

**BATTELLE  
COLUMBUS  
LABORATORIES  
DECOMMISSIONING  
PROJECT**

FEDERAL FACILITIES COMPLIANCE ACT

**DRAFT  
SITE TREATMENT PLAN**

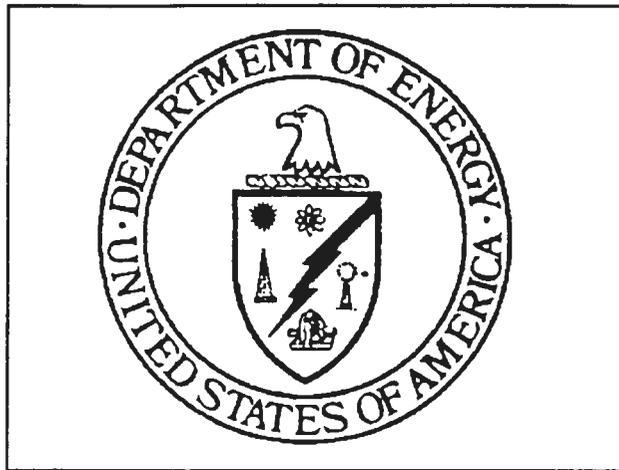
AUGUST 1994



**Battelle**

... Putting Technology To Work





**U.S. DEPARTMENT OF ENERGY  
BATTELLE COLUMBUS LABORATORIES  
DECOMMISSIONING PROJECT**

**DRAFT SITE TREATMENT PLAN**

**BACKGROUND VOLUME**

**August 1994**

**BATTELLE COLUMBUS LABORATORIES  
DECOMMISSIONING PROJECT  
DRAFT SITE TREATMENT PLAN**

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## ACRONYMS

As Low As Reasonably Achievable . . . . .	ALARA
Battelle Columbus Operations . . . . .	BCO
Battelle Columbus Laboratories Decommissioning Project . . . . .	BCLDP
Battelle Memorial Institute . . . . .	BMI
Decontamination and Decommissioning . . . . .	D&D
Draft Site Treatment Plan . . . . .	DSTP
Environmental Restoration . . . . .	ER
Environmental Management . . . . .	EM
Environmental Management Advisory Board . . . . .	EMAB
Environmental Assessment . . . . .	EA
Federal Facility Compliance Act . . . . .	FFCA
Land Disposal Restriction . . . . .	LDR
Low Level Waste . . . . .	LLW
Mixed Waste Inventory Report . . . . .	MWIR
National Environmental Policy Act . . . . .	NEPA
National Governor's Association . . . . .	NGA
Oak Ridge . . . . .	OR
Ohio Environmental Protection Agency . . . . .	OEPA
Programmatic Environmental Impact Statement . . . . .	PEIS
Resource Conservation and Recovery Act . . . . .	RCRA
Richland . . . . .	RL
Savannah River . . . . .	SR
Scientific Ecology Group . . . . .	SEG
Site Treatment Plan . . . . .	STP
Solid Waste Operations Complex . . . . .	SWOC
Transuranic . . . . .	TRU
U.S. Department of Energy . . . . .	DOE
U.S. Environmental Protection Agency . . . . .	EPA
Waste Isolation Pilot Project . . . . .	WIPP
Westinghouse Hanford Company . . . . .	WHC

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## 1.0 INTRODUCTION

### 1.1 Purpose and Scope

The Department of Energy (DOE) is required by Section 3021(b) of the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facility Compliance Act (the Act), to prepare plans describing the development of treatment capacities and technologies for treating mixed waste. The Act requires sites treatment plans (STPs) to be developed for each site at which DOE generates or stores mixed waste. At the Battelle Columbus Laboratories, the Department of Energy has accepted the obligation to remove radioactive contamination which occurred during 50 years of research activities for the Federal government. All radioactive waste generated during the course of decontamination, including radioactive mixed waste, is the responsibility of the DOE. The Battelle Columbus Laboratories Decommissioning Project's (BCLDP) *Draft Site Treatment Plan (DSTP)* is the second preliminary version of the plan required by the Act and is being provided to the Ohio Environmental Protection Agency (OEPA), the U.S. Environmental Protection Agency (EPA), and others for review. A list of the other DOE sites preparing *Draft Site Treatment Plans* is included in Appendix B of this document.

STPs are required for facilities at which DOE generates or stores mixed waste, defined by the FFCAct as waste containing both a hazardous waste subject to the Resource Conservation and Recovery Act, and a source, special nuclear or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 *et seq.*). On April 6, 1993, DOE published a *Federal Register* notice (58 FR 17875) describing its proposed process for developing the STP in three phases, including a *Conceptual STP*, a *Draft STP*, and a *Final Proposed STP*. The purpose of this *Draft Plan* is to identify the currently preferred options for treating the mixed waste at the BCLDP or for developing treatment technologies where technologies do not exist or need modification. The *Draft Plan* reflects the site-specific preferred options, developed with the State's input and based on existing available information. The options reflect the "bottoms-up" approach and have not been completely evaluated for impacts on other DOE sites and impacts to the overall DOE program. Therefore, changes in the preferred option and associated schedules are possible between the *Draft Plan*, the *Final Proposed Plan*, and final approval and issuance of the Order as evaluation of DOE-wide impacts and State-to-State discussions progress.

To the extent possible, the *Draft Plan* identifies specific treatment facilities for treating the mixed waste and proposes schedules as set forth in the FFCAct. When not possible, schedules for alternative activities such as waste characterization and technology assessment are provided as appropriate. All schedule information presented is preliminary and is subject to change. For new facilities, the schedule is heavily dependent upon decisions made during the design phase and is contingent on

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funding availability. Assumptions and professional judgments related to the type of treatment technology, location of the treatment facility, contracting mechanism, project approval process, cost, etc. were used to develop the estimated schedule. Any variation from these assumptions will impact the estimated schedule. In addition, cost data used in developing options and schedules and provided in the *Draft Plan* are planning estimates only and do not reflect a commitment of budgetary resources.

Emerging or new technologies not yet considered may be identified in the future that provide opportunities to manage waste more safely, effectively, and at lower cost than the current technologies identified in the *Draft Plan*. Working closely with regulators and other interested parties during the implementation of the *Draft Plan*, DOE will continue to evaluate and develop technologies that offer potential advantages in the areas of public acceptance, risk abatement, and performance and life cycle cost. Should more promising technologies be identified, DOE may request a modification of its treatment plan in accordance with provisions of the final *Site Treatment Plan* and/or the Order.

The DSTP includes the following information:

- The DSTP addresses mixed waste, which is defined by the Act as waste containing both a hazardous waste subject to RCRA, and source, special nuclear or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).
- The DSTP presents preliminary information on the treatment technology and capacity needs for the BCLDP's mixed waste. It also describes the lack of any existing mixed waste treatment capacity at the site.
- The DSTP provides a comparative analysis for possible options for treatment and selection of a preferred option to treat the discrete mixed waste streams and describes the actions required to characterize, package and ship waste to an off-site facility as well as economic and other implication associated with the options.
- The BCLDP does not anticipate generation of mixed wastes that require further characterization or for which the appropriate technology has not yet been identified.

The DSTPs are intended to provide a starting point for capacity planning. Once capacity needs are clarified, the DOE and the States can then establish, on an equitable basis through negotiation, where specific treatment facilities should be sited. While the BCLDP has completed the analysis as completely and with as much technical accuracy as possible, there are some limitations in the analysis because of the uncertainties associated with environmental restoration projects.

## 1.2 Site History and Mission

### 1.2.1 Site History

On April 16, 1943, Battelle Memorial Institute (BMI) entered into Contract No. W-7405-ENG-92 with the Manhattan Engineer District to perform atomic energy research and development activities. Since that time, Battelle has continuously performed research and development work under the contract at its facilities for the DOE and its predecessor agencies. The Battelle facilities are located at BMI's Battelle Columbus Laboratories King Avenue site in Columbus, Ohio, and West Jefferson site near West Jefferson, Ohio. Fifteen buildings or portions thereof, and related external areas, that became radioactively contaminated as a result of work performed under the government contract are to be decontaminated and released to Battelle, without radiological restrictions, as part of the government's obligation under the contract. The buildings are owned by BMI which is a charitable trust under provisions in Ohio law.

### 1.2.2 Site Description

Of the 15 contaminated buildings, nine are located in Columbus, Ohio (Figure 1-1), and the remaining six buildings are located at the West Jefferson site (Figure 1-2), which is approximately 15 miles west of Columbus. The type and extent of contamination varies from building to building, depending on the nature of nuclear research historically performed. Most of the contamination at the King Avenue site, for example, is due to uranium, thorium and associated daughter products. These radioactively contaminated research facilities are located in older buildings that comprise part of the main Battelle campus across the street from Ohio State University. The immediate contiguous area can be characterized as a moderate density residential area. A river, which passes through the city, and several commercial and industrial areas are within one-half mile of the King Avenue site. The West Jefferson site consists of contaminated facilities similar to the King Avenue site, as well as a building containing a number of hot cells that are highly contaminated. The bulk of transuranic (TRU), mixed fission products, and activation product contamination is confined to the Nuclear Sciences Area of the West Jefferson site. The West Jefferson site lies in a rural, agricultural setting in eastern Madison County. The nearest residence is over one half mile from the site boundary.

## Battelle Columbus Laboratories Decommissioning Project King Avenue Campus



Figure 1-1. Building Numbers and Locations at the King Avenue Site

## Battelle Columbus Laboratories Decommissioning Project West Jefferson North Campus



Figure 1-2. Building Numbers and Locations at the West Jefferson Site

### 1.2.3 Project Mission

DOE intends that Battelle's facilities be returned to a condition suitable for use without radiological restrictions. Actual future use of these facilities will be determined by Battelle. Battelle must also demonstrate compliance with NRC decommissioning requirements. Residual radioactivity will be kept as low as reasonably achievable (ALARA), consistent with the limits established in DOE Order 5400.5 and NRC Regulatory Guide 1.86. The objectives associated with decontamination and decommissioning (D&D) also include to:

- Identify all areas requiring control and cleanup by conducting pre- and post-D&D radiological characterization surveys;
- Maintain facilities awaiting decontamination in a manner that limits worker, public and environmental exposure to potential hazards;
- Prepare a detailed design and schedule for specific building campaigns;
- Decontaminate laboratory equipment, interior building surfaces, and any adjacent areas of soil contamination using available technology in the most cost-effective manner possible;
- Segregate and minimize low-level radioactive waste resulting from D&D activities to reduce waste shipment and disposal costs, and shipping to an approved offsite storage/disposal facility; and
- Receive an independent verification survey for all building decontaminations, and obtain NRC and DOE management certification of completed decontamination.

There are no major environmental issues regarding the BCLDP. Battelle, as a private, nongovernmental entity, is responsible for maintaining its operations in full compliance with all applicable health, safety, and environmental laws and regulations.

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All radioactive waste is from surveillance and maintenance, characterization, health physics, material removal, decontamination and waste management activities. The majority (approximately 95 percent by volume) of the BCLDP generated and stored waste is low level waste (LLW). TRU waste accounts for about 5 percent by volume. A small amount (less than 5 percent) of radioactive mixed waste is anticipated.

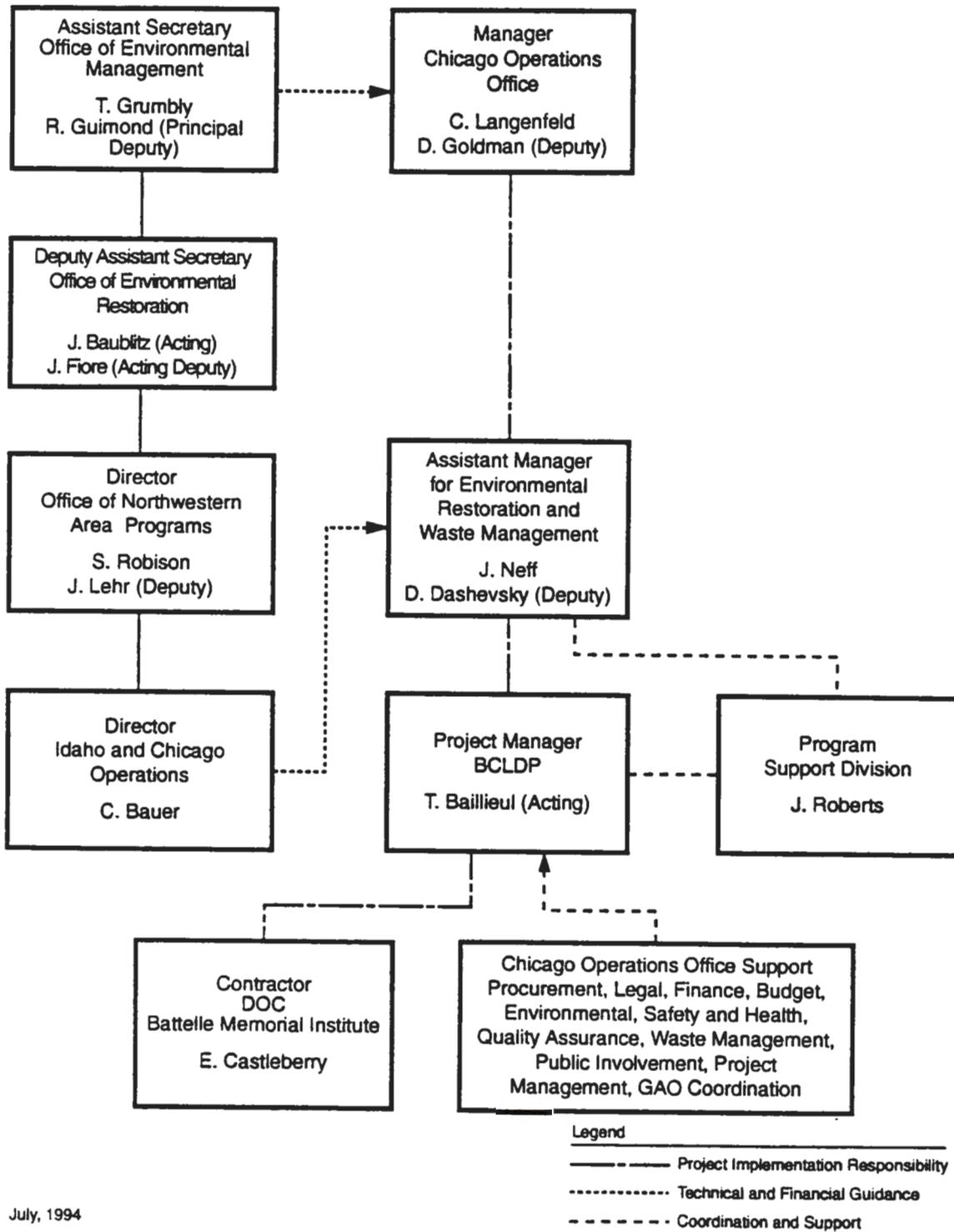
The Department is responsible for the handling and disposal of decommissioning wastes that are contaminated with radioactivity, including: high volume/low activity wastes such as building rubble; contaminated laboratory equipment; and protective clothing, high efficiency particulate air filters, and cleaning materials with residual low-level radioactivity. In addition, cleanup of the hot cell facility will result in both high- and low-activity TRU wastes. Hazardous wastes that have no radioactivity above established release limits are the responsibility of Battelle. All radioactive and radioactive mixed-wastes are to be shipped to an offsite, DOE-approved facility for treatment, storage or disposal.

#### 1.2.4 Organization

The BCLDP will be managed by the DOE Chicago Operations Office under the charter established between the Chicago Operations Office and DOE Headquarters. Direction and funding for the project will be provided by DOE Headquarters Office of Environmental Restoration, under a Memorandum of Understanding between Headquarters and the Chicago Operations Office. DOE will be assisted in monitoring the cost and schedule activities by a Management Support Contractor. BMI will function as the Decommissioning Operations Contractor and will be responsible for all operations, including procurement of appropriate subcontractors when needed.

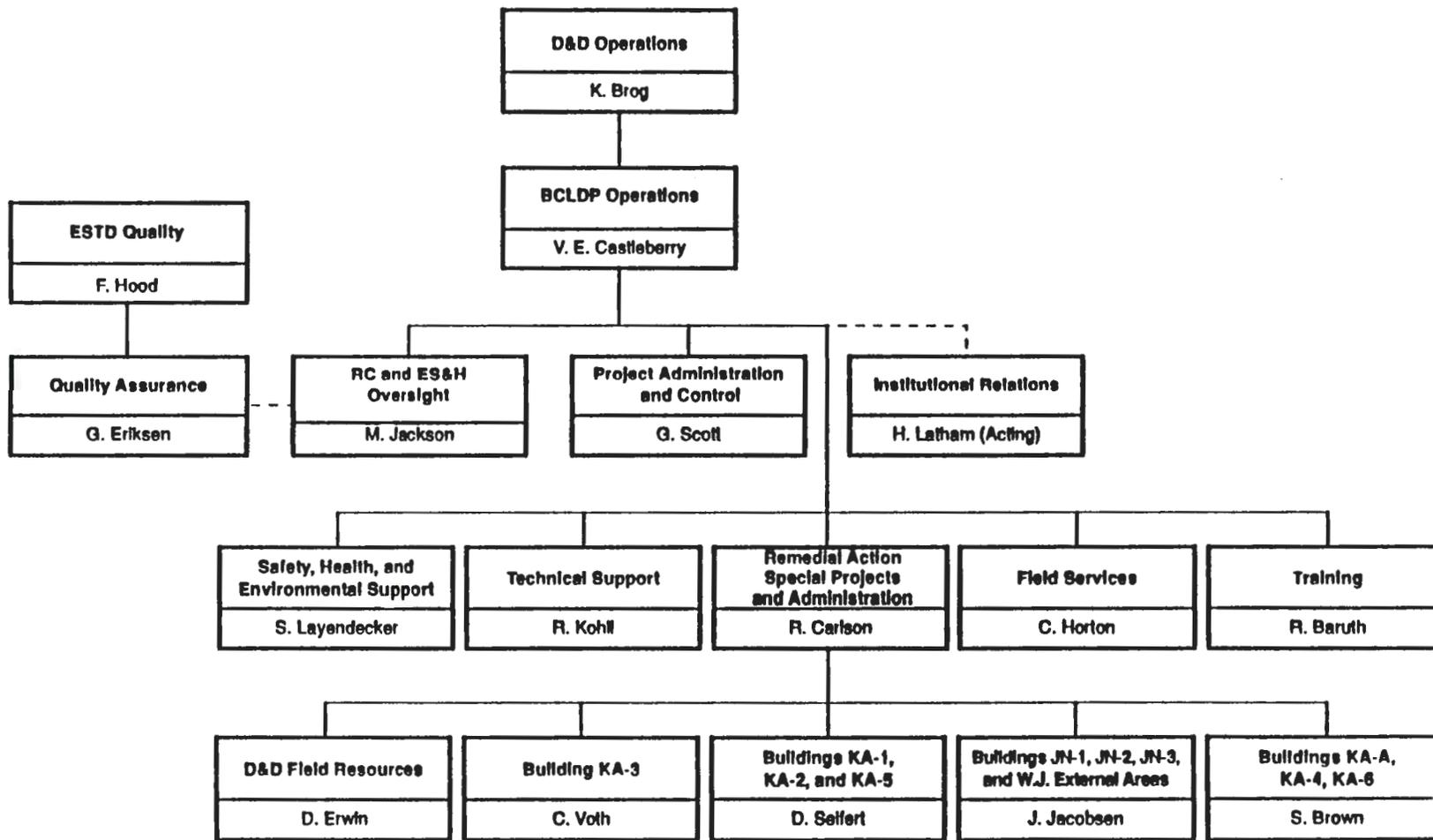
Figure 1-3 presents the DOE and contractor organizational relationships for the project. Figure 1-4 shows the organization of the Battelle Decontamination and Decommissioning Operations.

Figure 1-3 DOE-BCLDP Organization Chart



July, 1994

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BCLDP/4-16

Figure 1-4 Battelle Decontamination and Decommissioning Operations Organization

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### 1.2.5 Waste Management Operations

The BCLDP waste management group provides all administrative and operational directives and is responsible for all radioactive waste related activities. The BCLDP is responsible only for radioactive and radioactive mixed wastes generated by D&D activities. Hazardous wastes without collateral radioactivity are the responsibility of Battelle under all applicable regulations and its RCRA permit. Waste management activities include waste handling, monitoring, separation, segregation, minimization, characterization, sampling, classifying, certifying, packaging, and shipping of LLW, TRU waste, and low level radioactive mixed waste generated during all phases of the BCLDP. The BCLDP does not operate treatment, storage or disposal facilities.

The BCLDP maintains certification to ship low-level wastes to the Hanford site for treatment (as necessary), and disposal. Currently, the BCLDP is identified as a generator site for specific mixed-waste streams in Hanford's waste management plans. Waste accumulation, segregation, characterization, and packaging for shipment occurs on-site. The project also has received approval to utilize commercial facilities for its low-level (and certain low-level mixed) wastes. Since December 1993, the project has shipped over 22,000 cu ft of low-level radioactive waste to Envirocare of Utah. Additionally, the project has entered into a contract with the Scientific Ecology Group (SEG) at their Oak Ridge, TN facility for volume reduction services (incineration, supercompaction, and smelting) prior to final shipment of wastes to Hanford or Envirocare. Wastes are shipped in accordance with all applicable Department of Transportation regulations in order to assure public health and safety.

### 1.3 Framework For Developing DOE's Site Treatment Plans

The following paragraphs describe the relationships between the requirements that led to the process the DOE is following to prepare the site treatment plans. Key components of this regulatory framework are as follows.

**RCRA Land Disposal Restriction (LDR) requirements** mandate the treatment of hazardous waste (including the hazardous component of mixed waste) to certain standards before land disposal. The Land Disposal Restrictions prohibit storage of hazardous wastes that do not meet LDR standards (except for the purposes of accumulating sufficient quantities to facilitate proper recovery, treatment, or disposal of the waste. DOE is currently storing mixed waste at many of its sites, inconsistent with the LDR provisions, because treatment capacity for such wastes is not adequate or is simply unavailable at this time.

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**The Federal Facilities Compliance Act** signed on October 6, 1992 (P.L. 102-386) waives sovereign immunity for fines and penalties for RCRA violations at Federal facilities. However, a provision of the Act postpones that waiver for three years for mixed waste LDR storage prohibition violations at DOE sites. The Act requires that the DOE prepare site-specific treatment plans "for each facility at which the Department of Energy generates or stores mixed wastes". While the Battelle Columbus Laboratories are not a DOE Facility, the language of the Act has been interpreted to include the BCLDP because any mixed wastes generated during the clean-up of the site are the responsibility of the DOE.

The Act requires that the DOE submit the site-specific treatment plan to the appropriate state authority for "review and approval, modification, or disapproval." The plans will be approved by the State or EPA, after consultation with other affected States and consideration of public comment, and an order issued by the regulator requiring compliance with the plan. The DOE and the State of Ohio EPA have entered discussions on how to implement the required compliance order at a non-DOE site. The Act further provides that DOE will not be subject to fines and penalties for LDR storage violations as long as it is in compliance with the approved plan and order.

The Act specifies that the *Site Treatment Plans* must address all mixed waste at a site, regardless of the time of generation. For mixed waste for which identified treatment technologies exist, the plan must provide a schedule and milestones for constructing the necessary treatment capacity. For mixed waste without an identified existing treatment technology, the plan must include a schedule for identifying and developing technologies. The Act also requires the plan to address wastes where DOE proposes radionuclide separation and to provide an estimate of the volume of waste that would exist without such separation. Cost estimates and underlying assumptions must also be provided in the plan. Section 3021(b)(1)(C) of RCRA states that the plans may provide for centralized, regional, or on-site treatment of mixed waste, or any combination thereof. Section 3021(b)(2) requires the States to consider the need for regional treatment facilities in reviewing the plans.

**The "Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site"**, was published April 6, 1993, in the Federal Register (58 FR 17875). In the Notice, DOE committed to providing the site treatment plans in three phases: a "conceptual plan" completed in October 1993, a "draft plan" no later than August 1994, and a "final proposed plan" no later than February 1995. This process provides opportunity for early involvement by the States and other stakeholders to discuss technical and equity issues associated with the plans.

The *Conceptual Plan* submitted last October, focused on identifying treatment needs, capabilities, and options for treating the site's mixed waste. This *Draft Plan* focuses on identifying preferred options for treating the site's mixed wastes, wherever possible, as well as proposed schedules for constructing capacity. The options presented represent the site's best judgment of the available information and the States' preferences, and should be viewed as a starting point for discussion leading to the development of the *Final Proposed Plan*, which will be submitted to the regulatory agency for review and approval, approval with modification, or disapproval, as required by the Act. Each version of the *Plan* will reflect discussions among states, as well as site-specific input from the individual regulatory agency and other interested parties on the previous submittal. It is DOE's intent that this iterative process, with ample opportunity for input and discussion, will facilitate *approval of the Site Treatment Plan and issuance of the compliance order* required by the Act. DOE's goal is to have all plans and orders in place by October 1995.

#### 1.4 Draft Site Treatment Plan Organization

The BCLDP *Draft Plan* follows the same format as the *Draft Plans* of other DOE sites to facilitate cross-site comparisons. The *Draft Plan* is organized in two separate, but integrated volumes. The *Background Volume* provides the detailed discussion of the options: it contains information on the waste streams and treatability groups a particular treatment option or options would address and describes uncertainties associated with that option, as well as the budget status of the option, and regulator and stakeholder input. The *Plan Volume* is a short, focused document containing the preferred options and schedules for implementing the options and is intended to contain all the information required by the Act. The *Plan Volume* also contains a mechanism to implement the *Plan* and establish milestones that will be enforced by the Order. It references, but does not duplicate, details on the options in the *Background Volume*.

*Section 1.0 and 2.0* in both Volumes contain introductory material relevant to the purpose of the *Volume*. The *Background Volume* contains general information on the *Draft Plan* and the site in section 1.0 and provides top-level assumptions and a description of the process used to determine the preferred options in section 2.0.

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*Sections 1.0 and 2.0 of the Plan Volume* propose certain administrative provisions appropriate for implementing the *Plan* when finalized. These include provisions such as the approach to setting milestones, updates to the *Plan*, additions or removals to waste streams covered by the *Plan*, and funding considerations. These sections are intended to initiate discussion; it is expected that the specific language will be developed in conjunction with the regulatory agency and may eventually be expanded to address other administrative provisions or incorporated into a separate consent order.

*Sections 3.0 through 5.0* discuss the preferred option or options for low-level mixed waste, mixed transuranic waste, and mixed high-level waste, and each volume discusses the same waste streams and options in parallel sections. The Background Volume discusses the waste streams, technology needs, and uncertainties and other details on the preferred options. In the *Plan Volume*, the sections include proposed schedules, to the extent feasible, as required under the Act. The BCLDP expects to have low-level mixed waste, and possibly transuranic mixed wastes, but does not expect to have any high-level mixed waste.

*Section 3.0, "Low-Level Mixed Waste,"* is further organized according to the availability of capacity and treatment technology to treat the waste stream:

- 3.1 Waste Streams for Which Technology Exists
- 3.2 Waste Streams for Which Technology Exists But Needs Adaptation or for Which No Technology Exists
- 3.3 Mixed Waste Streams Requiring Further Characterization or For Which Technology Assessment Has Not Been Done.

The options identified are those that appear technically able to treat the waste, given the limits in the data on waste streams and facilities, particularly facilities in the early planning stages. The intention has been to narrow the field of feasible options.

*Sections 4.0 and 5.0* on TRU and high-level mixed wastes have similar formats. BCLDP generation of TRU mixed waste is possible but not anticipated based on current knowledge. Consequently, this section is abbreviated and will be expanded in a future version of the STP if necessary. BCLDP generation of high-level mixed waste is not expected.

*Section 6.0* describes wastes expected to be generated in the future within the next five year period, including environmental restoration wastes and wastes resulting from D&D activities.

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*Section 7.0* contains information regarding the future compliant storage of mixed wastes, such as RCRA Part B status and facility capacities both present and future.

*Section 8.0* describes a process being followed by DOE and the states for evaluating options for disposal of mixed waste treatment residues. Although the Act does not require disposal to be covered in the *Plans*, DOE is including disposal information to be responsive to the states' request that disposal be addressed and to support state discussions. *Section 8.0* identifies whether BCLDP is being further considered as a disposal site and explains why or why not.

## 1.5 Other Activities Related to DSTP Development

Other DOE efforts are closely linked to the STP development. These include the Interim Mixed Waste Inventory Report; activities conducted pursuant to the National Environmental Policy Act (NEPA); and compliance and cleanup agreements containing commitments relevant to treatment of mixed waste. The BCLDP is not a part of any current compliance agreement.

### 1.5.1 Mixed Waste Inventory Report

The **Mixed Waste Inventory Report**, required by the Act, provides an inventory of mixed waste currently stored or generated, or expected to be generated over the next five years, at each DOE site and an inventory of treatment capacities and technologies. The Interim Mixed Waste Inventory Report, published by DOE in April of 1993, provided information on a waste stream-by-waste stream basis for each DOE site that generates or stores mixed waste. DOE made updated waste stream and technology data available to the States and EPA in May 1994 and is preparing an *Updated Mixed Waste Inventory Summary*. The *Report* represents the best record of DOE's mixed waste inventory at the beginning of 1994. Since data is constantly being refined, waste stream information in BCLDP's *Draft Plan* may differ somewhat from the most recent *Inventory Report*. Any changes in waste stream information are explained in the *Background Volume*.

### 1.5.2 NEPA Activities

The BCLDP has an approved Environmental Assessment (EA) and Finding of No Significant Impact (dated June 1990). This EA provides an assessment of the impacts likely to result from waste characterization and packaging activities, as well as shipment by road, of project wastes to Hanford, Washington. This impact assessment has also been shown to bound impacts of shipping low-level wastes to commercial treatment and disposal facilities in Tennessee and Utah.

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### 1.5.3 The Programmatic Environmental Impact Statement for Environmental Restoration and Waste Management

DOE is preparing a Programmatic Environmental Impact Statement (PEIS) to support complex-wide integration of environmental management activities. The PEIS is intended to present to the public, states, EPA, and DOE an understanding of impacts to human health and the environment together with the costs associated with a wide range of alternative strategies for managing the DOE's environmental program. The PEIS is examining all waste types and activities, including mixed waste treatment also being addressed by the STP process.

Development of the Environmental Management (EM) PEIS is being coordinated with the preparation of the *Plans* under the Federal Facility Compliance Act. Information being generated to support the PEIS (e.g., hypothetical configurations, preliminary risk analyses, and cost studies) is shared with states to support *Plan* discussions. The Draft PEIS will not identify a preferred alternative (i.e., configuration) for mixed waste facilities since this will be evolving in consultation with the states and EPA through the STP process. However, the PEIS analyses of potential environmental risks and costs associated with a range of possible waste management configurations will provide valuable insight as the public, states, and DOE discuss using existing facilities and constructing new mixed waste facilities to treat mixed waste.

The Draft PEIS is scheduled to be published in the fourth quarter of 1994. The Final PEIS will be issued after a public comment period, at or near the time of submission of the Final Proposed STPs to the states or EPA for approval. To remain flexible and accommodate potential changes after submitting the Final STPs to the states and EPA, the PEIS Record of Decision for mixed waste will be issued after the appropriate regulatory agency approves the *Plans*.

## 2.0 METHODOLOGY

### 2.1 Assumptions

All sites used the following assumptions to provide for a degree of consistency in the preparation of the Draft STPs. The assumptions were developed as a part of the "*Draft Site Treatment Plan Development Framework*" and reflect review and comment from the states and EPA.

- 
- (1) High-level waste will continue to be managed according to current plans at each site (i.e., Hanford, West Valley, Savannah River, INEL). Primarily due to potential safety concerns, HLW will not be transported off-site except as a treated, stable waste that is ready for disposal. The DSTPs will not change management strategies for HLW.
  - (2) Regarding defense related TRU Waste, the DSTPs will reflect DOE's current strategy that the Waste Isolation Pilot Project (WIPP) will open and receive a No Migration Variance. The DSTPs should identify characterization, processing, and treatment of TRU waste to meet the WIPP Waste Acceptance Criteria. Consistent with this policy, treatment of mixed TRU waste to meet LDR standards will not be included in the DSTPs at this time.

However, the STPs will recognize that DOE's policy regarding WIPP is under review and may change in the future. As such, the STPs will provide for the flexibility to modify activities and milestones regarding TRU waste to reflect potential future changes in DOE policy.

- (3) DOE recognizes some states' preference for treatment of all wastes on-site. Where appropriate, existing on-site capacity will be utilized before new facilities are constructed. When on-site treatment or use of commercial or mobile facilities is not practicable, the use of existing off-site capacity, as well as the construction of new facilities, will be considered.
- (4) Sites in the same state will investigate the practicality of consolidated treatment facilities.
- (5) Mixed waste resulting from Environmental Restoration (ER) and D&D activities will be factored into planning activities and equity discussions, particularly where utilization of facilities identified in the DSTPs are being considered for managing ER and D&D waste.
- (6) The DSTP will address all wastes in the updated Mixed Waste Inventory Report (MWIR). Any changes/corrections to the MWIR waste stream and treatment facility information will be explained in the DSTP.
- (7) On a volume basis, the large majority of DOE's mixed waste will be treated on-site. Because of transportation concerns and costs, this generally includes process waste water, and some explosives and remote-handled wastes. In addition, other large volume waste streams will generally be treated on-site. At a minimum, Richland (RL), Oak Ridge (OR), Idaho (ID) and Savannah River (SR) will have on-site facilities to treat the majority of their wastes.

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- (8) The Environmental Management PEIS is being prepared in parallel with the development of the STPs. The DSTP process will provide information to the PEIS. Each site will prepare any necessary specific NEPA documentation before proceeding with a given project or facility ordered by the State of EPA as a result of the STP process.
  - (9) In support of DOE's cradle-to-grave waste management philosophy, disposal site location and criteria will be factored into state equity discussions, waste treatment facility designs, and the characteristics of the final waste forms.

## 2.2 Preferred Option Selection Process

DOE prepared several guidance documents to assist the sites in working through treatment identification and selection of preferred options. The overall process is contained in the *Draft Site Treatment Plan Development Framework* (DSTP Framework). The DSTP Framework establishes common terminology, objectives and values, planning assumptions, and a recommended methodology for narrowing the alternatives presented the Conceptual STP. The *Treatment Selection Guides* provides information on selecting among treatment options by comparing the options on fundamental criteria such as regulatory compliance, environmental health and safety, treatment effectiveness, implementability, stakeholder concerns, life-cycle costs, and technology development. The *Draft Site Treatment Plan Cost Information Guidance* provides a level of consistency in the cost information by providing common cost assumptions. Drafts of these and other technical assistance documents were provided to the states and their comments incorporated into the final revision.

Information concerning the treatment requirements of the waste and the treatment capabilities of the facility are provided in each case that an option is considered viable. Technical and non-technical issues associated with the choice of this option are identified. Primary issues such as characterization data that are not complete enough to determine the treatment requirements for a waste or lack of sufficient information concerning the Waste Acceptance Criteria for a facility are emphasized. Budgetary impacts of selecting an option are also included.

Battelle does not have the permitted capability of treating on-site the types and volumes of mixed wastes likely to be generated during decontamination. Building such a capability is inconsistent with DOE's goals of returning Battelle's facilities for use without radiological restriction in a timely fashion -- and at minimum cost. It is anticipated that D&D activities at the King Avenue facility will be completed by the fall of 1996. By this time, the majority of EM waste will have been generated and shipped off-site for treatment and disposal.

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### 2.3 Coordination with Regulatory Agencies and Other Stakeholders

The Act offers an opportunity for DOE and the state and EPA regulators who will be approving the *Plans* to work cooperatively toward defining mixed waste treatment plans. As requested by the states, DOE signed a cooperative agreement in August 1993 with the National Governor's Association (NGA) to facilitate the DOE-to-State interactions. To date, the NGA has sponsored several national meetings between DOE, the states, EPA, and the Indian Nations to discuss the development of the STPs. Two working groups have been formed to discuss technical issues related to treatment and disposal of mixed waste. NGA and the states have also reviewed and provided comment on the guidance documents discussed in *Section 2.2*.

The Act requires the states and EPA to provide for public involvement after the *Final Proposed Plans* are submitted in February 1995. It is the intent of the Department and the Ohio EPA to involve the public at an early stage in the development of the site treatment plans. To the extent possible, public interactions related to mixed waste issues will be incorporated into existing public involvement programs at each DOE site. Staff from Ohio EPA will be invited to participate in any public interactions where information related to the Federal Facilities Compliance Act is presented. Additionally, the DOE and Ohio EPA will coordinate the distribution of copies of the plan to interested members of the public, and share copies of all comments.

A summary of interactions conducted with Ohio EPA and other stakeholders regarding the DSTP is as follows:

- In October 1993, the *BCLDP Conceptual Site Treatment Plan* was submitted to the Ohio EPA.
- Since October 1993, several meetings have been held with representatives from the five Ohio DOE sites to discuss mixed waste treatment needs, capacity and technology development that would be common according to waste streams at each of the various Ohio sites.
- On March 22, 1994, a meeting was held with the Ohio EPA and the five Ohio sites to discuss the progress that is being made on the development of treatment technologies for wastes that are common to the Ohio sites.
- On April 14, 1994, a meeting was held to update the Ohio EPA on progress that is being made among the Ohio DOE sites on the Ohio treatment options. A presentation was made by EM-50 for mobile "skid-mounted" treatment modules that could be used by two or more of the Ohio DOE sites consecutively, thereby reducing or eliminating the need for intersite or interstate shipment of wastes for treatment.

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- On May 5, 1994, a meeting was held at DOE-CH to discuss the DSTP text and format. Presentations were given on mixed waste treatment technologies being developed at Argonne National Laboratories.
  - On June 6, 1994, a meeting was held with the Ohio EPA and the five Ohio DOE sites. A presentation was made on the progress being made with the Ohio treatment options.
  - On June 21, 1994, a conference call with Ohio EPA and the five Ohio DOE sites was conducted. The main topic discussed was the Agency's comments on the Ohio Work Group's fact sheet entitled "*Evaluation of Alternative Treatment Technologies*".

All the DOE mixed waste facilities and projects in Ohio will continue to conduct periodic meetings to develop a common approach to address areas of wastes stream classification and treatment and public participation. BCLDP anticipates periodic meetings with the State of Ohio and the other DOE facilities to review activities related to implementation of the Federal Facility Compliance Act (FFCA). One or more public meetings will be held at Ohio DOE mixed waste facilities to present the requirements of the FFCA, discuss the treatment strategies to be presented in the DSTPs, and solicit feedback on the preferred options presented. Battelle's future interactions with stakeholders are outlined in the *BCLDP Public Participation Plan* supplement (Appendix C).

A related on-going public information activity has been the public hearings on Battelle's application for a Part B Hazardous Waste facility. Although not directly related to the Federal Facility Compliance Act, the outcome of the Part B hearings will have an indirect effect on the future storage capacity of BCLDP radioactive mixed wastes. Subsequent to the Part B hearings, public and regulatory interaction activities have included tours of the current Battelle Part A storage facilities, BCLDP < 90 day storage areas, and satellite accumulation areas. Group members which have toured these facilities include the University Area Commission, Harrison West Society, University Community Association, members of the Ohio Attorney General's Office, Battelle permit opposition committee, community emergency response teams, Victorian Village Society, Columbus Department of Health, and representatives from various local news media. These tours are in addition to annual scheduled facility inspections conducted by the Ohio EPA, Central District Office officials.

At the National level, DOE has presented information on the development of the STPs to the Environmental Management Advisory Board (EMAB) and will continue to provide information to the EMAB and other national stakeholder groups as the STPs are developed. Other national level stakeholder involvement may be conducted after submission of the Draft STPs.

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Waste management issues, particularly the shipment of waste to offsite treatment or disposal facilities will be of interest to certain groups with which the project maintains regular communication. Several meetings related to implementation of the Federal Facilities Compliance Act have already taken place between representatives of DOE sites and projects in Ohio and staff from the OEPA and the Ohio Attorney General's Office. Other discussions of the Act and the development of plans for treatment of mixed waste will be included in the BCLDP's normal program of outreach to local officials and the public. These interactions are described in the project's public participation plan. Additionally, the BCLDP will work with state officials to establish a distribution list for the final *Site Treatment Plan* to meet the statutory requirement that the State make copies of the plan available to the public and consider any comments received.

Because of the statewide and national scope of the selection of mixed waste treatment technologies, all of the DOE sites within the State of Ohio have been working together as appropriate when providing information to the public. For the BCLDP this means providing project fact sheets and having technical representatives available to participate in briefings and public meetings sponsored by other DOE sites.

The mixed wastes which may possibly be produced as a result of decontamination activities have been subdivided into treatability groups as shown in section 3. These groups have been identified based on historical knowledge of facility operations, and the level of site characterization conducted to date. This grouping has been applied uniformly for sites in the State of Ohio, to provide a consistent data base upon which to make decisions regarding consolidated treatment and technology development. Because the exact volume of mixed wastes from decontamination and decommissioning of the Battelle facilities is speculative prior to detailed characterization and analysis, a range is given for each treatability group. The lower end of the range is based on waste in less-than-ninety day storage and satellite accumulation areas at the time the table was prepared. The maximum waste volume (mass) is based on conservative estimates of building rubble, soil, and other residues which may have both hazardous and radioactive residual contaminants. Care is taken in the planning of each major decontamination campaign to avoid the generation of mixed wastes.

## 2.4 Characterization of Mixed Wastes

First and foremost, wastes are characterized for the presence of radionuclides by gamma spectroscopy. If the matrix is proven to have an isotopic concentration of less than detectable limits or levels of isotopes less than the NRC-approved BCLDP volumetric release criteria, the waste is released by the project to Battelle Columbus Operations (BCO) Waste Management for any further characterization and disposition.

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Since RCRA regulations apply to containerized wastes, samples are generally taken from waste vessels ranging from 1 to 55 gallons in volume. When preliminary data for the building designated to be decontaminated indicates elevated levels of chemical contamination or historical process knowledge warrants, a specific accumulation container for the suspect mixed waste is provided by BCLDP waste management. Once the entire waste stream is containerized, a representative sample is taken. However, if a finite Solid Waste Management Unit exists, such as a sump or wood flooring which is destined to be removed in the process of D&D activities and is suspected to be RCRA regulated, pre-characterization sampling will be performed in-situ to facilitate the proper packaging, labelling and accumulation once it is removed. The respective sample is taken in accordance with EPA SW-846, under the guidance of established operating procedures.

Battelle has contracts with two separate outside analytical laboratories, Ecotek Laboratory Services, Inc. and IT Corporation Analytical Services. Both laboratories possess an NRC license to handle radioactive material in addition to performing EPA SW-846 test methods.

The analytical method selection is based upon the process knowledge of the activities conducted in the formerly utilized process area or laboratory, historical data, and pre-characterization "wet-chem" screening tests. These screening tests are utilized when there is little or no historical data on the specific waste stream. Test examples include pH measurement, presence/absence of cyanides and sulfides, flashpoint, air/water reactivity, presence/absence of peroxides or chlorine in oil. These tests can give indications on the group of compounds which need further analysis to confirm or refute that the radioactive waste is RCRA hazardous. All contract laboratory data is reported QC level III, which includes a matrix spike, matrix blank, and all of the raw data affiliated with the specific sample analysis for result validation.

Another factor in method analysis selection is the disposal site testing requirements. There are analyses which are State imposed or required under the sites' waste acceptance criteria such as leachable zinc and copper, percent moisture, or to perform totals in addition to leachable metals.

## 2.5 Waste Minimization

(The following information is summarized from the *Waste Minimization of Pollution Prevention Awareness Plan for the BCLDP*, Revision 2, April 21, 1994.)

The *BCLDP Waste Minimization Plan* outlines the policies, goals, and responsibilities for waste minimization and pollution prevention for the BCLDP. Battelle Corporate Operations and the BCLDP have a strong commitment and ongoing effort to make waste minimization and pollution prevention a standard operating philosophy.

The objective of the waste minimization and pollution prevention program is to systematically eliminate or reduce the generation of waste during the BCLDP project, to prevent or minimize the release of pollution in any environmental medium, to make source reduction and environmentally sound recycling an integral part of the operating philosophy of the BCLDP. It also seeks to develop in all employees an awareness of environmental problems and encourage their participation in minimizing the generation of waste.

Pollution Prevention consists of methods to eliminate or reduce waste volumes prior to generation. The BCLDP is continually placing additional emphasis on the safe, economical and environmentally sound disposal of waste material. The environmental impact of waste disposal is also taken into account while choosing methods and disposal sites. This is reflected by this projects continuous development and optimum utilization of the disposal options available today.

## **2.5.1 Pollution Prevention**

### **2.5.1.1 Past Activities**

In the past, the philosophy had been to decontaminate and radiologically release materials for transfer to the BCO property disposal group for final disposition. The remaining radioactive waste was then shipped to the Westinghouse Hanford Company (WHC) in Washington for storage or disposal. This practice was modified to include the use of SEG in Oak Ridge Tennessee for volume reduction prior to disposal. Currently these same options remain in use with the addition of Envirocare of Utah as a safe economical disposal option.

### **2.5.1.2 Current Pollution Prevention Activities**

The principal techniques are product substitution and process changes. The BCLDP continually strives to improve upon its current practices and to identify additional areas in which it can reduce pollution at the source. Some examples of current BCLDP practices are listed below.

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#### **2.5.1.2.1 Product Substitution**

The BCLDP has restricted the use of cleaners and solvents within radiological control areas to those which are non hazardous and non toxic. All purchased chemical products are required to under go a review, using the associated Material Safety Data Sheet (MSDS) to determine if hazardous constituents are present. Substitution with non hazardous equivalents occur whenever possible. Steel shot has also replaced standard silica grit in grit blasting decontamination activities as an environmentally safe alternative.

#### **2.5.1.2.2 Process Changes**

The following are examples of process changes which have been implemented to reduce or eliminate the generation of waste.

- Grit blasting has been used as an alternative to chemical decontamination.
- Soil pipe drain lines containing mercury contamination are now being honed and decontaminated to reduce the volume of mercury contaminated waste.
- Soil pipe drain joints sealed with poured lead are now being broken. The lead is removed and radiologically released to reduce the volume of contaminated lead entering the mixed waste disposal stream.
- Packaging, such as boxes, crates, and cushioning materials are now removed from new materials prior to entering radiological control areas, reducing the potential for creating contaminated waste unnecessarily.
- Training is provided and great care is taken to prevent the co mingling of contaminated oil and chemical wastes with uncontaminated wastes.

### **2.5.2 Current Waste Minimization Activities**

Waste minimization consists of techniques applied to waste after it is generated. Many opportunities are currently in use on site and off site. Examples of on site techniques to reduce waste volumes include separation of radioactively contaminated and non-contaminated items, decontamination of contaminated items, removal of contaminated parts from an item and reclaiming potential

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waste materials. Off site techniques include volume reduction through super compaction, incineration and metal melting.

#### **2.5.2.1 Segregation to Prevent Commingling**

The practice of segregating to prevent cross contamination is best demonstrated by the BCLDP chemical disposal process. Contaminated chemicals are segregated from uncontaminated chemicals. Those chemicals which are uncontaminated are radiologically released and transferred to the BCO hazardous waste group for reuse or disposal, thereby reducing the quantities of chemical waste generated by the BCLDP. Field sampling evaluations are performed as applicable to determine whether potential hazardous wastes meet the regulatory criteria to be categorized and regulated as hazardous waste. Radiologically contaminated chemical waste is further segregated to comply with various disposal site criteria. Similar emphasis is placed on the importance of preventing cross contamination throughout the entire waste segregation process.

#### **2.5.2.2 Separation of Hazardous Components**

Whenever feasible, hazardous components are removed from waste to reduce the volumes of hazardous waste. For example, decontamination of mercury from drain lines creates a relatively small quantity of mercury sludge waste and a large quantity of cast iron drain line which can then be disposed of separately. Pipe joints sealed with poured lead are broken and the lead is removed. In many cases the lead is radiologically released, then transferred to the BCO hazardous waste group for disposition. Florescent light bulbs, mercury vapor light bulbs and vacuum tubes are also radiologically released, further reducing the quantities of hazardous wastes.

#### **2.5.2.3 Recycling and Reuse**

Valuable equipment including items of Battelle or government property are radiologically released whenever feasible. Non contaminated items are transferred to the BCO property disposal group for reuse throughout Battelle, recycling through off site concerns, or release to staff for home use through a sealed competitive bid process. BCLDP participates in BCO programs for the collection of recyclable metals and office paper sent off site for recycling.

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#### 2.5.2.4 Off Site Volume Reduction

Off site volume reduction is performed through SEG in Oak Ridge, Tennessee. Volume reduction services provided to the BCLDP include super compaction at a volume reduction ratio of approximately 42:1, incineration of compactible and combustible materials at a volume reduction factor of approximately 100:1, and metal melting at a volume reduction factor of approximately 100:1. The ash from incineration, the slag from metal melting, and the super compacted containers are returned to BCLDP for disposal. The blocks of cast metal are recycled through an internal DOE project.

### 3.0 LOW-LEVEL MIXED WASTE STREAMS

#### 3.1 Mixed Waste Streams for Which Technology Exists (*Summarized in Table 3.1*)

The following is a description of the mixed-waste streams which have been identified by the project at this time. Based on historical knowledge and the level of characterization performed to date, it is assumed that future mixed wastes encountered during decontamination activities will fall into these categories as well. The volumes indicated are subject to change as work proceeds and material is sent off-site for treatment and disposal. It is anticipated that D&D activities at the King Avenue facility will be completed by the fall of 1996. By this time, the majority of EM waste will have been generated and shipped off-site for treatment and disposal.

##### 3.1.1 Lab Packs (Inorganic)

- *Lab Packs (Inorganic)*. Laboratory reagents in their original containers (flammable metal powders and oxidizers). RCRA Waste Code: D001.
- *Current Inventory*: Quantity in Satellite Accumulation = 77 kg/0.042 m<sup>3</sup>. Five-year projected = 130.0 kg/0.208 m<sup>3</sup>. Further characterization will be conducted to verify that the metal powders which are projected to be generated meet ignitibility criteria per 40 CFR 261.21. Based upon this further analysis, some of the metal powders may be able to be managed as low-level radioactive waste.

- *Treatment Technology:* Incineration, deactivation
- *Characterization Level of Confidence:* High

#### 3.1.1.1 Description of Technology and Capacity Needs

Waste Stream Name:	Lab Packs (Inorganic)
MWIR No.:	BC-W001
LDR Treatment Standard:	Deactivate so the waste does not exhibit the characteristic of ignitibility
Technology Needed:	Incineration, deactivation
Capacity Required:	0.042 m <sup>3</sup> initially; approximately 0.208 m <sup>3</sup> by 1998

#### 3.1.1.2 Preferred Option

Waste Stream Name:	Lab Packs (Inorganic)
MWIR No.:	BC-W001
Treatment Location:	Hanford, Washington
Facility Name:	WRAP II B
Technology Needed:	Deactivation by stabilization
Actions Needed to Implement:	RCRA Part B Permit

#### 3.1.1.3 Alternate Option

Waste Stream Name:	Lab Packs (Inorganic)
MWIR No.:	BC-W001
Treatment Location:	On-site
Facility Name:	Battelle Columbus Operations
Technology Needed:	Deactivation by stabilization
Actions Needed to Implement:	RCRA Part B Permit

Waste Stream Name:	Lab Packs (Inorganic)
MWIR No.:	BC-W001
Treatment Location:	Envirocare, Clive, Utah
Facility Name:	Mixed Waste Treatment Facility
Technology Needed:	Deactivation by stabilization
Actions Needed to Implement:	Treatability study and finalization of acceptance criteria

### 3.1.2 Lab Packs (Organic)

- *Lab Packs (Organic)*: RCRA Waste Code: D001, D040
- *Current Inventory*: Quantity in Satellite Accumulation = 5.0 kg/0.002 m<sup>3</sup>. Five-year projected = 40.0 kg/0.004 m<sup>3</sup>.
- *Treatment Technology*: Incineration, organic destruction
- *Characterization Level of Confidence*: High

#### 3.1.2.1 Description of Technology and Capacity Needs

Waste Stream Name:	Lab Packs (Organic)
MWIR No.:	BC-W002
LDR Treatment Standard:	Deactivate so the waste does not exhibit the characteristic of ignitibility
Technology Needed:	Incineration, organic destruction
Capacity Required:	0.002 m <sup>3</sup> initially; approximately 0.004 m <sup>3</sup> by 1998

#### 3.1.2.2 Preferred Option

Waste Stream Name:	Lab Packs (Organic)
MWIR No.:	BC-W002
Treatment Location:	Hanford, Washington
Facility Name:	WRAP II B
Technology Needed:	Organic destruction
Actions Needed to Implement:	RCRA Part B Permit

#### 3.1.2.3 Alternate Option

Waste Stream Name:	Lab Packs (Organic)
MWIR No.:	BC-W002
Treatment Location:	Oak Ridge, Tennessee
Facility Name:	K-25 TSCA Incinerator
Technology Needed:	Incineration
Actions Needed to Implement:	Variance to facility's Part B Permit and further waste analysis

### 3.1.3 Elemental Lead

- *Elemental Lead*: RCRA Waste Code: D008
- *Current Inventory*: Quantity in Satellite Accumulation = 0.0 kg/0.0 m<sup>3</sup> Five-year projected = 1180 kg/1.282 m<sup>3</sup>.
- *Treatment Technology*: Stabilization, Macroencapsulation
- *Characterization Level of Confidence*: High

#### 3.1.3.1 Description of Technology and Capacity Needs

Waste Stream Name:	Elemental Lead
MWIR No.:	BC-W003
LDR Treatment Standard:	Macroencapsulation so waste does not exhibit leachability characteristic
Technology Needed:	Macroencapsulation
Capacity Required:	1.282 m <sup>3</sup> by 1998

#### 3.1.3.2 Preferred Option

Waste Stream Name:	Elemental Lead
MWIR No.:	BC-W003
Treatment Location:	Hanford, Washington
Facility Name:	WRAP II B
Technology Needed:	Macroencapsulation
Actions Needed to Implement:	RCRA Part B Permit

#### 3.1.3.3 Alternate Option

Waste Stream Name:	Elemental Lead
MWIR No.:	BC-W003
Treatment Location:	Envirocare, Clive, Utah
Facility Name:	Mixed Waste Treatment Facility
Technology Needed:	Macroencapsulation
Actions Needed to Implement:	Treatability study and finalization of acceptance criteria

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### 3.1.4 Mercury Contaminated Particulate/Debris from Ductile Iron Drain Line

- *Mercury Contaminated Particulate/Debris from Ductile Iron Drain Lines:* RCRA Waste Code: D008, D009
- *Current Inventory:* 0.0 kg/0.0 m<sup>3</sup>. Five-year projected = 6545 kg/12.0 m<sup>3</sup>.
- *Treatment Technology:* Amalgamation, Macroencapsulation
- *Characterization Level of Confidence:* High

#### 3.1.4.1 Description of Technology and Capacity Needs

Waste Stream Name:	Mercury Contaminated Particulate/Debris
MWIR No.:	BC-W004
LDR Treatment Standard:	Amalgamation and macroencapsulation so the waste does not exhibit the characteristics of leachability
Technology Needed:	Amalgamation and macroencapsulation
Capacity Required:	12.0 m <sup>3</sup> by 1998

#### 3.1.4.2 Preferred Option

Waste Stream Name:	Mercury Contaminated Particulate/Debris
MWIR No.:	BC-W004
Treatment Location:	Hanford, Washington
Facility Name:	WRAP II B
Technology Needed:	Amalgamation, macroencapsulation
Actions Needed to Implement:	RCRA Part B Permit

## 3.1.4.3 Alternate Option

Waste Stream Name:	Mercury Contaminated Particulate/Debris
MWIR No.:	BC-W004
Treatment Location:	Envirocare, Clive, Utah
Facility Name:	Mixed Waste Treatment Facility
Technology Needed:	Amalgamation, macroencapsulation
Actions Needed to Implement:	Treatability study and finalization of acceptance criteria

## 3.1.4.4 Alternate Option

Waste Stream Name:	Mercury Contaminated Particulate/Debris
MWIR No.:	BC-W004
Treatment Location:	<i>to be determined</i>
Facility Name:	<i>to be determined</i>
Technology Needed:	Amalgamation, macroencapsulation
Actions Needed to Implement:	Further discussions and comparisons with FEMP and PORTS for development of DOE-Ohio treatment option

**3.2 Waste Streams for Which Technology Exists But Needs Adaptation or for Which No Technology Exists**

Not Applicable. All anticipated mixed wastes resulting from decontamination efforts are treatable with available technology.

**3.3 Waste Streams Requiring Further Characterization or for Which Technology Assessment Has Not Been Done**

Not Applicable. All anticipated mixed wastes resulting from decontamination efforts are treatable with available technology.

**Table 3.1 Mixed Waste Streams** (Updated Inventories/Projections as of June 8, 1994)

Treatability Group	Waste Description	EPA Code	Current Inventory (Kg/m <sup>3</sup> ) (Satellite Accumulation Areas)	5 Year Projected Generation (Kg/m <sup>3</sup> )	Treat. Tech.	Basis	Status	Issues/Comments
Lab Packs (Inorganic) BC-W001	Laboratory reagents in containers (flammable, metal powders, and oxidizers)	D001	77/0.042	130/0.208	INCIN. DEACT.	C	2	Characterized by a combination of lab analysis and process knowledge. High level of confidence in characterization.
Lab Packs (Organic) BC-W002	Paint, oils with solvents, cleaning compounds	D001 D040	5/0.002	40/0.004	INCIN. RORGS.	C	2	Characterized by a combination of lab analysis and process knowledge. High level of confidence in characterization.
Elemental Lead BC-W003	Shielding blocks, weights, lead shielding contained in walls, casks, and lead shot	D008	0/0	1180/1.282	MACRO.	T	2	Approximately 315,454 kg of lead shielding associated with the BCLDP. The majority of the shielding will not become waste until the end of the project (2000). It is anticipated that most of the lead can be decontaminated with treatment of the residues as appropriate. Characterized by lab analysis and process knowledge. High level of confidence in characterization.
Inorganic Sludges/ Particulates Drain Lines BC-W004	Debris generated from decontamination of ductile iron drain lines	D009 D008	0/0	6545/12.0	AMLGM. MACRO.	T	2	Characterized by a combination of laboratory analysis and process knowledge. High level of confidence in characterization.

EPA Code comes from the listings found in 40 CFR 265

(\*Not found in 40 CFR 268.42, Table 1. Proposed treatment technologies only.)

INCIN. - Incineration

DEACT. - Deactivation

RORGS. - Recovery of Organics

MACRO. - Macroencapsulation

AMLGM. - Amalgamation

Basis: C = concentration based treatment standard;

T = technology based treatment standard

Status 2 = waste stream for which technology exists, but without capacity on-site

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## 4.0 TRU MIXED WASTE STREAMS

### 4.1 Description of Waste Streams

The types of Transuranic wastes identified by the BCLDP include metallurgical samples of spent nuclear fuel, contaminated laboratory equipment, particulate contamination on interior hot cell walls and surfaces, and contaminated filters and resins. The potential generation of TRU mixed waste by the project is speculative at this time; further characterization of the JN-1 hot cell is required to make a determination. TRU mixed wastes are not anticipated based upon current knowledge.

### 4.2 Strategy for Managing TRU Waste

Current DOE strategy calls for TRU waste to be sent to WIPP. All TRU wastes generated as a result of decontamination and decommissioning efforts will be packaged in accordance with WIPP waste acceptance criteria. A no migration variance petition is being pursued for WIPP which, if successful, will not require treatment other than that necessary to meet the waste acceptance criteria. The project's characterization plan for Transuranic waste addresses these criteria.

## 5.0 HIGH-LEVEL MIXED WASTE STREAMS

Not applicable. The BCLDP does not anticipate generation of high-level wastes.

## 6.0 FUTURE GENERATION OF MIXED WASTE STREAMS

**6.1 Environmental Restoration Waste** - The BCLDP is a D&D Project (see 6.2).

**6.2 Decontamination and Decommissioning Waste** - All mixed waste types and volumes described herein are speculative, based on historic knowledge and preliminary characterization. See *Section 3.0* for information on current mixed waste projections by treatability group. It is likely that all future mixed wastes generated will fall into these groups as well. See *Section 2.4* for a discussion of the project's program to characterize waste media as part of the overall waste certification process.

**6.3 Other Wastes** - No "other wastes" are anticipated by the BCLDP. All BCLDP wastes will fall under *Sections 3.2 and 6.2*.

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## 7.0 STORAGE REPORT

DOE is committed to storing waste in compliance with RCRA storage requirements in 40 CFR 264 or 40 CFR 265 pending the development of treatment capacity and implementation of the *Site Treatment Plans*.

For mixed waste to be shipped off-site for treatment, storage of the mixed waste before and after treatment will be arranged on a case-by-case basis between the shipping and receiving sites, in consultation with the affected states. Factors such as inadequate compliant storage capacity at the shipping site and the need to facilitate closure of the shipping site will be considered in proposing shipping schedules.

Since December 29, 1981, Battelle has been operating its hazardous waste facilities under a Part A Permit which allows interim operation while the Part B Application has undergone reviews and revisions. The Part A allows storage of certain waste codes, not to exceed 500 gallons over 90 days, but less than one year. Unfortunately, most of the waste codes refer to "listed" wastes such as "P", "U", and "K". Therefore, BCLDP will not have the option to store the vast majority of its current or projected radioactive mixed waste. Battelle has requested a revision to the Part A Permit to include waste codes D003 through D043. Currently, the Ohio Environmental Protection Agency has Battelle's Part A renewal application under review. A decision to accept or deny the Part A Permit renewal is anticipated during the summer of 1994. If the Part A renewal is approved, the administrative approval process for the Part B Permit will recommence. To maintain compliance in light of Battelle's permit restrictions, the BCLDP operates a <90 storage area for project generated mixed waste. Wastes are characterized, profiled according to WHC's waste acceptance criteria, and shipped prior to the 90-day storage limitation. This is done in a BCLDP area to ensure proper control of DOE radionuclides in the hazardous waste matrix.

A major concern of the BCLDP and stakeholders is that through the application of FFCA consent orders, the BCLDP would no longer be able to send DOE-owned radioactive mixed waste to the Hanford facility. A worst-case scenario analysis would be that Battelle would be denied a renewal of the Part A Permit, negating the Part B Permit and the entire facility would be reverted to generator status. Therefore, a TSDF that can accept BCLDP mixed waste is essential to maintain compliance.

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## 8.0 PROCESS FOR EVALUATING DISPOSAL ISSUES IN SUPPORT OF THE STP DISCUSSIONS

### 8.1 Introduction

This section discusses the overall process developed by DOE for evaluating issues related to the disposal of residues from the treatment of mixed low-level wastes (MLLW) subject to the Act. The BCLDP is not among the sites being analyzed further under this process for potential development as a disposal site for residues from the treatment of MLLW subject to the Act.

The Federal Facility Compliance Act requires only that DOE develop a plan for the treatment of mixed wastes. The Act does not impose any similar requirement for the disposal of mixed wastes. DOE recognizes, however, the need to address this final phase of mixed waste management. The following process reflects DOE's current strategy for evaluating the potential options for disposal and, consistent with the purpose of this *Background Volume*, is provided for information purposes only.

It is important to note that the ultimate identification of sites that may host mixed waste disposal activities will follow state and federal regulations for siting and permitting and will include public involvement in the decision-making and preparation of the appropriate environmental impact analyses in accordance with the National Environmental Policy Act. Moreover, any recommendations concerning removal of sites from further evaluation under this process do not affect environmental restoration decisions by DOE under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) concerning remediation activities.

Mixed waste subject to the Act includes high level waste (HLW) and mixed-transuranic waste (mixed TRU). However, established processes are already being implemented for studying, designing, constructing, and ultimately operating disposal facilities for these wastes (e.g., HLW repository, Waste Isolation Pilot Project). Currently, however, there are no active permitted disposal facilities operated by DOE for residues from the treatment of MLLW.

Previously, the DOE planning baseline included the development of MLLW disposal facilities at the six DOE sites currently disposing of low-level waste (Hanford Site, Savannah River Site, Oak Ridge, Idaho, Nevada, and Los Alamos). Plans for the development of these facilities are currently on hold pending the results of this process and the Environmental Management Programmatic Environmental Impact Statement (EM PEIS) currently being prepared by DOE. Once the process of acquiring permits for these sites is initiated, along with associated design and radiological performance assessment efforts, some sites may be found to not be desirable for disposal activities. Additionally, some sites which have not been before considered for disposal activities may be suitable for the disposal of some MLLW residues.

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Pursuant to discussions between DOE and the States, DOE developed a process for evaluating the potential options for disposal of the residues from treatment of mixed waste subject to the Act. The sites subject to this evaluation are the 49 sites reported to Congress by DOE in the Mixed Waste Inventory Report, April 1993, as currently storing or expected to generate mixed waste.

This chapter outlines the process developed by DOE, in consultation with the States, for evaluating potential options for the disposal of residues from the treatment of MLLW. Importantly, because MLLW disposal sites are not currently being developed by DOE, preferred alternatives or final destinations for disposal of treatment residues may not be known at the time final proposed *Site Treatment Plans* are submitted to the States and EPA in February 1995. The results of this process are intended to be considered during the discussions about development of the *Act Site Treatment Plans*, both between DOE and States and among States themselves.

## 8.2 Disposal Site Evaluation Process to Date

Although the Act does not specifically address disposal of treated mixed wastes, both DOE and the States have recognized that disposal issues are an integral part of treatment discussions. A process was established to evaluate and discuss the issues related with potential disposal of the residues from the treatment of DOE MLLW at the sites subject to the Act. The focus of this process has been to identify, from among the sites currently storing or expected to generate mixed waste, sites that are suitable for further evaluation regarding their disposal capability. Sites determined to have marginal or no potential for disposal activities will be removed or postponed from further evaluation under this process. Remaining sites will be evaluated more extensively. Ultimately, a number of sites are expected to be technically acceptable for disposal activities.

### 8.2.1 Site Grouping

The initial step in this process was to examine each of the 49 sites to determine which sites, while individually listed in the Mixed Waste Inventory Report, were in such geographic proximity that further analysis could address them as a single site. This grouping reduced the number of sites to 44, as follows:

- The Idaho National Engineering Laboratory and Argonne National Laboratory (West) are located within several miles of each other on a single Federally-owned reservation in Idaho Falls, Idaho, and were considered a single site for further analysis;
- The Sandia National Laboratory, Livermore, and Lawrence Livermore National Laboratory are located on adjoining properties in Livermore, California, and were considered a single site for further analysis;

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- The Inhalation Toxicology Research Institute and Sandia National Laboratory, Albuquerque, New Mexico, are located on the same Federally- owned reservation within several miles of each other, and were considered a single site for further analysis; and
  - The Oak Ridge National Laboratory, Oak Ridge K-25 Site, and Oak Ridge Y-12 are all located within the Federally-owned Oak Ridge Reservation, in Oak Ridge, Tennessee, and were considered a single site for further analysis.

### 8.2.2 Initial Site Screening

The remaining 44 sites were screened against three exclusionary criteria. These criteria were developed by reviewing Federal and State laws regarding the siting of waste treatment, storage, and disposal facilities to determine whether any criteria existed which could be considered exclusionary minimum requirements for hosting disposal activities and which could be applied uniformly across sites. It was agreed at a joint DOE/States meeting in Tucson, Arizona on March 3-4, 1994, that in order to be further evaluated for potential disposal activities, a site:

- Must not be located within a 100-year floodplain;
- Must not be located within 61 meters (200 feet) of an active fault; and
- Must have sufficient area to accommodate a 100-meter buffer zone.

Two of the criteria (100-year floodplain and active fault) are derived from regulatory requirements under the Resource Conservation and Recovery Act which restrict the location of waste treatment, storage, and disposal facilities. The third criteria (sufficient area for 100-meter buffer) is derived from guidance from the U.S. Environmental Protection Agency, U.S. Nuclear Regulatory Commission, and U.S. Department of Energy concerning the area required to properly operate such facilities.

Application of the three exclusionary criteria identified 18 sites which did not meet the criteria (see Figure 8-1). The results were presented at a March 30-31, 1994, joint DOE/States meeting in Dallas, Texas. At the meeting, it was agreed to remove the 18 sites from further evaluation and that DOE would collect additional site-specific information on the remaining 26 sites to identify the strengths and weaknesses of the remaining sites for the purpose of disposal activities (see Figure 8-2). It was also agreed that DOE and any affected States may propose additional sites for elimination from further evaluation after review of the site-specific information and further discussions.

### 8.2.3 Twenty-Six Site Evaluation

DOE and the States met on July 26-27, 1994, in Denver, Colorado to discuss the site specific information on the 26 sites and to consider proposals for elimination of sites from further evaluation. The focus of these discussions was to identify sites suitable for further evaluation regarding their disposal capability. It was agreed that sites determined to have marginal or no potential for disposal activities would be removed or postponed from further evaluation under this process. As a result of the meeting, DOE and the States agreed that the following sites would be eliminated from further evaluation due to their limited potential for disposal activities:

Site	State
Energy Technology Engineering Center	California
General Atomics	California
General Electric Vallecitos Nuclear Center	California
Pinellas Plant	Florida
Site A/Plot M	Illinois

Additionally, DOE and the States agreed that due to its geographic proximity, the Knolls Atomic Power Laboratory at Niskayuna, New York, would be merged with the Knolls Atomic Power Laboratory at Kesselring, New York, for further analysis. DOE and the States also agreed that the following sites, while not eliminated from further evaluation, would be given a lower priority for further evaluation:

Site	State
Weldon Spring Remedial Action Project	Missouri
Brookhaven National Laboratory	New York
Mound Plant	Ohio
Bettis Atomic Power Laboratory	Pennsylvania

Sites assigned a lower priority for further evaluation had issues that required further consideration, including whether the technical abilities of the site were adequately known, the volume of mixed waste which may be generated by the site, and whether other arrangements for disposal of the sites' mixed waste were adequate. DOE and the States agreed to further evaluate these sites in terms of their ability to dispose of their own mixed waste on-site only if no other options for disposal of their wastes could be identified through the disposal evaluation process. In no case would these sites be considered as a disposal option for wastes from other sites, and could be eliminated from further analysis if sufficient information suggests that their potential for disposal activities is too limited.

### 8.3 Next Steps in Disposal Site Evaluation Process

For the sites not eliminated from further evaluation or assigned a lower priority for evaluation, a more technically detailed performance evaluation will be conducted to increase the understanding of the strengths and weaknesses of a site's potential for disposal activities and to better identify what types of disposal activities could or could not occur at a site. A configuration analysis (risk, cost, transportation) will also be prepared, and a final set of sites will be identified as disposal options which will be technically capable of disposing of some waste. DOE officials, in concert with the public and pursuant to the National Environmental Policy Act, will then identify those sites that will be further evaluated for potential development as disposal sites. Permitting and preparation of performance assessments in accordance with radioactive waste management regulations will then be undertaken collaboratively with States and regulators.

#### 8.3.1 Performance Evaluation

The performance evaluation to be conducted for each of the remaining sites will entail the collection of site-specific data related to the natural surroundings, geotechnical setting, groundwater and surface water characteristics, and other factors related to the disposal capabilities of each site. This information will then be used to evaluate the sites and determine what types and quantities of waste may be able to be disposed at a given site. The performance evaluations will be initiated in August, 1994, and will be completed by February, 1995. The 16 sites being carried forward for this analysis are:

Site	State
Lawrence Livermore National Laboratory, Site 300	California
Rocky Flats Plant	Colorado
Idaho National Engineering Laboratory	Idaho
Argonne National Laboratory	Illinois
Paducah Gaseous Diffusion Plant	Kentucky
Nevada Test Site	Nevada
Los Alamos National Laboratory	New Mexico
Sandia National Laboratory	New Mexico
Knolls Atomic Power Laboratory - Kesselring	New York
West Valley Demonstration Project	New York
Fernald Environmental Management Project	Ohio
Portsmouth Gaseous Diffusion Plant	Ohio
Savannah River Site	South Carolina
Oak Ridge Reservation	Tennessee
Pantex Plant	Texas
Hanford Site	Washington

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### 8.3.2 Configuration Analysis

Through the Draft EM PEIS currently being prepared by DOE, the potential cost, risks, transportation, and other environmental impacts of using each of the remaining 16 sites for some level of disposal activity will be analyzed. This analysis is currently scheduled to be released for public review and comment in Late 1994/early 1995.

### 8.3.3 Site Limitations Analysis

Following public comment on the Draft EM PEIS and completion of the performance evaluations on the remaining 16 sites, DOE will work with the States and public to develop estimates of the quantities and types of waste that could be disposed at the 16 sites. It is expected that the results of these two analyses may indicate that some of the remaining 16 sites are not suitable for further analysis.

### 8.3.4 Final EM PEIS

While the final proposed *Site Treatment Plans* are being prepared, and following their submission by DOE to the States and other regulators, it is expected that individual States and DOE will enter discussions concerning what wastes will be treated at which sites. It is also expected that as a part of these discussions, some arrangements may be established between DOE sites and States as to how any future disposal activities will be handled. DOE expects that the information supplied throughout this process will be used in those discussions. Likewise, DOE expects that the Final EM PEIS analyses will encompass the range of discussions and arrangements under consideration.

### 8.3.5 Post-Compliance Order Activities

It is expected that by October 1995, when Compliance Orders are expected to be issued under the Act, discussions among States and DOE sites concerning disposal of the residues from the treatment of mixed waste may not be completed. It is therefore expected that a Record of Decision under the EM PEIS relative to disposal activities may be delayed somewhat to allow discussions to continue further. When a Record of Decision is issued, it will identify preferred sites to be recommended for further development as disposal facilities.

### 8.3.6 Post-Record of Decision Activities

Following the issuance of a Record of Decision under the EM PEIS on disposal activities, DOE sites will, as appropriate, initiate site-specific Environmental Impact Statements on the proposed disposal facilities, initiate performance assessment processes in accordance with radioactive waste management regulations, and collaboratively with the States and other regulators initiate processes for permitting of disposal facilities.

**Figure 8-1.**  
Sites Eliminated in Initial Screening

SITE	EXCLUSIONARY CRITERIA		
	100 meter buffer	100-Year Floodplain	Active Fault
<b>California</b>			
Lawrence Berkeley Laboratory	●		
Laboratory for Energy-Related Health Research	●		
Mare Island Naval Shipyard (a)		●	
<b>Colorado</b>			
Grand Junction Project Office		●	
<b>Connecticut</b>			
Knolls Atomic Power Laboratory, Windsor	●		
<b>Hawaii</b>			
Pearl Harbor Naval Shipyard (a)		●	
<b>Iowa</b>			
Ames Laboratory	●		
<b>Maine</b>			
Portsmouth Naval Shipyard (a)		●	
<b>Missouri</b>			
Kansas City Plant		●	
University of Missouri	●		
<b>New Jersey</b>			
Middlesex Sampling Plant	●		
Princeton Plasma Physics Laboratory	●		
<b>New York</b>			
Colonie Interim Storage Site	●		
<b>Ohio</b>			
Battelle Columbus Laboratory	●		
RMI Titanium, Inc.	●		
<b>South Carolina</b>			
Charleston Naval Shipyard (a)		●	
<b>Virginia</b>			
Norfolk Naval Shipyard (a)		●	
<b>Washington</b>			
Puget Sound Naval Shipyard (a)		●	

- = Site fails Criteria  
(a) = Site Potentially in Coastal High-Hazard Area

**Figure 8-2.**  
**26 Sites Remaining After Initial Screening**

**California**  
Energy Technology Engineering Center  
General Atomics  
General Electric Vallecitos Nuclear Center  
Lawrence Livermore National Laboratory, Site 300

**Colorado**  
Rocky Flats Plant

**Florida**  
Pinellas Plant

**Idaho**  
Idaho National Engineering Laboratory

**Illinois**  
Argonne National Laboratory  
Site A/ Plot M

**Kentucky**  
Paducah Gaseous Diffusion Plant

**Missouri**  
Weldon Spring Remedial Action Project

**Nevada**  
Nevada Test Site

**New Mexico**  
Los Alamos National Laboratory  
Sandia National Laboratory

**New York**  
Brookhaven National Laboratory  
Knolls Atomic Power Laboratory - Kesselring  
Knolls Atomic Power Laboratory - Niskayuna  
West Valley Demonstration Project

**Ohio**  
Fernald Environmental Management Project  
Mound Plant  
Portsmouth Gaseous Diffusion Plant

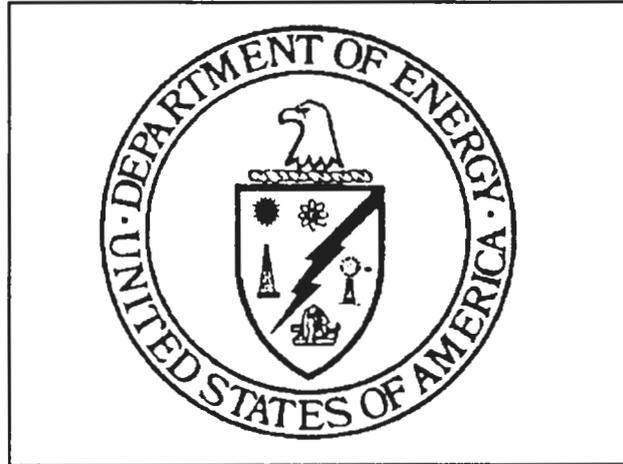
**Pennsylvania**  
Bettis Atomic Power Laboratory

**South Carolina**  
Savannah River Site

**Tennessee**  
Oak Ridge Reservation

**Texas**  
Pantex Plant

**Washington**  
Hanford Site



**U.S. DEPARTMENT OF ENERGY  
BATTELLE COLUMBUS LABORATORIES  
DECOMMISSIONING PROJECT**

**DRAFT SITE TREATMENT PLAN**

**COMPLIANCE PLAN VOLUME**

August 1994

**BATTELLE COLUMBUS LABORATORIES  
DECOMMISSIONING PROJECT  
DRAFT SITE TREATMENT PLAN**

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## ACRONYMS

Battelle Columbus Laboratories Decommissioning Project . . . . .	BCLDP
Department of Energy . . . . .	DOE
Federal Facility Compliance Act . . . . .	FFCA
Land Disposal Restriction . . . . .	LDR
Ohio Environmental Protection Agency . . . . .	OEPA
Resource Conservation and Recovery Act . . . . .	RCRA
Site Treatment Plan . . . . .	STP
U.S. Department of Energy . . . . .	DOE
U.S. Environmental Protection Agency . . . . .	EPA

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## 1.0 INTRODUCTION

### 1.1 Purpose and Scope

For each facility at which the Department of Energy (DOE) generates or stores mixed waste, section 3021(b) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6721, as amended by section 105(a) of the *Federal Facility Compliance Act* ((P.L. 102-386) (the *Act*)), requires DOE to prepare a plan for developing treatment capacities and technologies to treat mixed wastes to the standards promulgated by the U.S. Environmental Protection Agency (EPA) pursuant to section 3004(m) of RCRA. Upon submission of a plan to the appropriate regulatory agency, the *Act* requires the recipient agency to solicit and consider public comments, and approve, approve with modification, or disapprove the plan within six months. The agency is to consult with EPA and any State in which a facility affected by the plan is located. Upon approval of a plan, the agency shall issue an Order requiring compliance with the approved plan.

DOE has prepared this *Draft Site Treatment Plan (Draft Plan)* for mixed waste at Battelle Columbus Laboratories Decommissioning Project (BCLDP) in accordance with the schedule published in the April 6, 1993, Federal Register notice for submitting the site treatment plans for facilities at which the Department generates or stores mixed waste (58 FR 17875). The purpose of this *Draft Plan* is to identify the currently preferred options for treating the mixed waste at the BCLDP or for developing treatment technologies where technologies do not exist or need modification. The *Draft Plan* reflects the site-specific preferred options, developed with the State's input and based on existing available information. The options reflect the "bottoms-up" approach and have not been completely evaluated for impacts on other DOE sites and impacts to the overall DOE program. Therefore, changes in the preferred option and associated schedules are possible between the *Draft Plan*, the *Final Proposed Plan*, and final approval and issuance of the Order as evaluation of DOE-wide impacts and State-to-State discussions progress.

To the extent possible, the *Draft Plan* identifies specific treatment facilities for treating the mixed waste and proposes schedules as set forth in the *FFCAct*. When not possible, schedules for alternative activities such as waste characterization and technology assessment are provided as appropriate. All schedule information presented is preliminary and is subject to change. For new facilities, the schedule is heavily dependent upon decisions made during the design phase and is contingent on funding availability. Assumptions and professional judgments related to the type of treatment technology, location of the treatment facility, contracting mechanism, project approval process, cost, etc. were used to develop the estimated schedule. Any variation from these assumptions will impact the estimated schedule. In addition, cost data used in developing options and schedules are planning estimates only and do not reflect a commitment of budgetary resources.

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Emerging or new technologies not yet considered may be identified in the future that provide opportunities to manage waste more safely, effectively, and at lower cost than the current technologies identified in the *Draft Plan*. Working closely with regulators and other interested parties during the implementation of the *Draft Plan*, DOE will continue to evaluate and develop technologies that offer potential advantages in the areas of public acceptance, risk abatement, and performance and life cycle cost. Should more promising technologies be identified, DOE may request a modification of its treatment plan in accordance with provisions of the *Final Site Treatment Plan* and/or the Order.

The *Draft Site Treatment Plan* is comprised of two volumes: this *Compliance Plan Volume* and the *Background Volume*. The *Compliance Plan Volume* proposes overall schedules with target dates for achieving compliance with the land disposal restrictions (LDR) and procedures for converting these target dates into milestones to be enforced under the Order. The more detailed discussion of the options contained in the *Background Volume* is provided for informational purposes only.

When finalized, the *Site Treatment Plan* will satisfy DOE's obligation under the *Act* to develop and submit a treatment plan for the BCLDP. In addition, inasmuch as the *Plan* is intended to provide DOE's plans for achieving compliance with the LDR requirements of 3004(j) of RCRA at the BCLDP, it is understood that no further civil enforcement action, administrative or judicial, will be initiated for violations of RCRA section 3004(j) arising from storage of mixed waste covered by the approved *Plan* for so long as DOE is in compliance with the requirements of the approved *Plan* and the Order issued which requires compliance with the *Plan*. This will include all mixed waste and suspect mixed waste in storage at the BCLDP and identified in the approved *Plan*, as well as future mixed waste generated and incorporated into the *Plan* in accordance with the provisions of the *Plan*, and any mixed waste received from off-site which is being accumulated to facilitate the treatment of such waste at the BCLDP and which is covered in another site's treatment plan approved by the appropriate regulatory agency after consultation with the State of Ohio.

## 2.0 IMPLEMENTATION OF THE PLAN

Section 2.0 describes certain provisions DOE proposes to include in the *Final Site Treatment Plan* for the BCLDP to facilitate implementation of the *Plan*. This *Draft Plan* provides a general description of what these provisions would be intended to achieve and the approach DOE proposes; it is expected that the specific language to be used in the *Final Plan* and Order, as well as specific milestones, will be developed in conjunction with the State of Ohio. As discussions on the *Final Plan* and Order progress, the *Plan* for some sites may eventually be expanded to address other administrative provisions or, alternatively, some or all of these provisions may be incorporated into the Order.

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## 2.1 Approach to Setting Milestones

This Section of the *Final Plan* would establish a process for committing to milestones for specific activities based on the target dates in the schedules provided in Section 3.0 through 5.0 of the *Compliance Plan Volume*. Milestones would be defined as fixed, enforceable near-term dates on which a specified activity must be completed. Target dates would mark the anticipated completion of longer-term tasks and would not be enforceable until converted to milestones.

Activities to be proposed as milestones and target dates would generally be the activities identified in the *Act* for wastes with existing technology, for waste for which technology does not exist or needs adaptation, or for providing information when radionuclide separation is involved. However, other closely related activities, such as completion of design or characterization activities, may be proposed as milestones and target dates as well.

Target dates would be converted into milestones as the *Plan* is implemented according to procedures established in Section 2.0. DOE proposes establishing milestones for long-term projects such as those that will be covered by the *Plan* on a gradual basis because of such projects are subject to significant uncertainties. This would allow DOE and the Ohio Environmental Protection Agency (OEPA) to establish commitments as technical and funding information becomes known and would provide the OEPA with input from the public as appropriate, to play a significant role in establishing work priorities at the site. Possible approaches to establishing milestones include:

- Establishing milestones on an annual basis for near-term activities. Milestones would be proposed for approval for activities that will take place in the ensuing one year period, with target dates covering longer-term activities.
- Establishing milestones in a phased approach that correspond to the activities identified in the *Act*. A milestone would be established for the current phase of each project (e.g., initiating construction of a treatment facility), and the target date for the next phase (e.g., commencing facility testing) would be converted to a milestone when the previous phase was achieved and when there is a good technical understanding of the work involved in carrying out the next phase.

For mixed waste to be shipped off-site, the final milestone and target date associated with the wastes would be the date of shipment. Other milestones and target dates for on-site activities related to preparing wastes for shipment could be proposed. When the intended treatment site is a DOE site, the Section would recognize that the development and availability of such off-site capacity is pursuant to the *Site Treatment Plan* and Order or other enforceable agreement at that site.

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The Section would reference procedures for setting new milestones and for modifying milestones and target dates when necessary. Generally, where practical new milestones and changes to target dates would be achieved through Section 2.2, "*Annual Site Treatment Plan Update*." Modifications to current milestones would be governed by procedures in Section 2.5 "*Modifications/Extensions or Revisions to the Plan*."

## 2.2 Annual Site Treatment Plan Update

This Section of the *Final Plan* would provide for submission of an *Annual Site Treatment Plan Update* intended to communicate information on progress in implementing the *Plan* and to provide a mechanism for establishing new milestones, amending wastes covered by the *Plan*, and updating the *Plan*, as well as proposing revisions to the *Plan* when necessary. These latter actions may be accomplished through other mechanisms as described in other Sections of this *Plan*, but the *Annual Update* provides a coordinated mechanism to effect such changes on a routine basis. DOE proposes that all sites with a *Site Treatment Plan* provide *Annual Updates* in the same timeframe to facilitate necessary site and State interactions and to facilitate tracking progress across the DOE complex in developing treatment capacity and treating mixed waste.

The *Annual Update* would amend the *Background Volume* as necessary, identifying changes to mixed wastes covered by the *Plan*, including volumes; new waste streams and waste streams no longer covered by the *Plan*; and progress on activities undertaken to carry out the *Plan*.

The *Annual Update* would also update the *Compliance Plan Volume*. It would contain proposals for new milestones, identify any changes to target dates, and propose revisions to the *Plan* in accordance with Section 2.5, "*Modifications/Extensions or Revisions to the Plan*."

The *Annual Update* would be submitted to the OEPA for review and comment or approval, as appropriate, and made publicly available as defined in this Section and in accordance with the procedures in 2.8, "*Submittal, Review and Approval of Deliverables*." After the appropriate procedures are followed, the *Compliance Plan Volume* would be considered amended.

It is intended that the *Annual Update* be done in a way that minimizes unnecessary paperwork to the extent practical through page changes, etc. If there are no changes that require updates to the *Compliance Plan* and *Background Volumes* in a given year, a letter notifying the OEPA to that effect could be provided as an *Annual Update*.

## 2.3 Inclusion of New Waste Streams

This Section of the *Final Plan* would establish procedures for incorporating newly identified and newly generated or stored waste streams into the *Site Treatment Plan* and for developing a plan and schedules for providing treatment capacity.

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It would establish procedures for notifying the OEPA of a new waste stream as soon as possible. The notification would describe the waste code, volume, current and expected generation rate, and technology needs to the extent possible and would include the waste as a covered waste.

The next *Annual Update* would incorporate the new waste streams and propose a plan for treatment and associated schedules where possible, or schedules for developing a treatment plan as required by the *Act* if necessary.

#### **2.4 Duration of the Plan and Deletion of Wastes**

This Section of the *Final Plan* would establish that the approved *Plan* will terminate when the site's mixed waste, regardless of the time it was generated, is in compliance with the storage prohibition in RCRA 3004(j). This will occur: 1) when there is no longer any mixed waste stored or generated at the site that does not meet land disposal restriction requirements, or 2) when the mixed waste currently being stored or generated at the site, or that will be stored or generated, is being stored solely for the purposes of accumulating sufficient quantities as are necessary to facilitate proper treatment, recovery, or disposal.

Similarly, it would also establish that a specific waste would be deleted from the *Plan* when the waste is no longer being stored or generated at the site, or when the waste meets land disposal restriction standards or is being accumulated solely for the purposes of facilitating proper treatment, recovery, or disposal. This could occur, for example, when the last scheduled milestone under the *Site Treatment Plan* for treating the waste is completed; when the waste is shipped off-site, or when the characterization of the waste demonstrates it meets RCRA land disposal standards.

The Section would allow DOE and the OEPA to agree to terminate the *Plan* or to keep the *Plan* in effect, e.g., in anticipation of waste to be generated in the future, for reasons other than those provided above.

The Section would provide for notification of the OEPA and other procedures as appropriate for terminating the *Plan* and for deleting waste streams.

#### **2.5 Delays/Extensions or Revisions to the Plan**

This Section of the *Final Plan* would establish procedures to enable DOE to seek adjustments to milestones when events cause or may cause delays, and would define the circumstances which justify a delay. It would require DOE to notify the OEPA, provide an explanation for the delay, and set procedures for reviewing and approving/disapproving alternative milestones.

It would also define and establish procedures for those revisions to the *Plan* that would require the OEPA to follow procedures in Section 3021(b)(2) and (3) of RCRA, as amended by the *Act*, including providing the proposed revision to the public and consulting

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with other affected States and EPA. The *Annual Update* described in Section 2.2 would generally be used to propose and approve a revision, unless the revision would become effective before it could be addressed in the regularly scheduled *Annual Update*.

DOE proposes that all *Site Treatment Plans* consistently define what constitutes a "revision" to the *Plan* that is subject to Sections 3021(b)(2) and (3) of the *Act*, since such a revision may often require the involvement of other affected States. Revisions would include addition of treatment capacity, technology development or use of radionuclide separation not previously included in the *Compliance Plan Volume* of the *Site Treatment Plan* or extensions to milestones for a period greater than one year. Inclusion of new waste streams would not constitute a revision but may result in a revision if inclusion of the new waste results in a change to the *Site Treatment Plan* that meets one of the above criteria. Other types of modifications to the *Site Treatment Plan* such as milestone changes of less than one year, although not a "revision," would require approval as described in Section 2.8.

## **2.6 Funding Considerations**

This Section would describe DOE's obligations to seek the funding necessary to accomplish the activities in the *Final Site Treatment Plan*. It would also confirm DOE's authority over its budget and funding level submissions and its responsibilities under the *Anti-Deficiency Act*, 31 U.S.C. Section 1341, as amended.

## **2.7 Disputes**

This Section would provide procedures to address disputes concerning scheduling under Section 2.1, Modifications/Extensions or Revisions to the *Plan* under Section 2.5, Review and Submittal of Deliverables in Section 2.8, and other circumstances agreed to by DOE and the OEPA. The Section would establish timeframes to resolve a dispute and a process that would elevate the dispute when agreement cannot be reached.

## **2.8 Submittal, Review and Approval of Deliverables**

This Section would establish a process and timeframes for review, comment, response to comments, and approval as appropriate by the DOE and the OEPA of such deliverables as the *Annual Update*, notices signifying completion of milestones and identification of new wastes, and other deliverables.

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### 3.0 LOW-LEVEL MIXED WASTE STREAMS

#### 3.1 Mixed Waste Streams for Which Technology Exists

This section describes the plans and schedules to treat 4 low-level mixed waste streams at the BCLDP. The *Background Volume* of this report describes each waste stream and the preferred treatment option for that waste stream. The completion of decontamination and decommissioning activities at the King Avenue facility area anticipated by October 1996. By this time, it is projected that the majority of EM wastes will have been generated and shipped off-site for treatment and disposal.

##### 3.1.1 Lab Packs (Inorganic) BC-W001

###### 3.1.1.1 (a) Schedule for activities to ship waste off-site:

- Continue to accumulate in satellite area until waste sorting/processing activities are discontinued.
- Maintain and update appropriate SDAR to maintain acceptability.
- Obtain mixed waste treatability study guidelines/cost data from Envirocare once it's issued and evaluate site feasibility further

###### (b) On-site activities:

- Proceed forward with RCRA Part B permit to gain compliant permitted storage area should off-site TSD facilities become unavailable
- Continue to seek on-site treatment option under the RCRA Part B permit.

###### 3.1.1.2 Basis

- Waste is less than 5 gallons in volume. Therefore, the it is not cost-effective to ship immediately.

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### 3.1.2 Lab Packs (Organic) BC-W002

- 3.1.2.1 (a) Schedule for activities to ship waste off-site:
- Continue to accumulate in satellite area until waste sorting/processing activities are discontinued.
  - Maintain and update appropriate SDAR to maintain acceptability.
  - Maintain discussions with Ohio DOE sites in effort to seek Ohio option, perhaps having FERMCO accept this BCLDP waste stream for eventual disposal at TSCA incinerator.
  - Explore NSSI option further.
  - Explore inroads for possible direct shipment to TSCA incinerator
- (b) On-site activities:
- Proceed forward with RCRA Part B permit to gain compliant permitted storage area should off-site TSD facilities become unavailable
- 3.1.2.2 Basis
- Waste is less than 5 gallons in volume. Therefore, the it is not cost-effective to ship immediately.

### 3.1.3 Elemental Lead BC-W003

- 3.1.3.1 (a) Schedule for activities to ship waste off-site:
- Current SDAR in place
  - Once the Envirocare treatment facility comes on-line and the waste stream is regenerated, determine economic feasibility of submitting a treatability study
  - Should the SEG Part B permit for macroencapsulation become approved, obtain acceptance criteria and evaluate site feasibility
- (b) On-site activities:
- Proceed forward with RCRA Part B permit to gain compliant permitted storage area should off-site TSD facilities become unavailable

3.1.3.2 Schedule

- Ship to Hanford for storage pending disposal once waste is generated and approaching 90-day storage limit

3.1.3.3 Basis

- Anticipated generation only. No waste currently in accumulation.

**3.1.4 Mercury Contaminated Particulate/Debris from Ductile Iron Drain Lines BC-W004**

3.1.4.1 (a) Schedule for activities to ship waste off-site:

- Current SDAR in place
- Maintain discussions with Ohio DOE sites in effort to seek Ohio option

(b) On-site activities:

- Proceed forward with RCRA Part B permit to gain compliant permitted storage area should off-site TSD facilities become unavailable

3.1.4.2 Schedule

- Ship to Hanford for storage pending disposal once waste is generated and approaching 90-day storage limit

3.1.4.3 Basis

- Anticipated generation only. No waste currently in accumulation.

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## 4.0 TRU MIXED WASTE STREAMS

### 4.1 Description of Waste Streams

The types of Transuranic wastes identified by the BCLDP include metallurgical samples of spent nuclear fuel, contaminated laboratory equipment, particulate contamination on interior hot cell walls and surfaces, and contaminated filters and resins. The potential generation of TRU mixed waste by the project is speculative at this time; further characterization of the JN-1 hot cell is required to make a determination. TRU mixed wastes are not anticipated based upon current knowledge.

### 4.2 Strategy for Managing TRU Waste

Current DOE strategy calls for TRU waste to be sent to WIPP. All TRU wastes generated as a result of decontamination and decommissioning efforts will be packaged in accordance with WIPP waste acceptance criteria. A no migration variance petition is being pursued for WIPP which, if successful, will not require treatment other than that necessary to meet the waste acceptance criteria. The project's characterization plan for Transuranic waste addresses these criteria.

**APPENDIX A**  
**OPTIONS SELECTIONS**

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## APPENDIX A

### Options Selections

**BATTELLE COLUMBUS LABORATORIES DECOMMISSIONING PROJECT**

**FEDERAL FACILITIES COMPLIANCE ACT**

**TREATMENT TECHNOLOGY SELECTION PROCESS**

**—FACT SHEET NO. 1—**

#### Waste Stream Options Identification

The following logic train is being utilized to develop the treatment technology options for presentation in the *Draft Site Treatment Plan*, as required by the Federal Facilities Compliance Act (FFCA).

1. Is waste stream sufficiently characterized and technology defined so as to be able to define treatment need?

If not, define need for further waste characterization and/or technology development.

2. Can waste be treated to LDR standards?

If not, define technology development activities/schedules and/or LDR variances to be pursued.

3.
  - A. Can waste stream be (cost-effectively) treated by modifying an existing on-site treatment system?
  - B. Can waste stream be (cost-effectively) treated by modifying an existing on-site treatment system?
  - C. Can waste stream be (cost-effectively) treated under current agreement with an existing commercial vendor or by a mobile treatment system?

If yes to any of these, prepare "*Likely Preferred Option*" justification/rationale.

4. Is transport off-site unlikely?

If yes, 5A.

If no, 5A, 5B, 5C.

5. A. Evaluate treatment at a new on-site facility.
  - B. Evaluate treatment at existing or new DOE facility.
    1. Within the state of Ohio.
    2. Within the DOE complex nationwide.
  - C. Evaluate treatment by a commercial vendor or by a mobile treatment system.
6. Prepare options analysis and comparison.

**OHIO WORK GROUP**  
**FEDERAL FACILITIES COMPLIANCE ACT**  
**TREATMENT TECHNOLOGY SELECTION PROCESS**  
**—FACT SHEET NO. 2—**

**Evaluation of Alternative Treatment Technologies**

The following selection criteria are being utilized for the comparison of treatment technology options and selection of the preferred treatment option for presentation in the *Draft Site Treatment Plan*, as required by the Federal Facilities Compliance Act (FFCAct).

The technologies will be ranked first within an option category; such as an on-site option, an in-state option, an out-of-state option. A final ranking will be used to determine a "*Preferred Option*" between the categories.

Criteria	Weighted Value		
<b>Regulatory Compliance</b>	Threshold criteria, no weighted value		
Regulatory Compliance	(High = 5)	(Medium = 3)	(Low = 1)
<b>Environmental Health and Safety</b>	Threshold criteria, no weighted value		
Environmental/Public Health	(High = 5)	(Medium = 3)	(Low = 1)
Non-Operational Worker Health and Safety	(High = 5)	(Medium = 3)	(Low = 1)
Operational Worker Health and Safety	(High = 5)	(Medium = 3)	(Low = 1)

Criteria	Weighted Value		
<b>Stakeholder Concerns</b>	Reserved for future evaluation		
Public Acceptance			
Equity Issues			
<b>Treatment Effectiveness</b>	45% of total score		
Volume Reduction	(High = 5)	(Medium = 3)	(Low = 1)
Secondary Waste Generation	(High = 5)	(Medium = 3)	(Low = 1)
Destruction, Removal and Demobilization Efficiency	(High = 5)	(Medium = 3)	(Low = 1)
Flexibility	(High = 5)	(Medium = 3)	(Low = 1)
Final Waste Form	(High = 5)	(Medium = 3)	(Low = 1)
Ability to be Shipped	(High = 5)	(Medium = 3)	(Low = 1)
<b>Score</b>	<b>Average X.45</b>		
<b>Implementability</b>	30% of total		
System Implementability	(High = 5)	(Medium = 3)	(Low = 1)
Availability	(High = 5)	(Medium = 3)	(Low = 1)
Scalability	(High = 5)	(Medium = 3)	(Low = 1)
Schedule for Waste Treatment	(High = 5)	(Medium = 3)	(Low = 1)
<b>Score</b>	<b>Average X.30</b>		
<b>Life-Cycle Cost</b>	20% of total		
Life-Cycle Cost	(High = 5)	(Medium = 3)	(Low = 1)
<b>Score</b>	<b>Average X.20</b>		
<b>Technology Development</b>	5% of total		
Market for Technology	(High = 5)	(Medium = 3)	(Low = 1)
Private Sector Involvement	(High = 5)	(Medium = 3)	(Low = 1)
<b>Score</b>	<b>Average X.05</b>		
Weighted Average for Treatment Technology	Total of Individual Scores (Must equal at least 1.0, but not greater than 5.0)		
	<i>Note:</i> Threshold criteria are not used in this comparison.		

Note 1: The weighted values used in the above evaluation are subject to change at various decision points based on input received in the process of developing the *Draft Site Treatment Plan* into the *Final Site Treatment Plan*.

Note 2: Regulatory Compliance and ES&H criteria have been considered to be Threshold Criteria and are not calculated into the weighted average score. These criteria are evaluated on the basis of being met or not being met. A technology does not proceed further in the evaluation process if a score of 1 is received in any threshold criteria.

The Regulatory Compliance criteria include issues such as compliance with ARARs under CERCLA and appropriate permit requirements under RCRA, CWA, and CAA. The ES&H criteria include issues such as assessments of risk associated with the implementation of a particular treatment technology. These include occupational safety and health issues, pollution issues, and mechanical and electrical hazard issues.

Note 3: It should be noted that the final implementation of technologies will be influenced by factors including the integration of the CERCLA process with the FFCAct Consent Order, funding of the proposed budget for implementation, and Stakeholder Concerns and Public Acceptance of the technology, and Equity Issues. All of these are beyond the scope of this initial evaluation for the purpose of determining logical candidate technologies.

Stakeholder Concerns will be evaluated after the stakeholders have had the opportunity to review and comment on the document. This input will then be factored into the evaluation of technologies for the *Final Site Treatment Plan*.

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## 1.0 LOW-LEVEL MIXED WASTE STREAMS

### 1.1 Mixed Waste Streams for Which Technology Exists

#### 1.1.1 Lab Packs (Inorganic) MWIR No. BC-W001

- *Lab Packs (Inorganic)*. Laboratory reagents in their original containers (flammable metal powders).
- *Current Inventory*: Quantity in Satellite Accumulation = 77 kg/0.042 m<sup>3</sup>. Five-year projected = 130.0 kg/0.208 m<sup>3</sup>. Further characterization will be conducted to verify that the metal powders which are projected to be generated meet ignitibility criteria per 40 CFR 261.21. Based upon this further analysis, some of the metal powders may be able to be managed as low-level radioactive waste.

##### 1.1.1.1 Treatment Technology: Incineration, deactivation.

##### 1.1.1.2 Preferred Options and Alternate Options

- (a) *On-Site Option*: Under Battelle's Part B permit application, it is proposed to establish a treatment unit for deactivation of ignitable metal chip and powders by cement encapsulation. This unit could not be used to treat other inorganic lab-packs or oxidizers, only metals which are designated D001 exclusively. As described in the permit application, the unit will be small-scale in nature.
- (b) *Commercial Facility Option*: Envirocare of Utah would be capable of deactivating the metal powders by chemical stabilization. As of August 9, 1994, Envirocare anticipates this facility to be on-line by the end of December 1994. Given the small quantity, the cost for this treatment per unit volume will be high. It is estimated that the cost for the treatability study, packaging, shipping and treatment will be \$13,000. Facilities that are in the process of acquiring regulatory approval to treat LLRMW that are likely candidates for use by the BCLDP include SEG and DSSI in Tennessee. As of August 10, 1994, SEG's Part B for incineration is 90% complete, but has not yet been submitted. Discussions with DSSI have been unproductive and their operational status is questionable.

(c) *Other DOE Treatment Facilities:* The BCLDP is currently an approved shipper of low-level waste to Hanford. Hanford will accept limited quantities of this waste for storage pending eventual treatment. The 1994 cost-for-treatment and disposal of LLRMW at Hanford is \$180.67/ft<sup>3</sup>. There are four other Ohio DOE sites where no agreement exists: The Fernald Environment Management Project [FEMP], Mound Plant, Portsmouth Gaseous Diffusion Plant, and RMI Titanium. These facilities do not possess this particular mixed waste stream. An in-Ohio treatment option at any of the above-mentioned four sites is improbable.

### Option Evaluation and Preferred Option Selection

The preferred option for treatment of this waste stream is to ship to the Hanford WRAP II A/B facility for incineration and/or deactivation. The reasons for this selection are as follows.

- The technologies are demonstrated and straight-forward.
- Minimal risk is involved due to low volume and characteristics of waste stream.
- Known effectiveness of the proposed treatment.
- Known compliant >90 day storage facility pending treatment, should the satellite or generator accumulation time expire on this waste stream
- The on-site or in-state options are speculative at this time.
- By October 1995, nearly all of the mixed waste will have been generated and sent to Hanford for storage pending treatment. Continuing the shipment to Hanford for the remaining small portion of mixed waste will enable the project to be completed on schedule.
- Presently, the uncertainties associated with the alternate options would likely not allow shipments in the near future and could substantially delay the project's completion.

#### 1.1.2 Lab Packs (Organic) MWIR No. BC-W002

- *Lab Packs (Organic):* RCRA Waste Code: D001, D040
- *Current Inventory:* Quantity in Satellite Accumulation = 5.0 kg/0.002 m<sup>3</sup>. Five-year projected = 40.0 kg/0.004 m<sup>3</sup>.)

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**1.1.2.1 Treatment Technology: Incineration, organic destruction****1.1.2.2 Preferred Options and Alternate Options**

- (a) *On-Site Option:* A low cost, bench-scale treatment process for this waste stream may be technically feasible. Given the current opposition of the Ohio Hazardous Waste Facility Siting Board and local neighborhood groups to the Battelle Part B permit, the probability of this type of bench-scale treatment process becoming a reality is low. Under Battelle's Part B permit application, there is no intent or provision for the installation or operation of a thermal treatment unit on-site.
- (b) *Commercial Facility Option:* NSSI, in Houston, Texas, is the only known operating commercial facility able to treat this type of waste stream. The BCLDP does not have a contract nor the DOE approval required to ship to this facility. Facilities that are in the process of acquiring regulatory approval to treat LLRMW that are likely candidates for use by the BCLDP include SEG and DSSI in Tennessee. As of August 10, 1994, SEG's Part B for incineration is 90% complete, but has not yet been submitted. Discussions with DSSI have been unproductive and their operational status is questionable.
- (c) *Other DOE Treatment Facilities:* The BCLDP is currently an approved shipper of low-level waste to Hanford. Hanford will accept limited quantities of this waste for storage pending eventual treatment. The 1994 cost-for-treatment and disposal of LLRMW at Hanford is \$180.67/ft<sup>3</sup>. There are four other Ohio DOE sites where no agreement exists: The Fernald Environment Management Project [FEMP], Mound Plant, Portsmouth Gaseous Diffusion Plant, and RMI Titanium. Of the other Ohio DOE sites, Mound Laboratories and FEMP have this waste stream in common with BCLDP (see Appendix B). The TSCA incinerator at the K-25 Site in Oak Ridge, TN is the only operating DOE facility capable of treating this waste. The BCLDP is currently not licensed as an approved generator on the TSCA incinerator permit. The BCLDP is performing additional analysis required to complete the Waste Analysis Form necessary to comply with the TSCA incinerator's waste acceptance criteria, should a permit variance be granted.

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## Option Evaluation and Preferred Option Selection

The preferred option for treatment of this waste stream is to ship to the Hanford Thermal Treatment Facility for incineration and/or deactivation. The reasons for this selection are as follows.

- The technologies are demonstrated and straight-forward.
- Minimal risk is involved due to low volume and characteristics of waste stream.
- Known effectiveness of the proposed treatment.
- Known compliant > 90 day storage facility pending treatment, should the satellite or generator accumulation time of this waste stream expire.
- Minimal likelihood of modifying the Battelle Part B Permit/Application in a time-frame to meet the project's completion schedule.
- By October 1995, nearly all of the mixed waste will have been generated and sent to Hanford for storage pending treatment. Continuing the shipment to Hanford for the remaining small portion of mixed waste will enable the project to be completed on schedule.
- Presently, the uncertainties associated with the alternate options would likely not allow shipments in the near future and could substantially delay the project's completion.

### 1.1.3 Elemental Lead MWIR No. BC-W003

- *Elemental Lead*: RCRA Waste Code: D008
- *Current Inventory*: Quantity in Satellite Accumulation = 0.00 kg/0.00 m<sup>3</sup>. Five-year projected = 1180 kg/1.282 m<sup>3</sup>.)

#### 1.1.3.1 Treatment Technology: MACRO

#### 1.1.3.2 Preferred Options and Alternate Options

- (a) *On-Site Option*: It may be technically feasible to decontaminate the exterior of lead sheets and bricks by using conventional methods such as grit blasting or CO<sub>2</sub> blasting and managing the residues as RMW. Another option would be a "skid mounted" technology such as the LANL lead decontamination trailer.

- 
- (b) *Commercial Facility Option:* Envirocare of Utah has the facilities to stabilize D008 wastes. Envirocare anticipates this facility to be on-line by the end of December 1994. Currently, the BCLDP does not have this waste stream in accumulation. As of August 9, 1994, Envirocare has not yet performed a single treatability study. There would need to be sufficient quantities of waste to justify the overall cost of treatability studies. SEG has submitted a RCRA Part B permit for storage, cement stabilization and macroencapsulation (12/92). No estimate was given for anticipated permit approval/denial.
- (c) *Other DOE Treatment Facilities:* The BCLDP is currently shipping mixed waste to Hanford under an existing agreement. The 1994 cost-for-treatment and disposal of LLRMW at Hanford is \$180.67/ft<sup>3</sup>. There are four other Ohio DOE sites where no agreement exists: The Fernald Environment Management Project [FEMP], Mound Plant, Portsmouth Gaseous Diffusion Plant, and RMI Titanium. FEMP has a small amount of lead waste and has proposed to utilize the LANL Decon Trailer. The possibility of shipping small amounts of BCLDP lead for treatment at FEMP exists, given the uncertainties (Appendix B) are resolved.

### Option Evaluation and Preferred Option Selection

The preferred option for treatment of this waste stream is to ship to the Hanford WRAP II A/B facility for macroencapsulation/stabilization. The reasons for this selection are as follows.

- The technologies are demonstrated and straight-forward.
- Minimal risk is involved due to low volume and characteristics of waste stream.
- Known effectiveness of the proposed treatment.
- Known compliant > 90 day storage facility available pending treatment, should the satellite or generator accumulation time of this waste stream expire.
- By October 1995, nearly all of the mixed waste will have been generated and sent to Hanford for storage pending treatment. Continuing the shipment to Hanford for the remaining small portion of mixed waste will enable the project to be completed on schedule.
- Presently, the uncertainties associated with the alternate options would likely not allow shipments in the near future and could substantially delay the project's completion.

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#### 1.1.4 Mercury Contaminated Particulate/Debris from Ductile Iron Drain Line MWIR No. BC-W004

- (a) *Mercury Contaminated Particulate/Debris from Ductile Iron Drain Lines:* RCRA Waste Code: D008, D009
- (b) *Current Inventory:* 0.0 kg/0.0 m<sup>3</sup>. *Five-year projected =* 6545 kg/12.0 m<sup>3</sup>.

##### 1.1.4.1 Treatment Technology: AMLGM, MACRO.

##### 1.1.4.2 Preferred Options and Alternate Options

- (a) *On-Site Option:* A current effort is being utilized to separate the mercury from the debris to minimize volume of waste. The waste matrix currently passes TCLP for mercury, but further comprehensive analysis may prove otherwise. A low-cost, bench-scale treatment process may be technically feasible. Given the current opposition of the Ohio Hazardous Waste Facility Siting Board and local neighborhood groups, the probability of this type of bench-scale treatment process becoming a reality is low. Under Battelle's Part B permit application, there is no intent or provision for the installation or operation of a mercury amalgamation unit on-site.
- (b) *Commercial Facility Option:* Envirocare of Utah has the facilities to macroencapsulate D008 wastes. Envirocare anticipates this facility to be on-line by the end of December 1994. Currently, the BCLDP does not have this waste stream in accumulation. As of August 9, 1994, Envirocare has not yet performed a single treatability study. There would need to be sufficient quantities of waste to justify the overall cost of treatability studies.
- (c) *Other DOE Treatment Facilities:* The BCLDP is currently shipping mixed waste to Hanford under an existing agreement. The 1994 cost-for-treatment and disposal of LLRMW at Hanford is \$180.67/ft<sup>3</sup>. There are four other Ohio DOE sites where no agreement exists: The Fernald Environment Management Project [FEMP], Mound Plant, Portsmouth Gaseous Diffusion Plant, and RMI Titanium. FEMP and Portsmouth have wastes which are similar, but not an exact match to this BCLDP waste stream. Further discussions are warranted to determine compatibilities. The Mound Plant, which has liquid mercury waste, is conducting a treatability study utilizing copper shot for mercury amalgamation.

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## Option Evaluation and Preferred Option Selection

The preferred option for treatment of this waste stream is to ship to the Hanford WRAP II A/B facility for amalgamation and stabilization. The reasons for this selection are as follows.

- The technologies are demonstrated and straight-forward.
- Minimal risk is involved due to low volume and characteristics of waste stream.
- Known effectiveness of the proposed treatment.
- Known compliant >90 day storage facility available pending treatment, should the satellite or generator accumulation time of this waste stream expire.
- By October 1995, nearly all of the mixed waste will have been generated and sent to Hanford for storage pending treatment. Continuing the shipment to Hanford for the remaining small portion of mixed waste will enable the project to be completed on schedule.
- Presently, the uncertainties associated with the alternate options would likely not allow shipments in the near future and could substantially delay the project's completion.

**DSTP MODULE**  
**COST ESTIMATE SHEETS**

# DSTP MODULE COST ESTIMATE

Module Name: On-Site Treatment Option Name: On-Site Treatment/BCLDP (1.1.1)

Waste Type: MLLW X HLW M-TRU  
 alpha \_\_\_\_\_ non-alpha X contact-handled X remote-handled \_\_\_\_\_

Module Location: Building KA-7A

Module Status:  
 Existing \_\_\_\_\_ New X Small generator X Large Generator \_\_\_\_\_  
 Onsite X Offsite \_\_\_\_\_ Commercial \_\_\_\_\_ Portable \_\_\_\_\_ R&D \_\_\_\_\_

WBS ELEMENT	(\$ x 1000) SUB	(\$ x 1000) ELEMENT
1.0 Pre-Operations		
1.1 Studies and Bench Scale Tests	\$5	
1.2 Demonstration Costs	\$10	
1.3 Operations Budget Funded Activities	NA	
1.3.1 Conceptual Design	\$13	
1.3.2 Safety Assurance	\$24	
1.3.3 Permitting	\$200	
1.3.4 Preparation for Operations	\$70	
1.3.5 Project Management	\$22	
TOTAL PRE-OPERATIONS		\$344
2.0 Facility Construction Costs		
2.1 Design (Title I and II)	\$7	
2.2 Inspection	\$19	
2.3 Project Management	\$71	
2.4 Building Construction (inc. indirect)	\$375	
2.5 Equipment (inc. indirect)	\$323	
2.6 Construction Management	\$16	
2.7 Contingency	\$82	
TOTAL FACILITY CONSTRUCTION COSTS		\$893
3.0 Operations and Maintenance		
3.1 Annual Operating Labor	\$420	
3.2 Annual Utilities	\$13	
3.3 Annual Materials	\$28	
3.4 Annual Maintenance	\$17	
3.5 Annual Contingency	\$20	
TOTAL ANNUAL O&M	\$498	
X NUMBER OF YEARS OF OPERATION	5	
TOTAL OPERATIONS AND MAINTENANCE COSTS		\$2,490
4.0 Decontamination and Decommissioning		
4.1 Facility D&D	\$75	
4.2 Closure, Post-Closure, Monitoring	\$32	
TOTAL DECONTAMINATION AND DECOMMISSIONING		\$107
5.0 Contracted Services		
5.1 Commercial Treatment/Disposal	\$2	
5.2 Mobile Treatment	NA	
TOTAL CONTRACTED SERVICES		\$2
6.0 Off-Site Treatment (DOE)		
7.0 Transportation		
<b>TOTAL COST FOR ON-SITE TREATMENT</b>		<b>\$3,835</b>
	<b>MODULE (FY94 DOLLARS)</b>	







# DSTP MODULE COST ESTIMATE

Module Name: Off-Site Treatment/DOE Option Name: Hanford (1.1.1)

Waste Type: MLLW X HLW \_\_\_\_\_ M-TRU \_\_\_\_\_  
 alpha \_\_\_\_\_ non-alpha \_\_\_\_\_ contact-handled \_\_\_\_\_ remote-handled \_\_\_\_\_

Module Location: Hanford

Module Status:  
 Existing \_\_\_\_\_ New X Small generator \_\_\_\_\_ Large Generator \_\_\_\_\_  
 Onsite \_\_\_\_\_ Offsite X Commercial \_\_\_\_\_ Portable \_\_\_\_\_ R&D \_\_\_\_\_

WBS ELEMENT	(\$ x 1000) SUB	(\$ x 1000) ELEMENT
1.0 Pre-Operations		
1.1 Studies and Bench Scale Tests	_____	
1.2 Demonstration Costs	_____	
1.3 Operations Budget Funded Activities		
1.3.1 Conceptual Design	_____	
1.3.2 Safety Assurance	_____	
1.3.3 Permitting	_____	
1.3.4 Preparation for Operations	_____	
1.3.5 Project Management	_____	
TOTAL PRE-OPERATIONS		<u>\$0</u>
2.0 Facility Construction Costs		
2.1 Design (Title I and II)	_____	
2.2 Inspection	_____	
2.3 Project Management	_____	
2.4 Building Construction (inc. indirect)	_____	
2.5 Equipment (inc. indirect)	_____	
2.6 Construction Management	_____	
2.7 Contingency	_____	
TOTAL FACILITY CONSTRUCTION COSTS		<u>\$0</u>
3.0 Operations and Maintenance		
3.1 Annual Operating Labor	_____	
3.2 Annual Utilities	_____	
3.3 Annual Materials	_____	
3.4 Annual Maintenance	_____	
3.5 Annual Contingency	_____	
TOTAL ANNUAL O&M	<u>\$0</u>	
X NUMBER OF YEARS OF OPERATION	<u>YRS</u>	
TOTAL OPERATIONS AND MAINTENANCE COSTS		<u>\$0</u>
4.0 Decontamination and Decommissioning		
4.1 Facility D&D	_____	
4.2 Closure, Post-Closure, Monitoring	_____	
TOTAL DECONTAMINATION AND DECOMMISSIONING		<u>\$0</u>
5.0 Contracted Services		
5.1 Commercial Treatment/Disposal	_____	
5.2 Mobile Treatment	_____	
TOTAL CONTRACTED SERVICES		<u>\$0</u>
6.0 Off-Site Treatment (DOE)		<u>\$3</u>
7.0 Transportation		<u>\$5</u>
 TOTAL COST FOR OFF-SITE/HANFORD	 MODULE (FY94 DOLLARS)	 <u>\$8</u>

**APPENDIX B**  
**ALL OHIO OPTION**

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## APPENDIX B

### Ohio Mixed Waste Treatment Option

Augmenting evaluation of on-site and out-of-state alternatives (see Appendix A), the five DOE-Ohio sites listed below were chartered by DOE to coordinate efforts for evaluating common technology needs and potential mixed waste treatment options within the state of Ohio.

<u>Site</u>	<u>Location</u>	<u>DOE Office</u>
Fernald	Cincinnati	Fernald Field Office
Portsmouth Gaseous Diffusion Plant	Piketon	Oak Ridge Operations Office
Mound	Miamisburg	Albuquerque Operations Office
Battelle Columbus	Columbus	Chicago Operations Office
RMI Titanium	Ashtabula	Chicago Operations Office

The Ohio Work Group, consisting of representatives from each DOE-Ohio site, initiated DSTP interface during attendance at a Technology Support Workshop conducted by the DOE Technical Support Team in mid-March 1994. The Work Group has met on a regular basis since the workshop to present, quantify, discuss, and qualify DOE-Ohio treatability groups (and associated wastestreams), existing or planned treatment activities and viable treatment options/opportunities (from the CSTP, Technology Catalog or emergent) to identify common contaminant and treatment matrices that may be present. Additionally, the Ohio Work Group output and associated parameters provides a coordinated survey of each facility's on-site, and out-of-state options within each respective site's DSTP.

The issue of FEMP acceptance of off-site mixed waste (from the BCLDP or other DOE-Ohio sites) as may be identified by a DOE-Ohio site's DSTP Ohio option has been identified by FERMCO as a major topic of DOE/FERMCO contractual concern. FERMCO's "*Associated Uncertainties*" (see attachment) addressing contractual issues regarding disposition of off-site waste has been drafted to present this matter to affected entities.

The Work Group has already developed and utilized *Fact Sheet No. 1, "Waste Streams Options Identification"* and *Fact Sheet No. 2, "Evaluation of Alternative Treatment Technologies"* (see Appendix A) as a means to progress each facility's DSTP and continue maturation of the Ohio treatment schemes option within the Draft "Ohio Work Group MW Treatment Scheme" (see attachment). This Draft also extends a presentation of on-site and out of state options.

The Work Group is continuing to evaluate and hone viable treatment schemes and associated costs, including those identified within the Ohio option, as further guidance is obtained from DOE and each facility approaches its upcoming DSTP and STP milestones.

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## Key for Ohio Work Group MW Treatment Scheme

The alpha numeric designation above the drums was taken from the “Mixed Waste/Contaminant Treatment Matrix” and was used by all Ohio DOE sites as a means to compare common treatability groups/waste streams.

The treatability groups are organized according to the definitions provided in the CSTP.

Quantities are provided for both current and 5-year (5-year meaning the total quantity of mixed waste expected to be generated in the next five years).

Yr	Year
Qty	Quantity
m <sup>3</sup>	cubic meters
FEMP	(F) Fernald Environmental Management Project
PORTS	(P) Portsmouth Gaseous Diffusion Plant
RMI	(R) RMI Titanium
MOUND	(M) Mound Plant
BATTELLE	(B) Battelle Columbus Laboratories

**A**  
ON SITE                      A list of possible on-site mixed waste treatment options identified by the Ohio Work Group for one or more of the five Ohio DOE sites

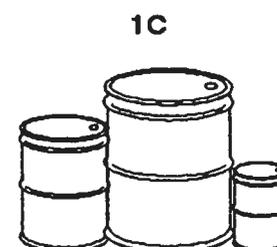
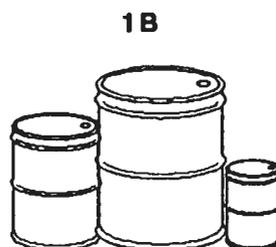
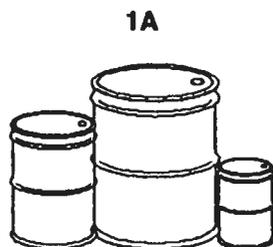
**B**  
OHIO                              A list of possible Ohio mixed waste treatment options identified by the Ohio Work Group for one or more of the five Ohio DOE sites.

**C**  
OUT OF STATE                A list of possible out-of-state waste treatment options identified by the Ohio Work Group for one or more of the five Ohio DOE sites.

“Mobile” is used to designate either mobile or skid-mounted units.

The preferred option for each site is designated by the alpha character in parenthesis at the end of the option. Each treatability group may include more than one FEMP preferred option as waste streams within each treatability group may be treated by different preferred option treatment projects. See *Appendix C* for further preferred option delineation.

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**ORGANIC LIQUID TOXIC ORGANICS**

**ORGANIC LIQUID TOXIC ORGANICS TOXIC METALS W/ MERCURY**

**ORGANIC LIQUID TOXIC ORGANICS TOXIC METALS W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	39	164.1/20.9
PORTS	3	46.9/0
RMI	3	7.5/0.69
MOUND	2	72.0/4.2

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	8	7.2/0.9
PORTS	3	172.5/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	25	44.2/16.9
PORTS	4	29.65/0

**A  
ON-SITE**

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Mound Glass Melter (M)  
Mound Packed Bed Reactor  
Wet Air Oxidation

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Hg Treatment  
Mound Glass Melter  
Mound Packed Bed Reactor  
Wet Air Oxidation  
Biological Treatment

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Mobile Stabilization (F)  
Mound Glass Melter  
Mound Packed Bed Reactor  
Wet Air Oxidation  
Biological Treatment  
FEMP WWTS/AWWT (F)

**B  
OHIO**

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical/Treatment

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical Treatment  
Hg Treatment

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical Treatment

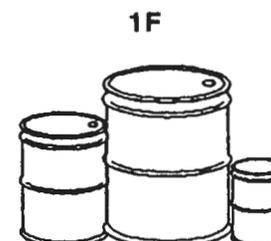
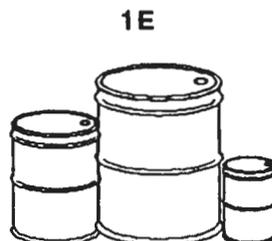
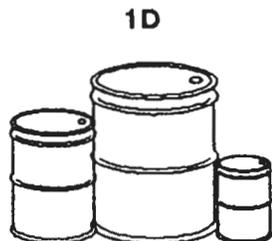
**C  
OUT OF STATE**

TSCA Incinerator (R)(P)(F)  
DSSI

TSCA Incinerator (P)(F)

TSCA Incinerator (P)(F)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**ORGANIC LIQUID  
TOXIC METALS  
W/O MERCURY**

**ORGANIC LIQUID  
TOXIC METALS  
W/ MERCURY**

**ORGANIC LIQUID  
IGNITABLE ONLY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	8	2.2/0.2
PORTS	1	11.34/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	2.6/0.8
PORTS	1	1.100/0.853

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	13	13.8/8.2
MOUND	1	0.005
PORTS	1	0.42/0

**A  
ON-SITE**

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Mound Glass Melter  
Mound Packed Bed Reactor  
Wet Air Oxidation  
Biological Treatment  
Mobile Stabilization (F)  
FEMP WWTS/AWWT (F)

Mobile Incinerator  
Mobile Chemical Treatment  
Hg Treatment  
Mobile Stabilization (F)

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Mound Glass Melter  
Mound Packed Bed Reactor  
Wet Air Oxidation  
Biological Treatment

**B  
OHIO**

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical Treatment  
Mobile Stabilization

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical Treatment  
Hg Treatment

Mound Glass Melter  
Mound Packed Bed Reactor  
Mobile Incinerator  
Mobile Chemical Treatment

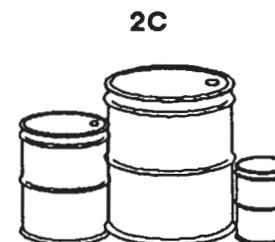
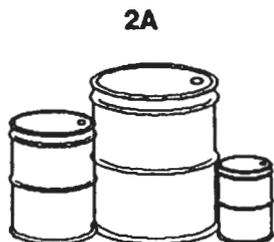
**C  
OUT OF STATE**

TSCA Incinerator (P)(F)

TSCA Incinerator (P)(F)

TSCA Incinerator (P)(F)(M)  
DSSI  
Envirocare (F)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**AQUEOUS LIQUID TOXIC ORGANICS**

**AQUEOUS LIQUID TOXIC ORGANICS TOXIC METALS W/ MERCURY**

**AQUEOUS LIQUID TOXIC ORGANICS TOXIC METALS W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	5	36.8/4.0
PORTS	1	52.7/83.5
RMI	1	1.3/4.5

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	4.0/16.8
PORTS	1	24.3/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	4	12.2/13.4
PORTS	2	23.3/0

**A ON-SITE**

PORTS Physical/Chemical (P)  
 FEMP Plant 8 VOC  
 PORTS Carbon Treatment  
 FEMP WWTS/AWWT (F)  
 Evaporation  
 Stabilization  
 Mobile Chemical Treatment (F)

**B OHIO**

FEMP Plant 8 VOC  
 PORTS WWTS  
 Mobile Incinerator  
 FEMP AWWT  
 Mobile Chemical/Treatment

**C OUT OF STATE**

TSCA Incinerator (R)(F)

PORTS Physical/Chemical (P)  
 FEMP Plant 8 VOC  
 PORTS Carbon Treatment  
 FEMP WWTS/AWWT  
 Evaporation  
 Stabilization

FEMP Plant 8 VOC  
 PORTS WWTS  
 FEMP AWWT  
 Mobile Incinerator

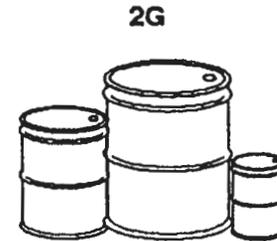
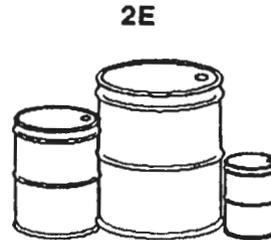
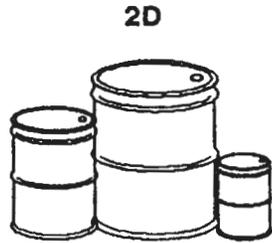
TSCA Incinerator (F)(P)

FEMP UNH Trt./Sys.  
 FEMP Plant 8 VOC  
 PORTS Physical/Chemical (P)  
 FEMP WWTS/AWWT  
 Removal/Stabl. of Metals  
 Evaporation  
 Mobile Stabilization (F)  
 Mobile Chemical Treatment (F)

FEMP Plant 8 VOC  
 PORTS WWTS  
 FEMP AWWT  
 Removal/Stabl. of Metals  
 Mobile Chemical Treatment

TSCA Incinerator (F)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**AQUEOUS LIQUID  
TOXIC METALS  
W/O MERCURY**

**AQUEOUS LIQUID  
TOXIC METALS  
W/ MERCURY**

**AQUEOUS LIQUID  
CORROSIVE ONLY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	8	1043.8/1.3
PORTS	6	31.45/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	1	0.2/<0.1
PORTS	1	3.900/12.400

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	3	7.4/0.7
PORTS	3	2.96/0

**A  
ON-SITE**

FEMP WWTS/AWWT (F)  
FEMP UNH Removal Action (F)  
PORTS Physical/Chemical (P)  
Evaporation  
Stabilization  
Mobile Chemical Treatment (F)

Mobile Chemical Treatment (F)  
PORTS Physical/Chemical Treatment (P)

FEMP WWTS/AWWT (F)  
FEMP UNH Trt. Sys.  
PORTS Physical/Chemical (P)  
Evaporation  
Stabilization  
FEMP HF Neutralization System (F)

**B  
OHIO**

FEMP UNH Trt. Sys.  
PORTS WWTS  
Mobile Chemical Treatment (F)

Mobile Chemical Treatment

FEMP UNH Trt. Sys.  
PORTS WWTS

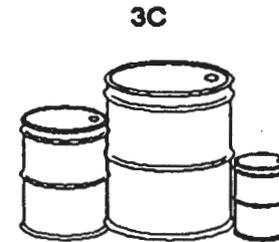
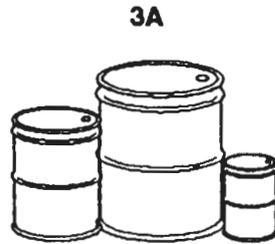
**C  
OUT OF STATE**

TSCA Incinerator (F)

TSCA Incinerator

TSCA Incinerator (F)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**ORGANIC SLUDGES/PARTICULATES  
TOXIC ORGANICS**

**ORGANIC SLUDGES/PARTICULATES  
TOXIC ORGANICS  
TOXIC METALS W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	19	189.6/0.0
PORTS	2	87.1/8.0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	8	6.4/0.0
PORTS	2	8.88/0

**A  
ON-SITE**

Carbon Regeneration/Thermal Desorp. (P)  
Mobile Incinerator/Stabl.  
FEMP MAWS  
Mobile Chemical Treatment (F)  
FEMP Rotary Kiln

Carbon Regeneration/Thermal Desorp.  
Mobile Incinerator/Stabl.  
FEMP MAWS  
Mobile Chemical Treatment (F)  
FEMP Rotary Kiln  
Stabilization

**B  
OHIO**

Mobile Incinerator/Stabl.  
FEMP MAWS  
Mobile Chemical Treatment  
FEMP Rotary Kiln

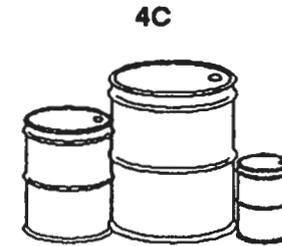
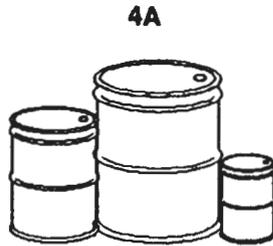
Mobile Incinerator/Stabl.  
FEMP MAWS  
Mobile Chemical Treatment  
FEMP Rotary Kiln

**C  
OUT OF STATE**

TSCA Incinerator (P)  
(Liquid Portion Only)  
Envirocare  
(Solids Portion Only)

TSCA Incinerator (P)(F)  
(Liquid Portion Only)  
Envirocare  
(Solids Portion Only)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**INORGANIC SLUDGES/PARTICULATES  
TOXIC ORGANICS**

**INORGANIC SLUDGES/PARTICULATES  
TOXIC ORGANICS  
TOXIC METALS W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	17	698.8/0.0
PORTS	2	27.9/0.0
MOUND	1	0.22/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	4	3.4/0.0
PORTS	1	2.1/0

**A  
ON-SITE**

FEMP Rotary Kiln  
FEMP MAWS  
Mobile Chemical Treatment (F)  
Mobile Stabilization (F)  
Thermal Desorption/Stabl.  
Mound Packed Bed Reactor (M)

FEMP Rotary Kiln  
FEMP MAWS  
Mobile Chemical Treatment (F)  
Segregation/Stabl.

**B  
OHIO**

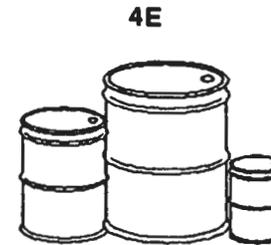
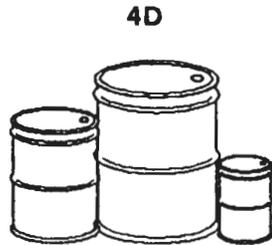
FEMP Rotary Kiln  
FEMP MAWS  
Mobile Chemical Treatment

FEMP Rotary Kiln  
FEMP MAWS (P)  
Mobile Chemical Treatment

**C  
OUT OF STATE**

TSCA Incinerator (P)  
TSCA Incinerator (F)  
(Liquid Portion Only)  
Envirocare (F)

# OHIO WORK GROUP MW TREATMENT SCHEME



**TREATABILITY GROUP**

**INORGANIC SLUDGES/PARTICULATES  
TOXIC METALS W/O MERCURY**

**INORGANIC SLUDGES/PARTICULATES  
TOXIC METALS W/ MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	42	507.8/1.6
PORTS	15	107.05/0

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	0.4/0.0
PORTS	3	382.8/2.0
BATTELLE	1	0.815/3.0

**A**  
**ON-SITE**

Mobile Chemical Treatment (F)  
Mobile Stabilization (F)  
FEMP MAWS  
Mobile Incinerator  
Metals Washing/Recovery  
Segregation/Stabl.

Low Temp. Thermal Desorp.  
Acid Leaching  
Sludge Blending  
Mobile Stabilization (P)  
Mobile Chemical Treatment (F)

**B**  
**OHIO**

Mobile Stabilization  
FEMP MAWS (P)

Mobile Stabilization  
Mobile Chemical Treatment

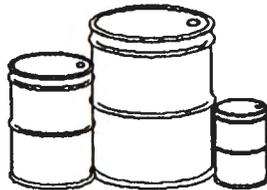
**C**  
**OUT OF STATE**

TSCA Incinerator (F)  
(Liquid Portion Only)

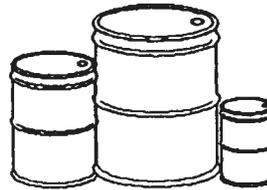
Hanford Wrap II A/B (B)

# OHIO WORK GROUP MW TREATMENT SCHEME

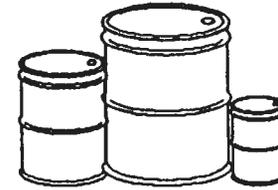
6A



6C



7D



**TREATABILITY GROUP**

**ORGANIC DEBRIS  
TOXIC ORGANICS**

**ORGANIC DEBRIS  
TOXIC ORGANICS  
TOXIC METALS W/O MERCURY**

**INORGANIC DEBRIS  
TOXIC METALS  
W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	10	9.8/9.1
PORTS	2	117.0/38.0
RMI	1	4.93/0.69

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	1.8/0.0
PORTS	1	0.500/0.500

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	10	25.8/8.6
PORTS	7	186.28/0
RMI	1	5.64/0.23

**A  
ON-SITE**

Mobile Incinerator  
Low Temp. Thermal Desorp.  
Washing/Stabilization (P)  
FEMP Rotary Kiln  
FEMP MAWS  
Mobile Chemical Treatment (F)  
Mobile Stabilization (F)

Mobile Chemical Treatment (F)  
Washing/Stabilization (P)  
Mobile Stabilization

Mobile Incinerator  
Mobile Chemical Treatment (F)  
Mobile Stabilization (F)(P)  
Mobile Metals Recovery/Stabl.  
Low Temp. Thermal Desorp.

**B  
OHIO**

FEMP Rotary Kiln  
FEMP MAWS  
Mobile Chemical Treatment  
Mobile Stabilization

FEMP Rotary Kiln/Stabilization  
FEMP MAWS  
Mobile Chemical Treatment  
Mobile Stabilization

Mobile Metals Recovery/Stabl.  
Mobile Stabilization

**C  
OUT OF STATE**

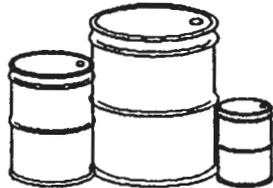
TSCA Incinerator (F)  
(Liquid Portion Only)  
Envirocare (R)

TSCA Incinerator  
(Liquid Portion Only)  
Envirocare

Envirocare (R)

# OHIO WORK GROUP MW TREATMENT SCHEME

8A



**TREATABILITY GROUP**

**HETEROGENOUS DEBRIS  
TOXIC ORGANICS**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	13	12.8/0.0
PORTS	2	3.14/1.7

**A  
ON-SITE**

FEMP Rotary Kiln  
Mobile Chemical Treatment (F)(P)  
Mobile Incineration  
Low Temp. Thermal Desorp.

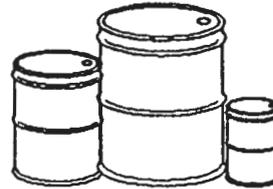
**B  
OHIO**

FEMP Rotary Kiln  
Mobile Chemical Treatment

**C  
OUT OF STATE**

Envirocare (F)

8C



**HETEROGENOUS DEBRIS  
TOXIC ORGANICS  
TOXIC METALS W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	9	9.0/19.1
PORTS	1	10.7/0

FEMP Rotary Kiln  
Mobile Chemical Treatment (F)(P)  
Mobile Incineration  
Low Temp. Thermal Desorp.

FEMP Rotary Kiln  
Mobile Chemical Treatment

Envirocare

8D



**HETEROGENOUS DEBRIS  
TOXIC METALS  
W/O MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	3	12.0/0.0
PORTS	3	14.9/0
RMI	2	0.23/0.23
MOUND	1	0.02/0

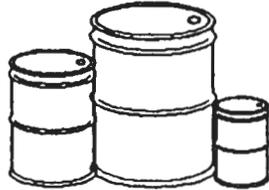
Mobile Chemical Treatment (F)(P)  
Mobile Encapsulation (M)  
Mobile Incineration  
Low Temp. Thermal Desorp.

Mobile Chemical Treatment

Envirocare (R)

# OHIO WORK GROUP MW TREATMENT SCHEME

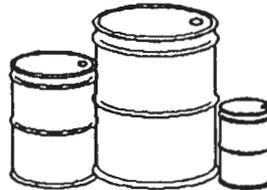
12



**LAB PACKS W/O METALS**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
BATTELLE	1	0.4/0.0
FEMP	2	0.400
MOUND	2	0.400

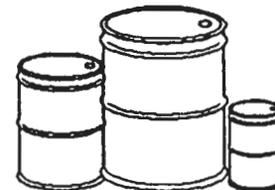
15D  
15F



**COMPRESSED GAS**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	1	0.2/0.3
PORTS	2	2.3/0

16E



**ELEMENTAL MERCURY**

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	0.8/1.1
MOUND	1	0.100/0.0072
PORTS	1	1.000/0

**A**  
**ON-SITE**

Further Characterization (M)  
Mobile Incinerator

Puncture/Capture Unit  
Mobile Incinerator  
Segregate/Reuse/Treatment (P)  
Mobile Chemical Treatment (F)

Mobile (LANL) Amalgamation/Recycling (M)  
Mobile Chemical Treatment (F)

**B**  
**OHIO**

Mobile Incinerator

Puncture/Capture Unit  
Mobile Chemical Treatment

Mobile Amalgamation/Recycling  
Mobile Chemical Treatment

**C**  
**OUT OF STATE**

TSCA Incinerator (F)  
Hanford Thermal Treatment Facility (B)

Puncture/Capture Unit  
TSCA Incinerator  
(Liquid Portion Only)

Y-12/Recycle (P)

# OHIO WORK GROUP MW TREATMENT SCHEME

17D



## ELEMENTAL LEAD (ACTIVATED AND NON-ACTIVATED)

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	4	4.8/20.5
BATTELLE	1	0.407/1.282
MOUND	1	5.0/0

**A**  
ON-SITE

Mobile Chemical Treatment (F)  
Decon/Recycle  
LANL Mobile Decon Trailer

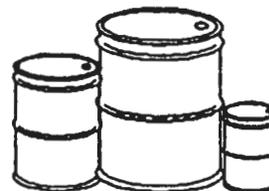
**B**  
OHIO

LANL Mobile Decon Trailer  
Mobile Chemical Treatment

**C**  
OUT OF STATE

LANL Mobile Decon Trailer  
Hanford Wrap II A/B (B)

19D



## BATTERIES (LEAD ACID, CADMIUM) TOXIC METALS W/O MERCURY

	# of Waste Streams	Qty in m <sup>3</sup> Current/5 yr.
FEMP	2	4.4/14.0
MOUND	1	0.85/0.79
PORTS	1	58.3/0

Mobile Chemical Treatment (F)  
Decon/Recycle (M)(P)

Mobile Chemical Treatment  
Decon/Recycle

Commercial Recycler

**APPENDIX C**

**BCLDP  
PUBLIC PARTICIPATION PLAN**

Draft July 13, 1994

**Battelle Columbus Laboratories Decommissioning Project (BCLDP)  
PUBLIC PARTICIPATION PLAN SUPPLEMENT FOR THE  
MIXED WASTE SITE TREATMENT PLAN**

August 1994

**1. Plan Overview**

The objective of this Public Participation Plan Supplement (PPPS) is to describe how the Battelle Columbus Laboratories Decommissioning Project (BCLDP) will provide information to stakeholders about the Federal Facility Compliance Act (FFCA), which was enacted on October 6, 1992. The PPPS is a supplement to the overall BCLDP Public Information Plan first prepared in August 1989 and updated in February 1993.

One of the FFCA's requirements is that federal facilities work with the U.S. Environmental Protection Agency, state environmental agencies, and other stakeholders to provide comprehensive information on mixed waste<sup>\*</sup> inventories, treatment capabilities, and treatment plans. Even though the BCLDP is not being conducted at a federal site,<sup>\*\*</sup> it is included in this process and a Site Treatment Plan (STP) is being developed because any mixed wastes that result during the cleanup process are the responsibility of the U.S. Department of Energy (DOE). Additional information about the FFCA process is in an attached fact sheet (Appendix A).

Quantities and types of waste that result from the BCLDP and current treatment and disposal methods are described in the Draft BCLDP STP issued

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<sup>\*</sup> Mixed waste is waste that contains both radioactive and other hazardous components.

<sup>\*\*</sup> The BCLDP work is co-funded by DOE and Battelle (90-10 percent, respectively) because most of the nuclear research and development was performed for federal agencies as part of the national defense effort. All decontamination and cleanup work is being conducted at Battelle-owned facilities where the BCLDP represents approximately three percent of all ongoing work. Information about the BCLDP work, progress, and schedule is in an attached fact sheet (Appendix A).

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in August 1994. An earlier Conceptual STP was available in October 1993. The STP describes the BCLDP's strategy for managing and disposing of the minimal amount of mixed waste that will result during the decontamination and decommissioning work. All wastes will be sent either to DOE-managed or NRC-licensed off-site disposal facilities. No mixed waste treatment or disposal facilities currently exist at Battelle's facilities in Central Ohio and no such facilities are planned as part of the decommissioning project.

DOE is committed to involving the public in the process to develop STPs for mixed waste at each of its sites. The Conceptual STP for the BCLDP was used as an early discussion document with the Ohio Environmental Protection Agency (OEPA) and other stakeholders. The Draft STP, released in August 1994, was also developed with input from OEPA officials.

The final BCLDP Site Treatment Plan will be released for approval by the state in February 1995. It is expected that the state would then distribute and solicit comments on the final plan.

In March, 1993, the BCLDP issued a Public Information Plan, and in September 1993, an Activity Plan for Stakeholder Involvement in the Mixed Waste Site Treatment Plan was issued as a supplement to the Public Information Plan. This Public Participation Plan Supplement updates the 1993 Activity Plan and was prepared in accordance with DOE guidance.\*

## 2. Roles and Responsibilities

The contact persons at the BCLDP for public participation information are:

Tom McClain, Director, Office of Communications, 614-424-7728, or  
Helen Latham, BCLDP Institutional Relations Manager, 614-424-4062, at  
Battelle  
505 King Avenue  
Columbus, OH 43201

and

Tom Baillieul, Acting Project Manager, 614-424-7226, at  
U. S. Department of Energy

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\* "Revised Guidance for Site-Specific Public Participation Plans for Implementation of the Federal Facility Compliance Act," U.S. Department of Energy memorandum, June 21, 1994.

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BCLDP Site Office  
505 King Avenue  
Columbus, OH 43201.

These members of the BCLDP team are responsible for informing the public and encouraging the participation of people or groups affected by or interested in the project, including the development of the STP. They are also responsible for implementing much of this plan.

The BCLDP is participating in the "Ohio Complex" planning process for implementation of the Federal Facilities Compliance Act, which includes representatives from the Ohio EPA and the Ohio Attorney General's Office. Comments received from the Ohio EPA on the Conceptual STP were used to develop the Draft STP. The "Ohio Complex" includes the sites at Fernald, Mound, Ashtabula (RMI), and Piketon, as well as the BCLDP. Representatives of the "Ohio Complex" meet regularly to discuss common issues, including the STP.

BCLDP has provided the new fact sheet, this PPPS, and the Draft STP to the DOE Chicago Operations office; it is anticipated that DOE-Chicago will then provide copies to the DOE-HQ Office of Waste Management and the Office of Public Accountability.

No resource issues or obstacles to implementation of this Public Participation Plan Supplement have yet been identified.

### **3. Issue Identification**

No anticipated regulatory or community issues have been identified in regard to the development of the STP for the BCLDP, other than a relative lack of interest among the public in spite of the availability of public information activities to date. This lack of interest is generally due to the very small quantity of mixed waste involved in the BCLDP, and to the fact that the waste would not be treated or stored onsite. All BCLDP mixed waste is being removed to a DOE facility for disposal.

For the BCLDP generally, stakeholder issues are outlined below.

#### **(a) Governmental:**

- In previous briefings, federal, state, and local officials have asked to be kept informed of progress, requested that the BCLDP proceed as scheduled, and wanted to be prepared to respond to any constituent concerns.

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- The NRC and U.S. EPA have requested periodic briefings on progress or changes in schedules and funding, and expressed concerns that the work be accomplished as prescribed in regulations and in accord with Battelle's NRC license.

- Other governmental clients want the BCLDP to proceed with as little effect as possible on their work products and schedules.

(b) Special interest groups:

- Battelle management's chief concerns are that the BCLDP proceed with as little effect on other projects as possible and that buildings are made available for use without radiological restrictions as soon as possible.

- For the nearly 3,000 Battelle staff members who work at the Columbus and West Jefferson facilities, their major issues, in addition to those of Battelle management, are that their health and safety are protected, that the BCLDP have as little impact on their day-to-day work as possible, and that the BCLDP not constrain Battelle's ability to obtain new projects.

- One of the adjacent neighborhood organizations at the Columbus site is the Harrison West Society, whose members and officers are interested in receiving periodic updates on all Battelle activities, including the BCLDP work. They and other nearby residents are also concerned about health and safety issues but view the BCLDP as more a positive than negative activity. (For more information about the areas near the BCLDP sites, see Appendix B).

- People in the town of West Jefferson and several subdivisions near the site, which is located in a rural area, are generally interested in activities at the site and several residents have requested information about the BCLDP on a periodic basis. Most of the highly radioactive materials inventory was removed from the site more than a decade ago.

- Special interest groups, principally those related to environmental issues, have shown an interest in Battelle's research activities in general but have not expressed concerns about the BCLDP or any desire for deeper involvement.

- Industrial clients of Battelle want the BCLDP cleanup activities to be conducted with as little effect as possible on their work products and schedules.

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(c) General Public

- Members of the general public in Central Ohio have expressed no issues related to the BCLDP, although health and safety are always primary concerns. The BCLDP is generally viewed as positive by the community at large because radioactive and hazardous materials are being removed from the site.

(d) Media

-Members of the print and broadcast media in Columbus and West Jefferson expect to be kept informed of major announcements and changes and periodically request status reports, special interviews, or tours regarding Battelle activities, including the BCLDP.

#### 4. Planned Activities

Copies of the BCLDP Conceptual STP and draft STP were provided to area public libraries along with the fact sheet about the STP. The fact sheet has been updated to incorporate changes in the draft STP.

Activities to involve stakeholders in the Draft STP after its release include informal briefings for Battelle staff; informal contacts with community groups and presentations to interested groups (if requested); informal contact with the mayors as well as U.S. Congressional and state legislative representatives for the two BCLDP site areas; and providing copies of the draft STP and revised fact sheet to libraries and governmental/oversight officials for review and comment. BCLDP representatives will also be available at the meetings/briefings for other "Ohio Complex" sites if requested by representatives of those sites. No news releases or media briefings are planned, except by specific request, because of the small quantity of mixed waste involved in the BCLDP.

Libraries that receive information about the BCLDP, including the STP, are:

- Columbus Metropolitan Library, Main Branch, 96 S. Grant Ave, and Northside Branch, 1423 N. High St., Columbus, OH
- State Library of Ohio, 65 S. Front St., Columbus, OH
- West Jefferson Public Library, 301 Main St., West Jefferson, OH

The final BCLDP Site Treatment Plan will be released for approval by the OEPA in February 1995. BCLDP staff will work with Ohio officials to establish a distribution list for the final Site Treatment Plan to meet the statutory requirement that the state make copies of the plan available to the public and consider any comments received.

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Information materials already available will be used during the interactions, including the STP and BCLDP fact sheets, video, and posters. The interactions described in this activity plan mirror communications underway since 1989 to describe the decontamination and cleanup of areas in 15 Battelle buildings located in Central Ohio.

To involve stakeholders in the development of the STP, Battelle follows the model that has seemed to satisfy each of the groups described below. In general, updates about the BCLDP are provided as part of more extensive Battelle-wide briefings. This allows people to make the most efficient use of their time and gives them a perspective of how the BCLDP fits within all Battelle operations and plans in the Columbus area.

A related ongoing public information activity has been the public meetings and hearings on Battelle's application for a Part B Hazardous Waste Facility permit, which is under the authority of OEPA. Although not directly related to the FFCA Act, the outcome of the Part B hearings could have an indirect effect on any future storage capacity of BCLDP radioactive mixed waste. As part of the Part B process, public and regulatory interaction activities have included tours of the current Battelle Part A storage facilities, BCLDP more-than-ninety-day storage areas, and satellite pick-up areas.

People who have toured those facilities include members of the University Area Commission, Harrison West Society, University Community Association, members of the Ohio Attorney General's Office, the Battelle Permit Opposition Committee (BPOC), community emergency response teams, the Victorian Village Society, Columbus Department of Health, and representatives of various local news media. The tours have provided opportunities to include discussions of BCLDP activities, including the STP. These tours are in addition to annual scheduled facility inspections conducted by the Ohio EPA-Central District Office officials.

### Stakeholders

The stakeholders with possible interest in the BCLDP are the internal and external institutions, groups, and individuals who may be interested in Battelle activities in general or who are potentially affected by the project's activities, principally the following: (a) Governmental, (b) Special Interest Groups (including Battelle staff), (c) General Public, and (d) Media.

**(a) Governmental:**

- U.S. NRC and EPA, Ohio Congressional delegation
- Ohio Governor's Office, Attorney General's Office, state senators and legislators from Central Ohio; the Ohio EPA and Department of Health
- Columbus and Franklin County officials, West Jefferson village, township, and Madison County officials.

**(b) Special Interest Groups:**

- Battelle management and staff (primary stakeholders)
- Residents in adjacent communities or neighborhoods
- Leaders of area community groups
- Environmental groups
- Other clients
- Other interested groups (e.g., business associations, technical associations, the Ohio State University).

**(c) General Public:**

- Nearby residents
- Other interested citizens.

**(d) Media:**

- Columbus area print and broadcast representatives
- Madison County daily print media and radio reporters
- Business press.

A stakeholder list for the BCLDP was developed and will be used to distribute information about the Draft STP and the FFCAct.

## Schedule

The schedule for upcoming activities is:

Release of Draft Site Treatment Plan	By August 30, 1994
Distribution of revised fact sheet and Draft STP to area libraries and governmental/oversight officials	By September 7, 1994
Informal contact of mayors, community groups, Congressional delegation, and state legislature representatives	September 1994
Informal briefing ("brown bag" luncheon) for Battelle staff regarding BCLDP activities in general	Fall 1994
Contact/coordination with other "Ohio Complex" sites	Fall 1994 (meeting dates to be determined)
Presentations to interested community groups or governmental officials/representatives	By request
Media briefings	By request

## Objectives

The objective of these activities is to inform stakeholders, including the public, about the STP. However, because the quantities of mixed waste involved in the BCLDP are very small, a low level of public interest is expected. For this reason, public participation activities regarding the STP will be incorporated into the overall public information activities for Battelle and the BCLDP, as outlined in the *Public Information Plan for Battelle Columbus Laboratories Decommissioning Project*, February 1993. Communications about the BCLDP are integrated with other Battelle corporate communications to present a broad perspective to stakeholders.

## 5.0 Evaluation

Because of the need to coordinate public information activities regarding the STP with overall BCLDP and Battelle communications, and because of the expected low level of public interest in the STP (due to the small quantity of mixed waste and the plans to remove it from the sites), the only evaluation of STP public participation efforts is the evaluation conducted for BCLDP communications in general. These methods are outlined in Section 6 of the *Public Information Plan for Battelle Columbus Laboratories Decommissioning Project*, February 1993 (see Appendix C). Separate evaluation efforts for STP public participation are not planned.



# Battelle Columbus Laboratories Decommissioning Project (BCLDP)



## APPENDIX A (revised 6/94)

### Mixed Waste Site Treatment Plan

**Background.** The Federal Facilities Compliance Act (FFCA), which was enacted by the U.S. Congress on October 6, 1992, contains requirements that affect the Battelle Columbus Laboratories Decommissioning Project (BCLDP). The FFCA requires that all federal facilities—including facilities owned by the U.S. Department of Energy (DOE)—be brought into full compliance with all federal hazardous waste laws.

The FFCA also requires that federal facilities work with the U.S. Environmental Protection Agency (EPA), state environmental agencies, and other stakeholders to provide comprehensive information on mixed waste inventories, treatment technologies, and treatment plans for each site. Mixed waste, which contains both radioactive and other hazardous components, represents a difficult management issue because of the dual regulatory requirements and limited treatment facilities.

Minimal quantities of mixed waste are expected to result from BCLDP activities. This project is decommissioning areas in 15 Battelle buildings located in Central Ohio where nuclear research and development work was conducted. These facilities are not a DOE site but are privately owned by Battelle. However, the BCLDP has been determined to be included under FFCA requirements because DOE is the owner of any radioactive waste generated during the cleanup.

The cleanup work at the Battelle sites is being co-funded by DOE and Battelle (90-10 percent, respectively) because most of the nuclear work was performed for federal agencies as part of the national defense effort. The accompanying fact sheet provides additional information about the BCLDP work, progress, and schedule.

**DOE Compliance.** In April 1993, DOE fulfilled the first FFCA milestone by publishing the Interim Mixed Waste Inventory Report containing preliminary estimates of volumes of mixed waste at each site. All DOE sites are now developing Site Treatment Plans that will specify current mixed waste streams and estimated volumes, identify existing treatment technologies and options, and provide a schedule for developing any needed new technologies. The BCLDP is included in this process, as indicated earlier. These plans are to be prepared with the involvement of stakeholders on the following schedule:

- **Conceptual Plan—October 1993:** provided an initial evaluation of treatment capacities, needs, and options.
- **Draft Plan—August 1994:** identifies the current preferred options, treatment locations, and schedule, reflecting comments from stakeholders, including the public.
- **Final Plan—February 1995:** will describe the selected options, locations, and schedule.

**BCLDP Plan.** No BCLDP mixed waste is currently being treated, stored, or disposed of at Battelle's facilities in Central Ohio and there are no plans to do so. In the draft BCLDP Site Treatment Plan, Battelle estimates that only small quantities of mixed waste will result through completion of the work in 2001. During 1993, for example, a total of five fifty-five gallon drums of mixed waste was shipped offsite. The mixed waste will continue to be shipped to either DOE-managed or NRC-licensed facilities. Currently all low-level radioactive-mixed waste and low-level radioactive waste are shipped to the DOE facilities at Hanford, Washington. Plans

are also being developed to send certain types of mixed waste to commercial treatment and disposal facilities. Hazardous wastes that have no radioactivity above established release limits are being disposed of by Battelle at licensed facilities in accordance with applicable regulations.

The draft BCLDP Site Treatment Plan presents current estimates of the types and amounts of mixed waste that may result throughout the project. The final edition of the plan will present updated information on waste types or volumes, new technologies, or other possible treatment methods. The draft plan discusses several options to the current mixed waste treatment method, including sending specific mixed wastes to an off-site treatment facility or combining BCLDP mixed wastes with similar waste streams at larger DOE facilities in Ohio.

The small quantities of mixed wastes that may be produced by the BCLDP include:

- Mercury-contaminated particulate/debris
- Lab packs (inorganic)—lab reagents in original containers (flammable metal powders)
- Lab packs (organics)—paint, oil with solvent, cleaning compounds
- Elemental lead—shielding blocks, weights, lead shielding contained in walls, casks, and lead shot.

The draft plan identifies the preferred option, off-site treatment of these mixed wastes—including technologies such as thermal destruction, vitrification, encapsulation, and incineration. Similar waste streams are being generated at a number of DOE-owned facilities. The plan concludes that (1) no new technologies will be required to accommodate the BCLDP mixed waste and (2) it will be possible to send all BCLDP mixed waste to DOE-owned sites for treatment.

**Stakeholder Involvement.** The FFCAct provides little guidance concerning public participation or stakeholder involvement in the process to complete the Site Treatment Plans. However, DOE has made a commitment that the public and other stakeholders will have opportunities to become involved as the plans are developed. Copies of the BCLDP Conceptual Site Treatment Plan were provided to area public libraries and this fact sheet was made available to the public. Plans to involve stakeholders in the draft BCLDP Site Treatment Plan include providing background briefings for Battelle staff, interested community groups, governmental officials; providing copies of the draft plan for review and comment; offering media briefings about the process; and distributing information about the project, such as this fact sheet.

**Further Information.** Further information about the BCLDP or Site Treatment Plans can be obtained from:

Battelle  
505 King Avenue  
Columbus, OH 43201

Tom McClain, Director, Office of Communications, 614-424-7728  
Helen Latham, BCLDP Institutional Relations Manager, 614-424-4062

Or:  
U.S. Department of Energy  
BCLDP Site Office  
505 King Avenue  
Columbus, OH 43201

Tom Baillieu, Acting Project Manager, 614-424-7226

The August 1994 Draft Site Treatment Plan identifies the currently preferred options for disposing of the small quantities for mixed waste from the BCLDP. The Draft Plan was prepared using the "bottoms up" approach and has not been completely evaluated for potential impacts to other DOE sites and the overall DOE program. These preferred options may change as evaluation of DOE-wide impacts and state-to-state discussions progress.

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## APPENDIX B

The BCLDP has two sites in the Greater Columbus area: the King Avenue Site and the West Jefferson Site.

### Description of Area Near the BCLDP King Avenue Site

The King Avenue site is located in the western central portion of the city of Columbus, Ohio. The 58.3 acre site, accommodating 21 buildings, is bounded on the north by King Avenue, Battelle Boulevard to the east, West Third Avenue to the south, and the Olentangy River to the west.

The area within two miles of the King Avenue site to the east and south consists of predominantly single-family urban residential neighborhoods. The Near Northside Historic District, listed on the National Register of Historic Places, encompasses these neighborhoods. The boundary of the district meets the boundary of the King Avenue site on the east and north, and the land owned by Battelle from Fifth Avenue south to Third Avenue is located within the district. Most of the residences in the Near Northside Historic District were built in the late 19th Century and early 20th Century, with some newer infill housing located on lots where older homes were demolished.

The area to the northeast and east of the King Avenue site, north of Fifth Avenue, is within the city's University District. This area includes neighborhoods known as Dennison Place (to the east) and the Elizabeth McMillan section (to the northeast). Although it has pockets of predominantly single-family residences, the University District is generally more densely populated than the area to the south of Fifth, which is a neighborhood known as Harrison West.

The Ohio State University, with a student enrollment of approximately 50,000 and a staff of approximately 29,000, is adjacent to the King Avenue site on the north. The area west of the Olentangy River consists mainly of small business and light industrial properties, with scattered residential patches.

### Description of Area Near the BCLDP West Jefferson Site

The West Jefferson site is located about 15 miles west of the King Avenue site and consists of a 1,000-acre tract that includes the Nuclear Sciences Area in the northern portion. The northern boundary of the site lies about a half mile south of Interstate Highway 70 and extends from the Georgesville-Plain City Road eastward to the Big Darby Creek. The eastern boundary of the site

roughly parallels the valley of the Big Darby Creek southward to the Conrail tracks, which constitute the southern boundary. The Georgesville-Plain City Road defines the western boundary of the site.

The area immediately adjacent to the West Jefferson Site has a low population density. The nearest residences to the Nuclear Sciences area (the area where the BCLDP is located at Battelle's West Jefferson Site) are two houses located 2,500 feet to the northwest and southwest, respectively. Camp Ken Jockety, a Girl Scout camp, is located on a bluff on the east side of the Big Darby Creek at a distance of 1,640 feet from the center of the site. Four thousand feet to the southeast, on the eastern side of the Big Darby Creek, the Lake Darby Estates residential subdivision currently contains a total of 965 single family units. A second subdivision, West Point, east of the Lake Darby Estates and Hubbard Road, has approximately 540 housing units.

The primary agricultural activity in the area is raising field crops such as corn and soybeans. Approximately 10 percent of the land area in agricultural use is devoted to pasturing beef cattle.

Two major highways, I-70 and I-270, are near the West Jefferson site. The junction of these highways, which lies near the eastern edge of the 10-mile perimeter around the Nuclear Sciences Area, has proven to be a popular area for industrial growth.

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## APPENDIX C

### Section 6.0, "Evaluation of BCLDP Communications" from the *Public Information Plan for Battelle Columbus Laboratories Decommissioning Project, February 1993*

Methods to evaluate the effectiveness of public information plans and materials range from formal (e.g., a survey) to informal (e.g., conversations with key sources). The informal events often occur automatically as part of the interactive process. Almost every interaction, response to a question, or optional step taken is a reflection of having evaluated the process then adapting or improving upon it. Most experienced communications personnel adjust as the process evolves almost by second nature. However, without some formality to evaluation techniques, an individual's concern or group's issue can be lost in the ongoing project. Additionally, during such a prolonged project, Battelle could lose the communications initiative.

This section describes methods being used to assess the effectiveness of the BCLDP Public Information Plan and the communications process, which will lead to adapting and adapt to changing needs. Several examples were provided the previous sections.

#### 6.1 Governmental

At the federal level, DOE provides regular feedback to Battelle through its normal oversight role. NRC input is provided through reviews of progress reports and periodic briefings.

In addition, frequent monitoring of the Congressional delegation, which Battelle does routinely with aides in the Columbus offices, provides feedback. Content analysis of news clippings and broadcast reports allows evaluations of any additional information needs. Periodic status reports to Congressional aides give them opportunities to express their constituents' unmet concerns but none has been expressed or conveyed to Battelle.

For state and local officials, monitoring of media coverage and periodic informal interactions have provided opportunities to gauge information gaps, but these officials have not indicated the need for more frequent information. Status reports continue to be offered, individually or in groups, at quarterly intervals to provide them with current information. Informal contacts with the mayors and presidents of councils or commissions (or their aides) give Battelle public affairs staff confidence that local people are comfortable with the information received about the BCLDP.

Evaluation forms are provided to emergency responders attending Battelle's training sessions and drills to encourage feedback and improving communications.

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**6.2 Special Interest Groups** The Battelle ES&H confidential "hot line" (4-4111), management, and supervisory staff in the affected buildings provide a sounding board to surface unmet needs or concerns within the Battelle staff. Technical managers in the affected buildings are consulted about the regularity of briefings and updates. These managers are being encouraged to provide status reports to their staffs. As work schedules pick up, Battelle staff in general will have opportunities to express their concerns or questions via the channels mentioned and at meetings or brown-bag luncheons being planned for 1993. Questions raised are reviewed to determine if they are frequent and alike enough to require additional information or activities. Articles in Current will report progress, the start and conclusion of various areas, and discussions of staff issues.

Interactions and quarterly contacts with leaders of community and business groups have to date indicated that their memberships are receiving adequate information. For the community and neighborhood groups, Battelle communications staff monitor statements in news coverage, association newsletters, and mailings to determine positions on various relevant issues. When the BCLDP began in 1989, Battelle called each group's leadership regularly to determine if they had questions or needed more information. Battelle also regularly asked key contacts in each neighborhood about concerns the D&D work might be causing members, as part of routine interactions with them. Battelle speakers at meetings of these groups or staff members who belong to the community groups also talk with leaders to determine if there are unmet needs.

Other channels to corporate, business, and environmental communities in the Central Ohio area have been routinely pulsed to obtain their opinions about whether concerns are being addressed and to obtain recommendations for improving communications.

### **6.3 General Public**

Opinions of the general public should be reflected in the feedback from these leaders and groups or should be evident in questions received at speakers' bureau events or via telephone questions. Public concerns are also gauged through monitoring of news coverage.

### **6.4 Media**

Media representatives' needs are assessed by regular interactions with them and from monitoring the amount and tone of coverage. Initially there was media interest and several articles but once the BCLDP activities became routine, there seems to be little media interest. The current approach is to respond to requests from the media representatives for information, interviews or tours.