;

- participated in 13 conferences, workshops, and national meetings on EM-related issues;

- made 19 presentations and briefings to area civic and governmental organizations and state legislators;

- revised the Board's Mission Statement, Bylaws, Standing Rules, and Special Rules of Order, and developed a training program for new Board members;

- co-sponsored and assisted DOE with the content of three public meetings on the EM budget process: "Overview of the 3-Year Budget" (February 8, 1999); "Life Cycle Baseline Planning and the FY 2001 Budget" (March 15, 1999); and "Life Cycle Baseline Preliminary Results and *Paths to Closure* Update" (April 26, 1999); and

- met and coordinated with interagency teams to promote unified participation in Oak Ridge health-related issues.

4. TECHNOLOGY DEVELOPMENT ACTIVITIES ON THE OAK RIDGE RESERVATION

4.1 ORNL TECHNOLOGY DEPLOYMENTS, DEMONSTRATIONS, AND TREATABILITY EVALUATIONS

4.1.1 High-Level Waste Tank Remediation Technologies

4.1.1.1 Improved Systems for Tank Sludge Retrieval, Conditioning, and Transfer (OR08SD10)

Description

ORNL is utilizing an integrated systems approach for managing tank wastes through deployment of innovative, but proven, technologies for retrieving, conditioning, and transferring radiologically contaminated low-level tank wastes. This task involved utilization of the following technologies: MLDUA, Houdini II remotely operated vehicle, confined sluicing end effector, remote tank cleaning system, ultra high pressure scarifier, Flygt mixer system, PulsAir mixer, collimated analyzing radiation probe, gunite scarifying end effector, and pipeline slurry monitor. Demonstration and deployment of these technologies was used to remediate gunite tanks at the ORNL North and South Gunite Tank Farms.

FY 1999 Accomplishments

- about 222,541 gallons of waste were transferred from GAAT to MVST;
- about 42,030 kg of solids, or approximately 37% of the original 88,000 gallons of estimated sludge inventory, were removed from GAAT; and
- approximately 48% of the rad inventory has been removed from GAAT.

Plans for FY 2000

- complete bulk sludge retrieval from GAAT by September 30, 2000;
- complete hot deployment of the waste conditioning system compact processing unit (CPU); and
- complete deployment of the heavy waste retrieval system at GAAT.

4.1.1.2 Modular Evaporator and Ion Exchange Systems for Waste Reduction in Tanks (OR08SD11) and Waste Tanks Pretreatment (OR16WT41)

Description

ORNL is utilizing an integrated systems approach for managing tank wastes through deployment of innovative, but proven, technologies for treatment of DOE tank wastes. State-of-the-art evaporators remove excess water from liquid waste before solidification by processing sluice water generated during the retrieval of sludges, and/or treatment of secondary wastes generated during treatment operations. Cesium and strontium removal is being implemented to minimize the volume of high-activity waste, thus reducing costs for waste treatment facilities' construction and operation, waste form transportation, and disposal. A solid/liquid separation system is used to manage the excess liquids generated during sluicing

of sludges between tank farms and/or to maintain desired feed composition for subsequent treatment operations. Technologies deployed for the processing of wastes from the MVSTs W-29 and W-30 include a single-stage, sub-atmospheric evaporator, highly selective crystalline silicotitanate ion exchange system, and cross-flow filtration system.

FY 1999 Accomplishments

- Five wastewater treatment campaigns were completed. Approximately 120,000 gallons of MVST waste were processed, removing 6,700 curies of ^{137}Cs while reducing overall supernate inventory by approximately 50%.

Plans for FY 2000

- Six additional wastewater treatment campaigns are scheduled for FY 2000.

4.1.1.3 Waste Tank Retrieval and Closure (OR16WT51)

Description

Robotics and sensing technologies are being developed and demonstrated for the characterization and remediation of underground storage tanks (USTs). Five areas of research, development, and demonstration are being conducted to support the tank remediation and closure efforts. These activities include: in situ grouting for stabilization and immobilization of radioactive and mixed wastes; deployment of the Borehole Miner in the OHF tanks; GAAT retrieval technologies for the efficient retrieval of bulk wastes; GAAT tank isolation technologies for cutting, cleaning, and plugging pipelines; and demonstration of closure techniques for small-diameter FFA tanks.

FY 1999 Accomplishments

- completed the cold field demonstration of the Multi-Point-Injection Technology;
- completed the documentation of performance data for the PulsAir mixer, slurry monitor, and pipe plugging system; and
- completed the draft closure plan for selected ORNL FFA Tanks.

Plans for FY 2000

- complete demonstration of the Russian Pulsating Mixer;
- complete hot demonstration of MPI grout on the OHF Tanks;
- issue the final GAAT deployment plan; and
- publish the closure plan for selected ORNL FFA Tanks.

4.1.2 Robotics

4.1.2.1 Armed-Based Tank Waste Retrieval TWR-1 (OR17C131)

Description

Oak Ridge is leading the DOE effort to develop, test, and demonstrate robotics technologies for the characterization and remediation of USTs. The emphasis is on the development and demonstration of remote maintenance capabilities for the sludge- CPU to reduce personnel exposure and downtime during maintenance of the CPU. The focus of the effort is twofold: (1) transferring slurries over long distances from a waste tank being remediated to a processing and treatment facility; and (2) deploying characterization and retrieval tools through small risers into large underground tanks. The system is being used for the remediation of GAAT at ORNL.

FY 1999 Accomplishments

- completed the CPU remote maintenance design;
- completed Scarab-3 qualification testing; and
- completed final design and fabrication of the Remote Tool Delivery System.

Plans for FY 2000

- complete design and fabrication of the Heavy Waste Retrieval System, and initiate deployment in Tank W-9;
- complete design, fabrication, and acceptance testing of the inspection camera and deployment platform for deployment at MVST; and
- initiate deployment of the CPU remote maintenance system at ORNL.

4.1.2.2 Vehicle-Based Tank Waste Retrieval (OR17C132)

Description

Oak Ridge is leading the DOE effort to develop, test, and demonstrate robotics technology for the characterization and remediation of USTs. Emphasis in this task is on the development and demonstration of a small remotely operated vehicle capable of deployment in the large number of horizontal tanks in the DOE Complex. Lessons learned from cold testing of the Houdini and Scarab vehicle systems will be used to improve the reliability and user access of the Houdini II and Scarab-3 systems.

FY 1999 Accomplishments

- completed Houdini II and Scarab-3 summary reports; and
- defined floor-cleaning system requirements.

Plans for FY 2000

- This project is operating on carryover only. No new tasking for FY 2000 is planned. No further reporting of this project will be included in future Annual Progress Reports.

4.1.3 Characterization, Monitoring, and Sensor Technologies

4.1.3.1 Comparative Testing of Pipeline Slurry Monitors (OR17C231)

Description

Several DOE sites are planning cross-site transfers of radioactive waste slurries. It is critical that the slurry is transported safely and successfully. ORNL is testing, demonstrating and evaluating state-of-the-art, commercially available, and DOE-developed slurry monitoring instruments.

FY 1999 Accomplishments

- completed the final report on slurry monitoring instrument tests;
- deployed the Particle Size Density Monitor at GAAT; and
- deployed the Density Monitor at GAAT.

Plans for FY 2000

- In FY 2000, it is planned to demonstrate and evaluate the Coriolis meter in radioactive applications.

4.1.4 Efficient Separation and Processing

4.1.4.1 Fission Products Separations Testing (OR16C312)

Description

The ORNL Corehole 8 area has groundwater contaminated with cesium, strontium, and uranium. Technologies are being investigated to remove and/or stabilize these radionuclides. Existing sorbents are not selective and generate large volumes of waste. New, more selective sorbents, such as crystalline silicotitanate (CST), are being compared to the zeolites presently in use for cost and performance.

FY 1999 Accomplishments

- completed demonstration of CST for removal of Sr-90 from groundwater at the Corehole 8 2016C sump; and
- compared breakthrough profiles and bed volume loadings for CST and zeolite.

Plans for FY 2000

- This project is operating on carryover only. No new tasking for FY 2000 is planned. No further reporting of this project will be included in future Annual Progress Reports.

4.2 ETTP TECHNOLOGY DEMONSTRATIONS AND TREATABILITY EVALUATIONS

4.2.1 Mixed Waste Characterization, Treatment, and Disposal

4.2.1.1 Toxic Substances Control Act Incinerator Test Bed for Continuous Emissions Monitors (OR16MW74)

Description

A national test bed has been established at the Toxic Substances Control Act (TSCA) Incinerator in Oak Ridge to evaluate promising, continuous emissions monitoring technologies. The TSCA Incinerator—a continuously operated, full-scale, mixed waste treatment facility—is being used to conduct field tests of emerging continuous emissions monitors in a real-world operating environment. This test bed facilitates passing continuous emissions monitoring technology from the engineering development phase to the demonstration phase. Testing of continuous emissions monitors is also assisting in gaining public and regulatory acceptance of thermal treatment technologies for treatment of DOE mixed wastes.

FY 1999 Accomplishments

- completed trial testing of the continuous metals sampling system in July 1999; and
- completed comparison testing against the EPA reference method for metals emissions in August 1999.

Plans for FY 2000

- publish the analytical results of monitor testing.

4.2.2 Subsurface Contaminants Remediation

4.2.2.1 Dense Non-aqueous Phase Liquid Remediation (OR18SS35)

Description

In situ degradation of chlorinated solvents is feasible where indigenous degrader populations, sufficient electron donors, and/or acceptors are available. Due to the large size of many of the plumes, intrinsic remediation or natural attenuation based on utilization of electron donors present at the site is a favored option. The focus of the study at ETTP was twofold: (1) to assess the potential for natural attenuation of trichloroethene at several ETTP areas, and (2) to compare the measured potential with that found at other sites to help identify controls on natural attenuation potential.

FY 1999 Accomplishments

- demonstrated a new characterization method to determine the potential for natural attenuation of chlorinated solvents at the K-1070A Burial Grounds and K-1232, K-1413, K-1401, and K-1035 plume areas; and
- presented a paper at the "In situ and On-site Bioremediation Fifth International Symposium" on the study.

Plans for FY 2000

There are no plans for FY 2000. No further reporting of this project will be included in future Annual Progress Reports.

4.3 Y-12 SITE TECHNOLOGY DEPLOYMENTS, DEMONSTRATIONS AND TREATABILITY EVALUATIONS

4.3.1 Subsurface Contaminants Remediation

4.3.1.1 In situ Reactive Barriers at the Y-12 Plant (OR18SS41)

Description

Two reactive barriers have been installed at the Y-12 BCV S-3 Pond area. The treatment system at Pathway 1 is approximately 220 ft long and consists of two wing walls designed to funnel groundwater to a below-ground treatment module and canisters. The treatment system at Pathway 2 consists of a 225-ft-long and 30-ft-wide trench containing gravel and reactive media to intercept and treat uranium and nitrates migrating to Bear Creek.

FY 1999 Accomplishments

- installed six new piezometers at Pathway 1 to evaluate the capture zone of the funnel and gate and to determine the quality of influent and effluent groundwater;
- completed two tracer tests at Pathway 2 using multiple tracers to assess groundwater transport rates, flowpaths, and residence times with the reactive media; and
- completed media, geochemical, and hydraulic evaluations at Pathways 1 and 2.

Plans for FY 2000

- evaluate a new treatment media for Pathway 1;
- conduct core sampling and analysis for Pathway 2;
- continue monitoring and evaluation of Pathway 2 barrier performance; and
- issue a final performance evaluation and report on the Y-12 barriers.

4.3.1.2 Reactive Barriers Performance Monitoring and Verification (OR09SS30)

Description

Technologies are needed to evaluate and maximize the effectiveness of permeable reactive barriers. The colloidal borescope is an instrument capable of directly observing the movement of colloidal size particles within boreholes to quantify groundwater flow rate and direction. The instrument was used at the two reactive barriers installed at the Y-12 BCV S-3 Pond area to monitor the performance of the treatment system.

FY 1999 Accomplishments

- The groundwater flow rate and direction at Pathways 1 and 2 were evaluated.

Plans for FY 2000

- The hydraulic capture performance of the two different barrier designs at Pathways 1 and 2 will be evaluated in FY 2000.

4.3.2 Mixed Waste Non-Thermal Treatment Systems

4.3.2.1 Demonstration of Mercury Sorbents to Meet DOE Customer Needs (OR09MW16)

Description

ORNL and Y-12 are facing increased stringency in regulations controlling mercury in the water and must find a technology that can remove the mercury to very low levels. The purpose of this activity is to test and evaluate self-assembled mercaptans on mesoporous silicia and other resins for efficiency and cost effectiveness in removing mercury from aqueous media.

FY 1999 Accomplishments

- completed long-term, field-scale tests of mercury sorbents; and

- issued a performance report on the test sorbents.

Plans for FY 2000

- There are no plans for work on this project in FY 2000.

4.3.2.2 Recovery of Mercury from Contaminated Liquids (FT06IP01)

Description

ORNL and Y-12 are facing increased stringency in regulations controlling mercury in the water and must find a technology that can remove the mercury to very low levels. The purpose of this activity is to test and evaluate a selective sorption system utilizing a noble metal sorbent. Once loaded with mercury, the sorbent can be thermally regenerated and reused. The ability of the sorbent to remove mercury from Y-12 groundwater to required regulatory levels in a reliable, efficient, and cost-effective manner was evaluated.

FY 1999 Accomplishments

- completed long-term, field-scale tests of the noble metal mercury sorbents; and

- issued a performance report on the test sorbent.

- sponsored a Mercury Forum in Knoxville on May 18-20, 1999, by the Integrated Treatment Remedial Demonstration and TechCon Programs. The purpose of the forum was to bring together qualified companies with proven, commercially available treatment processes for treating mercury in soil, sediment, and bedrock with representatives from DOE and Bechtel Jacobs Company to discuss remediation approaches for the cleanup of mercury contamination at Y-12. Over 50 companies participated in the 3-day event with several treatment processes identified for further evaluation and possible use.

5. ORR CONTRACTORS LIST

5.1 OAK RIDGE RESERVATION-WIDE

Armstrong & Associates – Facilitation services for public meetings.

Barge Waggoner Sumner & Cannon – Surveying and engineering services.

Bechtel Jacobs Company, LLC – Management and integration subcontractor for all ORO EM projects.

Bridgeman, Brookshire Communications & Graphics – Public relations support for Bechtel Jacobs Company LLC.

CDM Federal Programs Corp. – Technical support for groundwater and surface monitoring; Technical support, regulatory review and integration for CERCLA investigations; Preparation of a regulatory review and SAP for the WAG 6 performance monitoring activity; and MSRE RGR, UDR, FSD-mechanical and piping design engineering.

Design Integration Group, Inc. – Support to Public Affairs.

Entech, Inc. – Sampling and analysis of groundwater; remedial action services of discrete areas for environmental projects; development of treatability study implementation plans; and remediation design.

Envirocare – Waste disposal services.

Foster Wheeler Environmental Corp. – Design contractor for multiple projects.

Gram – General site characterization and pre-remedial design; development of an Integrated Monitoring database; and records, training, and audits support.

Highland Drilling Company – Well construction; well plugging and abandonment; and well maintenance monitoring.

Jacobs Engineering – Assistance in project scoping and preparation of EE/CAs, FSs, PPs, and decision documents.

Lockheed Martin Energy Systems, Inc. – Support on information systems and communications and analytical services.

MDM – Sampling support under the WRRP.

MK-Ferguson – Construction management for RA and D&D projects; valve replacement/cathodic protection for active low-level radioactive waste tanks.

Pacific Western Technologies, Ltd. – Document preparation and control for RA projects. Project control support. Subject-matter expertise for all waste management, handling, storage, treatment, and disposal considerations for some S&M programs; MSRE work package configuration control, procedures development, and document control; MSRE digital camera computing, photograph files, and procurement expediting; and procedures, CERCLA documentation, project reporting, training, and assessments.

PAI Corp. – Project control support; and production of integrated decision documents.

Parrallax – Project controls support.

Performance Development Corp. – Project control and technical support for S&M and RA and DNFSB projects; and statistical services in support of RMPE.

Phoenix Environmental *– Technical support for the ORSSAB.*

Radian – RA contractor.

Roane State Community College *– Technical and educational support to Bechtel Jacobs Company LLC.*

RSI, Inc. *– Support to Project Controls and watershed teams.*

Science Applications International Corporation – Support to Public Affairs; FFA support; Monitoring coordination, performance assessments, and hydrologic modeling for the WAG 6 Performance Assessment Program; RI and FS support, including field investigations, laboratory analyses, technical data sorting, tabulation, and validation, and preparation of RI reports; Data validation, effectiveness of ETTP Water Quality/Plumes systems; technical support to the UEFPC East End VOC Plume Project at the Y-12 Plant, including Phase II Pump and Tracer Tests; technical support for management and planning associated with the UEFPC Watershed; technical support for management and planning associated with BCV Watershed and site-specific characterization data for BCV BY/BY; WRRP support, estimating support; general technical support; Facility Management support.

Tetra Tech – Computer-aided design and drafting (CADD) support and general engineering services.

University of Tennessee – Technical support to ORO; Historical investigations support to Footprint Reduction and the ETTP Site-wide ROD project; Soil and water studies for Bear Creek and multiport well sampling. Technical service for RMPE; Assistance in performing data collection; data compilation; development of performance criteria, maintenance programs, and quality assurance plans; and oversight of surface water monitoring station upgrade activities; and Training Support

5.2 EAST TENNESSEE TECHNOLOGY PARK

Advanced Sciences, Inc. – Technical support to WRRP.

Avisco – Demolition sub-tier subcontractor to SaLUT.

BNFL – DOE subcontractor performing FFA cleanup action at buildings K-29, K-31 and K-33.

CSC – Business analysis and systems development and integration.

DPRA, Incorporated – Waste management planning and regulatory compliance support.

IDM Environmental Corporation – D&D of Bldgs. K-1031, K-1131, and K-1410:

Informatics – Project management support for the Groundwater Program.

IES –Breached the cylinders under the waste operation contract at TCGRS.

Jay Cor – Sampling data to the Biological Monitoring and Abatement Program's benthic macroinvertebrate community.

NFT –Sample management services for environmental projects.

North Brothers – asbestos abatement sub-tier subcontractor to SaLUT.

Pinkerton – Database support for S&M.

Safety and Ecology Corp. – radiological technician support as a sub-tier subcontractor to IDM Environmental Corporation.

Sharp –Capped the concrete pad at K-1071 (awarded as a task order under the small construction contract).

SCG – Support for computer systems development.

Soil and Land Use Technologies (SaLUT) – D&D of Bldgs. K-724 and K-725:

SEC RadCon Alliance – RadCon support, including data review and health physics services.

World Computer Systems – Programmatic and technical support.

Zhagrus – Waste management support, transportation and coordination with Envirocare for LLW disposal as a sub-tier subcontractor to IDM Environmental Corporation.

5.3 OAK RIDGE Y-12 PLANT

AJA Technical Services – Groundwater Quality Reports (S&M).

American Technologies, Inc. – Quality assurance and assessment support for the UEFPC Watershed ROD. General maintenance services in support of off-site facilities.

CACI/ASG – Project control support.

CKY, Inc. – Technical support and sediment sampling and risk assessment for UEFPC.

DASKR LTD, Inc. – Risk assessment support.

Frontier Geosciences Environmental – Sample analysis in support of RMPE.

General Engineering Lab., Inc. – Sample analysis in support of Offsite and RMPE.

Gulf Group, Inc. – RmAR contract for Basin 9822 Cleanout. Demolition of Bldg. 9419-1 in support of Y-12 S&M.

IRTEC, Inc. - Wetland mitigation design for BCV Watershed ROD.

IT Corporation – Sample analysis in support of RMPE.

Mountain States Analytical, inc. – Sample analysis in support of Y-12 S&M.

MSE Technology Applications – Removal action construction for BCV S-3 Ponds, Pathway 2.

ParaMax, Inc. – Project control and support for the UEFPC Watershed ROD.

Parsons Infrastructure & Technology – Estimating support.

Pro-2 Serve – (1) Quality assurance and assessment support and (2) review of regulatory requirements for no further investigation/no further assessment (NFI/NFA) determinations to identify specific data needed to support a technically credible NFI/NFA request.

Professional Project Services – Quality assurance and assessment support for Y-12 S&M.

Quanterra, Inc. – Sample analysis in support of EMWMF and East End VOC Plumes.

RCRA Environmental, Inc. – Sample analysis in support of WRRP, EMWMF, and off-site areas.

Roy F. Weston, Inc. – RA contractor for the Phase II LEFPC RA.

Sevenson Environmental Services, Inc. – RA design for BCV BY/BY.

Solutions to Environmental Problems (STEP), Inc. – RmAR contract for the Y-12 Plant Firing Range.

Southwest Laboratory of Oklahoma, Inc. – Sample analysis in support of EMWMF and East End VOC Plumes.

Southwest Research Institute, Inc. – Sample analysis in support of off-site areas.

Technics Development Corp. – Technical support for LEFPC.

Thermo Nutech – Sample analysis support.

TN and Associates – Technical support for UEFPC and RMPE.

Waste Management Federal Services, Inc. – Preliminary design for disposal cell.

5.4 OAK RIDGE NATIONAL LABORATORY

Advanced Integrated Management System – NMFS surplus facilities technical support. MSRE RGR fissile material handling.

Advanced Systems Technology – Waste characterization processing and transportation assistance.

AFI Permafreeze (Arctic Foundation's) – Maintenance of frozen soil barrier at HRE Pond.

AIMS – Technical and administrative support.

Allied Technologies Group Inc. – NMFS stabilization, remediation, and AEA Technology Deployment

Apercus – Project control and support.

APEX – Environmental safety and health support and management consulting.

Applied Technologies Inc. – Perform NMFS riser installation.

ATG – D&D of the Waste Evaporator facility and surveillance of RA sites.

ATI – Structural integrity assessments for active LLLW tanks. RA contractor for Impoundments C&D.

Automated Sciences Group/CACI – Biological data analysis, support for management, and analysis and interpretation of biological data from laboratory and field studies.

Battelle Pacific Northwest Laboratory – Design and fabrication services for an ISV off-gas hood and filtration system.

Bechtel National, Inc. – RI activities for WAGs 1, 5, 6, and 10.

Camber Corporation – Support for nonprogrammatic inflows.

CASI – Sampling support and waste certification support.

CH2M Hill) – RI activities for WAGs 1, 5, 6, and 10.

Commodore Advanced Sciences Inc. – NMFS Waste Management Support. MSRE FSD fluorine trapping materials lab tests and chemistry analysis; RGR, UDR, FSD, FAC-Procedures preparation and documentation; CONV-Prototype equipment cold tests, physical chemistry analysis; CONV - Actinide chemistry process lad tests and analysis.

EET – Waste analysis and disposal consulting.

Environmental Consulting Engineers – Preparation of remediation and post-remediation monitoring plans for WAG 6 and monitoring in WAGs 2 and 5 removal action investigations.

Environmental Systems Corporation – Structural integrity assessments for Category C tank systems.

ERC, Inc.) – RI activities for WAGs 1, 5, 6, and 10.

Geosafe – Geotechnical support services.

Geotek Drilling – Drilling services.

H&R Technical Associates, Inc. – Technical and administrative support in assembling reports, preparing minutes of meetings, and reviewing reports.

Haselwood Enterprises, Inc (HEI) – MSRE FSD remote inspections and qualifications of tanks, hardware, and systems

International Waste Management – Preparation of structural integrity assessments.

IT Corp. – Sampling, analysis, and quality assurance/quality control support. RI activities for WAGs 1, 5, 6, and 10. RA contractor for Corehole 8 Plume Source Removal

Jacobs EM Team – Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, PPs, RODs, environmental assessments, environmental impact statements, documents for interim actions, and cost estimates associated with these documents. Supported development of the EE/CA and BV ROD PP. Supported development of the MRF EE/CA. Supported development of the OHF Ponds and Tanks Remediation EE/CA.

JAYCOR – Sampling and analysis support for WOC and its tributaries.

JR Engel – Project control and support.

Jupiter Corporation – Administrative support.

Kansas Geological Survey – Collection of seismic reflection data for WAG 10.

Knoxville College – Database support and technical support for sample collections.

Lockheed Martin Energy Research Corporation – Technical support for GAAT and MSRE. RA contractor performing the GAAT work. FFA Tank Remediation Project Field support and analytical support.

M&EC – MSRE CONV-Charcoal process testing; UDR-Design review; CONV-Charcoal process lab tests, chemical properties analysis; UDR, FSD-Task leader

MAC Tech. – Implementation of data quality objectives and safer planning processes.

Molten Metals Technology, Inc. – Remove and dewater sludge from Tank WC-14.

Northern Arizona University – Technical direction for S&M and WAG 5 cryogenics.

Operational Technologies – Pre-remedial design support.

PDC–– MSRE RGR, UDR, FAC-Project controls

PEER – RI activities for WAGs 1, 5, 6, and 10. NMFS site preparation and riser installation. NMFS project technical support.

Performance Development Corporation – Technical and administrative support. MSRE FSD project controls

Pragmatics – Nuclear criticality safety reviews for MSRE.

Pro-2-Serve– MSRE general engineering support

SEC— MSRE industrial hygiene, safety, and radiological technicians

SEG – Field demonstration on waste stabilization in burial trenches.

SENES – Risk assessment and uncertainty analysis.

STEP – Health and safety support and Inactive Tanks Program support.

Theta Engineering – Waste management and engineering support.

TransNuclear, Inc. – **NMFS** design, licensing, and fabrication of the internal container for the TN-FSV shipping cask.

Westinghouse Hanford Company – Procurement and delivery of MLDUA for GAAT.

Westinghouse/NISYS – MSRE criticality safety, shielding, and radiological engineering

XL – Planning support for GAAT innovative technology development and testing.