6905 G-000-1013.119

FERNALD CITIZENS TASK FORCE AGENDA AND HANDOUTS FROM MAY 6, 1995 MEETING

05/06/95

TASK FORCE PUBLIC
~~100~~ 134
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

AGENDA

May 6, 1995

1. *Time and Place*

The next regularly scheduled meeting of the Task Force will be on Saturday, May 6, 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
8:50	Review of New Information
	Presentation of Assumptions Subcommittee
9:45	Break
10:00	Discussion and Draft Resolutions
11:45	Opportunity for Public Comment
12:00	Vote on Resolutions
12:15	Wrap Up
12:30	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*

P. O. Box 544 Ross, Ohio 45061 513·648·6478

FERNALD CITIZENS TASK FORCE

MEETING AGENDA AND MATERIALS MAY 6, 1995

8:30 - 8:45	Call to Order
	Approval of Minutes
	Chair's Remarks
8:45 - 9:00	DOE Remarks
9:00 - 10:00	Review of Markups to Future Use Recommendation
	Corrections and Approval of Recommendation
	Materials Provided:
	Future Use Recommendation Markup Draft 4/7/95
10:00 - 10:15	Opportunity for Public Input
10:15 - 10:30	Break
10:30 - 11:45	Discussion of EPA Groundwater Standards
	Materials Provided:
	Groundwater Subcommittee Memorandum
11:45 - 12:00	Opportunity for Public Input
12:00 - 12:15	Discussion of Final Report Schedule
12:15 - 12:30	Wrap-Up
12:30	Adjourn

May 1995

PUBLIC PARTICIPATION

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 7:30pm Morgan Township - Civic Center	2	3	4 7:00pm Ross Township - Ross Fire House	5	6 8:30am Fernald Citizens Task Force Meeting
7	8 7:30pm Crosby Township - Civic Center	9	10	11	12	13
14	15 7:00pm OEPA Public Briefing-OU5 FS/PP-Venice Pres. Church 7:30pm Morgan Township - Civic Center	16	17 7:00pm OEPA Pub Workshop-Prpd Site Treat. Plan-Crosby Sch	18 7:00pm Ross Township - Ross Fire House	19	20
21	22	23 7:00pm OU5 Public Mtg-FS/PP - Plantation	24	25 7:30pm FRESH - Venice Presbyterian Church	26	27
28	29 7:30pm Crosby Township - Civic Center	30	31			

Please call Judy Armstrong for changes at 738-0003.

5/5/1995

June 1995

PUBLIC PARTICIPATION

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 7:00pm Ross Township - Ross Fire House	2	3
4	5 7:30pm Morgan Township - Civic Center	6	7	8	9	10 8:30am Fernald Citizens Task Force Meeting
11	12 7:30pm Crosby Township - Civic Center	13	14	15 7:00pm Ross Township - Ross Fire House	16	17
18	19 7:30pm Morgan Township - Civic Center	20	21	22 7:30pm FRESH - Venice Presbyterian Church	23	24
25	26 7:30pm Crosby Township - Civic Center	27	28	29	30	

Please call Judy Armstrong for changes at 738-0003.

5/5/1995

-6905

MEMORANDUM

From: Gene E. Willeke, Groundwater Subcommittee

To: Fernald Citizens Task Force

Subject: Groundwater standards

May 4, 1995

An issue is under discussion between DOE and the two regulatory agencies that potentially has a significant impact on the Fernald remediation work. This issue is the appropriate standard for evaluating groundwater cleanup levels. A brief summary of the issues is given here, but considerable additional study is required before the Groundwater Subcommittee has a recommendation, if any, to make to the full Task Force.

The standards for groundwater quality, with regard to uranium, under the Safe Drinking Water Act, the MCLs we have talked about since last fall, exist only in draft form. USEPA was under orders to issue them by April 30, 1995, but did not meet that deadline. USEPA isn't saying on the record what the numbers for uranium will be. Meanwhile, a final rule was issued under the Uranium Mine Tailings Act that became effective in February, 1995 that has a groundwater standard protective of drinking water. At the present time, this is the only ARAR that applies to the site, according to one line of reasoning and argument. There is some evidence that the final rule under the Safe Drinking Water Act may contain MCLs for uranium that are no more stringent than those issued under the Uranium Mine Tailings rule. Indeed, there is some evidence that the MCLs will be less stringent than the UMTRA rule. If this is the case, it probably means the committee developing that rule were trying to be on the conservative side. All the numbers being considered are considerably below those found in the private wells that were considered contaminated.

DOE/FERMCO, USEPA, and OEPA recently met to discuss the issue. All parties agreed orally to use the new MCL numbers when the final SDWA rule is issued, without reopening the ROD. To date, that interagency agreement is not in writing.

The stakes are high on this issue at this site. If the higher numbers are used, it would mean a substantial reduction in the amount of earth that would have to be moved to be protective of the aquifer, more rapid aquifer cleanup, some reduction in risk from airborne pollutants during remediation, a cost savings of several hundred million dollars, and a much smaller disposal cell.

We are seeking some clarification of, and the reasoning behind, the positions of the respective agencies. We hope to have a recommendation to make by the July Task Force meeting. In the event the Safe Drinking Water Act rule were to be promulgated, this issue may become very simple to deal with, although there is little evidence that the rule will be issued soon.

DOE NEWS

NEWS MEDIA CONTACTS:
Press Office, 202-586-5806

FOR IMMEDIATE RELEASE:
May 3, 1995

DOE Alignment Delivers $1.7 Billion to Taxpayers

Includes Office Closings, Employee Reductions, Privatization, Asset Sales

Energy Secretary Hazel R. O'Leary today announced a Strategic Alignment and Downsizing Initiative that will yield $1.7 billion toward deficit reduction. The Alignment and Downsizing package includes closing 24 offices, reducing federal employees by 3,788 (27 percent), and cutting expenditures in a variety of other areas. Secretary O'Leary also submitted legislation today that would privatize three Power Marketing Administrations and the Naval Petroleum and Oil Shale Reserves. By the end of May, she will submit legislation to transform the Bonneville Power Marketing Administration into a government-owned corporation and remove the Federal Energy Regulatory Commission (FERC) from the Department. Enactment of the legislative package would generate an additional $5.3 billion.

"Today, we take an historic step in restructuring the Department of Energy for its vital post-Cold War missions. Our downsizing and alignment commitments will enable us to do our work better and at lower cost," said Secretary O'Leary. "Our legislative package puts the ball squarely in Congress' court. With their cooperation, we can deliver $5.3 billion more of our $14.1 billion commitment made to President Clinton and American taxpayers in December."

President Bill Clinton said, "For two years, the Department of Energy has been in the forefront of our Administration's effort to improve service to the American people, reduce costs and open government to the public. Now, the Department and Secretary O'Leary are building on that outstanding record by cutting the size of government and bringing government closer to the people we serve."

(MORE)

R-95-064

Printed with soy ink on recycled paper

Travel, Information Management and Reduced Contractor Support Totals $835 Million
The Secretary announced travel cuts of $175 million over five years to be realized through better travel decisionmaking, greater use of videoconferencing and leveraging Government buying power on behalf of contractors. DOE spends $365 million annually in travel for Federal and contractor employees. Improved information management systems will generate another $200 million over five years.

In addition, DOE will reduce use of support service contractors for activities such as technical analysis, communications and administrative functions. Cuts in these contracts will total $460 million over five years.

Regulatory Reform Yields $20 Million, Speeds Process
DOE has identified ways to speed compliance, streamline approvals, reform contracting processes and reduce costs for activities related to the National Environmental Policy Act (NEPA). NEPA documentation is required to assess environmental impacts of DOE initiatives. DOE actions will yield $20 million in savings. More important, the public will have access to environmental impact information in half the time, as we reduce the timeline for Environmental Impact Statements from an average of 33 months to 15 months.

Legislation to be Submitted
Consistent with the President's FY1996 budget proposal, the Administration is submitting legislation to Congress that would:

- Privatize the Western Area, Southwestern and Southeastern Power Administrations and transfer them to local utility customers, generating $3.7 billion in receipts upon implementation

- Establish the Bonneville Power Administration as an independent, government-owned corporation

- Sell the Naval Petroleum Reserves to the private sector, generating $1.6 billion in receipts upon implementation

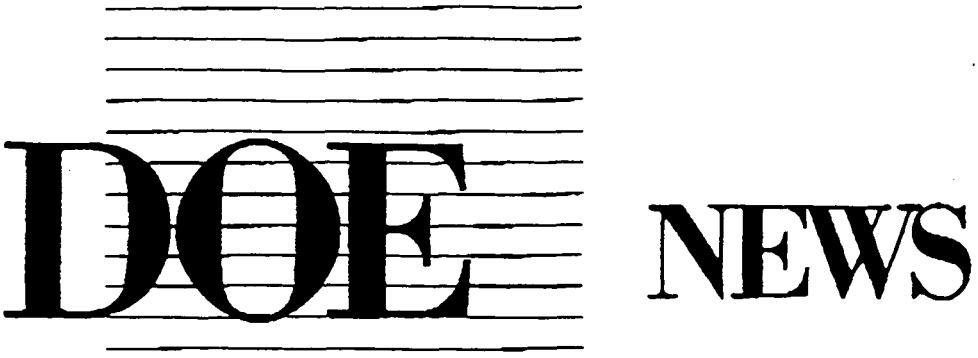
- Separate the Federal Energy Regulatory Commission from DOE.

The package of legislation would take more than 6,700 employees and 80 offices off the DOE rolls, although many individuals will remain in Federal employment.

Implementation Team Appointed
The Secretary appointed a team to manage implementation of Alignment and Downsizing; they include DOE leadership, Strategic Alignment team members and career employees.

(MORE)

R-95-064



STRATEGIC ALIGNMENT INITIATIVE
QUESTIONS AND ANSWERS

STRATEGIC ALIGNMENT

Q. Why are we doing this?

A. Strategic alignment is the next step in a process we began two years ago to reshape the Department of Energy to better accomplish its missions and to use taxpayer money more wisely. The Strategic Alignment step began last summer, and is the logical outcome of our prior strategic planning and quality management efforts. These actions will allow us to meet our goals of working more effectively and efficiently. Because we began this effort two years ago, today we have a better way than the recent proposals being floated in Congress to equip the Department to perform our vital national missions and cut unnecessary costs.

Q. Who made the decisions being announced today?

A. The Secretary of Energy made the final decisions. She was assisted by the recommendations of a special employee alignment team, Deputy Secretary Bill White, the assistant secretaries and outside experts.

Q. Who supports this?

A. The effort to improve the department has involved a wide range of individuals, study groups, and employees. It may not be perfect, but it's the outcome of a tremendous amount of time and effort from a multitude of interested people. And, as with any quality product, it is not static but open to alteration from constructive and persuasive suggestions.

Q. Is this supposed to save DOE?

A. It's supposed to enable DOE to accomplish its critical national missions better and at less cost. We began this effort two years before the recent proposals to dismantle DOE and this is a better way: a reasoned, thoughtful approach which is part of an overall strategic plan to better serve the American people. Performing better and more efficiently is the object, not "saving DOE."

Printed with soy ink on recycled paper

U.S. Department of Energy • Office of the Press Secretary • Washington, DC 20585

Q. Are most DOE activities being centralized?

A. Whether functions should be centralized or decentralized was decided on a case-by-case basis. For example, business, training, and administrative services will be centralized in a new Office of Headquarters Operations and Services rather than be located in program offices. On the other hand, professionals from the Offices of Chief Financial Officer and General Counsel will be co-located to the programs they serve.

Q. What about support service contractors? How many will lose their jobs?

A. Support service contractors frequently perform essential functions that are more appropriately performed by federal personnel. Strategic Alignment implementation will result in an across-the-board 20% reduction in spending for support service contractors at DOE. In addition, further reductions are expected as other changes in DOE are implemented.

Q. Even though M&O contracts were not specifically addressed in the Strategic Alignment, are any provisions being made to reduce the Department's reliance on the use of M&O contracts?

A. As a consequence of the Contract Reform Initiative, it is true that the Department will rely less on the old M&O contractor relationships to perform its missions. The Strategic Alignment Initiative will complement this trend by reducing spending on support services contractors.

Q. Information management has long been a source of inefficiency in DOE. Will DOE finally standardize its computer or telecommunications hardware, software, and data administration so information can be readily shared across functions or the Department?

A. A new office of the chief information officer will be created to realign all DOE information management functions.

Q. What is the staying power of the recommendations?

A. As long as they continue to improve the way we do business. Career employees have been intricately involved in developing the recommendations and will be involved in their implementation in order to make this better way a long-haul improvement that will last through political changes of administration.

Q. How do all the pieces fit together?

A. The past two years have been a period of intense reform, organizational change and fundamental rethinking at the Department of Energy. Never in the history of the Department has such an ambitious set of initiatives been pursued for the purpose of improving performance, cutting costs and reshaping our business activities. Several major efforts have examined different areas of the Department's operation and charted a course to a

Department of Energy: the Strategic Plan; Contract Reform; the Quality Initiative; the Galvin Task Force on Alternative Futures for the National Labs; the Yergin Task Force on Strategic Energy Research and Development; the Advisory Committee on External Regulation; and Strategic Alignment. This has allowed us to mold each seemingly separate area of our business around the common Departmental values and goals established in the Strategic Plan. The result will be a Department that is effective, professional and capable of delivering necessary and beneficial service to the nation.

IMPLEMENTATION

Q. **Does the Secretary require any approvals before she orders implementation of the Strategic Alignment?**

A. No. Section 643 of the Department of Energy Organization Act gives the Secretary broad discretionary powers and authority to reorganize the Department as she may deem necessary and appropriate. New legislation will be required to privatize or transfer functions from the Department.

Q. **When does this begin? When will it be over?**

A. This is the latest chapter of the strategic planning and quality process we began two years ago. Some alignment decisions have now been made; others await further detailed analysis. Many of the changes will occur within the next 12 months, while others will be phased in over five years beginning in fiscal year 1996.

Q. **Who will oversee implementation of these changes? Who will they report to?**

A. The Secretary will announce the creation of an implementation team made up of individuals who served on the Strategic Alignment Initiative, career federal employees, senior Department officials and others. The team will report directly to Secretary O'Leary.

Q. **How will we learn about progress made in implementing the Strategic Alignment?**

A. DOE managers have been charged with keeping their employees fully informed of changes within their offices. In addition, "DOE This Month" and the DOE Homepage on Internet will carry regular information about implementation progress.

STAFFING

Q. **Will everyone in DOE compete for the jobs they now hold?**

A. A number of staffing options are being considered. One focuses on selecting the individuals best qualified to staff the new DOE based on performance expectations and competencies tied to the Department's Strategic Plan. Under this approach, job skills and competencies are identified for each position and employees would be assessed against these requirements. This approach could be used to help achieve the objectives of the Alignment and other initiatives, and to address skills mix issues.

Q. **Are you using a competency-based staffing model?**

A. The Department must: reduce its budget; become more efficient, effective, and corporate in its focus; and address skills mix issues to meet the expectations of its customers and stakeholders. A competency-based staffing model could facilitate DOE in achieving its vision. This strategic approach focuses on selecting the best qualified to staff the new DOE and uses DOE's core competencies to tie performance expectations to the Department's Strategic Plan and core values. In a competency-based assessment, selection decisions would reflect an individual's competencies and skills along with their potential to model and support the core values.

This process increases the level of management's involvement in clarifying, articulating, and incorporating the vision, values, and critical success factors throughout the workforce; reinforces the positive demonstration of leadership and other competencies; facilitates culture change; serves as a driver for future re-engineering processes by identifying the new skills and competencies employees need to be successful; and provides a strong foundation to align other human resource organizational systems (e.g., compensation, selection, promotion, etc.).

Q. **Will Schedule C employees be treated the same as career employees in implementation? What about SESs?**

A. Schedule "C" and SES (career and non-career) employees may be at greater risk than GM employees, depending on the future work of the Implementation Team.

Q. **What role will the Unions have in implementation?**

A. Through the Partnership Councils already established, management and union leaders will meet to discuss Strategic Alignment implementation, making every effort to develop a plan that is sensitive to the needs of bargaining unit employees. As required, management will negotiate the impact and implementation of changes brought about by the Strategic Alignment, but will not negotiate away its essentials.

Q. **What rules will apply to RIFs?**

A. If reductions are necessary and cannot be achieved through voluntary actions within the implementation timeframe, RIF laws and regulations would be followed to identify placements in remaining DOE positions. The OPM RIF regulations are derived from the Veterans' Preference Act of 1944 and utilize the following four factors in releasing employees:

- type of appointment;
- veterans preference;
- length of service; and
- performance ratings.

Q. **What rules will apply to severance payments?**

A. Generally, those currently employed for a continuous period of at least 12 months who are RIFed are entitled to severance pay that consists of: 1) basic severance computed on 1 week pay for each year of civilian service up to and including 10 years; 2) 2 weeks basic pay for each year of civilian service beyond 10; and 3) an age adjustment allowance computed on the basis of 10% of the total severance allowance for each year the recipient exceeds 40 at the time of separation. Total severance may not exceed 1 year's pay and is paid in regular pay periods. An employee will not get severance pay if he/she is eligible upon separation for an immediate annuity from a Federal civilian retirement system or from the uniformed services.

Q. **What can I do to protect myself?**

A. Stay in touch with your supervisor and personnel expert. A special implementation team has been formed to work out the personnel details of this effort.

Q. **How do I survive? Succeed?**

A. By doing your job well. Each of us has a personal responsibility to continually grow and improve in our jobs. Likewise, our organization must live by the laws of employment as provided by Congress.

Q. **Will I have to relocate?**

A. It's too early to tell for specific jobs. The possibility exists that some people may be asked to move to different jobs as we match skills to locations there they are needed.

Q. **Will I be retrained for a new job?**

A. It's possible. Retraining will be one of the tools used to best match skills with positions. It's too early to tell which specific employees will need retraining.

Section 3161, National Defense Authorization Act

The Department's Office of the General Counsel has concluded that the National Defense Authorization Act of 1993, which authorizes DOE to provide separation incentives, applies to all contractor and Federal employees who work at Department of Energy defense nuclear facilities. Although not an entitlement, Section 3161 of this Act is one potential tool that could be used in the Department to provide incentives to employees. The Department is prepared to seek additional legislative resources should that be necessary in using this authority.

LATERAL VOLUNTARY ASSIGNMENTS

An agency may fill a position without competition by reassigning an employee, with his or her approval, from another position provided that the new position is at the same or lower grade and the position does not provide the employee with additional promotional potential.

PRIORITY PLACEMENT

The intent of the Priority Placement Program is to provide employees priority consideration in filling positions. Currently, each Operations Office as well as the Department's Headquarters has a priority placement program plan with consideration limited to the local commuting area.

Under the Interagency Placement Program, the Office of Personnel Management provides placement assistance to employees who have received notices of separation through a reduction-in-force. The program may be limited to certain categories of employees (e.g., those in the competitive service in an appointment that will last longer than one year).

DIRECTED REASSIGNMENTS

An agency may reassign an employee to a vacant position at the same grade or rate of pay when a determination is made that an employee's service can best be utilized in another position and a reassignment may be made without regard to reduction-in-force procedures and without the employee's consent. Additionally, the reassignment may be to the same or different kind of position from the one currently occupied and within the same or to a different organization and geographical area.

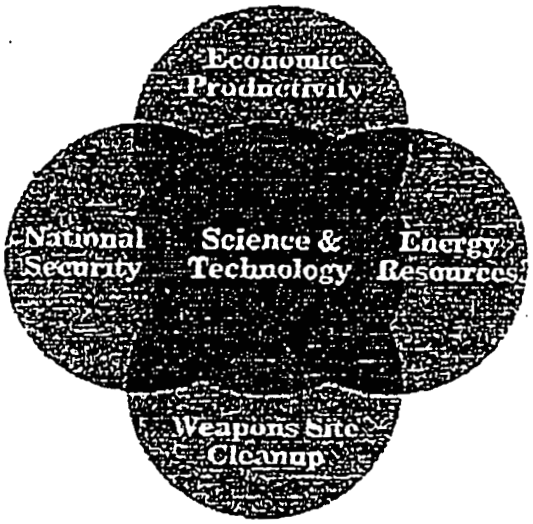
When a directed reassignment is made to a different commuting area, the agency pays relocation expenses for transportation and movement of household goods for the employee and immediate family.

The employee must agree to the reassignment or accept the possibility of removal through adverse action procedures.

DOE PA-01 001

-6905

cys; area mortage
Direct Repar
5/3/95



Saving Dollars and Making Sense

Strategic Alignment and Downsizing

United States
Department of Energy
May 1995

000014

Message from the Secretary

In early 1993, President Clinton and Vice President Gore challenged all federal agencies to help create a government that works better and costs less. At the Department of Energy we have met that challenge through an intense period of fundamental rethinking about how we conduct our work. Through a deliberate and phased strategy, we've begun a major organizational transformation that already has saved money and enhanced Government performance--two defining commitments of this Administration. Working together--

- *We created the Department's first-ever Strategic Plan, which provides a framework and shared vision for our missions in National Security, Energy Resources, Weapons Site Cleanup, and Science and Technology.*

- *We initiated a major overhaul of the Department's contracting practices, which will yield billions of dollars in savings through increased competition and performance-based contract management.*

- *We commissioned the first independent post-Cold War review of the Department's ten National Laboratories, and now are aggressively implementing recommendations that will reduce the cost of doing business at the labs and help sustain their long record of scientific discovery and technological innovation--essential for long-term economic growth.*

- *We launched ambitious reviews of our $2 billion applied energy R&D program and our complex system of regulating nuclear safety at our facilities. These two reviews are marshaling some of the most seasoned experts in the Nation to assist us in enhancing the productivity, efficiency, and cost performance of the Department.*

Finally, in the fall of 1994 we announced our Strategic Alignment Initiative--Phase II of our strategic planning process. This 120-day, employee-driven effort was given the job of identifying better, more cost-effective means of performing the core missions defined in our strategic plan.

The package of initiatives announced in this report includes many of the most compelling ideas developed by the Strategic Alignment team. It also includes several initiatives developed separately within the Department. The result is a major package of organizational reforms, legislative proposals, and cost-cutting measures that will contribute more than $1.7 billion in savings toward our commitment, announced in December 1994, to reduce the Department's budget by $14.1 billion over five years. Legislation we are submitting this month would produce an additional $5.3 billion in deficit reductions. The balance of our commitment--involving reductions of $4.4 billion from Environmental Management, $1.2 billion from applied energy programs, and up to $1.4 billion from the Department's laboratory complex--are being addressed through separate efforts.

Through the actions in this report, we have made tough decisions about how we perform our work in a fashion that reduces the size and cost of the Department. This alignment is a bold action plan to reduce layers of management, eliminate organizational redundancies, and integrate activities that historically have operated in isolation. In so doing, we will meet our most important objective, which is to better serve our customers as we deliver on our missions: protecting national security and reducing nuclear danger, enhancing our long-term energy security, advancing the frontiers of scientific understanding, protecting the environment, and developing technologies that contribute to U.S. economic productivity.

These are the missions which drive the Department of Energy's existence. These are not missions from which the Nation can, or should, walk away. While some have discussed dismantling the Department--and possibly even terminating further public support for our missions--we have responded with a clear and consistent message: We have a better way. That better way is to perform these vital missions at dramatically reduced cost, while increasing our level of service to the American public. We will achieve these goals through the continued pride, commitment, and excellence of our workforce.

Hazel R. O'Leary
Secretary of Energy

DELIVERING ON OUR MISSIONS

The Department of Energy is vested with public missions that fundamentally affect the security, prosperity, and quality of life of this and future generations. The commitments reviewed in this report are designed to improve our ability to deliver our missions, which include--

Protecting National Security and Reducing the Nuclear Danger: The Department's weapons laboratories are the Nation's repository of knowledge and engineering competence with regard to nuclear weapons. This unique and irreplaceable human resource helped win the Cold War. Our labs and facilities now are being directed to: continue the safe dismantlement of thousands of nuclear weapons in coming years; ensure a safe and reliable nuclear stockpile without testing; guard against nuclear terrorism; and curb the proliferation of weapons of mass destruction. Although we face a historic opportunity to further reduce nuclear stockpiles, nuclear dangers persist due to the availability of large quantities of weapons-grade materials throughout the world. Security against such risks will continue to depend on the technical expertise of the Department of Energy and our laboratories.

Enhancing Our Energy Security: Helping guard against energy supply disruptions and their associated threats to the United States remain fundamental priorities for the Department. The reasons why are clear: By the year 2010, the U.S. trade deficit in oil is projected to double to $100 billion per year; U.S. oil imports will grow to 60 percent of domestic consumption; and Persian Gulf oil producing nations will provide more than 70 percent of the world's oil exports--surpassing their peak of 67 percent in the embargo year of 1974. Continued federal investments in a diverse portfolio of energy supply and efficiency-related R&D helps ensure against future energy crises that could cripple our economy. The Department, in partnership with industry and academia, has pioneered technologies that are resulting in tens of billions of dollars in consumer energy savings each year. Further R&D, aimed at enhancing the production and efficiency of use of conventional fuels and developing alternative energy sources, must be explored as part of a national program to provide secure, reliable, and diverse energy resources for the future.

Environmental Cleanup and Stewardship: The Department handles some of the most challenging and highest-risk environmental problems in the world. Thousands of radioactive and hazardous waste sites at 15 major locations in 13 states require careful and highly sophisticated approaches to cleanup to ensure the protection of public health and safety. However, our Environmental Management program is more than simply cleanup. It also has the responsibility of providing stewardship over 26 tons of plutonium, managing potentially explosive underground radioactive waste tanks, developing new technologies that will drive down future cleanup costs, and decommissioning and stabilizing more than 7,000 buildings. Beyond the environmental management challenges, the Department and our laboratories also play a vital role in developing pollution prevention technologies that will save billions of dollars while reducing waste.

Advancing Frontiers of Science and Technology: The Nation has reaped enormous benefits from investments in science and technology over the past 50 years, yet continued scientific advance--the fuel for technology's engine--will be essential for continued economic prosperity and national security. The Department's National Laboratories provide world-class facilities for exploring uncharted scientific frontiers from the smallest detectable elements of nature to the farthest reaches of the universe. Our R&D programs have contributed to the Nation's knowledge base, and to our capacity for innovative solutions to emerging problems and national needs, and will continue to do so. Research supported by the Department and its predecessor agencies has earned 59 Nobel prizes and countless other distinctions.

The employees of the Department of Energy have a proud legacy of accomplishments. Our programs have expanded human understanding of the world, created new fields of science and technology, generated innovations that created new commercial markets, and, in the case of national security, determined the course of world history. We are committed to further excellence in our mission areas and know that we can implement these missions better and at lower costs through fundamental changes in the way we do business. We are driven by more than simply the imperative of deficit reduction. Our primary motivation for change derives from the fact that--

- *Fundamental processes which govern how the Department operates are cumbersome, inefficient, and drain our employees of energies that could be spent more productively in other ways.* In response, we must re-engineer these processes and eliminate unnecessary steps so that we can sharpen our focus on mission results.

- *Like most bureaucracies, the Department has responded to problems in the past by adding new layers of management and new processes on top of old ones.* In response, we must de-layer the organization, establish flatter organizational structures, and empower our employees to meet and exceed customer needs.

- *Redundancies within the Department and inefficient procedures have persisted from one Administration to the next, without a fundamental rethinking of how to do things better.* In response, we already have seized the initiative to make major changes in the way we operate, and will accelerate these changes through the commitments in this report (several examples are provided in Appendix C.

MOVING FROM OUR ORIGINS TO THE FUTURE

The origins of the Department of Energy help explain the multiple cultures and patterns of operations that govern the organization today, and also provide insight into why we must change and where we should be headed in the future.

The Department's ancestry dates back to World War II's Manhattan Project and the civilian Atomic Energy Commission (AEC), which were responsible for nuclear weapons development and efforts to create peaceful uses of nuclear energy. The 1973 oil embargo prompted Congress the following year to create the Federal Energy Administration (FEA); other considerations led to establishment in the same time period of the Energy Research and Development Administration (ERDA). Together, these agencies received authorities from the abolished AEC, as well as other Government agencies including the Department of the Interior, Department of Commerce, Department of Agriculture, Department of Transportation, Environmental Protection Agency, Department of the Treasury, and the National Science Foundation. In 1977, ERDA and FEA were combined and replaced by the Cabinet-level Department of Energy.

The creation of the Department of Energy succeeded in unifying many energy, national security, and scientific programs that previously were scattered throughout the Government. However, the diverse origins of the Department's many elements resulted in an organization consisting of multiple cultures, traditions, and modes of operation, which have never been fully harmonized. In addition, with the end of the Cold War, even the Department's national security-related work is being performed in a far more open and interactive R&D environment--a substantial change from the days of the AEC, and further cause for greater integration of programs within the Department.

One of the driving objectives behind the Strategic Alignment Initiative has been to achieve a far more integrated and efficient operation. Development of the Department's April 1994 Strategic Plan was a vital first step toward securing a common vision and framework for future mission activities. Now comes the more difficult challenge of institutionalizing changes in how the Department functions and ending many programmatic separations that the Department inherited from the past.

ALIGNMENT AND DOWNSIZING

In December 1994, 40 career employees from throughout the Department were selected to work full-time on the Strategic Alignment Initiative. Under the direction of Deputy Secretary Bill White, this team received training in how the private sector has implemented successful restructuring efforts. During the subsequent four months, the Strategic Alignment team conducted interviews and surveys aimed at examining how the Department conducts its business and ways in which we could secure better performance at lower cost. This process provided essential inputs to our Alignment and Downsizing package: out of 39 recommendations that were presented, 24 were adopted in whole or in part, 13 will receive further consideration during the implementation process, and two were rejected--1) a recommendation to privatize isotope production, and 2) a recommendation to further reduce expenditures of the Environmental Management program by $300M-$500M annually. The package also is derived from other analytical work aimed at helping deliver on our commitment of $14.1 billion in deficit reduction over the next five years.

Highlights of our Alignment and Downsizing Package are listed below, organized according to four guiding principles that are consistent with the National Performance Review's tenets of putting customers first, cutting red tape, cutting back to basics, and empowering employees to get results.

Alignment Summary

($ in thousands) (FY96 - FY2000)	$ Savings	Employment Reductions	Percent of 1995 Staff
Consolidate Headquarters Space	17,981		
Alignment - Headquarters Administration	109,285	377	
Alignment - Headquarters Program Offices	228,587	761	
Reduce Headquarters Support Service Contractors	309,525		
Integrate Information Management	200,000		
Reengineer Headquarters	247,910	1,200	
HEADQUARTERS & PROGRAM TOTAL	1,113,288	2,338	34%
Field Offices	502,899	1,450	21%
TOTAL	1,616,187	3,788	27%
Travel Savings	175,000		
Asset Sales Savings	75,000		
National Environmental Policy Act Savings	20,000		
Additional Alignment Savings	50,000		
Less Retraining, Outplacement and Buyout Costs	(165,540)		
TOTAL ALIGNMENT SAVINGS	1,770,647	3,788	27%

Principle #1: **Use fewer resources by eliminating redundancies, reducing the workforce, and streamlining processes.**

Problem: The Department uses more resources and is less efficient than it should be due to excessive layers of management and duplicative work. Bureaucratic layers and organizational redundancies are the result of confusion over roles and responsibilities, a lack of vigilance in eliminating duplicative work, and failure to eliminate non-value-added layers and processes.

Opportunities: The Strategic Alignment team identified many opportunities to eliminate, consolidate, and downsize redundant activities across the Department, resulting in substantial staff reductions and savings over the next five years. Some downsizing will be permitted through the establishment of matrixed organizations with shared staffing; additional cuts will result from organizational consolidations and the elimination of redundancies. The Department has increased its supervisor to employee ratio from approximately 4.7 in September 1993 to 7.0 in April 1995, but we must still do more to achieve--if not exceed--our goal of 10:1.

Major opportunities for reducing resources and downsizing employment also can be found through revamping and simplifying the Department's complex processes for decision-making and administrative action. Put another way, by reducing red tape we will be able to reduce the number of federal and contractor employees who have been involved both in dispensing the tape and in trying to cut through it to perform their work. Because of time constraints, the Alignment team could not re-engineer major departmental processes. However, we must seize the major opportunities that would permit us to use fewer resources through dramatically simplified processes across-the-board. Based on successful process re-engineering in the private sector, we are confident that the Department's federal and contractor workforce can be reduced dramatically.

Actions: Reducing Federal Employment: Over the next five years, the Department's federal employment will be reduced by 3,788 (27 percent) over five years, from our FY1995 target of 13,907 Full-Time Equivalents (FTEs). This number excludes employment of the Power Marketing Administrations (5,227) and the Federal Energy Regulatory Commission (1,463). This 27 percent FTE reduction greatly exceeds the eight percent reduction which the Department committed to in its September 1994 Streamlining Report to the Office of Management and Budget (OMB). A cut of this magnitude is commensurate with the estimated 27 percent reduction in DOE contractor employees that will occur between 1992 and 1998. We will fully utilize all available tools--including buy-out authority, attrition, early retirement, out-placement services, and retraining assistance--to soften the impact on our employees. We also intend to prepare a workforce restructuring plan. However, no matter how we approach this challenge, some involuntary separations will be required to meet the employment targets.

Implementation of the workforce reductions will be managed by the Alignment and Downsizing Implementation Team (discussed at the end of this report) and will be achieved without compromising worker health and safety. New FTE caps for federal employees will be submitted to OMB by the Implementation Team in order to secure the approximately $1 billion in savings over five years that will result from these workforce reductions. Specific elements of the downsizing include:

1) *Cutting Headquarters Staff*: Headquarters staff will be reduced by approximately 2,340 (34 percent), from a 1995 level of 6,850 (this number includes some staff who are duty-stationed in the field, but are reported as Headquarters personnel). Between 1987 and 1994, DOE Headquarters staff grew substantially. The largest areas of growth were in the Environmental Management and Environment, Safety, and Health programs. Increases in these programs were required in order to obtain the skills mix required by the expanding environmental clean-up program and to address worker health and safety issues. During the Headquarters staff drawdown, we will ensure retention of the skills necessary to perform these and other vital Departmental missions.

2) *Cutting Field Office Staff:* Field Office staff will be reduced by 1,450 (21 percent), from a 1995 level of 7,047. These cuts will involve reductions in staff across the field complex, as well as office closings and consolidations (discussed below).

<u>Restructuring and Downsizing Departmental Offices:</u> Significant redundancies will be eliminated and departmental performance will be enhanced through a number of structural changes in the Department, including:

1) *Realign Energy Cluster:* We will realign the Offices of Energy Efficiency, Fossil Energy, and Nuclear Energy, and the Energy Information Administration, as well as portions of the Office of Policy, within a new Energy Cluster. This action will eliminate redundant functions through utilization of common staff for many administrative, policy, regulatory, and budget activities, and will enable a more integrated approach to management of the Department's energy portfolio. At present, this action will not involve elimination of Assistant Secretary positions. Realigning the Energy Cluster will enable a reduction of 250 Headquarters employees and elimination of $98 million in support service contractor activities, for a total savings of $180 million.

2) *Consolidate Emergency Management:* We will consolidate six existing Headquarters organizations that deal with emergency management into one office in the National Security Cluster. This change will improve effectiveness and responsiveness of the emergency response staff at Headquarters, and result in a reduction of 24 FTEs.

3) *Merge Public and Congressional Affairs:* We will combine and downsize the Office of Public Affairs and the Office of Congressional Affairs, and reduce the size of "shadow staff" at the line programs who perform congressional and public affairs functions. Tools such as staff marrixing will be used to better connect the merged office with program offices. The new office will provide better service to our customers in the public, Congress, State and local governments, and the media.

4) *Create an Administrative Service Center:* We will establish an integrated Administrative Service Center that will provide customer service in areas such as personnel, procurement, training, and administrative services. The Service Center will be staffed with a mix of employees from the current Human Resources organization and the program offices--where many redundant capabilities have built up over the years. In addition, the Department will consolidate the 18 offices that currently process accounting transactions.

5) *Realign the Office of Policy:* We will reduce the Office of Policy, Planning, and Program Evaluation from its current size of 200 employees to a 75-person staff that reports to the Secretary, distributing 50 policy staff to the programs and eliminating approximately 75 positions. The remaining Office of Policy will include a strengthened economic analysis capability and house international activities currently performed in the program offices.

6) *Other Office Downsizing Actions:* Numerous other changes in staffing levels and functions were identified by the Alignment Team. Through the Alignment and Downsizing Implementation process, we will implement many of these additional recommendations and will allocate specific staff reductions to offices throughout the Department.

Reductions in M&O Contractor Employees: Through efforts outside the Alignment and Downsizing Initiative, we will have reduced employment of the Department's management and operations (M&O) contractors by more than 28,000 (20 percent) by the end of FY1996, from a 1992 level of 148,700 to a 1996 level of 120,000. More than 70 percent of these reductions have occurred as a result of employee cuts at our environmental management sites and former nuclear production facilities. We expect to cut thousands of additional contractor employees by FY2000.

Regarding contractor employees at the Department's laboratories, we are setting a goal of a 10 percent reduction over the next five years, which would result in a cut of approximately 5,900 employees from a FY1994 workforce base of approximately 59,000. This reduction would be facilitated through reform of the Department's oversight procedures of the labs--enabling the labs to eliminate employees and streamline internal systems of operation. Some workforce reductions at the labs also will be the direct result of cuts in

programmatic funding. However, one of our overall Alignment and Downsizing goals is to preserve our mission activities within a declining budget environment by exacting significant cuts in overhead costs. Details of the reductions in employment levels at the Department's labs will be developed through implementing recommendations of the Galvin Task Force report on the DOE National Laboratories. A plan will be released with our FY1997 budget.

Principle # 2: **Reduce overhead expenses so that we deliver more mission activity for less money.**

Problem: A growing proportion of our budget in recent years has been devoted to federal and contractor overhead costs, including administrative personnel, office leases, computer systems, support service contractors, and travel.

Opportunities: The Department has many opportunities immediately available to reduce overhead. Both contractor and federal workforce reductions will help ensure that our workforce levels track with the Department's overall budget. The Department reduced its budget from $19.2 billion to $17.5 billion during the past three years and has committed to reduce spending to $14.7 billion (23 percent) by the year 2000. Our projected reduction of 27 percent in federal employment and at least 27 percent reduction in contractor employment during this period will ensure that we are rightsized to perform our missions without sustaining personnel expenses that would cut into program budgets. Opportunities for further overhead reductions can be found in a broad range of contractor and federal expenses, ranging from shrinking the number of offices maintained by the Department to integrating and streamlining our information management systems.

Actions: Field Office Closings/Consolidations: The Department currently operates a field office structure that involves 64 offices with roughly 7,000 total employees in 25 states. To enhance efficiencies and reduce costs, we will close or consolidate 12 DOE field offices (19 percent) around the nation. As mentioned above, overall field office staffing will be reduced by approximately 23 percent. Details of the field office actions are as follows:

1) Four Energy Efficiency Regional Support Offices will be closed; they are located in San Francisco, California; New York, New York; Kansas City, Missouri; and Dallas, Texas. In addition, the Denver Energy Efficiency support office will be consolidated into the Golden, Colorado field office. These actions will be made possible as a result of consolidating several state grant programs into a "performance partnership"-type of block grant. Creation of a block grant program in this fashion will allow changing the work of regional support offices from grant-making and monitoring, to direct program operation. These changes will be implemented in FY1996 for a five-year savings of $38 million.

2) Four Fossil Energy offices will be closed, as follows: the Bakersfield, California and Casper, Wyoming offices which support the Naval Petroleum and Oil Shale Reserves will be closed with the passage of legislation to privatize the Reserves. The Fossil Energy offices at Metairie, Louisiana and Laramie, Wyoming will be closed. These two office closures will be completed in FY1996.

3) Two Office of General Counsel offices which are involved in completing work of the former Economic Regulatory Administration, will be closed. These are located in Houston and Dallas.

4) A small policy office in Paris, France which reports to the Office for Policy, Planning and Program evaluation will be closed.

5) Management and administrative functions at the Morgantown Energy Technology Center (Morgantown, West Virginia) and the Pittsburgh Energy Technology Center will be consolidated. This action will eliminate 90 federal FTEs. In addition, the Department will examine further opportunities for consolidation and cost-savings among its three fossil energy technology centers (Morgantown, Pittsburgh, and Bartlesville, Oklahoma). Further decisions regarding these offices will be made this year.

Headquarters Space Consolidation: The Department's Headquarters' staff will be consolidated from its present distribution among 16 different locations in the Washington, D.C. metropolitan area to just four locations by FY 2000– Forrestal Building; COMSAT Building (two blocks from Forrestal); Germantown, Maryland; and a Crystal City, Virginia building that houses DOE's Naval Reactors program staff. This consolidation will reduce leasing expenses and increase efficiencies through greater integration of the Department's workforce.

By FY 2000, Headquarters workforce reductions will enable the Department to vacate more than half of its 2,000-person Germantown facility, located 25 miles from the Forrestal Building. Substantial savings would be achieved in deferred travel costs associated with transporting employees between these multiple sites, particularly between Forrestal and Germantown. The Department currently spends approximately $250,000 annually on a shuttle bus service to move an average of 200 employees daily among existing Headquarters offices. After the year 2000, consolidation of all employees out of the Germantown facility and into a facility much closer to the Forrestal building may be feasible and would be implemented based on a thorough assessment of potential cost savings.

Curbing Travel Expenses: The Department will substantially reduce its travel costs through better management of travel decisions, utilization of spending caps, negotiating cheaper airfares for contractors, and better utilization of technology. At present, the Department spends $365 million annually on travel for federal and contractor employees--approximately three-fourths of which is contractor travel. The Department has over 115 videoconferencing rooms (including roll-around units), and has utilized these facilities for more than 10,000 videoconferences since 1993. We will install an additional 100 units during the next year to further reduce the need for travel. Savings of $175 million will be realized over five years.

Asset Sales: The Department will sell surplus assets over the next five years to generate $75 million in revenue and reduced overhead costs associated with storage, security and handling. Included in the Department's existing asset inventory are more than 10,000 pounds of precious metals (e.g., silver, platinum, gold), more than five tons of non-precious metals (e.g., lead, copper, stainless steel, aluminum), and large volumes of rare gases. These assets were required by the nuclear weapons production complex during the Cold War years, but are excess inventory today.

Information Management: We will reform and restructure our information management systems to generate $200 million in savings over five years. At present, the Department's information infrastructure is comprised of a complex set of duplicative and in many cases incompatible systems. Savings will be achieved through eliminating unnecessary or duplicative systems; consolidating computer, telecommunications, and information distribution operations; and reducing acquisition costs through consolidated bulk purchases. We will establish a position of Chief Information Officer who will oversee the development of an integrated information management and communications system for the Department.

Cut Support Service Contractor Costs: The Department will spend $90 million less annually on support service contracts, for a five-year savings of $460 million. At present, the Department spends close to $700 million a year on support service contractors. These short-term contractors help the Department achieve its missions without requiring long-term staffing increases. However, substantial growth in the use of support service contractors has resulted in an over-reliance on their services and excessive costs to the Department. In curbing the use of support service contractors, we will be empowering federal workers by returning to them many tasks that we have been hiring contractors to fulfill out of tradition or convenience.

3088 Principle #3: **Discard old work and privatize, eliminate, or transfer functions that can be performed better elsewhere.**

Problem: The Department of Energy was created by combining a broad range of functions from throughout the government, including several functions which now could be privatized or transferred. One example is the Naval Petroleum Reserves Program, established in the early 1900s to ensure a secure source of crude oil for the Navy. The Reserves no longer serve that purpose. Instead, they are operated today strictly as commercial ventures and thus properly belong in the private sector.

Opportunities: The President's FY1996 Budget request includes the policy decision to privatize the Naval Petroleum Reserves and parts of the Power Marketing Administrations (PMAs). By removing these type of functions from the Department, we will be able to sharpen our focus more directly on those areas that are central to our strategic plan.

Actions: Submit Legislation to Implement Administration Policy on the Power Marketing Administrations: The Administration will submit legislation this month to Congress that would implement its policy decision to: 1) establish the Bonneville Power Administration as a wholly-owned government corporation; and 2) transfer the Western Area, Southwestern and Southeastern Power Administrations to their utility customers for a sale price based on the net present value of the principal and interest payments that the Treasury presently expects to receive from each PMA in the future. Passage of this legislation would free these organizations from burdensome federal procurement and personnel rules and enable them to be more responsive to their customers. Making Bonneville an independent government-owned corporation will reduce the Department's employment by 3,350 FTEs, eliminate 1,744 contractors, and remove from the Department 25 offices. (The employees of the resulting Bonneville government-owned corporation would still be federal employees, but not within DOE; how many of the 25 offices would be retained would be determined by the corporation.) Privatizing the three PMAs mentioned above will reduce the federal workforce by approximately 1,700 FTEs, eliminate 975 contractor employees, and result in the closure of 56 DOE offices.

Submit Legislation to Privatize the Naval Petroleum Reserves: The Department will submit legislation this month to Congress that authorizes the Department of Energy to prepare a sales strategy and offer the Naval Petroleum Reserves for sale to the private sector in FY1997. Net revenue to the Treasury from enactment of this legislation and sale of the Reserves is estimated at $1.6 billion.

Submit Legislation to Detach the Federal Energy Regulatory Commission from the Department: The Department will submit legislation to Congress this month that would remove the Federal Energy

Regulatory Commission (FERC) from the Department. When the Department was formed and FERC was established "within the Department," the Nation was in the midst of an energy crisis, oil and gas price controls were in effect, and a substantial number of new laws governing energy supply and demand had been, and were being enacted. Very close coordination was required between energy policy and energy regulation.

In the 18 years since, much has changed and it no longer appears necessary to maintain FERC within the Department. Legislation that would make FERC fully independent would clarify and emphasize its status as a regulatory body and would free FERC from the tangled jurisdiction and constraints that accompany its current position in the Department. Enactment of this legislation would eliminate approximately 1,450 employees from the Department, although they would remain federal employees.

Principle #4: **Eliminate unnecessary and redundant regulations and red tape that impose excessive cost burdens on the Department's performance of its missions.**

Problem: Over the past 15 years, the Department has adopted an increasingly burdensome approach to managing its many laboratories and facilities. One example is found in the highly prescriptive and complex regulatory framework for our M&O contractors which is embodied in a large volume of departmental directives--which govern issues ranging from environment, safety, and health to business management and maintenance of classified documents. The directives system, our existing procurement system, and many other processes of the Department are mired in red tape--causing increased costs to the taxpayer for no real value.

Opportunities: Many deregulatory actions in relation to the Department's governance of its laboratories and facilities are being undertaken in the context of our response to the Task Force on Alternative Futures for the DOE National Laboratories (the Galvin Task Force). Others opportunities for cutting red tape are found in re-engineering processes such as preparing National Environmental Protection Act (NEPA) paperwork.

Actions: Streamline Burdensome Oversight of our Facilities: We will continue to aggressively implement actions that will reduce compliance costs and increase performance of our facilities and laboratories. These actions include: simplifying, reducing, and reissuing departmental directives with the goal of cutting them by 50 percent by December 1995; instituting a fundamentally new approach (called the "necessary and sufficient process") to the application of Departmental directives; simplifying and streamlining the Department's audits and appraisals of its laboratories; introducing a wholesale change in procurement practices for DOE contractors; working with the labs to remove costs from their operations as a result of simplified DOE oversight; and moving toward external regulation of our labs and facilities. The savings

from these efforts will be reported within the package of measures associated with Galvin Implementation actions. These actions are extremely relevant to the Strategic Alignment and Downsizing package because they represent process re-engineering which will enable cost reductions, enhanced responsiveness of the Department, and personnel reductions.

National Environmental Policy Act Process Reform: The Department is cutting in half--from 33 months to 15 months--the average time it takes for preparing environmental impact statements. We are achieving this goal through innovative contracting, better internal management of NEPA costs, and process improvements. These actions will result in savings of $20 million over five years.

IMPLEMENTATION

To ensure that the alignment and downsizing actions outlined in this report are completed in a timely fashion, we have established an Alignment and Downsizing Implementation Team. Chaired by Don Pearman, Associate Deputy Secretary for Field Management, this team will include several members of the Strategic Alignment team, as well as representatives from Department offices. This group will be responsible for:

1) Reviewing, coordinating, and monitoring detailed implementation plans which will be developed by affected organizations within the Department.

2) Developing an implementation plan for the FTE allocations for each Department office that will be required to meet our downsizing targets.

3) Identifying major Department policy and administrative processes which should be re-engineered for the purpose of enhancing performance, cutting costs, and achieving the FTE reduction commitments contained in this report.

4) Providing further analysis of opportunities for alignment and downsizing of the Department, including additional examination of issues identified by the Strategic Alignment team.

5) Providing regular reports to the Secretary on progress on all alignment and downsizing commitments.

CONCLUSION

The Department's missions in national security, energy, weapons site cleanup, and science and technology are extremely demanding and of great importance to the future of the Nation. Our challenge is to perform these responsibilities within a shrinking budgetary environment. This requires that we do things differently in the future than we have in the past. We must simplify and make sense out of internal processes that currently are burdensome and redundant, and we must save dollars across-the-board. The path we have charted, through the Strategic Alignment and other initiatives, is both exciting and daunting. Downsizing within the Department will be difficult and restructuring our activities will bring new anxieties to the workforce. However, this is the better way than sacrificing the Department's missions through dismantlement. Creating a government that works better and costs less is a compelling and exciting goal. We have embraced that goal and are proving that it can be done at the Department of Energy.

APPENDIX A: ALIGNMENT AND DOWNSIZING AT A GLANCE

- **Total DOE Downsizing:** Over the next five years, DOE staff will be reduced by 3,788 employees (27 percent) from our Fiscal Year 1995 target level of 13,907, resulting in five year savings of $1 billion. Sixty-seven percent of the total cuts will be accomplished in the first two years. [The base level excludes employment of the Power Marketing Administrations (5,227) and the Federal Energy Regulatory Commission (1,463).]

- **Headquarters Staff Downsizing:** Headquarters employment will be reduced by approximately 2,340 (34 percent) over the next five years, from a 1995 level of 6,850 (this number includes some staff who are duty-stationed in the field, but are reported as Headquarters personnel).

- **Field Staff Reductions:** Field office staff will be reduced by 1,450 (21 percent) over the next five years.

- **Field Office Closings and Consolidations:** We will close or consolidate 12 DOE field offices around the Nation. These include four Energy Efficiency Regional Support Offices, located in San Francisco, CA; New York, NY; Dallas, TX; and Kansas City, MO. In addition, the Denver, CO, Regional Support Office will be consolidated with the Golden, CO Field Office. The Fossil Energy Offices in Laramie, WY and Metairie, LA will be closed. The Naval Petroleum Reserves offices in Casper, WY and Bakersfield, CA will be closed with the privatization of the Reserves. Offices in Houston and Dallas, TX which support the DOE Office of General Counsel will be closed, as will a one-person policy office in Paris, France.

- **Overhead Cost Reductions:** Overhead costs will be cut through many initiatives, including: 1) Travel costs will be cut by $175 million over five years, from a current base of $400 million annually (75 percent of which is contractor travel); 2) More than $75 million in revenues and reduced overhead will be secured over five years through the sale of excess inventories of precious metals, non-precious metals, and rare gases that were needed during the Cold War for the weapons production complex, but can be sold today; 3) Headquarters offices will be consolidated from 16 to 4.

- **Office Alignment and Restructuring:** The Department's various energy offices will be restructured into a new energy cluster, with matrixed staffing. We will establish a new Administrative Services Center to provide personnel, procurement, and administrative services. Six headquarters organizations that deal with emergency management will be consolidated into one office. Most programs in the Department will be aligned and downsized to remove redundancies.

- **Legislative Package:** Legislation will be submitted to Congress to: 1) establish the Bonneville Power Administration as a wholly-owned government corporation; 2) privatize the Western Area, Southwestern and Southeastern Power Administrations; 3) privatize the Naval Petroleum and Oil Shale Reserves; and 4) make the Federal Energy Regulatory Commission fully independent from the Department. Enactment of these measures will result in $5.3 billion in deficit reduction.

Department of Energy
Strategic Alignment
May 3, 1995

($ in thousands) (FY96 - FY2000)	$ Savings by Year					
	1996	1997	1998	1999	2000	Total
Consolidate Headquarters Space	0	3,349	4,549	4,876	5,207	17,981
Alignment - Headquarters Administration	12,880	18,740	25,055	26,105	26,505	109,285
Alignment - Headquarters Program Offices	38,594	41,568	49,475	49,475	49,475	228,587
Reduce Headquarters Support Service Contractors	52,823	55,466	62,466	68,466	70,306	309,525
Integrate Information Management	40,000	40,000	40,000	40,000	40,000	200,000
Reengineer Headquarters	0	41,210	58,500	70,200	78,000	247,910
HEADQUARTERS & PROGRAM TOTAL	144,297	200,333	240,045	259,122	269,493	1,113,288
Field Offices	68,626	95,291	105,064	109,679	124,239	502,899
TOTAL	212,923	295,624	345,109	368,801	393,732	1,616,187
Travel Savings	35,000	35,000	35,000	35,000	35,000	175,000
Asset Sales Savings	15,000	15,000	15,000	15,000	15,000	75,000
National Environmental Policy Act Savings	4,000	4,000	4,000	4,000	4,000	20,000
Additional Alignment Savings	10,000	10,000	10,000	10,000	10,000	50,000
Less Retraining, Outplacement and Buyout Costs	(69,367)	(31,167)	(36,672)	(14,448)	(13,886)	(165,540)
TOTAL ALIGNMENT SAVINGS	207,556	328,456	372,436	418,352	443,846	1,770,847

DOE PA-01

-6905

Department of Energy
Strategic Alignment
May 3, 1995

($ in thousands) (FY96 - FY2000)	1995 Base	1996	1997	1998	1999	2000	Total
	Employment Reductions by Year						
Consolidate Headquarters Space							
Alignment - Headquarters Administration		192	84	91	10	0	377
Alignment - Headquarters Program Offices		594	46	122	0	0	761
Reduce Headquarters Support Service Contractors							
Integrate Information Management							
Reengineer Headquarters		0	634	266	180	120	1,200
HEADQUARTERS & PROGRAM TOTAL	6,851	786	764	479	190	120	2,338
Field Offices	7,047	594	410	150	71	224	1,450
TOTAL	13,898	1,380	1,174	629	261	344	3,788
Travel Savings							
Asset Sales Savings							
National Environmental Policy Act Savings							
Additional Alignment Savings							
Less Retraining, Outplacement and Buyout Costs							
TOTAL ALIGNMENT SAVINGS	13,898	1,380	1,174	629	261	344	3,788

000033

DOE PA-01

APPENDIX C: REFORM SAMPLER

Better Environmental Screening Through Streamlining: The Chicago Operations Office worked with the Department's Argonne National Laboratory to improve processes for implementing the National Environmental Policy Act (NEPA). The process--crucial for identifying potential environmental problems--was time consuming and manpower intensive: 70 steps among 10 organizations meant a 100-day-plus approval cycle. Each environmental assessment--an analysis that determines whether a more comprehensive Environmental Impact Statement is required--was taking a year and a half, or more, to complete.

The new process--a result of analysis, stakeholder feedback, and consensus on common goals and procedures--has been a major success. The cycle time for completing environmental assessments has dropped from 100 days to 10 days, at most. A 24-step process was reduced to seven. Environmental assessments now require a few months, not years. The overall result: better, faster and more effective decision making.

Privatization Test Yields $140 Million: At the Savannah River Site, privatization has yielded significant savings and improved services. Working with the site contractor--Westinghouse Savannah River Company--three areas were targeted for privatization:

- The contaminated laundry services operation is now contracted off-site for a capital cost savings of $13 million. In addition, the private supplier is building a new facility in the area, creating new local jobs.
- Sludge treatment was privatized for a cost savings of nearly $24 million.
- The effort created the largest, single fixed-price subcontract for hauling on-site-generated sanitary waste, saving $103 million in construction and operating costs.

Based on these successes, DOE is exploring where similar programs can be applied elsewhere in its complex of laboratories and facilities.

Interactive Video and CD-ROM Cut Costs by 90 Percent: DOE staff from eight sites frequently traveled to a central location in Albuquerque, NM, for needed training in such areas as nuclear materials control. Travel, per diem and lost work time drove costs-per-employee as high as $900. In response, the Department introduced interactive video learning via satellite and replaced a 32-hour classroom course with an interactive CD-ROM course.

The initiative has driven down costs by a factor of 10--to $90 per student for the interactive video class. In addition, less time is taken from work schedules, and more students can take advantage of training opportunities. Because students can learn at their own speed, the CD-ROM has lead to faster course completion and better retention of information.

These are only three examples of how fundamental re-examination of our work is leading to bottom line cost savings and improved services. Many more examples could be shared from throughout the Department.

-6905

DOE/EM-0232

Volume I
March 1995

Estimating the Cold War Mortgage

The 1995 Baseline Environmental Management Report

U.S. Department of Energy
Office of Environmental Management

Printed with soy ink on recycled paper

000035

At a Glance: The 1995 Baseline Environmental Management Report

RESULTS
"Base-Case"

$230 Billion over a 75-year period

- Waste Management – 49%
- Environmental Restoration – 28%
- Nuclear Material and Facility Stabilization – 10%
- Technology Development – 5%
- Other – 8%

Top 5 Sites - 70% of costs

- Hanford Site – 21%
- Savannah River Site – 21%
- Rocky Flats Site – 10%
- Oak Ridge Reservation – 10%
- Idaho Laboratory – 8%

ASSUMES:

- Significant productivity increases
- Meeting current compliance requirements
- Use of existing technologies

Development of most assumptions occurred at field locations (e.g., degree of cleanup)

EXCLUDED:

- Cleanup where no feasible cleanup technology exists (e.g., Nuclear explosion sites, most contaminated groundwater)
- Cleanup of currently active facilities (e.g., Pantex, Labs)
- Naval Nuclear Propulsion facilities cleanups handled by U.S. Navy.
- Activities during first 5 years of program ($23 billion)

ALTERNATIVE CASES evaluated the effect of:

- Landuse: biggest potential cost impact
- New Technologies
- Waste Management Facilities configuration
- Funding & Schedule
- Residual Risk: inadequate data limited analysis

WHAT DID WE LEARN?

- Total projected environmental costs are comparable to total U.S. nuclear weapons production costs.
- Projected future land use will dramatically affect costs.
- Significant ($24 billion) projected costs to support ongoing programs could be substantially reduced through greater pollution prevention.
- Development of new technologies will reduce certain cleanup costs and make possible other cleanups that are currently infeasible.
- Minimum action to stabilize sites - $170 billion.

ESTIMATES, NOT DECISIONS

- The estimated costs do not reflect final Departmental decisions in many cases. The report is intended to provide a framework for constructive local and national debate about the future of the environmental management program.
- Projected costs significantly exceed current budget targets. Bridging this gap will require renegotiating compliance agreements and some statutory changes, in addition to planned productivity improvements.

For further information, please contact the Center for Environmental Management Information (1-800-736-3282)

Executive Summary

This is the first annual report on the activities and potential costs required to address the waste, contamination, and surplus nuclear facilities that are the responsibility of the Department of Energy's Environmental Management program. The Department's Office of Environmental Management, established in 1989, manages one of the largest environmental programs in the world—with more than 130 sites and facilities in over 30 States and territories. The primary focus of the program is to reduce health and safety risks from radioactive waste and contamination resulting from the production, development, and testing of nuclear weapons. The program also is responsible for the environmental legacy from, and ongoing waste management for, nuclear energy research and development, and basic science research. In an attempt to better oversee this effort, Congress required the Secretary of Energy to submit a Baseline Environmental Management Report with annual updates.

The 1995 Baseline Environmental Management Report provides life-cycle cost estimates, tentative schedules, and projected activities necessary to complete the Environmental Management program.

The 1995 Baseline Environmental Management Report (Baseline Report) provides life-cycle cost estimates, tentative schedules, and projected activities necessary to complete the Environmental Management program. In doing so, it represents the Department's most comprehensive effort to date to develop a clearer picture of the "Cold War Mortgage."

The Cold War Mortgage

During World War II and the Cold War, the United States developed a vast network of industrial facilities for the research, production, and testing of nuclear weapons, known as the "nuclear weapons complex." It includes thousands of large industrial structures such as nuclear reactors, chemical processing buildings, metal machining plants, and maintenance facilities. During the last 50 years, this enterprise manufactured tens of thousands of nuclear warheads and detonated more than a thousand. The Department of Energy, the Federal agency responsible for managing the nuclear weapons complex, manages more than 120 million square feet of buildings and 2.3 million acres of land—an area larger than Delaware, Rhode Island, and the District of Columbia combined.

In addition to creating an arsenal of nuclear weapons, the complex left an unprecedented environmental legacy. Because of the priority on weapons production, the treatment and storage of radioactive and chemical waste was handled in a way that led to contamination of soil, surface water, and ground water and an enormous backlog of waste and dangerous materials. As a result of revelations by the news media and various organizations, as well as studies conducted by the Department of Energy during the last 10 years, this legacy has become increasingly well-known. However, part of the purpose of this report is to establish a more disciplined inventory of the problems and the potential liabilities so it can be used as a management tool.

The cost of dealing with these problems can be considered a "Cold War Mortgage." Much of these costs were deferred during the nuclear arms race. Paying the mortgage will take decades and substantial resources comparable to the level of effort expended for the nuclear weapons production and research activities.

000038

The Environmental Management Program

The Office of Environmental Management was created in 1989 to help address the environmental legacy of nuclear weapons production and other sources such as nuclear research programs.

Activities that encompass the Environmental Management program include: (1) environmental restoration; (2) waste management; (3) nuclear material and facility stabilization; and (4) technology development. Landlord functions (e.g., fire-fighting response, road maintenance, utilities) represent a fifth area, which includes cross-cutting support activities.

These activities are often simplified as "cleanup," but it is clear they involve a lot more than cleanup. Moreover, these activities are not only interrelated (e.g., facilities must be stabilized before they can be decontaminated, and waste must be managed after it is generated as a result of restoration work), but they are also inextricably related to the functions of the Department of Energy and other Federal agencies. For example, the Environmental Management program provides waste management services to the facilities that continue to operate and maintain the nuclear weapons stockpile such as the Los Alamos National Laboratory, the Savannah River Site, and the Kansas City Plant. Additionally, the spent nuclear fuel generated from U.S. Navy vessels is handled by the Environmental Management program.

In addition to these defense support functions, the Environmental Management program supports the variety of basic and applied scientific research facilities operated by the Department of Energy, including Brookhaven National Laboratory, and Fermi National Accelerator Laboratory.

Although most Environmental Management program work involves dealing with the legacy of contamination and the backlog of accumulated wastes, a significant amount involves handling newly generated waste from these programs—all while protecting worker health and safety. This report covers this broad span of Environmental Management program activities. Additional detail regarding these activities is provided in Chapter 2.

What Does the Nation Want to Buy?

The future course of the Environmental Management program will depend on a number of fundamental technical and policy choices, many of which have not yet been made. Ultimately, these decisions will be made on the basis of fulfilling congressional mandates, regulatory direction, and adequate stakeholder input. The cost and environmental implications of alternative choices can be profound. For example, many contaminated sites and facilities could be restored to a pristine condition, suitable for any desired use; they also could be restored to a point where they pose no near-term health risks to surrounding communities but are essentially surrounded by fences and left in place. Achieving pristine conditions would have a higher cost, but may or may not warrant the economic costs and potential ecosystem disruption or be legally required. Resolving such issues will depend on what the Nation wants to buy.

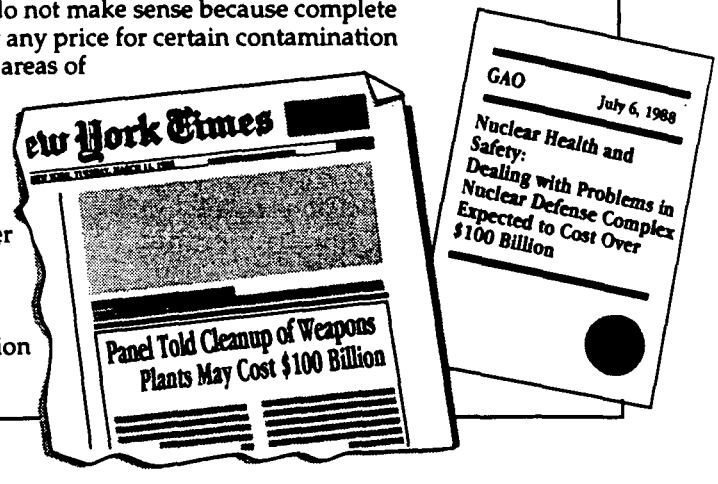
Other key questions that affect the cost of the program include the following:

- What level of residual contamination should be allowed after cleanup?
- Should projects to reduce maintenance costs (i.e., high storage costs pending ultimate disposition of materials) be given priority over certain low-risk cleanup activities? In other words, how should cost affect priorities?
- Should cleanup and waste management proceed with existing technologies or is it

Previous Cost Estimates

The Federal Government last estimated the total cost of environmental liabilities at Department of Energy facilities in 1988 before the end of the Cold War, when the renovation and indefinite operation of the existing nuclear weapons complex was being planned. These cost estimates primarily assessed what was needed to bring installations into compliance with environmental regulations to allow continued weapons production. For example, estimates focused on permitting installations and operation of air and water monitoring systems with limited short-term corrective action at active sites. Little emphasis was placed on more expensive activities such as remedial action at inactive sites. Most estimates ranged from $100 to $300 billion for total program cost. Even higher estimates were produced by speculative extrapolation without the benefit of the type of field data on which this report is based.

The Baseline Report is substantially different – both the results and the methodology – from past estimates for a number of reasons. First, the Base Case estimate in this report is based on a "bottom up" approach using large amounts of data and assumptions collected from field offices, rather than centralized estimating processes, which were used in previous estimates. This method resulted in more realistic land-use assumptions and, consequently, substantially lower costs than previous cost estimates. Second, this report does not attempt to provide cost estimates for cleanup activities that are not technically feasible using existing technologies. Such costs, which were included in some previous estimates, do not make sense because complete cleanup using existing technologies cannot be attained at any price for certain contamination situations such as nuclear weapons test residues or large areas of contaminated ground water and river system sediments. Third, the activities for which estimates are provided in this report reflect the Department's significantly reduced nuclear weapons production requirements. Finally, the Baseline Report also reflects a greater understanding of the nature and extent of contamination, as well as broader program support responsibilities than assumed for previous estimates. As a result of these differences, this Baseline Report is not comparable in scope and is substantially improved in the level of detail and integration over past estimates.



prudent, in some cases, to wait for the development of improved technologies? What criteria should guide decisions on this issue?

- Should waste treatment, storage, and disposal activities be carried out in decentralized, regional, or centralized facilities? How are issues of equity among states factored into configuration decisions?

The most cost-effective way to resolve these issues is to engage in a broad debate to assess the costs, risks, and other public trade-offs associated with different approaches. The 1995 Baseline Report lays the foundation for this constructive discussion. It describes where the Environmental Management program is headed, according to current assumptions, and illustrates potential impacts if these assumptions vary.

Estimating Costs in the Face of Large Uncertainties

Estimating the cost of future activities requires making assumptions about what those activities will be and is inherently uncertain. The uncertainty stems from:

- lack of characterization of the problems. For example, of the 10,500 hazardous substance release sites addressed in this report, only one-fourth have been fully characterized.
- lack of knowledge about what remedies will be effective or considered acceptable to regulators and the public, or what level of human health and environmental protection is sought through these remedies.

The Baseline Report Is Not a Budget Document

The purpose of the Baseline Report is to provide a total long-term (life-cycle) cost estimate for the Environmental Management program. The Baseline Report is not intended to be a budget document, and none of the estimates given in the document should be interpreted as Federal budget requests.

Furthermore, the schedule of activities presented in the Baseline Report should not be interpreted as establishing specific long-term priorities or construed as a definitive basis for planning specific projects. Too many decisions that will affect the strategic long-term goals for the program are yet to be made. The issues underlying these decisions, such as future land use, funding availability, and acceptable levels of residual contamination, will be resolved over several years in conjunction with broad public discussion. Fostering and informing this discussion is a key purpose of this analysis.

- lack of fundamental economic, social, and defense related decisions that affect the future use of land and facilities. For example, policy decisions related to the role of sites for nuclear nonproliferation and defense readiness will define the future mission for the Department's nuclear weapons complex. These policy decisions will affect the continued operations of some installations, including future land-use options and the final disposition of nuclear materials.
- lack of technical remedies for the problems. The contamination of soils deep underground from nuclear tests in Nevada is one such case. The costs to remediate these types of sites were excluded from the cost estimate, not because of a departmental policy to ignore such problems, but because no effective remediation technology currently exists.
- lack of defined program duration. The length of the program—approximately 75 years—is sufficient to introduce a variety of uncertainties into any cost and schedule estimate.

Despite these uncertainties, there is an important advantage in attempting to estimate costs before all this information is available or these decisions have been made: the cost consequences of different technical and policy options can be explicitly analyzed and debated to make wise decisions in an open manner. Hence, this first baseline analysis serves as a benchmark to gauge future progress in defining, as well as solving, the problems. In addition to better facilitating program management, this is exactly the value of this study.

The Department expects assumptions about the program and the resulting cost-and-schedule estimates to change in future Baseline Reports as new information becomes available, and ongoing decisionmaking processes evolve, thereby reducing uncertainty.

Approach Used For Estimating Costs and Schedules

The Department used two methods for estimating costs in this report: the "Base Case" and "Alternative Cases." The Base Case was used to represent current views of the most likely set of activities. Because many assumptions are preliminary (i.e., they were made to estimate costs for activities that will happen decades from now) and will undoubtedly change in many cases, alternative cases are presented.

Estimates of Base Case costs and schedules provided in the Baseline Report are based largely on site-specific assumptions regarding future land use; treatment, storage, and disposal facility needs; and the technologies to be used at the site. These assumptions were developed at individual sites and reflect specific regulatory requirements and site-specific planning efforts.

Alternative case cost and schedule estimates were developed by Department of Energy

Headquarters to show the potential cost impacts of changing assumptions in four key areas: future land use, program funding and scheduling, technology development, and waste management configurations.

Base Case Assumptions

Because the Baseline Report uses currently available information, the Base Case estimates reflect a broad range of assumptions. These assumptions reflect potential decisions regarding the scope and pace of the Environmental Management program.

In addition, the Department excluded projects with no current feasible remediation approach from this year's Baseline Report scope. These projects include large contaminated river systems like the Columbia, Clinch and Savannah rivers and the Nevada Test Site's underground weapons test area. The cost estimate would obviously be higher if some remediation were assumed for these areas for which complete cleanup is not technically feasible with existing technologies. However, because no effective remedial technology could be identified, no basis for estimating cost was available. A more detailed description of the Base Case is provided in Chapter 3.

Note: Volume II provides summary assumptions and results for each site as well as site personnel contacts for additional details.

Environmental Restoration

Usually described as "cleanup," environmental restoration encompasses a wide range of activities such as stabilizing contaminated soil; treating ground water; decontaminating and decommissioning nuclear reactors and process buildings, including chemical separation plants; and exhuming buried waste.

The Base Case estimate for environmental restoration was developed by compiling data from approximately 10,500 "release sites," grouped into 614 subprojects or "operable units."

The assumptions used in developing the Base Case were virtually all developed at the particular site or field office, usually in consultation with regulatory officials.

Although each site generally used its own assumptions for developing the Base Case estimate, several fundamental assumptions were used by all sites. These general assumptions include the following:

- use of existing technologies;
- compliance with existing or reasonably anticipated regulatory/negotiated agreements or Energy Department Orders; and
- remedies considered technically and environmentally reasonable and achievable by local project managers and appropriate regulatory authorities.

To the extent that restricted future land use was assumed by field offices to estimate costs, it reflects current or anticipated agreements with regulators and /or stakeholders, or interim determinations based on what remediation goal is achievable using existing technologies. The Administration has proposed legislative changes to the Superfund law to allow such considerations to be used in selecting remedies to a greater extent. In some cases, the cost estimates reflect projected remedial actions that assume these changes to the law because unrestricted future land use was not reasonably achievable using existing technologies. The particular assumptions used varied among sites because of the "bottom up" method used for estimating Base Case costs in this report.

Waste Management

The Department is responsible for storing, treating, and disposing of an extraordinary array of wastes and spent nuclear fuel. These wastes include a variety of physical forms (e.g., solids, liquids, and sludges); chemical types (i.e., solvents, metals, and salts); and sources (e.g., high–level waste from reprocessing, spent nuclear fuel from production reactors, and naval reactors); transuranic waste from

000042

Key Waste Management Assumptions

High-Level Waste

- Continue storage in tanks at Hanford, Savannah River Site, West Valley Demonstration Project, and in calcine bins at Idaho National Engineering Laboratory.
- Vitrify and dispose of all high level wastes in geologic repository (available beginning in 2015).

Spent Nuclear Fuel

- Continue storage at 10 sites with costs for new wet and dry storage facilities estimated.
- No reprocessing.
- Dispose in geologic repository.

Transuranic Waste

- Continue storage at 10 sites.
- Treat as necessary to meet disposal criteria at the Waste Isolation Pilot Plant (starting in 1998).

Low-Level and Low-Level Mixed Waste

- Storage until treatment at 34 sites to meet minimum disposal requirements.
- Disposal at Hanford, Idaho National Engineering Laboratory, Los Alamos National Laboratory, Nevada Test Site, Oak Ridge Reservation, and Savannah River Site.
- Western sites using shallow land disposal and eastern sites using engineered disposal techniques.

plutonium operations; and low-level waste, which includes virtually everything else that is radioactive waste.

Most of the wastes included in the Baseline Report were generated during the production of nuclear weapons during the Cold War. Smaller amounts of the existing waste legacy resulted from various nuclear and other research projects. In the future, the Department expects that the quantities of waste from these sources will decrease as pollution prevention efforts become more effective, and nuclear weapons production activity decreases, and that a new source of waste will become increasingly important: secondary waste generated as a result of environmental restoration and nuclear material and facility stabilization.

Costs for waste management cover all life-cycle phases from planning through decommissioning. The Base Case reflects site-specific planning assumptions, which may include the use of commercial facilities (e.g., hazardous waste treatment and disposal). Costs were compiled from existing program cost estimates for high-level waste and spent nuclear fuel and from standardized calculations designed to estimate treatment, storage, and disposal costs based on predicted waste throughput for transuranic, low-level, low-level mixed, and hazardous wastes.

Nuclear Material and Facility Stabilization

With the end of the Cold War, production of most nuclear weapons materials has been indefinitely halted. Consequently, many Department of Energy facilities are not needed for their previous missions. Before "cleanup" can safely occur at many sites, however, the facilities and the nuclear material they contain must be stabilized. Stabilization entails removal of stored raw materials, stored finished products, and in-process materials at production facilities, which were simply turned off. Because of the urgent risks associated with these dangerous materials, this work is one of the highest priorities for the Environmental Management program. Also, the cost of maintaining facilities before stabilization is usually significantly higher than after it is completed.

The Base Case estimate for nuclear material and facility stabilization activities was built on cost estimates for stabilizing 22 different types of facilities as well as the costs for maintaining them before and after stabilization. In this way, the source of the Base Case estimates is somewhat different than that for waste management and environmental restoration

activities. Because of limited data and experience, nuclear material and facility stabilization Base Case estimates are largely extrapolated from available data regarding the 22 categories of facilities for the number of facilities known to exist in each category.

The strategy for the Environmental Management program is to address urgent risks first and then pace the subsequent final cleanup with the availability of effective technologies, funding, and legal requirements. To implement this strategy, the Department recently completed an inventory of surplus "assets" (i.e., buildings, reactors, structures, etc.); identified high risks among them; and began transferring management responsibility and performing stabilization work. The Base Case estimates assume that:

- 3,500 contaminated facilities are being transferred from other Department of Energy programs to the responsibility of the Environmental Management program;
- these facilities will require 10 years of surveillance and maintenance, followed by 5 years of stabilization activities and 2 years of post-deactivation surveillance and maintenance before final decontamination or disposition;
- most nuclear material and facility stabilization activities will occur in later years because these activities are not typically driven by legal requirements (a reevaluation of this sequence may be warranted based on results of the risk report to be completed in June 1995 and renegotiation of compliance agreements with regulators); and
- surplus plutonium scraps and residues must be stabilized, safeguarded, and dispositioned. The Environmental Management program currently is responsible for approximately 26 metric tons of plutonium in these various forms. The Department currently is involved in a process to decide on the future disposition of surplus plutonium and what quantities of plutonium will be considered surplus.

Technology Development

The Environmental Management program manages a national program of applied research, development, demonstration, testing, and evaluation of technologies. These technologies support environmental restoration, nuclear material and facility stabilization, and waste management. Examples of savings from specific technologies are discussed in Chapter 5 of the report.

Landlord

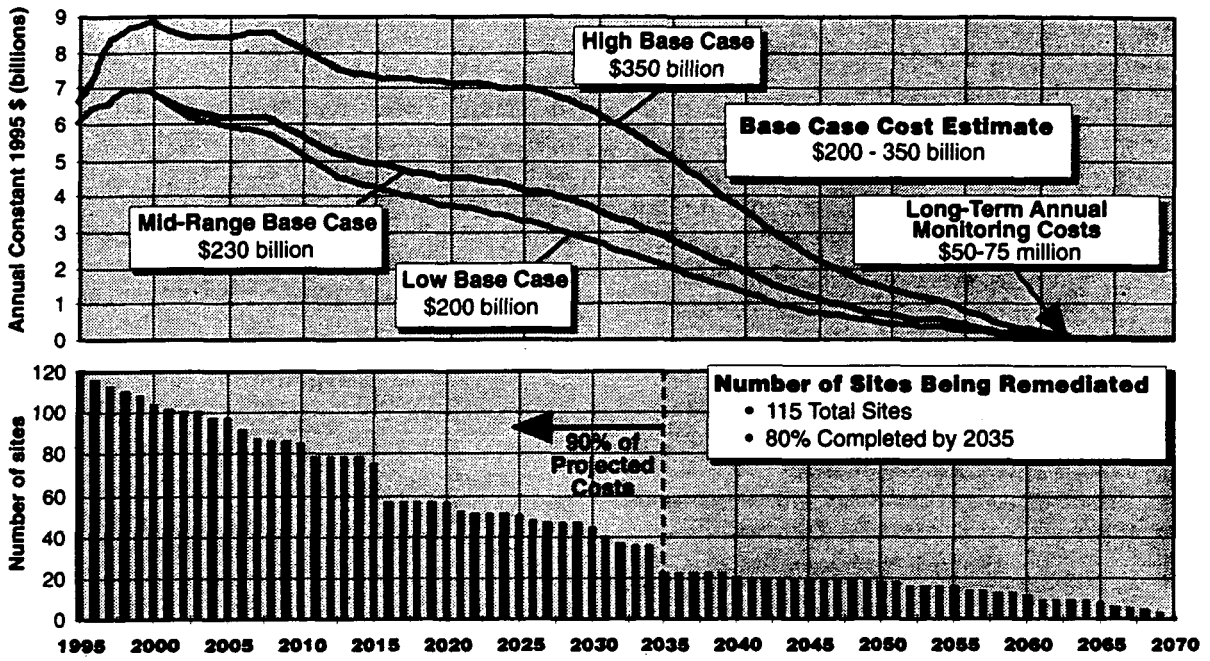
Landlord activities include such services as safeguards and security, transportation, property management, and emergency preparedness (e.g., fire and medical response). The Base Case includes costs for landlord activities at the 10 installations where the Office of Environmental Management has landlord responsibility.

Results

The Base Case cost estimate begins in 1995 and ends in approximately 2070, when environmental management activities are projected to be substantially completed. The estimate does not include costs expended since the program's formal inception in October 1989—about $23 billion–or costs incurred before 1989. Nor does it include costs beyond 2070 for long-term surveillance and maintenance, which are estimated at about $50-75 million per year. These costs are assumed to continue indefinitely after a disposal site or restricted access area is closed.

Under the Base Case, the life-cycle cost estimate for the Department of Energy's Environmental Management program ranges from $200 to $350 billion in constant 1995 dollars, with a mid-range estimate of $230 billion. Figure 1 graphically depicts the life-cycle cost profiles. This includes not only the $172 billion for dealing with the nuclear weapons complex legacy, but $24 billion for future wastes from nuclear weapons activities, and $34 billion for

Figure 1. Base Case Cost and Schedule Estimate



past and future wastes from other activities. The projected costs for treatment, storage, and disposal of waste generated by ongoing defense and research activities is $19 billion. The significant projected cost for support for future ongoing programs indicates the value of vigorous pollution prevention efforts to reduce these costs and threats.

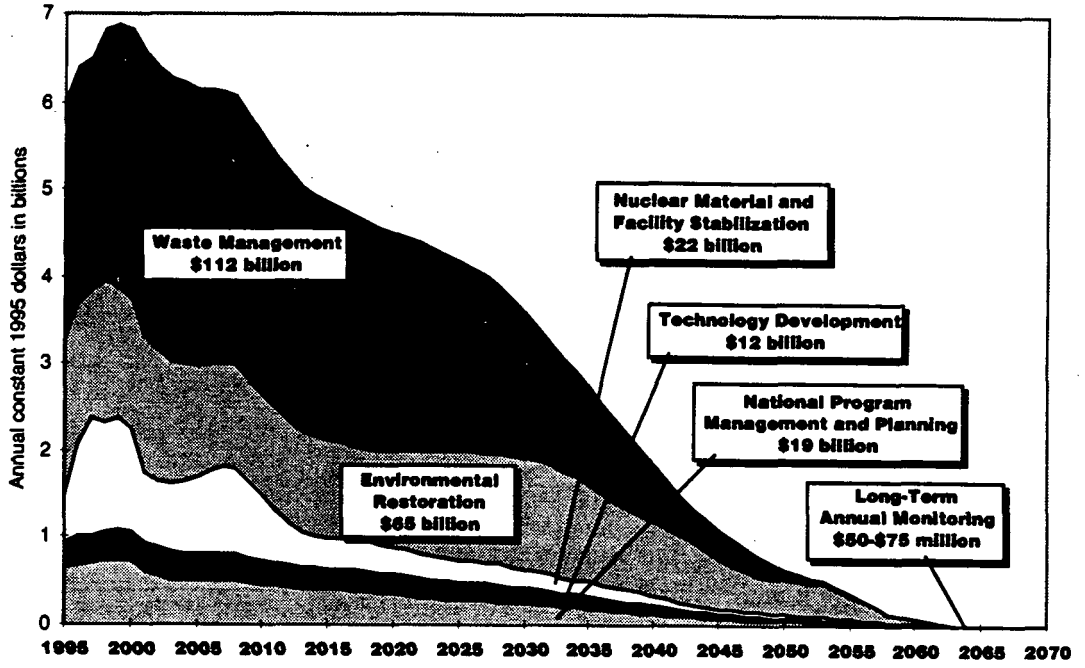
The range of the cost estimate varies depending on the assumed level of productivity over the life of the program as described below.

- The mid-range total program estimate of $230 billion reflects a planned 20-percent increase in productivity and efficiency over the next 5 years, plus an annual 1-percent productivity improvement over the remaining life of the program.
- The low-end estimate of $200 billion reflects a more aggressive efficiency and productivity improvement program—20-percent for the next 5 years as in the mid-range total estimate, and subsequent annual improvements of nearly 2 percent (a number commonly used by the private sector in today's business climate).
- The high-end estimate of $350 billion reflects costs if current levels of inefficiency and productivity were sustained over the program's life.

These levels of efficiency improvement are not only needed and planned, they are attainable. The Environmental Management program already has achieved significant improvements in efficiency and productivity. From FY 1994 to FY 1996, the program will have saved more than $2.1 billion through greater productivity.

Although the total life-cycle estimate is derived from a 75-year program duration, more than 90 percent of the life-cycle cost estimate reflects activities projected to occur during the next 40 years. The remaining costs are primarily for the operation of large waste treatment facilities at a limited number of sites. In 2070, given the Base Case assumptions, access will be restricted at the large, isolated Department of Energy sites with existing burial grounds. These sites

Figure 2. Mid-Range Base Case Cost Profile for Major Elements of the Environmental Management Program



include certain sections of the Hanford Site, Idaho National Engineering Laboratory, Savannah River Site, Nevada Test Site, Oak Ridge, Los Alamos National Laboratory, and the Waste Isolation Pilot Plant. At smaller Department of Energy sites, such as the Mound Site in Ohio or the Pinellas Plant in Florida, where contamination has been contained in place, future use is expected to be limited to industrial purposes.

Small non-Department sites or sites near heavily populated areas or water sources are assumed to be released for residential or industrial use. Examples include the General Atomics Site at La Jolla, California, and Battelle Columbus Laboratories in Columbus, Ohio.

Figure 2 shows cost estimates for the Environmental Management program under the mid-range Base Case estimate. The cost estimate is divided among the five major elements of the program: waste management, environmental restoration, nuclear material and facility stabilization, program management, and technology development.

The Administration's Budget and the 1995 Baseline Report

The Administration has established budget targets for the next 5 years that reflect the allocation of resources among competing national priorities, including lower taxes and deficit reduction. These targets move the Environmental Management program from $6.6 billion in FY 1996 to $5.5 billion in FY 2000 in current dollars. This equates to a target of $4.8 billion in constant 1995 dollars in FY 2000. For purposes of this comparison, this target was assumed to remain unchanged over the life of the Environmental Management program.

A shortfall remains between the Base Case cost estimate (the estimated costs of meeting the Department's compliance agreements) and the FY 1996 funding request and outyear targets. For the high Base Case estimate of $350 billion, this shortfall would be about $100 billion over the next 40 years.

For the mid-range estimate of $230 billion, the savings of about $8 billion from the assumed 20-percent productivity improvement over the next 5 years begins to bridge this gap. Even with these savings, however, a shortfall remains of about $7 billion through FY 2000. The total projected shortfall for the mid-range cost estimate is $24 billion until 2015, at which point the projected budget target would match the projected needs. Figure 3 compares the Baseline Report cost estimate and the administration's FY 1996 budget and outyear projections.

The Department is addressing this shortfall in several ways. First, it has reduced the cost of doing business by streamlining the contractor workforce and negotiating and recompeting contracts. Second, the Department is renegotiating compliance agreements for various sites and installations, many of which were crafted during a different budget climate. In addition, the Administration has proposed legislative improvements to Superfund to make it work better and cost less. These changes would include greater opportunities to consider future land use in remedy selection and potential risks to workers.

Base Case Estimate by State and Site

Further examination of projected costs by State and site shows where the mid-range Base Case would be incurred (see Table 1):

- Washington, South Carolina, Tennessee, Colorado, and Idaho account for $170 billion over the life of the Environmental Management program (71 percent).
- The most costly sites are the Hanford Site (Washington); the Savannah River Site (South Carolina); the Rocky Flats Environmental Technology Site (Colorado); the K-25 Site, the Y-12 Plant, and the Oak Ridge National Laboratory (Tennessee); and the Idaho National Engineering Laboratory.

Figure 3. Comparison between the Base Case Report Cost Estimates and the Administration's Budget Projection

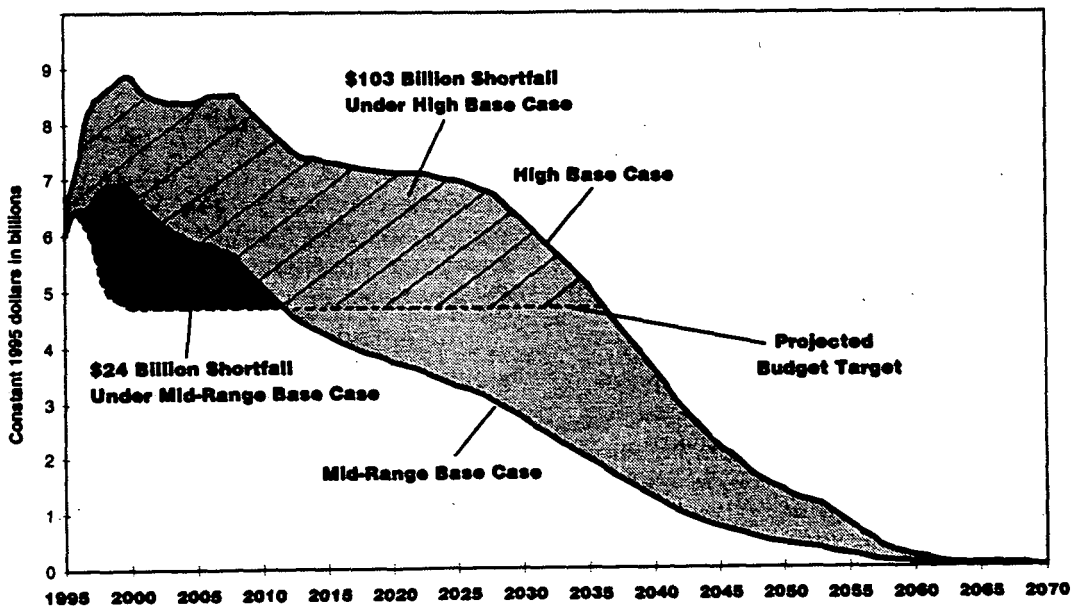


Table 1. Mid-Range Base Case Estimated by State and Site

Site	Mid-Range Base Case Cost (Constant 1996 $ in Millions)	Percentage of Total Mid-Range Base Case Cost
Alaska	***2***	***<1%***
Nevada Offsite* - Alaska	2	<.01%
Arizona	***139***	***<1%***
Completed UMTRA S&M** - Arizona	139	0.06%
California	***2,273***	***0.98%***
Energy Technology Engineering Center	249	0.11%
General Atomics	12	0.01%
General Electric Vallecitos Nuclear Center	18	0.01%
Geothermal Test Faciity	6	<.01%
Laboratory for Energy Related Health Research	34	0.01%
Lawrence Berkeley Laboratory	208	0.09%
Lawrence Livermore National Laboratory	1,521	0.66%
Oxnard	13	0.01%
Sandia National Laboratories - Livermore	92	0.04%
Stanford Linear Accelerator Center	119	0.05%
Colorado	***23,254***	***10.10%***
Completed UMTRA S&M - Colorado	7	<.01%
Grand Junction Project Office Site	707	0.31%
Gunnison	<14	0.01%
Maybell	23	0.01%
Naturita	26	0.01%
Rifle	34	0.01%
Rocky Flats Environmental Technology Site	22,455	9.74%
Nevada Offsite - Colorado	3	<.01%
Slick Rock	25	0.01%
Connecticut	***3***	***<.01%***
FUSRAP*** - Connecticut	3	<.01%
Florida	***188***	***<1%***
Pinellas Plant	188	0.08%
Idaho	***18,658***	***8.09%***
Argonne National Laboratory - West	229	0.10%
Completed UMTRA S&M - Idaho	<1	<.01%
Idaho National Engineering Laboratory	18,430	7.99%
Illinois	***512***	***<1%***
Argonne National Laboratory - East	527	0.23%
Fermi National Accelerator Laboratory	76	0.03%
FUSRAP - Illinois	1	<.01%
Site A/Plot M	8	<.01%
Iowa	***12***	***<1%***
Ames Laboratory	12	0.01%
Kentucky	***3,380***	***1.47%***
Maxey Flats	22	0.01%
Paducah Gaseous Diffusion Plant	3,358	1.46%
Maryland/District of Columbia	***30,143***	***13.07***
FUSRAP - Maryland	7	<.01%
Environmental Management Headquarters****	30,136	13.07%
Massachusetts	***14***	***<1%***
FUSRAP - Massachusetts	14	0.01%
Michigan	***1***	***<1%***
FUSRAP - Michigan	1	<.01%
Mississippi	***3***	***<1%***
Nevada Offsite - Mississippi	3	<.01%
Missouri	***1,074***	***0.47%***
FUSRAP - Missouri	388	0.17%
Kansas City Plant	312	0.14%
Weldon Spring Site Remedial Action Project	373	0.16%

*Nevada Offsite are locations where nuclear detonations occurred and environmental management activities are managed by the Nevada Operations Office.

** UMTRA S&M is the acronym for Uranium Mill Tailings Remedial Action projects with long-term Surveillance and Maintenance activities.

***FUSRAP is the acronym for the Formerly Utilized Sites Remedial Action Program.

****Approximately 71 percent of these costs are distributed across Environmental Management sites.

Table 1. Mid-Range Base Case Estimated by State and Site (continued)

Site	Mid-Range Base Case Cost (Constant 1995 $ in Millions)	Percentage of Total Mid-Range Base Case Cost
Nebraska	***<1***	***<1%***
Hallam Nuclear Power Plant	<1	<.01%
Nevada	***2,472***	***1.07%***
Nevada Test Site	2,443	1.06%
Nevada Offsite - Nevada	29	0.01%
New Jersey	***440***	***<1%***
FUSRAP - New Jersey	322	0.14%
Princeton Plasma Physics Laboratory	118	0.05%
New Mexico	***9,847***	***4.18%***
Albuquerque Operations Office	450	0.20%
Ambrosia Lake	<1	<.01%
Completed UMTRA S&M - New Mexico	3	<.01%
Inhalation Toxicology Research Institute	19	0.01%
Los Alamos National Laboratory	3,304	1.43%
Nevada Offsite - New Mexico	10	<.01%
Sandia National Laboratories - New Mexico	890	0.39%
South Valley Site	19	0.01%
Waste Isolation Pilot Plant	4,948	2.15*
New York	***4,003***	***1.74%***
Brookhaven National Laboratory	460	0.20%
FUSRAP - New York	273	0.12%
Separations Process Research Unit	112	0.05%
West Valley Demonstration Project	3,157	1.37%
North Dakota	***22***	***<1%***
Belfield/Bowman	22	0.01%
Ohio	***11,743***	***5.09%***
Battelle Columbus Laboratories	110	0.05%
Fernald Environmental Management Project	4,186	1.82%
FUSRAP - Ohio	197	0.09%
Mound Plant	1,539	0.67%
Piqua Nuclear Power Plant	<1	<.01%
Portsmouth Gaseous Diffusion Plant	5,575	2.42%
Reactive Metals, Inc.	135	0.06%
Oregon	***3***	***<1%***
Completed UMTRA S&M - Oregon	3	<.01%
Pennsylvania	***3***	***<1%***
Completed UMTRA S&M - Pennsylvania	3	<.01%
South Carolina	***48,174***	***20.90%***
Savannah River Site	48,174	20.90%
Tennessee	***24,812***	***10.76%***
Oak Ridge Y-12 Site	4,127	1.79%
Oak Ridge Reservation	277	0.12%
Oak Ridge K-25 Site	12,662	5.49%
Oak Ridge Associated Universities	18	0.01%
Oak Ridge National Laboratory	7,729	3.35%
Texas	***562***	***<1%***
Completed UMTRA S&M - Texas	21	0.01%
Pantex Plant	562	0.24%
Utah	***140***	***<1%***
Completed UMTRA S&M - Utah	8	<.01%
Monticello Millsite and Vicinity Properties	131	0.06%
Washington	***48,671***	***21.11%***
Hanford Site	48,671	21.11%
Wyoming	***25***	***<1%***
Completed UMTRA S&M - Wyoming	25	0.01%
Total	**$230 Billion**	**100%**

Alternative Cases

The alternative cases reflect ways the Base Case could change if certain policy decisions were made. The alternative cases analyzed four areas most likely to affect total cost, scope, and pace of the Environmental Management program:

- **land use**—What are the ultimate uses for currently contaminated lands, waters, and structures at each installation?
- **program funding and schedule**—How might activities be prioritized, and how rapidly will this money be spent?
- **technology development**—How might future technologies influence the Environmental Management program?
- **waste management configurations**—Where and how will we treat, store, and dispose of wastes?

Land Use

How land will be used after environmental remediation dictates the type and extent of remedial approaches, and thus, total costs. The Base Case estimate in this report is based on a "bottom up" approach using large amounts of data and assumptions collected from field offices, rather than centralized estimating processes. This method resulted in more realistic land-use assumptions and, consequently, substantially lower costs than previous cost estimates. For comparison, total program costs were analyzed for a range of alternative future land uses, ranging from most to least restricted. Figure 4 depicts a contiuum of land use ranging from totally restricted to totally unrestricted use.

The most restricted case involves containing existing contamination in place and restricting public access thereafter. The least restricted land use requires removing or destroying contaminants in all parts of the environment, which would leave land clean enough for a wide variety of uses, potentially including farming and public recreation. Two other cases were also analyzed that were more reflective of the contractual and legal requirements accounted for in the Base Case analysis.

The life-cycle cost estimates for the range of land uses vary from approximately $175 billion to $500 billion depending on the level of cleanup assumed. This analysis indicates that future land-use determinations will have the single greatest impact on total program cost among the factors analyzed.

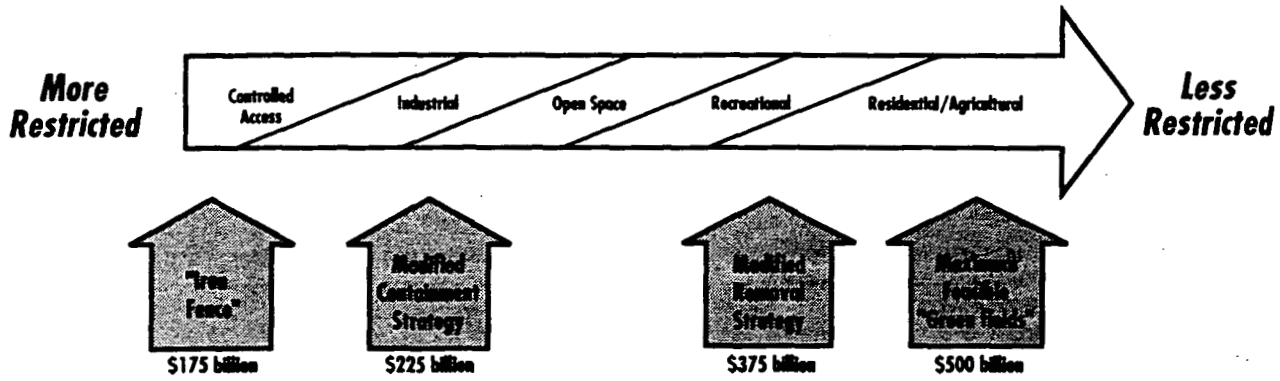
Each land-use case has its limitations. For example, containment rather than remediation is unrealistic across the Department of Energy complex because it would violate several existing cleanup compliance agreements. Also, in some cases, it is less costly to remediate contamination than to contain it. Establishing "green fields" at Department facilities nationwide is not realistic because it would preclude establishing any waste disposal areas, which must be located in restricted areas. Also, for certain contamination situations, technologies do not yet exist to remediate the environment to the level required for unrestricted use. For example, ground water beneath 150 square miles of the Hanford Site is contaminated with radioactive and chemical particles captured within a labyrinth of sediment and rock layers.

Residual Contamination Standards

Costs and schedules reported in the Base Case are based on each installation's best estimate of ultimate cleanup levels. The site-specific land use assumptions in the Base Case result in significant restrictions on future land-use at many of the sites. Variations in residual contamination standards have little impact on costs because containment, rather than the removal of contamination, is assumed to be used. The Department believes that more stringent cleanup standards will result in higher costs if more active remediation approaches are assumed. However, if less active remediation, such as containment is assumed, then little change in cost will occur

000050

Figure 4. Conceptual Illustration of Land Use Contiuum



(1) This scenario represents a modified "pure" Green fields case, which is not achievable at all sites with today's technology.

from more stringent residual contamination standards. More information must be collected, and analyses need to be conducted before costs can be quantified nationwide.

Program Funding and Schedule

Another set of analyses addressed the impacts of more or less available funding for the program. Assuming additional funding, the impacts of accelerating stabilization activities and early closure of sites were analyzed. Assuming reduced funding, the impacts of reducing the scope of remediation and waste management activities are also addressed. Highlights of the scheduling analysis are shown below.

- The life-cycle cost estimate for surveillance and maintenance could be reduced to approximately $500 million if pre-stabilization surveillance maintenance was reduced from 10 years (as in the Base Case) to 1 year. This is about 87 percent lower than the $4 billion in the Base Case. However, annual costs during the early years of the program would exceed the constant, or "flat," funding limit assumed for the Base Case.
- Almost $5 billion would be saved if the Department closed the Rocky Flats Site, Oak Ridge's K-25 Plant, and the Fernald Plant substantially earlier (20–40 years) than currently scheduled. However, annual costs would exceed flat funding limits for several years.
- If funding were significantly reduced beyond the year 2000, minimal action would require about $170 billion. This is about 27 percent lower than the Base Case through 2070. Minimal action would exclude environmental restoration, decontamination and dismantlement, and all treatment and disposal activities associated with future low-level, low-level mixed, and transuranic wastes. Annual surveillance and maintenance costs, however, would be as high as $500 million, compared with $50-$75 million projected in the Base Case.

Technology Development

Innovative technologies could make cleanup and other related activities more efficient and cost effective. More than 100 potential technology systems scheduled to be implemented by the year 2000 were screened based on the potential applicability to high-cost remediation projects. Of these, 15 were selected to evaluate potential cost savings.

Potential cost savings from implementing these new technologies range from $9 to $80 billion, depending on future land use strategies, and assuming the technologies could be implemented by 2010.

Waste Management Configurations

The Department currently is examining alternative configurations (centralized, regionalized, and decentralized) for waste management facilities. This involves deciding where in the country wastes will be stored, treated, or disposed.

Alternative configurations, ranging from decentralized to centralized approaches, could increase costs by $9 billion or decrease them by $5 billion from the Base Case, because of the potential for economies of scale in building and operating fewer facilities. There is substantial uncertainty about the exact benefits of these economies. More analysis should be available for next year's version of the report.

Next Steps

The purpose of the Baseline Report is to clearly articulate the potential life-cycle cost and schedule of the Department of Energy's Environmental Management program. The report represents numerous perspectives on the Base Case estimate, together with the analysis of the alternative cases, the range of policy, technical, and management decisions facing the program, and indeed, the Nation. After considering economic factors, productivity improvements, and alternative cases, the range of life-cycle costs for the Environmental Management program is seen to be substantial. Naturally, this range will narrow as the program matures. However, in the short term, the range of uncertainties highlights the need for a broad public debate both nationally and locally regarding the future of the Environmental Management program.

Many significant decisions must be made during the next several years that will affect the cost and direction of the Environmental Management program for years to come. This report provides a useful framework to analyze those decisions–the alternatives and their impacts. We expect next year's version of this report to change as a result of better information, additional analyses, and different assumptions resulting from stakeholder input. In addition, the compliance agreement and legal requirements underlying many of these estimates could be altered by regulators and Congress. The potential impacts of these changes can be better analyzed using an open process and an analytical tool such as this Baseline Report. Specifically, the next steps currently planned for next year's report are to:

- broaden the range of policy, technical, and management issues evaluated by the Baseline Report;
- improve the life-cycle cost and schedule estimates;
- use the Baseline Report tools to address ongoing program issues; and
- expand stakeholder involvement in the debate.

Contents

The 1995 Baseline Report consists of two volumes: Volume I – *The 1995 Baseline Environmental Management Report*, and Volume II – *Site Summaries for the 1995 Baseline Environmental Management Report*.

Volume I

Introduction (Chapter 1) sketches the basic framework of the report by providing background on the scope and technical complexity of the Department's environmental problems, a description of the scope of the

000052

report mandated by the 1994 National Defense Authorization Act, and a description of the Environmental Management program in general.

Sources of Contamination and the Remedies (Chapter 2) describes in more detail both the sources of environmental contamination, the nuclear weapons production process and the various resulting waste types, and the responsibilities of the Environmental Management program.

The Base Case (Chapter 3) provides a detailed overview of the methods, data sources, and assumptions the Department used in developing a total life-cycle cost estimate.

Results (Chapter 4) describes the results of the Base Case analysis in constant 1995 dollars. It provides the projected life-cycle estimate for the major elements of the Environmental Management program—environmental restoration, waste management, nuclear material and facility stabilization, technology development, and program management. Costs are examined by State and site.

Alternative Cases (Chapter 5) illustrates how costs vary when assumptions are changed in four major areas: land use, scheduling, the pace of funding and activities, technology development, and waste management configurations.

Next Steps (Chapter 6) discusses how this report can be a more useful tool for national and local discussions on the future of this program.

Volume II: Site Summaries

Volume II presents the site-specific data used to generate the Department of Energy's 1995 Baseline Report. The site summaries provided in this volume give specific information about the activities and projected costs at each site as requested by the National Defense Authorization Act. The site summaries are organized alphabetically by State. Each summary provides a brief discussion of the site's past, current, and future missions followed by discussions of the projects and activities necessary to remediate the site. Costs and schedules are also provided, including milestones. The projects are divided into five activities: environmental restoration; waste management; nuclear material and facility stabilization; landlord activities; and program management.

Table of Contents

Executive Summary iii

1.0 Introduction 1.1

1.1 The Cold War Mortgage 1.1

1.2 What Does the Nation Want to Buy? 1.2

1.3 What the Baseline Report Covers 1.3

1.4 Estimates, Not Decisions 1.4

1.5 Preview of the Report 1.5

2.0 Sources of Contamination and the Remedies 2.1

2.1 Contamination from Nuclear Weapons Production 2.1

2.2 Contamination from Other Sources 2.4

2.3 The Environmental Management Program 2.5

2.3.1 Environmental Restoration 2.7

2.3.2 Waste Management 2.9

2.3.3 Nuclear Material and Facility Stabilization 2.13

2.3.4 Technology Development 2.15

2.3.5 Support Functions 2.16

3.0 The Base Case 3.1

3.1 Estimating Costs in the Face of Large Uncertainties 3.1

3.2 Developing the Base Case 3.3

3.3 Assumptions for the Base Case 3.4

3.3.1 Funding and Schedule Assumptions 3.4

3.3.2 Environmental Restoration 3.5

3.3.3 Waste Management 3.8

3.3.4 Nuclear Material and Facility Stabilization 3.11

3.3.5 Technology Development 3.12

3.3.6 Landlord Activities 3.13

3.4 Waste Volumes for the Base Case 3.13

3.5 Sites Included in the Analysis 3.14

Table of Contents

4.0 Results **4.1**

4.1 The Total Life-Cycle Cost of the Environmental Management Program 4.1

4.1.1 The Administration's Budget and the 1995 Baseline Report 4.5

4.1.2 Uncertainty of the Estimate 4.6

4.2 Base Case Estimate for Major Elements of the Environmental Management Program 4.7

4.3 Base Case Estimate by State and Site 4.12

4.4 Costs of Activities Supporting the Environmental Management Program 4.18

4.4.1 Field Support Costs 4.18

4.4.2 Headquarters Support Costs 4.19

4.5 A Closer Look at the Cold War Mortgage 4.20

4.6 Comparison of Results to the Department's Previous Cost Estimate 4.22

5.0 Alternative Cases **5.1**

5.1 Land Use 5.2

5.1.1 Base Case Assumptions 5.3

5.1.2 Land-Use Extremes 5.5

5.1.3 More Realistic Land-Use Alternatives 5.7

5.1.4 Potential Effects of Residual Contamination Standards 5.11

5.2 Funding and Scheduling Analysis 5.15

5.2.1 Accelerating Stabilization Activities 5.15

5.2.2 Early Site Closures 5.16

5.2.3 Minimal Action 5.17

5.3 Technology Development 5.19

5.3.1 Impacts of New Technology 5.20

5.3.2 Analytical Approach 5.21

5.3.3 Savings Projection 5.22

5.4 Waste Management Configuration Perspective on the Base Case 5.23

6.0 Next Steps **6.1**

Glossary

Appendixes

Appendix A: National Defense Authorization Act for FY 1994 ..... A.1

Appendix B: The Nuclear Weapons Production Process B.1

Appendix C: Baseline Report Methodology C.1

Appendix D: Effects of Productivity and Discounting on the Base Case D.1

Appendix E: Department of Energy Reading Rooms E.1

List of Figures

2.1 Locations of Nuclear Weapons Production and Assembly Activities 2.2

2.2 Overview of Department of Energy Environmental Management Activities 2.6

4.1 Base Case Cost and Schedule Estimate 4.2

4.2 Comparison Between the Base Case Cost Estimates and the Administration's Budget Projection 4.5

4.3 Uncertainty Range Surrounding the Mid-Range Base Case Estimate 4.7

4.4 Mid-Range Base Case Estimate for Major Elements of the Environmental Management Program 4.8

4.5 Mid-Range Base Case Cost Profile for Major Elements of the Environmental Management Program 4.9

4.6 Annual Costs of Waste Treated, Stored, and Disposed by the Waste Management Program 4.11

4.7 Mid-Range Base Case Estimate by State 4.15

4.8 Mid-Range Base Case Estimate by Site 4.16

4.9 Mid-Range Base Case Cost Profiles for the Five Largest Sites 4.17

4.10 Distribution of Site-Wide Support Costs 4.19

4.11 Contributions of the Weapons Legacy to the Environmental Management Total Life-Cycle Cost 4.21

5.1 Conceptual Illustration of the Land-Use Continuum 5.2

5.2 Site Land-Use Illustration 5.4

5.3 Results of Land Use Analysis 5.10

5.4 Land-Use Case Relationships 5.11

5.5 Illustration of Land-Use and Residual Contamination on Environmental Restoration Costs and Volumes 5.13

5.6 Conceptual Illustration of Potential Relationship Between Land Use, Residual Contamination, and Total Program Cost 5.14

5.7 Potential Savings from Accelerating Facility Transition to Decommissioning 5.16

5.8 Potential Savings from Accelerating Site Closure are Large: Two Case Studies 5.17

5.9 Minimal Action Reduces Near-Term Costs But Increases Future Liabilities 5.18

5.10 Technologies Available for Implementation by 2000 May Reduce Total Program Cost 5.22

5.11 Base Case Comparison to Other Configuration Alternatives 5.24

6.1 Potential Range of the Life-Cycle Cost Estimate 6.1

List of Tables

3.1 Examples of Remedial Action Cost Estimates Excluded from the Baseline Report 3.2

3.2 Examples of Site-Specific Assumptions for Environmental Restoration Activities 3.5

3.3 Base Case Waste Management Assumptions 3.9

3.4 Total Waste Volumes Addressed in the Base Case from 1995-2070 ..... 3.14

3.5 Sites with Environmental Management Activities in the 1995 Baseline Report 3.15

4.1 Life-Cycle Cost Estimates for the Low, Mid-Range, and High Base Case 4.4

4.2 Estimate of Costs for Selected Environmental Management Projects 4.10

4.3 Mid-Range Base Case Estimate by State and Site 4.13

4.4 Comparison of Cost Estimates in 1988 Needs Report and 1995 Baseline Report 4.23

5.1 Basic Assumptions for Land-Use Case 5.6

5.2 Sites Varied in Land-Use Analysis 5.8

5.3 Technology Systems Used to Estimate Potential Cost Savings 5.21

5.4 Base Case Waste Management Configuration 5.23

DOE/EM-0232

Volume II: Site Summaries March 1995

Estimating the Cold War Mortgage

The 1995 Baseline Environmental Management Report

U.S. Department of Energy
Office of Environmental Management

Printed with soy ink on recycled paper

000060

Table of Contents
VOLUME II SITE SUMMARIES

READER'S GUIDE 1

ALASKA ..... AK 1

Amchitka Island Test Site (Nevada Offsite Program) ..... AK 2

ARIZONA ..... AZ 1

CALIFORNIA ..... CA 3

Energy Technology Engineering Center ..... CA 3
General Atomics ..... CA 15
General Electric Vallecitos Nuclear Center ..... CA 23
Geothermal Test Facility ..... CA 29
Laboratory for Energy-Related Health Research ..... CA 35
Lawrence Berkeley Laboratory ..... CA 43
Lawrence Livermore National Laboratory ..... CA 53
Stanford Linear Accelerator Center ..... CA 67
Oxnard ..... CA 77
Sandia National Laboratories ..... CA 83

COLORADO ..... CO 1

Grand Junction Projects Office Site ..... CO 3
Rocky Flats Environmental Technology Site ..... CO 11
Colorado UMTRA Sites ..... CO 41
- Gunnison ..... CO 42
- Maybell ..... CO 46
- Naturita ..... CO 50
- Rifle ..... CO 54
- Union Carbide Corporation and Old North Continent ..... CO 58
- Rio Blanco Site ..... CO 62
- Rulison Site ..... CO 62

CONNECTICUT ..... CT 1

Connecticut FUSRAP Sites ..... CT 3
- Combustion Engineering Site ..... CT 4

FLORIDA ..... FL 1

Pinellas Plant ..... FL 3

HAWAII ..... **HI 1**

IDAHO ..... **ID 1**

Argonne National Laboratory - West ..... ID 3
Idaho National Engineering Laboratory (and Idaho Chemical Processing Plant) ..... ID 11

ILLINOIS ..... **IL 1**

Argonne National Laboratory - East ..... IL 3
Fermi National Accelerator Laboratory ..... IL 11
Site A/Plot M, Palos Forest Preserve ..... IL 17
Illinois FUSRAP Sites ..... IL 21
Madison ..... IL 22

IOWA ..... **IA 1**

Ames Laboratory ..... IA 3

KENTUCKY ..... **KY 1**

Maxey Flats Disposal Site ..... KY 3
Paducah Gaseous Diffusion Plant ..... KY 7

MARYLAND/WASHINGTON D.C. ..... **MD/DC 1**

Environmental Management Program Headquarters ..... MD/DC 3
Maryland FUSRAP Sites ..... MD/DC 9
W.R. Grace & Company ..... MD/DC 10

MASSACHUSETTS ..... **MA 1**

Massachusetts FUSRAP Sites ..... MA 3
Chapman Valve ..... MA 4
Shpack Landfill ..... MA 6
Ventron ..... MA 8

MICHIGAN ..... **MI 1**

Michigan FUSRAP Sites ..... MI 3
General Motors ..... MI 4

MISSISSIPPI ..... **MS 1**

Salmon Site (Nevada Offsite Program) ..... MS 2

MISSOURI ..... **MO 1**

Kansas City Plant ..... MO 3
Weldon Spring Site Remedial Action Project ..... MO 17
Missouri FUSRAP Sites ..... MO 23
St. Louis Downtown Site ..... MO 24
St. Louis Airport Storage Site ..... MO 26
St. Louis Airport Site Vicinity Properties ..... MO 28
Latty Avenue Properties ..... MO 30

NEBRASKA ..... **NE 1**

Hallam Nuclear Power Facility ..... NE 3

NEVADA ..... **NV 1**

Nevada Test Site ..... NV 3
Central Nevada Test Site, Project Shoal Site, Tonopah Test Range
(Nevada Offsite Program) ..... NV 22

NEW JERSEY ..... **NJ 1**

Princeton Plasma Physics Laboratory ..... NJ 3
New Jersey FUSRAP Sites ..... NJ 11
DuPont & Company ..... NJ 12
Maywood Chemical Works ..... NJ 14
Middlesex Sampling Plant ..... NJ 16
New Brunswick Laboratory ..... NJ 18
Wayne Site ..... NJ 20

NEW MEXICO ..... **NM 1**

Inhalation Toxicology Research Institute ..... NM 3
Los Alamos National Laboratory ..... NM 11
Sandia National Laboratories - Albuquerque ..... NM 29
South Valley Superfund Site ..... NM 43
Albuquerque Operations Office ..... NM 47
Waste Isolation Pilot Plant and
National Transuranic Waste Program Office ..... NM 51
Uranium Mill Tailings Remedial Action Project ..... NM 59
New Mexico UMTRA Sites ..... NM 63
Ambrosia Lake ..... NM 64
Gnome-Coach Site and Gasbuggy Site (Nevada Offsite Program) ..... NM 68

NEW YORK ..... **NY 1**

Brookhaven National Laboratory ..... NY 3
Separation Process Research Unit ..... NY 13
West Valley Demonstration Project ..... NY 19
New York FUSRAP Sites ..... NY 25
Ashland Oil #1 ..... NY 27
Ashland Oil #2 ..... NY 29
Bliss & Laughlin Steel ..... NY 31
Colonie Site ..... NY 33
Linde Air Products ..... NY 35
Seaway Industrial Park ..... NY 37

NORTH DAKOTA ..... **ND 1**

North Dakota UMTRA Sites ..... ND 3
Belfield and Bowman ..... ND 4

OHIO ..... **OH 1**

Battelle Columbus Laboratories ..... OH 3
Fernald Environmental Management Project ..... OH 9
Mound Plant ..... OH 21
Piqua Nuclear Power Facility ..... OH 31
Portsmouth Gaseous Diffusion Plant ..... OH 35
Reactive Metals, Inc. ..... OH 43
Ohio FUSRAP Sites ..... OH 49
Alba Craft ..... OH 50
Associated Aircraft Tool Manufacturing ..... OH 52
Baker Brothers ..... OH 54
B&T Metals ..... OH 56
HHM Safe Site ..... OH 58
Luckey ..... OH 60
Painesville ..... OH 62

OREGON ..... **OR 1**

PENNSYLVANIA ..... **PA 1**

SOUTH CAROLINA ..... **SC 1**

Savannah River Site ..... SC 3

000064

Table of Contents

TENNESSEE ..... **TN 1**

Oak Ridge Associated Universities and
Oak Ridge Institute for Science and Education ..... TN 3
Oak Ridge K-25 Site ..... TN 11
Oak Ridge National Laboratory ..... TN 23
Oak Ridge Reservation ..... TN 43
Oak Ridge Y-12 Site ..... TN 51
Formerly Utilized Sites Remedial Action Program Office ..... TN 63

TEXAS ..... **TX 1**

Pantex Plant ..... TX 3

UTAH ..... **UT 1**

Monticello Millsite and Vicinity Properties ..... UT 2

WASHINGTON ..... **WA 1**

Hanford Site ..... WA 3

WYOMING ..... **WY 1**

GLOSSARY ..... **GL 1**

READER'S GUIDE TO THE SITE SUMMARIES

INTRODUCTION

Volume II presents the site data that was used to generate the Department of Energy's (DOE) initial Baseline Environmental Management Report (BEMR). The raw data was obtained by DOE field personnel from existing information sources and anticipated environmental management strategies for their sites and was tempered by general assumptions and guidance developed by DOE Headquarters personnel. This data was then integrated by DOE Headquarters personnel and modified to ensure that overall constraints such as funding and waste management capacity were addressed.

The site summaries are presented by State and broken out by discrete activities and projects. The Volume I Glossary has been repeated to facilitate the reader's review of Volume II.

The information presented in the site summaries represents the best data and assumptions available as of February 1, 1995. **Assumptions that have not been mandated by formal agreement with appropriate regulators and other stakeholders do not constitute decisions by the Department nor do they supersede existing agreements.** In addition, actions requiring decisions from external sources regarding unknowns such as future land use and funding/scheduling alternatives, as well as internal actions such as the Department's Strategic Realignment initiative, will alter the basis and general assumptions used to generate the results for this report.

Consequently, the numbers presented in the site summaries do not represent outyear budget requests by the field installations.

SITE SUMMARY FORMAT

The site summaries provided in this volume give specific information about the activities and projected costs at each site as requested by the National Defense Authorization Act. The site summaries are organized alphabetically by State. Each summary provides a brief discussion of the site's current, and future missions followed by discussions of the projects and activities necessary to remediate the site. Costs and schedules are also provided. The projects are divided into five activities (as defined by Volume I, Section 2.3): environmental restoration, waste management, nuclear material and facility stabilization, landlord activities, and program management.

The cost tables provide costs for the activities identified in the site summaries. The annual costs are provided for each year from 1995 through the year 2000, and then 5-year average annual costs are provided until the project or activity is complete. Costs for all five activities at sites that have only environmental restoration missions — FUSRAP, UMTRA, and Nevada Offsites — are typically included within the scope of environmental restoration activities.

Waste Management support activities that the Environmental Management program performs at facilities managed by other DOE programs, such as the laboratories operated by Energy Research and Defense Programs, will continue for the foreseeable future. However, for the purpose of this analysis, waste management support of other DOE programs was truncated in 2030 or six years after the completion of environmental restoration activities.

APPROACH FOR THE SITE SUMMARIES

To ensure compliance with the requirements set forth in the National Defense Authorization Act (Volume I, Appendix A), DOE Headquarters developed a guidance package instructing the field installations on how to prepare their cost data and site summaries. The guidance was refined by conferring with congressional staffers, stakeholders, and DOE field office representatives. The guidance included relevant portions of the overall methodology (Volume I, Appendix C) and national assumptions regarding the Environmental Management program (Volume I, Section 3.3).

The field compiled their data and initial write-ups using existing information sources and professional judgement (regarding anticipated outcome of undefined segments of their scope that were not addressed globally by the guidance package). These initial submittals were reviewed by Headquarters program managers and BEMR project representatives, and returned to the field with specific recommendations.

Following the field's second submission of their site summaries, BEMR project representatives integrated the results in accordance with the methodology defined in Appendix C of Volume I. Additional review cycles were conducted by field and headquarters representatives after the integration model compiled and modified the field submittal to meet funding, waste capacity, and other programmatic constraints. The results of this iteration were used to form the base case analysis as defined in Section 3 of Volume I.

SITE SUMMARY RESULTS

The numbers shown in the site summaries' cost tables for 1995 reflect the Congressional appropriation. Costs portrayed for 1996 reflect the Department's most recent Congressional Budget submittal. The numbers presented for 1997-2000 reflect the funding level required to meet existing compliance agreements as identified by the Environmental Management program's recently conducted budget shortfall analysis (Volume I, Section 4.1.1). Outyears funding is capped at the FY 2000 level.

To maintain consistency with FY 1995-2000 numbers already published by the Department as noted above, the first 6 years of cost data are reported in *current year dollars*. However, *constant dollars* are used for both the outyears and the total cost as it is a more appropriate approach for long-range cost projections.

THE YELLOW PAGES

Fourth Edition

The technical reference guide for activists, citizens and policy makers on nuclear waste and cleanup issues.

Contents

Table of Radionuclides and Half-lives 1

Table of Units 3

Periodic Table 5

Chemical Elements and Symbols 6

Fractions and Multiples 7

Explanation of Scientific Notation 7

Logarithmic Scale 9

Radioactive Decay 10

Classification of Radioactive Waste 12

Table of Unit Conversions 13

Glossary of Terms 16

Common Abbreviations 20

Resources for Further Information 22

An IEER publication

Institute for Energy and Environmental Research
6935 Laurel Ave.
Takoma Park, MD 20912
(301) 270-5500

July 1994

Table of Radionuclides

Abbreviations: a = alpha radiation; b = beta radiation; g = gamma radiation, mil = million; bil = billion, Ci = curies; chemical names shown in parentheses

radionuclide	half-life	specific activity curies/gram	decay energy keV	comments
hydrogen-3 (H-3) (tritium)	12.26 yrs	9,800	18.61 (b)	combines with oxygen to form water
carbon-14 (C-14)	5,730 yrs	4.5	156.48 (b)	present in air as carbon dioxide
sodium-24 (Na-24)	14.97 hrs	8.8 mil	5,514 (b, g)	created by neutron activation of sodium-23
phosphorous-32 (P-32)	14.28 days	290,000	1,710 (b)	used in medicine
potassium-40 (K-40)	1.25 bil yrs	7.2 microCi/gm	1,320 (b, g)	occurs in nature; present in human body
cobalt-60 (Co-60)	5.272 yrs	1,143	2,824 (b, g)	gamma source in medicine
nickel-59 (Ni-59)	76,000 yrs	0.081	see note	decays by electron capture; activation product
nickel-63 (Ni-63)	100 yrs	57.4	65 (b)	activation product
krypton-85 (Kr-85)	10.72 yrs	397	687 (b, g)	a main gaseous gamma emitter fission product
strontium-90 (Sr-90)	29 yrs	139	546 (b)	
zirconium-95 (Zr-95)	64.03 days	21,700	1,124 (b, g)	
niobium-94 (Nb-94)	24,000 yrs	0.16	2,040 (b, g)	
technetium-99 (Tc-99)	213,000 yrs	0.017	293 (b)	fission product
ruthenium-106 (Ru-106)	372.6 days	3,342	39.4 (b)	fission product
iodine-129 (I-129)	16 mil yrs	175 microCi/gm	193 (b, g)	fission product
iodine-131 (I-131)	8.04 days	125,000	971 (b, g)	fission product; thyroid disorders
xenon-133 (Xe-133)	5.25 days	189,000	427 (b, g)	fission product

radionuclide	half-life	specific activity curies/gram	decay energy keV	comments
cesium-135 (Cs-135)	3 mil yrs	893 microCi/gm	205 (b)	fission product
cesium-137 (Cs-137)	30.17 yrs	87.5	1,170 (b, g)	fission product
cerium-144 (Ce-144)	284.4 days	3,200	318 (b, g)	fission product
samarium-151 (Sm-151)	90 yrs	26.6	76 (b)	
lead-210 (Pb-210)	22.3 yrs	77.2	63 (b, g)	U-238 decay chain
bismuth-210 (Bi-210)	5.01 days	125,000	1,160 (b)	U-238 decay chain
polonium-210 (Po-210)	138.4 days	4,540	5,407 (a, g)	U-238 decay chain
radon-222 (Rn-222)	3.82 days	156,000	5,590 (a, g)	U-238 decay chain
radium-226 (Ra-226)	1,600 yrs	1.0	4,870 (a, g)	U-238 decay chain
radium-228 (Ra-228)	5.75 yrs	276	45 (b, g)	Th-232 decay chain
thorium-230 (Th-230)	75,400 yrs	0.021	4,771 (a, g)	U-238 decay chain
thorium-232 (Th-232)	14 bil yrs	0.11 microCi/gm	4,081 (a, g)	
uranium-234 (U-234)	245,000 yrs	0.0063	4,856 (a, g)	U-238 decay chain
uranium-235 (U-235)	704 mil yrs	2.2 microCi/gm	4,679 (a, g)	
uranium-238 (U-238)	4.46 bil yrs	0.34 microCi/gm	4,180 (a)	weak gamma also
neptunium-237 (Np-237)	2.14 mil yrs	713 microCi/gm	4,957 (a, g)	
plutonium-238 (Pu-238)	87.74 yrs	17.3	5,593 (a, g)	transuranic element
plutonium-239 (Pu-239)	24,110 yrs	0.063	5,244 (a, g)	transuranic element
plutonium-240 (Pu-240)	6,537 yrs	0.23	5,255 (a, g)	transuranic element
plutonium-241 (Pu-241)	14.4 yrs	104	21 (b)	transuranic element
americium-241 (Am-241)	432.2 yrs	3.47	5,637 (a, g)	decay product of Pu-241; transuranic
americium-243 (Am-243)	7,370 yrs	0.202	5,438 (a, g)	transuranic element

0000

Table of Units

In reading environmental literature (or DOE documents), one comes across a large variety of units. Here are some common units with conversion factors in tabular form. Conversion factors have been rounded off, so conversions back and forth between British and metric units will not be exact.

(Common Abbreviations are shown within the parentheses)

Physical quantity	Unit of Measure	Equivalence	Comments
Length	millimeter (mm)		metric
	centimeter (cm)	10 mm; 0.39 in	metric
	meter (m)	100 cm; 1.09 yd	metric
	kilometer (km)	1,000 m; 0.62 mile	metric
	inch (in; ")	2.54 cm	British
	foot (ft; ')	12"; 30.5 cm	British
	yard (yd)	3'; 0.91 m	British
	mile (mi)	1,760 yd; 1.61 km	British
Area	square centimeter (sq cm; cm^2)	0.155 sq in	
	square meter (sq m; m^2)	1.20 sq yd	1 m on a side
	hectare (ha)	10,000 sq m; 2.48 acres	100 m on a side
	square km (sq km; km^2)	100 ha; 0.39 sq mi	1 km on a side
	square foot (sq ft; ft^2)	144 sq in; 929 cm^2	
	square yard (sq yd)	9 sq ft; 0.84 sq m	
	acre	4,840 sq yd; 0.4 ha	
	square mile (sq mi)	640 acres; 2.59 sq km	
Volume	milliliter (ml) or cubic centimeter (cc)		cc and ml are equal
	liter (l)	1,000 cc or ml	
	cubic meter (cu m; m^3)	1,000 liters; 35.3 cu ft	
	quart (qt)	0.95 liter	U.S. quart
	gallon (gal)	4 qt; 3.79 liters	U.S. gallon
	cubic foot (cu ft; ft^3)	7.48 gal; 28.3 liters	
	acre-foot (ac-ft)	43,560 cu ft; 1 acre 1 ft deep	
Mass	gram (gm)		
	kilogram (kg)	1,000 gm; 2.205 lb	
	metric ton (t; tonne)	1,000 kg; 1.1 short tons	
	ounce (oz)	28.4 gm	
	pound (lb)	16 oz; 454 gm	
	short ton (ton)	2,000 lb; 0.91 metric ton	normal U.S. ton

Physical quantity	Unit of Measure	Equivalence	Comments
Energy	joule (J)	basic metric unit of energy; amount used by a one watt light bulb lit for 1 second	
	erg	one-ten-millionth of a joule	
	calorie (cal)	4.2 joules	
	kilocalorie (kcal)	1,000 calories	measure for food
	kilowatt-hour (kWh)	3,600,000 joules	1 kilowatt for 1 hr
	electron-volt (eV)	0.16 billion-billionth of a joule	(see Note 4)
Radio-activity	becquerel (Bq)	1 disintegration per second (dps)	
	disintegration per minute (dpm)	1/60 Bq	
	curie (Ci)	37 billion Bq	
Dose	rad	100 ergs per gram	
	gray (Gy)	1 joule/kg; 100 rad	standard unit
	roentgen	0.87 rad to air; about 0.96 rad to living tissue	
	rem	100 ergs/gram for gamma and beta radiation; 5 ergs/gram for alpha radiation	
	sievert (Sv)	100 rem	

Notes:

1. In the case of "British" units, the measures are U.S. versions. The British imperial gallon is 20 percent larger than the U.S. one (277.4 cubic inches versus 231 cubic inches). The British long ton is 2,240 pounds versus the U.S. short ton of 2,000 pounds.

2. Prefixes are attached to basic units (meters, grams, joules, watts, electron-volts, curies, becquerels, rads, grays, rems, sieverts) to create units that are different by various multiples of 10. The common prefixes are: *pico-* (one-trillionth); *nano-* (one-billionth); *micro-* (one-millionth); *milli-* (one-thousandth); *centi-* (one-hundredth); *kilo-* (thousand), *mega-* (million); *giga-* (billion); *tera-* (trillion). Hence *nano*curie is one-billionth of a curie; *mega*curie is one million curies, and so on. These prefixes are abbreviated by their first letters, except micro, which is abbreviated by the Greek letter "mu," which is written "μ."

3. Rads and grays measure the deposition of energy in tissue. Rems and sieverts measure biological damage. Rems and rads are equivalent for gamma and beta radiation. Alpha radiation is far more damaging per unit of energy deposited in living tissue. The current conversion factor from rads (or grays) to rems (or sieverts) for alpha radiation is 20—that is, multiply rads of alpha radiation by 20 to get rems. This factor of 20 is just the currently accepted one; it may change from one official assessment of radiation damage to another, as it has in the past. It is called the "*quality factor*" or *Q factor*, for short.

4. An electron-volt is the energy gained by an electron as it accelerates through an electric potential of one volt. An electric potential is similar to a gravitational potential—the higher you take a mass, the greater energy it has when it is released and drops to the ground. Units of electron-volts (and multiples of eV) are used to measure energies of nuclear, atomic, and molecular (chemical) phenomena.

PERIODIC TABLE

Atomic number → 20; Atomic weight → 40.08; Symbol → Ca

1 1.00797 H																	2 4.0026 He
3 6.939 Li	4 9.0122 Be											5 10.811 B	6 12.0111 C	7 14.0067 N	8 15.9994 O	9 18.9984 F	10 20.183 Ne
11 22.9898 Na	12 24.312 Mg											13 26.9815 Al	14 26.086 Si	15 30.9738 P	16 32.064 S	17 35.453 Cl	18 39.948 Ar
19 39.102 K	20 40.08 Ca	21 44.956 Sc	22 47.90 Ti	23 50.942 V	24 51.996 Cr	25 54.938 Mn	26 55.847 Fe	27 58.933 Co	28 58.71 Ni	29 63.54 Cu	30 65.37 Zn	31 69.72 Ga	32 72.59 Ge	33 74.922 As	34 78.96 Se	35 79.909 Br	36 83.80 Kr
37 85.47 Rb	38 87.62 Sr	39 88.905 Y	40 91.22 Zr	41 92.906 Nb	42 95.94 Mo	43 99 Tc	44 101.07 Ru	45 102.905 Rh	46 106.4 Pd	47 107.870 Ag	48 112.40 Cd	49 114.82 In	50 118.69 Sn	51 121.75 Sb	52 127.60 Te	53 126.904 I	54 131.30 Xe
55 132.905 Cs	56 137.34 Ba	57 138.91 La	72 178.49 Hf	73 180.948 Ta	74 183.85 W	75 186.2 Re	76 190.2 Os	77 192.2 Ir	78 195.09 Pt	79 196.967 Au	80 200.59 Hg	81 204.37 Tl	82 207.19 Pb	83 208.980 Bi	84 210 Po	85 210 At	86 222 Rn
87 223 Fr	88 226 Ra	89 227 Ac															
			58 140.12 Ce	59 140.907 Pr	60 144.24 Nd	61 147 Pm	62 150.35 Sm	63 151.96 Eu	64 157.25 Gd	65 158.924 Tb	66 162.50 Dy	67 164.930 Ho	68 167.26 Er	69 168.934 Tm	70 173.04 Yb	71 174.97 Lu	
			90 232.038 Th	91 231 Pa	92 238.04 U	93 237 Np	94 242 Pu	95 243 Am	96 247 Cm	97 247 Bk	98 251 Cf	99 254 Es	100 253 Fm	101 256 Md	102 254 No	103 257 Lr	

1. *The capital letter or combination of a capital letter and lower case letter in the center of the box is the symbol for the element. For example, H stands for hydrogen, He for helium.*
2. *In the upper left corner of each box is the atomic number for the element. This number is equal to the number of protons in the nucleus of the element.*
3. *In the right corner of the box is the atomic weight, given in decimals. Atomic weight is the average weight of all isotopes of a particular element. Rounded off to the nearest whole number, the atomic weight is the number of protons and neutrons added together.*

Source: DOE, First Edition Teacher Guide

000023

-6905

THE CHEMICAL ELEMENTS AND THEIR SYMBOLS

actinium	Ac	hafnium	Hf	praseodymium	Pr
aluminum	Al	helium	He	promethium	Pm
americium	Am	holmium	Ho	protactinium	Pa
antimony	Sb	hydrogen	H	radium	Ra
argon	Ar	indium	In	radon	Rn
arsenic	As	iodine	I	rhenium	Re
astatine	At	iridium	Ir	rhodium	Rh
barium	Ba	iron	Fe	rubidium	Rb
berkelium	Bk	krypton	Kr	ruthenium	Ru
beryllium	Be	lanthanum	La	samarium	Sm
bismuth	Bi	lawrencium	Lr	scandium	Sc
boron	B	lead	Pb	selenium	Se
bromine	Br	lithium	Li	silicon	Si
cadmium	Cd	lutetium	Lu	silver	Ag
calcium	Ca	magnesium	Mg	sodium	Na
californium	Cf	manganese	Mn	strontium	Sr
carbon	C	mendelevium	Md	sulfur	S
cerium	Ce	mercury	Hg	tantalum	Ta
cesium	Cs	molybdenum	Mo	technetium	Tc
chlorine	Cl	neodymium	Nd	tellurium	Te
chromium	Cr	neon	Ne	terbium	Tb
cobalt	Co	neptunium	Np	thallium	Tl
copper	Cu	nickel	Ni	thorium	Th
curium	Cm	niobium	Nb	thulium	Tm
dysprosium	Dy	nitrogen	N	tin	Sn
einsteinium	Es	nobelium	No	titanium	Ti
erbium	Er	osmium	Os	tungsten	W
europium	Eu	oxygen	O	uranium	U
fermium	Fm	palladium	Pd	vanadium	V
fluorine	F	phosphorus	P	xenon	Xe
francium	Fr	platinum	Pt	ytterbium	Yb
gadolinium	Gd	plutonium	Pu	yttrium	Y
gallium	Ga	polonium	Po	zinc	Zn
germanium	Ge	potassium	K	zirconium	Zr
gold	Au				

Source: First Edition Teacher Guide, DOE

000074

Fractions and multiples

Multiple	Decimal equivalent	Prefix	Symbol	English
10^9	1,000,000,000	giga	G	billion
10^6	1,000,000	mega	M	million
10^3	1,000	kilo	k	thousand
10^2	100	hecto	h	hundred
10^1	10	deca/deka	da	ten
10^0	1	*none needed*	*NA*	
10^{-1}	0.1	deci	d	tenth
10^{-2}	0.01	centi	c	hundredth
10^{-3}	0.001	milli	m	thousandth
10^{-6}	0.000001	micro	μ (mu)	millionth
10^{-9}	0.000000001	nano	n	billionth
10^{-12}	0.000000000001	pico	p	trillionth

Explanation of Scientific Notation

Scientific Notation is a convenient way of writing very large and very small numbers. For example, 635,000 is written as 6.35×10^5 in Scientific Notation. This number is read as follows: "6 point 35 times ten raised to five."

The "exponent" in Scientific Notation (the small number above and to the right of 10) is also called the "power of 10." It refers to the number of zeros that follow the 1. So $10^1 = 10$; $10^2 = 100$; $10^3 = 1{,}000$, and so on. By logical extension, $10^0 = 1$, since the zero exponent means that no zeros follow the 1. And in the example above:

$$6.35 \times 10^5 = 6.35 \times 100{,}000 = 635{,}000$$

Negative exponents indicate negative powers of 10, which are expressed as fractions with 1 in the numerator (on top) and the power of 10 in the denominator (on the bottom). So $10^{-1} = 1/10$; $10^{-2} = 1/100$; $10^{-3} = 1/1{,}000$, and so on. Then we can express other small numbers this way. For example:

$$2.5 \times 10^{-3} = 2.5 \times 1/1{,}000 = 0.0025$$

Every number can be expressed in Scientific Notation. In our first example, 635,000 should be written as 6.35×10^5. In theory, it can be written as 63.5×10^4, but by convention the number is usually written as 6.35×10^5 so that the lead number is less than 10, followed by as many decimal places as necessary. Sometimes this may be written as 0.635×10^6.

Another way to think about Scientific Notation is that the exponent will tell you how the decimal point moves; a positive exponent moves the decimal point to the right, and a negative one moves it to the left. So for example:

$4.0 \times 10^2 = 400$ (2 places to the right of 4); while
$4.0 \times 10^{-2} = 0.04$ (2 places to the left of 4).

Note that Scientific Notation is also sometimes expressed as E, as in 4 E 2 (meaning 4.0 x 10 raised to 2). Similarly 4 E -2 means 4 times 10 raised to -2, or = $4 \times 10^{-2} = 0.04$. This method of expression makes it easier to type in scientific notation.

Addition and subtraction of numbers expressed in Scientific Notation: the key is to make sure the exponents are the same. For example,

$(2.0 \times 10^2) + (3.0 \times 10^3)$

can be rewritten as $(0.2 \times 10^3) + (3.0 \times 10^3)$. Now you just add 0.2 + 3 and keep the 10^3 intact. Your answer is 3.2×10^3, or 3,200. We can check this by converting the numbers first to the more familiar form. So $2 \times 10^2 + 3.0 \times 10^3 = 200 + 3{,}000 = 3{,}200 = 3.2 \times 10^3$.

Let's try a subtraction example.

$(2.0 \times 10^7) - (6.3 \times 10^5)$

The problem needs to be rewritten so that the exponents are the same. So we can write $(200 \times 10^5) - (6.3 \times 10^5) = 193.7 \times 10^5$, which in Scientific Notation would be written 1.937×10^7.
Check: $2 \times 10^7 - 6.3 \times 10^5 = 20{,}000{,}000 - 630{,}000 = 19{,}370{,}000 = 1.937 \times 10^7$.

Multiplication: the exponents can be different. They will be added together. This is because the exponent represents the number of zeros following the one. So:

$10^1 \times 10^2 = 10 \times 100 = 1{,}000 = 10^3$ Check: $10^1 \times 10^2 = 10^{1+2} = 10^3$
Similarly $10^1 \times 10^{-3} = 10^{1-3} = 10^{-2} = .01$ Check: $10 \times 1/1000 = 1/100 = .01$

Look at another example: $(4.0 \times 10^5) \times (3.0 \times 10^{-1})$. The 4 and the 3 are multiplied, giving 12, but the exponents 5 and -1 are added. Answer: 12×10^4, or 1.2×10^5.
Check: $4 \times 10^5 \times 3 \times 10^{-1} = 400{,}00 \times 0.3 = 123{,}000 = 1.2 \times 10^5$.

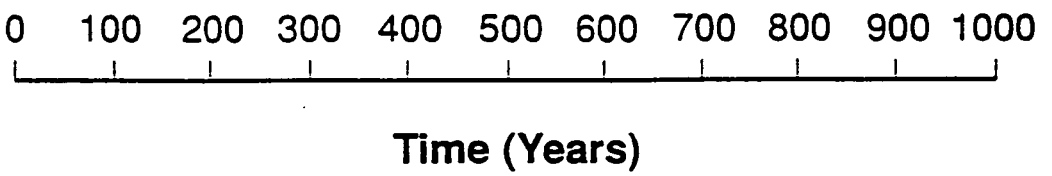
Interesting note: another way to see that $10^0 = 1$ is as follows. $10^1 \times 10^{-1} = 10^{1-1} = 10^0$.
It is also: $10 \times 1/10 = 1$. So $10^0 = 1$

Division: consider the example $(6.0 \times 10^8) / (3.0 \times 10^5)$. The 6 is divided by the 3, giving 2. The exponent in the denominator is then moved to the numerator, reversing its sign. So we move the 10^5 to the numerator with a negative exponent, giving $2 \times 10^8 \times 10^{-5}$. Solve as a multiplication problem, adding the exponents. The answer is 2.0×10^3, or 2,000.

THE LOGARITHMIC SCALE

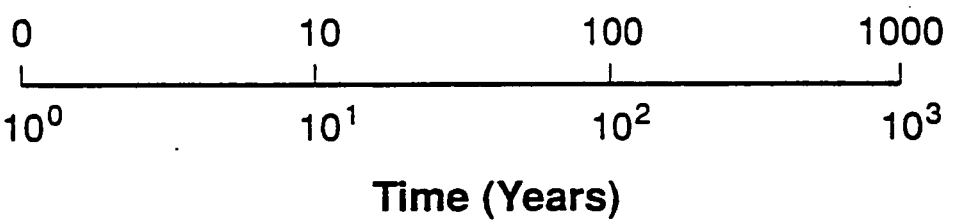
If we want to plot something that changes with time and the time period is relatively short, we often use a linear scale. Thus if we were considering 1,000 years, the linear scale might look like this:

Each tick mark represents 100 years and each subdivision of the scale would be the same length.



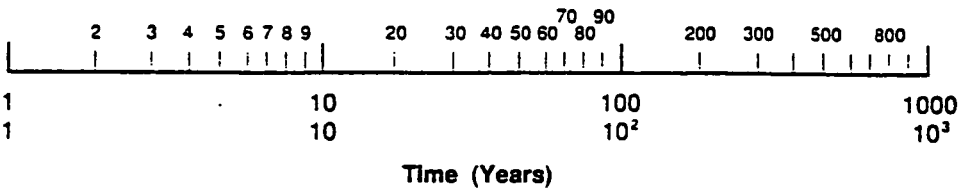
When we consider the many thousands of years it will be necessary to store nuclear waste in a geologic repository, it would not be possible to represent the decay on a linear time scale. Hence, we resort to a convenient device called the logarithmic scale for plotting large numbers.

In the logarithmic scale the only line segments that are equal are those that represent multiples of 10. Thus, 1000 years on a simple logarithmic scale that showed only the broad divisions would appear thus:



As you can see, such a scale can plot a great many more years than is possible on a linear scale, but its use would be limited by its lack of detail.

However, if we were to divide each broad segment into nine segments and let the ticks represent the years from 1 to 10, 10 to 100, and 100 to 1000, the scale would look like this and would be much more useful:



Note that each broad segment is subdivided in the same way. Each tick within a broad segment represents a multiple of 10 over the corresponding tick in the previous segment. For example, in segment 10^0 - 10^1 the first mark equals 2. In the segment 10^1 - 10^2, the first mark equals 20, and in the segment 10^2 - 10^3, the first mark equals 200.

Note also that the subsections within each broad segment are unequal. The divisions become smaller and represent the years from 1 to 10, or 10 to 100, or 100 to 1000.

All nuclides with an atomic number greater than 83 are radioactive. There are both stable and radioactive isotopes of elements with atomic numbers 1 to 83. You can find the atomic number of a nuclide by referring to the periodic chart of the elements.

Radioactive isotopes, or radionuclides, are a lot like a cone resting on its point. They are unstable and will inevitably teeter and fall. In the process of falling they emit energy. The process of emitting energy from the nucleus is called "decay." As the nuclide decays, it emits a particle. Some radionuclides are stable after one radioactive decay, but others can go through a series of decays before becoming stable. In general, nuclides with an equal number of protons and neutrons are stable.

Remember that two things are always constant in nuclear equations. First, the number representing the sum of protons and neutrons is constant, though the separate numbers of protons and neutrons change. For example, when the number of protons goes up by one, the number of neutrons goes down by one. Second, the electric charge is always equal in number on both sides of the equation.

The nuclide is often expressed in terms of its **nominal atomic mass** (as in "234" of U-234), which is the sum of the number of neutrons and protons. A nuclide is also often referred to by its **atomic number** (as in "94" of $_{94}$Pu-239), which tells you the number of protons in the nucleus. You can figure out how many neutrons are in the nucleus by subtracting the atomic number from the atomic mass. So $_{94}$Pu-241 has 147 neutrons (241 nominal atomic mass - 94 protons = 147 neutrons). The atomic mass given in the periodic table for an element differs from the nominal atomic mass mainly because it is the average mass for various isotopes that exist in nature. Also, the nominal mass ignores the small difference in weight between neutrons and protons for any isotope.

Alpha Decay

In alpha decay, an alpha particle is emitted as the nuclide decays. Consider plutonium-239.

$$_{94}\text{Pu-239} \quad \text{-----} \quad _{92}\text{U-235} + {}_{2}\text{He-4}$$

Here plutonium-239 has decayed into one of its "daughter" products, uranium-235, and has emitted a helium particle (without orbiting electrons) in the process. The helium particle is also called an alpha particle. Notice that the atomic number of the uranium (92) plus the helium (2) equals the atomic number of the plutonium (94). In the same way, the nominal atomic mass of the uranium (235) and helium (4) add up to the nominal atomic mass of the plutonium (239).

As an aside, the particles emitted by radioactive decay are called "alpha" and "beta" because scientists did not know what they were when they were first detected. Scientists gave them the names corresponding to the first two letters of the Greek alphabet (alpha-beta = alphabet).

Beta Decay

In beta decay, a negatively charged "beta" particle (an electron) is emitted as the nuclide decays. Look at the example of plutonium-241.

$_{94}$Pu-241	-----	$_{95}$Am-241 + B^-
(94p, 147n)		(146n, 95p)

Since the beta particle (B^-) weighs so little, the nominal atomic mass (241) has not changed from one side of the equation to the other.

As you can see from the weight and number of beta particles compared to alpha, they have very different penetration properties. Alpha particles are much larger and heavier, and therefore cannot penetrate deeply into even slightly dense material, like paper. Beta particles, on the other hand, are far more penetrating. But alpha particles are much more destructive to human tissue if they enter the body through ingestion, or especially through inhalation, because they deposit all their energy in a very small mass of tissue.

Gamma Radiation

Often there is residual excess energy in an otherwise stable nucleus (much like the vibrations of a cone after is has fallen into a stable state). Nuclei emit this excess energy as gamma radiation. Gamma radiation often occurs after alpha and/or beta particles have been emitted (the cone vibrates after it has fallen).

Gamma radiation is another name for very high frequency electromagnetic radiation. Visible light is also electromagnetic energy but of lower frequency. Also, visible light has lower energy in its **photons**, or "packets" of electromagnetic energy. Radio waves are of even lower frequency than visible light.

Some Classifications of Radioactive Waste

In general, radioactive waste classes are based on the waste's origin, not on the physical and chemical properties of the waste that could determine its safe management. Other categories of radioactive waste not listed here include mixed waste and NARM/NORM wastes.

Category of Radioactive Waste	Definition	Legislation
High-Level Waste (HLW)	1) *Spent fuel*: irradiated commercial reactor fuel 2) *Reprocessing Waste:* liquid waste from solvent extraction cycles in reprocessing. Also the solids into which liquid wastes may have been converted. NOTE: DOE defines HLW as reprocessing waste only, while NRC defines HLW as spent fuel and reprocessing waste	NWPA[1] [10 CFR 60]
Low-level Waste (LLW)	Defined by what it is not. It is radioactive waste not classified as high-level, spent fuel, transuranic or byproduct material such as uranium mill tailings. LLW has four subcategories: Classes A, B, C, and Greater-Than-Class-C (GTCC), described below. On average, Class A is the least hazardous while GTCC is the most.	Low Level Radioactive Waste Policy Act [10 CFR 61]
Class A	On average the least radioactive of the four LLW classes. Primarily contaminated with "short-lived" radionuclides. (average concentration: 0.1 curies/cubic foot)	10 CFR 61
Class B	May be contaminated with a greater amount of "short-lived" radionuclides than Class A. (average concentration: 2 curies/cubic foot)	
Class C	May be contaminated with greater amounts of long-lived and short-lived radionuclides than Class A or B. (average concentration: 7 curies/cubic foot)	
Greater-Than-C	Most radioactive of the low level classes (average concentration: 300 to 2,500 curies/cubic foot)[2]	
Transuranic Waste (TRU)	Waste containing elements with atomic numbers (number of protons) greater than 92 (the atomic number of uranium) and with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram. If the concentrations or the half-lives are below the limits, it is possible for waste to have transuranic elements but not be classified as TRU waste.	40 CFR 191

Sources: Makhijani and Saleska, *High-level Dollars, Low-level Sense*, IEER, 1992; U.S. EPA, Issues Paper on Radiation Site Cleanup Regulations (EPA 402-R-93-084), 1993.

---

1 Nuclear Waste Policy Act 1982, as amended in 1987.

2 The 300 figure is based on the 1985 inventory. The higher figure represents anticipated inventory in 2020, including some decommissioning wastes.

000080

Table of Unit Conversions[3]

-6905

IF YOU HAVE	AND YOU WANT	MULTIPLY BY
air, dry (m^3)	grams	1185
americium-241 (curies)	americium-241 (grams)	0.286
americium-241 (grams)	americium-241 (curies)	3.49
Angstrom	centimeters	10^{-8}
barrels (55 gal.)	cubic feet	7.35243
barrels (55 gal.)	cubic meters	0.20820
barrels (US liquid)	gallons (US)	31.5
becquerels	curies	27×10^{-12}
becquerels	picocuries	about 27
body weight (kg.)	blood volume (cc.)	70
Btu	joules	1054.35
calories	joules	4.18400
Celsius	centigrade	1
Celsius	Fahrenheit	multiply by 1.8, add 32
Celsius	Kelvin	add 273.16
centigrade	Celsius	1
centimeters	inches	0.39370
centimeters	meters	0.01
centimeters	microns	10,000
centimeters	yards	0.01094
curies	becquerels	37×10^{9}
curies	picocuries	10^{12}
ergs	joules	10^{-7}
dpm	curies	4.5×10^{-13}
grains	grams	0.06480
grams	ounces	0.03527
Grays	rads	100
hours	years	0.0001141
inches	centimeters	2.54
in. mercury	atmospheres	0.03342
joules	Btu	9.48451×10^{-4}
joules	ergs	10^{7}

3 Adapted from "Evaluating Chemical Hazards or You Don't Have to Be a Scientist..." by Peter Montague, Ph.D., Environmental Research Foundation: Annapolis, MD. November, 1991. Available for $5.00 from the Environmental Research Foundation, (410) 263-1584.

IF YOU HAVE	AND YOU WANT	MULTIPLY BY
joules	tons TNT	2.38095×10^{-10}
joules	Watt-hours	0.00027
joules	Watt-seconds	1joules per
second	Watts	1
Kelvin	centigrade	subtract 273.16
kilograms	pounds	2.20462
kilometers	miles	0.62137
liters	cubic centimeters	1,000
liters	cubic feet	0.03532
liters	cubic meters	0.001
liters	gallons (US)	0.26418
liters	quarts	1.05672
meters	centimeters	100
meters	feet	3.28084
meters	yards	1.09361
microCi/gram	picoCi/gram	10^6
microCi/km^2	dpm/100 cm^2	0.022
microCi/m^2	dpm/100 cm^2	2.2×10^4
micrograms/m^3 (weight in air)	ppm (volume)	0.0241/molecular weight
microns	Angstrom	10,000
microns	centimeters	0.0001
microrad/hour	millirad/year	8.76
miles	centimeters	16,0934.4
miles	kilometers	1.609344
milliliters	fluid ounces	0.00338
millimeters	centimeters	0.1
nanoCi./m^2	dpm/100m^2	22.22
nanograms/gram	ppb (parts/bil)	1
nanograms/liter	ppb	0.001
ounces (US fluid)	cubic centimeters	29.57373
ounces (US fluid)	milliliters	29.57373
percent	ppm	10,000
picocuries	becquerels	0.037
picocuries	curies	10^{-12}
picoCi./gram	dpm/gram	2.22
plutonium-238 (curies)	plutonium-238 (grams)	0.054
plutonium-238 (grams)	plutonium-238 (curies)	18.6
plutonium-239 (curies)	plutonium-239 (grams)	15

IF YOU HAVE	AND YOU WANT	MULTIPLY BY
plutonium-239 (grams)	plutonium-239 (curies)	0.067
plutonium-240 (curies)	plutonium-240 (grams)	4.11
plutonium-240 (grams)	plutonium-240 (curies)	0.24
plutonium-241 (curies)	plutonium-241 (grams)	0.0083
plutonium-241 (grams)	plutonium-241 (curies)	121.2
pounds	grams	453.59237
pounds	kilograms	0.45359
power	energy	time
ppb	nanograms/gram	1
ppb	nanograms/liter	1,000
ppb	ppm	0.001
ppm	grains/gallon	0.0584
ppm	percent	0.0001
ppm	ppb	1,000
quarts	liters	0.94633
rads	Grays	0.01
rads	rems	RBE factor
rems	Sieverts	0.01
seconds	years	3.171×10^{-8}
Sieverts	rems	100
square centimeters	square feet	0.00108
square feet	square centimeters	929.0304
square feet	square meters	0.09290
square meters	square feet	10.76391
square miles	acres	640
therms	Btu	100,000
tons TNT	Btu	3,983,500
tons TNT	joules	4.2×10^{9}
tons (metric)	pounds	2204.6226
U-234 (curies)	U-234 (grams)	154.4
U-234 (grams)	U-234 (curies)	6.48×10^{-3}
U-238 (curies)	U-238 (grams)	2.81×10^{6}
U-238 (grams)	U-238 (curies)	3.56×10^{-7}
Watt-hours	Btu	3.41443
Watt-hours	joules	3,600
Watts	Btu/hour	3.41443
Watts	joules/second	1
Watts/second	joules	1
yards	centimeters	91.44
yards	meters	0.9144
years	hours	8760
years	seconds	31.54×10^{6}

Alpha radiation: Radiation consisting of helium nuclei (without orbiting electrons) of nominal atomic weight. 4, atomic number 2, that are discharged by radioactive disintegration of some isotopes of heavy elements, including uranium-238, radium-226 and plutonium-239.

Atomic number (symbolized Z): The atomic number of an element is the number of protons in the nucleus of each atom. It determines the chemical properties of the element.

Atomic weight, nominal (symbolized A): The nominal atomic weight of an isotope is given by the sum of the number of neutrons and protons in each nucleus. The exact atomic weight of an isotope differs fractionally from that whole number, because neutrons are slightly heavier than protons and the mass of the nucleus is also affected by the binding energy. Atomic weight of an element reflects combinations of isotopes of that element found in nature.

Background Radiation: Radiation found in the environment due to naturally occurring radioactive elements and cosmic rays. In general, and excluding indoor radon, background radiation is about 100 millirem per year at sea level.

Becquerel: A unit of radioactivity equal to one disintegration per second. It is a very small unit, equal to about 27 picocuries.

Beta radiation: Radiation consisting of electrons or "positrons" (the same as electrons but with positive electrical charge) emitted in many radioactive disintegrations, at speeds approaching the speed of light.

Bioaccumulation: the accumulation of radionuclides in a living organism.

Calorie: A unit of heat or energy sufficient to raise the temperature of 1 gram of water by 1 degree Celsius. In dietetics, the kilocalorie, a thousand times bigger, is the unit usually used. It is frequently called a "calorie," omitting the prefix.

Critical mass: The amount of a fissile substance that will allow a self-sustaining chain reaction. The amount depends both on the properties of the fissile element, the shape of the mass, and other parameters.

Curie: The traditional unit of radioactivity equal to the radioactivity of 1 gram of pure radium. It is equal to 37,000,000,000 (37×10^9) disintegrations per second (37 billion becquerels).

Daughter: As a radionuclide decays, it may decay into a "daughter" radionuclide. For example, uranium-238 decays into a succession of radionuclides, including thorium-234, radium-226, and radon-222, among others. This decay succession is called a "decay chain."

Decay-correction: The amount by which the calculated radioactivity (for example, of a release of radioisotopes) must be reduced after a period of time, to allow for its radioactive decay during that time.

Decommissioning: The process of removing a facility from operation.

Environmental Impact Statement (EIS): A study prepared when a major federal action is considered that could affect the environment, such as building a waste repository. The study evaluates the potential effects of the action, in accordance with the National Environmental Policy Act (NEPA) of 1970.

External radiation dose: The dose from sources of radiation located outside the body. This is most often from gamma rays, though beta rays can contribute to dose in the skin and other relatively superficial tissues (like some lymph nodes). Sometimes neutrons are also an external radiation source. For instance, the people of Hiroshima and Nagasaki during the atomic blasts in 1945 received significant radiation from neutrons.

Fission: The splitting of the nucleus of an element into fragments. Heavy elements such as uranium or plutonium release energy when fissioned.

Fission product: Any atom created by the fission of a heavy element. Fission products are usually radioactive.

Fusion: the combining of two nuclei to form a heavier one. Fusion of the isotopes of light elements such as hydrogen or lithium generally gives a release of energy.

Gamma radiation: Electromagnetic radiation of high photon energy. The term is used for radiation that comes from radioactive disintegration. X-rays are identical with the lowest energy gamma rays and have sufficient energy to ionize atoms with which they interact.

Gray: A unit of absorbed radiation dose equal to 100 rads.

Half-life: The time in which half the atoms of a radioactive substance will have disintegrated, leaving half the original amount. Half of the residue will disintegrate in another equal period of time. Thus one-fourth the original amount is left after two half-lives; one-eight after three, and so on.

Highly-enriched uranium (HEU): Uranium containing over 20% uranium-235. HEU is one of the explosive components of nuclear bombs and is also used in nuclear submarine reactors, research reactors, and plutonium production reactors. Fresh HEU for these purposes typically contains 93% or more uranium-235. HEU is not used in commercial electricity producing reactors. Because of its military applications, HEU is classified as a "highly strategic material".

Induced radioactivity: Radioactivity produced in any material as a result of nuclear reactions, especially by absorption of neutrons.

Internal radiation dose: the dose to organs of the body from radioactive material inside the body. It may consist of any combination of alpha, beta, and gamma radiation.

Ionize: To split off one or more electrons from an atom, thus leaving it with a positive electric charge.

Isotope: The atoms of any one element all have the same number of protons (and hence the same chemical properties) but may have different numbers of neutrons and, therefore, different weights. Thus, there is more than one kind of atom for any one element, and the different kinds are called the isotopes of that element. Some isotopes are stable; others are unstable and therefore radioactive (radioisotopes).

Kiloton (kT): In the context of nuclear weapons, this term, which means 1,000 tons, is always used as a measure of explosive power. It is equal to the explosive power of 1,000 tons of TNT.

Low-enriched uranium (LEU): Uranium containing less than 20% uranium-235 but greater than 0.71%. (Uranium in nature contains 0.71% uranium-235). Commercial nuclear reactors use LEU as fuel that typically contains about 3-5% uranium-235.

Micron: One one-millionth of a meter.

Neutron: An elementary particle slightly heavier than a proton, with no electric charge. Free neutrons are unstable, decaying into protons and electrons with a half-life of about 12 minutes.

Nucleus: The nucleus of an atom is the central core that comprises almost all the weight of the atom. All atomic nuclei (except H-1, which has a single proton) contain both protons and neutrons.

Photon: The indivisible unit, or quantum, of electromagnetic radiation. The energy of the photons determines the nature of the radiation, from radio waves at the lowest energy levels, up through infra-red, visible, and ultra-violet light, to X- or gamma rays, which have energy high enough to ionize atoms.

Plutonium (Pu): A highly toxic, heavy, radioactive metallic element. There are 16 isotopes of plutonium, of which only five are produced in significant quantities: plutonium-238, -239, -240, -241, and -242. Plutonium-239 is the most important plutonium isotope as it is fissile and is used in nuclear weapons some reactors. On the other hand, plutonium-240 is unsuitable for use in nuclear weapons and reactor fuel. Thus, in a reactor whose main purpose is plutonium production, the rate at which plutonium-240 is formed controls the length of time fuel is allowed to remain under irradiation.

Plutonium is categorized according to plutonium-240 content, as follows:

Category	% plutonium-240
super-grade	2-3
weapons-grade	less than 7
fuel-grade	7-18 (sometimes given as 7-19)
reactor-grade	18 or greater (or 19 or greater)

Positron: An elementary particle with a positive electric charge, but in other respects identical with an electron.

Proton: An elementary particle with a positive electric charge and a mass that is given the value 1 on the scale of atomic weights.

Rad: (radiation absorbed dose) The old unit of absorbed dose of radiation, defined as deposition of 100 ergs of energy per gram of tissue. It amounts to approximately one ionization per cubic micron. Thus one rad creates roughly one billion ionizations per cubic centimeter (or about one gram of tissue). In practice, the rad and the roentgen both represent about the same amount of energy since 1,000 rad equals 1,100 plus or minus 50 roentgens, but unlike the roentgen, the rad is applicable to all types of radiation (alpha, beta, and gamma).

Radioactivity: The spontaneous discharge of radiation from atomic nuclei. This is usually in the form of beta or alpha radiation, together with gamma radiation. Beta or alpha emission results in transformation of the atom into a different element, changing the atomic number by +1 or -2 respectively. Some residual energy is often emitted as gamma radiation.

Raffinate: A liquid waste stream resulting from extraction of a liquid with a solvent.

RBE (Relative Biological Effectiveness): RBE compares the effectiveness of absorbed doses of different types of radiation. It is calculated as the inverse ratio of the doses of two different kinds of radiation necessary to produce the same biological effect.

Rem: (radiation equivalent man) A unit of equivalent absorbed dose of radiation, taking account of the relative biological effectiveness of the particular radiation. It is the amount of ionizing radiation required to produce the same biological effect as one roentgen of x-rays. The dose in rems is the dose in rads multiplied by the Relative Biological Effectiveness (RBE). This old unit is replaced with the sievert (Sv) in the SI units. One sievert is equal to 100 rem.

Roentgen: The old unit of radiation exposure. It is a unit of gamma radiation measured by the amount of ionization in air. In non-bony biological tissue 1 roentgen delivers a dose approximately equal to 1 rad. See also rad.

Sievert (Sv): A unit of equivalent absorbed dose equal to 100 rems.

SI units: The "International System of Units" (designated SI in all languages) is a system of measures established by an international organization promoting international uniformity in standards of measurement.

Names of units in the SI are not capitalized, though symbols for units are based on a person's name. For example, the symbol of the "gray" is "Gy".

One of the main advantages of SI units, as opposed to the old units (curies, etc.) is that they correspond to actual properties. For example, 1 becquerel = 1 disintegration per second, whereas 1 curie = 37 billion disintegrations per second. Clearly, the becquerel is easier to work with mathematically. One of the main complaints about SI units is that the gray is too big or the becquerel is too small.

Specific Activity: The number of disintegrations over a given period of time (referred to as "activity") per unit mass of a pure radioisotope; or the activity of a radioisotope in a material per unit mass of that material. Specific activity is expressed in becquerels per gram (Bq/g) or curies per gram (Ci/g).

Tailings: The residue left over after a product is produced. Usually refers to "uranium mill tailings".

TNT equivalent: The weight of TNT which would release the same amount of energy as a particular nuclear explosion. One ton of TNT releases approximately 1.2 billion calories (that is, 5.1 kiloJoules per gram). Nuclear explosions are usually measured in kilotons (KT) or megatons (MT).

Ton: A unit of mass in the American system that equals 2,000 pounds, or 909.1 kilograms. A British ton (or "Imperial" ton) equals 2,240 pounds. A metric tonne is equal to 1,000 kilograms.

Tonne: A unit of mass in the metric system equal to 1,000 kilograms or 2,205 pounds. An American ton or "short" ton is 2,000 pounds or 909.1 kilograms.

Transuranics: Elements that have a higher atomic number than uranium (and are thus heavier), such as plutonium, curium, americium, and neptunium. Transuranic elements are human made, though traces do occur naturally.

Uranium (U): A dark grey, radioactive, metallic element. Naturally occurring uranium is a mixture of three isotopes: uranium-234 (0.0055%), uranium-235 (0.711%), and uranium-238 (99.284%). Uranium is the heaviest non-human-made element. Uranium ore normally contains several hundredths of a percent uranium, though some extremely high-grade ore can contain up to 60% uranium. Uranium is both chemically and radiologically toxic. It poses a health hazard as a heavy metal as well as a radioisotope.

Vitrify: To convert into glass. Vitrification often refers to glassification of high-level waste to reduce its solubility.

Yield: The energy released by a nuclear explosion.

Watt (W): The SI unit of power, equal to one joule per second.

Weapons-grade uranium, or very-highly enriched uranium: Uranium containing approximately 93% uranium-235.

Common Abbreviations

AEC	(U.S.) Atomic Energy Commission
AGR	advanced gas-cooled reactor
ATSDR	Agency for Toxic Substances and Disease Registry
Btu	British Thermal Unit(s)
Bq	becquerel(s)
C	Celsius (or carbon)
cal	calorie(s)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
cc	cubic centimeter(s)
Ci	curie(s)
cm	centimeter(s)
DOD	(U.S.) Department of Defense
DOE	(U.S.) Department of Energy
dpm	disintegrations per minute
dps	disintegrations per second
DU	depleted uranium
EPA	(U.S.) Environmental Protection Agency
FOIA	(U.S.) Freedom of Information Act
ft	foot, feet
G	giga (billion times)
Gy	gray(s), SI unit of absorbed dose, 1 Gy = 100 rad
g	gram(s)
H	hydrogen
HEU	highly enriched uranium
HLW	high-level waste
hr	hour(s)
in	inch(es)
IAEA	International Atomic Energy Agency
J	joule(s)
K or k	kilo (thousand times)
kg	kilogram(s), or 2.205 pounds
km	kilometer(s), 10^3 meters, or 3,281 feet
kT	kiloton(s), 10^3 tons (of TNT), nuclear weapon energy yield
LET	linear energy transfer
LLW	low-level waste
M	mega (million times)
m	meter(s)

mg	milligram(s)
MOx	mixed oxide fuel
MW	megawatt(s)
MWt	megawatt(s) thermal
MRS	monitored retrievable storage
n	nano (billionth)
NAS	(U.S.) National Academy of Sciences
NRC	(U.S.) Nuclear Regulatory Commission
O	oxygen
OECD	Organization for Economic Co-operation and Development
ppb	parts per billion
ppm	parts per million
Pu	plutonium
Purex	plutonium-uranium extraction process
PWR	pressurized water reactor
R	Roentgen
RBE	relative biological effectiveness
RCRA	("ReCRA") Resource Conservation and Recovery Act
Redox	reduction-oxidation (process)
s or sec	second(s)
SDMP	Site Decommissioning Management Plan (of the NRC)
SI	standard international
Sv	Sievert, SI unit of dose equivalent
TRU	transuranic (radioactive waste)
U	uranium
W	watt(s)
WIPP	Waste Isolation Pilot Project (for TRU waste)

References

Goldstick, M. 1990. *Nuclear Words and Terms.* World Information Service on Energy-International): Amsterdam.

Evaluating Chemical Hazards or *You Don't Have to be a Scientist...* Peter Montague, Environmental Research Foundation: Annapolis, MD, November 1991.

Science, Society and America's Nuclear Waste, First Edition Teacher Guide, Department of Energy, Washington, DC

Science for Democratic Action, the IEER newsletter, published four times a year by IEER. The tables on pages 1 through 4 all appeared in past issues.

Resources for Further Information

Cochran, T., et al. 1987. *Nuclear Weapons Databook: U.S. Nuclear Warhead Facility Profiles*. Volume 3. Ballinger Publishing Co: Cambridge, MA. Send $23.50 to: Natural Resources Defense Council, 1350 New York Ave, NW, Washington, DC 20005, Attention: Tanya Washington. Or call (202) 783-7800.

Goldstick, M. 1990. *Nuclear Words and Terms*. World Information Service on Energy (WISE-International): Amsterdam. Write to: WISE-International, P.O. Box 5627, 1007 AP Amsterdam, The Netherlands. Or send to Email (gn:wiseamster)

Kimball, D., et al. 1993. *Covering the Map: A Survey of Military Pollution Sites in the United States*. Physicians for Social Responsibility and Military Toxics Project: Washington, DC and Litchfield, ME. $8.00 Call (202) 898-0150 or (207) 268-4071.

Lenssen, N. 1991. *Nuclear Waste: the Problem that Won't Go Away*. Worldwatch Paper 106. Worldwatch Institute: Washington, DC, December 1991. Available from Worldwatch Institute for $5.00. Call (202) 452-1999 or write to Worldwatch Institute, 1776 Mass Ave., NW, Washington, DC 20036.

Mahoney, K., and Murakami, L. 1993. *Farewell to Arms: Cleaning Up Nuclear Weapons Facilities*. National Conference of State Legislatures: Denver, CO and Washington, DC. $15.00. Call (303) 830-2200.

Makhijani, A. and Saleska, S. 1992. *High-level Dollars, Low-level Sense: A Critique of Present Policy for the Management of Long-lived Radioactive Waste and Discussion of an Alternative Approach*. Apex Press: New York. Available from IEER for $15.00. Call (301) 270-5500.

Montague, P. *Evaluating Chemical Hazards* or *You Don't Have to be a Scientist...* 1991. Environmental Research Foundation: Annapolis, MD. Available for $5.00 from the Environmental Research Foundation, (410) 263-1584.

National Research Council. 1994. *Building Consensus Through Risk Assessment and Management of the Department of Energy's Environmental Remediation Program*. National Academy Press: Washington, D.C. Available from: National Academy Press, 2101 Constitution Avenue, NW, Box 285, Washington, DC 20055, or by calling (800) 624-6242, or in the Washington Metropolitan Area call (202) 334-3313.

Science for Democratic Action, the IEER newsletter on nuclear waste issues, published four times a year by IEER. $10/year in the US or free to grassroots groups, seniors and students in the U.S. Call (301) 270-5500 or write to the address on the cover of the *Yellow Pages*.

U.S. Congress. Office of Technology Assessment. 1993. *Dismantling the Bomb and Managing the Nuclear Materials*. (OTA-O-572). U.S. Government Printing Office: Washington, DC., September 1993. $12.00. Call (202) 783-3238.

U.S. Congress. Office of Technology Assessment. 1991. *Complex Cleanup: the Environmental Legacy of Nuclear Weapons Production* (OTA-O-484) U.S. Government Printing Office: Washington, DC, February 1991. $10.00. Call (202) 783-3238 to order.

U.S. Department of Energy. 1993. *Environmental Restoration and Waste Management Five-Year Plan: Fiscal Years 1994-1998*. (DOE/S-00097P), August 1993. Three volumes. Available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161.

U.S. Environmental Protection Agency. 1993. *Issues Paper on Radiation Site Cleanup Regulations*. (EPA 402-R-93-084) September 1993. Office of Radiation and Indoor Air: Washington, DC. Call (202) 233-9354 to order a copy.

RECOMMENDATIONS REGARDING FUTURE USE OF FERNALD PROPERTY

(Markup Draft 5/5/95)

One important component of the mission of the Fernald Citizens Task Force is to make recommendations for the future use of the Fernald property. Understanding future use as a goal has been instrumental in focusing our deliberations and our recommendations on cleanup levels, waste disposition, and site priorities are all intrinsically tied to our vision for the future of the Fernald property and its ultimate impact on surrounding communities.

It was never the intention of the Fernald Citizens Task Force to identify specific uses of the land at Fernald following remediation. We believe that those decisions are best left to the 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 decisionmaking regarding future use and ownership of the property.** Moreover, these specific decisions will be better made close to the time when actual use is being contemplated as actual reuse of any Fernald property is at least a decade away. We do, however, believe that it is our responsibility to outline the overall plan for bringing Fernald back to productive and safe uses, and to identify the general categories of use that should not be provided for as a result of remediation.

Conceptually, we divide 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, we offer the following recommendations:

- The on-site disposal facility (zone one) should be tied into the natural environment to the greatest extent possible. 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.
- ~~While it is~~ **It will be** important to isolate the disposal facility from public access, ~~this is~~ primarily to protect the cover system of the disposal facility and not due to direct exposure risks to individuals in the area. ~~Therefore, t~~he barriers to prevent access should be as unobtrusive as possible, **while still providing clear markings and protection from intrusion.** ~~preferably~~ **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 ~~for at least~~ **a minimum of** 300 feet in each direction of the cell property be reserved for **limited use. These uses may include** undeveloped green space, ~~nurturing a~~ natural habitats**,** ~~and providing for~~ **or at most limited** surface recreational use.
- 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 **or generation** of hazardous, radioactive, mixed, or solid waste for any reason. Possible beneficial uses for zone three could include the continuation of undeveloped green space,

nature preserve, educational facilities, a developed park or recreational facilities, light industry, office parks, or commercial development.

- In planning for the future use of the Fernald property, sufficient space should be provided for the permanent relocation of Native American burial sites exhumed during construction of the new water line in the vicinity.
- All property containing the on site disposal cell and surrounding green space must remain under federal government control and ownership in perpetuity. The remaining property at Fernald must remain under federal government control and ownership until remediation is complete, at which time local preferences for ownership should be revisited. However, **any changes of ownership or leasing of property must be conducted with strict assurances that** ~~all ownership arrangements must permit~~ 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.**
- DOE must refrain from making any commitments for potential future uses of property following remediation until community input has been registered.
- 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 will protect and enhance existing natural resources, with particular emphasis on the Great Miami Aquifer, Paddy's Run, and forested wetlands.**

April 8, 1995 Meeting:

★ • It was suggested that the first sentence of the second paragraph of the "Recommendation For An On-Site Disposal Facility At Fernald" could be reworded for clarity. After some discussion, the Task Force voted unanimously to reword the sentence. The changes are marked in the following:

RECOMMENDATION FOR AN ON-SITE DISPOSAL FACILITY AT FERNALD

> 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.

The Fernald Citizens Task Force does not make this recommendation lightly. It is the result of one and one-half years of study, discussion, and evaluation. Disposition of contaminated material is one of four key recommendations required of the Task Force by August 1993 charter. In the December 1993 work plan, we scheduled this decision for 1995. This schedule was then further refined in a revised work plan approved in December 1994. The draft final recommendation was prepared as scheduled in February 1995, with discussion and a public workshop on the full range of issues having been conducted as scheduled in January 1995. It is important to the Task Force that all our recommendations be based on a thorough evaluation of the technical information available, and through discussion and feedback with our neighbors surrounding Fernald. To this end, all of our meetings are open to the public and widely publicized, and all agendas are mailed to an extensive list of local residents and government officials. Comments are received at Task Force meetings, other public meetings attended by Task Force members, by mail, and through the Task Force message line.

All members of the Task Force live ~~and~~ or work in communities that are impacted by the decisions being made at Fernald, and eight of 14 live ~~and~~ or work in the direct vicinity of the site. No member of the Task Force wishes to see contaminated materials from Fernald or any other location stored on the Fernald property indefinitely. As it adjoins residential and agricultural lands and is situated directly above a sole source aquifer, Fernald is far from an ideal location for disposal of contaminated materials. Nevertheless, we are aware of the many

engineering, political, and financial challenges facing a project the size of the Fernald cleanup. Our primary goals are protecting human health and the Great Miami Aquifer. We believe 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, is the most effective way to achieve prompt and enduring protection for the communities surrounding Fernald. We ultimately arrived at this recommendation in consideration of the following:

★ • The Task Force unanimously approved the amended draft "Recommendation to Establish Site Priorities and to Accelerated Remediation at Fernald", and the transmittal of the final recommendation to Secretary O'Leary and Assistant Secretary Grumbly with a request for a response on a specific date. The final recommendation reads as follows:

RECOMMENDATION TO ESTABLISH SITE PRIORITIES AND ACCELERATE REMEDIATION AT FERNALD

The Fernald Citizens Task Force believes that the Fernald site is poised to make great progress in its remediation program, but only if allowed to operate in an efficient and streamlined manner. The most difficult and complex decisions regarding remediation have been clearly mapped out in accordance with the amended consent agreement and Records of Decision and will be in place within the next few months. The challenge now is to implement these decisions in a quick, safe, and cost-effective manner. The Fernald Citizens Task Force believes that this cannot be done under the remediation approach and operating rules that exist at Fernald today.

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, period. 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 Waste. 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 decisionmaking 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 form a slow moving and expensive dinosaur, to a model of government/contractor efficiency. Given the tools **and the reforms,** Fernald can lead the way.

★ • The Task Force asked the chair and the consultant to create a draft recommendation regarding the future use of the Fernald property for the May 6, 1995, meeting.

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

MEMORANDUM

TO: Those Listed

FROM: John S. Applegate, Chair

DATE: May 16, 1995

RE: Task Force Document for "Recommendations Regarding Future Use of Fernald Property"

Enclosed is the final future use recommendation document. The recommendation reflects all of the comments that I received from Task Force members.

If you have any questions or comments, feel free to call me at (513) 556-0114.

JSA:rmt
Enclosure

C:PA:(FCTF):95-1068

P. O. Box 544 Ross, Ohio 45061 513·648·6478

at MS 82-3 (Public Affairs)

Amy Engler
Jeanie Foster
Kathy Graham
Jack Hoopes
Julie Loerch
Sarah Snyder

Total: 6

at MS 45 (Department of Energy)

Randi Allen
Jack Craig
Glenn Griffiths
Randy Janke
Rob Janke
Dave Lojek
Johnny Reising
Gary Stegner
Rod Warner
Pete Yerace

Total: 10

CRUs

Bob Fellman, MS 52-1 (CRU1)
Nancy Weatherup, MS 51-2 (CRU2)
Steve Houser, MS 52-3 (CRU3)
Mike Skriba, MS 82-2 (CRU4)
Dave Brettschneider, MS 52-5 (CRU5)

Total: 5

Office of the President

Robert Gates, MS 80-1
Arlen Hunt, MS 7
Don Ofte, MS 1
Jim Thiesing, MS 2
Mike Yates, MS 9

Total: 5

at EM-5 (Secretary of Energy)
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Don Beck (Same address as above, EM 521 is the room number)
Dierdre McCarthy Gallager (see BCC List for address. Takes the place of EM-5 files on original list).
Thomas Grumbly

Total: 3

OTHERS

Jim Jackson, MS 52-5
Ken Morgan (see BCC list)
Mike Strimbu, MS 65-2

Internal

File 106.4.2.5
Judy Armstrong

Unidentified

Gail Jernigan
P.O. Box 616 Building 773-41A
Aiken, South Carolina 29802

Larissa Gilham
Ohio Department of Health
35 E Chestnut St. Box 118
Columbus, Ohio 43215-2541

Total: 7

Mark Albertin, MS 72
William Benson, MS 52-1
Dennis Beissel, MS 52-3
Shelby Blankenship, MS 71-3
Dennis Carr, MS 52-5
Jennifer Curtis, MS 8
Bill Den Herder, MS 80-3
Steve Garland, MS 51-2
R D George, MS 52-2
Terence Hagen, MS 65-2
Jim Hanna, MS 15
John Harmon, MS 52-2
Bob Heck, MS 76
Marc Jewett, MS 52-5
Pete Kelley, MS 82-3
Mike Lee, MS 3
Paul Mohr, MS 82-3
Morman Reeves, MS 3

Total: 18

Grand total: 54

FERNALD CITIZENS TASK FORCE

RECOMMENDATIONS REGARDING FUTURE USE OF FERNALD PROPERTY

One important component of the mission of the Fernald Citizens Task Force is to make recommendations for the future use of the Fernald property. Understanding future use as a goal has been instrumental in focusing our deliberations and our recommendations on cleanup levels, waste disposition, and site priorities are all intrinsically tied to our vision for the future of the Fernald property and its ultimate impact on surrounding communities.

It was never the intention of the Fernald Citizens Task Force to identify specific uses of the land at Fernald following remediation. We believe that those decisions are best left to the 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 decisionmaking regarding specific future use and ownership of the property. Moreover, these specific decisions will be better made close to the time when actual use is being contemplated as actual reuse of any Fernald property is at least a decade away. We do, however, believe that it is our responsibility to outline the overall plan for bringing Fernald back to productive and safe uses, and to identify the general categories of use that should not be provided for as a result of remediation.

Conceptually, we divide 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, we offer the following recommendations:

- 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 to protect the cover system of the disposal facility and not due to 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.

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

MEMORANDUM

TO: Task Force Members

FROM: John S. Applegate, Chair

DATE: May 22, 1995

RE: Fernald Health Effects Subcommittee

Enclosed are two items of interest regarding the nominations to the Fernald Health Effects Subcommittee and the Fernald Health Effects Subcommittee Working Draft Operational Guidelines draft document.

I hope that you will take the opportunity to review the announcement for nominations to the subcommittee and the draft operational guidelines document. It would be very helpful to the Task Force to have a liaison with this group, and I encourage any one who is interested in being a member to sign up immediately.

Please give me a call at 556-0114, if you have any questions.

JSA:jaa
Enclosure

C:PA:(FCTF):95-1072

P. O. Box 544 Ross, Ohio 45061 513·648·6478

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30341-3724

Announcement for Nominations to the Fernald Health Effects Subcommittee

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) are actively conducting public health activities at U.S. Department of Energy (DOE) nuclear weapons facilities. For CDC and ATSDR to effectively plan and conduct work around the Fernald, Ohio facility, it is essential that the agencies coordinate their activities and involve the public in all aspects of their work. The Fernald Health Effects Subcommittee will be formed in response to this need.

The Fernald Health Effects Subcommittee will be a formal, Federal Advisory Committee Act (FACA) chartered, advisory body. The purpose of the Subcommittee will be to establish a representative and knowledgeable body of citizens to advise CDC and ATSDR on their health research and public health activities related to Fernald. Health-related questions will be addressed by the Subcommittee and include: (a) what has happened from the release of radioactive and hazardous materials into the environment at Fernald; (b) what may happen in the future from these releases; and © what can be done once the findings of health research and public health activities are reported. All Subcommittee meetings will be open to the public and announced in advance.

When appropriate, this Subcommittee will also work in conjunction with the Department of Energy's Fernald Citizens Task Force to address health concerns and issues which may be related to environmental restoration and waste management options being discussed by that Board.

The enclosed operational guidelines for the Fernald Health Effects Subcommittee have been developed in series of public meetings with interested members of the community. The guidelines provide information about how the Subcommittee will operate.

If you are interested in serving on the Subcommittee or wish to nominate another individual, please submit a resume, biographical sketch, and/or any other information which tells us about yourself or the person you wish to nominate, and describes why this individual would be well suited to serve on this Subcommittee. Please include the nominees' address and phone number as well. If nominating a person other than yourself, please include a signed acknowledgement of the nomination by that individual.

Nominations should be sent to the following address:

Steven Adams
CDC, M.S. F-35
4770 Buford Highway, NE
Atlanta, Georgia 30341-3724

All nominations must be received no later than June 30, 1995. If you have questions or comments on the nominations process or the Subcommittee please contact Steve Adams or Nadine Dickerson at (404) 488-7040.

Draft Document Including 2-25-95 Revisions

FERNALD Health Effects Subcommittee Working Draft Operational Guidelines

AGENCY NOTE:

With valuable input from national and local community interest groups, this document was prepared by the Agency for Toxic Substances and Disease Registry (ATSDR) and the Centers for Disease Control and Prevention (CDC) for the purpose of developing effective and meaningful community involvement with the Fernald community. These draft operational guidelines reflect both the principles outlined in the Keystone report and the significant input from community representatives.

The agencies have recently obtained authorization to form a formal national advisory committee chartered under the Federal Advisory Committee Act (FACA) to involve the public in health related CDC and ATSDR activities at up to six present or former DOE weapons complex sites. Under the charter for this advisory committee, the agencies have formed a site specific subcommittee at Hanford and are in the process of forming subcommittees at the Savannah River Site, and the Idaho National Engineering Laboratory. It is the desire of the agencies to form an additional subcommittee in Ohio to address issues at the Fernald Site.

1.0 Purpose

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) are committed to open and substantive public and labor involvement in agency decision-making, planning, and activities.

The purpose of the Fernald Health Effects Subcommittee (hereafter called the Subcommittee) is the creation of a representative and knowledgeable body of citizens to advise CDC and ATSDR on the selection, design, scope, prioritization and adequacy of their health research and public health activities connected with the Fernald Site. The establishment of the Subcommittee is intended to be the key component of a broader effort to involve and communicate with citizens interested in, and affected by, the conduct of CDC and ATSDR health research and their public health activities at the Fernald Site.

If implemented properly, the Subcommittee should be capable of identifying the legitimate needs of exposed and potentially exposed persons and providing answers to their health-related questions about:

(a) what are the potential health effects due to releases of radioactive and hazardous materials into the environment at Fernald;

(b) what may happen in the future from these releases; and

© what can be done once the findings of health research and public health activities are reported.

Likewise, the Subcommittee should be capable of satisfying the legitimate needs of citizens for studies that are technically sound, fiscally prudent, and capable of providing credible information about exposures and/or health consequences.

This Subcommittee will work in conjunction with the Fernald Citizens Task Force to address health concerns and issues related to restoration and waste management options, as appropriate.

2.0 Background

The CDC (National Center for Environmental Health and the National Institute for Occupational Safety and Health) and ATSDR are actively conducting health research and public health activities at U.S. Department of Energy (DOE) nuclear weapons facilities. Historically, DOE facilities have released radioactive materials and toxic substances into the environment, and the exposure to people and possible adverse health outcomes are not well documented. For CDC and ATSDR to effectively plan and conduct studies at Fernald, it is essential that the agencies coordinate their activities and involve the public in all aspects of their work.

Public participation is necessary to provide guidance to ATSDR's activities under the Superfund law (CERCLA, e.g., public health assessments, health studies, surveillance activities, and exposure registries) and CDC's energy-related health research under the Memorandum of Understanding between DOE and U.S. Department of Health and Human Services (analytic epidemiology studies of workers and residents) involving Fernald.

The proposal for this Subcommittee has been developed with important input from representatives of community interest groups involved at Fernald, as well as using components from several other community involvement strategies. Meetings with a variety of citizens and community interest group leaders have provided valuable insight on the their needs and concerns about involvement in federal studies. The Military Production Network has recently drafted a proposal for a national plan to implement site-specific advisory groups. The Interim Report of the Federal Facilities Environmental Restoration Dialogue Committee (Keystone report) has outlined the details of community involvement for environmental remediation and restoration. Although ATSDR has used Community Assistance Panels to achieve similar objectives at other National Priorities List sites around the nation, citizen organizations interested in Fernald health research have expressed a clear preference for a more formal advisory process that is consistent with the recommendations regarding 'Site Specific Advisory Boards' in the Keystone Report.

3.0 Logistical Support for the Subcommittee

In order to implement the Subcommittee within the next few months, it will be necessary to use the services of an existing Federal government contractor. Currently, CDC and ATSDR do not have sufficient staff to properly conduct all the logistical activities in support of the Subcommittee meetings. Within the next year, an independent contractor for logistical support to the Subcommittee will be sought. To the extent allowed by law, criteria for awarding contracts shall specify that the logistical support contractor shall not have substantial history of contracting at Fernald in order to avoid appearance of conflicts of interest.

The contract will be between the U.S. Government and the logistical support contractor. The direct management and supervision of the contract will be the responsibility of a Federal project officer. Several requirements have been identified which will be included in the contract as allowed by law:

1. Arranging and announcing the Subcommittee meetings which will all be open public meetings. The contractor will work with CDC and ATSDR and assure that all logistical needs are attended to;

2. Providing mailing services, and obtaining and duplicating documents;

3. Distributing written materials;

4. Providing for transcription services at Subcommittee meetings and preparing minutes of each Subcommittee meeting;

5. Assuring that Subcommittee meeting minutes and materials are placed in local repositories for public access;

6. Arranging and paying for travel and per diem for ~~Subcommittee members and~~ consultants as approved by CDC and ATSDR;

7. Maintain a public written record of recommendations and responses to each, including the status and substance of the response;

8. Providing financial reports to the Subcommittee as approved by the agency; and

9. Providing other services as requested by the Subcommittee and approved by CDC, and ATSDR.

4.0 Responsibilities of CDC and ATSDR

Specifically, CDC and ATSDR shall:

1. Commit to seek DOE funding levels adequate to cover or provide: technical assistance for independent reviews of all foreseeable major policy issues (focused on health studies and public health activities) that the Subcommittee believes warrant independent technical advice or review prior to the Subcommittee rendering advice, and support the Subcommittee including logistical support for meetings, travel requirements, and the needs of technical consultants or specialists;

2. Actively involve the Subcommittee early in the planning and implementation of CDC and ATSDR health research and their public health activities at Fernald, as well as the planning and scheduling of subcommittee meetings and agendas;

3. Work with individuals, interested groups, and the Subcommittee to determine how best to respond to the health concerns of exposed and potentially exposed communities;

4. Provide the Subcommittee with timely responses to their recommendations, questions, and concerns about CDC and ATSDR health research and their public health activities. Explain how the recommendations, comments, or concerns were incorporated into the decision-making process, and if not incorporated, give the reasons for not accepting or acting on them;

5. Respond in writing to written Subcommittee recommendations with provision for adequate time for the Subcommittee to review, and respond to, such agency responses prior to final agency action;

6. Provide all materials and present any information on studies and public health activities, as well as CDC and ATSDR programs and goals requested by the Subcommittee, except as prohibited by law;

7. Continue individual agency public involvement activities (e.g., newsletters, fact sheets, technical workshops, media relations, accessible study documents, etc.) seeking regular, periodic evaluation of such activities by the Subcommittee and committing to seek resources to implement additional recommended public involvement activities;

8. Provide regular CDC and ATSDR activity updates to Subcommittee members;

9. Pursuant to Section 6.0, receive and review written nominations for Subcommittee members, and select and notify members;

10. Identify contact persons for ATSDR, NCEH and NIOSH, who will attend Subcommittee meetings in an *ex officio* (non-voting) capacity and serve as the primary liaisons from the agencies to the Subcommittee;

11. Keep the local, state, and federal governmental organizations informed of CDC and ATSDR health research and their public health activities;

12. Conduct and coordinate scientific peer reviews of study methods and findings and consider nominations of peer reviewers that are recommended by the Subcommittee;

13. Oversee and approve all activities of the logistical support contractor; and

14. Coordinate with other established local, state, and federal government groups or panels involved in current health related studies, projects, and regional environmental remediation and/or restoration. The agencies will seek to coordinate meetings and avoid duplication of public involvement activities.

5.0 Responsibilities of the Fernald Health Effects Subcommittee

1. Provide recommendations to CDC and ATSDR on their health research and public health activities at Fernald, including but not limited to: the selection, design, scope, prioritization and adequacy of health research; selection of lead agency for particular studies; reviewing of study documents; identification of potential contractors and tasks to be included in requests for proposals; dissemination of findings; recommendations for future work; and related matters;

2. Review regularly, and advise CDC and ATSDR on their public information and involvement activities and budget for studies and public involvement efforts.

3. Encourage a wide range of community, and scientific viewpoints for input into Subcommittee deliberations and provide opportunity for public comment at the meetings;

4. Address at Subcommittee meetings, public recommendations, questions, and

concerns about CDC and ATSDR health research and their public health activities. The Subcommittee may present public recommendations, questions and concerns to CDC and ATSDR. A public record of the meeting will be available (e.g., Public Environmental Information Center, PEIC), including the Subcommittee's discussion on how the recommendations, comments, or concerns were considered in the decision-making process, and whether incorporated or not incorporated, with the reasons for accepting or rejecting them (e.g. time, cost, personnel, or technical capability, or regulatory constraints);

5. Review and advise CDC and ATSDR on ways to coordinate with other established groups or panels and avoid duplication of public involvement activities;

6. Encourage members to share information with and provide feedback from and report to the constituencies they represent;

7. Review the CDC and ATSDR written record of meetings and agency responses for accuracy, content, and follow-up;

8. Follow the progress of CDC and ATSDR activities;

9. Review and approve the minutes of Subcommittee meetings;

10. The Subcommittee shall be involved in the production and review of all public involvement activities, including newsletters, fact sheets, media relations, workshops, and other activities; and

11. Determine when the Subcommittee has completed its work and consider a sunset clause.

6.0 Composition and Selection of Subcommittee Membership

The Subcommittee will consist of 12 to 20 individuals. This range allows for flexibility in determining a balance of diverse interests to represent the concerned and affected populations and bring valuable technical or experiential qualifications to the Subcommittee. Members of the Subcommittee should represent a diversity of interests.

Interested local, state and federal officials, as well as representatives from other existing panels will be welcome at all Subcommittee meetings. State health agencies will be requested to designate representatives who will work with the Subcommittee and attend all meetings as non-voting liaison representatives.

Members of the Subcommittee should represent a diversity of interests. In selecting such a representative group, CDC and ATSDR should attempt to select individuals who represent the following interests or groups:

Potentially exposed populations
Potentially Affected workers (past and present)
Local health providers (public and private)
Local Environmental Organizations
Scientific/medical expertise
Communities of color
Native American Tribes (at their discretion and direction)
Others with interest

In addition to these interests and groups being represented, it is critically important that the chosen members have specific qualities that will assist them and the Subcommittee to be effective. Suggested qualities are listed in the attachment.

In the interest of maintaining public trust and credibility, individuals who have a conflict of interest may not participate as Subcommittee members. The rules for conflict of interest will follow the guidance under the Ethics and Government Act.

CDC and ATSDR will solicit written nominations for membership on the Subcommittee from interested individuals, organizations, and concerned interest groups through widely distributed media releases and mass mailings for a period of 30 days. CDC and ATSDR will then select and notify nominees within 45 days of the end of the outreach period. Each nominee selected will be contacted to verify his/her commitment to serve on the Subcommittee. All nominees will be informed of their status and who was selected for the Subcommittee. CDC and ATSDR will announce the selections and the overall basis for the selections made. Every effort will be made to create a Subcommittee that reflects the community's interests regarding health concerns, varied viewpoints, general knowledge of the Fernald site and special minority issues.

Once established, the Subcommittee will be asked to provide recommendations for adding, replacing, and rotating members (following FACA requirements). In doing so, the Subcommittee shall carefully consider the need to assure that a diversity of views in the community/region is fairly represented.

7.0 Travel Expense Reimbursement

Subcommittee members will be reimbursed by the federal agency for expenses related to their participation in Subcommittee meetings, which includes travel to and from Subcommittee meetings and per diem according to Federal Travel Regulations. In addition, the federal agency will reimburse members as special government employees according to established guidelines.

8.0 Subcommittee Meetings

The Subcommittee will meet locally at least four (4) times and no more than eight (8) times a year. It is understood that initially more meetings may be necessary to update the Subcommittee on scientific issues, studies, or other important topics. The meetings will be announced, open meetings with public comment sessions and generally be one - to two-days. In addition, an evening meeting to obtain further public comment may be held in conjunction with each Subcommittee meeting. Any meetings of subgroups formed to the site specific Subcommittee will also be open public meetings.

The designated federal official must be present at all Subcommittee meetings. A transcriber will be present at all Subcommittee meetings and a written record will be kept.

The Subcommittee will evaluate the efficiency and effectiveness of meetings on a regular basis using evaluation methods developed jointly by the Subcommittee and the agencies.

9.0 Operating Procedures

Upon the establishment of the Subcommittee, members shall develop with agency approval appropriate ground rules and operating procedures to allow for the efficient and productive operation of the Subcommittee. Such rules and procedures shall include those for the establishment of subgroups, membership on which shall not be restricted to Subcommittee members. In addition, the Subcommittee should recommend for adding and replacing members.

ATTACHMENT

Suggested Guidelines for Selecting Members of The Fernald Health Effects Subcommittee

The following list of personal qualities was developed by the Hanford Community Involvement Workgroup, including representatives of community interest groups and Native American Nations involved at the Hanford DOE site. These personal qualities should be considered by CDC and ATSDR in their review of nominees and selection of members to the Fernald Health Effects Subcommittee. It is understood that these are only suggested guidelines and that persons with one or more of these qualities may help the effectiveness of the Subcommittee.

List of Personal Qualities:

1. Able to represent and be sensitive to the concerns of multiple constituencies.

2. Has demonstrated basic diplomatic sensibilities and shown open-mindedness.

3. Can represent vitally interested groups and will report back to his or her constituency or group.

4. Has proven merit, pertinent expertise, and genuine interest and concern; should not be token or "political" appointees.

5. Understands and concurs with the fundamental purpose of the Subcommittee's missions and does not have a clear record of contradictory goals or agendas.

6. Has demonstrated sound judgement and common sense.

7. Is not overly fearful of public speaking and will not dominate or prevent others from speaking.

8. Believes in constructive participation and not destructive sabotage; should not resort to personal attacks.

9. Is capable of making rational arguments and can offer support, backing, or evidence for his or her position.

10. Is earnest, serious, and has consistency and conscientiousness regarding meeting attendance and work.

11. Is capable of accepting reasonable compromise and can engage in productive dialogue toward reaching consensus.

12. Has a genuine sense of urgency and acknowledges the importance of timeliness in work related to human health issues.

13. Is a technical expert who is skilled in communicating his or her area of knowledge to the lay public and has respect for people of diverse backgrounds and educational levels.

14. Does not have a conflict of interest.

15. Accepts the public's expectation that the Subcommittee have a proportionately larger number of representatives from the affected populations than other groups.

16. Is sensitive and compassionate regarding the affected public's anger, confusion, and suffering.

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

MEMORANDUM

TO: Task Force Members

FROM: John S. Applegate, Chair

DATE: May 22, 1995

RE: Transmittal of Approved Minutes from March 28, 1995 Meeting, April 8, 1995 Meeting, and the "Recommendations Regarding Future Use of Fernald Property"

I have enclosed the minutes of the March 28, 1995 meeting and the April 8, 1995 meeting, as approved by the Task Force at its May 6, 1995 meeting. I have also included the "Recommendations Regarding Future Use of Fernald Property". If you have any questions, please call me at 556-0114 or Judy Armstrong at 738-0003.

JSA:rmt
Enclosure

C:PA:(FCTF):95-1071

P. O. Box 544 Ross, Ohio 45061 513·648·6478

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

-6905

Minutes from March 28, 1995 Meeting

The Fernald Citizens Task Force met from 5:06 p.m. until 6:24 p.m. on March 28, 1995, at the Ross Fire House, 2565 Cincinnati-Brookville Road, Ross, Ohio. The meeting, which was advertised in local newspapers, was open to the public; time was reserved for accepting public comments.

Members Present: John Applegate
Marvin Clawson
Lisa Crawford
Pam Dunn
Constance Fox
Phil Hamric, DOE
Darryl Huff
Gene Jablonowski, U.S. EPA
Tom Rentschler
Tom Schneider, Ohio EPA (for Graham Mitchell, OEPA)
Warren Strunk
Bob Tabor
Gene Willeke

Members Absent: James Bierer
Guy Guckenberger
Jerry Monahan
Thomas Wagner

Deputy Designated Federal Official Attending: Gary Stegner, DOE Fernald Area Office for Ken Morgan, DOE Ohio Field Office

Task Force Staff: Doug Sarno, consultant
Judy Armstrong
Ruth Triplett
Chris Varner

P. O. Box 544 Ross, Ohio 45061 513·648·6478

About 25 spectators, including members of the public and representatives from FRESH, DOE, U.S. EPA, Ohio EPA, the Ohio Department of Health, the Agency for Toxic Substances and Disease Registry, FERMCO, Ross Township Trustees, and other interested parties.

1. Remarks:

Chair John Applegate called the meeting to order by stating that there were no announcements or new business and that he would like to get on with the old business and keep the session informal.

2. Site Priorities Discussion:

Applegate said that the priorities issue which is left over from the meeting on March 11, is complicated by budget cuts. Everyone thought that funding would remain relatively constant and that determining cleanup priorities would be simpler. Under the circumstances now, it is much more complicated in that each little piece affects the other pieces. The Task Force is in a difficult position to suggest a schedule, and should possibly keep it's eyes on a broader picture. Applegate suggested that a detailed look at management's priorities may be a task for after July 1995, given present time constraints.

Applegate stated that there are two items potentially in conflict with each other: 1) the Amended Consent Agreement that separates Fernald into Operable Units, and 2) funding. He believes that the Task Force can make the most immediate impact within these two items. The Task Force is not DOE or the regulators, and can do things differently and present specific ideas.

Applegate asked Jack Craig, Director of the Fernald Area Office, if there was any new budget information to share with the group. Craig replied that no new information had been received other than the Senate had approved a recision of $100 million from the Department of Energy's Fiscal Year 1995 budget and the House of Representatives had approved a $145 million recision. He said that he had no idea how Fernald would be affected by this situation, and that he also hadn't talked with the regulators about it yet.

Gene Jablonowski, U.S. EPA, said that EPA is not in a position to talk yet about what it sees, other than about the site's Remedial

Investigation/Feasibility Study (RI/FS) documents. He said that the Amended Consent Agreement doesn't set due dates, but does establish process and sequencing. Applegate asked him to explain the system after the Record of Decision (ROD) is issued. Jablonowski explained the RI/FS document submittal process, and added that the Remedial Action (RA) documents should have costs and timelines included. He stated that the costs and timelines are somewhat covered in the RODs before the Remedial Design/Remedial Action (RD/RA) documents. He said the RAs and workplans associated with these documents establish firm dates which the U.S. EPA fully expects DOE to abide by.

Tom Schneider, Ohio EPA, added that the dates in these documents become enforceable against DOE when the documents are accepted and approved by the EPAs. Darryl Huff asked if the RODs can be changed? Jablonowski responded that RODs can be amended by the regulators, DOE, and the public. Schneider stated that Ohio EPA agrees with the position of U.S. EPA that the Amended Consent Agreement dictates the site progress.

Doug Sarno explained the ten year unconstrained timeline for cleanup and funding, pointing out the shortfalls in the funding on the chart he created. (Chart is attached to the minutes.) Craig stated that Quality Assurance is not in any particular department, and the breakdown on the chart can be somewhat misleading. Lisa Crawford questioned why the cost didn't drop in later years? Craig said it should, but that Mike Yates, FERMCO, can explain this better. Yates and Sarno will meet later for an explanation.

Sarno stated that there are items that can be cut that won't affect the cleanup, according to the regulators, so efficiency will or should prevent cleanup timelines from being affected. He suggested that Fernald should be managed like a private sector site.

Pam Dunn asked how much of the costs on the chart were for processes and DOE orders left over from the Cold War? Craig responded that he couldn't think of any, but would get back to her.

Gene Willeke said that he had some comments regarding last month's chart. He said legacy waste costs and the organization of the OUs are a concern to him. He felt that the Task Force should identify landlord costs and discuss how those can be reduced.

Applegate stated that there are a number of costs not addressed by the Amended Consent Agreement, like the cost of staying in compliance

with the agreement, and the cost of security for the Uranium and Special Nuclear Materials still on site. Sarno stated that some of the decisions regarding those items were above the Fernald level, as far as decisionmaking goes. The items may be removed, as far as we know, but no one at Headquarters has taken charge of them yet. He suggested that the Task Force could make a strong recommendation for DOE to focus on someone taking charge of making the decision about Uranium and Special Nuclear Materials. Willeke agreed with the suggestion and said that other Site Specific Advisory Boards (SSABs) might be utilized for support.

Lisa Crawford asked if the Special Nuclear Materials are sent off the site, does that mean less compliance costs and more money for cleanup? Craig answered a firm yes. Dunn spoke up about the fact that Oak Ridge would probably take most of the materials, and that Oak Ridge doesn't have an SSAB in place yet. Craig answered that the Task Force shouldn't wait for the Oak Ridge SSAB.

Sarno said that the recommendation by the Task Force doesn't have to be presented in a combative way. Crawford agreed and suggested a strong letter with actual numbers. Sarno also suggested that the Task Force make clear that its belief that cleanup can be done differently. DOE should treat Fernald like a true cleanup site. He said the Task Force could recommend changes in how the cleanup is viewed and how the money is spent.

Applegate suggested that base services costs could be potentially cut, and asked if anyone knew how much Safe Shutdown would save? Craig responded that DOE did have the numbers, but he couldn't state them off the top of his head. He said DOE-FN could examine these costs further, such as the offices in the buildings and the costs of services to them, etc. Willeke said that the OU3 buildings could go down any time.

A discussion followed about management costs not decreasing in the later years of the ten year schedule. Sarno said that he was not vouching for the numbers he used on the chart, and that this was the most recent information available. Craig said that the costs should drop after the year 2001. He said DOE is looking for offsite office space so they can shut down the site buildings, but they still need office space presently. Rentschler asked if DOE was spending more money to save money? Craig said the answer is no because there isn't more money.

Marvin Clawson asked if Superfund was just more bureaucracy? A discussion followed about the process of Superfund. It was observed that the rules inhibit progress somewhat, but they're not going away. The National Priorities List will stick around, RCRA overlaps with CERCLA and DOE orders, and the delays continue in DOE-HQ approving documents. Dunn stated that Superfund is the driving force that makes DOE clean up Fernald.

Applegate asked if there were any other general overhead type costs that the Task Force could look at cutting, such as Legacy Wastes and Thorium? Schneider said that the Task Force should be careful how it defines Legacy Wastes. He said that not all RCRA waste is Legacy Wastes and that it won't be off the site by 1996. Dunn suggested that DOE lawyers should be asked to find out where the overlap is regarding compliance with the different environmental laws.

Applegate suggested general working efficiencies as another item of concern. A discussion followed on how Fernald could work smarter. The work force restructuring was mentioned and the voluntary reduction in force. Craig stated that the reduction in staff will continue over time. Crawford said that it was important that the work force actually does drop in numbers. Applegate agreed and asked for specific numbers. Jablonowski stated that maybe the figures on how many people are needed to do specific work could be added to the RODs and RAs.

Lisa Crawford asked if a workshop could be given on the ten year plan that had been hand out previously by Gary Stegner, DOE-FN. She would like the $3 billion savings explained thoroughly. Rentschler asked if DOE's future plans and costs could be explained in simple terms. Craig said that DOE was preparing something presently.

3. Opportunity for Public Participation:

Applegate asked for public comments. Don Thiem, Ross Township Trustee, directed a question to Ohio EPA which Tom Schneider answered.

No further comments were made at this time.

4. Discuss Recommendation Issue Items:

Applegate asked if anyone had suggestions to list for creating the priorities and schedule recommendation? A discussion followed with the members of the Task Force offering suggestions for the recommendation and raising questions that they would like to have answered. The list reads as follows:

Questions:

- 10 year schedule - why the lull in '98 - '99?
- Measures of efficiency?
- Adequacy of staffing levels?

Statement:

Fernald is different - Model for cleanup - Change the System (exist to go out of business)

Recommendation suggestions:

- Special Nuclear Materials
- Safe Shutdown
- Legacy Waste
- Simplify overlapping regulations
- Staffing levels

Applegate summarized the discussion by stating that there are three different types of issues: 1) DOE Headquarters, 2) DOE Fernald, and 3) information needs. He asked Sarno to write the recommendation for review by the Task Force before the next meeting. Sarno said he would have a draft recommendation ready by early next week.

5. Materials Distributed at Meeting (Attached):

- Agenda
- Chart - Funding Requirements vs. Expected Funding for Unconstrained 10 Year Remediation Scenario
- Table - Comparison of Criteria to Remedial Actions

6. Next Meeting:

The next meeting of the full Task Force is the regularly scheduled monthly meeting on April 8, 1995, at 8:30 a.m., at the Joint Information Center in Fairfield, Ohio.

The meeting adjourned at 6:24 p.m.

Approved May 6, 1995

I certify that these minutes are an accurate account of the March 28, 1995, meeting of the Fernald Citizens Task Force.

5/18/95

John S. Applegate, Chair, Date
Fernald Citizens Task Force

5/5/95

Ken Morgan Date
Deputy Designated Federal Official

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

Minutes from April 8, 1995 Meeting

The Fernald Citizens Task Force met from 8:40 a.m. until 12:23 p.m. on April 8, 1995, at the Joint Information Center, 6025 Dixie Highway, Fairfield, Ohio. The meeting, which was advertised in local newspapers, was open to the public; time was reserved for accepting public comments.

Members Present:
John Applegate
Jack Craig, DOE (for Phil Hamric, DOE)
Pam Dunn
Guy Guckenberger
Darryl Huff
Gene Jablonowski, U.S. EPA
Graham Mitchell, Ohio EPA
Jerry Monahan
Tom Rentschler
Bob Tabor
Thomas Wagner
Gene Willeke

Members Absent:
James Bierer
Marvin Clawson
Lisa Crawford
Constance Fox
Phil Hamric, DOE
Warren Strunk

Deputy Designated Federal Official Attending:
Ken Morgan, DOE Ohio Field Office

Task Force Staff:
Doug Sarno, consultant
Judy Armstrong
Ruth Triplett
Chris Varner

P. O. Box 544 Ross, Ohio 45061 513·648·6478

About 15 spectators, including members of the public and representatives from FRESH, DOE, U.S. EPA, Ohio EPA, the Ohio Department of Health, the Agency for Toxic Substances and Disease Registry, and FERMCO.

1. Call to Order and Approval of Minutes:

Chair John Applegate called the meeting to order and extended sympathy to Jim Bierer, who was absent, and his family for the death of his mother-in-law. He announced that Connie Fox and Lisa Crawford were out of town.

The draft minutes of the March 18, 1995, meeting of the Task Force were approved without amendment.

2. Remarks:

Applegate said that, after today's decision on priorities, there remain two items to discuss, a future use recommendation and the path forward. He said that the May meeting agenda had been left deliberately flexible to allow the opportunity to tie up loose ends, and to talk about production and approval of the final report. He asked the members to think about these items and to submit their ideas to him as soon as possible.

Applegate announced that the Baseline Environmental Management Report (BEMR) had been released by DOE Headquarters. He felt that clarification of some possible misconceptions was in order. The BEMR is NOT a proposal for the extent of DOE cleanup, but is an attempt to get a handle on the expected total cost of cleanup. He said it was more an estimate than a plan and referred to Bob Tabor, who agreed with this assessment. Tabor said that he understood the BEMR to be a comprehensive cost estimate for all sites, not a budgetary document to be used as such.

Ken Morgan said that the BEMR was a framework or guidance, a way of comparing the costs using different levels of cleanup as the variables such as doing nothing versus baseline costs, faster or slower cleanup, cleaner or not so clean, etc.

Applegate then opened the floor to Darryl Huff who asked to change two words in the second paragraph of the "Recommendation For An On-Site Disposal Facility At Fernald" document. Huff said that the

sentence is misleading when it states "All members of the Task Force live and work in communities that are impacted by the decisions made at Fernald, and eight out of 14 live and work in the direct vicinity of the site." He thought the word AND should be replaced by the word OR in both places of the sentence.

Guy Guckenberger moved to reword the recommendation for the clarity that Huff suggested, and several Task Force members seconded the motion. The Task Force voted unanimously to change the sentence.

3. Site Priorities Draft Recommendation Discussion:

Applegate shifted the discussion to cleanup priorities, calling attention to the handouts of the draft priorities recommendation document. (The Task Force had received a draft of the document in the mail and was asked to send comments to Doug Sarno before this meeting. One version of the draft document showed the original draft document with the changes marked, and the other was a single spaced version with everyone's comments incorporated into the text.) Applegate recognized FERMCO Executive Vice President, Mike Yates, who was attending the meeting to answer budget questions.

To start the discussion, Doug Sarno reviewed graphs showing the 7 and 10 year budget scenarios. The draft recommendation calls for accelerated remediation under the 7 year scenario and recommends actions to make this scenario work. Sarno pointed out that both the 7 and 10 year plans reduce overall costs and are obviously faster than the 25 year scenario.

Pam Dunn asked if this scenario included 3 shifts a day for 7 years? Yates answered that only rarely are 3 shifts needed other than for the vitrification plant. He also said the 7 year scenario included the cost of the groundwater cleanup within those 7 years.

Yates stated that the 7 year plan has some time risks. The schedule is very tight, especially with planning work. Also, the requirement to conduct Operational Readiness Reviews (ORR) in accordance with DOE Orders will likely slow things down. FERMCO has not yet had to conduct an ORR.

Jerry Monahan asked what recommendations the Task Force would have to make with respect to DOE orders in order to implement the 7 year plan.

Sarno stated that the Task Force recommendation is to waive redundant or inapplicable DOE requirements that overlap with state and federal regulations, and don't apply to this particular cleanup. He said that the regulations under discussion apply more to all the paperwork that has to be done.

Graham Mitchell said that the DOE orders keep the cleanup from proceeding at the pace it should. He said that many of the states are asking DOE to evaluate the orders and regulations that slow down the process.

Applegate asked everyone to read the draft recommendation before the discussion continued. Guckenberger then suggested that the substantive changes be reviewed.

A general discussion followed with much word-smithing in each section of the recommendation. The sections are as follows:

- Special Nuclear Materials - expedient removal from Fernald
- Legacy Wastes - expedient removal from Fernald
- Safe Shut Down - shift the culture from operations to environmental remediation
- Ongoing Maintenance Activities - reduce these to a minimum to cut costs
- Overlapping Regulations - waive DOE requirements that overlap with state and federal regulations
- Budgeting for the Long Haul - under current budget constraints - 25 years escalated cost - $5.7 billion --- without constraints - 7 years escalated cost - $2.7 billion

In regard to the safe shutdown section, Mike Yates said that Plant 4 was shut down last week and the implosion would occur in approximately one year.

Willeke turned everyone's attention to the suggestion that Doug Sarno made that current money is being spent on maintenance of buildings rather than being focused on cleanup. It was suggested to use explicit language when stating "change the culture" from an operational facility to a remediation facility.

Tom Rentschler suggested that the recommendation go to Secretary O'Leary. Applegate agreed that it was time to address the recommendation to the people who make specific decisions for the site.

Sarno said that the rationale behind choosing the 7 year scenario as the basis for the formal recommendation is to send a strong message to DOE Headquarters that the time is right for action.

Rentschler said that he wanted to add the language "a window of opportunity exists for a win-win situation for Fernald and DOE." Everyone agreed that conditions are right for Fernald to become a prototype for successful DOE remediation. Specifically, Fernald's RI/FS studies are nearing completion and the Fernald project is a manageable size.

After more rewording and discussion, Rentschler made a motion to adopt the recommendation as amended. The Task Force unanimously approved the amended recommendation, and voted to transmit the recommendation to Secretary O'Leary and Assistant Secretary Grumbly personally with a request for a response on a specific date.

4. Discussion on Future Use Recommendation:

Applegate guided the meeting to the future use issues with a recap of past Task Force decisions. He stated that two constraints on future use previously developed by the Task Force are no new agricultural use, no residential use, and the existence of a disposal facility. He said that there was no new information other than the second opinion report on the risk of grazing at the site that the Task Force had requested from the Georgetown Risk Group in Washington, D.C..

Jerry Monahan asked if the report should be interpreted that the study by DOE was not very good? Doug Sarno said that the report basically said that DOE results appeared adequate to show little risk from grazing, but that more data would be useful.

Applegate asked the Task Force if the release of property that is not part of the cell or the buffer zone were a good idea.

With that question in mind, Sarno recapped what the Task Force had decided previously, 50 ppm total uranium in soils for off-site property and 100 ppm total uranium in soils for on-site property, and no new agriculture use and no residential use on site. He also reviewed the

Ohio solid waste landfill siting requirements which require that landfills be 300 feet from the property line, and 1000 feet from the nearest domicile or residence.

Tabor asked what happens inside the buffer zone? Sarno answered that it could be used for something, explaining that there is no danger posed by the cell. The problem is that people could hurt the cell by being on the cell cover itself.

Pam Dunn asked if future use was already dictated if DOE maintains ownership of the land areas for OU1, OU2, and OU4? Applegate answered that federal ownership does not preclude other uses.

Tom Wagner asked Sarno to show the location of the cell again, and if that location complied with the 1000 feet requirement, and what would happen if someone would build within the 1000 feet? Sarno said that they were complying, but future development could not be controlled for property off site.

Darryl Huff stated that he thought the cell location was the worst place on the site to put the cell because of its visibility to the community. Both Graham Mitchell and Gene Jablonowski stated that it was the best geology for the cell and that safety couldn't be sacrificed. However, every effort will be made to reduce the visual impact of the facility, and the site's neighbors will have the opportunity to be directly involved in design decisions.

Sarno explained the hydrogeology of the site and why the location had to be the North East corner. Jablonowski said that considering the slope of the North East corner location, the cell design should blend in with the natural landscape.

There was a general discussion on the disposal cell location and the aesthetic possibilities. Doug Sarno suggested that the cell design is an area where the Task Force and the public could have input and influence decisions.

Tom Szymoniak, a FERMCO consultant, shared information about the study he is doing on the plants and grasses that grow in this area that might be planted on the disposal facility to be compatible with native vegetation.

Larissa Gilham, Ohio Department of Health, said that the State of Ohio legislature is currently considering a bill regarding low level waste

disposal facilities in Ohio, which also discusses access controls and environmental monitoring zones.

Applegate suggested that this discussion was more appropriate during the Remedial Design/Remedial Action (RD/RA) stage of cleanup, and shifted the discussion to the effect of the buffer zone on future land use. Sarno said that the land outside of the cell area is available for any kind of use, except the previous decided residential and agriculture restrictions. He said the Task Force could now be more specific on future land use inside the buffer zone and outside the cell area.

Gene Willeke suggested that the only real reason for the buffer zone is to protect the cell itself, and that 300 feet was more than adequate.

Sarno said that beyond this distance, land could be available for other uses with more restrictive uses with closer proximity to the cell. Applegate agreed, saying that some use should be allowed, otherwise there was no point in spending huge sums of money for remediation.

Pam Dunn suggested that Native American remains found should be considered, and a place for them should be made available on the site.

Guy Guckenberger said he had a problem with going too far with land use decisions without more input from local real estate people about the sewage and water capabilities of the site. Gene Willeke and Tom Wagner agreed. Wagner brought up that the area around Fernald will probably develop significantly in the next 25 years, and that the land could potentially be used in the future.

Gene Jablonowski suggested that the Task Force recommend what can't be done rather than what will be done, which Applegate said is in keeping with the Task Force's idea that specific economic reuse and development plans are for another day and perhaps another group.

Applegate asked if there were any comments from the audience? When there were no further comments, he recapped the discussion stating that progress had been made on the kind of recommendation to make. Future use recommendations would focus on concentric uses allowing greater use farther from the cell. The Issues regarding specific land use decisions were better made by some future group.

Gene Willeke said that the transitional use issue still needed to be discussed, such as grazing during construction, particularly in light of the accelerated schedule.

Guckenberger stated, and Task Force members acknowledged, that it would be best for members of the local community (i.e., Ross, Morgan and Crosby Township residents) to confer with DOE about specific future uses of the site.

It was also decided that federal ownership of Fernald is what everyone wants at this point in time. Willeke stated that this decision could change, and possibly should change, as future generations re-evaluate the circumstances.

Referring to the May 6, meeting, Applegate said that the Task Force needs to talk about the future use recommendation, to organize the final report, and to talk about the assumptions that went into the ground water block modelling (Gene Willeke's committee). He said that the May meeting is the last chance for new information, and June and July will be reserved for the final report. He stated that he would like to have a firm enough draft of the final report by the end of June to allow comments by other stakeholders.

A request was made by Graham Mitchell, Ohio EPA, to ask DOE and FERMCO to create artists renderings or computer generated graphics of alternative disposal facility designs so Task Force members and local residents could see what the facility might look like. Pictures of UMTRA Project sites where disposal facilities were contoured to match the surrounding terrain were also requested.

5. Opportunity for Public Participation:

Applegate asked for public comments. No further comments were made.

6. Materials Distributed at Meeting (Attached):

- 1995 Tool Box additional pages
- Revised Agenda
- Chart - Seven year funding scenario
- Chart - Ten year funding Scenario
- Proposed word change for page 1 of Recommendation For An On-Site Disposal Facility
- Markup Draft of Recommendation To Establish Site Priorities And Accelerate Remediation At Fernald 4/7/95

- Draft Recommendation To Establish Site Priorities And Accelerate Remediation At Fernald 4/7/95
- Future Use Issues, 4/8/95
- Memorandum on Grazing Risks
- Draft Final Report Outline, 4/6/95

7. Next Meeting:

The next meeting of the full Task Force is the regularly scheduled monthly meeting on May 6, 1995, at 8:30 a.m., at the Joint Information Center in Fairfield, Ohio.

The meeting adjourned at 12:23 p.m.

Approved May 6, 1995

I certify that these minutes are an accurate account of the April 8, 1995, meeting of the Fernald Citizens Task Force.

5/12/95

John S. Applegate, Chair, Date
Fernald Citizens Task Force

5/9/95

Ken Morgan Date
Deputy Designated Federal Official

RECOMMENDATIONS REGARDING FUTURE USE OF FERNALD PROPERTY

One important component of the mission of the Fernald Citizens Task Force is to make recommendations for the future use of the Fernald property. Understanding future use as a goal has been instrumental in focusing our deliberations and our recommendations on cleanup levels, waste disposition, and site priorities are all intrinsically tied to our vision for the future of the Fernald property and its ultimate impact on surrounding communities.

It was never the intention of the Fernald Citizens Task Force to identify specific uses of the land at Fernald following remediation. We believe that those decisions are best left to the 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 decisionmaking regarding specific future use and ownership of the property. Moreover, these specific decisions will be better made close to the time when actual use is being contemplated as actual reuse of any Fernald property is at least a decade away. We do, however, believe that it is our responsibility to outline the overall plan for bringing Fernald back to productive and safe uses, and to identify the general categories of use that should not be provided for as a result of remediation.

Conceptually, we divide 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, we offer the following recommendations:

- 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 to protect the cover system of the disposal facility and not due to 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.