PADUCAH GASEOUS DIFFUSION PLANT SITE SPECIFIC ADVISORY BOARD

Chartered under the Federal Advisory Committee Act

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TO: Paducah SSAB Members
Ex Officio Members

DATE: May 3, 1999

SUBJECT: **MEETING REMINDER**

The next meeting will be held May 13, 1999, at the Information Age Park Resource Center at 5:30 p.m.

Tentative agenda for the May 13, 1999, meeting:

- Call to order/Discussions
- Minutes
- Public Comments and Questions
- Information Handouts
- Program Status Updates
  - EM&EF Projects
  - Vortec
  - Depleted UF_6
- Sitewide Cummulative Effects
- Programatic Presentations
  - WAG 6 — Gregory Waldrop
  - WAG 22 SWMU 2 & 3 -- Nola Courtney
  - National Metal Recycle Program: Scrap Metal Options
  - Operable Unit Strategy Overview -- John Morgan
- SSAB Subcommittee Reports
  - Board Evaluation -- Jim Smart
  - Community Relations -- Judy Ingram
  - Consultant -- Bill Tanner
  - New Members -- Nola Courtney
- SSAB Recommendations Status--Jimmie Hodges

- Administrative Issues for the Board
  - Review of the SSAB Draft Workplan
  - Financial Update
  - SSAB Letterhead
  - Tours

Action Items from the April 15, 1999 SSAB Meeting

- Bruce Gardner/Shirley Speer to work on integration of new members--create "new members orientation packet."
- Shirley Speer to provide acronym list in packet.
- John Sheppard to consider suggested revisions for workplan.
- Debbie Wattier to develop and place newspaper ads. Publish advertisement for May 13, 1999 meeting in *The Paducah Sun* Sunday before meeting including tentative agenda.
- Shirley Speer to remind SSAB members through e-mail and phone calls of the May 4, 1999, site tour.
- Shirley Speer to include SSAB letterhead choices in packet.
- Shirley Speer to obtain list of websites for site-wide EISs.

PADUCAH GASEOUS DIFFUSION PLANT
SITE SPECIFIC ADVISORY BOARD

padssab@apex.net www.oro.doe.gov/pgdpssab/

2000 McCracken Boulevard • Paducah, Kentucky 42001 • (502) 744-9010

Co-Chairs

Mark Donham
Vicki Jones

Board Members

Kit Atkinson
Nola Countney
Edward Duff
Joyce Farmer
David Fuller
Judy Ingram
Merryman Kemp
Ronald Lamb
Linda Long
Douglas Raper
Craig Rhodes
Rosa Scott
Jim Smart, Ph.D.
Pat Stephenson
Bill Tanner
Rev. Gregory Waldrop

Ex Officio Members

Carl Froede, Jr.
Environmental Protection Agency

Wayne L. Davis
Fish and Wildlife Resources
(Kentucky)

Tuss Taylor
Division for Waste Management
(Kentucky)

John A. Volpe, Ph.D.
Radiation Control Branch
(Kentucky)

Jimmie C. Hodges
Department of Energy

DOE Federal Coordinator

John D. Sheppard

Additional information about contacting board members directly can be obtained from the SSAB web site or by contacting Shirley Speer at (502) 462-2550.

Meeting Minutes

May 13, 1999

The May 13, 1999, Site Specific Advisory Board (SSAB) meeting took place at the Information Age Park Resource Center in Paducah at 5:30 p.m.

The following board members were present: Kit Atkinson, Nola Countney, Mark Donham, Edward Duff, Judy Ingram, Vicki Jones, Merryman Kemp, Ronald Lamb, Linda Long, Douglas Raper, Craig Rhodes, and Jim Smart. The facilitator present was Steve Kay. The United States Department of Energy (DOE) federal coordinator present was John D. Sheppard. Also present were the following members of the public and employees, contractors, and subcontractors of the DOE: Bruce Gardner, Pat Hopper, David Hutcheson, Norm Jetta, John Morgan, Shirley Speer, and Debbie Wattier.

Agenda

Steve Kay called the meeting to order and asked if there were any modifications to the agenda. John Sheppard asked that the Land Use Control Assurance Plan (LUCAP) handout be added. Mark Donham added discussion of co-chair to administrative issues. The modified agenda was approved and adopted.

Facilitator's Orientation

Kay said the orientation primarily was for the new members. He reviewed highlights of the SSAB bylaws. Kay said the facilitator's role is to help the board stay on the agenda, to reach closure on issues, and to check for consensus when there are decisions to be made. His role also includes making sure all views are heard and valued until a decision is reached.

Public Comments from Guests

There were no comments made during this period.

Minutes

The minutes from the April 15, 1999, meeting were approved by consensus and adopted.

Information Handouts

John Sheppard explained the *Accelerating Cleanup: Paths to Closure* and appendix F. Mark Donham recommended the Fernald Transportation Seminar.

Environmental Management and Enrichment Facilities Project Updates

Mark Donham asked about the *Transport Modeling Results for the Northeast Plume Interim Remedial Action and the Northwest Plume at the Paducah Gaseous Diffusion Plant, DOE/OR/07-1803&D1.* John Sheppard said the plan is to address sources. John Morgan said this is an incremental step. Donham asked if report addresses an underlying assumption that the sources are going to be cleaned up. Sheppard agreed to get a response.

Vortec Update

Doug Raper noted that the Vortec site was seen on the May 4, 1999, tour and asked for background. Norm Jetta explained the process, and noted that the Draft Environmental Assessment (EA) is expected to be issued in September 1999. Several questions were asked, and, after some discussion, it was agreed to provide an updated fact sheet on Vortec and a copy of a previous presentation on Vortec to board members.

Depleted Uranium Hexafluoride (DUF_6)Programmatic Environmental Impact Statement Update

John Sheppard reported there was a three-state meeting in Lexington, Kentucky, and progress is up-to-date. Mark Donham noted that the *Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride*, DOE/EIS-0269, should be discussed. He suggested board members read it before next meeting so it could be discussed.

Sitewide Cumulative Effects

John Sheppard referred to website address list in packet for viewing available documents.

Waste Area Group 6

No comments.

Waste Area Group 22, SWMU 2 & 3

Nola Courtney recommended that this be put on August agenda.

National Metal Recycle Program

Representatives of this program had to cancel. They will reschedule at a later date.

Operable Unit Strategy Overview

John Morgan of Bechtel Jacobs Company provided a briefing on the Background Information for Operable Units Strategy Overview. He discussed highlights of this new environmental cleanup strategy, which organizes the multiple Waste Area Groups (WAGs) into four major groupings: Soils, Burial Grounds, Surface Water, and Groundwater. John Sheppard noted the handout on the Land Use Control Assurance Plan (LUCAP). Sheppard said the LUCAP is important for implementation of the overall plan. Morgan said EPA and State are meeting with DOE at the end of May regarding the new strategy. Mark Donham asked if any estimates have been made considering the volume of soils and other waste materials that will be generated when the cleanup is done. Morgan noted the life cycle baseline addresses that. Donham said there will be a substantial amount of waste as more restoration gets underway.

Board Evaluation

Jim Smart said this group has no plans to meet again.

Community Relations

Judy Ingram reported that the committee had met. They would like to publish the ads for three consecutive months and would like to include co-chairs as points of contact. They would like to see if newsletter could be published four times per year. Debbie Wattier talked about what would be included in an upcoming DOE community newsletter. John Sheppard noted that SSABs in other areas put out newsletters specifically for board activities. DOE's July public workshop was discussed, and the board was invited to participate by John Sheppard. Linda Long commented that it may be a good idea to have a table. Vicki Jones said the exposure to the public might be positive. The committee decided to reconsider participation in the workshop. Jim Smart recommended changing the name of the board from Site Specific Advisory Board (SSAB) to Citizens' Advisory Board. This name may clarify identity to the public. John Sheppard said he would check on officially changing the name of the board.

Consultant

Bill Tanner was not present. He had included the RFP for a board consultant in the handouts; requested comments by May 21, 1999. Sheppard noted that it is actually an Expression of Interest rather than a Request for Proposal.

New Members

The new members have been approved.

Co-Chair Discussion

Mark Donham stated that he had enjoyed serving as co-chair for the last two and half years, but he feels it is time someone else had that opportunity. He would like to continue to serve on the board but proposed the board elect a new co-chair. He suggested putting election of a new co-chair on the June agenda. Jim Smart asked why the board had co-chairs instead of one chairperson. Steve Kay said if the board members wanted to amend the bylaws, they could change to a chairperson.

Workplan

Steve Kay recommended the SSAB workplan be revised and updated. The workplan is going to be addressed by Nola Courtney and Mark Donham.

Financial Update

John Sheppard gave this report. Vicki Jones questioned increase in spending. It was explained that office rent was a large part of the increase.

Site Specific Advisory Board Letterhead

All members names will be listed on letterhead with addresses and phone numbers deleted.

Tours

An evaluation form was included in packet that needs to be sent to Debbie Wattier. John Sheppard said comments would be helpful and that more tours would be planned.

The next meeting will be held June 17, 1999, at the Information Age Park Resource Center at 5:30 p.m.

The meeting was adjourned.

PLEASE SIGN IN

Paducah Gaseous Diffusion Plant
Site Specific Advisory Board

Name	Affiliation
JOHN Morgan	BJC
Norman [illegible]	Vertec Corp.
[illegible]	SSAB
DAVID HUTCHESON	LAN-CON, INC
[illegible]	SSAB
JOHN D SHEPPARD	DOE
[illegible]	SSAB
Craig Phelps	SSAB
[illegible]	SSAB
PAT Hopper	Waste Management Federal Services
Nola Courtney	SSAB
Judy C. [illegible]	SSAB
[illegible]	SSAB
[illegible]	SSAB
[illegible]	SSAB
Shirley Speer	JACOBS
Linda Long	SSAB
Debbie Wattier	Bechtel Jacobs
Bruce GARDNER	" "
Kit Atkinson	SSAB

May 13, 1999

PADUCAH GASEOUS DIFFUSION PLANT (PGDP)
SITE SPECIFIC ADVISORY BOARD
ENVIRONMENTAL MANAGEMENT PROJECT UPDATES
May 1, 1999

1. PROJECT: Waste Area Groups 3, 8, 28 and Data Gaps

Summary: Current work on Waste Area Groups 3, 8, and 28 has been combined into one project. Remedial Investigations will be done on WAGs 3 and 28. A Site Evaluation will be done on WAG 8. In addition, this project includes a "Data Gaps" investigation to collect groundwater and subsurface soil samples to supplement existing data.

- WAG 3 includes three burial grounds within the plant security fence, in the western section: C-747 Contaminated Burial Yard (Solid Waste Management Unit/SWMU 4), C-746-F Classified Burial Yard (SWMU 5) and C-747-B Burial Yard (SWMU 6).
- The concern at WAG 3 is potential contributions to groundwater contamination from the content of the burial grounds: natural and slightly depleted uranium, technetium-99 (Tc-99), magnesium fluoride, uranium-contaminated solid waste, security-classified weapons components, radionuclide-contaminated scrap metal, and slag from nickel and aluminum smelters.
- WAG 8 includes: SWMUs 82-85, which are the C-531, C-533, C-535, and C-537 Electrical Switchyards, as well as the C-340 Reduction and Metals Facility, which is inactive and is part of the Decontamination and Decommissioning program.
- The concern at WAG 8 is similar to WAG 28, but the Site Evaluation will first determine whether contaminants have been released.
- WAG 28 includes SWMUs 99, 183, 193, 194, which are locations related to the 1950s construction of the plant, including the C-745 Kellogg Building Site, the McGraw Underground Storage Tank, McGraw Construction Facilities, as well as Area of Concern 204 (potential construction debris area).
- The concern being addressed at WAG 28 is potential contributions to groundwater contamination.

Status:

- Remedial Investigation and Site Evaluation field work for WAGs 8 and 28 continued in April1999, and is on schedule for completion in mid to late summer 1999. Limited field work for WAG 3 was initiated in April 1999, with most of the WAG 3 field work projected to begin in the early fall.
- Upcoming regulatory documents will be: the Draft (D1) Remedial Investigation Report for WAG 28, scheduled to be issued to regulatory agencies in January 2000; the D1 Site Evaluation Report for WAG 8, June 2000; and D1 Remedial Investigation Report for WAG 3, August 2000.

2. PROJECT: Waste Area Group 22, SWMU 2

Summary: SWMU 2 is the C-749 Uranium Burial Ground in the west-central portion of the plant.

- The SWMU 2 Feasibility Study (September 1998) presented four potential remedial alternatives: 1) No further action other than: continued groundwater monitoring, current institutional controls, and implementation of deed restrictions; 2) In-situ containment with soil cap and subsurface barriers; 3) In-situ containment using low-pressure grout injection with a cap; and 4) Excavation of waste and soils.
- The preferred remedy in DOE's D1 Proposed Plan (October 1998) for SWMU 2 is the "No further action" option. The Kentucky Department for Environmental Protection considers excavation to be the only acceptable remedy.

Status:

- A revised (D2) Proposed Plan is expected to be issued in August 1999, pending approval of the PGDP Land Use Control Assurance Plan in June.
- A final (D3) Proposed Plan and D1Record of Decision could then be issued during 2000.

3. PROJECT: Waste Area Group 22, SWMUs 7&30

Summary: This project includes the investigation of the C-747-A Uranium Burial Ground and C-747-A Burn Area in the northwest corner of the plant.

- The D2 Feasibility Study for SWMUs 7 & 30 was issued to regulatory agencies for review in November 1998, proposing four remedial alternatives: 1) No action; 2) Limited action (installation of additional monitoring wells and long-term groundwater monitoring); 3) Soil cover and groundwater monitoring with additional monitoring wells; and 4) Surface soil removal and groundwater monitoring with additional monitoring wells.

Status:

- EPA has given conditional approval of the D2 Feasibility Study. Final approval is pending review of the Land Use Control Assurance Plan.
- The Kentucky Department for Environmental Protection provided comments on the D2 Feasibility Study in December 1998; DOE responded to the comments in January 1999, with comment resolution pending.

4. PROJECT: Northwest/Northeast Plume Groundwater Systems

Summary: Approximately 367 million gallons of groundwater water have been treated through April1999 at the Northwest Plume Groundwater Treatment Facility since operations began in September 1995. The facility operates under a 1993 Record of Decision to contain a high contamination zone of trichloroethylene (TCE) and Tc-99. Approximately 199 million gallons of groundwater have been treated via the Northeast Plume system since the facility began operations under a Record of Decision in March 1997. The facility operates under a 1994 Record of Decision to contain a high contamination zone of TCE.

Status:

- 8.4 million gallons groundwater were treated at the Northwest System during April 1999, with the facility operational 97.4% percent of the time.
- 7.8 million gallons groundwater were treated at the Northeast System during April 1999, with the facility operational 97.7% of the time.
- Bechtel Jacob Company awarded a subcontract to CDM Federal Programs, Inc., effective April 1, 1999, for continued operation of the two groundwater facilities for a 3-year base period. Operational costs have been reduced continuously at the facilities, with further cost reductions expected from the new contract.

5. PROJECT: Lasagna™ Soil Remediation at SWMU 91

Summary: Lasagna is a soil remediation technology already demonstrated at PGDP by DOE and industry partners (Monsanto, DuPont, General Electric), and then selected to reduce TCE levels in soil at SWMU 91 under a 1998 Record of Decision. SWMU 91 is an area of approximately one acre on the west side of the plant once used to drop test empty DUF6 cylinders. Lasagna is an in-situ technology that uses buried electrodes to move water through soil, picking up contaminants. The water passes through buried treatment zones that trap or degrade the TCE.

Status:

- Bechtel Jacobs Company awarded a subcontract February 12, 1999, to CDM Federal for the design, construction, and operation of the Lasagna treatment system at SWMU 91.
- The D1 Remediation Design Report, Construction/Quality Control Plan/Remedial Action Work Plan is scheduled to be issued May 18, 1999.
- The D1 Operation and Maintenance Plan is scheduled to be issued June 3, 1999.
- Construction of the treatment system is scheduled for August 1999, with operations scheduled to begin in October 1999.
- The system is expected to be operated for approximately 2 years in order to achieve targeted clean-up levels.

6. PROJECT: Groundwater Operable Unit/WAG 6

Summary: WAG 6 includes five SWMUs near the C-400 Chemical Cleaning Facility, which is still in operation, and leased by DOE to USEC, Inc. Past operations at the facility resulted in TCE and Tc-99 groundwater contamination. Use of TCE for cleaning equipment was ended in 1993. Following the completion of the WAG 6, 27 and 28 Remedial Investigations, all data will be used to develop a Feasibility Study for the Groundwater Operable Unit, which includes the groundwater plumes themselves as well as the primary sources of TCE and Tc-99 groundwater contamination. Following this Feasibility Study, a Proposed Plan and Record of Decision for the selected remedial action will be developed. The selected remedial action will be designed and implemented after the ROD is signed.

Status:

- The D2 WAG 6 Remedial Investigation Report was submitted to the U. S. Environmental Protection Agency Region 4, State of Kentucky and stakeholders on May 7, 1999.
- The D1 WAG 6 Treatability Studies reports, which evaluate Surfactant Flushing and Chemical Oxidation of the Regional Gravel Aquifer, are under review by the regulatory agencies and other stakeholders. Comments are expected to be received around May 19, 1999.
- The Innovative Treatment Remediation Demonstration process for the Groundwater Operable Unit Feasibility Study was continued with meetings held on April 22-23, 1999. The scope of this process includes a cooperative public-private partnership developed to reduce remediation schedules and costs by accelerating acceptance and use of new technologies. The program coordinates DOE, EPA, industry, and regulatory agencies in evaluating, implementing and validating innovative remediation technologies at selected DOE sites.
- As part of the Groundwater Operable Unit project, a sonic cone penetrometer drilling method will be tested near the C-400 facility and in the area of the Southwest Plume in June 1999. The test will attempt to penetrate the Regional Gravel Aquifer for the first time with a direct push drilling method. The direct push drilling method excels over other rotary and auger drilling methods in that waste generation is minimized. In addition to minimizing waste, water saturations and contaminant concentrations are not altered since drilling fluid is not used. Direct push drilling is less costly than these other methods, typically taking less time and using smaller rigs allowing easier access. The test will also evaluate a method for detecting the presence and location of TCE Dense Non-Aqueous Phase Liquids (DNAPLs). The method uses a membrane that when contacted by TCE stains red. The membrane resembles a large diameter reactive garden hose that can be lowered and hydraulically expanded in the borehole to define areas with pure phase TCE present.

7. PROJECT: Waste Area Groups 9 & 11

Summary: WAGs 9 and 11 include seven in-ground tanks, vaults and pits at the PGDP. A Site Evaluation was conducted in Fiscal Year 1998 to determine whether any releases of contaminants had occurred. WAG 9 consists of the C-722 acid neutralization tank, off the northeast corner of the C-720 maintenance facility; the C-712 acid neutralization tank, off the southwest corner of the C-710 laboratory; the C-616-L Pipeline and vault soil contamination area; and the C-729 Acetylene building drain pits, just east of C-720. WAG 11 consists of the C-410-B hydrofluoric acid (HF) neutralization sludge lagoon; the C-410-E HF emergency holding pond; and the C-410-C HF neutralization tank.

Status:

- The D1 Site Evaluation Report was issued December 23, 1998, recommending: 1) no further action for WAG 9; and 2) performance of a risk assessment for WAG 11.
- Any actions beyond these recommendations would be deferred to the Surface Soils Operable Unit project.
- The Kentucky Department for Environmental Protection provided comments on the D1 Site Evaluation Report on March 26, 1999, and these comments are being addressed.

8. PROJECT: Waste Area Group 23/PCB spill sites

Summary: WAG 23 consists of eight SWMUs inside the PGDP security fence, and one outside the fence, located near the C-611 Water Treatment Facility fence on DOE property. Past use of PCBs and subsequent accidental spills and leaks of oils that contain PCBs caused the surface soil contamination at these SWMUs. Excavation of approximately 175 cubic yards of contaminated soil at several PCB sites was completed in late 1997 and early 1998.

Status:

- A D1 Proposed Remedial Action Plan recommending No Further Action was submitted to regulators November 6, 1998. EPA provided comments, dated December 17, 1998.
- A Residual Risk document and explanation of average concentrations calculations were provided to the State on February 18, 1999.
- State comments on the D1 Proposed Remedial Action Plan were received April 16, 1999 (vs. April 14 as reported in April project updates)
- At the request of the Kentucky Department for Environmental Protection, supplemental samples have been collected in the drainage area south and east of SWMUs 56 and 80.

9. PROJECT: Waste Area Group 27

Summary: WAG 27 consists of potential or known sources of TCE on the west side of PGDP suspected of contributing to groundwater contamination. WAG 27 includes the C-747-C Oil Land Farm, SWMU 91 (the cylinder drop test area), SWMU 196 (C-746-A warehouse septic systems) and the C-720 maintenance facility.

Status:

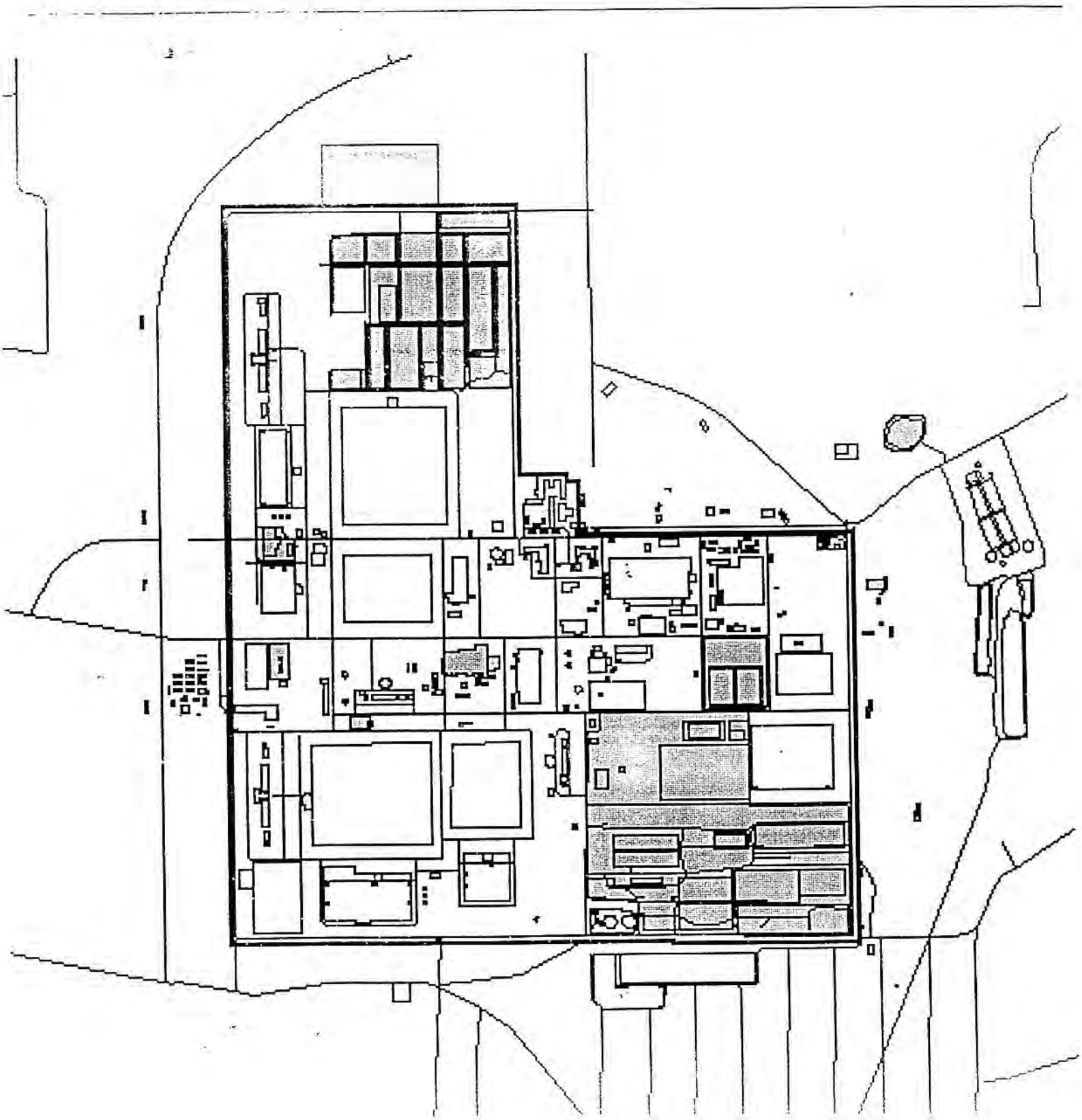
- Issued D1 WAG 27 Remedial Investigation Report December 23, 1998.
- EPA comments were received March 31, 1999.
- State comments were received on April 5, 1999.
- D2 Remedial Investigation Report is scheduled to be issued by June 4, 1999.

10. PROJECT: Surface Water Operable Unit

Summary: The Surface Water Operable Unit includes the Big and Little Bayou Creeks, all Kentucky Pollutant Discharge Elimination System (KPDES) outfall ditches, and the primary source areas potentially contributing to contamination in these locations, including: past releases from C-333A and C-337 vaporizers and the switchyards, and sediment from plant storm sewer systems. Primary contaminants of concern are PCBs and radionuclides with metals as a secondary concern.

Status:

- Issued the D1 Scoping Document to the regulators March 29, 1999.
- Data Quality Objective meetings were conducted April 14-15, 1999, with the regulators and representatives of the Kentucky Fish and Wildlife Resources Department, and U.S. Fish and Wildlife Services.
- The Risk Assessment for the Surface Water Operable Unit is scheduled to include a baseline human health risk assessment and a comprehensive baseline ecological risk assessment.



REGISTRATION INFORMATION ON THE NATIONAL STAKEHOLDER FORUM ON THE PEIS LAWSUIT SETTLEMENT'S CENTRAL INTERNET DATABASE

Wattier, Debbie S. (DSI)

From: Perry, Walter N [PerryWN@oro.doe.gov]
Sent: Tuesday, April 27, 1999 8:49 AM
To: Sheppard, John.; Wattier, Debbie S.; Childers, Sandra; Cassandra Savage (E-mail)
Cc: Heiskell, Marianne M; Chuck Jenkins (E-mail); Plant, Sandra W
Subject: FW: REGISTRATION INFORMATION ON THE NATIONAL STAKEHOLDER FORUM ON THE PEIS LAWSUIT SETTLEMENT'S CENTRAL INTERNET DATABASE

Importance: High

Register.doc register.wpd

Ports/ Pad/Weldon - Please make the information below available to
stakeholders as appropriate in your reading rooms, via newsletters, etc. In Oak Ridge, ORO Public Affairs will send to the Public Reading Room and IRC, along with placing in May Public Involvement News (with POC as Matt Zenkowich at HQ).

Thanks,
Walter Perry
DOE Public Affairs
(423) 576-0885

-----Original Message-----
From: Fred Butterfield [mailto:Fred.Butterfield@EM.DOE.GOV]
<mailto:[mailto:Fred.Butterfield@EM.DOE.GOV]>
Sent: Monday, April 26, 1999 5:06 PM
To: Karol Hazard; Angela Harvey (E-mail); Barbara Wise (E-mail); Bobbie McClure (E-mail); Carmen Rodriquez (E-mail); Dennis Hurtt (E-mail); Frank Gines (E-mail); Gail McClure (E-mail); George Mishra (E-mail); Gerri Flemming (E-mail); John Carter (E-mail); Kathy Whitaker (E-mail); Ken Morgan (E-mail); Kevin Rohrer (E-mail); Mariane Anderson (E-mail); Mary-Jo Acke Ramicone (E-mail); Mike Antiporda (E-mail); Mike Jacobs (E-mail); Ron Duvall (E-mail); Tami Toops (E-mail); Tracy Loughead (E-mail); Walter Perry (E-mail); Audrey Berry (E-mail); Gary Stegner (E-mail); Jerry Johnson (E-mail); John Sheppard (E-mail); Karol Hazard (E-mail); M. J. Byrne (E-mail); Marianne Heiskell (E-mail); Patty Natoni (E-mail); Woody Russell (E-mail)
Cc: James Werner; Mathew Zenkowich; Martha Crosland; Michael Purkey; Steven Livingstone
Subject: REGISTRATION INFORMATION ON THE NATIONAL STAKEHOLDER FORUM ON THE PEIS LAWSUIT SETTLEMENT'S CENTRAL INTERNET DATABASE

<<Register.doc>> <<register.wpd>> To: EM Field Public Participation Coordinators and EM SSAB Federal Coordinators
Attached is registration information on the National Stakeholder Forum on the Central Internet Database to be held June 3-4, 1999, in Columbia, MD. The Department is developing this database and sponsoring this forum pursuant to the terms of a recently settlement lawsuit regarding the Programmatic Environmental Impact Statement (PEIS).
The registration material is provided in both Wordperfect 8.0 and MS Word 6.0/7.0 formats. We would appreciate it if you could forward the files to stakeholders at your sites who may be interested in attending. Also, we would appreciate it if you could put a hard copy of the registration materials in your public reading rooms.
More information on the PEIS lawsuit settlement, including the Central Internet Database and stakeholder forum, can be obtained on the EM Home Page at http:\\www.em.doe.gov\settlement
Questions on the forum or other parts of the PEIS lawsuit settlement should

be directed to Jim Werner, EM-24, on 202/586-9280, or to Matt Zenkowich of his staff at 202/586-4612.

Fred
DOE/EM-22
Phone: 202/586-8809
E-mail: fred.butterfield@hq.doe.gov <mailto:fred.butterfield@hq.doe.gov>

Central Internet Database
National Stakeholder Forum Registration
June 3 and 4, 1999 - Columbia Inn Hotel and Conference Center
(a.k.a. Sheraton Columbia Hotel)
Columbia, MD

The Department of Energy (DOE) is sponsoring a forum on the development of a Central Internet Database that will contain specified information on DOE managed waste, contaminated environmental media, spent fuel and facilities. DOE is developing this database and sponsoring this forum pursuant to the terms of a recently settled lawsuit [*Natural Resources Defense Council et al. v. Richardson et al.*, Civ. No. 97-936 (SS)].

To Register for the National Stakeholder Forum Complete the Following Steps:

Step 1. Register for the forum
Review the Registration Directions and complete the Registration Form
Step 2. Make your hotel reservations
Follow the instructions on the Logistical Information form
Step 3. If you need travel funding assistance, apply to the Environmental Law Institute
Review the Guidelines and Procedures for Travel Support and complete the Application for Travel Support
Step 4. If you are not applying for travel funding, make your airline reservations to Baltimore Washington International (BWI) airport
Follow the instructions on the Logistical Information form

* * * * *

Purposes of Meeting. There are three main purposes for this first National Forum:

- to discuss the status of database development; review the data that will be contained in the database, most of which was specified in the settlement agreement; and discuss internet linkages;
- to engage in constructive dialogue with potential users about the capabilities of the database, including its design and report-producing capabilities; and
- to discuss ongoing opportunities for continued stakeholder involvement in the project.

What Types of Information Will be Available From the Central Database?

The Database will provide publicly available data that DOE collects nationally on waste; contaminated media; contaminated facilities; DOE-managed, domestic, and foreign research reactor spent nuclear fuel; sites governed by Section 151(b) of the Nuclear Waste Policy Act; Formerly Utilized Sites Remedial Action Program (FUSRAP) sites returned to DOE for management; data on non-radioactive hazardous wastes; and data about excess fissile materials and other hazardous or radioactive waste inventories from the 1996 materials in inventory (MIN) report.

For each type of data, the settlement specifies what information DOE will provide. Examples of this type of information include location and schedule of generation, treatment, storage, and disposal; volume or mass; and major radionuclides or chemicals of concern.

A tentative agenda is provided below. A final agenda, background information on each of the topics to be discussed, and status fact sheets will be available prior to the forum through **http://www.em.doe.gov/settlement** or through a mailing (when you register, you will be placed on a list to receive a copy of these materials). In addition to materials on the forum, this web site provides essential technical information including details on the requirements of the settlement agreement and the status of DOE's compliance with the settlement terms, including a draft project plan.

Who Will Attend the Forum. Representatives from DOE responsible for developing and implementing the database as well as key staff responsible for managing the primary data sources that will be used to populate the database will be present. Representatives from the plaintiffs organizations and other stakeholders who are actively engaged in DOE-related issues will also attend and participate actively in many of the presentations and discussions.

Forum Agenda (subject to change)

Thursday, June 3

8:30 Welcome and Introductions
9:00 Overview and Status Reports by DOE and Plaintiffs on the Database and Links
10:30 Challenges and Issues During Database Development and Deployment
11:00 Public Comments and General Discussion
12:00 Lunch
1:00 Combination of Plenary and Breakout Sessions on Specific Topics - Topics may include the following:
- Spent Nuclear Fuel/High Level Waste
- Low Level Waste/Mixed Low Level Waste
- Transuranic Waste - Buried/Stored
- Facilities/Contaminated Media

5:00 Adjourn

Friday, June 4

8:30 Agenda Review and Announcements
8:40 Reports from Previous Day Sessions
9:40 Combination of Plenary and Breakout Sessions on Specific Topics - Topics may include the following:
- User Interface - Look and feel of interface
- Database search and query capabilities
- Database deployment, training, and documentation
- Updating and maintaining the database, including ongoing opportunities for public involvement

12:00 Lunch
1:00 Next Steps (database deployment, update, and maintenance)
2:15 Closing Comments
2:30 Adjourn

Questions on the Agenda?

Contact: Jim Werner at (202) 586-9280 or at james.werner@em.doe.gov

PEIS Settlement Database Forum

Logistical Information

Airport: **Baltimore/Washington International Airport** (BWI)

Ground:
Transportation:

The Airport Shuttle - if you provide your flights and time of arrival on your registration form, your transportation to the hotel will be scheduled.

If you do not provide your flights and times, you will need to make your own ground transportation arrangements with:

Airport Shuttle: 1-800-776-0323.

The first passenger cost for one way is $16; each additional passenger is $4.

Arrival Pick-Up Procedure:

- Proceed to your baggage claim area on the lower level.
- Proceed to the ground transportation area on the lower level (Pier C)
- Walk outside to the first roadway (Taxi Lane)
- **"The Airport Shuttle"** van will be parked nearby
- Look for the dark navy blue van featuring **"The Airport Shuttle"** in bright yellow letters
- The driver will have your name and will be waiting for you

NOTE: Do not worry if your flight is delayed – the shuttle company follows flights and will arrange for a van to meet you 15 - 20 minutes after your actual arrival.

Hotel: Sheraton - Columbia
10207 Wincopin Circle
Columbia, MD 21044
(410) 730-3900
Reservations: (800) 325-3535

Make your reservation by calling the hotel directly prior to May 19, 1999. *Indicate that you will be attending the* ***Department of Energy Conference.*** *Rooms have been reserved for June 2nd and 3rd only.*

REGISTRATION DIRECTIONS/HOTEL RESERVATIONS

Ways to Register: ****Deadline for Registration is May 19, 1999****

For your convenience, there are four different registration options. Please register only once.

1. **By Mail**
   a. Complete the Registration Form
   b. Mail completed form to:
      Center for Environmental Management Information (CEMI)
      P.O. Box 23769
      Washington, DC 20026-3769

2. **By Fax**
   a. Complete the Registration Form
   b. Fax completed form to:
      Center for Environmental Management Information
      FAX: (202) 554-3267

2. **By Phone**
   a. CALL: 1-800-7 EM DATA toll free

2. **Via the Internet**
   a. Go to the Settlement Web Site: www.em.doe.gov/settlement
   b. Follow prompts on web site to settlement registration materials
   c. Complete registration directly on-line and press the REGISTER button

Hotel Reservations

Hotel: Columbia Inn Hotel and Conference Center (a.k.a Sheraton Columbia Hotel)
10207 Wincopin Circle
Columbia, MD 21044
(410) 730-3900
Reservations: (800) 325-3535

Make your hotel reservation by calling the hotel directly prior to May 19, 1999. Indicate that you will be attending the **Department of Energy Conference**. Rooms have been reserved for June 2nd and 3rd only.

Questions on Registration?

Contact: CEMI at 1-800-7 EM DATA or at eminfo@cemi.org

Central Internet Database
National Stakeholder Forum

Registration Form

Please print.

Name: _____
Last First Middle

Organization: _____

Address: _____

_____

_____
City State Zip

Phone: (____) _____

FAX: (____) _____

Email address: _____

Are you seeking travel expense funding from ELI? ____ yes ____ no

---

Flight Arrangements *(Optional: needed to arrange sharing of ground transportation - if information is not supplied, see* **Ground Transportation** *on the Logistics Page)*

Arrival:

Flight No.	Airline	Date	Time
_____	_____	_____	_____

Departure:

Flight No.	Airline	Date	Time
_____	_____	_____	_____

☐ I will not need ground transportation arrangements.

☐ I have the following special needs:

_____

_____

_____

APPLICATION FOR TRAVEL SUPPORT

Limited funds are available in cases of demonstrated need to support reasonable travel expenses incurred in attending the Department of Energy's (DOE) Central Internet Database National Stakeholder Forum (Forum). Plaintiffs of record or representatives of other organizations that work on issues relating to DOE's environmental management activities may apply to have their travel costs paid. (see *Natural Resources Defense Council, et al. v. Bill Richardson, Secretary of Energy, et al., Civ No. 97-936 (SS)*, Joint Stipulation and [Proposed] Order, Section II.E.1)

The travel funding is intended to help achieve the objectives of the Forum by allowing for equitable and diverse stakeholder representation and participation. To be eligible for travel support, you must fill out the attached form, fax or mail it as directed below, and receive approval *prior* to incurring travel expenses (no electronic applications will be accepted). **Forms must be received by 5 p.m. EDT on May 14, 1999.**

Name: _____

Organization: _____

Address: _____

_____
City State Zip

Phone: ( ) _____ FAX: ( ) _____

Email address: _____

Please describe your organization and how its mission and activities relate to DOE's environmental management activities and the subject matter of the Forum:

_____
_____
_____

Please provide detailed information explaining why financial assistance for travel expenses is needed to secure your attendance at the Forum:

_____
_____
_____
_____

I hereby certify that I need my reasonable travel costs paid in order to attend the National Stakeholder Forum. I understand that I will receive travel funds only if I follow the guidelines and procedures provided.

_____
Signature

Please submit forms to:

Environmental Law Institute (Attn: Eric Feldman)
1616 P Street, N.W., Suite 200
Washington, DC 20036-1434
Fax: (202) 939-3868 Phone: (202) 939-3823
E-mail: feldman@eli.org

Guidelines and Procedures for Travel Support
Department of Energy Central Internet Database National Stakeholder Forum
June 3-4, 1999 - Columbia Inn Hotel and Conference Center
(a.k.a. Sheraton Columbia Hotel)
Columbia, Maryland

The following procedures and guidelines apply to National Stakeholder Forum participants who have applied and been approved to receive travel support. To obtain an application, please call toll free 1-800-7 EM DATA or visit the Settlement web site on the Internet: http://www.em.doe.gov/settlement. Applications are due May 14, 1999.

Covered Expenses

For those applicants approved to receive support for travel to the National Stakeholder Forum, the Department, through the Environmental Law Institute (ELI), will provide travel support for the following expenses:

- *Reserved through Embassy Travel (Tel: 1-800-775-6911) and billed directly to ELI:* (a) **Air fare to BWI Airport** (14 day advance, if possible), (b) **train fare,** (c) **rental car** (if the rental car is the primary means of transportation)
  Reimbursable if receipts are submitted: (a) **bus fare** and (b) **mileage** at 25 cents per mile for qualifying attendees driving their own cars to the meeting location, both reimbursed if receipts are submitted.

- **Hotel** expenses up to the maximum federal per diem rate of $89 per night plus tax for the nights of June 2 and 3, 1999.

- **Meals** not to exceed the federal per diem rate of $42 per day. This rate includes expenses for breakfast, lunch and dinner, but *does not include* alcoholic beverages, entertainment expenses, and any expenses incurred for other persons. Please note that the meals rate will be prorated to 3/4 of the rate for days of departure and return travel.

- **Ground transportation** (round trip between the airport and hotel on the dates of arrival and departure) provided by "The Airport Shuttle" between BWI Airport and the Columbia Inn Hotel and Conference Center at the cost of $16 one way for the first passenger ($4 for each additional passenger).

Overall, given the limited funds available for travel support and in order to provide travel support to the maximum number of qualifying attendees possible, we would greatly appreciate cost sharing by participants for hotel, ground transportation and/or meal expenses, or contributions for your expenses, if your organization is able to support these expenses.

Restrictions

Travel funds and reimbursement of expenses are provided for the express purpose of attending the National Stakeholder Forum. Recipients' meetings must be limited to those involving officials of Executive Branch agencies consistent with DOE's policy on "Reimbursement of EM Site-Specific Advisory Board Member Travel to Washington, D.C." Copies of the policy are available on the Settlement web site.

Procedures

- **Applications for travel support must be received by ELI by 5:00 p.m. on May 14, 1999.**

- Applicants will be notified as early as possible regarding whether their applications have been approved.

- Approved applicants are asked to make their travel arrangements as soon as possible. In the interest of allowing the maximum number of qualifying attendees to receive travel, we strongly urge attendees to make their reservations at least *14 days in advance* of the travel date.

- **Air Travel to BWI Airport**: Embassy Travel (1-800-775-6911) will handle all flight reservations for attendees receiving travel support. Upon notification of approval for travel support during the week of May 17, 1999, all supported attendees should contact Embassy to make their reservations. Once flight reservations have been approved by ELI, tickets for air travel will be mailed to ticket holders or made available for pick-up at the airline check-in counter. *All costs for air travel will be billed directly to ELI.*

- **Train**: Please contact Embassy Travel (1-800-775-6911) to make reservations. *ELI will be billed directly for the costs of travel by train.*

- **Automobile**: Attendees approved for travel support may contact Embassy Travel (1-800-775-6911) to make car rental reservations. *ELI will be billed directly for the cost of car rentals.* Qualifying attendees who drive their own cars to the Forum may be reimbursed for mileage at the rate of 25 cents per mile.

- **Bus:** Approved attendees may be reimbursed for the cost of bus tickets

- **Hotel**: Attendees approved for travel support should call the hotel – Columbia Inn Hotel and Conference Center (a.k.a. Sheraton Columbia Hotel) – directly at (800) 325-3535 to reserve a room. *When making your reservation, please indicate that ELI should be billed directly.* Please see the Forum registration materials for additional hotel information. All attendees receiving travel support will be responsible for handling any additional charges, such as expenses for telephone calls, refreshments and entertainment, that may be added to their hotel bill.

- **Ground Transportation**: Approved attendees will be reimbursed for the cost of round trip shuttle service between BWI Airport and Columbia Inn Hotel and Conference Center (a.k.a. Sheraton Columbia Hotel). Please contact "The Airport Shuttle" at 1-800-776-0323 to make your ground transportation arrangements. The first passenger cost for one way service is $16 ($4 for each additional passenger). Arrangements for transportation between the hotel and train or bus stations will be determined on a case-by-case basis, but must be approved in advance by ELI.

- **Meals**: Attendees will be reimbursed up to the maximum federal per diem rate of $42 for the cost of meals as described in the above guidelines.

Saturday Night Stay Option

To conserve the budget as much as possible, ELI will support hotel and meal expenses up to the rates mentioned above for extended stays *only* in the event that 1) any resulting cost savings on airfare (with return travel on Sunday, June 6) exceeds the cost of two additional days of hotel and meal expenses *and* 2) this option is specifically approved in advance by ELI.

Reimbursement

To receive reimbursement for ground transportation, meals, and mileage, you must fill out the Reimbursement Form and attach all *original* receipts. All attendees must submit receipts in order to be reimbursed. Please send the completed form to Eric Feldman, Environmental Law Institute, 1616 P Street, N.W., Suite 200, Washington , DC 20036 by Friday, June 18, 1999.

consistent with Federal travel policies. The SSAB may choose to retain the services of the selected individual(s) for consultation on other EMEF projects at the PGDP site.

Proposal should be mailed to: PGDP - SSAB

200 McCRACKEN BLVD

PADUCAH KY 42001

May 13, 1999

Thank you for participating in the tour of the Paducah Gaseous Diffusion Plant May 4, 1999. We would appreciate your feedback.

1. What improvements/changes would you suggest for such tours?

2. What did you find most helpful about the tour?

3. What did you find least helpful?

Please return this form to Debbie Wattier, Bechtel Jocobs Company, 761 Veterans Ave., Kevil, Kentucky.

You're invited to the meeting of the U.S. Department of Energy's

Site Specific Advisory Board

for the

Paducah Gaseous Diffusion Plant

Next Meeting: Thursday, May 13
Time: 5:30 p.m.
Location: Paducah Information Age Park Resource Center

Agenda Highlights:

- Environmental cleanup
- National metal recycling program
- Opportunity for comments
- SSAB subcommittee reports

For more information, call Shirley Speer at 462-2550.

Agency for Toxic Substances and Disease Registry (ATSDR) "Draft Agenda for Public Health Activities for Fiscal Years 1999 and 2000 at U. S. Department of Energy Sites April 1999"

Wattier, Debbie S. (DSI)

From: Perry, Walter N [PerryWN@oro.doe.gov]
Sent: Tuesday, April 27, 1999 2:49 PM
To: Sheppard, John.; Wattier, Debbie S.; Bors, Lee; Childers, Sandra; Chuck Jenkins (E-mail)
Cc: Wyatt, Steven L; Heiskell, Marianne M; Plant, Sandra W; Rothrock, John D
Subject: DRAFT AGENDA FOR PUBLIC HEALTH ACTIVITIES/STAKEHOLDER COMMENT PERIOD

Importance: High

The document "Draft Agenda for Public Health Activities for Fiscal Years 1999 and 2000 at U.S. Department of Energy Sites - April 1999" has been released by ATSDR for public comment from May 3, 1999, until June 30, 1999. Summary information for Portsmouth, Paducah and Oak Ridge is mentioned within. You may access this document via the web site:
http://tis.eh.doe.gov/epi/docs/book-toc.html
<http://tis.eh.doe.gov/epi/docs/book-toc.html> .

Please make sure your stakeholders are aware this document is out for public comment via announcements at public meetings, newsletters, etc. As this is an ES&H initiative, may want to forward to the appropriate person on your staff who handles this area.

Thanks,
Walter Perry
DOE Public Affairs
(423) 576-0885

Draft Agenda for Public Health Activities for Fiscal Years 1999 and 2000 at U.S. Department of Energy Sites

April 1999

U.S. Department of Energy
and
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
National Center for Environmental Health
National Institute for Occupational Safety and Health

Table of Contents

Introduction

Brookhaven National Laboratory

Energy Technology Engineering Center

Fernald Environmental Management Project

Hanford

Idaho National Engineering and Environmental Laboratory

Laboratory for Energy-Related Health Research

Lawrence Livermore National Laboratory

Los Alamos National Laboratory

Middlesex Sampling Plant

Monticello Mill Tailings Site

Mound Plant

Nevada Test Site

Nuclear Naval Shipyard Workers

Oak Ridge Reservation

Paducah Gaseous Diffusion Plant

Pantex Plant

Portsmouth Gaseous Diffusion Plant

Rocky Flats Plant

Savannah River Site

Sites to be Selected Following Further Review

Next Section

Public Health Activities Site Plan
Draft for Public Comment
Paducah Gaseous Diffusion Plant
Paducah, Kentucky

Background

The Paducah Gaseous Diffusion Plant (PGDP) is a uranium enrichment facility covering approximately 1,350 acres in western McCracken County. It is approximately 10 miles west of Paducah, Kentucky, and about 3 miles south of the Ohio River. The Paducah plant began operating in 1952. Previously the site and surrounding areas were used as a World War II-era ordnance facility known as the Kentucky Ordnance Works. Currently, the plant is leased and operated by the United States Enrichment Corporation (USEC) to produce low-enriched commercial power reactor fuel. The U.S. Department of Energy (DOE) owns the site and retains responsibility for environmental remediation activities and waste generated prior to July 1, 1993, when USEC assumed responsibility.

The entire PGDP reservation covers a total of 3,424 acres, with approximately 750 acres in a fenced security area and an uninhabited buffer zone surrounding the fenced area. Beyond the DOE-owned buffer zone is an extensive wildlife management area of 2,100 acres deeded or leased to the Commonwealth of Kentucky.

PGDP performs the first step in the uranium enrichment process, enriching uranium-235 (U-235) in a physical separation process. The separation process is based on the fact that U-235 diffuses through a barrier at a faster rate than the heavier uranium-238. Subsequent to the separation processing at the Paducah plant, the uranium is further enriched at another

public availability sessions.

Off-Site Contamination

- ATSDR is conducting a **public health assessment** at PGDP. The main public health issues around the plant are potential off-site exposures to air releases, contaminated biota, surface water releases, and contaminated groundwater. The contamination includes both chemicals and radioactive materials. ATSDR is also looking at potential hazards presented by the outdoor storage on the site of thousands of cylinders, the majority of which contain depleted uranium hexafluoride.

Community Health Studies and Activities:

- There are no community health studies.

Occupational Health Studies

- The **DOE Former Worker Medical Surveillance Program at DOE Gaseous Diffusion Plants** involves former production workers from the Oak Ridge K-25, Paducah, and Portsmouth gaseous diffusion plants. The project is led by Dr. Steven Markowitz of Queens College, City University of New York, and Mr. Robert Wages of the Oil, Chemical, and Atomic Workers International Union, in cooperation with the University of Massachusetts at Lowell. The Phase I needs assessment was completed in 1997. The Phase II medical screening began in late 1998 and is scheduled to run through 2001. Initially, approximately 200-300 former Paducah production workers were identified as potentially at high risk for lung disease. A second priority group includes approximately 2,000 workers at Paducah. Exposures of concern that were identified in Phase I and that will be focused on during the Phase II medical screening include asbestos, beryllium, bladder carcinogens, chlorinated solvents, fluorine compounds, nickel, noise, silica, uranium, welding fumes, and heavy metals (for example, cadmium, lead, and mercury).

What are the gaps in our knowledge and what important issues need to be addressed?

- For many of the off-site samples, there is no information to identify whether they were collected on or near residential properties.

- There is inadequate air monitoring data for hexavalent chromium, sulfur dioxide, and nitrogen oxides: chemicals that are released or have potential for release at levels of concern.

- Health outcome data for the immediate area around PGDP is not available. The data available cover an area that is too large to demonstrate impact from the site.

- There is a need to determine whether the current occupational radiation exposure limits are adequate for radiation workers.

- Internal dosimetry of radiation workers is not well characterized or understood,

SSAB Aboard Members, please feel welcome to attend this Environmental Fair.

If you need more information, call Debbie Wattier at 441-5023.

Department of Energy
Oak Ridge Operations
Paducah Site Office
P.O. Box 1410
Paducah, KY 42001

April 21, 1999

Distribution

Environmental Fair

We'd like you to join more than 800 sixth grade students from McCracken and Massac counties at our 8th Annual Environmental Fair. The fair will be May 11 and 12 at the West Kentucky Wildlife Management Area.

The U.S. Department of Energy; Bechtel Jacobs Company LLC, DOE's management and integrating contractor; the Kentucky Department of Fish and Wildlife Resources; and Heath Middle School coordinate the event with the help of other organizations and individuals.

During the fair, students attend 10 presentations and learn about topics from beavers and birds of prey to water quality, wetlands, power generation, forestry and recycling.

The fair runs from 9-11:15 a.m. and 12:30-2 p.m. on Tuesday and Wednesday. In the event of rain, the fair will move to Thursday and Friday, May 13 and 14.

Those providing help for this event include Westvaco Corporation, TVA's Shawnee Steam Plant, Heath Middle School, Heath High School, the West Kentucky Wildlife Management Area, Murray State University's Environmental Education Center, Bechtel Jacobs Company LLC and Paducah wildlife rehabilitator Gene Boaz.

Students from Heath, Lone Oak, Reidland, and Paducah Tilghman high schools assist in making the presentations.

I have enclosed a map and an agenda. If you need more information, please call Jim Ethridge at (502)441-5104 or Debbie Wattier at (502)441-5023.

I hope to see you at the Environmental Fair.

Sincerely,

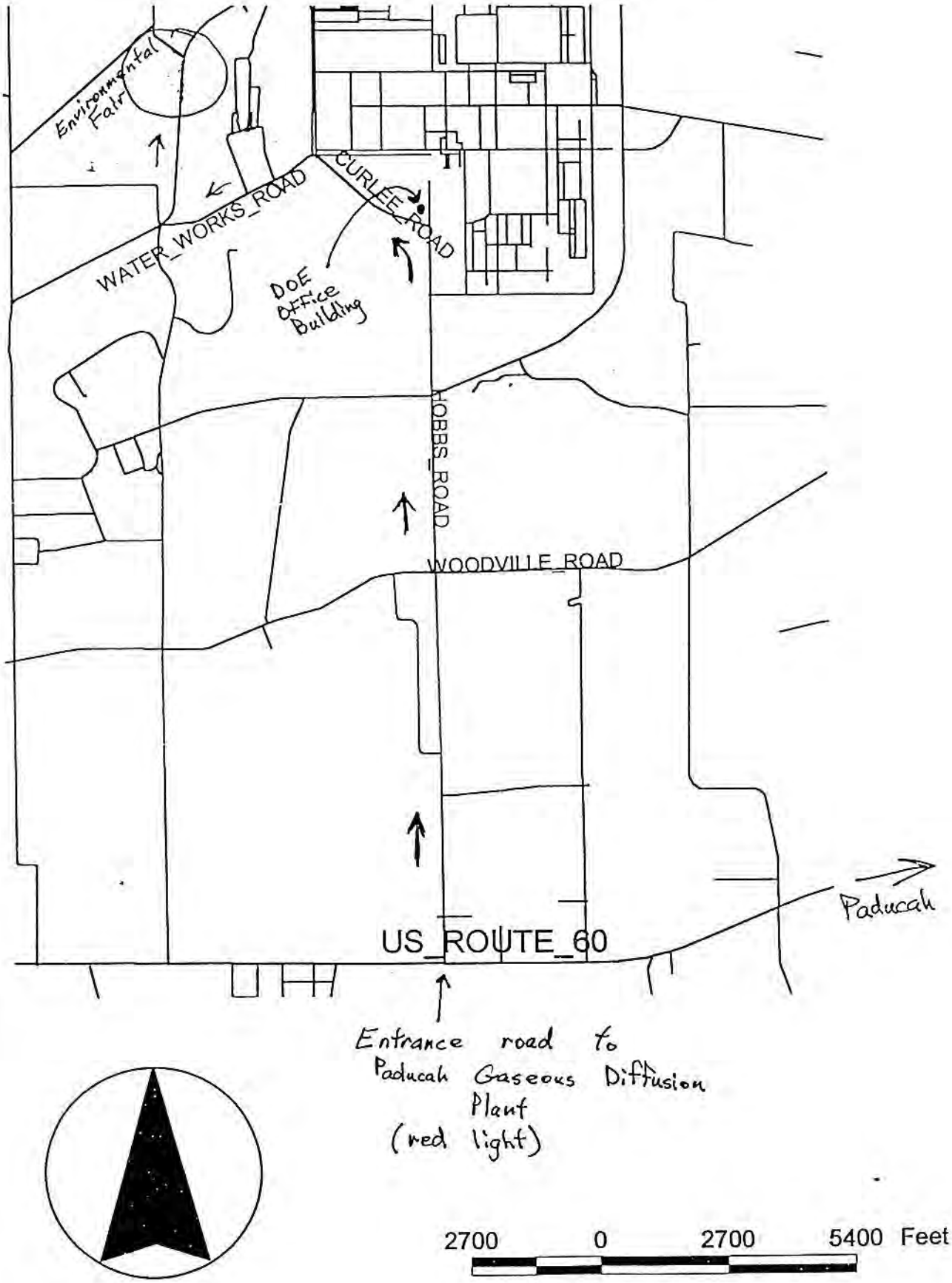
Jimmie C. Hodges

Jimmie C. Hodges, Site Manager
Paducah Site Office

JCH:DSW:as

Agenda for
Environmental Fair
May 11 and 12, 1999
West Kentucky Wildlife Management Area

9:00 a.m.	Students Arrive at WKWMA
9:00 a.m. - 11:15 a.m.	Morning Presentations
11:15 a.m.- 12:00 Noon	Lunch
12:00 Noon - 2:00 p.m.	Afternoon Presentations
~2:00 p.m.	Students Leave - Return to School


Environmental Fair
WATER_WORKS_ROAD
CURLEE_ROAD
DOE Office Building
HOBBS_ROAD
WOODVILLE_ROAD
US_ROUTE_60
Paducah
Entrance road to Paducah Gaseous Diffusion Plant (red light)
2700 0 2700 5400 Feet

Handouts for May 13, 1999 SSAB Meeting

- Evaluation form for May 4, 1999 Site Tour.
- Ad for *The Paducah Sun*, Sunday, May 9, 1999 (SSAB meeting notice)
- Ad for *The Paducah Sun*, Sunday, May 9, 1999 (Public review notice for Paths to Closure document)
- Article "A season of Change" from *The Paducah Sun*, May 9, 1999.
- Article "Kids doing what comes naturally; Environmental fair grows, teaches" from *The Paducah Sun*, May 12, 1999.
- Fact Sheet: Engineering Evaluation/Cost Analysis for Scrap Metal Removal at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/OR/07-1797&D1) May 13, 1999
- Agenda for SSAB Transportation Seminar
- Draft Environmental Impact Statements (note website address in upper right corner for further research.)
- Budget Report
- EPA Region IV Policy Assuring Land Use Controls at Federal Facilities.
- *Accelerating Cleanup: Paths to Closure*
- Draft 1999 Accelerating Cleanup: Paths to Closure, Appendix F: Public, Environment and Worker Hazards and Risks.

REQUEST FOR PROPOSAL

The Paducah Gaseous Diffusion Plant (PGDP), Site Specific Advisory Board (SSAB) wish to retain the services of hydrogeologist/geological engineers to review data and advise the Board pertaining to groundwater contamination at the PGDP site.

The Paducah SSAB was formed in 1996 and chartered under the Federal Advisory Committee Act. It is a stakeholders board that provides advice and recommendations to the Department of Energy (DOE), U.S. Environmental Protection Agency (EPA) and the Commonwealth of Kentucky on Environmental Restoration and Waste Management (EMEF) programs at the Paducah site. The SSAB receives funding for its activities through DOE.

The Paducah Gaseous Diffusion Plant is located approximately 10 miles west of Paducah Kentucky in McCracken County (fig. 1). The site is approximately 3.5 miles south of the Ohio River. PGDP has been producing enriched uranium for military and commercial use since 1952. Under terms of the National Energy Policy Act, DOE leases the plant production facilities to the United States Enrichment Corporation (USEC). USEC is a privately held corporation. The mission of the SSAB does not apply to ongoing production activities of USEC.

Groundwater contamination resulting from industrial activities at PGDP was discovered in 1988. Offsite contaminants were determined to be trichlorethylene (TCE), an industrial degreasing solvent and technetium-99, a fission by-product (fig. 2 & 3).

The DOE, through its subcontractor, has performed an extensive review of the groundwater contamination and as a result has installed a pump and treat facility for both the Northwest and Northeast plumes. The investigation has determined that a major source of TCE in the groundwater is from a location within the industrial area identified as Waste Area Group (WAG) 6. The DOE has also formed an Innovative Treatment Remediation Demonstration (ITRD) group to investigate and recommend innovative and/or new technologies to remediate TCE groundwater pollution from WAG6.

The SSAB wishes to retain the service of one or more hydrogeologists to review all data pertaining to the contamination plumes and the groundwater policies in general, including approach and methodologies utilized in the investigation, effectiveness of the pump and treat systems, and recommendation on additional investigation and/or remediation technologies. The person(s) selected is also requested to review and recommend on all activities associated with the remediation of WAG 6 including the recommendation provided to DOE by the ITRD project group.

Proposals received by the SSAB will be separated into two groups; those which have been involved in any manner with the investigation/remediation at PGDP and those which have not in any manner been associated with activities at PGDP. The SSAB will initially select an individual from those who have not been associated with PGDP. The SSAB desires this approach in an effort to obtain independent and fresh recommendations pertaining to groundwater contamination and the remediation. The SSAB may also retain the services of an individual who has been involved in activities at PGDP. This individual will provide the SSAB and the non associated individual selected with background information, assist in document reviews and perform presentations which summarize past and present activities pertaining to groundwater contamination and remediation.

Proposal should include education and job experiences, concentrating on the investigation/remediation of groundwater contamination. List all past projects or jobs associated with any DOE facility. Proposal should be submitted to the SSAB by July 1, 1999. The SSAB anticipates selection by August 1, 1999. Final selection will be made following phone and/or personal interviews. Please provide an hourly rate for the initial site visit. Following the initial site visit the selected individual(s) will be requested to complete a detailed work plan which better defines the anticipated schedule and costs. At this time it is estimated that in addition to document review at the selecteds office, at least four (4) site visits and one or more public presentations will be required. Costs for travel, lodging and meals will be reimbursed at cost,

SIDE A

Paducah Gaseous Diffusion Plant (PGDP)
Site Specific Advisory Board (SSAB)
1999 Workplan

ISSUE	EXPECTED ACTIONS	STATUS/APPROACH	Jan 99	Feb 99	Mar 99	Apr 99	May 99	Jun 99	Jul 99	Aug 99	Sep 99	Oct 99	Nov 99	Dec 99
Waste Management		Transuranic Waste												
Waste Minimization/ Pollution Prevention	Review documents	Monitor and provide suggestions as appropriate												
Transportation of Wastes/ Hazardous Materials		Discuss issues for Paducah			✔									
Decontamination & Decommissioning	Review documents	Monitor and provide suggestions as appropriate						✔						
Economic Impact on Community	Monitor	Monitor and provide suggestions as appropriate												
Protection/Restoration of Natural Resources & Ecological Values	Review documents	Monitor and provide suggestions as appropriate												
Protection of Workers, Public Health, and Safety	Monitor projects	Monitor and provide suggestions as appropriate												
Technology Development and Transfer	Review documents	Monitor and provide suggestions as appropriate												
Strategies for Effective and Meaningful Public Input	Work 2 DOE/CRP	Monitor and provide suggestions as appropriate												
Cost Effectiveness	Review documents	Monitor and provide suggestions as appropriate												
WAG 6	Review documents	Innovative Technology Remediation Demonstration (ITRD) Update	✔		✔	✔								
WAG 22, SWMUs 2 and 3	Review documents	Review DOE's reply to regulator comments	✔ SWMU 2		✔									
WAG 22, SWMUs 7 and 30	Review documents	Monitor and provide suggestions as appropriate	✔											
WAGs 9 & 11 Preliminary Assessment/Site Inspection (PA/SI) Process Site Evaluation Report			✔		✔	✔								
WAG 17		Record of Decision (ROD) signed 9/29/97												
Lasagna														
Drum Mountain (WAG 24)	Review documents	Monitor and provide suggestions as appropriate												
Site Treatment Plan Annual Report														

March 24, 1999

SIDE B

Paducah Gaseous Diffusion Plant (PGDP)
Site Specific Advisory Board (SSAB)
1999 Workplan

ISSUE	EXPECTED ACTIONS	STATUS/APPROACH	Jan 99	Feb 99	Mar 99	Apr 99	May 99	Jun 99	Jul 99	Aug 99	Sep 99	Oct 99	Nov 99	Dec 99
Federal Facilities Agreement (FFA)	Review progress of update	Discuss milestones and schedule			✔									
Integrated Waste Management Plan		IWMP yearly update completed 12/15/97												
Vortec	Receive update		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Board Evaluation	Receive recommendations	Conclusions presented by the SSAB Evaluation Committee		✔	✔	✔								
Bechtel Jacobs M&I														
National Environmental Protection Act (NEPA)														
Environmental Report														
Accelerating Cleanup Plan - Paths to Closure	Review documents	Monitor and provide suggestions as appropriate												
Depleted UF_6 PEIS	Receive update	Review budget	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Northeast and Northwest Plumes Pump and Treat Facilities		Discuss hiring technical support	✔	✔	✔									
Training Options for SSAB	Review catalog	Discuss hiring technical support												
DOE Rulemaking Process														
Membership and Public Outreach		Review membership applications	✔								✔			
Paducah-Area Community Reuse Organization (PACRO)		Discuss how PACRO relates to the SSAB	✔											
Risk Assessment		Receive training and relate to WAGs 6 and 22	✔											
Cumulative Effects on the Site		Open discussion, review NRDC settlement information		✔	✔	✔								
Groundwater Operable Unit	Review Feasibility Study	Monitor and provide suggestions as appropriate		✔										
Surface Water Operable Unit	Review documents					✔								
Risk Profile	Review documents	Monitor and provide suggestions as appropriate			✔									

March 24, 1999

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

May 11, 1999

Oak Ridge Operations Office Environmental Management Stakeholders

Ladies and Gentlemen:

DRAFT 1999 ACCELERATING CLEANUP: PATHS TO CLOSURE, APPENDIX F: PUBLIC, ENVIRONMENT AND WORKER HAZARDS AND RISKS

Enclosed is a draft of the subject appendix to the 1999 Paths to Closure. Comments on this document should be provided to me by June 4, 1999, at the U. S. Department of Energy, Oak Ridge Operations Office, Post Office Box 2001, Oak Ridge, Tennessee 37831 or in care of the Information Resource Center, 105 Broadway Avenue, Oak Ridge, Tennessee 37830.

Thank you for your efforts.

Sincerely,

Barbara Brower

Barbara Brower, Team Leader
Program Integration Team
Environmental Management

Enclosure

APPENDIX F

PUBLIC, ENVIRONMENT, AND WORKER HAZARDS AND RISKS

OAK RIDGE OPERATIONS OFFICE

RISK PROFILE

May 1999

Prepared by the
Center for Risk Excellence
U.S. Department of Energy

Introduction

This document contains a brief description of the risks to public health and safety for the Environmental Management (EM) Program at the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The DOE Center for Risk Excellence (CRE) and DOE-ORO have created this document to increase communication regarding the risks at DOE-ORO sites by creating a common-sense approach to telling the EM risk story for DOE-ORO. This profile is one of a series of similar documents created for the other major DOE operations and field offices.

In February 1997, the Assistant Secretary for Environmental Management signed a Memorandum of Agreement with the Chicago Operations Office creating the Center for Risk Excellence (CRE). The CRE's goal is to help DOE make more credible risk-informed decisions. The role of the Center is to support the EM program and other DOE offices by providing field-based expertise and resource coordination.

The risk profile uses existing data from the sites to present the risk information in a user-friendly manner and to support communication of hazards to those not familiar with the sites. First, key risk-related challenges are listed. The current risk situation is then examined and future risk reduction activities are discussed. Finally, the document presents tabular information of planned risk reduction activities.

The technical approach taken in this profile is to focus first on the hazards that exist at the sites. The hazards are briefly described in terms of the characteristics that could impact the public. Second, potential pathways for exposure of the public to site hazards are discussed. Next, the profile looks at the control, storage, treatment, disposal, characterization, and other activities that DOE has taken, is taking, or will take to limit the risks posed by the hazards. This hazard-pathway relationship is discussed in the context of potential human "receptors" at the sites.

The risk profile is not a comprehensive look at all risks at the sites, as it does not include all programs. Rather, it focuses on activities and/or materials addressed by the EM program. In addition, there is a discussion of some materials managed by the Nuclear Energy Program, which has been included to provide a more comprehensive picture of ORO hazards. This focus is on human health and, to a lesser extent, on worker safety. Ecological risk and other project, cultural, and societal risks are not specifically included. In addition, not every hazard is described, so that the profile provides a summary of overall potential public health risks from the site; some hazards that pose little or no risk may not have been included.

Two general caveats should be kept in mind when viewing this and other risk information. First, risk levels are highly dependent on the assumptions used to estimate them. For example, assumptions about future land use may drastically affect the estimate of health risk from contaminated groundwater. Second, different risks may be of greater concern to different people. For example, local residents may be concerned about chronic or accidental releases of contaminants to environmental media, whereas neighboring businesses may be more concerned about an acute release that generates greater news media attention than small chronic releases. Regulatory agencies, as surrogates for future residents, are concerned about managing residual contamination and minimizing releases. Showing that the calculated risks are small does not always assuage concerns. For these and other reasons, accurate risk calculations do not always lead to clear, straight-forward cleanup decisions. Nevertheless, the consideration of these risks is a critical element in determining DOE-ORO cleanup actions.

Overview of Oak Ridge Operations Office Sites

The Oak Ridge Operations Office (ORO) of the U.S. Department of Energy (DOE) is located in Oak Ridge, Tennessee. The ORO is responsible for Environmental Management (EM) activities at six sites in four states:

Oak Ridge National Laboratory (ORNL or X-10) in Oak Ridge, Tennessee
Y-12 Nuclear Weapons Facility (Y-12 Plant) in Oak Ridge, Tennessee
East Tennessee Technology Park (ETTP) (formerly known as the K-25 plant or the Oak Ridge Gaseous Diffusion Plant) in Oak Ridge, Tennessee
Portsmouth Gaseous Diffusion Plant (PORTS) in Pike County, Ohio
Paducah Gaseous Diffusion Plant (PGDP) in McCracken County, Kentucky
Weldon Spring Site Remedial Action Program (WSSRAP) in St. Charles County, Missouri.

The major risk management and reduction activities at these sites are those related to (1) environmental restoration at release sites known to be contaminated with hazardous and/or radioactive materials from historical operations, (2) management of waste in inventory and generated from environmental restoration activities and continuing facility operations, and (3) decontamination and decommissioning of radioactively contaminated facilities. In addition, NE operations associated with the management of special nuclear materials and weapons components.

The remedial goals for environmental restoration projects in the ORO are to (1) protect industrial workers from direct exposure to contaminated media or facilities, (2) protect the groundwater users at the DOE property boundary, (3) protect recreational users outside the secure areas, and (4) protect sensitive ecosystems outside the secure, industrialized areas. To accomplish these goals the environmental restoration program includes a combination of source-control actions followed by groundwater, surface water and soil remedial actions.

DOE is currently in the process of reducing its inventory of hazardous and radioactive materials. By reducing the amounts of stored waste, the risks at the sites are reduced. DOE intends to only maintain materials that are directly involved in key operations, such as the uranium enrichment cascades at Portsmouth and Paducah. In addition, DOE has mapped the disposition of low level waste, mixed low level waste, and environmental restoration wastes for these sites: the treatment and disposition of legacy wastes will reduce the volume of these wastes on-site and lessen the likelihood of environmental contamination from these materials. The disposition of special nuclear materials and weapons components, and the stabilization of contaminated facilities will leave the ORO facilities in a low-risk condition. Long-term monitoring and institutional control will be maintained to ensure continuing protection of human health and the environment.

"EM is committed to achieving compliance with laws, regulations, and agreements that protect human health and the environment and is focusing its resources on cleanup of inactive waste sites and facilities; conducting safe and effective waste management operations; minimizing risk to the public, the worker, and the environment; emphasizing waste minimization and pollution prevention; and coordinating applied technology development initiatives."

James Hall
Manager, DOE Oak Ridge Operations Office

Three of the ORO sites (ORNL, Y-12, and ETTP) are located on the Oak Ridge Reservation (ORR). These will be considered in a single risk profile. The individual risk profiles for each of the sites under the direction of the ORO are provided on the following pages.

Major Risk-Related Challenges at the Oak Ridge Operations Office

* **Oak Ridge Reservation**
  - 140 acres of buried waste in water-rich environment
    - 40 million pounds of uranium
    - 6 million Curies of radioactivity
  - VOC plume impacting groundwater off-site
  - Current releases of radioactivity to the environment
    - 100 miles of contaminated streams and rivers
  - 6 shutdown reactors
  - 156 surplus facilities in deteriorating condition

* **Paducah Gaseous Diffusion Plant**
  - TCE plume impacting 10 billion gallons of groundwater off-site

* **Portsmouth Gaseous Diffusion Plant**
  - TCE contaminated groundwater within the site boundary

* **Weldon Spring Site**
  - Contaminated groundwater plume 0.5 miles from well field serving 60,000 residents

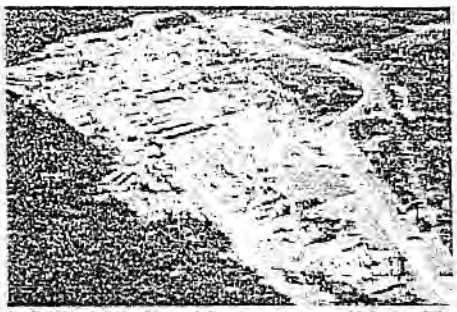
OAK RIDGE RESERVATION (ORR)

Site Description

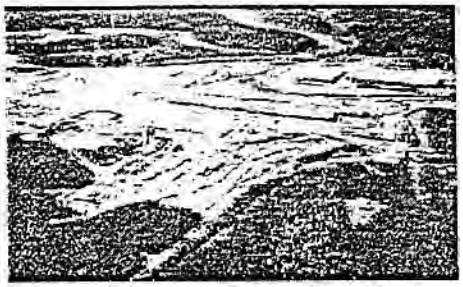
The Oak Ridge Reservation (ORR) is a 14,000-ha (34,700-acre) federally owned facility managed by the Department of Energy (DOE). The ORR has three major plant sites: the Oak Ridge National Laboratory (ORNL, also known as X-10), the Y-12 Nuclear Weapons Facility (Y-12 Plant), and the East Tennessee Technology Park (ETTP, formerly known as the K-25 site and the Oak Ridge Gaseous Diffusion Plant). The ORR also has approximately 8,800 ha (22,000 acres) of relatively undisturbed natural land known as the Oak Ridge National Environmental Research Park (Research Park). The three plants were established in the early 1940s as part of the Manhattan Project. Except for a small western portion, the ORR is within the limits of the city of Oak Ridge, located in Anderson and Roane counties in east Tennessee. Oak Ridge lies in a valley between the Cumberland and the Blue Ridge mountain ranges and is bordered on two sides by the Clinch River. The population of the ten-county region is approximately 800,000, with 5% of its labor force employed on the ORR. Other towns near the reservation include Oliver Springs, Clinton, Lenoir City, Farragut, Kingston, and Harriman. Knoxville, the major metropolitan area nearest Oak Ridge, is located about 45 km (25 miles) to the east. ORR was placed on the National Priorities List (NPL) in 1989, and site remediation is being conducted under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

The ORR is located in a water-rich environment with diverse hydrologic and hydrogeologic characteristics. The Clinch River borders the site to the south and west. Each of the major plant areas on the ORR drains into one or more tributaries to the Clinch River. This surface water system serves as a primary water source for site employees

Y-12 Nuclear Weapons Facility

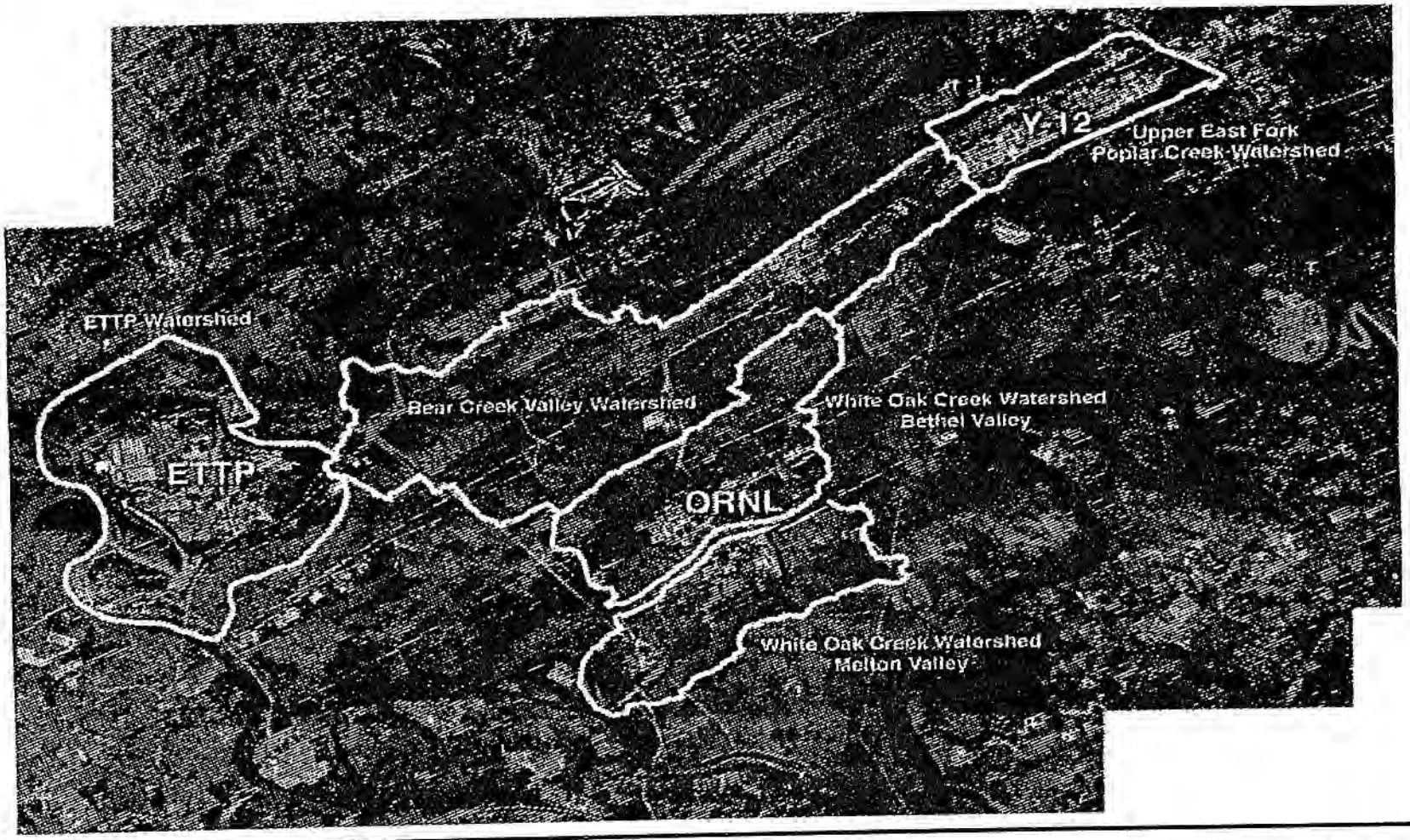


Oak Ridge National Laboratory (Main Plant)



East Tennessee Technology Park

Oak Ridge Reservation Watershed Map



and approximately 94% of the population in surrounding Anderson, Knox, Loudon, Morgan, and Roane counties.

The Clinch River is classified by the State of Tennessee as a domestic water supply source. In rural areas near the ORR that are not served by a public water supply, groundwater wells are used for domestic water supply and other uses. Water yields in shallow unconfined aquifers are typically low, while deep carbonate aquifers typically provide greater yields.

Major surface water features at the Y-12 Plant include Bear Creek and Upper East Fork Poplar Creek (UEFPC). For purposes of environmental restoration, Bear Creek and UEFPC watersheds are addressed separately. Surface water drainage at ORNL discharges into White Oak Creek and ultimately into the Clinch River. For purposes of environmental restoration, ORNL has been subdivided into the Bethel Valley and Melton Valley watersheds. ETTP surface water runoff discharges into the ETTP holding ponds and Poplar Creek and finally to the Clinch River. For purposes of environmental restoration, ETTP is considered as a single watershed.

Current operations at ORNL involve research and development for the DOE in the areas of science and technology, including energy resources, environmental quality, and national security. The Y-12 Plant operates as a technology-based manufacturing center, which focuses on the production of complex components and assemblies, and the dismantlement, refurbishment, disposition, and evaluation of decommissioned nuclear weapons. Uranium enrichment operations at the ETTP site were discontinued in 1985, and the current mission focuses on environmental restoration and waste management, to facilitate productive redevelopment of the site by commercial industry (reindustrialization). The ETTP Toxic Substances Control Act (TSCA) incinerator is the only currently operational facility in the United States for incineration of radioactive wastes from DOE facilities that contain constituents regulated under the Resource Conservation and Recovery Act (RCRA) and TSCA.

Current Understanding of Hazards and Risks

Materials at the ORR that pose a potential risk may be categorized as those associated with environmental restoration, waste management, and nuclear materials inventory. Risks associated with these materials are summarized in Table 1 and discussed below. Many sites at the ORR have been contaminated through accidental releases, past material management practices, and waste disposal practices that were formerly considered acceptable. Impacted environmental media include soils, surface water, and groundwater. Surface water and groundwater-transport constitute the primary mechanisms for contaminant transport, which could potentially result in off-site exposures. In addition, previously generated radioactive and hazardous wastes (legacy wastes) are managed on-site in controlled storage pending final disposition, and additional wastes continue to be generated from ongoing facility operations and environmental restoration activities. Finally, radioactive and chemically hazardous materials maintained in the nuclear materials inventory at ORR may also pose potential hazards.

Environmental Restoration. Because of the complex surface water and groundwater flow regimes that exist on the ORR, the environmental restoration program is organized in Watershed Project Areas, whereby the ORR has been subdivided into five watershed areas. Within each watershed multiple sources, contaminated areas and media are linked together by groundwater and surface water flow. The division of the site by watersheds was designed to focus remediation and risk reduction activities on: (1) source control; (2) groundwater and surface water transport as the primary pathways for movement of contaminants on the ORR; (3) development of realistic future land use scenarios (in order to determine appropriate cleanup levels); and (4) effective utilization of existing environmental data to focus attention on activities with the greatest potential for reducing risk and to promote cost savings and more timely completion of the cleanup process. Separate remedial investigations and feasibility studies (RI/FSs) are underway for each of these watershed areas. A brief summary of the current hazards and potential risks associated with each of the watersheds is presented below.

The **Bethel Valley Watershed** encompasses the northern portion of the White Oak Creek Watershed, including the main plant area at ORNL. More than 220 contaminated areas have been identified for potential remediation, including groundwater plumes, buried waste tanks, transfer pipelines, inactive radiochemical processing facilities, inactive nuclear reactors, and various shops and warehouse facilities. Contaminants of concern include radionuclides, metals, and volatile organic compounds. Potential risks to on-site and off-site receptors are maintained at protective levels through appropriate engineering and institutional controls. The RI/FS for the Bethel Valley Watershed is scheduled for completion in 1999. Early response actions taken to date to reduce potential risks include removal of contaminated sediments from inactive surface impoundments, remove of radioactive residues from underground tanks, and upgrades to liquid waste piping

and collection systems, sanitary sewer systems, and process waste treatment systems.

The Melton Valley Watershed includes White Oak Lake and the reaches of White Oak Creek south of the main plant area at ORNL. Planned remediation areas include buried waste sites (e.g., solid waste storage areas 4, 5, and 6), impoundments, basins, inactive piping, seepage pits, trenches, and inactive nuclear reactors. Contaminants of concern include radionuclides, metals, volatile organic compounds, and polychlorinated biphenyls (PCBs). Releases of contamination to off-site surface water have occurred due to past process water discharges at ORNL and leachate migration from waste disposal areas. Potential risks to on-site and off-site receptors are maintained at protective levels through appropriate engineering and institutional controls. The RI/FS for the Melton Valley Watershed was approved in August, 1998. Early response actions taken to date to reduce risks include the transfer of more than 60,000 gallons of TRU wastes from aging underground storage tanks to safe storage in the Melton Valley Storage Tanks, stabilization of potentially explosive conditions at the Molten Salt Reactor Experiment facility, capping and water management actions at waste burial grounds, and sediment retention measures in White Oak Creek.

The Upper East Fork Poplar Creek (UEFPC) Watershed contains the operational industrial facilities at the Y-12 Plant. Potential remediation sites include groundwater plumes, numerous industrial facilities, as well as waste processing, storage, and disposal areas. Primary contaminants of concern include uranium, carbon tetrachloride, nitrates, PCBs, and mercury. Off-site releases of contamination to surface water and groundwater are occurring, but potential off-site risks associated with these releases are controlled through institutional controls to prevent use of contaminated water. The RI/FS for the UEFPC Watershed is scheduled for approval in 2000. Early response actions taken to date to reduce risks include removal actions to remediate contaminated sumps and sediment basins and an inactive firing range. RCRA closure and capping of various waste management units, effluent reduction measures, and imposition of restrictions on groundwater use. In addition, approximately 45,000 yd3 of mercury-contaminated soils and sediments have been excavated from the floodplain of the Lower East Fork Poplar Creek, immediately downstream from the UEFPC watershed.

The Bear Creek Valley Watershed consists of largely undeveloped land west of the main Y-12 Plant including numerous areas historically used for storage and disposal of radioactive and hazardous wastes. Potential remediation sites include waste storage areas, burial grounds, burnyards, surface disposal areas, and groundwater plumes. Primary contaminants of concern include uranium, nitrates, metals, PCBs, and organic compounds. Surface water appears to be the most significant pathway for contaminant migration, carrying contaminants from shallow groundwater to tributaries flowing into Bear Creek. However, these contaminants have not been identified to exceed water quality criteria beyond the site boundary, and no adverse exposure conditions or off-site risks have been identified. Potential risks to on-site personnel are controlled through engineering and institutional controls. The RI/FS for the Bear Creek Valley Watershed was completed in 1998, and a Record of Decision (ROD) is scheduled for 1999. A second ROD to address final remediation decisions for burial grounds and groundwater in the watershed is planned. Early response actions taken to date to reduce risks include closure and capping of various waste management units and development of groundwater interception systems to control contaminant migration.

The East Tennessee Technology Park (ETTP) Watershed addresses the entire ETTP site. More than 100 structures or contaminated areas at ETTP have been identified as known or suspected sources of environmental contamination. Potential remediation sites include groundwater plumes, waste storage and disposal areas, retention ponds, process buildings, and various shops and warehouse facilities. Releases of contamination to surface water and groundwater appear to have occurred primarily from process drains that discharged to holding ponds; however, no adverse exposure conditions or off-site risks have been identified, and risks to on-site personnel are controlled through engineering and institutional controls.

Decontamination and decommissioning (D&D) activities at ETTP are scheduled to be complete by 2009. Stabilization activities for decommissioning include the deactivation of surplus facilities to bring them to a safe shutdown condition, limited demolition of internal structures, and disposition of sensitive and hazardous

materials. Removal of uranium deposits which pose potential criticality concerns from the gaseous diffusion process pipelines at ETTP constitute one of the most significant risk reduction activities; large portions of the process lines have been decontaminated to date, and these uranium removal actions are expected to be complete by 1999. The primary goal of these D&D actions is to minimize or eliminate the hazardous characteristics of these facilities and minimize long-term surveillance and maintenance requirements.

Primary contaminants of concern at ETTP include uranium, volatile organic compounds, and PCBs. The RI and FS for the ETTP site is scheduled for completion in calendar year 1999. Early response actions taken to date to reduce risks include removal actions for demolition of inactive buildings, remediation of retention basins, improvements to holding ponds, installation of groundwater interception systems, and closures of inactive facilities. Over 50 structures have been demolished at ETTP since 1994.

Waste Management. The ORR facilities also manage and dispose of wastes in storage (legacy waste) and continue to generate waste from ongoing facility operations and environmental cleanup activities. Major categories of materials at the ORR include low level waste (LLW), mixed low level waste (MLLW), spent nuclear fuel (SNF), transuranic waste (TRU), and special nuclear materials (NM). The ETTP site also operates the DOE TSCA incinerator for MLLW, which receives wastes from ORO facilities and other DOE facilities for incineration. DOE is currently in the process of reducing its inventory of hazardous and radioactive materials. The treatment and disposal of legacy LLW, MLLW, SNF, TRU, NM and environmental restoration wastes will reduce the volume of these potential hazards on-site and lessen the likelihood of further environmental contamination. Currently these hazards are managed through containment, controlled storage, and monitoring. Access controls and comprehensive surveillance and monitoring programs help to prevent environmental releases or accidental exposures.

Waste management facilities operate on-site to treat, store, and dispose of waste generated by ongoing operations and environmental cleanup activities, or to prepare waste for off-site treatment or disposal. Waste management activities are conducted in accordance with the requirements of applicable Federal and state regulations and DOE directives. Mixed wastes will be managed in accordance with the Site Treatment Plan submitted under the Federal Facility Compliance Act and the Unilateral Order for compliance issued by the State of Tennessee; mixed waste treatment technologies currently identified include incineration, stabilization, chemical/physical treatment, and metal recovery. Disposal options are driven by waste type and include off-site disposal at various DOE and commercial LLW, MLLW, and TRU disposal facilities, as well as potential on-site disposal alternatives.

Nuclear Materials Inventory and Facilities Stabilization. In addition to the contaminated environmental media and wastes at the ORR, risks also may be associated with the nuclear materials inventory (NMI) in storage at ORR facilities. The major categories of NMI and other inventoried materials posing potential risk at the ORR include highly enriched uranium (HEU), low enriched uranium (LEU), depleted uranium (DU), natural uranium (NU), plutonium (Pu), lead (Pb), sodium/potassium (Na, NaK), lithium (Li), weapons components (WC), and other nuclear materials management and safeguards system (NMMSS) tracked materials. These materials may present high radiation and thermal hazards. The risks associated with these materials are controlled through rigorous containment, storage, and monitoring programs designed to prevent environmental releases or accidental exposures. Site access restrictions including security, fences, and locks further reduce the risk of exposure to these materials. DOE is reducing the amounts of these materials on the ORR through dismantlement or sale to industry for beneficial reuse. DOE intends to only maintain materials that are directly involved in ongoing operations or necessary for national strategic defense. In addition, 50,000 tons of slightly radioactive inventoried scrap metal are also stored on the ORR. Reuse, recycle, and sale of this material is being actively pursued; the potential value of this material is estimated at 6.5 million dollars.

Also, several ORR facilities are scheduled to enter the Facility Stabilization. These programs will reduce potential safety and health risks to workers and the environment by stabilization and deactivation of contaminated buildings.

A total of 70 facilities at the ORNL and the Y-12 Plant are managed under the Nuclear Material and Facility Stabilization Program or scheduled to enter the program. This program seeks to accomplish stabilization and deactivation of facilities previously used for management of nuclear materials, thereby reducing potential risks to

human health and safety or the environment, consolidating and removing waste inventories, and reducing surveillance and maintenance costs as facilities are prepared for decommissioning. Stabilization activities also may include limited demolition of internal structures and management and disposition of surplus materials to reduce hazards. Designated facilities are either currently declared surplus or projected to be surplus within the next five years. Nineteen of these facilities, which were formerly used to produce radioactive isotopes for a variety of purposes, began the process of stabilization/deactivation in 1994. Thirty-one additional facilities, which were added to the program in 1996, are currently in a pre-stabilization surveillance and maintenance phase. A total of 23 of these 31 facilities are located at the Y-12 Plant, and three of these 23 facilities comprise almost 93,000 m^2 (1 million ft^2) of combined floor space. Additional facilities may transfer to the program over time.

End-State Disposition and Risk

DOE is currently in the process of reducing its inventory of hazardous waste and radioactive materials at the ORR. The amounts of NU, DU, LEU, HEU, NMMSS, Pb, WC, Na, Pu, and LiOH stored on-site will be reduced through sale to industry, identifying opportunities for reuse, and dismantlement. Only those materials that are directly involved in ongoing facility operations or necessary for national strategic defense will be maintained on-site. The disposition of legacy LLW, MLLW, SNF, TRU, NMI and environmental restoration wastes will reduce the volume of these hazardous materials on-site and lessen the likelihood of further environmental contamination. Treatment or removal of contaminated groundwater, soil, sediment, or surface water will reduce risks to on-site and off-site personnel. Planned risk reduction activities for each material category are summarized in Table 1.

Environmental Restoration. Remediation of ORR facilities will begin upon approval of the watershed CERCLA decision documents, which will be completed over the period 1999 through 2001. However, it is anticipated that additional decision documents will be needed to ensure that all hazards are addressed by remediation efforts. Environmental restoration, inventory waste reductions, and D&D actions will be implemented according to a schedule determined by the watershed cleanup strategy, in order to optimize resources (time and money) and to ensure consistent, environmentally sound cleanup actions. Ultimately the goal of environmental restoration activities at all of these sites is to return them, as nearly as possible, to a state that presents manageable potential risk to human health and the environment. A major component of the environmental restoration program is the CERCLA process for the comprehensive management of remediation waste. Alternative actions include off-site disposal and on-site disposal in an engineered disposal facility (Environmental Management Waste Management Facility, EMWMF) located in East Bear Creek Valley. Regulatory acceptance of the completed RI/FS (1998) and Proposed Plan for selecting on-site disposal in the EMWMF (1999) have been obtained. A ROD for the construction of the facility is expected late in 1999 or early in 2000, and the EMWMF should be operational in the spring of 2001. Where contaminants remain on-site at levels that could pose a potential future risk, the potential for off-site migration will be restricted through engineering (e.g., containment) and institutional controls (e.g. access restrictions). In addition, long-term monitoring programs will be implemented so that mitigative actions can be taken before any unsafe conditions arise.

Removal of uranium deposits with potential criticality risk in former process buildings at ETTP will be complete by FY1999.

All environmental management waste is expected to be shipped off-site for final disposal by 2006. Beyond 2006, groundwater treatment systems will continue operation, and surveillance and maintenance activities will continue to monitor the effectiveness of remedial actions and to ensure the safety of the public and the environment. Some areas (e.g., waste disposal areas and locations where contaminants have been contained on-site at relatively high levels) may require long-term engineering and/or institutional controls; future use at such locations would be restricted to ensure safety. End-state conditions for each site will be determined through the completion of the CERCLA decision process.

Waste Management. The treatment and disposition of legacy LLW, MLLW, SNF, TRU, NMI and environmental restoration wastes will reduce the volume of these materials on-site and lessen the likelihood of further environmental contamination or exposures. All waste management operations will continue to comply with

applicable Federal and state rules and regulations and best management practices.

It is expected that legacy wastes currently stored at ORR facilities will be disposed of by 2006 for TRU waste, 2006 for MLLW, and 2007 for LLW. TRU wastes are targeted for the Waste Isolation Pilot Plant (WIPP) for ultimate disposal. Off-site DOE and commercial treatment and disposal facilities will be evaluated for disposal of LLW and MLLW. Some buried wastes at ORR facilities are expected to remain isolated in place with appropriate engineering and institutional controls implemented to prevent migration or exposures. Certain wastes generated from environmental restoration activities are expected to be disposed of in a potential on-site disposal facility (e.g., EMWMF).

Nuclear Materials Inventory and Facilities Stabilization. Stabilization of contaminated facilities will continue to reduce risk. Final disposition of nuclear materials (e.g., for off-site reuse) and stabilization of contaminated facilities will achieve safe conditions at ORR facilities. Residual risks due to any materials remaining on-site will be maintained at low levels through engineering and institutional controls..

After completion of environmental remediation activities, disposal of wastes, and disposition of nuclear material inventories, some areas at ORR will still require long-term engineering and/or institutional controls. Some areas, such as waste disposal grounds, will not be available for other uses in the future.

ORNL is expected to continue to operate as a federal research facility. Future land use at the Y-12 Plant is expected to include continuing DOE operations, commercial industrial activities, and recreational use; some areas will continue to be managed by DOE under controlled access for secure storage of nuclear materials and waste. The end -state use for ETTP is expected to be an industrial park occupied by private business.

Planned activities will reduce the effectively eliminate potential risk from LLW, MLLW, TRU, SNF, NM (uranium), and LiOH with the total removal of these materials from ORR. Quantities of DU, NM (all others), HEU, LEU, Na, Na/K, NMMSS, NU, Pb, Pu, and WC will likely be sold or removed from the ORR; however, the final dispositions of these materials have not been determined. Residual risk from the contaminated environmental media on-site will remain; however, the potential for exposures or associated risks will be controlled to low levels through engineering (e.g., containment) and institutional controls (e.g., access controls), and such residual risk may diminish over time. The effectiveness of the groundwater containment systems will be monitored to ensure that any residual risk to off-site receptors is very small.

Table 1. Summary Risk Profile for the Oak Ridge Reservation

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress	End State Disposition and Risk
TRU (solids, sludges)	Currently 2,300 m^3 of TRU exist in 5 separate material streams, including contact and remote handled solids and sludges. An additional 1,980 m^3 are expected to be generated through the year 2070. This includes volumes expected to be received from other sites	Potential exposure to radiation and/or hazardous chemicals	Risks are managed by limiting access to waste storage facilities and routine maintenance of storage containers. TRU waste is collected in storage tanks. TRU solid debris (both contact-handled [CH] and remote-handled [RH]) have been stored in waste storage facilities at ORNL.	Contact handled (CH) TRU solid debris, remote handled (RH) TRU solid debris, and RH TRU sludge will be repackaged on-site at the Transuranic Waste Treatment Plant (TWTP). After 2006, newly generated TRU will be transported directly to the Waste Isolation Pilot Plant (WIPP)	A Transuranic Waste Treatment Plant (TWTP) is being constructed to repackage TRU waste to meet disposal requirements of WIPP. This will be completed by 2006. TRU waste generated after 2006 will be certified by the generator for immediate transfer to WIPP	All current existing and future generated TRU waste will be disposed at WIPP after meeting waste acceptance criteria. After 2006 newly generated TRU waste will be directly transported to WIPP, greatly reducing the on-site risk of container failure
Pu (metal, oxides, other solids and liquids)	ORNL and Y-12 maintain small amounts of Pu. More than 300 sources are maintained at Y-12	Storage of Pu metal, oxides, solutions, scrap and reactor fuel is managed in drums, cans, casks, pipes, and tanks. Failure of containment system could result in criticality or exposure to ionizing radiation. Theft of Pu could result in threat to public health and safety	Extensive criticality controls are in place to ensure safe storage. Risks are controlled to safe levels through access restrictions and tight security measures, and stringent monitoring and maintenance programs	Disposition pathways for Pu are presently being investigated by the Materials Disposition Program	Disposition decisions will be based on reducing risk at the site. Once disposition has been determined, implementation of the plan will reduce on-site risks	SRS may receive Pu residuals. LANL may receive Pu metal and oxides. Following removal of these materials from the site, on-site risk will be effectively eliminated
Pb (metal, solids)	ORR maintains an inventory of 308,000 kg of radioactively contaminated lead. An additional 717,000kg have yet to be categorized. This constitutes ~10% of DOE's entire quantity in inventory	If exposed to the weather, lead can leach into surrounding soils. Potential ingestion or absorption of lead can cause detrimental health impacts	Access to these storage facilities is restricted. Storage under cover and on concrete pads reduces risk of migration	Not determined at present	Not determined at present	Not determined at present
Li (metals, salts, other solids)	Y-12 maintains strategic Li in the following forms: metal, LiH/deuterium, Li_2CO_3, LiCl, LiCl-KCl, $LiOH*H_2O$, and Li_3PO_4. Amounts are classified, but the total is more than 10% of DOE's entire quantity in inventory	Exposure to lithium could occur if containment failed. Inhalation of released powder could cause toxic effects	Currently all Li has been removed from ETTP (23,000,000 pounds). Y-12 remains the sole repository of Li on the ORR. All Li was recently repacked and restacked to ensure container effectiveness and allow for visual inspection. Access to Li warehouses is restricted	Strategic Li will remain at Y-12 at sufficient quantities to support any future operations. Excess nonstrategic Li will be sold	Removal of 23,000,000 pounds of Li from ETTP was completed in FY1998	Li will continue to be stored at Y-12 under special management controls to minimize risk
Na and Na/K	As of 1996, the ORR maintained an inventory of 15,500 gallons of Na. The majority of this inventory is radioactively contaminated. Also, 330 gallons of NaK alloy are maintained in inventory	These materials are highly reactive, and are typically stored under inert gas. Failure to maintain appropriate storage controls could result in explosive reaction	Access to these storage facilities is restricted. Storage conditions are controlled and monitored to reduce risk	Not determined at present	Not determined at present	Not determined at present
Weapons Components (WC)	Y-12 reports 120,000 weapons component "pieces" in inventory. The number of "parts", reported mass, and storage volume are not reported	Failure of boxes and bins used to store WC could result in criticality risk. Theft of WC could result in a threat to public safety	WC parts and subassemblies are rigorously controlled and accounted for by a classified secret restricted data system. Safeguard of WC is extremely vigilant to prevent theft. Access to these facilities is restricted to prevent exposure	Y-12 will continue to store pieces and parts in inventory. No risk reduction is planned	Not determined at present	Not determined at present

Table 1. Summary Risk Profile for the Oak Ridge Reservation

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress	End State Disposition and Risk
Nuclear Materials Management and Safeguards System (NMMSS)	ORNL maintains very small amounts of Am-241, Am-243, Cm, Np-237, and Th. ORNL also maintains 423 kg of U-233 Y-12 maintains a classified amount of deuterium and 3,000 kg of Th	Storage of these materials is managed in drums, cans, casks, pipes, and tanks Failure of containment systems could result in criticality risks or exposure to ionizing radiation. Theft of NMMSS could result in a threat to public health and safety	Extensive criticality controls are in place to ensure safe storage NMMSS materials are under constant guard to prevent theft Access to storage areas is restricted	Not determined at present	Not determined at present	Not determined at present

Portsmouth Gaseous Diffusion Plant

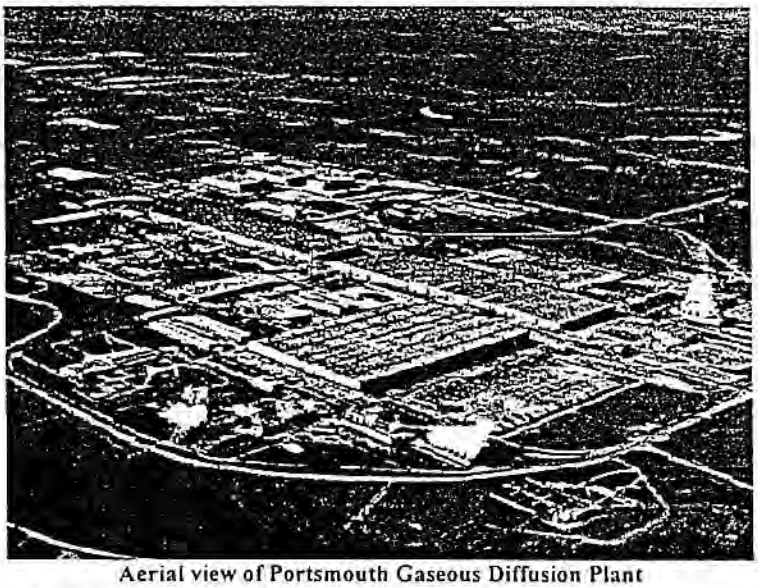
Site Description

Portsmouth Gaseous Diffusion Plant

The Portsmouth Gaseous Diffusion Plant (PORTS) is located in south-central Ohio, approximately 43 km (27 mi) north of Portsmouth, Ohio, and 113 km (70 mi) south of Columbus, Ohio. The site is situated on a 1,500-ha (3,700-acre) U. S. Department of Energy (DOE) reservation, located in Pike County. Pike County has a population of approximately 24,250. The nearest community, Piketon, is 8 km (5 mi) north of the site and has a population of less than 2,000. The environment surrounding the site consists largely of farmland and forests.

The Portsmouth facility was constructed between 1952 and 1956 and has been operational since 1954. The current primary mission of the facility is the enrichment of uranium for use in commercial nuclear reactors. Until 1991, the facility also produced highly enriched uranium for the U.S. Navy. The facility receives feedstock from another gaseous diffusion plant in Paducah, Kentucky, for further enrichment in the fissionable uranium-235 isotope. In 1993, uranium enrichment operations at the plant were transferred to the U.S. Enrichment Corporation. DOE has retained responsibility for cleanup of legacy wastes and contaminated environmental media created as a result of past operations.

The Portsmouth site lies within the Scioto River drainage basin, approximately 3 km (2 mi) east of the Scioto River, a major tributary to the Ohio River. Two small tributaries of the Scioto River, Little Beaver Creek and Big Run Creek, cross the site. Surface water from the site discharges into these tributaries, two pipelines, and the plant's southwest drainage ditch, all of which ultimately flow into the Scioto River. Groundwater flow at the Portsmouth reservation is characterized by 4 separate flow regions, which are termed quadrants. The site is underlain by two aquifer systems, which are poorly connected due to confining shale and clay layers. The most productive aquifer


Aerial view of Portsmouth Gaseous Diffusion Plant

system near the site is the Scioto River aquifer system, which serves private drinking water wells and provides water to the site.

Current Understanding of Hazards and Risks

The hazards and risks at Portsmouth are summarized in Table 2 and discussed below. Categories of materials that

may pose potential risks at the site include low level waste (LLW), mixed low level waste (MLLW), highly enriched uranium (HEU), low enriched uranium (LEU), depleted uranium (DU), and contaminated environmental media (soil, sediment, groundwater, and surface water). The hazards posed by these stored materials and environmental media are currently controlled through containment and monitoring programs to maintain risk at safe levels. Contaminant migration through soil, sediment, surface water, and groundwater has been restricted through the use of interim controls and containment actions.

Environmental Restoration. As a result of facility operations from the 1950s to the present, large quantities of environmental media have become contaminated with radioactive and chemical materials at the PORTS site. The cleaning and changeout of process equipment at the facility has generated spent solvents and other contaminants that were disposed of in on-site landfills and surface impoundments. Contaminants include chlorinated solvents, uranium and other radionuclides, metals, and polychlorinated biphenyls (PCBs). Additional sources of contaminants include uranium deposits in process equipment, as well as radionuclides and chemical contaminants in buildings, cooling towers, burial grounds, and wastewater ponds. Remedial actions for the site are being conducted under the Resource Conservation and Recovery Act (RCRA) [with Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) provisions].

The site has been divided into four separate cleanup areas, or quadrants, based on groundwater flow directions, to facilitate the assessment and remediation process. This process is based on a standard action plan: (1) remove well-defined sources of contamination; (2) consolidate and integrate remedial actions, corrective measures, and RCRA closures for solid waste management units (SWMUs) or SWMU groups that have common contaminant sources or inter-related groundwater contaminant plumes; (3) contain groundwater plumes within site boundaries; (4) use risk-based closure criteria rather than "clean" closure criteria where practical; and (5) use results of risk analyses to establish cleanup levels and the sequence of cleanup efforts. By prioritizing activities that address contaminants most likely to migrate off-site, risks of off-site exposure are maintained at low levels. Contaminated sites within each quadrant are summarized below.

Quadrant I: Sites requiring remedial cleanup alternative assessments include two oil biodegradation plots and a trichloroethylene (TCE) groundwater plume. Interim remedial actions have been taken at the oil biodegradation plots. The primary contaminant, in the groundwater plume contained within the plant boundary is TCE. Eighteen other sites, which require no action or alternative assessment, will be referred to the Decontamination and Decommissioning (D&D) program.

Quadrant II: Sites requiring remedial cleanup alternative assessments include TCE groundwater plumes, an acid neutralization pit, and neutralization/settling retention ponds. The primary contaminant in the groundwater plumes is TCE. The neutralization pit and settling ponds are contaminated with cyanide, TCE, uranium, and technetium. Twenty-one other sites require no action or alternative assessment, and will be referred to the site D&D program.

Quadrant III: The site requiring a remedial cleanup alternative assessment is a small TCE groundwater plume from a former waste oil handling facility. Phytoremediation is being used to remediate the groundwater by planting hybrid poplar tress to absorb and biodegrade the organic compounds. Twenty-eight other sites require no action or alternative assessment and will be referred to the D&D program.

Quadrant IV: The sites requiring remedial cleanup alternative assessments are sanitary and construction landfills. Thirty-eight other sites require no action or alternative assessment and will be referred to the D&D program.

Currently, these contaminated environmental media do not pose significant off-site risks, as contaminants have not migrated off-site. Potential on-site risks are currently managed through appropriate engineering and institutional controls. The primary environmental concern at the site is groundwater contamination by TCE and, to a lesser degree, uranium, technetium and possibly metals. Metals concerns have recently been attributed to sampling techniques. A special study is currently underway to determine the presence or absence of metals contamination in

groundwater at the site. Groundwater contamination appears to be limited to the on-site, shallow aquifers that are not hydrologically connected to the nearby Scioto River aquifer that is used for drinking water. Contaminated groundwater will be remediated through on-site treatment facilities or other technologies to decrease contaminant concentrations and prevent any off-site migration. Interim measures have been implemented to prevent contaminants from migrating off-site, including construction an in-ground slurry wall and a seep collection system. Five groundwater treatment facilities have been constructed and are operational.

Contaminated soils at the site contain TCE, uranium, technetium and metals. Remedial actions completed to date include closure of several former waste storage facilities and consolidation of mixed waste into two permitted waste storage facilities, closure of surface impoundments and lagoons, removal a chromic acid tank and closure of six landfill sites. Ten under-ground and above-ground storage tanks have also been addressed. Three tanks that had never been placed into service were removed, as was another underground tank that did not pass container tightness tests; six inactive above-ground storage tanks have also been demolished. Surrounding soils have been characterized and, where necessary, excavated and treated according to protective regulatory requirements for petroleum contamination in soil. Interim measures have been implemented to prevent contaminants from migrating off-site, including construction of an in-ground slurry wall and a seep collection system. Additional environmental restoration actions are underway or are being planned to cap the last landfill and implement final remedial action to address four TCE groundwater plumes.

Waste Management. In addition to contaminated environmental media, other materials have the potential for posing risk at the site. As a result of its mission activities, the site currently has large quantities of HEU, LEU, and DU in storage, as well as lithium hydroxide monohydrate (LiOH). Current inventories of these materials include approximately 16,000 m^3 of LLW, 8,600 m^3 of MLLW, undisclosed amounts of HEU and LEU, 160,000 metric tons of DU, and 37.34 million lb of LiOH. Approximately 610 kg (1350 lb) of lead and 11 million kg (11,143 tons) of scrap metal are also stored on-site in inventoried quantities. Risks associated with these materials are controlled through rigorous containment, storage, and monitoring programs designed to prevent environmental releases or accidental exposures; site access restrictions and other institutional controls further reduce the risk of exposure to these materials. Current waste storage and management practices comply with applicable state and federal rules and regulations.

All LiOH was repacked in 1998, which decreases the potential for contaminant release. Portsmouth is currently removing the drummed LiOH that has been in storage since the 1950's. DOE has sold the LiOH and has been shipping it off-site since 1996, with 59,634 drums shipped to date. The HEU is currently being transported off-site and downblended to LEU as a product. The DU is currently being evaluated for future use. A conversion facility is to be constructed on site by 2004, to convert the DU to uranium oxide or uranium metal. DOE will directly dispose of approximately one-third of the LLW solids, which will be sorted, segregated, and volume-reduced prior to disposal. MLLW will be treated, as necessary, in accordance with applicable requirements as prescribed in the Ohio EPA Site Treatment Plan; treatment technologies currently identified include incineration, stabilization, chemical/physical treatment, and metal recovery. Some LLW may require treatment to immobilize radiological or chemical constituents before disposal; treatment technologies for this waste will be identified through successful treatability studies. Disposal options are driven by waste type and include disposal at various commercial and DOE low-level and mixed waste disposal facilities.

End-State Disposition and Risk

DOE is currently in the process of reducing the inventory of hazardous and radioactive materials at the site, thereby reducing risk of environmental release or accidental exposures. Only those materials that are directly needed for ongoing facility operations will be maintained.

Environmental Restoration. RCRA facility investigations (RFIs) for each quadrant have been completed and cleanup alternatives are being assessed. Response actions have already been completed in several areas of the site, and interim measures have been implemented to prevent off-site migration of contaminants. Following completion of all cleanup actions at the site, a low level of residual risk will remain, due to trace quantities of contaminants

remaining in remediated soils and groundwater. A comprehensive environmental surveillance and monitoring program will be maintained to provide early warning of any potential off-site contaminant migration. Institutional controls will be maintained for any on-site landfills or burial grounds that may be closed with contamination remaining in place.

All legacy environmental management waste is scheduled to be shipped off-site for final disposal by 2014. Beyond 2014, groundwater treatment systems will continue operation, and surveillance and maintenance activities will monitor remedial action and decontamination and decommissioning. Active groundwater treatment facilities will be shut down in 2050 and passive groundwater monitoring and treatment will continue until 2055. While future use of the site area will be determined at a later date, long-term surveillance, maintenance and institutional controls are expected to continue indefinitely, which will limit future use. The current land use of mixed industrial/recreational is expected to be the most likely future use at the site.

Waste Management. The treatment and disposal of legacy LLW, MLLW, and environmental restoration wastes will reduce the volume of these wastes on-site and lessen the likelihood of further environmental contamination or exposures. All waste management operations will continue to comply with applicable state and federal rules and regulations and best management practices. All LiOH is to be shipped off site by FY 2001. The HEU trap and oxide material will be shipped off-site by the end of FY 1999, effectively removing associated risks from the site. Other HEU will be downblended to a useable product. DU is being evaluated for future use, and the end-state disposition is not yet determined. LLW will be disposed of at an off-site facility, effectively removing associated risks from Portsmouth. Cyanide waste will be sent to an off-site destruction facility, mercury will be sent to the Idaho National Engineering Laboratory, and incinerable material will be mixed with similar LLW materials for off-site incineration or other appropriate treatment.

After the uranium enrichment operations at Portsmouth are no longer needed, DOE will decommission the site. Under provisions in the U. S. Enrichment Corporation lease, a two notification must be provided to DOE prior to shutdown. Stabilization and shutdown activities are the responsibility of the U.S. Enrichment Corporation. The end use for the property may include restricted industrial, open space/recreational, and controlled access.

The potential risk from the quantities of LLW, MLLW, HEU, LEU, and LiOH will be effectively reduced to zero with the total removal of these materials from the site. The DU will likely be converted to a more stable form and stored onsite until a future use has been determined, effectively reducing any hazard. Residual risk from the contaminated environmental media on-site will remain; however, this risk would be very low and may diminish over time. The effectiveness of the groundwater containment systems will be monitored, and maintained as necessary, to ensure that there is no adverse impact to off-site receptors.

Table 2. Summary Risk Profile for the Portsmouth Gaseous Diffusion Plant

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress	End State Disposition and Risk
Environmental media (groundwater, soil, sediment, other solids and surface water)	Nearly 6 million m^3 of environmental media (soil, sediment, surface water, groundwater, and solids) are expected to be generated from environmental restoration activities. Primary contaminants of concern include TCE, uranium, and technetium-99.	Currently, off-site migration of contaminants via groundwater and surface water have been mitigated by interim containment actions. If containment failed, then exposure to TCE and radionuclides could be possible.	For purposes of remediation activities, the Portsmouth reservation has been divided into 4 separate groundwater flow regions, termed quadrants. Quadrant division is the basis for nearly all environmental restoration activities at PORTS. A RCRA remedial facility investigation (RFI) has been completed for each quadrant.	Contaminated soil, sediment, groundwater, surface water, and solids will be collected and treated. Contaminants under caps will remain.	Migration of contaminants off-site via groundwater and surface water have been controlled by interim containment actions. Groundwater is actively being remediated by on-site treatment facilities. At present, corrective actions are being assessed for each quadrant. All remedial actions are expected to be in place by 2002.	By 2014, all legacy waste associated with environmental restoration of the site will be dispositioned (excluding D&D activity, which will be conducted following termination of uranium enrichment operations at the plant).
LLW	An inventory of 16,800 m^3 of LLW is stored on-site. No additional LLW is expected to be generated through 2070.	Potential exposure to radionuclides could result from the failure of containment and/or institutional controls.	Risks are controlled to low levels by limiting access to waste storage facilities and routine maintenance of storage containers.	LLW will be sorted and segregated prior to treatment on-site or disposal off-site.	Waste treatment is expected to begin in 1998.	Disposition for all LLW has not been determined. Most materials are expected to be treated or disposed off-site, which would effectively eliminate on-site risk from these materials.
MLLW	The existing inventory of MLLW is 9,400 m^3. This total includes 12 distinct waste streams including TSCA, Asbestos, RCRA, and cyanide materials. An additional 11,000 m^3 of MLLW is expected to be generated through the year 2070.	Potential exposure to the radionuclides and chemicals could result from the failure of containment and/or institutional controls.	Risks are managed at safe levels by limiting access to waste storage facilities and routine maintenance of storage containers.	Containerized liquid MLLW will be treated under the ER program. Other remaining MLLW will be treated, sorted, segregated, stabilized, recycled, or destroyed.	Waste treatment is expected to begin in 1998 by several off-site vendors.	Most MLLW is expected to be treated and disposed off-site at commercial facilitie, which would effectively eliminate on-site risk from these materials.

Table 2. Summary Risk Profile for the Portsmouth Gaseous Diffusion Plant

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress*	End State Disposition and Risk
Highly enriched uranium, HEU (>10% of the entire quantity in DOE's inventory)	A classified quantity of HEU is stored on-site, including HEU trap and oxide material that will be removed by FY1999. Other HEU will be downblended into the process system by U.S. Enrichment Corp.	HEU is stored in approved cylinders. Potential exposures to radionuclides and chemicals could occur if the cylinders fail to provide containment. Theft of material could also result in public safety risk. Storage configuration failure could result in criticality risk.	HEU is stored in high security facility. Routine maintenance is performed to ensure container integrity and criticality safety measures are in place.	HEU trap and oxide material will be removed by FY1999. Other HEU will be downblended into the process system by USEC.	HEU is currently being transported off-site and downblended to a useable product.	All HEU will be removed from the site or downblended to LEU as a product, effectively eliminating on-site risks from this material.
Low-enriched uranium, LEU	USEC has an agreement to purchase 500 metric tons of HEU from dismantled Russian nuclear weapons from the Russian Federation over 20 years. This material is to be downblended to LEU before being shipped to the Portsmouth site. This LEU will be sold as commercial reactor fuel by USEC.	Russian LEU is stored in cylinders. Potential exposures to radionuclides and chemicals could occur if the cylinders fail to provide containment.	Risks are managed at safe levels by limiting access to the storage facilities and by routine maintenance of storage containers.	The LEU will be sold as commercial reactor fuel by USEC throughout the 20-year purchase agreement.	The LEU will continue to be shipped off-site.	The Russian LEU will be removed from the site and sold as fuel for commercial nuclear reactors, effectively removing all on-site risk from this material.
Depleted uranium, DU (>10% of the entire quantity in DOE's inventory)	13,400 cylinders (160,000 metric tons) of depleted uranium hexafluoride are in storage at the Portsmouth site, as well as relatively small quantities of depleted UF_4 and UO_3.	DU is stored in cylinders. Potential radiation and chemical exposures to workers or the public could occur if the cylinders fail to provide containment	Risks are managed at safe levels by limiting access to the storage facilities and by routine monitoring and maintenance (repainting skirted cylinder ends and restacking to allow visual inspection).	A Programmatic Environmental Impact Statement (PEIS) is in progress to determine future disposition of material.	Not determined at present. Continuing engineering and institutional controls will maintain risk at safe levels until disposition	Not determined at present

Table 2. Summary Risk Profile for the Portsmouth Gaseous Diffusion Plant

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress*	End State Disposition and Risk
LiOH (>10% of the entire quantity in DOE's inventory)	More than 187,000 drums (62 million pounds) of lithium hydroxide monohydarate are stored on-site.	Potential exposure to hazardous chemcals could occur if containment and institutional controls fail (e.g., rupture of a packaged drum).	All LiOH was recently repacked and restacked to ensure container effectiveness and allow for visual inspection. Access to DOE LiOH sale and removal program warehouses is restricted by security measures.	All LiOH is expected to be shipped off-site before repackaging is necessary. The buyer has responsibility for maintenance of the inventory.	DOE has sold the entire inventory of LiOH. To date >60,000 drums have been shipped off-site. Risk will continue to be reduced as additional shipments are completed.	By 2001, all LiOH will be removed from the site, effectively eliminating on-site risk from this material.

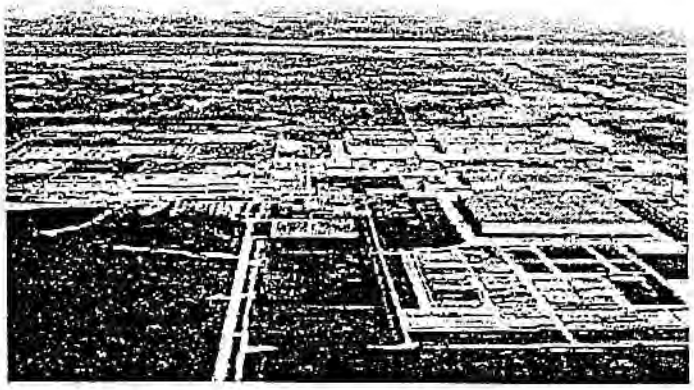
PADUCAH GASEOUS DIFFUSION PLANT

Site Description

The Paducah Gaseous Diffusion Plant (PGDP) is located in western Kentucky in McCracken County about 6 km (4 mi) south of the Ohio River and 32 km (20 mi) east of the confluence of the Ohio and Mississippi Rivers. The closest communities are the villages of Heath and Grahamville, 2-3 km (1-2 mi) east of the plant. Magruder Village, approximately 3 km (2 mi) southwest of the plant, and Kevil, approximately 5 km (3 mi) southwest of the plant. The closest municipality is Paducah, Kentucky, about 12 km (8 mi) east, with a population of 29,000. Approximately 39,500 people live within 10 miles of the plant, and approximately 300,000 people live within 50 miles of the plant. Total employment at the PGDP is approximately 2,300. The DOE reservation occupies 3,400 acres, of which 750 are within the main security fence. Approximately 1,800 acres outside the secure area and a surrounding buffer zone is leased to the public or to the Commonwealth of Kentucky as part of the Western Kentucky Wildlife Management Area. Land use in the vicinity of the site is primarily agricultural and undeveloped forest land.

Since its construction in the early 1950's, in part of the area occupied by the former Kentucky Ordnance Works, the primary mission of the plant has been the enrichment of uranium for use in commercial nuclear reactors, in defense applications, and as feedstock for another gaseous diffusion plant in Portsmouth, Ohio. Construction of the plant began in 1951, enrichment operations began in 1952, and the plant was fully operational by 1955. During the enrichment process, the percentage of uranium-235 is increased by passing a uranium hexafluoride (UF_6) feedstock through a series of converters. The maximum enrichment state reached at PGDP ranges from 2 to 2½% uranium-235 by mass. Operation of the enrichment facility requires an extensive array of support facilities. These include a steam plant, electrical switchyards, cooling towers, a recovery and decontamination building, water and sewage treatment facilities, a cooling water blowdown treatment facility, ancillary maintenance buildings, and a security department. In 1993, uranium enrichment operations at PGDP were transferred to the U.S. Enrichment Corporation. DOE has retained responsibility for cleanup of legacy wastes and contaminated environmental media created as a result of past operations.

Surface water features at the site include Big Bayou Creek to the west and Little Bayou Creek to the east, which both ultimately discharge to the Ohio River. Drinking water for the plant and surrounding communities is provided through public water supplies obtained from the Ohio River. A major hydrogeologic feature of interest is the Regional Gravel Aquifer. This aquifer underlies the majority of the DOE property, is the uppermost aquifer at the plant [approximately 12-15 m (40-50 ft) below ground], and flows towards the Ohio River; it also is the primary aquifer used by local private residents, and domestic wells within 1 km (0.6 mi) of the site have been identified. Other interconnected aquifers at the site include McNairy Flow System, Terrace Gravels, and Upper Continental



Paducah Gaseous Diffusion Plant (Looking towards the Ohio River)

Fact Sheet:
Engineering Evaluation/Cost Analysis for Scrap Metal Removal
at the Paducah Gaseous Diffusion Plant, Paducah Kentucky (DOE/OR/07-1797&D1)
May 13, 1999

The Paducah Gaseous Diffusion Plant (PGDP) was placed on the National Priorities List on May 31, 1994. Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) required the negotiation and implementation of the PGDP Federal Facility Agreement (FFA), which provides the regulatory strategy for site CERCLA actions. Removal of materials from the PGDP scrap yards is an action required by the FFA and is necessary before other scheduled FFA actions can be achieved. Removal and disposition of the contaminated scrap materials will mitigate contaminant migration from the scrap yards and allow for the planned investigation of the underlying soils. The scrap yards are Areas of Concern (AOCs) under CERCLA. Removal actions for the scrap yards will address requirements for AOCs under CERCLA. The removal action will assist in meeting the clean-up objectives for the entire PGDP site.

A document titled *Engineering Evaluation/Cost Analysis for Scrap Metal Removal at the Paducah Gaseous Diffusion Plant, Paducah Kentucky* (DOE/OR/07-1797&D1) has been prepared to support the removal and disposition of over 60,000 tons of scrap metal and other material from the scrap yards at the PGDP. Removal and disposition of the scrap material will be performed as a non-time-critical removal action under the FFA process for CERCLA. Publication of this document meets a FFA milestone.

This Engineering Evaluation/Cost Analysis (EE/CA) addresses scrap material in scrap yards C-746-P1, C-746-P, C-747-A Drum Yard, C-746-E, C-746-E1, C-746-C, C-746-C1, C-746-H4, C-747-B, C-746-D Classified Scrap Yard; and in two U.S. Department of Energy (DOE) Material Storage Areas (DMSAs). This EECA document was prepared in accordance with the *Annotated Outline for an Engineering Evaluation/Cost Analysis* (DOE 1996).

This EE/CA analyzes four alternatives for removal and disposition of contaminated scrap material at the PGDP. The alternatives include:

1) No Action
2) Removal of Scrap Followed by Storage
3) Removal of Scrap Followed by Disposal; and
4) Removal of Scrap Followed by Recycle, Reuse, Resale, and Disposal.

These alternatives were evaluated for effectiveness, capability of being implemented, and cost. The Removal Action Objectives (RAOs) for this removal action were the basis for evaluating the alternatives. The RAOs for this action are:

1) Reduce or remove risk and hazards posed to PGDP personnel from exposure to materials at or potentially migrating from deteriorating scrap piles and equipment.
2) Reduce or remove potential risks and hazards posed to offsite individuals, including residents and recreational users from exposure to materials migrating from deteriorating scrap piles and equipment.
3) Remove the scrap from the surface to allow investigation and potential remediation of the underlying soils and burial grounds, which are potentially contributing risks to off-site individuals, including residents and recreational users, and on-site workers.

The objectives of the EE/CA are to:

1) Describe the environmental conditions prompting this non-time critical removal action;
2) Develop and evaluate alternatives, including costs;
3) Recommend the alternative that best that best meets the RAOs; and
4) Assess the risk associated with the preferred alternative.

Community involvement is an important aspect of the CERCLA process. DOE will conducting community relations activities for this project in compliance with 40 CFR 300.415(m)(1), (m)(3) and (m)(4) and its approved community relations plan, as described in the *Community Relations Plan for the Environmental Management and Enrichment Facilities Program, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1998).

The D1 EE/CA is scheduled for regulator review beginning May 27, 1999. Upon incorporation of comments, a D2 document is scheduled for regulator approval early in September 1999. A 45-day public comment period will begin in September following that approval.

- end -

Draft Enviromental Impact Statements

NEW Revised Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan (April 1999)	DOE/EIS-0222
Draft Environmental Impact Statement - Sandia National Laboratories/New Mexico Draft Site-Wide Environmental Impact Statement	DOE/EIS-0281
Draft Environmental Impact Statement - Conveyance and Transfer of Certain Land Tracts Administrered by the Department of Energy and Located at the Los Alamos National Laboratory, Los Alamos and Sante Fe Counties, New Mexico	DOE/EIS-0293
Draft Environmental Impact Statement - Savannah River Site, Spent Nuclear Fuel Management	DOE/EIS-0279
Draft Environmental Impact Statement Construction and Operation of the Spallation Neutron Source	DOE/EIS-0247
Surplus Plutonium Disposition Draft Environmental Impact Statement	DOE/EIS-0283
Draft Environmental Impact Statement (EIS) for the Production of Tritium in a Commercial Light Water Reactor	DOE/EIS-0288
U.S. Department of Energy Idaho National Engineering and Environmental Laboratory Advanced Mixed Waste Treatment Project Draft Environmental Impact Statement	DOE/EIS-0290
Draft Environmental Impact Statement (EIS) for the Construction and Operation of a Proposed Tritium Extraction Facility (TEF) at the Savannah River Site (SRS)	DOE/EIS-0271
Draft Sitewide Environmental Impact Statement on the Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico	DOE/EIS-0238

Return to NEPA Docs

Bechtel Jacobs Company LLC
Paducah Project

Site Specific Advisory Board

Participant	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
Bechtel Jacobs Company LLC	3,508	176	(176)	42	42	88	87	109	0	0	0	0	0	369
BJC Sub. - Roberts & Kay, Inc.	15,570	0	1,292	1,186	0	4,277	496	2,008	0	0	0	0	0	9,261
BJC Sub. - Jacobs Engineering Group	19,713	0	0	10,171	2,996	3,204	19,669	9,627	0	0	0	0	0	45,667
Overhead	7,979	14	90	923	246	613	1,640	951	0	0	0	0	0	4,479
Total Project	46,770	190	1,207	12,323	3,284	8,183	21,892	12,697	0	0	0	0	0	59,776

NOTES: *Cost Corrections will be made in May to move cost for the SSAB to a single charge code. An adjustment to April's cost (including Overhead) may be made at that time.*
Accruals for Roberts & Kay, Inc. and Jacobs Engineering were overstated in April. Corrections will be made in May's Report.

Budget for FY99: $ 92,484
FY99 CTD: $ 59,776
Remaining Funding: $ 32,708

Bechtel Jacobs Company LLC
Paducah Project

10-May-99
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Participant	Description	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Engineering Cost Center	OR - Ron Wells - Task Support	858	84	(84)	42	42	88	87	48	0	0	0	0	0	308
BJC Procurement	Contract Work	982	92	(92)	0	0	0	0	0	0	0	0	0	0	0
BJC Project Controls	Project Analyst/Finance Officer Support	829	0	0	0	0	0	0	0	0	0	0	0	0	0
SSAB - Misc Expenses	Rents, Food, Sound Recording, Public Notice, etc.	840	0	0	0	0	0	0	61	0	0	0	0	0	61
Total Project		3,508	176	(176)	42	42	88	87	109	0	0	0	0	0	369

Roberts & Kay, Inc.
Paducah Project

10-May-99
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Material Charge Number
54 / P / JEC04

Participant	Type of Service	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Sub. - Roberts & Kay, Inc. (Payments)	Subcontractor Independent	13,033	0	1,292	1,186	0	1,202	1,015	1,108	0	0	0	0	0	5,805
BJC Sub. - Roberts & Kay, Inc. (Accruals)	Facilitator to the SSAB	2,537	0	0	0	0	3,075	(519)	900	0	0	0	0	0	3,456
Total Project		15,570	0	1,292	1,186	0	4,277	496	2,008	0	0	0	0	0	9,261

Jacobs Engineering Group, Inc.
Paducah Project

10-May-99
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TASK NUMBER:
35 - H831 - 48

Participant	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Sub. - Jacobs Engineering (Payments)	8,381	0	0	1,402	3,836	3,694	3,161	5,920	0	0	0	0	0	18,014
BJC Sub. - Jacobs Engineering (Accruals)	11,332	0	0	8,769	(840)	(490)	16,507	3,707	0	0	0	0	0	27,653
Total Project	19,713	0	0	10,171	2,996	3,204	19,669	9,627	0	0	0	0	0	45,667

INVOICES

35-H831-48 Statement of Cost - Voucher Number: N/A

Total Amount Due $ 107.00 **PAID - JUNE**

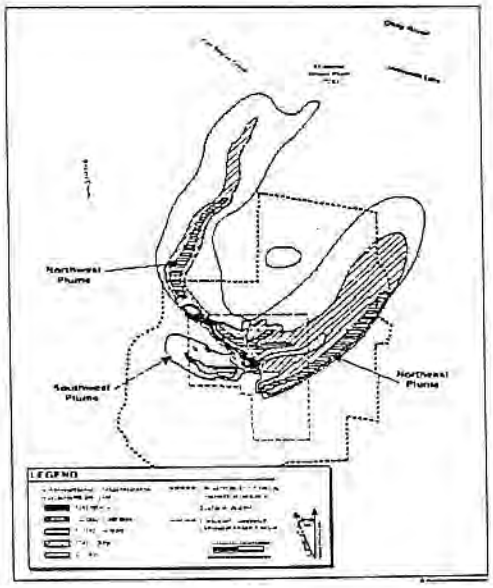
35-H831-48 Statement of Cost	Voucher Number: 59	Voucher Number: 60	Voucher Number: 61	Voucher Number: 62	Voucher Number: 63	Voucher Number: 64	Voucher Number: 65	Voucher Number: 66	Voucher Number: 67
LABOR @ Office	95.63	107.58	234.49	46.26	439.87	495.27	386.97	286.59	245.64
LABOR @ Site	182.28	130.21	294.94	286.75	477.19	870.92	1,468.86	763.57	1,206.48
Teaming Subcontractors: PAI Corporation	258.03	680.28	1102.53	950.04	0.00	1570.63	1,013.77	754.99	1,138.10
Other Direct Costs	1,195.00	16.21	2706.46	94.80	485.07	899.24	824.41	1,356.22	3,330.10
Amounts Previously Invoiced	(137.76)	0.00	0.00	0.00					
Total Amount Due	$ 1,593.18	$934.28	$4,338.42	$1,377.85	$1,402.13	$3,836.06	$3,694.01	$3,161.37	$5,920.32
	PAID - JULY	**PAID - SEPT**	**PAID - SEPT**	**PAID - SEPT**	**PAID - DEC**	**PAID - JAN**	**PAID - FEB**	**PAID - MAR**	**PAID - APR**

Recharge System.

Current Understanding of Hazards and Risks

Hazards and risks at PGDP are summarized in Table 3 and discussed here. Past practices at PGDP have resulted in contamination of environmental media and accumulation of hazardous and radioactive wastes. Categories of materials that may pose potential risks at PGDP include low level waste (LLW), mixed low level waste (MLLW), transuranic waste (TRU), low enriched uranium (LEU), depleted uranium (DU), natural uranium (NU) and contaminated environmental media (soil, sediment, groundwater, and surface water). The hazards posed by these materials are currently controlled through containment and monitoring programs to maintain risk at safe levels. Contaminant migration through soil and sediment to groundwater and surface water has occurred. In 1988, groundwater samples collected from residential wells north of the site had detectable levels of technetium and trichloroethylene (TCE). PCBs have been found downstream of the plant in sediment and fish, and are also present in on-site soil and off-site drainage ditches.

Environmental Restoration. Environmental restoration activities at PGDP are being conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The remedial goals for all environmental restoration projects at the PGDP are to: (1) protect industrial workers from direct exposure to surface (0–1 ft below ground surface) and subsurface soils when working inside the secure areas (2) protect the groundwater users at the DOE property boundary (3) protect recreational users outside the secure area; and (4) protect sensitive ecosystems outside the secure, industrialized areas. To accomplish these goals, the remedial strategy includes a combination of source-control actions followed by groundwater and surface water (integrator unit) actions. This strategy recognizes that the integrator units serve as potential transport and exposure pathways to receptors both on-site and off-site. Therefore, the strategy also includes interim actions to address exposure to contaminated media in the following integrator units:



Groundwater: Two major off-site groundwater plumes have been identified at PGDP (designated the Northwest Plume and Northeast Plume). A third plume has also been identified, the Southwest Plume, which has not migrated beyond the DOE site boundary. Suspected sources of the plumes include: burial pits, leaking process lines, spill sites, and process buildings. It is estimated that about 13 million m^3 (3 billion gallons) of groundwater is contaminated with TCE or technetium or both, with plumes extending over an area of approximately 1,000 ha (4 sq mi) on- and off-site in the uppermost aquifer. To address these issues, DOE extended a community water line to residences with contaminated wells while pursuing long-term remedial actions. Thus, risks associated with groundwater are controlled through provision of this alternate water supply to prevent exposures.

Surface water/sediment: Soils, drainage ditches, surface waters, and sediments are contaminated with PCBs. Suspected sources include electrical switchyards, landfills, and waste oil biodegradation plots. Current use restrictions of the impacted surface water bodies are intended to limit exposure to contaminants by the public. Landfill caps have been installed or improved to reduce leachate migration, and underground storage tanks are being closed or monitored to prevent additional releases.

Remedial investigations (RIs) have been completed for several waste area groupings and feasibility studies (FSs) are now being conducted. Removal and treatment of contaminated groundwater, soil, sediment and surface water will

reduce risks to potential receptors on-site and off-site. A groundwater-monitoring network of 164 wells has been installed, and there are two operating groundwater containment systems. Contaminated groundwater is pumped to existing towers within the plant for treatment with an air stripping process; approximately 525 million gallons of contaminated groundwater has been treated to date. Risks associated with on-site and off-site groundwater are controlled by preventing exposures through provision of an alternate water supply; DOE extended community water lines and offered municipal water hook-ups to all residents in the potentially impacted area. Contaminant migration has been restricted through the use of interim control and containment actions. Current use restrictions of surface water bodies are designed to limit exposure to contaminants by the public. The combination of groundwater treatment, containment, and provision of an alternate water supply are intended to mitigate the potential risks associated with contaminated groundwater. Institutional controls restricting site access also help to reduce risk to low levels.

Waste Management. As a result of its mission activities, PGDP has accumulated large quantities of natural uranium (NU), low-enriched uranium (LEU), and depleted uranium (DU) in storage, as well as radioactive (LLW, MLLW, TRU) and hazardous wastes. The hazards posed by these stored materials are all controlled through standard containment and monitoring methods to maintain risk at safe levels.

Approximately 7.6 m^3 of transuranic waste (TRUW) is currently stored at the site. Risks associated with this material are managed by limiting access to waste storage facilities and routine maintenance of storage containers. The TRUW will be treated on-site then transported to the Oak Ridge Reservation for storage and eventual disposal (targeted for WIPP).

The current amount of MLLW in storage is approximately 4,200 m^3, including PCBs and asbestos wastes. This volume includes approximately 2,000 m^3 of MLLW soils, sludges, and other solids, and approximately 80 m^3 of MLLW liquids. The risks associated with stored MLLW are managed by site access controls, limiting access to waste storage facilities and routine maintenance of storage containers. The soils, sludges and other solids will be treated by VORTEC vitrification. The MLLW liquids will be collected and incinerated.

There are 6,100 m^3 of LLW soils, sediments, rubble, liquids, and other solids. In addition, 65,000 tons (92,000 m^3) of slightly radioactive scrap metal are also stored at PGDP in inventoried quantities; this is more than 10% of the entire DOE inventory of scrap metal. The risks associated with LLW are managed by limiting access to waste storage facilities, site access controls, and routine maintenance of storage containers. The scrap metal will be decontaminated and recycled. The soil will be collected and disposed of off-site. Rubble and debris will be characterized and shipped off-site to a LLW landfill. Other solids will be characterized, treated and disposed of either on-site or at an off-site LLW landfill. Liquids will be characterized and shipped to a licensed incinerator in Oak Ridge. An additional 16,000 PCB-contaminated gaskets are also stored on-site.

There are 2,200 cylinders of natural uranium (NU), 1,700 cylinders of low enriched uranium (LEU), and 28,000 cylinders of depleted uranium (DU) on site. The risks associated with these materials are managed by limiting access to the uranium storage yards and by routine maintenance of storage containers. The DU is in the form of DUF_6 and presents primarily a chemical toxicity hazard; cylinder failure would result in release of hydrogen fluoride gas and uranium, which would form a crystalline solid, resealing the cylinder.

Two facilities (C-410 and C-340) have begun decontamination and decommissioning procedures with monitoring. Contamination includes depleted uranium, normal uranium, UF_4, PCBs, asbestos, and lead paint.

End-State Disposition and Risk

DOE is currently in the process of reducing its inventory of legacy hazardous and radioactive materials at the site, thereby reducing risk of environmental release or accidental exposures. Only those materials that are directly needed for ongoing facility operations (e.g., enrichment cascades) will be maintained.

Environmental Restoration. Treatment or removal of the contaminated groundwater, soil, sediment, or surface water will lower the risks to on-site and off-site personnel. All environmental restoration waste is expected to be shipped off-site for final disposal by 2010. Low levels of residual contamination will remain in soils, and also in groundwater because the pump-and-treat system is not capable of completely removing all contamination; however, such residual risks will be small and are expected to eventually diminish over time. Beyond 2010, the groundwater treatment systems will continue operation, and the surveillance and maintenance program will continue to monitor the effectiveness of the remedial action and decontamination and decommissioning activities. Institutional controls will be maintained for any on-site disposal areas that may be closed with levels of contamination in place that require continued management to ensure long-term safety.

Waste Management. The disposition and treatment of legacy TRUW, MLLW, LLW and environmental restoration wastes will reduce the volumes of these wastes on site and lessen the likelihood of related environmental contamination. The TRUW, MLLW, and LLW will be shipped off-site. Following shipment, there will be no end-state risk at PGDP associated with these materials. At present, the end-state disposition of the NU, LEU and DU materials have not yet been determined, but it is likely that they also will be removed from the site, effectively eliminating risk. DOE plans to have all the legacy environmental management waste shipped off-site for final disposal by 2012.

After the uranium enrichment operations at PGDP are no longer needed, DOE will decommission the site. The end use for the property may include restricted industrial, open space/recreational, and controlled access. Several landfills will be closed with contamination in place in the industrial area.

The potential risk from the quantities of LLW, MLLW, and TRU will be effectively reduced to zero with the total removal of these materials from the site. The NU, DU, and LEU will likely be sold and removed from the site, effectively removing any risk. Residual risk from the contaminated environmental media on-site will remain; however, this risk is expected to be very low. The effectiveness of the groundwater containment systems will be monitored, and the systems maintained as necessary, to ensure that any residual risk to off-site receptors is very low.

Table 3. Summary Risk Profile for the Paducah Gaseous Diffusion Plant

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress	End State Disposition and Risk
Environmental Media (contaminated groundwater, surface water, soils, sediments, and other solids)	Approximately 81,000 m^3 of contaminated media will be generated following implementation of various response actions at the site. These media include soil, sediment, construction debris, and other solids. In addition, approximately 5,000,000 m^3 of ground water and surface water will be generated. The categories of solid and liquid contaminated media include LLW, MLLW, HAZ, and TRU.	Failure of the groundwater policy to prevent use of groundwater potentially could expose the public to TCE and Tc-99. Failure of access controls could allow the public to be exposed to contaminated surface water off-site and sediments and soils on-site.	Currently risk from exposure to contaminants in groundwater is controlled by providing alternative water supply to residents potentially affected by the contaminated groundwater and implementation of groundwater containment systems. Institutional controls (e.g. access restrictions) help to prevent exposure to surface water and on-site contaminated media.	Contaminated groundwater is currently being collected and treated by air stripping. Remedial alternatives for contaminated soils, sediments, and surface water will be determined for each investigation unit [208 solid waste management units (SWMUs) grouped into 30 Waste Area Groupings]. Contaminants under caps and landfills may remain on-site.	Exposure to contaminated groundwater has been mitigated by the groundwater policy to restrict use and provision of alternative water supply. Four RODs have been signed. Eight interim remedial actions are underway.	Contaminated groundwater will continue to be collected and treated with treatment residues disposed off-site or contained. Residual contaminants in groundwater are expected to be below drinking water standards. Other legacy waste associated with environmental restoration is expected to be shipped off-site by 2006 (excluding D&D activities, which will be conducted following termination of uranium enrichment operations).
LLW (scrap metals, soil, sediment, rubble, other solids, and liquids)	The LLW inventory stored on-site is 99,000 m^3. Approximately 93,000 m^3 of this volume is LLW scrap metal.	Potential exposure to radionuclides could result from the failure of containment and/or institutional controls.	Risks are managed at safe levels by limiting access to waste storage facilities, routine maintenance of storage containers, and sediment control measures.	Scrap metal will be decontaminated and recycled. Rubble and debris will be characterized and shipped off-site for disposal. Other solids will be characterized, treated using VORTEC technology and disposed either in the on-site landfill or at an off-site LLW disposal site. Liquids will be characterized and shipped to the TSCA incinerator in Oak Ridge for incineration.	Valuable scrap metals have been identified and processed for potential recycling and reuse. An additional 5,000 m^3 of LLW is expected to be generated as part of future DOE activities through the year 2070.	Scrap metals will be removed from the site, effectively removing any risk. Other LLW transported for off-site treatment or disposal also would not contribute to site risks. Residual risk may remain from LLW disposed on-site, and will be controlled at safe levels through engineering and institutional controls.

Table 3. Summary Risk Profile for the Paducah Gaseous Diffusion Plant

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction Measures and Control Measures	Anticipated Risk Reduction Progress	End State Disposition and Risk
MLLW (soil, sediment, liquids, and solids)	Approximately 4,200 m^3 of MLLW is currently in storage, including PCB and asbestos materials, as well as RCRA-regulated wastes.	Potential exposure to the radionuclides and chemicals that comprise the MLLW category could result from the failure of containment and/or institutional controls.	Risks are managed at safe levels by limiting access to waste storage facilities and routine maintenance of storage containers.	MLLW will be treated by vitrification, incineration, or other treatment processes, as necessary, prior to off-site disposal.	An additional 1,800 m^3 of MLLW is expected to be generated as part of future DOE activities through the year 2070.	MLLW will be vitrified, incinerated, or treated for off-site disposal, effectively removing all risks from the site.
TRU waste	Approximately 4.6 m^3 of TRU waste is stored on-site.	Potential exposure to radioactive and hazardous materials could result from the failure of waste containers and release of waste.	Risks are managed at safe levels by limiting access to waste storage facilities and routine maintenance of storage containers.	TRU waste will be treated on-site and transported to the Oak Ridge Reservation for storage and eventual disposal (at WIPP).	No additional TRU waste is expected to be generated.	All TRU waste will be shipped off-site to the ORR. No risk from this material will remain at PGDP following off-site shipment.
Natural uranium (NU), low enriched uranium (LEU), and depleted uranium (DU) (>10% of the entire quantity in DOE's inventory)	There are 2,200 cylinders of NU (natural assay UF_6), 1,700 cylinders of slightly enriched UF_6, and 28,400 cylinders of depleted UF_6 as well as a relatively small amount of UF_4 and uranium metal on-site.	Potential exposures to radionuclides and chemicals could occur if the cylinders in which these materials are stored fail to provide containment.	Risks are managed by limiting access to the storage facilities and by routine maintenance of storage containers.	The materials will continue to be stored in a safe manner to maintain risk at low levels.	The materials will continue to be maintained in safe storage.	Not yet determined

Weldon Spring Site

Site Description

The Weldon Spring site is located 48 km (30 mi) west of St. Louis in St. Charles County, Missouri (Figure 1). The site consists of an 88-ha (220-acre) chemical plant and a 3.6-ha (9-acre) quarry, located 6.4 km (4 mi) apart on State Route 94. The chemical plant was initially used by the Army to produce nitroaromatic explosives (trinitrotoluene [TNT] and dinitrotoluene [DNT]) in the early 1940s. From 1957 to 1966, the Atomic Energy Commission used the site to process uranium and thorium ore concentrates, generating 11e(2) byproduct material wastes. The plant was subsequently deactivated, and no further activities were carried out until remediation began in 1985.

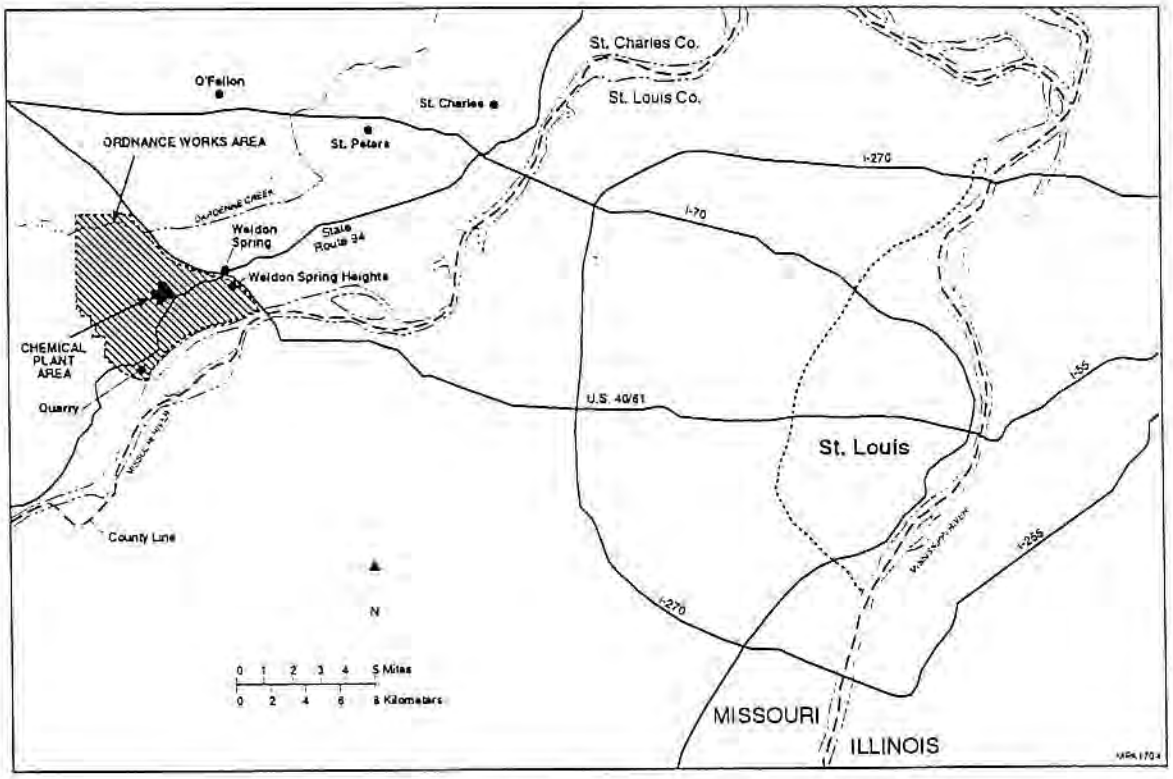


Figure 1. Location of the Weldon Spring Site

The chemical plant consisted of about 40 buildings. Process wastes from previous operations were piped to four raffinate pits covering about 10 ha (26 acres). Three dump areas (North, and South Dump and Ash Pond) totaling about 6 ha (15 acres) were used to dispose of solids such as drums, waste particulates, and building debris. The quarry was used by the Army and the Atomic Energy Commission to dispose of wastes from the 1940s through the 1960s. The EPA placed the quarry on its National Priorities List (NPL) in 1987 and the chemical plant in 1989.

The closest communities are Weldon Spring Heights and Weldon Spring, 3.2 km (2 mi) east and north of the chemical plant, with a combined population of about 850; the city of St. Charles with a population of 50,000 is 24 km (15 mi) northeast of the plant. The nearest residence is 1.6 km (1 mi) north of the plant site; two others are within 3.2 km (2 mi). A high school with more than 1,700 students and staff is 1 km (0.6 mi) east of the chemical plant. Production wells that provide drinking water to 63,000 residents are 1.6 km (1 mi) southeast of the quarry, in the floodplain of the Missouri River. An adjacent Army training area is also on the NPL, and surrounding land is managed as wildlife and recreational areas.

Current Understanding of Hazards and Risks

Cleanup at this site began in the late 1980s to address potentially serious risks. At that time, the primary hazards at the site were contaminated groundwater and surface water at the quarry. Uranium (detected at up to 3000 pCi/L in groundwater) could potentially migrate from the quarry toward the nearby well field. Surface water also contained arsenic, manganese, and 2,4-DNT at levels that exceeded drinking water standards. At the chemical plant, the raffinate pits contained relatively high levels of thorium (up to 34,000 pCi/g thorium-230), as well as radium and uranium (up to 1,700 pCi/g). Groundwater in the vicinity of the pits contained slightly elevated levels of uranium (less than 30 pCi/L). Inactive since the end of site operations, the chemical plant buildings were in serious disrepair and still contained relatively high levels of radionuclides (notably uranium) in addition to some hazardous chemicals (including polychlorinated biphenyls [PCBs] and lead).

A number of small-scale interim actions were begun in 1988 to remove safety hazards (e.g., fallen power lines) and reduce the levels of contamination (notably uranium) in surface runoff at the chemical plant (by building a diversion berm around Ash Pond). The DOE conducted several expedited response actions beginning in 1991 to address the main hazards at the site. These included treating surface water, excavating previously disposed of wastes and placing them in controlled storage, and decontaminating and dismantling the buildings. Most wastes generated by these actions were placed in controlled storage at the chemical plant area pending the comprehensive disposal decision for the site (a relatively small amount of liquid mixed 11e(2) waste has been sent to the Oak Ridge incinerator). The comprehensive disposition decision reached in 1993 called for on-site placement of site wastes in an engineered cell that includes a synthetic liner and leachate collection system and thick earthen/rock cover.

Interim actions at the Weldon Spring Site significantly reduced hazards and potential risks. Some of these actions include (1) pumping (surface) water out of the quarry pond (>15,000 m^3 [3 million gal]) -- to reduce the gradient for contaminant migration and allow the wastes in the quarry (the source of contamination) to be removed-- then treating the water to remove contaminants to levels that met drinking-water standards, at which point it was released to the Missouri River, (2) excavating contaminated debris, sludge, and soil from the quarry (92,000 m^3 [120,000 yd^3]), (3) decontaminating and dismantling the chemical plant buildings (>100,000 m^3 [130,000 yd^3]), and (4) pumping water out of the raffinate pits (230,000 m^3 [57 million gal]).

These interim actions have significantly reduced the risk of off-site contaminant migration and the potential for public exposure. Site access restrictions (fences and a security guard at the gate) and institutional controls prevent unauthorized access to the pit area to ensure that the remaining risk associated with the pit sludge was maintained at low levels while the sludge was removed and treated for disposal in the on-site cell. The major remaining risk concerns at the site are contaminated groundwater and residual soils in the pits. In addition to

radionuclides, the pit sludges contained nitrate and a limited amount of PCBs, and if left untreated, the unlined pits could have leached additional contamination into the groundwater. The raffinate pit waters have been pumped off and treated as part of an interim action, and the sludges and soils have been excavated and treated via a stabilization/solidification process in an onsite facility. Treated sludges and soils are being placed with other site wastes in the on-site engineered disposal facility.

End-State Disposition and Risk

The raffinate pit sludges (170,000 m^3), which represent the last major source of on-site contamination, have been removed, treated, and placed in the on-site disposal facility. Remaining contaminated soils will be excavated within the next year, and all closeout environmental remediation activities are expected to be completed in 2002. The total on-site disposal cell capacity is about 1 million m^3 (1.3 million yd^3). The cell covers an area of about 17 ha (41 acres).

The potential risks currently associated with groundwater from the chemical plant and quarry are low because no one is ingesting or otherwise using water that has been adversely impacted by the site and the source-control actions that will be completed by 2002 are expected to lower the contaminant levels in groundwater over time. The DOE will also continue to monitor the groundwater for an extended time to ensure continued safety of the public. A comprehensive long-term monitoring and surveillance program will be put in place, including regular reviews of the effectiveness of the risk-control measures, to ensure that the public and environment will be protected for the long term.

Upon completion of site cleanup, residual contaminant levels in site soil will be low and the land outside the disposal cell area could support residential use, including meeting EPA's action level of 4 pCi/L for indoor radon. (The soil contaminants for which these safe levels have been developed are: uranium, radium, thorium, PCBs, polycyclic aromatic hydrocarbons, arsenic, chromium, lead, thallium, and TNT.) Some portion of the site may be transferred to the State of Missouri for expansion of the surrounding wildlife area, and/or to the U.S. Army for expansion of their adjacent training area. The quarry area will be released for recreational use, about 63 ha (155 acres) of the former chemical plant will be released to the appropriate agency for permitted use, and the disposal cell area will remain under controlled access of the Federal government.

Table 1. Summary Risk Profile for the Weldon Spring Site[a]

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction and Control Measures	Anticipated Risk-Reduction Progress	End-State Disposition and Risk
11e(2) contaminated sludges & residues (chemical plant/pits, treatment plants)	110,000 m^3 of sludges and residues from raffinate pits at the chemical plant (most hazardous material on-site). The primary contaminants are thorium, uranium, and radium; concentrations are relatively high (to 20,000 pCi/g thorium).	These sludges are hazardous, but no exposures are occurring so there are no risks. Some contaminants have migrated from the pits; the primary release pathway is of concern is leaching to groundwater.	Access restrictions (fences and guards) and other controls manage risks to low levels. The pits were constructed with earthen berms, and they continue to be maintained as needed to prevent releases.	The sludges have been excavated, stabilized and mixed with a cementitious material and will be permanently entombed with other site wastes in the on-site cell.	Removal and treatment of the sludges has eliminated a primary source of groundwater contamination. Potential risks from any future public exposures to these sludges have also been eliminated.	These wastes will have been disposed of in the on-site facility, which will be maintained and monitored to ensure long-term protection. Possible future land use is as an extension of adjacent military training facilities or wildlife areas.
11e(2) debris (chemical plant and quarry)	190,000 m^3 debris resulting from D&D and consolidation activities includes equipment, building materials, and concrete rubble; primary contaminants are uranium, radium, thorium; levels are generally low.	This debris could potentially pose a risk, but it's in controlled storage with access restrictions and there are no current exposures. Airborne transport is the primary release pathway of concern during waste placement activities.	Site debris is consolidated in controlled storage pending disposal in the on-site cell. Some has been washed and volume-reduced. Access restrictions limit exposures.	This material will continue to be maintained in a safe condition in controlled storage. The final risk reduction measure will be placement of this debris in the engineered disposal facility on site.	Nearly all chemical plant structures have been dismantled; the limited ones remaining (to be down by 2001) aren't contaminated, so the remaining risk reduction to low levels will be from final disposal.	This material will be disposed of in the on-site facility, which will be maintained and monitored to ensure long-term protection of the public and environment. Likely possible future land use is as indicated above.
11e(2) groundwater & surface water	Groundwater beneath the chemical plant contains uranium (up to near the drinking water standard of 30 pCi/L), nitroaromatic compounds, nitrate and TCE, mainly from the raffinate pits. Pit water (initially 230,000 m^3 [57 million gal]) has similar contaminants. Groundwater beneath the quarry contains uranium up to 3000 pCi/L.	Risks associated with this water are low because no one has been (or is likely to be) exposed to any hazardous concentrations and major sources have been removed.	Two water treatment plants have been constructed and over 380,000 m^3 (94 million gal) of water have been treated to meet permitted release standards. Contamination sources have been removed and the well field is monitored to ensure safe conditions.	The surface (pit) water will continue to be treated to meet appropriate standards, with treated water being discharged to the Missouri River. (Excavation of and treatment of additional contaminated materials from the raffinate pits will further mitigate this potential source.)	Risks have already been significantly reduced per removal and treatment actions; some additional risk reduction will be achieved through final source control (removal of pit bottom material).	Removing contaminants from the water (leaving levels safe for public consumption) reduces risks from treated water to essentially zero, and contaminant levels in the water that remains are also low. Monitoring will be used to evaluate groundwater prior to site release. Likely possible future land use is as indicated above.

Table 1. Summary Risk Profile for the Weldon Spring Site[a]

Material Category	Nature of Hazard	Nature of Potential Risk	Status of Current Risk Management	Planned Risk Reduction and Control Measures	Anticipated Risk-Reduction Progress	End-State Disposition and Risk
11e(2) contaminated soils (chemical plant and quarry)	480,000 m^3 (620,000 yd^3) soil from the chemical plant and 92,000 m^3 (120,000 yd^3) soil from the quarry are currently in controlled storage at the chemical plant. Primary contaminants are uranium, radium, thorium, and limited nitroaromatic compounds and PCBs. Levels are generally low.	These materials do not pose a significant risk because they are in controlled storage, levels are relatively low, and there are no public exposures to any hazardous concentrations. The primary release pathway of concern was leaching to groundwater.	Access restrictions are in place (the area is guarded and fenced) to manage risks to low levels. The groundwater concern is being mitigated by excavation (and some treatment) of these contaminated soils.	The remaining contaminated soil (e.g., beneath the pits) is to be excavated, treated, and disposed of in the on site disposal cell.	The excavation was essentially completed in 1998. Concentrations were reduced to near background levels.	This soil will be disposed in the on-site facility, which will be maintained and monitored to ensure long-term protection of the public and environment. Likely possible future land use is as indicated above.
HAZ solids and Mixed 11e(2) liquids	14 m^3 of hazardous components are comprised primarily of asbestos wastes removed during D&D activities in the buildings.	These materials have been in controlled storage in on-site facilities. Risks to site workers have been controlled to safe levels, and no member of the public is being exposed.	This material is in controlled storage and site access is restricted, so there are essentially no risks. Liquid wastes were sent to the Oak Ridge incinerator.	The asbestos has been packaged and placed in the permanent disposal facility on site.	The asbestos has been disposed of in the on-site facility, which eliminates the risk associated with these materials.	Placement of this waste in the engineered on-site facility limits the potential for any future exposures and maintains risks at low levels; land use is discussed above.

[a] Volumes have been rounded to two significant figures to simplify the presentation.

BACKGROUND INFORMATION FOR OPERABLE UNIT STRATEGY OVERVIEW

PADUCAH
REMEDIAL ACTION STRATEGY

SSAB BRIEFING

MAY 13, 1999

BACKGROUND

BACKGROUND

- Under the original strategy known areas of contamination were designated as SWMUs and grouped into waste area groups (WAGs) based on common characteristics such as:
  - geographic locations
  - contaminants
  - media
  - release mechanisms
  - operational status
  - remedial technologies
- WAGs were then prioritized for RI/FSs based on their contribution to off-site contamination
- Sixteen WAGs containing low-risk sources were being proposed for site evaluations prior to the scheduled RI/FS in an attempt to reach early NFA decisions

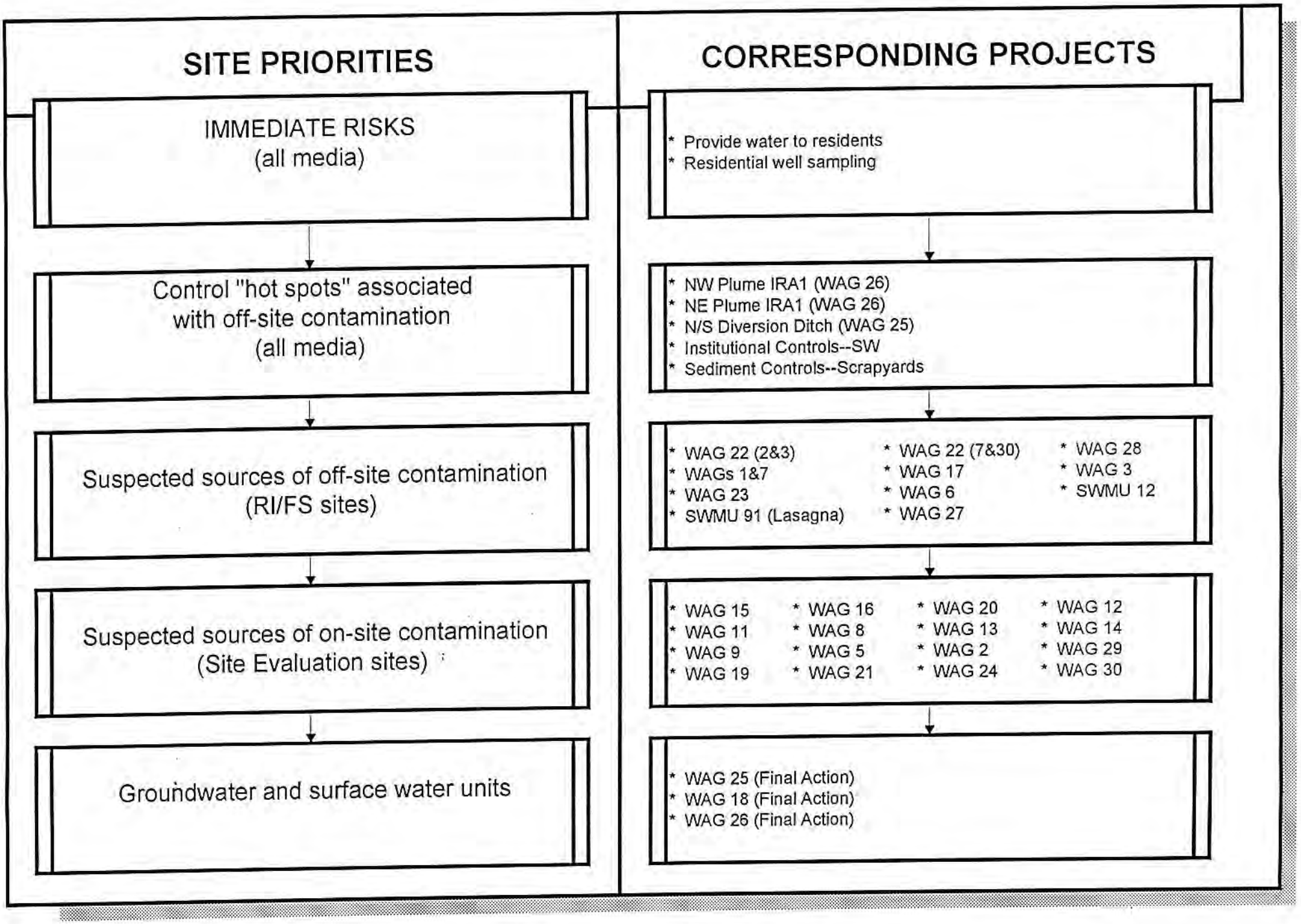


Figure 3.3. Site priorities and corresponding projects.

BACKGROUND

- Recently completed significant revisions to strategy to incorporate:
  - Expected efficiencies from new M&I Contract
  - Regulator and stakeholder comments on the "Paths to Closure" document
  - Recommendations from a recent internal assessment

- Concerns associated with original strategy include:
  - Significant amount of resources being consumed by paperwork
  - Reduced opportunity to benefit from regional approaches and economies of scale
  - Did not recognize interdependencies between the sources and affected media
  - Easier to defer Paducah work during budget resequencing
  - Did not provide an adequate framework for evaluating cumulative risks
  - Emphasized a SWMU-by-SWMU approach resulting in "piece-meal" remediation, potentially omitting large geographic areas

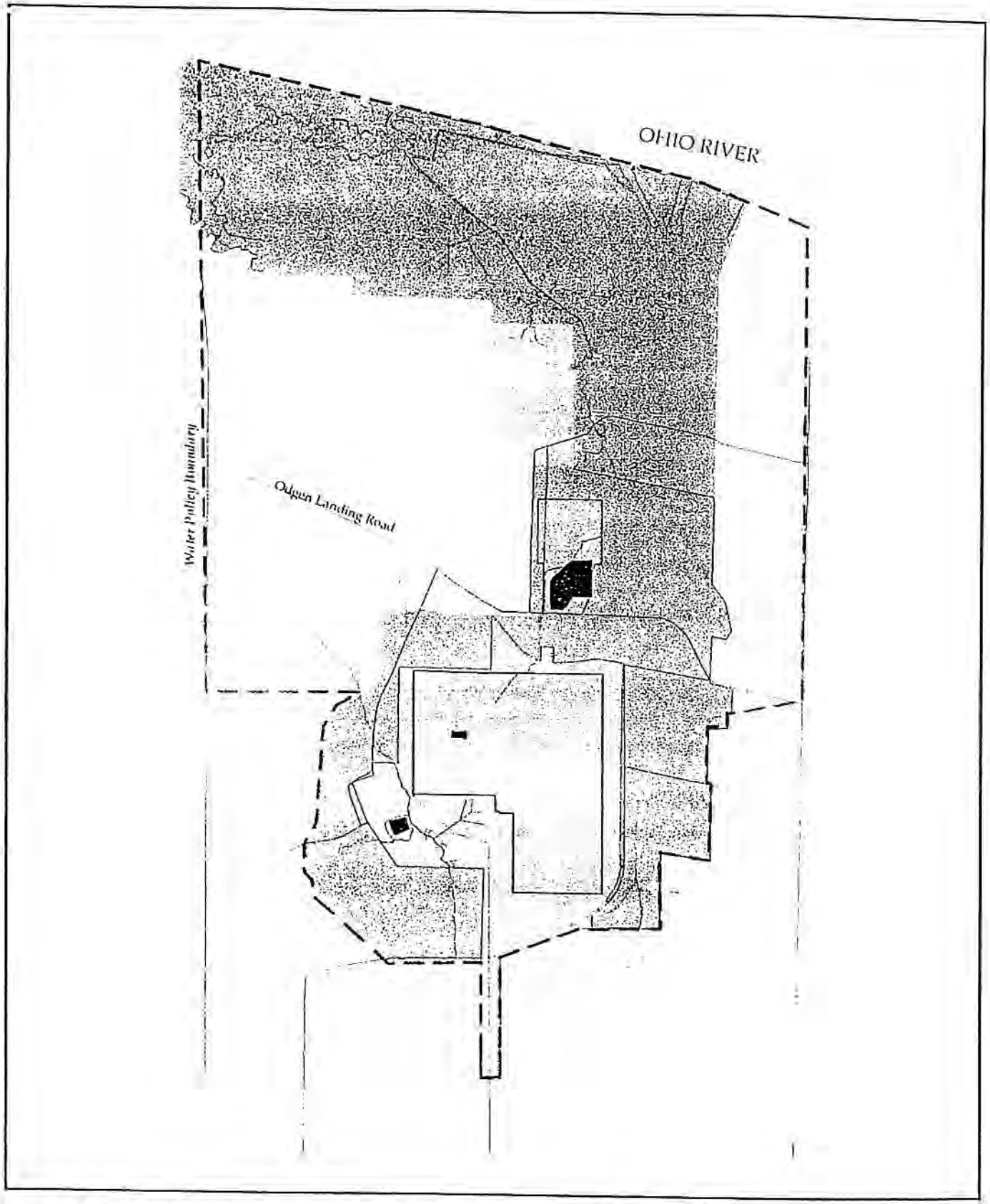
BACKGROUND

- Highlights associated with revised strategy include:
  - Focuses efforts on accomplishing site-wide remedial objectives, as opposed to SWMU-by-SWMU remediation
  - Accelerates overall cleanup by approximately four years beyond the original FFA schedule, including:
    - acceleration of groundwater by five years
    - acceleration of surface water by two and one-half years
  - Projected to result in approximately $50M in cost savings from gained efficiencies and reduced documentation costs
  - Redirects cost savings into fieldwork and more aggressive cleanup actions

SITE REMEDIAL OBJECTIVES

SITE REMEDIAL OBJECTIVES

- **Protect Human Health and Environment:**
  - **Who** are we trying to protect--receptors?
  - **Where** do we need to be protective--points of exposure?
- Understanding current and future land use is the key element to developing a protective remediation strategy

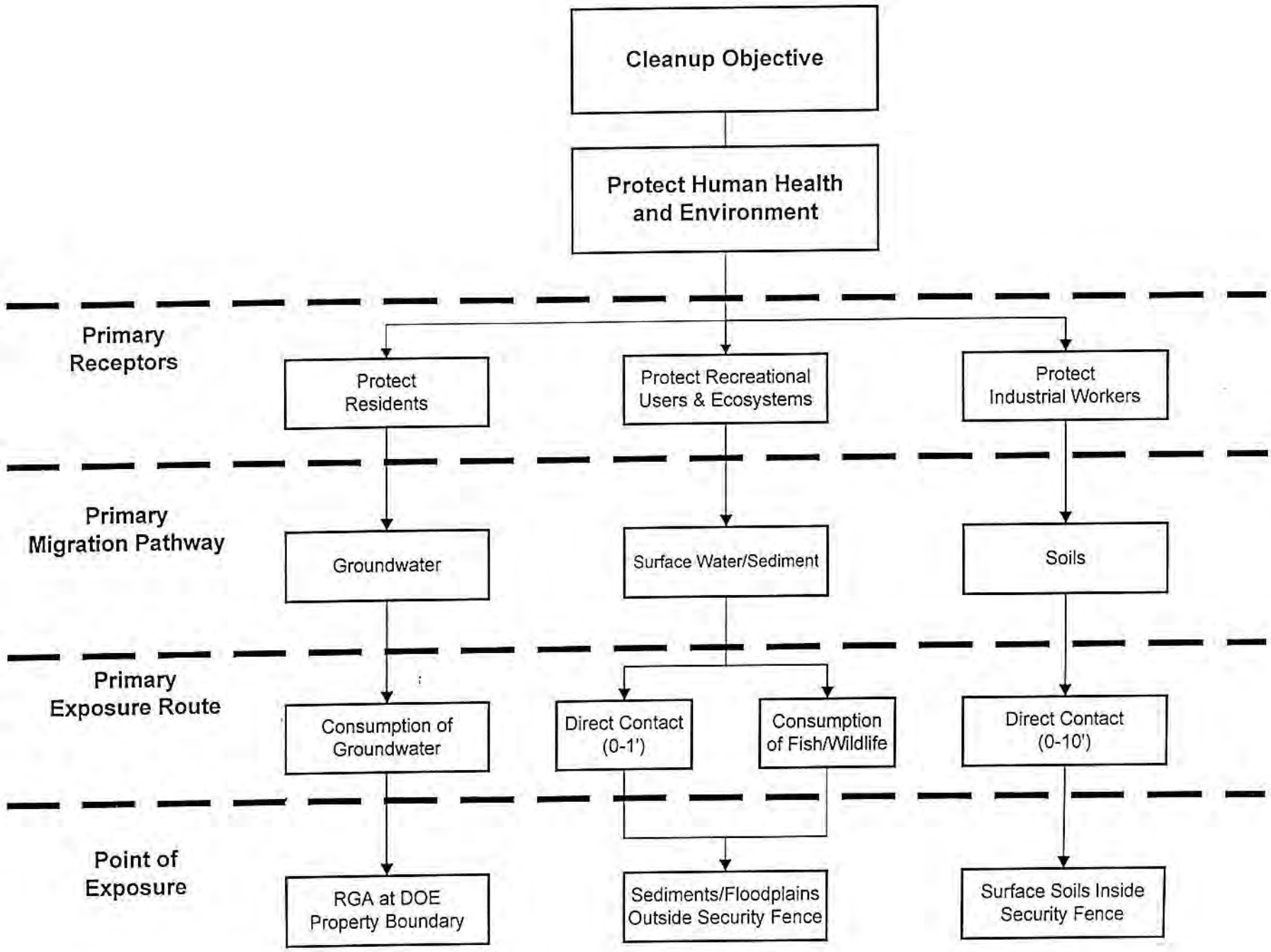


Mixed Industrial/Recreational
Current Use

2000 0 2000 4000 Feet

Controlled Access
PGDP Fence
DOE owned Industrial Area
DOE property leased to KDWLR
WKWM owned by KDWLR

Figure 3-3 Land Use


Cleanup Objective
Protect Human Health and Environment
Primary Receptors
Protect Residents
Protect Recreational Users & Ecosystems
Protect Industrial Workers
Primary Migration Pathway
Groundwater
Surface Water/Sediment
Soils
Primary Exposure Route
Consumption of Groundwater
Direct Contact (0-1')
Consumption of Fish/Wildlife
Direct Contact (0-10')
Point of Exposure
RGA at DOE Property Boundary
Sediments/Floodplains Outside Security Fence
Surface Soils Inside Security Fence

OPERABLE UNITS AND PRIORITIES

OPERABLE UNITS

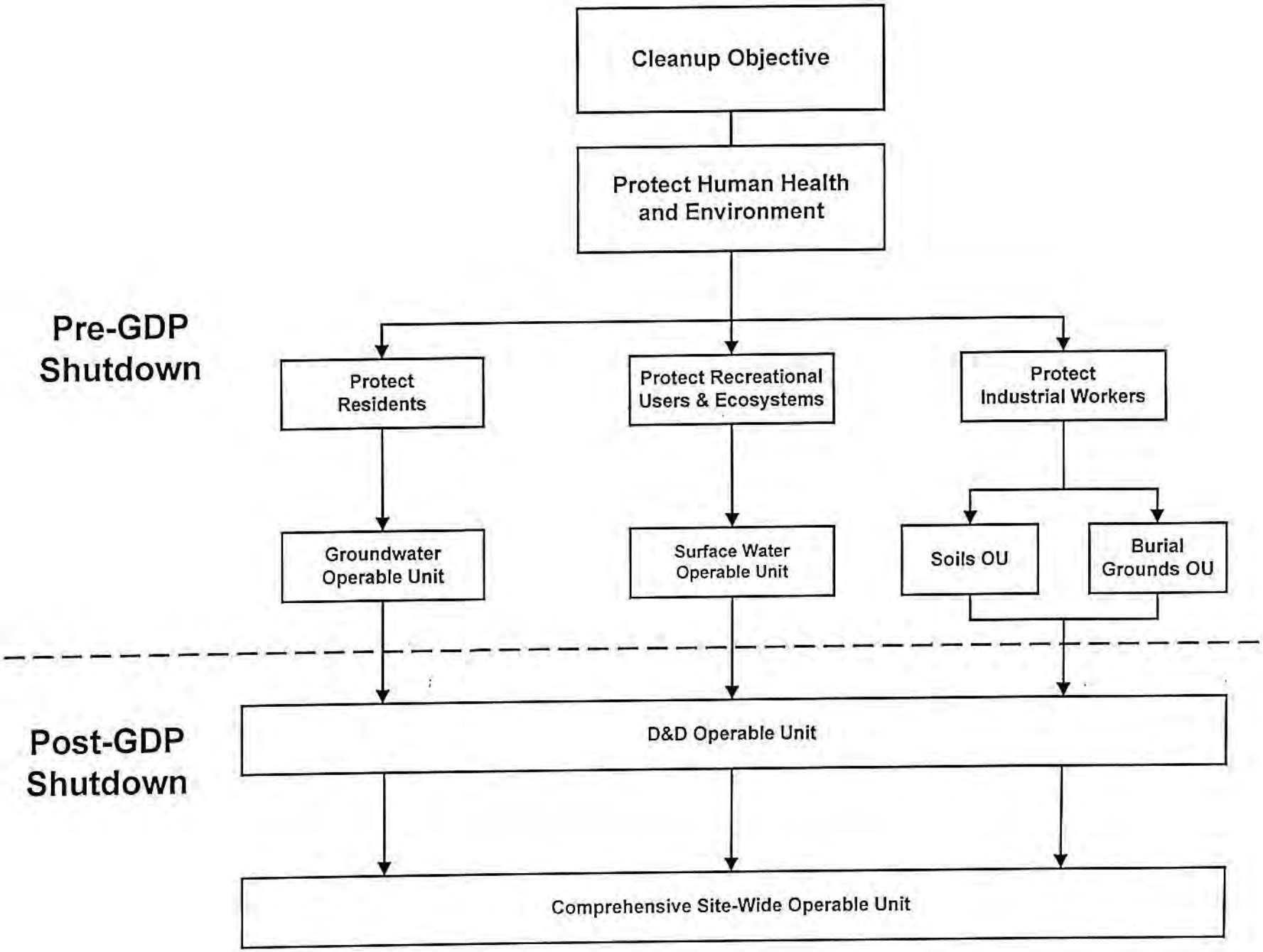
- Intent is to initially address the **obvious** site problems through expedited interim actions focused on specific exposure pathways

- WAGs or SWMUs were segregated into operable units based on their potential contribution to a specific exposure pathway

- Some SWMUs were considered potential contributors to multiple pathways and were assigned to two different OUs

- RI/FS data collection and remedial decision for each OU will focus on COCs and exposure routes corresponding to a specific remedial objective, but:
  - Sampling strategies will be flexible to address unique situations and minimize the need for multiple sampling events under separate OUs
  - Cleanup standards for a specific OU should also be protective of other exposure scenarios when applicable

- A comprehensive site-wide OU will be conducted after completion of the specific OUs to evaluate residual risks and cumulative effects from all media



h:home\onz\visio\Clenobj3

SITE PRIORITIES	CORRESPONDING PROJECTS	PRIMARY CONTAMINANTS[1]
GROUNDWATER OU	WAG 6 WAG 27 WAG 28 WAG 22 (7&30) WAG 26 *SWMU 59*	- TCE - Tc-99
SURFACE WATER OU	SWMU 70 SWMU 71 WAG 8 C-340 Area SWMUs 58&59 SWMU 67 SWMU 168 SWMU 102 Internal Ditches WAG 18 WAG 25 WAG 12 WAG 13	- PCBs - Radionuclides - Metals
SOILS OU	WAGs 9&11 WAGs 16&19 WAG 20&21 WAG 2 WAG 23 WAG 6 WAG 27 WAG 29 WAG 28 Site-Wide PCBs Site-Wide Uranium WAG 30 *WAG 5*	- PCBs - Radionuclides - Metals
BURIAL GROUNDS OU	WAG 22 (7&30) WAG 3 WAG 24 WAG 14 WAG 22 (2)[2]	- PCBs - Radionuclides - TCE - Metals
D&D OU	Facility Decommissioning Facility Decontamination D&D-Related Soils	- All of the above
COMPREHENSIVE SITE-WIDE OU	Groundwater OU Surface Water OU Soils OU Burial Grounds OU D&D OU	- All of the above

Note: [1]Other contaminates of concern will be evaluated and considered furing RI/FS scoping for each OU.

Surface Water Operable Unit RI/FS Workplan Scoping Document

April 15, 1999

Raul Castaneda
Department of Energy

Project Team

Raul Castaneda.....DOE Program Manager
Chris Marshall....Bechtel Jacobs Program Manager
Gary Reside.....Jacob EM Team Members
Richard Bonczek.....University of Tennessee

Surface Water Operable Unit FY 99 Activities and Deliverables

- Submit the D1 RI/FS Scoping Document to EPA & KDEP.....3/30/99
- EPA & KDEP Review.....3/30/99 to 4/13/99
- RI/FS Scoping Meeting.....4/14-15/99
- Submit D1 RI/FS Workplan to EPA & KDEP.....9/30/99

RI/FS Scoping Document

Due to the complexity of the SWOU project, the Scoping Document was prepared to provide a strategy for preparing the RI/FS WP & conducting the RI/FS

The document consists of the following main sections:

- Surface Water Operable Unit Scope
- Data Quality Objectives
- Review of the Historic Data Base
- Conceptual Site Model
- Applicable Relevant and Appropriate Requirements

Introduction

- Outlines the Operable Unit strategy in relationship to the SWOU;
- Defines the purpose of the investigation;
- Presents a draft Problem Statement; and
- Provides a SWOU conceptual model for the flow pathway of the source units to the receiving units (ditches and creeks) .

Historical Activities

- Provides a list of the past investigations which have been conducted at PGDP. These investigations are included in the SWOU database;
- Summarizes the five large scale studies which have been conducted on the SWOU; and
- Describes the remedial actions taken at PGDP which effected the SWOU.

Investigation Boundaries and Conceptual Models

- Boundaries of the Investigation
  - Big Bayou Creek Watershed
  - Little Bayou Creek Watershed
  - Internal Plant Ditches
  - SWMU Boundaries of the identified Sources
- Division of the SWOU into reaches for investigation. These reaches are based upon KPDES drainage and the Biological Monitoring Program.
- Conceptual Site Model of Physical Processes
- Human Health Conceptual Site Model
- Ecological Conceptual Site Model

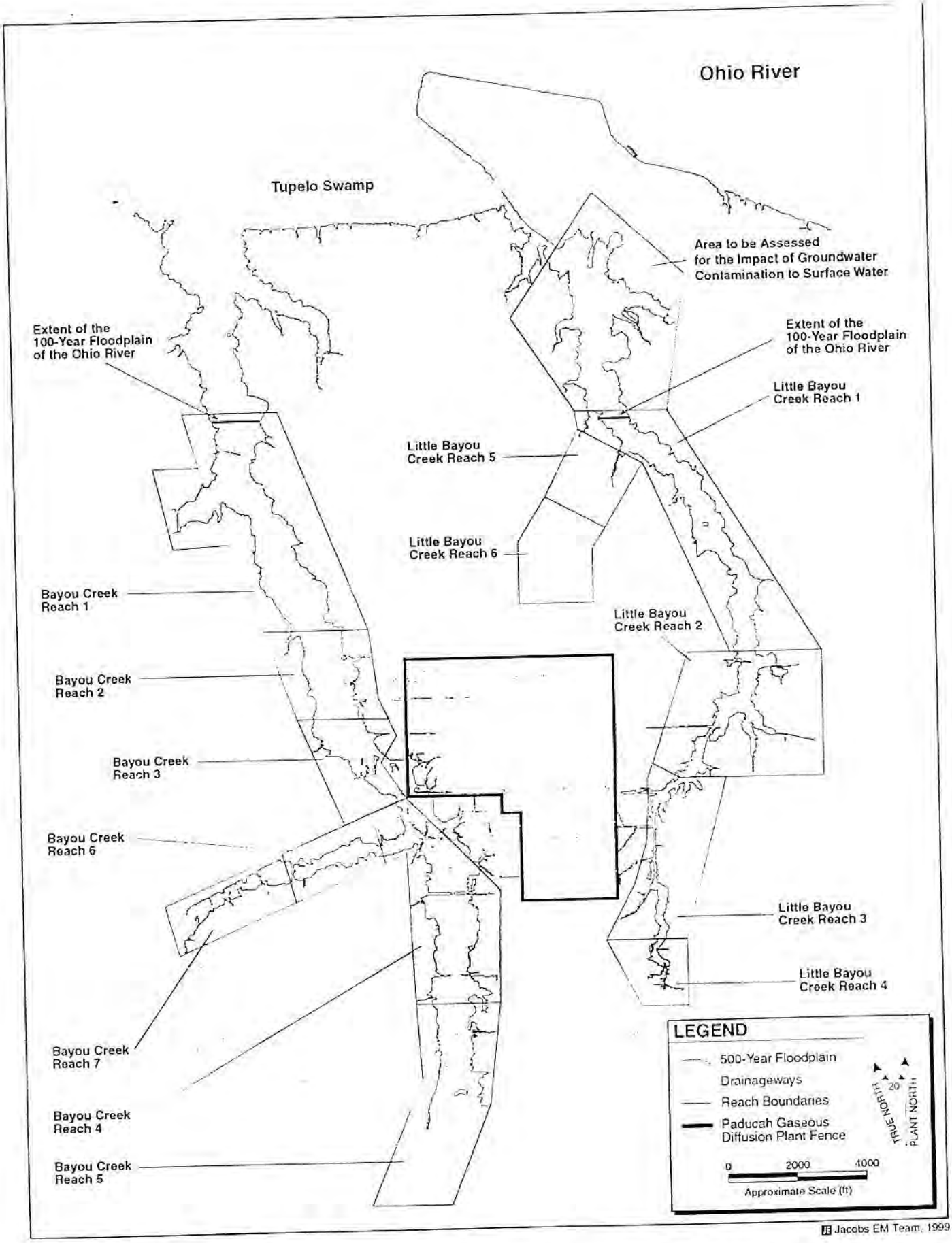


Figure 3-2. Extent of the 500-Year Floodplain for Bayou and Little Bayou Creeks and the 100-Year Floodplain for the Ohio River in the Area of the Paducah Gaseous Diffusion Plant

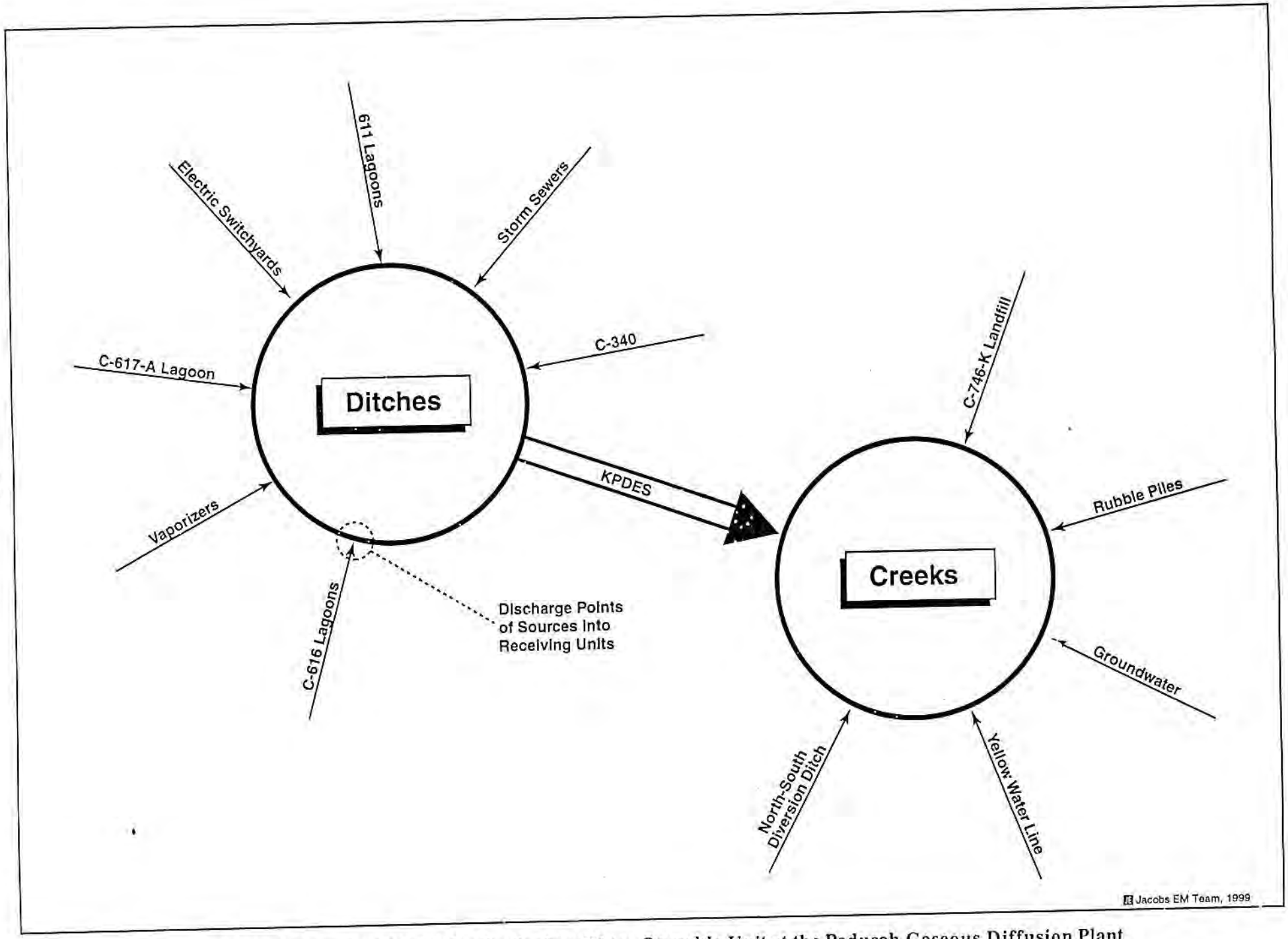


Figure 1-3. Site Conceptual Model for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant

Decision Rules

- The Draft Decision rules are as follows:
  - Nature
  - Reference Levels
  - Ecological Risk: Piscivores
  - Ecological Risk: Soil Invertebrates
  - Ecological Risk: Terrestrial Plants
  - Ecological Risk: Terrestrial Vermivores
  - Ecological Risk: Terrestrial Carnivores
  - Ecological Risk: Wetland Function
  - Human Health Risk: Industrial
  - Investigation-Derived Waste
  - Data Evaluation Rules
  - Extent
  - Ecological Risk: Fish
  - Ecological Risk Aquatic Invertebrates
  - Ecological Risk: Soil Microbes
  - Ecological Risk: Terrestrial Herbivores
  - Ecological Risk: Terrestrial Omnivores
  - Ecological Risk: T & E Species
  - Human Health Risk: Recreational
  - Human Health Risk: Agricultural
  - Remediation Screening

Current Database

- Provides a general overview of the sources of data incorporated in the SWOU database
- A *draft* list of priority contaminants to assist in review of the data needs.
- Figures and tables that show the distribution of specific priority contaminants by reach to assist in the review of the database.
- Will incorporate database from sources to assist in investigation of contribution of sources to receiving units

Preliminary Characterization with Historical Data

- Presents a preliminary evaluation of the SWOU database, (as presented in Section 5), to assess contaminant fate and transport.
- Provides a scoping-level assessment of individual priority contamiants throughout the length of the creeks.

Applicable or Relevant and Appropriate Requirements

- Chemical-Specific ARARs
  - Surface Water
  - Sediment
  - All Exposure Pathways - Radiation Protection
  -
- Location-Specific ARARs
  - Protection of Wetlands
  - Protection of Floodplains
  - Discharge of Dredged or Fill Material
  - Protection of Fish and Wildlife
  - Protection of T & E Species
  - Protection of Cultural Resources

TEAM BUILDING

4/15/99

Subcommittee members: Vicki Jones, Greg Waldrop, Jim Smart

WHY?

* Increase effectiveness of the board as a whole.
* Emphasize values and the search for agreement, maintaining a balance between technical and policy orientations.
* Set a conducive atmosphere for work, creating a productive environment, and encouraging member participation.
* Develop a sense of "group" and promote consensus building.

RECOMMENDATIONS:

(1) Members need to feel what they're doing is important => set up subcommittee to explore increased community involvement (TV, newspaper, public engagement, outreach, etc.). Prepare a list of media sources and stakeholders.

(2) Move meeting start time to 6 PM. Offer mixer/refreshments from 5:30 - 6 PM. Set up 3 groups with rotating members (board and ex officio members) to encourage interaction.

(3) Identify and hire local person (technical manager-type) familiar with plant and community to help assimilate information for board members (review, summarize, and prioritize issues). 20 hr/wk

(4) Offer more tours (3 - 4 a year) in lieu of a meeting to remain familiar with equipment and new progress in remedial areas.

(5) Improve integration of new members (tours, slow release of prioritized material, new member orientation packet).

(6) Each board meeting, an existing member to spend 5 - 10 minutes covering past, current, and future goals of a particular area/issue.

Bechtel Jacobs Company LLC

Paducah Project

07-Apr-99
9:17 AM

Site Specific Advisory Board

Actual Costs to Date thru
March, 1999: $ 94,080

Participant	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
Bechtel Jacobs Company LLC	3,508	176	(176)	42	42	88	87	0	0	0	0	0	0	260
BJC Sub. - Roberts & Kay, Inc.	15,570	0	1,292	1,186	0	1,202	1,015	0	0	0	0	0	0	4,696
BJC Sub. - Jacobs Engineering Group	19,713	0	0	10,171	2,996	3,204	19,669	0	0	0	0	0	0	36,040
Overhead	7,979	51	160	2,601	611	352	2,540	0	0	0	0	0	0	6,314
Total Project	46,770	227	1,276	14,001	3,649	4,846	23,311	0	0	0	0	0	0	47,310

Bechtel Jacobs Company LLC
Paducah Project

07-Apr-99
9:17 AM

Participant	Description	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Engineering Cost Center	OR - Ron Wells - Task Support	858	84	(84)	42	42	88	87	0	0	0	0	0	0	260
BJC Procurement	Contract Work	982	92	(92)	0	0	0	0	0	0	0	0	0	0	0
BJC Project Controls	Project Analyst/Finance Officer Support	829	0	0	0	0	0	0	0	0	0	0	0	0	0
SSAB - Misc Expenses	ents, Food, Sound Recording, Public Notice, et	840	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project		3,508	176	(176)	42	42	88	87	0	0	0	0	0	0	260

Roberts & Kay, Inc.
Paducah Project

07-Apr-99
9:17 AM

Material Charge Number
54 / P / JEC04

Participant	Type of Service	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Sub. - Roberts & Kay, Inc. (Payments)	Subcontractor Independent	13,033	0	1,292	1,186	0	1,202	1,015	0	0	0	0	0	0	4,696
BJC Sub. - Roberts & Kay, Inc. (Accruals)	Facilitator to the SSAB	2,537	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project		15,570	0	1,292	1,186	0	1,202	1,015	0	0	0	0	0	0	4,696

Jacobs Engineering Group, Inc.
Paducah Project

07-Apr-99
9:17 AM

TASK NUMBER:
35 - H831 - 48

Participant	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
BJC Sub. - Jacobs Engineering (Payments)	8,381	0	0	1,402	3,836	3,694	3,161	0	0	0	0	0	0	12,094
BJC Sub. - Jacobs Engineering (Accruals)	11,332	0	0	8,769	(840)	(490)	16,507	0	0	0	0	0	0	23,946
Total Project	19,713	0	0	10,171	2,996	3,204	19,669	0	0	0	0	0	0	36,040

INVOICES

35-H831-48 Statement of Cost - Voucher Number: N/A
Total Amount Due $ 107.00 **PAID - JUNE**

35-H831-48 Statement of Cost	Voucher Number: 59	Voucher Number: 60	Voucher Number: 61	Voucher Number: 62	Voucher Number: 63	Voucher Number: 64	Voucher Number: 65	Voucher Number: 66
LABOR @ Office	95.63	107.58	234.49	46.26	439.87	495.27	386.97	286.59
LABOR @ Site	182.28	130.21	294.94	286.75	477.19	870.92	1,468.86	763.57
Teaming Subcontractors: PAI Corporation	258.03	680.28	1102.53	950.04	0.00	1570.63	1,013.77	754.99
Other Direct Costs	1,195.00	16.21	2706.46	94.80	485.07	899.24	824.41	1356.22
Amounts Previously Invoiced	(137.76)	0.00	0.00	0.00				
Total Amount Due	$ 1,593.18	$934.28	$4,338.42	$1,377.85	$1,402.13	$3,836.06	$3,694.01	$3,161.37
	PAID - JULY	**PAID - SEPT**	**PAID - SEPT**	**PAID - SEPT**	**PAID - DEC**	**PAID - JAN**	**PAID - FEB**	**PAID - MAR**

Overhead

07-Apr-99
9:17 AM

Participant	Prior Year	Actual OCT	Actual NOV	Actual DEC	Actual JAN	Actual FEB	Actual MAR	Actual APR	Actual MAY	Actual JUNE	Actual JULY	Actual AUG	Actual SEPT	TOTAL FY 99
OVERHEAD	7,979	51	160	2,601	611	352	2,540	0	0	0	0	0	0	6,314
Total Project	7,979	51	160	2,601	611	352	2,540	0	0	0	0	0	0	6,314

JACOBS EM TEAM

Paducah Project

TASK NUMBER: 35 - T081 - 48

BUDGETED BASELINE (BCWS) FY1999

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Hours	73	74	80	74	73	82	73	74	80	74	74	82	913
Cumulative Hours	73	147	227	301	374	456	529	603	683	757	831	913	913
$	$7,057	$7,096	$7,376	$7,096	$7,057	$7,441	$7,057	$7,096	$7,376	$7,096	$7,145	$7,417	$86,310
Cumulative $	$7,057	$14,153	$21,529	$28,625	$35,682	$43,123	$50,180	$57,276	$64,652	$71,748	$78,893	$86,310	$86,310

ACTUAL COSTS (ACWP)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Hours	84	87	98	77	126								472
Cumulative Hours	84	171	269	346	472								
$	$2,973	$3,279	$3,435	$3,544	$7,208								$20,439
Cumulative $	$2,973	$6,252	$9,687	$13,231	$20,439								

CUMULATIVE COST VARIANCE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
(BCWS - ACWP)	$4,084	$7,901	$11,842	$15,394	$15,243								

Apr-05-1999

JACOBS EM TEAM

Paducah Project

TASK NUMBER: 35 - T081 - 48

DISCIPLINE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
ISS	47	32	18	22	62								181
CIS/GRA	1	18	34	18	12								83
CLC	14	12	13	9	14								62
PCT	10	9	8	7	6								40
TSM	4	4	8	2	6								24
TEC	3	2	7	8	6								26
SMG	2	2	4	2	4								14
QAS/HLS	1	4	3	3	12								23
CTA	0	4	3	0	0								7
DCT	2	0	0	6	4								12
TOTAL	84	87	98	77	126								472

ISS	INFORMATION SYSTEMS SPECIALIST (Shelley Hawkins)
TSM	TASK MANAGER (Patricia Barnhill)
PCT	PROJECT CONTROLS SPECIALIST (Cheryl Cardwell)
TEC	TECHNICAL EDITOR (Judy Jackson)
CLC	CLERICAL (Darlene Miller)
SMG	SITE MANAGER (Bruce Phillips)
DCT	DOCUMENT CONTROL (Shirley Speer)
CIS/GRA	COMPUTER INFORMATION SPECIALIST / GRAPHICS (Derek Jones)
CTA	CONTRACTS (Jill Armstrong, Kathy Collins)
QAS/HLS	QUALITY / HEALTH & SAFETY (Ava Siener)

Apr-05-1999

Paducah ITRD Project
Technical Advisory Team

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Richards	Walt	Bechtel Jacobs Co.	761 Veterans Blvd.	Kevil	KY	42053	502-441-5189	502-441-5149	wr7@oml.gov
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Redfield	Bill	Systematic Management Services, DOE Site Office	P.O. Box 1410, 5600 Hobbs Rd.	Paducah	KY	42001	502-441-6805	502-441-6825	redfieldwjr@oml.gov
Maudlin	Sarah	Jacobs EM Team	175 Freedom Blvd.	Kevil	KY	42053	502-462-2550	502-462-2551	sarah.maudlin@jacobs.com
Davis	Kenneth	Jacobs EM Team	175 Freedom Blvd.	Kevil	KY	42053	502-462-2550	502-462-2551	Ken.Davis@jacobs.com
Hightower	Mike	Sandia National Laboratories	P.O. Box 5800, MS 0755	Albuquerque	NM	87185-0755	505-844-5499	505-844-0968	mmhight@sandia.gov
Kuzio	Kenneth	Sandia National Laboratories	P.O. Box 5800, MS 0720	Albuquerque	NM	87185-0720	505-284-3145	505-844-1480	kakuzio@sandia.gov
Gerrick	Doug	TechCon/Argonne National Laboratory	622 Park Ave.	Newport	KY	41071	606-291-7794	606-291-7554	dmg@fuse.net
Pflug	Dale	TechCon/Argonne National Laboratory	9700 S. Cass Ave., EAD-900	Argonne	IL	60439-4832	630-252-6682	630-252-6414	dpflug@anl.gov
Redfield	Myrna	US Department of Energy, Paducah Site Office	P.O. Box 1410	Paducah	KY	42001	502-441-6815	502-441-6801	redfieldme@oml.gov
Morgan	John W.	Bechtel Jacobs Co.	761 Veterans Blvd.	Kevil	KY	42053	502-441-5069	502-441-5154	morganjw@bechteljacobs.org
Douthitt	Jeff	GEO Consultants, LLC	P.O. Box 488	West Paducah	KY	42086	502-534-0033	502-534-0004	geocon@sunsix.infi.net
Dollins	Dave	US Department of Energy, Paducah Site Office	P.O. Box 1410	Paducah	KY	42001	502-441-6819	502-441-6801	dollinsdw@oml.gov
Wood	Lynn	US EPA	P.O. Box 1198	Ada	OK	74820	580-436-8552	580-436-8582	wood.lynn@epa.gov
Sheppard	John	US Department of Energy, Paducah Site Office	P.O. Box 1410	Paducah	KY	42001	502-441-6804	502-441-6801	sheppardjd@oml.gov
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de Percin	Paul	US EPA, NRMRL	26 West Martin Luther King Dr.	Cincinnati	OH	45268	513-569-7797	513-569-7620	dePercin.Paul@EPAMail.epa.gov
McKenna	Sean	Sandia National Laboratories	P.O. Box 5800, MS 0735	Albuquerque	NM	87185-0735	505-844-2450	505-844-4426	samcken@sandia.gov
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Morti	Eric	Bechtel Jacobs Co.	761 Veterans Blvd.	Kevil	KY	42053	502-441-5089	502-441-5064	e22@oml.gov
Vickers	Al	Clean Sites Environmental Services, Inc.	1289 N. Fordham Blvd., Suite A	Chappel Hill	NC	27514	919-929-0011	919-929-3005	alvickers@earthlink.net
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Yager	Kathy	US EPA, Technology Innovation Office	2890 Woodbridge Ave., Bldg. 18, MS 101	Edison	NJ	08837	703-603-1237		yager.kathleen@epa.gov
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EPA speeds technology implementation

The ITRD program—with government, industry, and regulatory agencies working together—chooses promising remediation technologies. Cost and performance data are developed for these using small one- and two-acre sites.

M. Michael Hightower

Common barriers block the use of innovative remediation technologies. These barriers include the lack of validated full-scale cost and performance data for these technologies, a lack of industry and regulatory involvement in technology evaluations, and the fear of penalties or fines for delays or failure of a new technology to meet required cleanup levels. The Innovative Treatment Remediation Demonstration (ITRD) Program at the U.S. Department of Energy's (DOE's) Sandia National Laboratories was initiated in 1993 in cooperation with the U.S. Environmental Protection Agency's (EPA's) Technology Innovation Office in an attempt to reduce these barriers and accelerate the implementation of innovative remediation technologies.

The ITRD program is based on a public–private technology demonstration concept that improves communications and teamwork among key participants (Figure 1). Government, industry, and regulatory agencies are directly involved in assessing, implementing, and evaluating innovative technologies. Sandia National Laboratories, as technical coordinator for the ITRD Program, is responsible for forming advisory groups for each project. Groups are composed of technical representatives from DOE and the national laboratories, EPA and its laboratories, user industries with similar problems, and state and federal regulatory agencies.

The innovative technologies considered for evaluation by the ITRD program lack the cost and performance information that would otherwise permit their full consideration as remedial alternatives. These technologies have often shown promise in pilot-scale applications but have limited full-scale data. Some examples in this category include

- bioremediation,
- in situ dynamic stripping,
- soil washing and soil flushing,
- solvent and surfactant extraction and chemical treatment,
- in situ passive treatment, and
- advanced physical separation techniques.

After applicable innovative technologies for a particular site are carefully reviewed, treatment studies and engineering evaluations of technology cost and performance estimates are conducted. The advisory group then recommends the best remediation technology options for that site considering cost, performance, and regulatory issues.

The technologies selected for implementation are used to completely remediate small, one- to two-acre sites. The operations, treatment performance, and cost are closely monitored by the advisory group. This information provides the participating government, industry, and regulatory entities with the necessary full-scale operational and evaluation data to validate the performance of these new technologies. In turn, validation by the independent technical group ultimately accelerates the technologies' acceptance and use at other sites within DOE and across the nation.

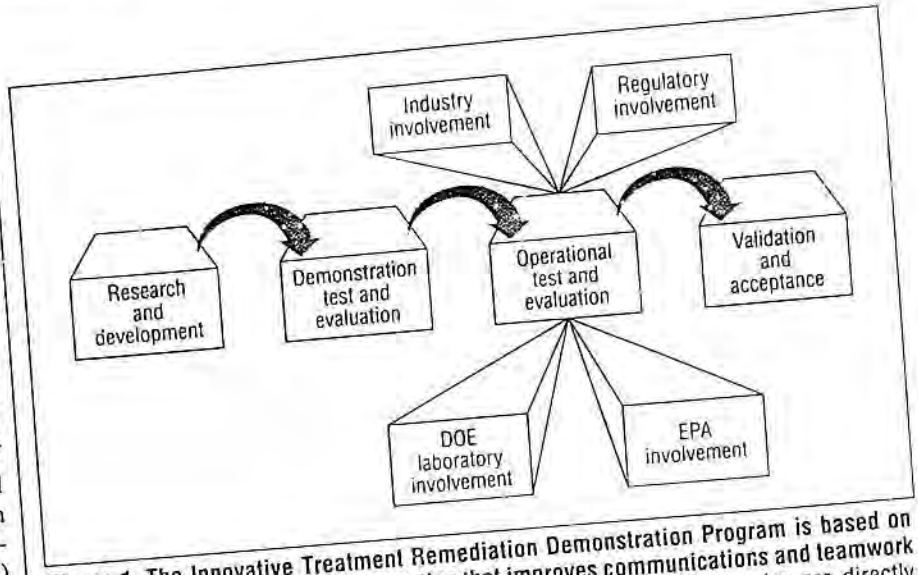

Figure 1. **The Innovative Treatment Remediation Demonstration Program is based on public–private technology demonstration that improves communications and teamwork among key participants.** Government, industry, and regulatory agencies are directly involved in assessing, implementing, and evaluating innovative technologies. DOE, U.S. Department of Energy; EPA, U.S. Environmental Protection Agency.

The author is with Sandia National Laboratories.

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Mike Hightower
PMTS

January 11, 1999

John Sheppard
Department of Energy
P. O. Box 1410
Paducah, KY 42001

Dear John,

An agreement has been reached to proceed with an Innovative Treatment Remediation Demonstration (ITRD) project at DOE's Paducah Plant. The project will look at the application of innovative technologies for the remediation of TCE and technicium in groundwater and primary sources to contamination of the groundwater. The site includes large dissolved phase plumes and large suspected DNAPL source areas that need to be addressed.

As technical coordinator of the ITRD program, Sandia National Laboratories is responsible for organizing and coordinating the efforts of a technical advisory group. Participants will consist of technical experts selected from federal agencies, including the DOE, and EPA, industry, and state and federal regulatory agencies. The group will help identify and suggest enhancements to baseline pump and treat technologies for consideration in remedial actions at the site.

The tentative schedule for this project includes monthly meetings or conference calls through August 1999 to identify and assess new technologies and to make appropriate technology suggestions. Necessary treatability or pilot studies needed to address site specific conditions will be conducted as a follow-on as needed. Assistance and review will be provided as requested through the design, construction, and operation of the system. The group will also help review the operational cost/performance data of the technologies selected for application.

You have expressed interest in the Paducah ITRD Project as a technical group participant. As a participant in this project, we ask your assistance in identifying appropriate innovative technologies, evaluating technical concepts, and assessing remediation data. Benefits of participation will include information on innovative and emerging technologies; access to technology cost/performance data; and interaction with technical, regulatory, and industrial contacts from across the country.

The TechCon Program

Linking the Public and Private Sectors for Environmental Remediation Gains

http://www.ead.anl.gov/~techcon/index.html

TechCon is a Department of Energy (DOE) Program connecting DOE's site-specific environmental management needs with private industry capabilities and public sector experience. To facilitate the connection, TechCon solicits information from private industry and the public sector about solutions to specific remediation project opportunities within the DOE complex. The TechCon Web site lets companies review a list of current projects and provides instructions for presenting company capabilities and project experience to the respective DOE remediation project team, review submitted capabilities statements and project histories, or communicate with others involved in the project.

Companies exploring current project opportunities at the TechCon Web site will find information on the following:

What's New: New information from TechCon including lessons learned, success stories and interesting activities.

TechCon Overview: Explains the TechCon Program and answers key questions frequently asked.

Technology Needs: Provides background information and key Internet links to site specific needs that have been documented.

Commercial Capabilities: There are many Internet databases and information resources available. This page provides links to a few of the links that are used by TechCon including both commercial capabilities and emerging technologies.

Internet Resources: Links to some Internet resources that could be useful to persons looking for information.

DOE Procurement Web Sites: These are links to DOE and DOE Contractor home pages and "doing business" pages across the nation. Included are the Field or Operations Office home pages, their "doing business" pages, and any contractors for that location.

TechCon is a Department of Energy, Office of Environmental Management, program operated by Argonne National Laboratory and supported by Pacific Northwest National Laboratory.

For more information, contact Dale Pflug, TechCon Program Manager, Argonne National Laboratory (630/252-6682, dpflug@anl.gov) or visit the TechCon Web site (http://www.ead.anl.gov/~techcon/tcprog.htm).

Innovative Treatment Remediation Demonstration
Paducah Project
Meeting Minutes
March 10-11,1999

Participants

Bryan Clayton/Bechtel Jacobs Co.
Paul de Percin/US EPA-NRMRL
Jeff Douthitt/GEO Consultants, LLC
Tom Early/Oak Ridge National Lab
Bruce Ford /Bechtel Jacobs Co.
Doug Gerrick/Argonne National Lab
Sarah Maudlin/Jacobs Engineering
Eric Morti/Bechtel Jacobs Co.
Dale Pflug/TechCon-Argonne National Lab
Myrna Redfield/DOE-Paducah
Walt Richards/Bechtel Jacobs Co.
Craig Rightmire/Bechtel Jacobs Co.
John Sheppard/DOE-Paducah
Al Vickers/Clean Sites Environmental Svcs.
John Volpe/KY Rad. Health & Toxic Agnts.
Lynn Wood/US EPA
Mike Hightower/Sandia National Labs
Ken Kuzio/Sandia National Labs

April ITRD Meeting

The next meeting of the Paducah ITRD Project will be held on Thursday and Friday morning April 22-23, 1999 at the Hilton Greater Cincinnati Airport. A block of rooms will be reserved at the government rate for this meeting. A letter and meeting agenda will be e-mailed to all ITRD Technical Advisory Group (TAG) members during the week of 3/15/99. The purpose of the meeting is to:

- Discuss technical information on candidate technologies identified during the 3/10-11/99 conference call,
- Assess options and possible strategies related to these technologies, and
- Identify appropriate technologies for more in-depth evaluation.

Approximately 30-45 minutes will be allotted for each presenter to discuss the basic capabilities and applications of those technologies retained from the 3/10-11/99 screening. The presentations should include:

- Background on the technology including the type and the number of applications to date (technical basis, overall maturity, and acceptability),
- Most appropriate application areas (vadose zone, DNAPL, ground water, etc.),
- Range of possible technology performance in terms of contaminant reduction levels and required duration,
- Range of probable costs ($/yd, $/gal, $/ft^2, etc.) for deployment,
- Affect on associated co-contaminants, positive or negative,
- Types and amount of wastes that might be generated.

This presentation format will help TAG participants assess technologies relative to the criteria developed at the initial kick-off meeting. The outcomes will be:

1. A suite of technologies requiring further in-depth evaluation,
2. Preliminary methods to combine technologies to develop the most cost-effective remediation strategies, and
3. Technology areas needing site-specific evaluation or testing.

PGDP Feasibility Study and ITRD Schedule Concurrence

A schedule showing the parallel project activities and milestone dates for the PGDP Feasibility Study and ITRD processes was sent to the Paducah Site Office (c/o John Sheppard) for Site Office and Bechtel Jacobs review and comment. The TAG needs to complete the ITRD technology identification/assessment phase (i.e., identify the top 4-5 technology candidates) by June 1999 to accommodate performing treatability studies from July 1999 to January 2000. The goal is to include the treatability study results in the DOE Internal Review version of the PGDP FS. SNL will send the approved FS/ITRD schedule to the entire TAG for informational purposes.

Technology Screening Overview

A summary of the first round of technology screenings is included in the attached table. This information was obtained directly from the 3/10-11/99 TAG conference calls.

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Sonic-assisted Cone Penetrometer	TO BE ADDRESSED			
Bio-Barrier	• Mature technology (used by oil industry for oil recovery); • bacteria indigenous to work area; • May be able to remove barrier after remediation • Barrier may accumulate metals through reducing environment • May be used as stopgap measure (barrier) in combination with other technologies	• No remediation application field tests, only lab work; • Used mainly for flow control, not contaminant remediation; • May need periodic feeding to keep bugs from reducing in size	K	• Some usage as TCE remediation (adhesion deficient microbes); several field trials conducted; can survive TCE concentrations up to 200 ppm; • Clayton will contact MSE for updated status report
Redox Manipulation	• Some field applications for TCE	• Need good understanding of aquifer to get material to stay within affected zone otherwise migration occurs • Regulators may not allow reducing agent to be introduced into aquifer;	K	• Typically used for Chromate VI to Chrome III reduction; • Hanford field test cost $1.2 M
Gaseous Reduction	• Safety-related issues (i.e., use of hydrogen sulfide) have been resolved • Reduces 99Tc mobility	• Currently in early demonstration phase (not commercially available) • Applicable to vadose zone only • Used predominately for metals (i.e., chromium)	D	

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Huma-Sorb	• Proven effective for metals; investigating TCE reduction applications • Could be used in conjunction with another technology • Satisfactory for use to 100 ft below ground surface (bgs)	• Questionable absorption of 99Tc; • Product/cost question ($0.80–1.00/lb) • Production rates a concern (2000 lbs/week);	K	• Carl Enfield is investigating properties of humic acid and will investigate this technology for the PGDP ITRD
Iron Reactive Wall	• Extensive field applications • Works for TCE and some metals	• Standard technology • Applicable to < 40 bgs	K	• May be used in shallow applications or with injection technologies for deep applications
Deep Iron Barriers	• Jet assisted grouting may result in thicker wall installation as opposed to fracturing; • Potential for deep application; • Mature technology • For application in offsite areas as well as source term areas to knock down concentrations before plume goes offsite;	• Iron generates reducing environment; undesirable process by-products possible; may need longer residence time to catch by-products; • Higher contaminant concentrations may require > 1 wall being emplaced; • Costs? • How to optimize? • Unknown rates of desorption once getters become loaded;	K	• Mostly use iron filings, iron filings with porous ceramics, with bacteria, alcohol • Application 120 feet bgs is feasible • Possible to use other materials for 99Tc: Hanford applications (CuO, Imogolite (altered clay); Hydrotalcite; bone char; aluminum-oxy-hydroxide); • No criticality issues associated with 99Tc buildup on getters;

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Chemical Oxidation	• Used at PORTS with good results • Used grout to create horizontal reactive barriers in clay material to prevent downward contaminant migration • Oxidation will have good effects on TCE; • Has been used successfully to clean contamination from under buildings; • Commercially available	• No effect on 99T • Concerned over products of incomplete reaction (i.e., not much research/data available on this); need to look for specific products of incomplete reaction; • Some channeling known to occur in underground; Need to be concerned about preferred permeability pathways; • Primarily vadose zone application to block source term from entering aquifer;	K	• Subsurface application s with ozone, Fenton's agent; potassium permanganate • Cost of application depends on delivery system ($50-100 per cu yd treated) • Information shows no permanganate fixation on TCE • Iron, potassium-permanganate particulate grout has been shown to work well;

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Steam Stripping (Hydrous pyrolysis)	• Used to depths of 120 ft bgs in gravel aquifer; • Mature technology (operating at SoCalEd for 1.5 years (Creosote instead of TCE for DNAPL); 7 ac site cost $4-6 M) • Application for predominately gravel remediation; some penetration into finer materials without artificial fracturing; DNAPL in fine clay may be removed with alternate technology;	• Commercial costs (approx. $30-40/cu yd treated) likely lower than DOE site costs • Significant TCE in McNairy Formation may be difficult to get at using steam; • concerns about finer grains making TCE recovery difficult • Potential for steam breakout under buildings in shallower zones; need to investigate ways to cordon off building areas from steam breakout • No experience with 99Tc interaction with steam (PORTS may info on this);	K	• Vendor on web: www.steamtech.con; • 2 demos with steam and fracturing of clay for additional steam introduction pathways • Hightower/Early/Richards will investigate further
Dual Phase Extraction	• May be applicable for areas above RGA • Several successful applications	• Not practical at PGDP RGA since contamination not near surface of water table; • Generally used with LNAPL or light density contaminants	K	• Rightmire may have cost info on this technology from PORTS; will work with Hightower

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Flushing Technologies	• Mature technology; several demos: OU 2 at Hill AFB TCE source area (90% mass removal); • Co-solvent used at FL dry cleaning site w/ limited success due to inadequate source area characterization;	• Limited to surfactants and solvents; • limited to saturated zones and permeable formations; • Mixing and contact with contaminants is critical to achieve success; need good source delineation; • Large volumes of secondary waste produced and initial materials are costly. • Costly since typically use a one-pass rather than re-circulating system ($50-500/cu yd treated); • Permitting issues with respect to reinjection • Will not get total mass removal (typically 90% removal) (if MCLs in source area is target, not a good application for flushing since residuals need to be addressed); may need to use bio technologies as complementary technologies for residual removal	K	• 2 approaches: solublization or immobilization; immobile more efficient but greater risk for DNAPL mobilization; • If 99Tc prefers to stay in water phase, flushing may provide remediation; • Regulators are softening hard-line stance against reinjection, opening doors for this technology;

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Direct Thermal Approaches (In Situ only; 6 Phase Soil Heating)	• Increase vapor pressure; solubility, adsorption; • Commercially available now ($30-80 per yd) • About 8-9 deployments to date (e.g., Hanford; Dover AFB; Corps of Engineers sites); • De-watering not required; • Focused on depths 40-45 feet; Seattle application of 65 feet bgs; • Vadose and saturated zone applications • Uses utility-provided electrical power; • Contractor using fixed price contracts to perform work, not time/material; • Reported cleanup efficiencies of up to 99+%	• Soil composition, and soil density affect process; • Site-specific conditions may required specific technology configuration; • Safety issues related to uncontrolled voltage potential, but being addressed; • Low saturation sediments provide voltage drain/breakdown; • Infrastructure may limit optimal array design • Potential affect on sensitive communication lines; • Limited to remediation temps of 100 deg C • Vadose zone requires water/brine injection • Negotiated clean-up levels, not necessarily MCLs • Showstoppers: no underbuilding deployment; infrastructure limited; not for greater depth deployments	K	• Saturated zone applications: raise water temp to 85-90 deg C and boil water, not NAPL off; • Technology costs fairly scale dependent;

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Microwave Heating		• No available technology; • No currently active projects; DOE project is dead;	D	• Vendors are selling RF heating technology; • RF used in vadose zone (pesticides); • self limiting technology (turns off after moisture leaves soil); • excess moisture increases RF power requirements; • 6-7 RF demonstrations have been/being conducted (cost of RF: $15-20/ton treatment)
Pump and Treat with Reinjection	• Provides hydraulic control	• Substantial long-term O&M costs	K	• Goes with aquifer leveling; considered hydraulic manipulation/control
High Vacuum Enhanced Recovery	• Several applications to date • Can be used in low permeability soils ($1x10^{-6}$ to $1x10^{-7}$) • Can be used with fracturing to treat tight soils	• Unfavorable costs vs. other technologies		• TO BE ADDRESSED
Aerobic-Bioremediation	• No secondary wastes produced aerobically; • Quick degradation of TCE realizable if site is conducive to bio-activity • Several applications	• 99Tc impact unknown • TCE cannot be biodegraded without use of co-metabolites (e.g., propane; methane) to support TCE digestion; • Most effective in vadose zone, saturated zone application limited • TCE contamination levels above 200 ppm not a good candidate for success	K	• Several applications, each needs to be closely assessed • O&M costs need to be quantified
Air Sparging (In-well Vapor Stripping)	• Several applications • Applicable below water table • Sets up treatment cell for faster groundwater remediation	• High capital costs • Soil lenses cause problems	K	• Need to assess costs vs. utility

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Horizontal Reactive Barriers	• Applied with fracturing • Some field trials		K	
Horizontal Well	• Mature technology/commercially available • Use in vadose and saturated zones • Used in combination with other technologies (air sparging; vapor extraction; gravity drains; iron assisted extraction with reinjection) • Functional in infrastructure-intensive areas	• Overcoming heterogeneities	K	• Progress made in real-time drilling head location
Aquifer Leveling	• Mature technology (large refineries); • Claims of reduced pump and treat costs of 60%; • Low permeability and porous soils applications;	• May be a limit to aquifer transmissivity that disallows application	K	• Intent: stop contaminant movement; use other technologies (horizontal wells, barrier walls) to remove contaminants; reverse flow path;
Grout Walls/Barriers	• Soil-mix barrier used at PORTS to gain time to assess alternate plume remediation technologies • Mature technology • Permeable barriers can now go impermeable;	• Not intended to be a permanent impermeable barrier	K	• Used in conjunction with horizontal drilling • Outcome reports on jet grout barriers at Dover AFB available? • Need to investigate associated costs for each type of barrier
Permeation Grouting	• Very low cost technology	• Not a lot of info available; commercial available unknown • Used at ORR WAG 4 • Not permanent solution • Not applicable for areas of high hydraulic conductivity	K	• Used in vadose zone with seasonal saturation • Used to contain 90Sr; • No cost info available; need to get cost and performance data and compare results to jet grouting results; • May be best used for source stabilization;

Technology	Pros	Cons	Keep (K)/ Delete (D)	Comments
Electrokinetics	• Used historically for enhanced oil recovery; remediation is new application • Developed to recover contaminants in low permeability soils;	• Costs are site-specific based on geology	K for UCRS; maybe McNairy; not for RGA or high permeability zones in UCRS;	• Separation technology (recovery) • Used for heavy metals, radionuclides, organics (dissolved phase and DNAPLs); • Saturated or unsaturated soils (in and ex situ) • In situ for water treatment • $20-100/cu yd; $60-220/cu yd
Rotary Steam Stripping	• In situ DNAPL treatment • When used in conjunction with iron filings, can get 90-95% contaminant removal; • Several applications	• Only penetrate 40 feet bgs; • Infrastructure limited	K	• Is there a suitable application site at PGDP?
Biowalls (reactive)	• 5 field trials • Shown effective for TCE • Uses biostimulation	• Developing technology	K	• Effectiveness of bio process needs to be assessed
Biosparging	• Used to treat dissolved phase plume; • Augment sparging with microbes to set-up reactive bio-wall or zone		K	• Effectiveness of bio process needs to be assessed
Barometric Pumping	• Vadose zone application (VOCs); • Passive technique • Low cost	• Vent VOCs directly to atmosphere • Generally slow removal • Typically applied to high permeability soils	K	• Need to assess effectiveness and suitability at PGDP

DOE NEWS

NEWS MEDIA CONTACT:
Steven L. Wyatt, (423) 576-0885
www.oakridge.doe.gov

April 14, 1999

DOE SELECTS PORTSMOUTH SITE FOR STORAGE OF FERNALD URANIUM

OAK RIDGE, TN – The U.S. Department of Energy (DOE) has selected the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio, as the storage site for 3,800 metric tons of uranium now in storage at the DOE's Fernald, Ohio site.

The uranium will be stored at Portsmouth on a temporary basis until the material is reused or sold. This material has both commercial and military value and potential applications within the DOE complex.

The Portsmouth facility was selected upon completion of an Environmental Assessment (EA) that evaluated impacts for receipt and storage of the uranium. Other DOE facilities in Tennessee and Kentucky were considered, but the Portsmouth Site was chosen based primarily on the availability of suitable storage space. The EA determined that no significant environmental impacts will result from the transfer of the uranium to the Portsmouth Site.

The uranium will be stored in the 744G Building at Portsmouth, which is currently being used for storage of similar uranium materials. Shipments from Fernald, under Department of Transportation certification and packaging, will begin in late June 1999. This schedule will enable the Fernald Site to meet agreements with the State of Ohio to move the uranium from Fernald to meet site closure milestones.

Potential commercial uses for the Fernald uranium include use as a shielding material and as an agent for special alloy metal applications. The depleted and slightly enriched uranium compounds to be stored at Portsmouth are in the form of metal and powder. The compounds were produced at Fernald as part of the nation's nuclear weapons program.

-DOE-

R-99-019

DOE F 1325.8
(04-93)

United States Government **Department of Energy**

memorandum

DATE: April 5, 1999

REPLY TO ATTN OF: EM-24

SUBJECT: PEIS Lawsuit Settlement

TO: Distribution

As you are aware, on December 12, 1998 the Department settled the long running lawsuit regarding the Programmatic Environmental Impact Statement (PEIS)[1]. The "settlement agreement" requires the Department to do the following:

- Develop and deploy a central Internet database providing specified information including data on waste, contaminated media, spent nuclear fuel, and facilities.
- Perform a study on long-term stewardship; and
- Establish a fund of $ 6.25 million to support independent technical and scientific reviews

The settlement agreement (section II, G-1) also requires DOE to identify a Point of Contact (POC) regarding the central Internet database. I have identified James D. Werner as the POC and have asked him to take responsibility for implementing the terms of the settlement agreement. I would like to emphasize that the settlement agreement generally does not require any additional data to be collected by the field offices beyond what the Department already collects or plans to collect. Consequently, Mr Werner is responsible for working with ongoing data collection efforts to organize the appropriate data and make it available in a manner that has technical fidelity to the source of data and is useful to a variety of users. Because the PEIS Settlement database requires information from across DOE, EM is only one, albeit the largest, source of data to be included.

The settlement agreement was developed with the expectation that the "PEIS Settlement Database" would use the information residing in the following existing data systems to the maximum extent possible:

For EM waste and contaminated media, virtually all information can be supplied from the EM Corporate Database, particularly the data currently collected by the Analysis and Visualization System (AVS). I expect Mr. Werner to coordinate closely with the newly formed EM Data team led by Stephen Warren , pursuant to my recent memorandum, on all matters and issues related to EM Data and information Management.

[1] NRDC et al. v. Richardson et al., Civ No. 97-936 (SS) (Joint Stipulation and Order)

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- Information on facilities can be supplied by the Facilities Information Management System (FIMS) maintained by Office of Field Management.

- Spent fuel data can be supplied from the National Spent Fuel Database maintained at the INEEL.

- Information on hazardous waste can be obtained from the *Annual Report of Waste Generation and Pollution Prevention* as well as the data reported to EPA's Toxic Release Inventory.

This approach underscores the need that the data supplied to these systems be complete and of high quality. For waste managed by other programs (Offices of Defense Programs, Science, and Nuclear Energy), I expect Mr. Werner to work with those offices to obtain the required information in a cost-effective, manner. We have set a target date of January 2000 to have the database operational.

The settlement agreement also requires the Department to hold a national stakeholder forum on the database. Based on discussions with a number of DOE offices and a representative group of stakeholders, the forum has been scheduled for **June 3-4, 1999 in Columbia, MD**. Planning for that forum is underway and is being done in conjunction with some of the plaintiff organizations who were involved in the lawsuit. A *Federal Register* notice officially announcing the meeting date and location will be published and additional information on the forum will be forthcoming soon.

Another requirement of the settlement agreement is that, in addition to the central database, the Department must provide Internet linkages to other available site specific DOE databases that may contain relevant or useful information. We will work closely with field offices to identify such potential databases before establishing any linkages.

In order to facilitate communication and coordination on this effort and compliance with the terms of the settlement, I would like to request that you identify a (POC) for your office. Please provide the POC name to Jim Werner (202-586-9280; <James.Werner@em.doe.gov>) by March 31, 1999. I expect Mr. Werner to coordinate with the group of POCs regularly, and to report to me monthly on the status of the implementation of the requirements of the settlement agreement or as events deem appropriate.

A fact sheet that provides additional information on the settlement and the status of the various activities is attached. In addition, a Settlement Website where more information can be obtained has been established. The URL for the site is http://www.em.doe.gov/settlement.

James M. Owendoff
Acting Assistant Secretary for
Environmental Management

BUSINESS & Investment

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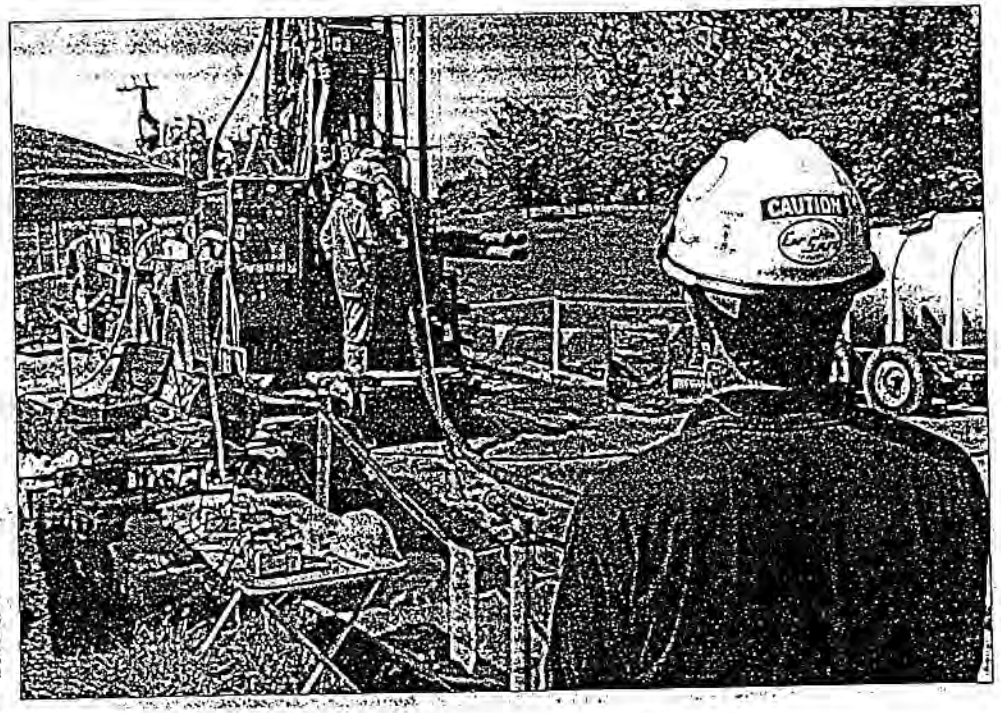
a season of change

Cost-cutting measures have altered the lives of most of the employees of the Paducah Gaseous Diffusion Plant. A year later, many of those changes have been embraced.



By Joe Walker
Sun Business Editor

Jimmy Massey knows how it feels to face major changes in a steady job. That's why he understands employees' varied reactions to a new, tighter way of doing environmental management work at the Paducah Gaseous Diffusion Plant.

In 1997, the Department of Energy, which owns the plant, decided to replace an old, fee-based business structure with one that splits work into competitive subcontracts while cutting costs. As a result, Bechtel Jacobs beat four other bidders to replace Lockheed Martin, which had employed Massey and his co-workers for the past 14 years.

Agenda for SSAB Transportation Seminar

Scott, Alicia Jane (AST)

From: Wattier, Debbie S. (DSI)
Sent: Wednesday, May 12, 1999 7:56 AM
To: Scott, Alicia Jane (AST) ; 'Speer, Shirley'
Cc: Wattier, Debbie S. (DSI)
Subject: FW: AGENDA FOR SSAB TRANSPORTATION SEMINAR

here is one more thing we need as SSAB handout. Alicia.. can you please print and Shirley from Jacobs can pick this up later today. I can't print it. need the Fred Butterfield e mail printed and the attachment. thanks

Debbie S. Wattier,
Manager of Public Affairs, Paducah Project
Bechtel Jacobs Company LLC
761 Veterans Avenue
Kevil, Kentucky 42053
(502) 441-5023
FAX: 441-5022

----Original Message----
From: Fred Butterfield [SMTP:Fred.Butterfield@EM.DOE.GOV]
Sent: Tuesday, May 11, 1999 1:32 PM
To: Karol Hazard; Abbey Wells (E-mail); Ann Dubois (E-mail); Becky Lopez (E-mail); Carolyn Gardner (E-mail); Dawn Haygood (E-mail); Deb Thompson (E-mail); Debbie Wattier (E-mail); Donna Sterba (E-mail); Doug Sarno (E-mail); Erin Rogers (E-mail); Gwen Doddy (E-mail); Karol Hazard (E-mail); Ken Korkia (E-mail); Michelle Smith (E-mail); Sheree Black (E-mail); Tisha Patton (E-mail); Wendy Green Lowe (E-mail); Chuck Rice (E-mail); Dale Slade (E-mail); George Chandler (E-mail); H. Ray Johnson (E-mail); Jim Bierer (E-mail); Jim Kinsinger (E-mail); Mark Donham (E-mail); Robert Peelle (E-mail); Ron Zerm (E-mail); Tom Marshall (E-mail); Tom Wagner (E-mail); Vicki Jones (E-mail); Audrey Berry (E-mail); Gail McClure (E-mail); Gary Stegner (E-mail); Gerri Flemming (E-mail); Jerry Johnson (E-mail); John Sheppard (E-mail); Kevin Rohrer (E-mail); M. J. Byrne (E-mail); Mariane Anderson (E-mail); Marianne Heiskell (E-mail); Patty Natoni (E-mail); Tami Toops (E-mail); Woody Russell (E-mail)
Cc: Martha Crosland; Gene Schmitt; Bob Alcock; Nolan, Betty; Kelvin Kelkenberg
Subject: FW: AGENDA FOR SSAB TRANSPORTATION SEMINAR

The draft agenda for the May 20-23 EM SSAB Transportation Seminar is forwarded as a <*.*.pdf> file.

Fred
DOE/EM-20
Phone: 202/586-5542
E-mail: fred.butterfield@hq.doe.gov

-----Original Message-----
From: PhnxEnvir@aol.com@INTERNET [mailto:PhnxEnvir@aol.com]
Sent: Tuesday, May 11, 1999 12:21 PM
To: Butterfield, Fred; Butterfield, Fred
Cc: Crosland, Martha
Subject: agenda

Fred-
The attached is a pdf of the Transportation Workshop agenda. Please forward it to the proper DOE Field Office Personnel.
Thanks!

TransSem.pdf

Gwen

SSA TRANSPORTATION WORKSHOP
MAY 1999 ■ CINCINNATI

Draft
Workshop At-A-Glance

Thursday, May 20		***2:00 p.m. -6:00 p.m.*** Facilitator's Meeting (Parlor I)	***6:00 p.m. - 7:00 p.m.*** Registration (Regency Ballroom) ***7:00 p.m. - 9:00 p.m.*** Reception
Friday, May 21	***7:45 a.m. - 12:30 p.m.*** Tour of Fernald Site (Meet in hotel lobby) ***8:30 a.m. - 12:00 p.m.*** Presentation Dry-Run (Regency Ballroom)	***12:00 p.m. - 1:00 p.m.*** Lunch (Provided on tour or else on your own)	***1:00 p.m. - 1:30 p.m.*** Welcome and Orientation (Regency Ballroom) ***1:30 p.m. - 3:00 p.m.*** Plenary: Site Introductions and Site Information ***3:00 p.m. - 3:15 p.m.*** Break ***3:15p.m. - 5:30 p.m.*** Transportation Presentation ***5:30 p.m. - 6:00 p.m.*** Site-Specific Preparation (Optional)
Saturday, May 22	***8:00 a.m. - 9:30 a.m.*** Plenary: Discuss Areas of Shared Concern (Regency Ballroom) ***9:30 a.m. - 9:45 a.m*** Break ***9:45 a.m. - 12:00 p.m.*** Core Topic Breakouts	***12:00 p.m. - 1:30 p.m.*** Deli Buffet Luncheon	***1:30 p.m. - 2:30 p.m.*** Site-Specific Breakouts ***2:30 p.m. - 3:45 p.m.*** Core Topic Breakouts ***3:45 p.m. - 4:00 p.m.*** Break ***4:00 p.m. - 5:30 p.m.*** Plenary: Discuss Draft Statements from First Two Core Topics (Regency Ballroom)
Sunday, May 23 -	***8:00 a.m - 9:30 a.m.*** Plenary: Discuss Draft Statements from Last Two Core Topics (Regency Ballroom) ***9:30 a.m. - 9:45 a.m.*** Break ***9:45 a.m. - 10:30 a.m.*** Core Topic Breakouts ***10:30 a.m. - 10:45 a.m.*** Break ***10:45 a.m - 12:00 p.m.*** Plenary: Discuss and Agree on Revised Statements of Concern (Regency Ballroom)	***12:00 p.m. - 12:45 p.m.*** Plenary: Discuss Next Steps ***12:45 p.m. - 1:00 p.m.*** Sign Statements and Adjourn	

BUSINESS & Investment

BUSINESS section editor:
Joe Walker, 575-8656
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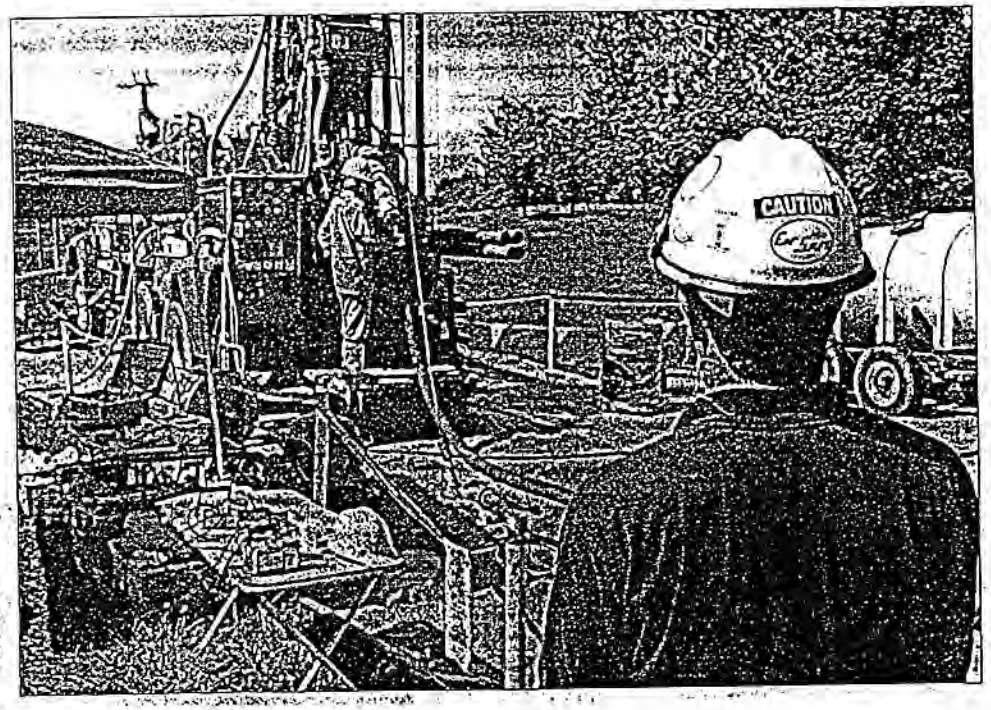
a season of change

Cost-cutting measures have altered the lives of most of the employees of the Paducah Gaseous Diffusion Plant. A year later, many of those changes have been embraced.



By Joe Walker
Sun Business Editor

Jimmy Massey knows how it feels to face major changes in a steady job. That's why he understands employees' varied reactions to a new, tighter way of doing environmental management work at the Paducah Gaseous Diffusion Plant.

In 1997, the Department of Energy, which owns the plant, decided to replace an old, fee-based business structure with one that splits work into competitive subcontracts while cutting costs. As a result, Bechtel Jacobs beat four other bidders to replace Lockheed Martin, which had employed Massey and his co-workers for the past 14 years.

Massey, who had been environmental site manager for Lockheed Martin, saw the inevitable and applied with Bechtel Jacobs before the company made its bid. The gamble paid off, but he remembers the emotional rollercoaster that went with it.

"I'd worked out here since 1973, so my first thought was, they did away with MY job," he said. "What are they doing to me?"

On April 1, 1998, Massey began the two-year task of subcontracting 93 percent of the work Lockheed Martin had done. A year later, about $24 million in work has been subcontracted to a patchwork of firms. Of the roughly 250 people doing environmental work, 17 have been hired by subcontractors and the pace is expected to quicken this year.

Many have embraced the changes, Massey said, and some have chosen new careers. Six employees took voluntary layoffs in December.

Debbie Wattier, Massey's staff assistant, said virtually everyone worked for Lockheed Martin when she came to the plant in 1986. From 1993, when the environmental management program starting moving to offices at Kevil, until Bechtel Jacobs took over, the mix had changed, with nearly two-thirds of the work going to other firms and one-third to Lockheed Martin.

In the past year, some people have left to work for such companies as Paducah Power System and Electric Energy Inc. in Joppa, Ill. (the plant's chief power supplier), and even a local church. Those who stayed have seen their jobs and employers change, but with similar pay and benefits.

"It's sure brought an interesting mix of people out here," Wattier said.

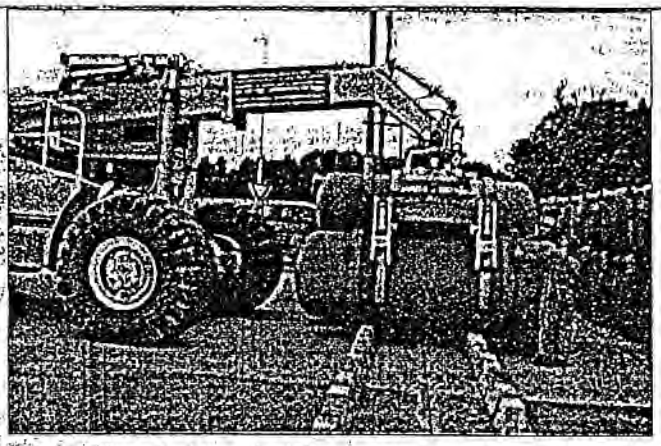
Still other Lockheed Martin workers formed small businesses and won subcontracts with Bechtel Jacobs. Jeff Douthitt and his wife, Sharon, joined Ross Miller to start GEO Consultants, which provides hydrogeology work and groundwater and surface water sampling. Five samplers who had worked in the Lockheed Martin system moved with them.

GEO Consultants teamed with CDM Federal, a national environmental firm, along with Lan Associates, Hydrovision and Pro-2-Serve, under an $8.4 million contract. Lan's Paducah operation is headed by David Hutcheson, another former Lockheed Martin employee.

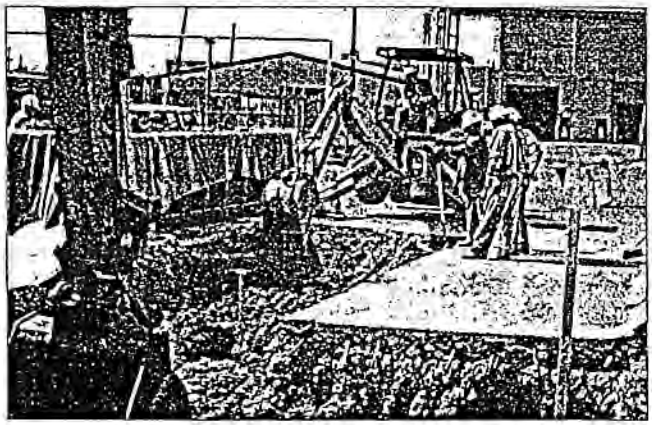
"We looked at it as an opportunity, more than anything else, to take advantage of our skills out here and we formed our own company," Miller said. "Obviously, we're very pleased with the way things are beginning to work out, and we have room for our company to grow."

The firm provides job security for the small staff when there were no guarantees of being hired by a subcontractor, he said. "They realize that of all the 200 or so employees, not all of them were going to get hired because the whole idea is to reduce the price of work."

DOE's goal is to complete 12 percent more cleanup work through 2006 by spending the same by subcontracting as under the old system. Massey said the process is "off to a good start," gauged by formulas when contracts are awarded and tracked by performance milestones.



Thirteen firms, local to national in scope, have been hired for work ranging from soil cleanup to treating contaminated groundwater. Last week, a $6 million contract went to Mactec Inc. of Golden, Colo., to build three concrete storage yards for depleted uranium hexafluoride (UF6) cylinders at the plant. When the work is finished in October 2001, nearly 80 percent of DOE's more than 36,000 cylinders will be on concrete, compared with 40 percent now.



Paducah's H&G Construction was hired last year to do security fencing, lighting and road work for the cylinder yards.

Other major subcontracting includes:

- $2.3 million for Lasagna, a new soil-cleanup technology named for its layering effect. CDM should have the project running by fall, Massey said.
- $3.3 million for CDM's continued operation of a groundwater pump and treat system. The work, expected to save $2 million, is "slowing the speed" of heavy areas of contamination while a permanent fix is sought, he said. Among the most promising ideas is installing in-ground barriers to trap and treat contamination, which could save $100 million. Groundwater is one of five broad areas defined under a streamlined, plantwide cleanup strategy that could save another $50 million, Massey said.

A few years ago, DOE provided city water to about 100 homes and two businesses whose wells were in the general contamination area. This year, four homes will be added that were not part of the original network because their owners live out of state. Massey said there was no risk from the delay.

- $9.4 million to TN & Associates, teaming with CDM, to investigate waste areas for cleanup.

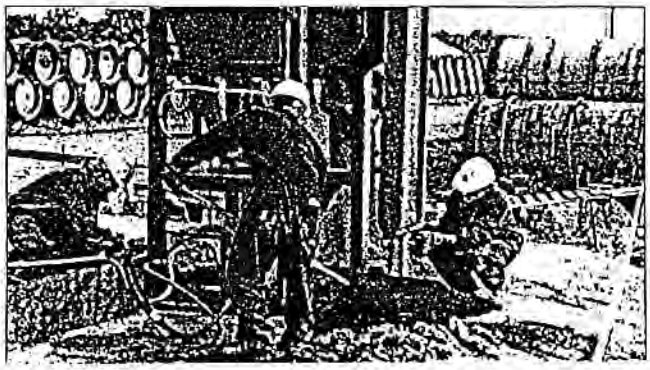
Notable accomplishments in the past year were:

- Reducing about 9 percent of the DOE waste by treating and shipping hazardous waste and burying non-hazardous waste in a landfill.
- Cleaning and painting 1,200 UF6 cylinders, while DOE studies options to convert the material into something useful. Nearly 3,400 cylinders were cleaned and painted under Lockheed Martin.
- Meeting a no-accident goal for Bechtel Jacobs employees. Subcontract workers had only two injuries, neither causing a lost workday.
- Giving more than $40,000 to Paducah area nonprofit causes, such as United Way. Bechtel Jacobs has approved $33,000 more for donation soon.

Despite the stress of change, Massey said the good in the first year far outweighs the bad.

"It's been very difficult, very challenging. There were lots of things we had to learn," he said. "But we've made good progress, and we've got one more year to see if we can meet our goals."

DOE



Change in the air: (From top) 1) Bechtel Jacobs now manages investigations like this one of groundwater contamination sources from past practices. 2) Storage conditions for the nearly 37,000 cylinders of solid uranium hexafluoride have been improved by installing concrete storage yards and painting older cylin-

Kids doing what comes naturally

■ **What started** *as a one-day field trip for students has expanded to a combination environmental fair and cleanup project.*

By Anne Thrower
The Paducah Sun

Little did Wava Grandon know her love for nature and interest in Metropolis Lake would eventually lead to an environmental fair for hundreds of sixth-graders.

Grandon

"I take pride in it," Grandon said Tuesday as the energy-charged students rushed past her on their way from one science experiment to the next. "It just started as a little one-day field trip."

Compared with today's multi-agency event, which takes weeks to plan, Grandon's original "Earth day" was simple. It was a chance to learn about the environment and at the same time do a little cleaning around the lake. "It kind of grew from that,"

Please see **FAIR** / 14A

STEVE NAGY/The Sun

Literal hugger: Lone Oak Middle School sixth-grader Andy Ford (left), 12, gives a tree a squeeze while Sumeet Patel, 12, looks on Tuesday morning during the environmental fair. Ford was blindfolded and led to a random tree which he later had to identify after learning its features by touch.

Environmental fair grows, teaches

Continued from 1A

Grandon said.

A former eighth-grade science teacher at Heath Middle School, Grandon started in the early 1990s what has evolved into a two-day fair that by the end of today will have attracted about 1,000 sixth-graders.

Although 66 and retired, she said she likes to return to see everybody. And she's always invited.

She says she looks forward to the day when her granddaughter, now in kindergarten, will attend, knowing "memaw" helped start the fair.

Joe Baust, director for the Center for Environmental Education at Murray State University, said people like Grandon are rare. "They challenge kids early on that this is a field that is not for any specific group of people," he said.

The fair was relocated to the West Kentucky Wildlife Management Area next to the Paducah Gaseous Diffusion Plant because there was no danger of the spring flooding often experienced at Metropolis Lake.

Students stay active all day, going from one science lesson to the next, often participating in the experiments. Among the more popular lessons Tuesday was a water quality experiment.

As part of the lesson, students "polluted" vials of water using antacid tablets. The students then placed minnows in the water and watched them struggle to get oxygen. After the fish went lifeless, they were quickly added to unpolluted water, where the students watched as the fish start swimming again.

Erica Maddux, 12, of Lone Oak Middle School, liked the fish experiment and the other activities. "It lets you know more about Earth and how to help it," she said.

Another favorite lesson, conducted by Baust, had students learning what it was like to be animals at night looking for their mates and avoiding the dreaded predator. For Baust it's a lesson in teaching the students "ecological principles."

Each student was blindfolded and given a unique sound such as a clicker or sleigh bells. The students then proceeded to find the student with the exact sound. At the same time another student acted as a predator whose purpose was to "kill" as many "animals" as possible.

Students caught on quickly. The goal: to be just loud enough to attract the animal with the similar sound but quiet enough to avoid attracting the predator. "It's a good learning experiment," said Opie Butler of Lone Oak Middle School.

Lone Oak Middle science teacher Steve McCuiston said the fair gives students a chance to get outside and do science-related things.

Having students experience the outdoors has benefits beyond the science lesson. "It keeps them centered," Baust said, "and it makes them understand that we have to work together."

The Kentucky Department of Fish and Wildlife Resources brings in experts for many of the science exhibits. "A lot of people don't realize what we have here," said Tim Kreher, a state wildlife biologist.

Principals from several county schools helped keep things running smoothly Tuesday. "We have got to open the door to them instead of showing them the computers," said Larry Hopper, principal at Lone Oak Middle. "That's where a lot of kids' problems are."

The Paducah Sun May 12, 1999

PADUCAH GASEOUS DIFFUSION PLANT (PGDP)
SITE SPECIFIC ADVISORY BOARD
ENVIRONMENTAL MANAGEMENT PROJECT UPDATES
April 15, 1999

1. PROJECT: Waste Area Groups 3, 8, 28 and Data Gaps

Summary: Current work on Waste Area Groups 3, 8, and 28 has been combined into one project. Remedial Investigations will be done on WAGs 3 and 28. A Site Evaluation will be done on WAG 8. In addition, this project includes a "Data Gaps" investigation to collect groundwater and subsurface soil samples to supplement existing data.

- WAG 3 includes three burial grounds within the plant security fence, in the western section: C-747 Contaminated Burial Yard (Solid Waste Management Unit/SWMU 4), C-746-F Classified Burial Yard (SWMU 5) and C-747-B Burial Yard (SWMU 6).
- The concern at WAG 3 is potential contributions to groundwater contamination from the content of the burial grounds: natural and slightly depleted uranium, technetium-99 (Tc-99), magnesium fluoride, uranium-contaminated solid waste, security-classified weapons components, radionuclide-contaminated scrap metal, and slag from nickel and aluminum smelters.
- WAG 8 includes: SWMUs 82-85, which are the C-531, C-533, C-535, and C-537 Electrical Switchyards, as well as the C-340 Reduction and Metals Facility, which is inactive and is part of the Decontamination and Decommissioning program.
- The concern at WAG 8 is similar to WAG 28, but the Site Evaluation will first determine whether contaminants have been released.
- WAG 28 includes SWMUs 99, 183, 193, 194, which are locations related to the 1950s construction of the plant, including the C-745 Kellogg Building Site, the McGraw Underground Storage Tank, McGraw Construction Facilities, as well as Area of Concern 204 (potential construction debris area).
- The concern being addressed at WAG 28 is potential contributions to groundwater contamination.

Status:

- Field work for WAGs 8 and 28 began in March 1999, and is on schedule for completion in mid to late summer 1999. Field work for WAG 3 is projected to begin in the early fall.
- Upcoming regulatory documents will be: the Draft (D1) Remedial Investigation Report for WAG 28, scheduled to be issued to regulatory agencies in January 2000; the D1 Site Evaluation Report for WAG 8, June 2000; and D1 Remedial Investigation Report for WAG 3, August 2000.

2. PROJECT: Waste Area Group 22, SWMU 2

Summary: SWMU 2 is the C-749 Uranium Burial Ground in the west-central portion of the plant.

- The SWMU 2 Feasibility Study (September 1998) presented four potential remedial alternatives: 1) No further action other than: continued groundwater monitoring, current institutional controls, and implementation of deed restrictions; 2) In-situ containment with soil cap and subsurface barriers; 3) In-situ containment using low-pressure grout injection with a cap; and 4) Excavation of waste and soils.
- The preferred remedy in DOE's D1 Proposed Plan (October 1998) for SWMU 2 is the "No further action" option. The Kentucky Department for Environmental Protection considers excavation to be the only acceptable remedy.

Status:

- A revised (D2) Proposed Plan is expected to be issued in August 1999, pending approval of the PGDP Land Use Control Assurance Plan in June.
- A final (D3) Proposed Plan and D1Record of Decision could then be issued during 2000.

3. PROJECT: Waste Area Group 22, SWMUs 7&30

Summary: This project includes the investigation of the C-747-A Uranium Burial Ground and C-747-A Burn Area in the northwest corner of the plant.

- The D2 Feasibility Study for SWMUs 7 & 30 was issued to regulatory agencies for review in November 1998, proposing four remedial alternatives: 1) No action; 2) Limited action (installation of additional monitoring wells and long-term groundwater monitoring); 3) Soil cover and groundwater monitoring with additional monitoring wells; and 4) Surface soil removal and groundwater monitoring with additional monitoring wells.

Status:

- EPA has given conditional approval of the D2 Feasibility Study. Final approval is pending review of the Land Use Control Assurance Plan.
- The Kentucky Department for Environmental Protection provided comments on the D2 Feasibility Study in December 1998; DOE responded to the comments in January 1999, with comment resolution pending.

4. PROJECT: Northwest/Northeast Plume Groundwater Systems

Summary: Approximately 358 million gallons of groundwater water have been treated through March 1999 at the Northwest Plume Groundwater Treatment Facility since operations began September 1995. The facility operates under a 1993 Record of Decision to contain a high contamination zone of trichloroethylene (TCE) and Tc-99. Approximately 191 million gallons of groundwater have been treated via the Northeast Plume system since the facility began operations under a Record of Decision in March 1997. The facility operates under a 1994 Record of Decision to contain a high contamination zone of TCE.

Status:

- 8.4 million gallons groundwater were treated at the Northwest System during March 1999, with the facility operational 99.2 percent of the time.
- 8.3 million gallons groundwater were treated at the Northeast System during March 1999, with the facility operational 99.9 percent of the time.
- Bechtel Jacob Company awarded a subcontract to CDM Federal Programs, Inc., effective April 1, 1999, for continued operation of the two groundwater facilities for a 3-year base period. Operational costs have been reduced continuously at the facilities, with further cost reductions expected from the new contract.

5. PROJECT: Lasagna™ Soil Remediation at SWMU 91

Summary: Lasagna is a soil remediation technology already demonstrated at PGDP by DOE and industry partners (Monsanto, DuPont, General Electric), and then selected to reduce TCE levels in soil at SWMU 91 under a 1998 Record of Decision. SWMU 91 is an area of approximately one acre on the west side of the plant once used to drop test empty DUF6 cylinders. Lasagna is an in-situ technology that uses buried electrodes to move water through soil, picking up contaminants. The water passes through buried treatment zones that trap or degrade the TCE.

Status:

- Bechtel Jacobs Company awarded a subcontract February 12, 1999, to CDM Federal for the design, construction, and operation of the Lasagna treatment system at SWMU 91.
- The D1 Remediation Design Report, Construction/Quality Control Plan/Remedial Action Work Plan is scheduled to be issued May 18, 1999.
- The D1 Operation and Maintenance Plan is scheduled to be issued June 3, 1999.
- Construction of the treatment system is scheduled for August 1999, with operations scheduled to begin in October 1999.
- The system is expected to be operated for approximately 2 years in order to achieve targeted clean-up levels.

6. PROJECT: Groundwater Operable Unit/WAG 6

Summary: WAG 6 includes five SWMUs near the C-400 Chemical Cleaning Facility, which is still in operation, and leased by DOE to USEC, Inc. Past operations at the facility resulted in TCE and Tc-99 groundwater contamination. Use of TCE for cleaning equipment was ended in 1993. Following the completion of the WAG 6, 27 and 28 Remedial Investigations, all data will be used to develop a Feasibility Study for the Groundwater Operable Unit, which includes the groundwater plumes themselves as well as the primary sources of TCE and Tc-99 groundwater contamination. Following this Feasibility Study, a Proposed Plan and Record of Decision for the selected remedial action will be developed. The selected remedial action will be designed and implemented after the ROD is signed.

Status:

- A comment resolution teleconference on the D1 WAG 6 Remedial Investigation Report was conducted April 4, 1999.
- The D2 WAG 6 Remedial Investigation Report is on schedule to be issued May 7, 1999.
- The D1 WAG 6 Treatability Studies reports, which evaluate Surfactant Flushing and Chemical Oxidation of the Regional Gravel Aquifer, are under review by the regulatory agencies and other stakeholders. Comments are expected to be received around May 19, 1999.
- The Innovative Treatment Remediation Demonstration process was kicked off February 10-11, 1999, for the Groundwater Operable Unit Feasibility Study. The scope of this process includes a cooperative public-private partnership developed to reduce remediation schedules and costs by accelerating acceptance and use of new technologies. The program coordinates DOE, EPA, industry, and regulatory agencies in evaluating, implementing and validating innovative remediation technologies at selected DOE sites. The second series of meeting with the ITRD Group is scheduled for April 22-23, 1999.
- As part of the Groundwater Operable Unit project, a sonic cone penetrometer drilling method will be tested near the C-400 facility and in the area of the Southwest Plume in June 1999. The test will attempt to penetrate the Regional Gravel Aquifer for the first time with a direct push drilling method. The direct push drilling method excels over other rotary and auger drilling methods in that waste generation is minimized. In addition to minimizing waste, water saturations and contaminant concentrations are not altered since drilling fluid is not used. Direct push drilling is less costly than these other methods, typically taking less time and using smaller rigs allowing easier access. The test will also evaluate a method for detecting the presence and location of TCE Dense Non-Aqueous Phase Liquids (DNAPLs). The method uses a membrane that when contacted by TCE stains red. The membrane resembles a large diameter reactive garden hose that can be lowered and hydraulically expanded in the borehole to define areas with pure phase TCE present.

7. PROJECT: Waste Area Groups 9 & 11

Summary: WAGs 9 and 11 include seven in-ground tanks, vaults and pits at the PGDP. A Site Evaluation was conducted in Fiscal Year 1998 to determine whether any releases of contaminants had occurred. WAG 9 consists of the C-722 acid neutralization tank, off the northeast corner of the C-720 maintenance facility; the C-712 acid neutralization tank, off the southwest corner of the C-710 laboratory; the C-616-L Pipeline and vault soil contamination area; and the C-729 Acetylene building drain pits, just east of C-720. WAG 11 consists of the C-410-B hydrofluoric acid (HF) neutralization sludge lagoon; the C-410-E HF emergency holding pond; and the C-410-C HF neutralization tank.

Status:

- The D1 Site Evaluation Report was issued December 23, 1998, recommending: 1) no further action for WAG 9; and 2) performance of a risk assessment for WAG 11.
- Any actions beyond these recommendations would be deferred to the Surface Soils Operable Unit project.
- The Kentucky Department for Environmental Protection provided comments on the D1 Site Evaluation Report on March 26, 1999, and these comments are being addressed.

8. PROJECT: Waste Area Group 23/PCB spill sites

Summary: WAG 23 consists of eight SWMUs inside the PGDP security fence, and one outside the fence, located near the C-611 Water Treatment Facility fence on DOE property. Past use of PCBs and subsequent accidental spills and leaks of oils that contain PCBs caused the surface soil contamination at these SWMUs. Excavation of approximately 175 cubic yards of contaminated soil at several PCB sites was completed in late 1997 and early 1998.

Status:

- A D1 Proposed Remedial Action Plan recommending No Further Action was submitted to regulators November 6, 1998. EPA provided comments, dated December 17, 1998.
- A Residual Risk document and explanation of average concentrations calculations were provided to the State on February 18, 1999.
- State comments on the D1 Proposed Remedial Action Plan were received April 14, 1999.

9. PROJECT: Waste Area Group 27

Summary: WAG 27 consists of potential or known sources of TCE on the west side of PGDP suspected of contributing to groundwater contamination. WAG 27 includes the C-747-C Oil Land Farm, SWMU 91 (the cylinder drop test area), SWMU 196 (C-746-A warehouse septic systems) and the C-720 maintenance facility.

Status:

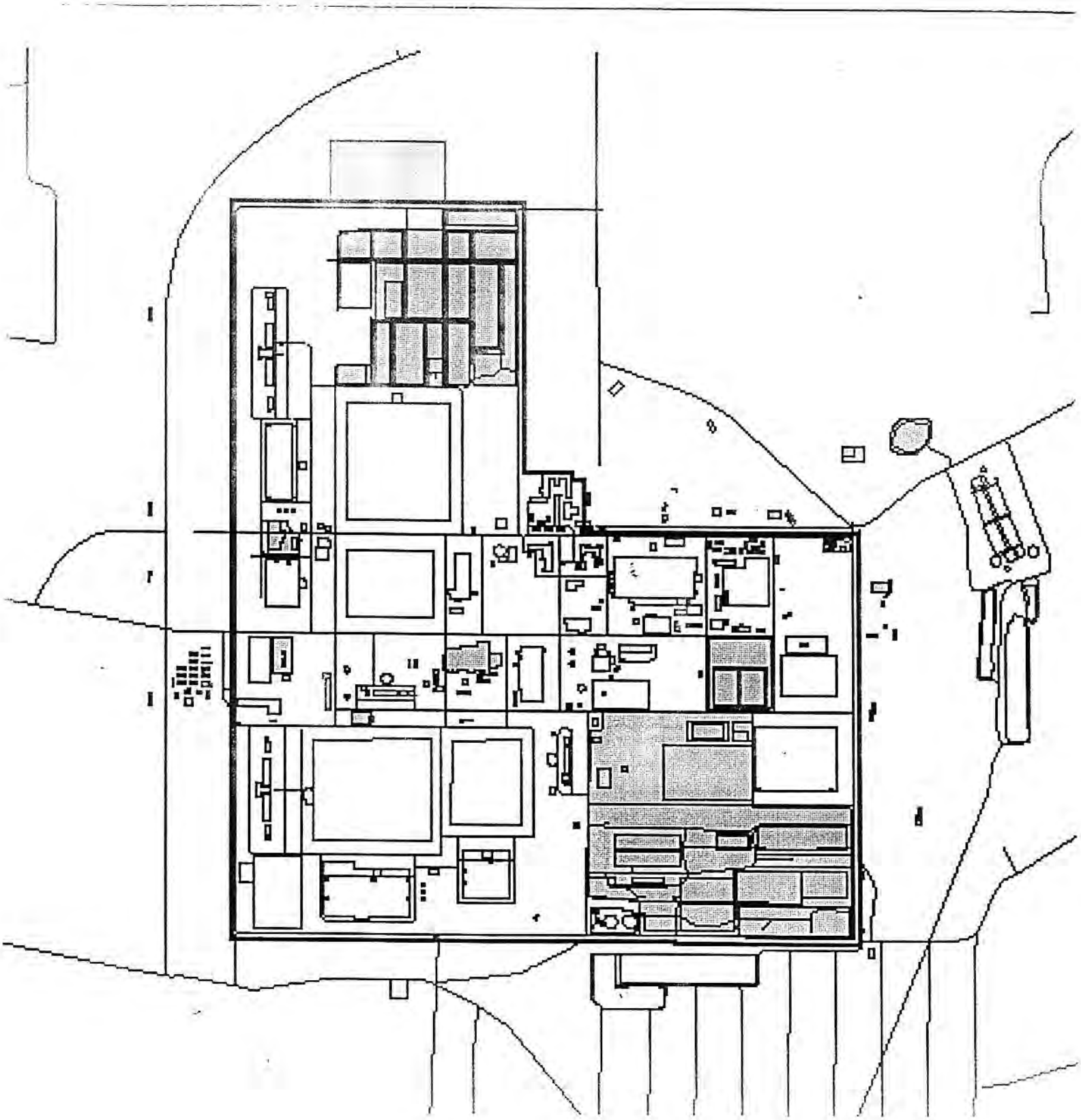
- Issued D1 WAG 27 Remedial Investigation Report December 23, 1998.
- EPA comments were received March 31, 1999.
- State comments were received on April 5, 1999.
- D2 Remedial Investigation Report is scheduled to be issued by June 4, 1999.

10. PROJECT: Surface Water Operable Unit

Summary: The Surface Water Operable Unit includes the Big and Little Bayou Creeks, all Kentucky Pollutant Discharge Elimination System (KPDES) outfall ditches, and the primary source areas potentially contributing to contamination in these locations, including: past releases from C-333A and C-337 vaporizers and the switchyards, and sediment from plant storm sewer systems. Primary contaminants of concern are PCBs and radionuclides with metals as a secondary concern.

Status:

- Issued the D1 Scoping Document to the regulators March 29, 1999.
- Data Quality Objective meetings were conducted April 14-15, 1999, with the regulators and representatives of the Kentucky Fish and Wildlife Resources Department, and U.S. Fish and Wildlife Services.
- The Risk Assessment for the Surface Water Operable Unit is scheduled to include a baseline human health risk assessment and a comprehensive baseline ecological risk assessment.



DOE/OR/07-1785&D1
PRIMARY

WAGs 9 & 11 Site Evaluation Report at the Paducah Gaseous Diffusion Plant Paducah, Kentucky

This document has received the appropriate reviews for release to the public.

EXECUTIVE SUMMARY

This Site Evaluation (SE) Report document presents the field sampling and analytical strategies and activities performed during the Waste Area Groupings (WAGs) 9 & 11 investigation. The data obtained from this investigation was used to evaluate potential exposure to chemical releases that may have resulted from the processes and definable process features present at each solid waste management unit (SWMU) location.

The field investigation was successfully completed according to the work plan (DOE 1997). The risk evaluation utilized the information collected during the field investigation to determine if exposure to contamination at the SWMUs could adversely impact human and non-human receptors. Specifically, the risk evaluation considered risk to human and non-human receptors through direct contact with the contaminated media and risk to a human receptor through use of groundwater potentially contaminated by contaminants migrating from contaminated soil sources. Due to the location of the SWMUs, only industrial workers were considered in the risk evaluation due to the confined SWMU locations. However, the location of the SWMUs was not considered when performing the evaluation for non-human receptors. The location was not considered for non-human receptors in order that the evaluation could act as a surrogate for risks posed by the potential migration of contaminants from the SWMUs to ditches and creeks surrounding the PGDP.

In this summary, the conclusions and recommendations are presented by SWMU within each WAG. The flow charts presented in Sect. 7 were utilized in developing the following conclusions and recommendations. As presented in these flow charts, the possible conclusions are 1) risks to human and non-human receptors are de minimis, 2) results from risk screening do not apply or cannot determine if risks are de minimis, and 3) additional analyses (i.e., a risk assessment) should be performed to determine if risks are de minimis.

The general conclusion derived from the WAG 9 SWMUs (SWMUs 27, 28, 165, and 170) analytical data and subsequent risk screening calculations indicate that the risks to human and non-human receptors are de minimis. The recommendation for the WAG 9 SWMUs is for no further action. The general conclusion derived from the WAG 11 SWMUs (SWMUs 19 , 20, and 41) analytical data and subsequent risk screening calculations indicate that additional information and risk evaluation is necessary to determine of risks are de minimis. The recommendation for WAG 11 SWMUs is for further investigation (risk assessment) due to the inconclusive determination that the risk to human and non-human receptors are de minimis.

WAG 9 - SWMU 27

It is concluded from the SE of SWMU 27 that the contamination present does not present risks to industrial workers, potential residential groundwater users, or non-human receptors that exceed de minimis levels. Direct contact risks are de minimis because contaminated media are not available for direct contact at SWMU 27. Risks from use of groundwater contaminated by the migration from soil are de minimis because the concentrations of all contaminants in soil were below the groundwater protection screening criteria.

The recommendation for SWMU 27, based on field data and calculated risk, is for no further action.

WAG 9 - SWMU 28

From the SE of SWMU 28, it is concluded that the contamination present does not present risks to industrial workers, potential residential groundwater users, or non-human receptors that exceed de minimis levels. Direct contact risks are de minimis because contaminated media are not available for direct contact

at SWMU 28. Risks from use of groundwater contaminated by migration from soil are regarded acceptable low even though one detected concentration of one contaminant, antimony, exceeds the groundwater protection screening criteria. It is believed that this detection is either anomalous or indicates that the contamination, if any, is not widespread at SWMU 28. Therefore, no impacts on groundwater can be reasonably expected.

The recommendation for SWMU 28, based on field data and calculated risk, is for no further action.

WAG 9 - SWMU 165

It is concluded that the contamination present at SWMU 165 does not present risks to industrial workers, potential residential groundwater users, or non-human receptors that exceed de minimis levels. Direct contact risks are regarded acceptably low even though a confirmatory sample it was determined that PAHs may be present at SWMU 165 at concentrations that exceed de minimis levels. The results of this confirmatory sample are declared suspect because all other data collected at SWMU 165 indicate that PAHs are not present in soils at concentrations that are above screening criteria. Risks from the use of groundwater that contaminated by migration from soil are de minimis because the concentrations of all contaminants detected at SWMU 165 are below screening criteria.

The recommendation for SWMU 165, based on field data and calculated risk, is for no further action.

WAG 9 - SWMU 170

From the SE of SWMU 170, it is concluded that the contamination present does not present risks to industrial workers, potential residential groundwater users, and non-human receptors that exceed de minimis levels. Direct contact risks are de minimis because contaminated media are not available for direct contact at SWMU 170. Risks from the use of groundwater where contamination has migrated from soil are also regarded acceptably low even though two detections of ^{238}U exceed background These exceedances are deemed to be of little significance because the magnitude of the exceedence is minor. (i.e., 1.40 and 2.55 pCi/g versus a background of 1.20 pCi/g) and because previous work has determined that uranium has limited mobility in the subsurface at PGDP (DOE 1997b).

The recommendation for SWMU 170, based on field data and calculated risk, is for no further action.

WAG 11 - SWMU 19 (including SWMU 41)

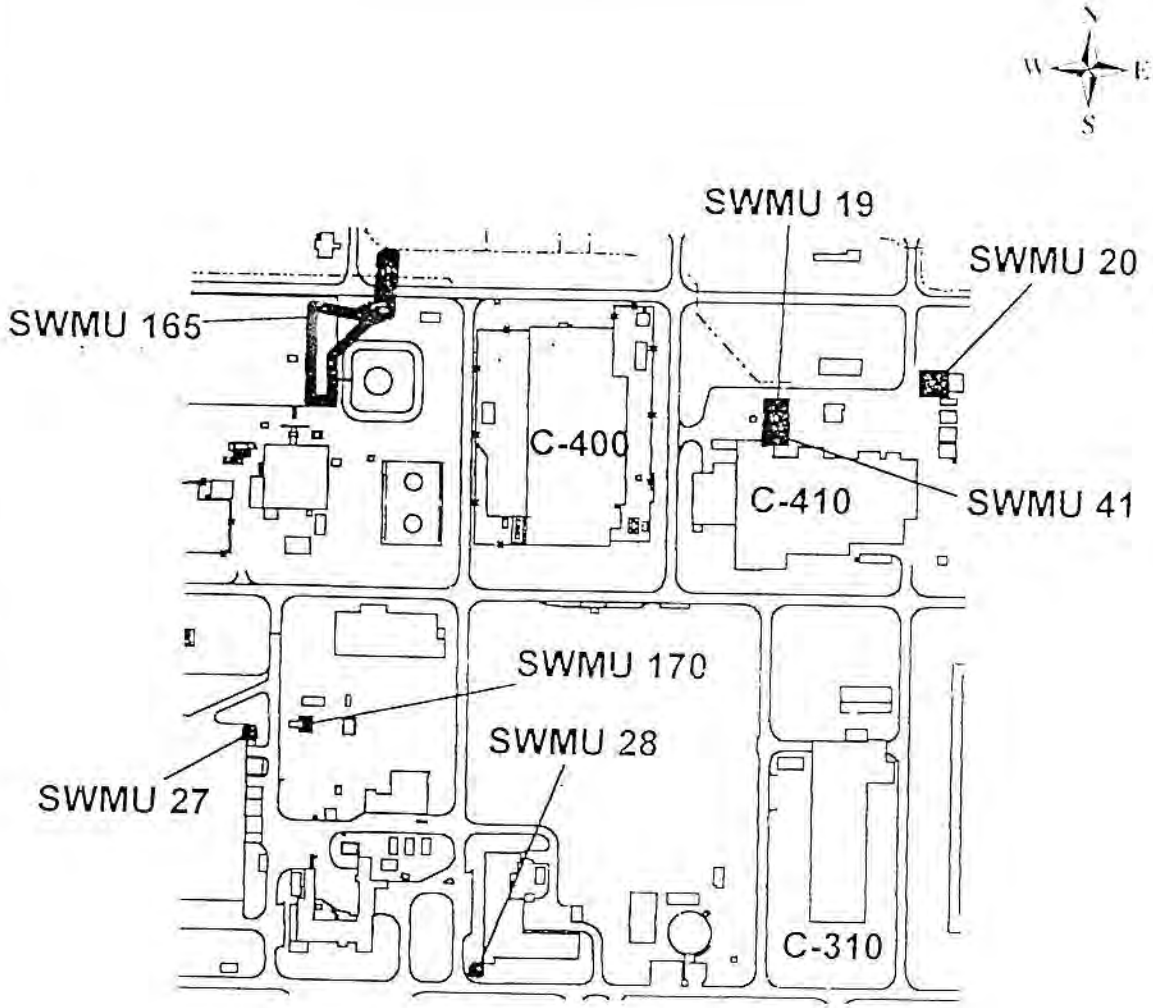
It is concluded from the SE of SWMU 19 that additional analyses (i.e., risk assessment) are necessary to determine the extent risks to industrial workers and non-human receptors. Several organic compounds and inorganic chemicals were detected at concentrations that exceed their direct contact screening criteria. However, the additional evaluation can be limited to direct contact risks only because it does not appear that contaminants are present in soil at concentrations that exceed the groundwater protection screening criteria for residential groundwater users. Two PAHs were detected at concentrations that exceed the groundwater protection screening criteria, but these PAHs were detected in surface soil only and apparently have not migrated to the subsurface. This observation is consistent with previous work where it was determined that PAHs are not mobile in the subsurface at PGDP (LMES 1996).

The recommendation for SWMU 19 (including SWMU 41) is for additional site-specific analyses (i.e., risk assessment) to determine if site risks due to direct contact really exceed de minimis levels.

WAG 11 - SWMU 20

The SE of SWMU 20 concludes that additional analyses (i.e., risk assessment) are necessary to determine the extent of risks to industrial workers and non-human receptors. Several organic compounds and inorganic chemicals were detected at concentrations that exceed their direct contact screening criteria. However, the additional evaluation can be limited to direct contact risks only because it does not appear that contaminants are present in soil at concentrations that exceed the groundwater protection screening criteria for residential groundwater users. PCB-1254 was detected in two samples concentrations that exceed the groundwater protection screening criteria, but these detections were in surface soil only. Therefore, this PCB has not migrated to the subsurface. This observation is consistent with previous work where it was determined that PCBs are not mobile in the subsurface at PGDP (DOE 1994).

The recommendation for SWMU 20 is for additional site-specific analyses (i.e., risk assessment) to determine if site risks due to direct contact really exceed de minimis levels.



N.T.S.

Fig. 1.2 WAGs 9 & 11 SWMUs
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