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**FERNALD CITIZENS TASK FORCE AGENDA AND HANDOUTS FOR  
JULY 8, 1995 PUBLIC MEETING**

07/08/95

**TASK FORCE      PUBLIC**  
**30**  
**AGENDA**

# FERNALD CITIZENS TASK FORCE

A U.S. DEPARTMENT OF ENERGY SITE-SPECIFIC ADVISORY BOARD

Chair:

John S. Applegate

Members:

James Bierer  
Marvin Clawson  
Lisa Crawford  
Pam Dunn  
Dr. Constance Fox  
Guy Guckenberger  
Darryl Huff  
Jerry Monahan  
Tom B. Rentschler  
Robert Tabor  
Warren E. Strunk  
Thomas Wagner  
Dr. Gene Willeke

Alternates:

Russ Beckner  
Jackie Embry

Ex Officio:

J. Phillip Hamric  
Graham Mitchell  
Jim Saric

## REVISED AGENDA

July 8, 1995

1. *Time and Place*

The next regularly scheduled meeting of the Task Force will be on Saturday, July 8, 1995, from 8:30 a.m. to 12:30 p.m., at the Joint Information Center, 6025 Dixie Highway, Fairfield, Ohio. We will begin the meeting promptly at 8:30.

2. *Subjects*

8:00	Continental Breakfast (optional)
8:30	Call to Order
	Approval of Minutes
	Chair's Remarks
8:45	Review of Draft Final Report
10:15	Break
10:30	Opportunity for Public Input on Draft Final Report
11:00	Determination of Changes to Draft Final Report
11:45	Wrap Up
12:00	Adjourn

3. *Documents*

The documents and other materials relevant to the meeting's subjects are being developed by the Task Force staff. They will be distributed at the meeting.

4. *Chair's Announcements*

5. *Other Meetings of Interest (calendars enclosed)*

# July 1995

## PUBLIC PARTICIPATION

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
2	3 7:30pm Morgan Township - Civic Center	4	5	6 7:00pm Ross Township - Ross Fire House	7	8 8:30am Fernald Citizens Task Force Meeting
9	10 7:30pm Crosby Township - Civic Center	11	12	13	14	15
16	17 7:30pm Morgan Township - Civic Center	18	19	20 7:00pm Ross Township - Ross Fire House	21	22
23	24	25	26	27 7:30pm FRESH - Venice Presbyterian Church	28	29
30	31 7:30pm Crosby Township - Civic Center					

Please call Judy Armstrong for changes at 738-0003.

# August 1995

## PUBLIC PARTICIPATION

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
6	7 7:30pm Morgan Township - Civic Center	8 7:00pm Community Meeting - Plantation Business Fair Expo	9	10 7:00pm Ross Township - Ross Fire House	11	12
13	14 7:30pm Crosby Township - Civic Center	15	16	17 7:00pm Ross Township - Ross Fire House	18	19
20	21 7:30pm Morgan Township - Civic Center	22	23	24 7:30pm FRESH - Venice Presbyterian Church	25	26
27	28 7:30pm Crosby Township - Civic Center	29	30	31		

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**FERNALD**

Environmental Management Project

## RADIUM AND PRECIOUS METAL EXTRACTION FROM K65 RESIDUES

Considerable attention has been focussed lately on the potential for using Fernald's K65 silo residues as a source of radium for feedstocks for the production of medical isotopes, and as a source of gold for precious metal recovery. Dialogue has been ongoing for the past two years on these issues and precipitated a May 11, 1995, meeting at Fernald in which parties interested in radium extraction presented their positions, followed by discussions on precious metal recovery.

Fernald's position at that meeting was the site is under a legal requirement by EPA through a record of decision to vitrify the silo materials and ship them to the Nevada Test Site for burial. Signed in December 1994, the record of decision requires that the project start within 15 months from the signing, which is March 1996. The present schedule shows that all residues will be processed by 2001. In addition, extraction of the radium was considered as part of Operable Unit 4's Feasibility Study (FS) under CERCLA, and the conclusion was that it would be considerably more expensive than disposal. The study showed the extraction option was cost prohibitive, and it was rejected as an option (Alternatives 3A.1 and 5A.1 in Volume 2 of FS report).

Concern was expressed at the meeting that the radium would be unavailable for the medical purposes being discussed. However, it was clear from the discussions that there is some doubt the proposed methodology will work for treating cancer. If the methodology does work, much work needs to be done to develop the process for making the cancer treating agent. The attached figure shows the steps necessary for production of the cancer treating agent: each step is quite complicated. Fernald's position is we will continue to implement the Operable Unit 4 Record of Decision.

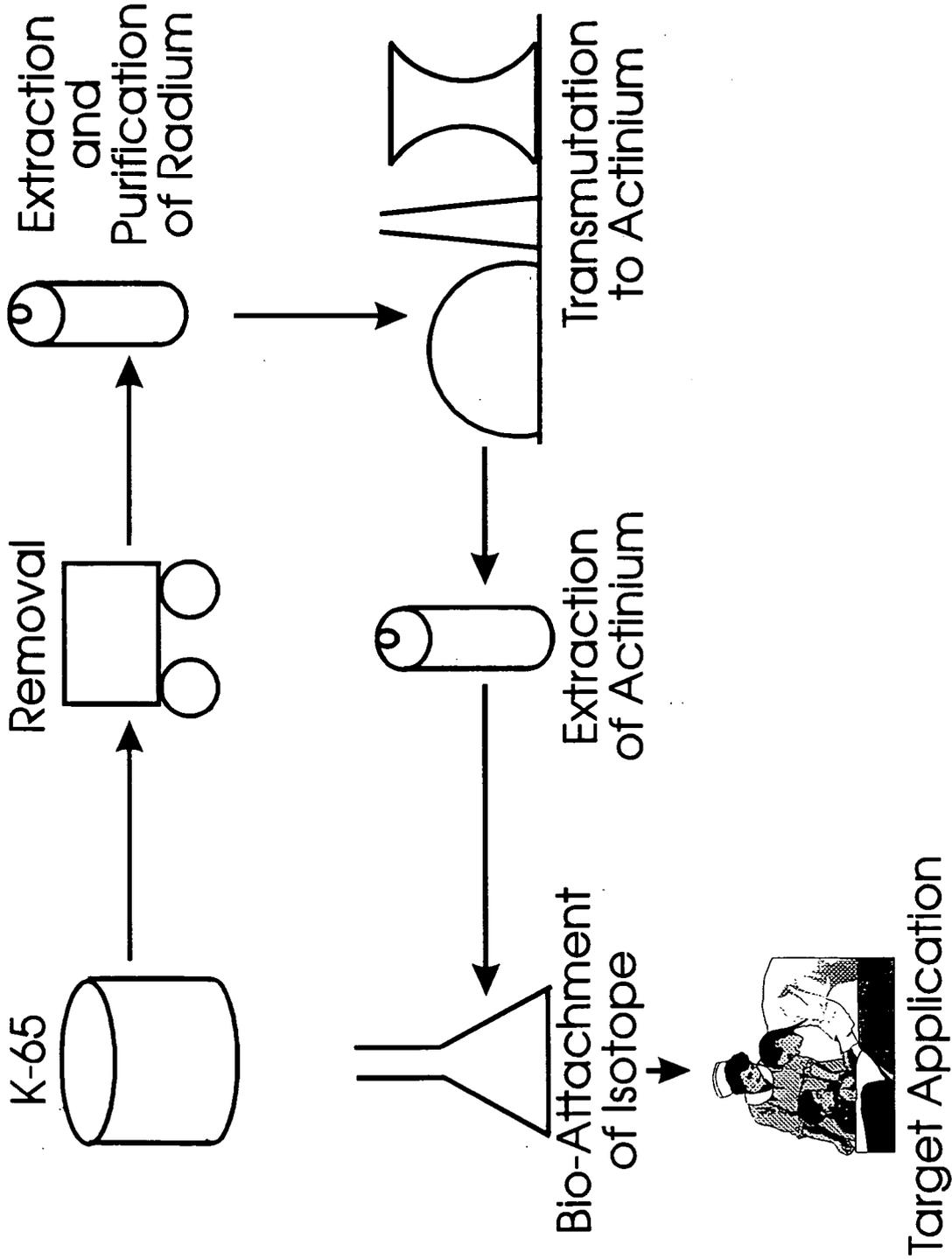
As a path forward from the meeting, discussion centered around getting sufficient funding for extraction testing in the event the radium was needed at the conclusion of the medical testing. The vitrification process needs to go forward because of the legal requirements under CERCLA and because the residues are only one potential source of radium. Other sources of radium may be available in the future. The glass form that is the product of the vitrification process is very stable and will contain radium into the foreseeable future. If the need arises, the radium can be recovered from the glass in a more safely handled form. The radon release from the glass form is approximately 500,000 times lower than from the residue form. The location of the glass gems will be known in the burial site and, in all likelihood, will be buried in a single location over the three years of the Vitrification Plant's operation. This will allow recovery and reuse, if necessary.

A one ton per day vitrification pilot plant is scheduled to start producing glass from the silo residues in early 1996. At that time, samples of both the silo materials and the vitrified glass form could be made available for testing purposes.

As far as separation of precious metals (gold) from the residues is concerned, data in Operable Unit 4's Remedial Investigation (Page 1-37) shows an average of 50 ppm gold is in the residues. If consistent throughout the residues, this would represent less than \$10 million worth of gold at \$400 per ounce. Creating facilities just for dealing with the precious metals from Fernald would probably be impractical. While it is possible the gold might be economically extracted using arsenic heap leaching, the resultant gold will have small quantities of radionuclide contamination throughout the volume and it is doubtful that it could be free released to the public under today's laws.

For more information on this subject, contact Gary Stegner, DOE Fernald Area Office Public Information, 513-648-3153, P.O. Box 538705, Cincinnati, Ohio, 45253-8705.

# Conceptual Production Of Cancer Treating Agent



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FINAL REPORT OF THE  
FERNALD CITIZENS TASK FORCE

Final Review Draft  
June 26, 1995

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## **I. INTRODUCTION**

This report presents the formal recommendations of the Fernald Citizens Task Force to the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Ohio Environmental Protection Agency (OEPA) regarding environmental remediation of the Fernald Environmental Management Project. The report also provides background on the Fernald site and the Fernald Citizens Task Force.

The Fernald Citizens Task Force was established in August 1993 by DOE as a site-specific citizens advisory board for the Fernald facility. Also chartered under the Federal Advisory Committee Act, the task force was created to provide DOE, EPA, and OEPA with recommendations regarding four specific questions:

- 1) What should be the future use of the Fernald site?
- 2) What residual risk and remediation levels should remain following remediation?
- 3) Where should the waste be disposed?
- 4) What should be the priorities among remedial actions?

A detailed description of recommendations for each of these issues is reported in Section V, "Task Force Recommendations."

This report also presents background information on the Fernald site and the Fernald Citizens Task Force. This background information is necessary to understand the task force's recommendations and how they were developed. This background information is presented to frame the task force's understanding of the Fernald site and its environmental conditions. The recommendations outlined in this report are based upon the accuracy and validity of information that was provided to the Fernald Citizens Task Force. Should any key information prove erroneous or change significantly in the future, then certain recommendations may require reconsideration.

A final purpose of this report is to provide the reader a complete understanding of the Fernald Citizens Task Force and how it developed its recommendations. Section III "Task Force Organization and Approach," describes the organization of the task force. Section IV "Task Force Decision-making Process" describes the process the task force used to make decisions. Selected materials are also included as appendices to present a more detailed record of the task force's operations and deliberation. Also included is a glossary of technical terms used in this report. Words found in the glossary are printed in **bold type** the first time they appear in the report.

## II. OVERVIEW OF THE FERNALD FACILITY

### *History*

The Fernald site in Fernald, Ohio, was first established under the auspices of the Atomic Energy Commission as the Feed Materials Production Center (FMPC) and is now owned and operated by the U.S. Department of Energy (DOE). Ground was broken on May 16, 1951, and production of uranium metal for use in nuclear weapons began on October 11, 1951, continuing for nearly 40 years. More than 500 million pounds of high-purity uranium metals were produced for use throughout the nation's nuclear weapons complex. The facility was operational until 1989, when production stopped and DOE changed Fernald's mission to environmental restoration. DOE also renamed the site the Fernald Environmental Management Project (FEMP).

Environmental remediation activities began at the Fernald site in 1986 under a Federal Facility Compliance Agreement between DOE and the U.S. Environmental Protection Agency (EPA). Little remediation progress had been made when the facility was placed on the National Priorities List in 1989, formally making it a Superfund site.

In April 1990, a new consent agreement between DOE and EPA was signed in accordance with Superfund regulations. Amended in September 1991, this consent agreement provides the guidelines by which environmental remediation activities at Fernald are conducted. This consent agreement identified a specific schedule for compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements for conducting remedial investigations (RI), feasibility studies (FS), and records of decision (ROD). In accordance with the consent agreement, DOE has been engaged in a thorough investigation of the facility and surrounding lands to provide a detailed understanding of the environmental damage and human health risks created by uranium production at Fernald. At the time of this writing, these investigations are nearing completion and decisions regarding the most appropriate remediation approaches and schedules are being reached.

To address the contamination problems at Fernald, DOE and EPA have organized and managed the site as five operable units (OUs). Each of these operable units is composed of areas of the site that have similar characteristics:

**OU 1:** Waste pits 1-6, clearwell, burnpit, berms, waste pit liners, and soil within the operable unit boundary;

**OU 2:** Fly ash piles, south field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the operable unit boundary;

OU 3: Former production area, including all production-associated facilities and equipment and all other materials and waste in the former production area;

OU 4: Silos 1-4, berms, decant sump tank system, and soil within the operable unit boundary;

OU 5: Groundwater, surface water, all soil not included in OUs 1-4, sediments, and fauna.

A map identifying the location of each operable unit is shown in Figure 1. Because technical information was developed separately for each operable unit, and because the regulatory schedule is based on them, the Task Force generally followed this organization in its consideration of the site.

### **Setting**

The Fernald property consists of 1,050 acres in a primarily rural setting located approximately 18 miles northwest of downtown Cincinnati. Surrounding properties consist of agricultural and residential development with some light industry within a two-mile radius. Uranium production operations were concentrated within a 136-acre industrial area in the center of this property. The property surrounding Fernald's former production area includes: to the west, several large, open pits for waste storage; to the north, forested wetlands; a small creek which dissects the eastern edge of the Fernald property from north to south; and open fields leased for cattle grazing at the site's perimeters. A map identifying land uses and natural resources at the site is shown in Figure 2.

The Great Miami Aquifer underlies the entire 1,050-acre site. A sole source aquifer, the Great Miami Aquifer is the major source of drinking water in the region. In all, the Great Miami Aquifer covers much of southwest Ohio and is one of the largest drinking water aquifers in the nation, containing almost 10 trillion gallons of water. The Fernald site has contributed to the above background levels of contamination of as much as 5.8 billion gallons of water, or 0.062% of the total aquifer.

Significant natural features of the site include the northern wetlands and Paddys Run, an intermittent stream which is inhabited by an endangered species of crayfish. At certain intervals, water from Paddys Run enters the Great Miami Aquifer, carrying contaminants from runoff into the groundwater. Paddys Run also feeds into the Great Miami River, which lies approximately one-half mile south and east of the Fernald site.

Figure 1 - under development

Figure 2 - under development

The soil immediately beneath the Fernald site consists of a clay-rich glacial overburden of up to 50 feet thick at the northeast corner of the site and thinning to nothing near Paddys Run. This clay layer contains silty sand lenses which contain a perched aquifer system that is not used as a source of drinking water. Beneath the clay layer is a thick sand and gravel layer containing the Great Miami Aquifer.

## **Contamination**

Production and disposal activities, wind, and runoff during nearly 40 years of operation have resulted in widespread contamination from uranium and other hazardous and radioactive chemicals on and near the 1,050-acre site. These materials include drummed nuclear waste materials, bulk waste in pits and silos, mixed waste, and contaminated soil and debris. Based on the cleanup levels recommended by the task force, over 3 million cubic yards of waste and contaminated material will require disposal. However, if background-level conditions were to be sought, the volume of material to be managed would increase substantially. Figure 3 "Waste Volumes and Disposition Options," provides a breakdown of waste materials by location, volume, and severity, according to task force recommended cleanup levels, and identifies potential options for disposal.

Approximately 100 contaminants of concern have been identified at Fernald. These contaminants of concern are located throughout the former production area, in site soils, and in groundwater. Many of the chemical contaminants are consistent with those typically found at industrial operations including solvents, asbestos, polychlorinated biphenyls (PCBs), and heavy metals. In addition, the Fernald site is heavily contaminated with radioactive compounds including uranium, thorium, radium, and radon. By far, uranium is the most prevalent contaminant found in the soil and groundwater at Fernald.

In the Fernald Dose Reconstruction Project, the Centers for Disease Control estimated that as many as 1 million pounds of uranium were released into the environment during Fernald operations. Very high concentrations of uranium exist in soils at depths up to 20 feet in the former production area as a result of leaks, spills, and runoff during production. Airborne uranium has also resulted in widespread contamination of surface soils outside of the former production area. Because uranium is relatively heavy, most particles fell to the ground near the former production area. However, enough uranium was carried as far as 5 miles from the site to exceed background levels over an area of 11 square miles.

The highest level of contamination at Fernald is found in three concrete storage silos to the west of the former production area. Two of these silos, Silos 1 and 2 (also known as the K-65 silos), contain 216,300 cubic feet of waste residues generated from processing high grade uranium ores. This processing was conducted during the 1950s at both the Fernald site and at Mallinckrodt Chemical Works, in St. Louis to extract uranium from the natural ores. These silos were constructed in

Figure 3 - under development

1951 to provide temporary storage; however the waste material was never removed. The high concentrations of radium in these silos result in the production of dangerous levels of radon gas. This radon problem has been temporarily controlled by placing a thick clay layer at the top of each silo. Because of its very short half-life, most of the radon decays before it is able to escape from the clay.

Silo 3 contains "old" metal oxide waste residues which were also generated at Fernald during uranium extraction operations in the 1950s. The Silo 3 residues are substantially different from those in Silos 1 and 2. The silo 3 residues are dry; the residues in Silos 1 and 2 are wet. Also while the radiological constituents are similar to those in Silos 1 and 2, certain radionuclides, such as radium, are present in Silo 3 in much lower concentrations. Silo 4 was never used and remains empty, except for rain water.

North of the silos are six waste pits that contain solid and semi-solid wastes of varying types and concentrations. Fly ash and sludges from industrial operations were also disposed in landfills west and south of the site. In the former production area, numerous contaminated structures and equipment require decontamination and disposal, as well as thousands of drums of waste awaiting off-site disposal.

As a result of leaching through soil and runoff into Paddys Run, a large plume of contamination is present in the Great Miami Aquifer beneath the Fernald site and some distance south, beyond the site boundary. DOE has provided a number of homes bottled water as a result of Fernald-related contamination. Five pumping wells south of the Fernald site boundary are also operating and have successfully halted migration of this contamination plume until groundwater remediation can begin.

### III. TASK FORCE ORGANIZATION AND APPROACH

Planning for the Fernald Citizens Task Force began in early 1993. Below is a timeline of key task-force-related activities; the remainder of this section provides more details.

- January 1993  
- February 1993:** DOE and its contractor begin organizing ideas for establishing a citizens advisory board at Fernald.
- March 1993:** DOE decides to use an independent convener to establish the advisory board, and identifies criteria for convener.
- April 1993:** DOE searches for a convener.
- May 1993:** Dr. Eula Bingham from the University of Cincinnati is hired as convener and begins work on charter and identification of potential stakeholders.
- June 1993:** Bingham works within Ross, Crosby, and Morgan townships to evaluate stakeholders, and receives recommendations from local trustees.
- July 1993:** Bingham sends a letter to local residents announcing a public meeting to discuss the citizens advisory board. The meeting is held, and trustees from all local townships attend.
- August 1993:** Bingham delivers the membership slate to DOE; the entire slate is accepted. Bingham recommends John Applegate, a law professor at the University of Cincinnati, as the task force chair.
- September 1993  
- November 1993:** First meetings of the task force are held. The task force tours the site, is provided background information, and works to complete charter and develop ground rules.
- December 1993:** Douglas Sarno, Phoenix Environmental, is hired as a consultant to the task force.
- January 1994:** The task force approves its 18-month work plan.

- February 1994 - August 1994:** The task force focuses on technical site information and evaluation of alternative future uses and cleanup levels. The "FutureSite" exercise is developed to evaluate alternative future uses for the Fernald Site.
- September 1994:** The task force finalizes and approves consensus values.
- November 1994:** The task force releases its interim report identifying recommendations for cleanup levels and future use.
- December 1994:** The task force approves its revised work plan for 1995 activities.
- January 1995:** The task force holds a public workshop to discuss waste disposition issues.
- February 1995:** The task force releases its waste disposition recommendations.
- April 1995:** The task force releases its recommendations on site priorities.
- May 1995:** The task force releases its final future use recommendations.
- July 1995:** The task force releases its final report.

### ***Convening the Task Force***

Though small in size compared to other DOE sites, Fernald has received significant national publicity. In the 1980s, it was discovered that the Fernald facility had been contaminating local drinking water for many years. Sued by local residents and by the State of Ohio, DOE paid \$78 million in damages. Diminishing trust of the Department and its contractors resulted in strong grassroots citizen activity. In 1985, the Fernald Residents for Environmental Safety and Health (FRESH) group was established and has been among the leaders in reforming remediation efforts throughout DOE.

As work progressed under the 1991 revised Consent Agreement, DOE managers at Fernald recognized many important, far-reaching decisions surrounding remediation of the Fernald site would have a profound impact on the long-term interests of local citizens. The DOE managers also realized that direct citizen involvement would be essential to making sound decisions. In the spring of 1993, DOE decision makers at Fernald decided a citizens advisory board would be the

most effective means of obtaining focused stakeholder input on the most pressing issues regarding remediation of the Fernald site.

At about the same time, a model of citizen participation was emerging from the **Federal Facilities Environmental Restoration Dialogue Committee (FFERDC)**, as described in its February 1993 interim report (also referred to as the **Keystone report**). An excerpt of this report is included in Appendix A. The FFERDC recognized that individuals affected by environmental remediation activities ("affected stakeholders") were not being given sufficient opportunity for meaningful dialogue or to provide input regarding the remediation process. The FFERDC recognized opportunities were needed for the full spectrum of stakeholders to voice their interests and concerns.

To correct this situation, the FFERDC recommended creating independent public bodies, called site specific advisory boards (SSABs), to provide policy and technical advice regarding key cleanup decisions to the regulated and regulating agencies. The FFERDC interim report suggested the creation of SSABs would improve decision making by:

- 1) Providing a setting for direct, regular contact between agencies and a diverse set of stakeholders;
- 2) Providing a forum for stakeholders and agencies to understand the competing needs and requirements of the government and the affected communities;
- 3) Providing a forum for discussing citizen issues and concerns, thus enabling the development of a more complete and satisfactory plan or decision;
- 4) Enabling citizen review and the evaluation of plans and their technical adequacy in more depth than is possible in most single opportunity public participation efforts;
- 5) Permitting a more detailed consideration of issues than is possible as a result of the minimal legal requirements identified in various state and federal laws; and
- 6) Broadening consideration of issues to include values as well as facts.

The SSAB concept was ultimately adopted by DOE. The Fernald Citizens Task Force was established as one of the first SSABs in the nuclear weapons complex. To establish the SSAB, an independent convener was used to provide timely and fair identification of potential SSAB members.

In May 1993, DOE hired from the University of Cincinnati, Dr. Eula Bingham, a former Administrator of the Occupational Safety and Health Administration. Her role was to identify potential candidates for membership on the board, interview the candidates, and deliver a slate of recommendations to DOE. During the summer of 1993, Dr. Bingham used a combination of public meetings, mass mailings, and personal recommendations from local officials and stakeholder groups to identify potential candidates for the board. DOE accepted the complete slate of candidates presented by Dr. Bingham, and the board was formally established in August 1993 as the Fernald Citizens Task Force.

The convener also was asked by DOE to identify a chair for the task force and to develop a draft charter for the board in conjunction with the DOE, EPA, and OEPA. Dr. Bingham identified John Applegate, a professor of environmental law at the University of Cincinnati, to serve as the chair. The charter she drafted cited a mission for the task force, focusing on four specific and far-reaching issues: future use, remediation levels, waste disposition, and remediation priorities for the Fernald site.

### ***Membership***

Dr. Bingham recommended 14 members and 2 alternates to serve on the board. Two of these nominees cited time constraints and declined; one by stepping down completely and the other by switching with an alternate. An additional individual petitioned for membership immediately after the board was established. The charter members recommended the individual's appointment to DOE resulting in a total membership of 14 at the first meeting of the task force. To provide member continuity over time, half of the members were given two-year terms, and half were given three-year terms. In addition, representatives from DOE, EPA, and OEPA were placed on the task force as non-voting *ex officio* members.

This report was completed within the original terms of all 14 members; all of the original members have served on the task force for the entire period. The alternates were fully informed of all task force activities; however, they attended no meetings and did not participate in any task force deliberations.

In accordance with the FFERDC report, the 14 members of the all-volunteer task force represent a broad spectrum of interests and backgrounds that are critical to the cleanup decisions at Fernald. Eight members live or work in the direct vicinity of the site. The remaining members were selected to reflect a combination of skills, interests, and constituencies that are important to the remediation of the Fernald property. All live and work within the greater Cincinnati area. Brief profiles of the task force members are provided in Appendix B "Member Profiles."

## ***Charter and Ground Rules***

Initial meetings of the task force were devoted to site orientation and developing the group's path forward. Using the charter drafted by Dr. Bingham as a starting point, during the first few months the task force worked to clearly identify its mission, formalize its charter, and develop ground rules. The charter and ground rules are included in Appendix C "Charter and Ground Rules."

The task force formally reports to the DOE Assistant Secretary for Environmental Management, the EPA Region V Regional Administrator, and the Director of the OEPA.

This report represents the completion of the task force's original charter to provide recommendations regarding future use(s) of the Fernald property, remediation levels, remediation priorities, and waste disposition.

## ***Organization and Staffing***

Task force meetings were held monthly, originally on a weekday evening and then on Saturday mornings to provide more time. Every effort was made to hold these meetings in the direct vicinity of the site; however, space requirements and the desire to reduce costs resulted in the meetings being held in various locations, some further from the site. Ultimately a site-owned facility was identified as the permanent location of meetings. Open to the public, all meetings were widely publicized in local papers and through mass mailings. Sufficient space for public attendance was always available.

Most of the group's work was performed during the task force's regular monthly meetings. On several occasions, important issues were raised which were either outside of, or more in depth than, the immediate scope of the task force mission. In these instances, the task force established a subcommittee to address the issue and report back to the entire board. Subcommittees generally contained three to five board members and were chaired by a member charged with completing the product required. In total, three subcommittees were formed to address membership, groundwater cleanup standards, and waste disposition issues.

In accordance with its charter, the task force chair was responsible for overall organization and administration of the advisory body. Administrative support was provided by DOE's site contractor, FERMCO. One full-time staff member and clerical staff worked under the direction of the chair to provide the many organizational and logistical services necessary to plan and run task force activities. In addition to this dedicated staff, FERMCO provided continuous and invaluable support to all aspects of task force operations.

Task force members believed it was essential to obtain independent technical support to assist in developing accurate information. The task force realized it had to focus its time and energy effectively to best use its limited resources. Meeting more than once per month for approximately four hours was seen as untenable. Some members were able to devote more time, but most could not. Early, the task force realized the need for significant staff support to help gather and synthesize pertinent information and to develop a detailed decision-making process.

The task force decided that it must obtain technical and facilitation support from a source other than DOE and the site contractor to ensure independence and neutrality. The task force created a selection subcommittee and, working with DOE, selected and contracted with Douglas J. Sarno of Phoenix Environmental to serve as a consultant directly to the task force. Sarno began working with the task force in December 1993. In addition, the task force retained funds to contract with outside experts on specific issues should the need arise. This was done only once, to hire an expert to review risk assessment results for cattle grazing on leased property at the Fernald site.

### ***Approach to Achieving the Task Force Mission***

During its first months, the Fernald Citizens Task Force established a general strategy for conducting its business. Because of the enormous breadth of its mission, a clear organization of issues was needed to focus the task force's efforts. It became apparent to task force members that a decision with regard to the future use of the Fernald property following remediation would give direction to its deliberations and also provide needed insight to its recommendations. Remediation levels were directly tied to the exposure scenarios generated as a result of the anticipated future use of the Fernald property. These risk levels, in turn, would drive total volumes of waste material, which would help to determine appropriate locations for the long-term disposal of wastes, and ultimately the desired timing of activities. Thus, the task force organized its decision-making process around the questions of future use of the Fernald property.

In December 1993, the task force consultant's first task was to develop a detailed work plan for the group to achieve its mission based on the future use focus. Task force decision making was scheduled so needed information was developed and recommendations were made in time to affect DOE decisions. The task force was feeling pressure because the DOE decision-making process was well underway, there did not appear to be enough time to catch up. Several of the five operable units were progressing toward records of decision. The schedule for decision making outlined in the Amended Consent Agreement identified key milestones for each of the five operable units. Described below, the dates represent the first submittal of DOE documents to EPA.

Milestone:	OU1	OU2	OU3	OU4	OU5
Draft RI	10/12/93	2/18/94	9/11/96	4/19/93	6/24/94
Draft FS/ Proposed Plan	3/7/94	4/29/94	9/11/96	9/10/93	11/16/94
Draft ROD	11/7/94	2/4/95	9/26/96	8/9/94	7/3/95

To overcome these time constraints, the task force work plan was developed by first defining the existing timeline for DOE decision making at the site and then identifying where the task force would need to provide input for its recommendations to be effective. The task force realized that the key decisions in which it would be providing input would actually not be made until July 1995, coinciding with the draft operable unit five record of decision. This gave task force members time to work at the level of detail they desired. In January 1994, a detailed work plan was developed and approved to follow an 18-month schedule, concluding with a July 1995 final report. A comparison of the Amended Consent Agreement schedule and the task force schedule is shown in Figure 4.

The work plan was designed to focus on the four key recommendations of the task force. A key to this work plan was the conscious decision of the task force not to review and evaluate each decision and piece of information that would be released by DOE over that time period, but to focus solely on achieving its own objectives in the time available. As the work progressed, the task force learned how site decisions were being made and its potential impact on the decisions. Following the release of its interim report in November 1994, the task force decided to review activities planned for 1995 to ensure its ultimate recommendations were focused on the most important issues. As a result, a new work plan was developed and approved in December 1994 which refined the activities planned for 1995.

### ***Getting Broad Public Involvement***

From the beginning, the task force recognized that it could not represent the entire public interested in the Fernald environmental remediation. Though DOE and FERMCO had an active and effective public involvement program, the task force believed it needed to conduct its own outreach efforts to make clear its differentiation from DOE and to obtain specific input to the issues under consideration. Therefore, a number of activities were used to ensure that broader public input was considered.

Particular focus was placed on public input regarding the more controversial issues, such as waste disposition. To ensure all sides were heard, the task force mailed personal invitations to stakeholders, identifying the issues and decisions to

Figure 4: under development

be addressed in upcoming meetings. The task force sponsored two workshops to ensure public understanding and involvement in the remediation levels, future use, and waste disposition issues. Specific activities conducted to ensure public understanding of, and comment on, the task force's process and recommendations included:

- open monthly meetings with active public participation;
- a June 9, 1994, public workshop on the FutureSite exercise;
- a January 25, 1995, public workshop on waste disposal options;
- presentations at the February 1994, June 1994, October 1994, and March 1995 DOE community meetings;
- face-to-face meetings between task force members and other stakeholder groups;
- attendance by members and staff at all DOE public meetings and workshops;
- a task force mailing address and message line for public comment;
- disseminating information through community channels;
- news releases; and
- advertisement of all task force meetings in local papers.

A summary of task force public outreach activities and comments received is presented in Appendix D.

## **IV. TASK FORCE DECISION MAKING PROCESS**

### ***Goal Setting and Planning***

Focusing on a discrete set of goals was a key component of the task force's success. Each of the four recommendations outlined in the task force charter was identified as a discrete end point of the task force process. Identifying these goals and creating an understanding of the activities required to achieve them, was the basis for a detailed work plan developed to identify the purpose of each meeting and how it fit into the full eighteen-month decision-making scheme. Particular focus was placed on identifying specific questions to be addressed during each meeting, the information to be evaluated, and the expected outcome of each meeting. Clearly identifying this path forward assisted the task force in avoiding the burn-out that often occurs in a long-term process when little early progress is apparent.

### ***Developing and Disseminating Information***

When the task force was established in August 1993, site investigations had been underway for several years. The task force was well behind site managers in its level of knowledge about site characteristics and cleanup alternatives. To catch up, the task force decided to use the first six months of 1994 as a learning period. While necessary, this approach presented two distinct challenges:

- 1) in a short period of time, how to present large volumes of detailed technical information to a group of individuals of various backgrounds and experiences; and
- 2) how to maintain the group's interest over a period of months when little action or progress would be perceived.

These challenges were met by approaching the group as executive decision makers, focusing on the decisions that had to be made, rather than attempting to gain an understanding of all the site information available. Presenting all of the information available would have resulted in information overload and would have paralyzed the process.

The task force chair and the consultant collaborated to identify the information that was critical to decisions and presented their recommendations to the task force members. These information needs were incorporated into the work plan, after discussion and amendment by the entire group. In this way, the group understood what was to be presented and discussed at each meeting.

It was important for the task force members to overcome their own individual preconceptions about the site and cleanup options, so that the group could approach its challenges as objectively as possible. To achieve this, information had to be accurate and unbiased and presented in an understandable and useful form. Gathering and presenting information was done by the consultant. Developing new site information was simply not practical. However, the formats of existing information did not fit the task force's needs. The task force consultant identified the group's information needs and worked closely with DOE and the site contractor to obtain information. The task force consultant then created formats for use by the Task Force to portray the information in the most effective manner for decision making. Once the chair and the consultant were confident that the information was accurate and useful to the Task Force, it would be formally included in Task Force materials and a Task Force logo affixed. Other information was used occasionally if necessary, but not placed in formal task force format. Finally, the task force consultant presented the information to the task force, explained its origin, and described its utility to task force activities.

It was important to task force members that the task force consultant evaluate the validity of all information presented to the task force. Early in the process, there was a great deal of mistrust in information provided by DOE. However, the role of the consultant and the openness of DOE and the site contractor throughout the process alleviated this mistrust over time. The unprecedented access given to the task force sometimes resulted in newly generated information being made available to the task force. In a few cases, key pieces of information changed over the course of task force deliberations. Rather than create a problem or further mistrust, these changes were simply incorporated into the decision process and the level of trust in this information remained high. Ironically, much of the information and formats developed first for the task force were used later by the site, bolstering its validity.

Materials were enlarged into posters to allow the entire group to work together during task force meetings. A cornerstone of each meeting was also an "information bin" which was used to record important questions and issues not yet addressed by existing information. The consultant was to answer these questions before the next meeting.

About halfway through its decision-making process, the task force was requesting information and considering issues that had yet to be contemplated on site. In several instances, task force requirements led site decision makers to create information in new and useful ways that benefitted not only task force members, but site managers as well.

## ***Decision-making Approach***

Early in the process, task force members realized decisions could not be made until some vision of the future use of the Fernald property was established. The task force's work plan and approach were built upon this understanding. Therefore, future use of land and natural resources at the Fernald site were the first order of business for the task force.

The task force began by identifying a broad range of plausible uses for the Fernald site following remediation. Next, the task force identified all issues and concerns that were important to consider in evaluating options for the future of Fernald. These issues were refined and incorporated into a set of consensus values for the future use of Fernald, which are presented in Figure 5. These consensus values were used throughout the decision-making process to provide guidance for developing and evaluating alternative recommendations. These values were distilled into the following discrete evaluation criteria:

**Long-term Safety:** Effectiveness of available technologies over time, long-term monitoring, and ownership of the Fernald property are seen as crucial to the long-term acceptability of any cleanup scenario.

**Short-term Risks:** Risks to workers and residents resulting from the cleanup activities themselves are of paramount concern.

**On-Site Disposal Requirements:** The volume of soil that will be excavated and the ultimate size of any on-site disposal facility will greatly determine the overall impact of the cleanup on local communities during and after construction.

**Impact on Natural Resources:** Excavation of the large quantities of contaminated soil present at Fernald will have a significant impact on the flora, fauna, sensitive habitats, farmlands, and wetlands that comprise the Fernald site and surrounding properties.

**Transportation and Off-Site Disposal Requirements:** The task force is sensitive to the impacts on and potential risks to communities along transportation routes and at the ultimate disposal facility.

**Community Impacts and Benefits:** Disruption of adjacent lands and the long-term economic, social, and aesthetic impacts on local communities and work force of the Fernald cleanup are likewise of significant importance.

Figure 5: under development

**Cost:** As a taxpayer-funded project, the total cost of cleanup is important. While task force members repeatedly expressed unwillingness to trade lives for dollars, the task force recognized DOE budget projections indicate real limitations on available resources in the future.

By constantly weighing the pros and cons of alternatives as they related to these criteria, the task force members narrowed options and ultimately reached consensus. The task force did not use any formal quantitative models to conduct these analyses, and, other than overall health and safety, no one criterion ranked more importantly than another. Instead, a number of tools were developed to help to create a complete understanding of the opportunities, constraints, risks, costs, and benefits associated with alternative approaches to remediation.

Ultimately, decisions were made through a parliamentary process. Using recommendation language and supporting arguments developed by the entire group, the task force chair and consultant prepared formal recommendations between task force meetings and circulated drafts for review. This allowed all members to fully consider the ramifications of the recommendation and enabled absent members to evaluate recommendations before final discussions. Additional discussions and amendments were conducted at subsequent meetings before final recommendations were brought to vote. An important part of this process was providing for expression, discussion, and inclusion of diverse and minority positions.

### ***Decision-making Tools***

The main tool used by the task force was a system of organizing and presenting information in a single three-ring binder for each member. This system, referred to as the "Tool Box," was organized by topics for easy reference and focus on specific questions. The concept was to present information in a simple and clear manner. Information regarding each decision was broken into discrete pieces and organized to focus on key tradeoffs or alternatives. Most ideas were presented on a single sheet of paper using charts, graphs, maps, and tables, and color. Rarely did a single concept require more than two or three pages.

The Tool Box was developed and organized to provide the knowledge needed to understand the risk presented by the Fernald site and the various costs and benefits of the alternatives the Task Force wished to consider. Key information in the Tool Box included:

- physical and chemical characteristics of Fernald and surrounding lands;
- current land and natural resource uses; and
- information on risk and risk analysis, alternative cleanup levels, waste management options, and detailed descriptions of alternative future use scenarios.

The future use descriptions were supplemented by charts and maps showing volume, cost, disposal cell size, and off-site transportation requirements for different options. Also included were color-coded maps that identify the scope and depth of excavation of soil required for each alternative. In some cases, information was readily available in existing site documents and modified by the consultant for use by the Task Force. In other cases, the Task Force consultant worked directly with DOE and FERMCO to identify and develop specific information that had not been previously generated. Selected figures and tables used in the Tool Box have been used as figures in this report and are included in Appendix E, "Key Elements of the Task Force Tool Box."

Another decision-making tool developed for the task force was an exercise called FutureSite, which was designed to show how achieving different levels of land use impacted requirements for remediation. The FutureSite exercise provided insight into costs and volumes resulting from the remediation of contaminated soil to achieve different objectives. The exercise was designed as a three-dimensional representation of contamination at the Fernald site. A large site map was divided into a grid, with each square containing a stack of colored chips representing the actual volumes of contaminated soil and materials found at that site location. By removing different color chips from the board, participants illustrated the volumes of contaminated material that would have to be moved to achieve different land uses.

Successively less restrictive land uses for the site required participants to remove more material from the board. Participants were forced to decide what to do with that material; they could choose either on-site or off-site disposal. Associated costs and requirements were then applied to calculate total volumes and costs of the selected option, truck and train transport requirements, and the size of on-site disposal facilities.

This exercise formed the foundation for understanding the waste disposition and remediation-level decisions that were to be made. The exercise was also used widely by DOE and FERMCO and helped shape and widen understanding of the site.

By conducting the exercise with many different groups, several remediation and future use scenarios were developed which could be compared and evaluated. Analysis of these scenarios was the first step in reaching consensus on future use and cleanup levels.

Another tool used extensively in the task force decision-making process was a magnetic white board portraying the site and major attributes of the site remediation problem. The task force used magnetic blocks, erasable markers, and clear overlays to portray and compare remedial options. This magnetic white board allowed the task force to physically portray and work through the many options available regarding future use partitioning of the site, levels of remediation across

the site, impacts of remediation, and the size and location of on-site disposal facilities. These tools, combined with the Tool Box, provided the focus for task force decision making.

Additional information regarding task force operations has been provided in Appendix F, "Summary of Task Force Meetings," and Appendix G, "Task Force Budget and Administration."

## **V. TASK FORCE RECOMMENDATIONS**

All recommendations in this report have been previously reported to DOE, EPA, OEPA, and the public in order to make the most immediate impact on the decision-making process. The first recommendations on cleanup levels and preliminary future use were presented in November 1994 in an interim report which also described the decision-making process. Subsequent recommendations on waste disposition, priorities, and final future use were developed and released as fact sheets in February, April, and May 1995.

The task force recognizes that it has provided recommendations only, and that it is not in a position to make actual decisions. Still, we approached these recommendations as we would have had we been decision makers so that our recommendations could be reasonable and meaningful. We believe the value of this task force is as an addition to other forms of direct citizen involvement. Most important, the advisory group approach allowed us to bring a diverse group of people together to recommend a common approach to remediation that everyone can support. Coming into this process we all had very different expectations and preferences regarding the remediation of Fernald. Only through many months of hard work were we able to look beyond these pre-conceived positions. These recommendations are based on a common vision for Fernald, the result of a process that focused on ideas, not individual preferences.

These recommendations are also the result of the task force's careful, thorough consideration of all important health, social, economic, and political constraints and ramifications associated with remediation of the Fernald site. These recommendations do not represent a negotiating position; they do, however, represent the task force's best effort to develop a reasonable, balanced approach to Fernald site remediation. The task force believes these recommendations, if taken in total, will provide remediation of the Fernald site in a manner which protects human health and the environment, maintains the integrity of the surrounding communities, and prevents unnecessary expense.

The specific recommendations of the task force are presented in boxes throughout this section. Supporting information includes a summary of each recommendation and an overview of the issues that were evaluated in developing the recommendations.

## ***Recommendations on Site Cleanup Levels***

### **Summary**

The recommendations on cleanup levels were presented in the task force's November 1995 interim report. The task force identified specific cleanup levels based on total uranium in soil and groundwater as these comprise the bulk of the contamination at Fernald. In establishing these cleanup levels, of primary concern to the task force were protection of the Great Miami Aquifer and consistent protection of human health across all potential pathways of exposure and land uses. The task force sought to balance the absolute requirement of protecting human health with the desire to minimize impact on the environment resulting from the remediation itself.

To achieve background conditions would require surface soil excavation for 5 miles surrounding the site, a condition the task force found unacceptable. Ultimately, the task force arrived at recommended cleanup levels which were protective of human health and the environment and which require little off-site excavation. These levels were based on:

- 1) cleaning and protecting the aquifer to conform with maximum contaminant levels (MCLs) under the Safe Drinking Water Act;
- 2) reducing the risk of cancer during an individual's lifetime to one in 10,000, and;
- 3) reducing non-cancer risks below the EPA target for hazard index of one.

## Detailed Recommendations

- Past impacts of the Fernald site on the Great Miami Aquifer must be remediated and any future impacts controlled so that groundwater quality meets the standards of the Safe Drinking Water Act.
- The excess risk of contracting cancer posed by exposure to Fernald contamination under any use of land, on or off the Fernald property, shall never exceed one in ten thousand ( $1 \times 10^{-4}$ ). This is a maximum level; the other recommendations of the Task Force regarding aquifer protection and hazard index override this risk level to make remediation more stringent. Additionally, the Task Force recommends limiting land use even in cases where the concentrations achieved in the soil would allow for less restrictive uses, to provide for an additional margin of safety.
- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will provide safety from non-cancer toxicological effects at a level equivalent to a hazard index of one.
- All contaminated soils and other waste sources both on and off the Fernald property must be reduced to levels that will prevent contaminants from leaching into the aquifer at concentrations exceeding Safe Drinking Water Act levels.

## Key Issues Evaluated

Because protection of the aquifer was one of its consensus values, the task force took an in-depth look at the options for dealing with groundwater contamination. The task force evaluated three distinct endpoints: cleaning to the  $1 \times 10^{-6}$  drinking water risk, which is 3 parts per billion (ppb) for uranium, cleaning to the EPA maximum contaminant level (MCL), which is currently proposed at 20 ppb for uranium (equivalent to a risk of  $2 \times 10^{-5}$ ), and not cleaning at all but allowing the aquifer flush itself over time.

Comparing these alternatives, the task force evaluated a wide range of issues. Due to the prevailing groundwater flow through the Fernald site, all contamination would ultimately reach the Great Miami River, where the volume of water would dilute the contamination to low levels. The primary threat of the contamination to drinking water sources has been largely checked by DOE, which has provided bottled water to affected homeowners and has partially funded the installation of a new drinking water line to area residents.

On the surface, dilution appeared to a viable approach to dealing with groundwater contamination. However, if left unchecked, as much as 4,000 surface acres and 32 billion gallons of water would ultimately be impacted according to current projections. The result would be condemnation of the aquifer beneath those 4,000 acres for many generations. The task force views the social, environmental, and potential legal and administrative costs of such an approach as unacceptable.

The task force also evaluated measures to contain the contaminated groundwater within the Fernald site boundaries. The current pumping wells appear to have successfully stopped migration of the south groundwater contamination plume. However, any such interim or containment measure would only result in the need for virtually perpetual action, due to the long half-life of uranium. Thus, interim or containment measures would require repeated replacement of water treatment facilities at the end of their useful lives, approximately every 30 to 40 years.

With the constant risk of losing funding for new construction activities, the task force was unwilling to take such an approach. Ultimately, such an approach would result in higher costs than for a total and rapid cleanup today. Decisive action now will enable cleanup to MCLs within the life span of a single treatment plant.

The task force concluded that Fernald's impact on the Great Miami Aquifer is a significant concern, and the only viable action is to seek complete and rapid cleanup. The task force opted to recommend cleanup of the aquifer to meet MCLs. The use of MCLs is widely accepted for groundwater remediation. MCLs are designed to be protective of human health and the environment, and MCLs are technologically and practically achievable.

The task force believes remediation of the aquifer to  $1 \times 10^{-6}$  levels is not technologically and practically achievable. Seeking this level would likely result in great expense to capture relatively little additional contamination, would require much longer periods of time to achieve results, and would offer little ultimate benefit in the overall protection of human health and the environment.

In looking at cleanup levels for soils, the task force evaluated the range of risks considered acceptable by EPA for Superfund cleanups of  $1 \times 10^{-4}$  (1 in 10,000) to  $1 \times 10^{-6}$  (1 in 1,000,000) excess chance of contracting cancer in a lifetime. The task force evaluated this range of risks across a broad spectrum of land uses in evaluating the overall level of cleanup that should be required at Fernald.

Evaluating the impacts of applying different risks across different land uses allowed the task force to compare numerous factors including total soil volumes requiring excavation; off-site disposal requirements; on-site disposal requirements and disposal cell size; total cost; environmental impacts; and technical, legal, economic, and social implementability.

The most striking concern in making this decision was the volume of soil that would require excavation beyond the Fernald property boundary if a  $10^{-6}$  residential scenario were chosen. At this risk level, a total of 5,200,000 cubic yards of soil would be removed from off property alone. Disposal of this amount of material combined with the on-site volumes, would require a disposal cell of approximately 400 acres, and approximately 430,000 truckloads or 1,350 trainloads for off-site shipment.

The task force is also concerned about the serious ecological damage that would occur from widespread excavation. At the  $1 \times 10^{-6}$  cleanup levels, the required excavation would rob 11 square miles of surrounding homes and farmlands of vital top soil, mature trees, and vegetation and would cause enormous disruption to lives and livelihoods during construction. Though ultimately the top soil would be replaced and vegetation replanted, it would be generations before the ecosystems fully recovered. The short-term risks to current residents and workers due to disturbance and resuspension of contamination and construction accidents far outweigh the very small reductions in long-term risk that would be achieved. Moreover, because the 5 ppm cleanup level for resident farmer at  $1 \times 10^{-6}$  is so close to background levels of uranium of 3.7 ppm, it would be difficult to even distinguish where this contamination occurs. Finally, it is important to the Task Force that risk criteria be consistently applied across the site and  $1 \times 10^{-6}$  was rejected as an option for groundwater cleanup.

The task force carefully examined the levels of contamination that have actually been found off of the Fernald property. Several interim cleanup (removal) actions and the tilling action of farming on much of the off property land has resulted in eliminating much of the detectable contamination. In all cases, the contamination is well below the cleanup requirements to protect for a resident farmer exposure at  $1 \times 10^{-4}$  (130 ppm), and only marginally above the resident farmer requirements at  $1 \times 10^{-5}$  (15 ppm). Approaching background (3.7 ppm), uncertainty would require high volumes of soil removal. Considering the existing low levels of contamination found off of the Fernald property and the desire to limit the disruption of off-site homes and farms, the task force decided on a maximum residual risk from Fernald soils of  $1 \times 10^{-4}$ .

The task force selected the  $1 \times 10^{-4}$  risk, however, with the full understanding that uranium concentrations in soil necessary to meet the goal of fully protecting the aquifer to MCLs over the long term are even more stringent. At most locations both on and off the Fernald property, a total uranium concentration of 100 ppm is required to prevent leaching into the aquifer above the currently proposed MCLs for uranium, which is lower than the 130 ppm concentration necessary for a resident farmer exposure scenario at  $1 \times 10^{-4}$ . Further, as a result of the high solubility of uranium found in the former production and sewage treatment areas, the uranium concentration required to protect the aquifer in these areas is 20 ppm.

The task force's commitment to safe cleanup levels requires the consideration of toxicological impacts in addition to carcinogenic impacts. For uranium in a resident farmer scenario this requires cleanup to 50 ppm so as not to exceed a hazard index of one. Taking this approach, the task force has deliberately provided a level of protection above the stated risk maximum. This 50 ppm concentration would apply at all off-property locations, but not on the Fernald property as the task force does not recommend allowing such intensive uses of Fernald. However, sampling results to date indicate that there are actually few places outside the former production area where concentrations exceed 50 ppm.

In sum, the specific cleanup levels for total uranium in soils recommended by the task force for the Fernald facility are as follows:

- 20 ppm within the former production and sewage treatment areas,
- 100 ppm within all other points on the Fernald property, and
- 50 ppm for all locations off the Fernald property.

The task force understands that, for the most part, remediation of total uranium to the levels recommended will result in the excavation and safe disposal of all of the contaminants of concern found at the Fernald site. There will be exceptions, however, and for them these general remediation criteria apply:

- cancer risks not to exceed  $1 \times 10^{-4}$ ,
- protection of aquifer to MCLs,
- non-cancer risks not to exceed hazard index of one.

One task force member expressed concern that the task force began and concluded its work without the benefit of objective evidence of human health risks. This member believes the risks, as presented to the task force, are not sufficiently established. Further, it has been suggested by other sources that EPA-proposed guidelines, EPA Maximum Contaminant Levels, and other measures supplied to the task force, are rooted in arbitrary extrapolation of decades old, massive dose tests on laboratory animals, rather than empirical human long-term disease analysis. All task force members accept that certain radionuclides can cause disease, but this member is uncertain which types and how much exposure to humans is really acceptable. Therefore, this task force member questions whether the true risk is much lower than the task force's presumptions and whether the cost of the remediation is grossly excessive.

## **Recommendations on Waste Disposition**

### **Summary**

The Fernald Citizens Task Force evaluated the political and logistical considerations involved in disposing over 3 million cubic yards of contaminated material and determined that a balanced approach in which some waste was disposed on site and some was disposed off site was most prudent.

Of paramount importance was for the highest-level wastes be taken off site for safe disposal and for no new wastes to come to Fernald for disposal. Therefore the task force concurred with existing DOE decisions for the most highly contaminated materials to be disposed off-site. The task force recommended that an on-site disposal facility be constructed to store materials with low levels of contamination from only the Fernald site. One task force member objected to this recommendation, preferring that all contaminated material be removed from Fernald and disposed off site.

### **Detailed Recommendations**

The Fernald Citizens Task Force recommends the construction of an on-site disposal facility to accept, from the Fernald site only, materials solely with low levels of contamination meeting the site-specific waste acceptance criteria. However, on-site storage of low-level materials at Fernald is acceptable only in the context of the considerations laid out in the following section and under the following conditions, such considerations and conditions being inseparable from the recommendation:

- The Fernald Citizens Task Force strongly and unanimously opposes the use of the Fernald site for the permanent disposal or long-term storage of any waste or contaminated materials originating from other locations.
- Any on-site disposal facility will be built for long-term performance using the best design, technology, and engineering available.
- Any on-site disposal facility at Fernald will be designed to make the least possible negative aesthetic impact. The Fernald Citizens Task Force and the public at large shall be explicitly involved in the process for determining the ultimate appearance of the disposal facility.

- Any on-site disposal facility at Fernald will provide an adequate buffer area to minimize negative impacts to neighboring properties and the future use of the Fernald property. The Fernald Citizens Task Force and the public at large shall be explicitly involved in the planning and design process for the disposal facility.
- The U.S. federal government will retain permanent ownership of any property containing the disposal facility.
- The U.S. federal government will continually monitor the disposal facility and report these findings in a timely manner to residents and interested parties.
- The U.S. federal government will commit to retrieve and treat or redispense of the material contained in the disposal facility if a new, proven, and economically justified technology to manage these materials should become available.
- The U.S. federal government shall have in place adequate procedures to identify and correct any and all failures in performance of the disposal facility before any increased risk to public health occurs.
- The U.S. Department of Energy commits to the above conditions.
- U.S. Department of Energy budget adjustments in the short or long term will not adversely impact the substance of this recommendation.

### **Key Issues Evaluated**

Waste disposition was the most difficult decision faced by the Fernald Citizens Task Force and the only one in which complete consensus could not be achieved. The task force spent a great deal of time collecting and evaluating data regarding the ramifications of on-site *vs.* off-site disposal. A great deal of time was also spent in working with other local stakeholders through meetings and workshops. The evaluation of disposal options actually began with the FutureSite exercise, when it first became evident how many trucks or trains would be required to haul the millions of cubic yards of material off site. It was this realization, combined with the associated short-term risks of transportation, that most members found most compelling in recommending on-site disposal.

Another compelling argument was the desire to get the most hazardous materials off site as soon as possible. A balanced approach in which DOE, EPA, and OEPA showed willingness to deal with at least part of the problem was seen as the most prudent in achieving this goal. It was strongly believed that exhibiting an

unwillingness to deal with part of the problem at Fernald would result in political ramifications with the states to receive Fernald waste, resulting in the inability to get any waste sent off site. Additionally, most task force members were sensitive to the safety concerns of other citizens living along transportation routes and in the vicinity of the receiving facilities.

The need to explain the rationale for the decision to select partial on-site disposal was strong enough to make the considerations for the recommendation itself. These considerations are presented in the following paragraphs.

All task force members live or work in communities impacted by the decisions being made at Fernald, and eight of 14 live or work in the direct vicinity of the site. No task force member wishes to see contaminated materials from Fernald or any other location stored on the Fernald property indefinitely. Because it adjoins residential and agricultural lands and is situated directly above a sole-source aquifer, Fernald is not an ideal location for disposal of contaminated materials. Nevertheless, the task force is aware of the many engineering, political, and financial challenges facing a project the size of the Fernald cleanup. The task force's primary goals are protecting human health and the Great Miami Aquifer. The task force believes that a balanced approach to cleanup, in which the most hazardous materials are disposed off the Fernald property and the least hazardous materials are stored safely on the property, will result in prompt, enduring protection for the local communities. The task force ultimately arrived at this recommendation in consideration of the following issues, the understanding of which is critical to the entire recommendation:

- The sooner source materials are taken out of the environment, the better the aquifer is protected and the sooner it can be restored. The Fernald Citizens Task Force believes an on-site disposal facility is the quickest way to protect the aquifer and the overall environment.
- The hazard associated with the materials to be placed in the on-site disposal facility is very low. The maximum level of contamination to be allowed in the disposal facility would allow for a land use as a developed park under cleanup levels recommended by the task force. The materials are to be contained in a disposal facility solely for the purpose of long-term protection of the aquifer. Failure of the disposal facility would not present any immediate or significant threat to human health.
- In the off-site option, the risk of transporting the expected 2.4 million cubic yards of low-level contaminated soil and debris from the Fernald site to Utah and/or Nevada includes a probability of six fatalities within the public along the transportation routes, while relatively little health and safety risk is incurred by the public under the on-site option. Both on- and off-site options require similar levels of work in excavating, loading, unloading, and disposing of materials; therefore, the risk to remediation workers in both

options is roughly equivalent. The Fernald Citizens Task Force believes the on-site option is the most responsible with regard to overall safety.

- The cost of off-site disposal is three times that of on-site disposal. The Fernald Citizens Task Force believes that under current and foreseeable budget conditions, an off-site decision would greatly delay cleanup and may prevent any progress. An on-site disposal facility is more viable under the current budget and political constraints.
- Both Utah and Nevada have written to Fernald, encouraging a balanced approach to cleanup. The Fernald Citizens Task Force is concerned that if the decision were made to send all Fernald waste and contaminated materials off site, Fernald would face the likelihood of reprisals from other states resulting in its inability to send any waste off site. The Fernald Citizens Task Force believes it is of paramount importance for off-site shipment of the most hazardous materials to be the first priority of cleanup, and it should be carried out expeditiously.
- Because the entire Fernald property is situated over a sole-source aquifer, only the lowest-level materials, as defined by the site-specific waste acceptance criteria, will be allowed into an on-site disposal facility. The waste acceptance criteria for Fernald were established by modeling the proposed disposal facility over a 1,000-year period to prevent any contamination at levels that would exceed the federal maximum levels of contamination for drinking water from reaching the aquifer. This modeling assumed only natural materials would be used in providing protection of the aquifer and excluded consideration of man-made liners that are subject to failure over the 1,000-year period.
- The Fernald Citizens Task Force wants to prevent any waste or contaminated materials from coming to Fernald from other sites for permanent disposal or long-term storage. Under the Federal Facilities Compliance Act of 1992, that potential exists. By managing the Fernald materials fairly and effectively, the Fernald Citizens Task Force believes Fernald will be in a more equitable position to prevent a decision to send outside wastes to Fernald.

The decision regarding waste disposition was highly controversial. A vocal public emerged, opposing any on-site contaminated material disposal. To fully hear and evaluate all points of view, the task force spent a great deal of time on this decision. The task force provided extra publicity for meetings, met with community members, and conducted a special workshop to present the information and materials being used in the decision-making process. While ultimately the supporting considerations and conditions were approved unanimously, one task force member, Darryl Huff, was unable to support the decision to place a disposal facility at Fernald. He believed the arguments to recommend on-site storage of materials containing low-level contamination were outweighed by the following:

- The contamination problems at Fernald did not evolve from local concerns or result in sufficient local benefit to warrant the long-term impact the presence of a disposal facility would have on local communities.
- Facilities in the western U.S. are geologically better suited for the long-term management of this material.
- Local communities do not wish to incur the stigma associated with a disposal facility.
- A disposal facility on the Fernald property limits the land available for productive reuse by local communities.

## **Recommendations on Priorities for Remediation**

### **Summary**

The Fernald Citizens Task Force recommended that Fernald accelerate remediation on a 7- to 10-year schedule to provide rapid protection of human health and the environment and to control overall costs. The recommendation calls for DOE to focus on remediation by reducing non-remediation costs as quickly as possible and to eliminate redundant requirements. Specific sequencing of activities within that accelerated schedule was viewed to be less important. However, the task force did make specific recommendations for high-level wastes awaiting shipment to be removed from the site immediately.

### **Detailed Recommendations**

As part of our charge to recommend site priorities, we are calling for a fundamental shift in the approach to remedial operations at Fernald. DOE and its contractor must view the project as an environmental remediation operation. It is their job to implement the remediation decisions that have been made, quickly, safely, and cost-effectively—and then to leave. If Fernald is to be really treated like the remediation project it is—where work should be focused on a single goal and completed in a finite period of time—management at all levels must make an immediate and decisive change. Such an approach has several important consequences for remedial priorities, and focuses attention on obstacles to remediation apart from the existing operable units. Its cornerstone must be to eliminate big sources of non-productive expense: high overhead, storage of materials awaiting shipment, and cumbersome Department of Energy requirements. Specifically, we would like to see immediate and substantial steps taken to deal with the following:

**Special Nuclear Materials.** There are 17 million pounds of special nuclear (non-waste) materials throughout the Fernald site, which require a high level of expensive security, accounting, and safety procedures to maintain. This material is not going to stay at Fernald. This material does not belong at Fernald now, as Fernald is an environmental remediation project. Storage and maintenance of this material is being done at the expense of remediation operations. Appropriate storage facilities already exist within the DOE complex for materials such as these. The Secretary of Energy and the Assistant Secretary for Environmental Management must ensure that DOE make and implement the decision immediately to move these materials to such an appropriate location.

**Legacy Wastes.** There are approximately 70,000 drum equivalents of legacy waste sitting at Fernald awaiting shipment and another 12,000 drum equivalents of mixed waste awaiting treatment and shipment. Again, the storage and maintenance of these wastes is diverting money from other much needed remediation activities. There is no mystery surrounding the location for disposal of most of these wastes, and their immediate shipment should be a top priority.

**Safe Shutdown.** When production ceased at the plant in the summer of 1989, it was conducted without taking the proper steps to bring the equipment and buildings to a safe configuration. As a result, millions are spent each year to maintain and provide security to buildings that should be closed and shuttered for subsequent demolition. Every effort must be made to expedite the safe shutdown of the Fernald facility to eliminate these burdensome overhead costs and hasten the shift in culture from operations to environmental remediation.

**Ongoing Maintenance Activities.** Another aspect of approaching Fernald as a remediation project is to discontinue the ongoing repair, maintenance, and improvement to on-site buildings and infrastructure, except where essential to remediation progress or worker safety.

**Overlapping Requirements.** Perhaps the most cumbersome of all requirements facing the remediation of the Fernald site are those internally imposed by DOE on itself. Significant time and money is wasted by requiring remediation activities to comply with DOE orders that are geared to the operation of highly complex and dangerous nuclear operations. Where these orders are superfluous or are redundant of other state and federal regulations, DOE can and should waive them. The Fernald Citizens Task Force recommends that the Fernald site be the prototype for streamlining these requirements and placing remediation first.

**Budgeting for the Long Haul.** Fernald holds a unique position among DOE's major remediation sites: its decision making is nearly complete, needed technologies are in place, and its size is manageable. With the above reforms, a relatively modest up-front investment will yield a nearly complete remediation in one-half to one-third of the time projected in current reduced-budget scenarios. Under current budget constraints, remediation is estimated to take 25 years at a total escalated cost of \$5.7 billion. Without constraints, the same remediation could be conducted in seven years at a total escalated cost of \$2.7 billion. In addition to saving billions of dollars, the symbolic significance of getting a major facility "off the books" is incalculable. Our understanding of the options available to DOE in budgeting the Fernald project boil down to two basic choices: the potential for a big win by completing remediation in the seven year time-frame or a project constrained

by annual funding caps that eventually costs twice as much and lasts three times as long. Dollar for dollar, there must be few opportunities in the DOE complex that offer a clearer choice or more attractive dividends.

There exists at this time at Fernald a window of opportunity to efficiently select and implement an accelerated remediation. DOE, its regulators, and its stakeholders must work together, with flexibility on all sides, to make these changes happen. It is time that DOE changed its legacy to a model of government/contractor efficiency. Given the tools and the reforms, Fernald can lead the way.

### **Key Issues Evaluated**

Originally, site priority recommendations were envisioned as a sequencing of specific remedial activities according to their importance to the concerns and goals of stakeholders. However, as dramatic cuts in the DOE budget began to occur, the nature of the problem shifted. Suddenly, the task force was faced with remediation time frames stretching to 25 years at total costs of twice what was expected within projected annual budgets.

The most important aspects of site remediation for the task force were to remove the highest-level contaminants from the site as quickly as possible and to conduct remediation as cost-effectively as possible. That combination left the most rapid cleanup as the only viable alternative. As remediation schedules and logistics were evaluated for accelerated remediation, it became clear that little opportunity existed to release some portions of land more rapidly than others, and there would be little opportunity to cost-effectively complete demolition of the former production area before other activities. Therefore the focus of prioritization became how to obtain funds necessary to conduct overall remediation as quickly as possible in the most cost-efficient manner possible.

## **Recommendations on Future Use**

### **Summary**

The Fernald Citizens Task Force focused its future use recommendations on creating a broad understanding of how the Fernald site could best be used after remediation, rather than identifying specific detailed ideas for future use of the property. The task force recommended that residential and agricultural uses of the property be avoided. However, it was also important to the task force that the land be used productively. For this reason, the cleanup levels recommended for the site provide for all uses other than residential or agricultural. The task force also recommended that a sufficient buffer be provided between the on-site disposal cell and any other uses of the property. Ultimately, the task force recommended that within the guidelines set forth, specific uses of the property would be best determined closer to the time of reuse by the people most impacted by that use.

### **Detailed Recommendations**

Conceptually, The Task Force has divided the Fernald property into three zones: 1) the land containing the proposed on-site disposal cell and supporting facilities, 2) a transition zone surrounding the cell on all sides, and 3) all remaining property at Fernald. In support of this concept, the following recommendations have been developed:

- The on-site disposal facility (zone one) should be tied into the natural environment to the greatest extent possible consistent with public health and safety. This includes a natural vegetative cover of native plants, and gentle slopes keyed into natural contours of surrounding land. Extensive public input into facility design is anticipated to ensure that the visual impact of the facility on surrounding properties is minimal.
- It will be important to isolate the disposal facility from public access. This isolation is required to protect the cover system of the disposal facility and not because the facility poses any direct exposure risks to individuals in the area. The barriers to prevent access should be as unobtrusive as possible, while still providing clear markings and protection from intrusion. The Task Force prefers combining man-made barriers with natural barriers to soften the visual impact and to blend in with the total surroundings.
- To limit temptation for trespassing on the cell property and to provide for a natural transition in uses, the land immediately surrounding the cell and supporting facilities (zone two) should have limited use. Therefore, the Fernald Citizens Task Force recommends that a minimum of 300 feet

in each direction of the cell property be reserved for limited use. These uses may include undeveloped green space and natural habitats, and public access should be clearly discouraged.

- The remainder of the Fernald property (zone three) should be made available for the uses most beneficial to surrounding communities, recognizing that a mixed use strategy may be the most beneficial. While encouraging uses that provide economic and social benefit to surrounding communities, the Fernald Citizens Task Force strongly recommends the prohibition of any sort of agricultural or residential uses, or any uses involving the importing of hazardous, radioactive, mixed, or solid waste for any reason or the generation of hazardous, radioactive, or mixed waste.
- DOE must refrain from making any commitments for potential future uses of property following remediation until community input has been registered.
- In planning for the future use of the Fernald property, sufficient space should be provided for the permanent relocation of any Native American burial sites exhumed in the vicinity of the Fernald property.
- All property containing the on site disposal cell (zone 1) and surrounding green space (zone 2) must remain under federal government control and ownership in perpetuity.
- The remaining property at Fernald (zone 3) must remain under federal government control and ownership until remediation is complete. Any changes of ownership, leasing, or control of property must be conducted after consulting with local preferences for use and ownership, and with strict assurances that necessary monitoring of air, water, and soil will be conducted, maintenance of the disposal facility will take place, land use restrictions will be clearly enforced, and a program for prompt response to any future release of contamination is in place.
- The use of any Fernald property for other than remediation purposes prior to the completion of remediation should be carefully screened to ensure that such use does not present any additional health or safety concerns and that remediation progress is not hampered in any way.
- All future uses of the Fernald property must protect and enhance existing natural resources, with particular emphasis on the Great Miami Aquifer, Paddy's Run, and forested wetlands.

## **Key Issues Evaluated**

In evaluating future uses for the Fernald property, the Fernald Citizens Task Force did not intend to identify specific uses of the land in the sense of planning or zoning. The task force believes it is best those decisions be made by those persons who would ordinarily make such decisions—local planning and zoning officials and the people of the townships in which this property resides. In particular, residents adjacent to and immediately impacted by the future use of Fernald should be provided significant access to and participation in decisions regarding specific future use and ownership of the Fernald property. Moreover, the specific decisions will be better made closer to the time when actual use is being contemplated; actual reuse of any Fernald property is at least a decade away. However, the task force's mission was to outline the overall plan for bringing Fernald back to productive and safe uses, and to identify the general categories of uses that should not be allowed at the site after remediation.

Discussion of future uses of the Fernald property was the cornerstone upon which all task force recommendations were built. The task force was most concerned with the ability of area residents to maintain their homes and livelihoods safely and continuously with the least amount of negative economic impact possible. Having some benefit from the property after remediation was a strong theme in all discussions.

The location of a disposal facility on site was a major factor in future use recommendations. Though it was recognized that the disposal facility posed no danger to human health through direct contact, it was felt the perception of the disposal facility was strong enough to warrant strict isolation from any surrounding uses. Ohio solid waste landfill siting requirements were evaluated in determining an appropriate buffer space. Most task force members felt the disposal facility should be as inconspicuous as possible and uses of the land should be as unobtrusive as possible. In the final analysis, the consensus values developed early in the process provided the best overall understanding of the guiding issues the task force believes should be followed in contemplating future use of Fernald.

## ***Impact Of Recommendations***

While the task force has not yet received formal response from DOE with regard to all of its recommendations, input from the task force has already resulted in dramatic changes to the site decision-making process, as well as the decisions themselves. As a result of close coordination and ongoing sharing of ideas and information, the task force recommendations and the site's records of decision have been similar. Because the task force and the OU5 decision-making process were simultaneously occurring, many of the task force's recommendations were incorporated into DOE's process. The cleanup levels presented in the OU5 proposed plan are sufficiently similar to those recommended by the task force to allow for the same future use scenarios envisioned by the task force.

Task Force recommendations have resulted in direct changes to the remedial approach at Fernald. The task force members and the general public were able to reverse a proposed decision for in-place capping of OU2 materials. The task force's recommendations to accelerate remediation helped to bring that alternative to national level debate, and resulted in getting a significant increase to Fernald's budget to support this approach. It now appears remediation of the Fernald property may well be completed in a 10-year time-frame as recommended by the task force.

## **VI. NEXT STEPS**

Though the formal mission of the Fernald Citizen's Task Force has been completed with the final presentation of its recommendations, the members feel the task force's usefulness has not ended. What to do next presents an interesting challenge for the task force. From its inception, the Fernald Citizens Task Force had a dual mission. Its charter identifies specific subjects for its consideration, and the task force followed those instructions closely, regularly avoiding opportunities to be side-tracked by other, more immediate issues. However, the task force's charter provides for staggered terms and reappointment, as well as dissolution by action of the membership. The question of whether the Task Force should continue to exist arises.

Dissolution of the Fernald Citizen's Task Force at this time is an attractive possibility for several reasons:

- Dissolution of the task force would be consistent with the task-oriented approach of the group: once the task is over, the group dissolves.
- Dissolution of the task force would avoid institutionalization of the group. The task force was careful to conduct substantial community outreach to avoid the kind of isolation that typically occurs with a group that has formed internal cohesion, works closely with governmental agencies, and develops a greater degree of knowledge than the average observers of site-related activities. While the task force was largely successful in avoiding this isolation, the threat remains and is likely to increase over time.
- Member burn-out must be considered. The time required of members cannot be overstated. The high degree of faithful attendance at meetings was astonishing, and can at least be partially attributed to the task orientation. A focused goal and process were essential to maintaining interest.

The above arguments notwithstanding, dissolution of the Fernald Citizen's Task Force at this time would not serve the best interests of DOE or the community. DOE has a continuing need for organized, informed citizen input. The total remediation process is a long-term enterprise (10 to 20 years), and it is certain that conditions will change as it proceeds. The task force's recommendations are not self-executing, so a continuing presence for monitoring, clarifying, and (if necessary) revisiting recommendations would be useful.

Important, far-reaching decisions in the CERCLA remediation process do not end with records of decision. Detailed design plans must still be developed, and they involve many potentially controversial choices. (For example, a major local

concern about the disposal facility recommended by the task force is the associated stigma on local property values. A well-crafted design that takes such concerns into account can alleviate much of that effect by making the disposal facility as unobtrusive and aesthetically pleasing as possible.)

Difficult choices are often faced during remediation as unexpected field conditions can result in the need to change established designs. Furthermore, legal requirements have changed during the task force's own deliberations, and more changes can be expected. Finally, the vagaries of the budget process are likely to call for decisions on priorities throughout the remediation period. Where DOE and the regulators must exercise discretion, informed public input will continue to be helpful.

As focused as the Fernald Citizens Task Force was on specific issues, other issues were necessarily and wisely postponed. The best example of that is detailed land use planning and associated economic development. The kind of future use exercise undertaken by the task force is general, setting boundaries on possible uses, rather than making specific recommendations for use. It is targeted primarily at present-day regulatory and technical choices and can only guess at long-term community development needs.

Such recommendations can only be made by those persons intimately concerned with local and regional economic development, land-use planning, and zoning. The task force could move into such a role, but not without some revision of its current membership, which is not well-suited for this particular task.

The task force members and DOE find the arguments to maintain the task force persuasive. Ongoing task force activities are expected to include monitoring the implementation of task force's recommendations into the design and construction phases, evaluating closure, and perhaps long-term monitoring of the facility. The task force also hopes to have some role in economic redevelopment issues. The task force will reconvene in the fall of 1995 to evaluate these options.

Presently, the most sensible option appears to be maintaining the task force in its present form - a small group representing a broad range of stakeholders - but meeting less frequently. This arrangement would take advantage of the administrative and information-gathering infrastructure that has already been established, as well as the high degree of recognition the task force has built within the community. Such an arrangement would also guard against the haphazard revisiting of the original recommendations by an entirely different group of citizens. Willingness to serve on intensive advisory boards such as the task force would be diminished if their conclusions were casually superseded by others.

The primary challenge of continuing to maintain the task force would be creating and maintaining focus on a more diffuse set of issues than were faced under the initial charter. Without focus and intensive development of specific

issues, the group's recommendations will not have the weight of the original recommendations. There would also be potential for the task force to micromanage random issues, which would detract from the group's authority.

Focus could best be created by organizing around a series of short-term, intensive evaluations over the long-term cleanup operations. Timing of activities would have to be coordinated carefully with significant anticipated decisions, and ways must be found to keep the task force apprised of current and developing issues at the site. A system of regular communication with DOE and continuity of task force staff will be keys to success.

The difficulties of maintaining an effective task force over the long term are significant, but in the task force's view, sustaining this continuity would be essential. It would be important to build on the success and credibility of the original task force by ensuring effective implementation of the concepts and spirit embodied by the task force's recommendations. Focus, teamwork, knowledge, and self-discipline – all of which are important ingredients of the Fernald Citizens Task Force's success—are difficult to replicate. Continuation of the task force would be the most effective approach to ensuring balanced representation of local citizenry in decisions that will impact lives of residents near Fernald for many generations.

Respectfully submitted,

Fernald Citizens Task Force

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