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SITE MANAGEMENT PLAN PADUCAH GASEOUS DIFFUSION PLANT PADUCAH, KENTUCKY

ANNUAL REVISION—FY 2004



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SITE MANAGEMENT PLAN
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

ANNUAL REVISION—FY 2004

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ACRONYMS

ACO	Administrative Consent Order
AOC	areas of concern
ARAR	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSOU	comprehensive site operable unit
D&D	decontamination and decommissioning
DMSA	DOE Material Storage Area
DNAPL	dense, nonaqueous-phase liquid
DOE	U.S. Department of Energy
EM	Environmental Management
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	feasibility study
FY	fiscal year
GDP	gaseous diffusion plant
KDFWR	Kentucky Department for Fish and Wildlife Resources
KNREPC	Kentucky Natural Resources and Environmental Protection Cabinet
LCB	lifecycle baseline
LOI	Letter of Intent
NCP	National Contingency Plan
NPL	National Priorities List
OU	operable unit
PCB	polychlorinated biphenyl
PGDP	Paducah Gaseous Diffusion Plant
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RGA	Regional Gravel Aquifer
RI	remedial investigation
ROD	Record of Decision
SMP	Site Management Plan
SWMU	solid waste management unit
TCE	trichloroethene
USEC	United States Enrichment Corporation
WAG	Waste Area Grouping
WKWMA	West Kentucky Wildlife Management Area

1. INTRODUCTION

The Paducah Gaseous Diffusion Plant (PGDP) was placed on the National Priorities List (NPL) on May 31, 1994. In accordance with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the U.S. Department of Energy (DOE) entered into a Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and the Commonwealth of Kentucky on February 13, 1998. The FFA established one set of consistent requirements for achieving comprehensive site remediation under Resource Conservation and Recovery Act (RCRA) and CERCLA, including stakeholder involvement.

Section XVIII of the FFA requires DOE to submit an annual Site Management Plan (SMP), which outlines DOE's strategic approach for achieving cleanup under the FFA, to EPA and the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) by November 15th of each year. The FFA states that the purpose of the SMP is to coordinate and document the potential and selected operable units (OUs), including removal actions; define cleanup priorities; identify work activities that will serve as the basis for enforceable timetables and deadlines under the agreement; and establish long-term cleanup goals.

In May 2001, the FFA parties invoked the dispute provisions of the FFA on the fiscal year (FY) 2001 SMP. This dispute pertained to the lack of agreement on enforceable milestones. Resolution to the dispute for near-term milestones was reached on April 14, 2003. The agreement established enforceable milestones for FY 2003, FY 2004, and FY 2005. It also stated the FFA parties shall continue negotiations and agree to work in good faith to finalize the schedules and milestones for the remaining outyear scope.

In addition to the SMP Agreement of April 14, 2003, DOE and the Commonwealth of Kentucky entered into a Letter of Intent (LOI) in August 2003. EPA was not a signatory to the LOI. EPA's review and approval of the terms of the LOI as incorporated into the SMP will be

established upon its review and approval of the SMP. The LOI documents the commitment by the Commonwealth of Kentucky and DOE to promote accelerated cleanup at the PGDP, develop integrated planning and funding request, meet commitments under the FFA, and settle all identified outstanding enforcement and compliance issues through an Agreed Order.

The LOI establishes a phased approach with a series of early actions being accomplished through implementation of five strategic cleanup initiatives prior to plant shutdown, followed by a second phase of cleanup activities implemented after plant shutdown. The five strategic cleanup initiatives being implemented as part of early activities

Strategic Cleanup Initiatives	
▶	Decontamination and Decommissioning (D&D) OU Strategic Initiative,
▶	Groundwater OU Strategic Initiative,
▶	Burial Grounds OU Strategic Initiative,
▶	Surface Water OU Strategic Initiative, and
▶	Soils OU Strategic Initiative.

include those shown below.

This revision of the SMP officially incorporates the provisions of the SMP Agreement signed by DOE, EPA, and KNREPC on April 14, 2003; input from various strategic planning meetings between DOE and the regulators; and terms of the LOI. Specifically, this SMP establishes enforceable milestones for FY 2004, FY 2005, and FY 2006, and enforceable completion dates for the five strategic initiatives based upon the approach outlined in the LOI.

The primary objectives of these initiatives are to take early actions necessary to prevent both on-site and off-site human exposure that presents an unacceptable risk, ensure safe environmental conditions for industrial workers during ongoing plant operations, and implement actions that provide the greatest opportunities to achieve significant risk reduction prior to site closure. The

following concepts will guide the implementation of the site cleanup strategy:

- Use risk-based cleanup with realistic exposure assumptions based on current and reasonably anticipated future land use.
- Implement a remediation approach that uses OUs, with an emphasis on early actions.
- Establish priorities that balance risk and compliance with mortgage reduction and visible progress toward completing the Environmental Management (EM) mission.
- Ensure that enforceable milestones and funding requests are based on clearly defined work scope and objectives.

In accordance with Section XVIII.F of the FFA, execution of these concepts, combined with other cost and productivity initiatives, will continue to be used to achieve efficient and cost-effective cleanup that is protective of human health and the environment.

The SMP is considered a strategic planning document that is updated annually in accordance with the FFA. It contains scope, schedule, and milestones based upon certain planning assumptions and is not intended to be predecisional. The actual scope and schedule associated with remedy selection and implementation will be proposed in the appropriate CERCLA document and subjected to public comment in accordance with CERCLA and RCRA, as specified by the FFA. In the event that an actual or apparent inconsistency arises between the FFA and the SMP, the provisions of the FFA will govern.

2. BACKGROUND

PGDP reached its 50th anniversary of operation in October 2002 as the only operating uranium enrichment plant in the U.S. With a half-century of production behind it, the plant faces significant environmental cleanup challenges.

2.1 FACILITY LOCATION AND OPERATIONS

PGDP is situated on a 3,556-acre parcel of DOE-owned property in western Kentucky, approximately 10 miles west of the city of Paducah and 3 miles south of the Ohio River (Fig. 1). The primary plant operations associated with the enrichment process are located on 748 acres within the plant security fence. Of the remaining acreage comprising the DOE-owned property (i.e., outside the main security fence), 1,986 acres are leased to the Kentucky Department for Fish and Wildlife Resources (KDFWR), as part of the West Kentucky Wildlife Management Area

(WKWMA), and the remaining land (822 acres) is relegated as a buffer zone around the secure area.

The area surrounding the PGDP is predominantly rural. Immediately adjacent to PGDP is the WKWMA, which is used by hunters and fishermen. The remaining area is lightly populated with randomly located residences and farms. The small communities of Grahamville and Heath are located approximately 2 miles east of the plant. Metropolis, Illinois, is located north of PGDP, across the Ohio River.

PGDP is in an area of abundant surface water and groundwater resources. Bordering the east and west sides of the secure area are Little Bayou Creek and Bayou Creek, respectively. Little Bayou Creek originates in the WKWMA, and Bayou Creek originates about 2.5 miles south of PGDP. Both creeks flow north toward the Ohio River, which is about 3 miles north of PGDP. Much of the flow in both creeks is caused by permitted effluent releases from PGDP. These effluents constitute the majority of normal flow in Bayou Creek and Little Bayou Creek.

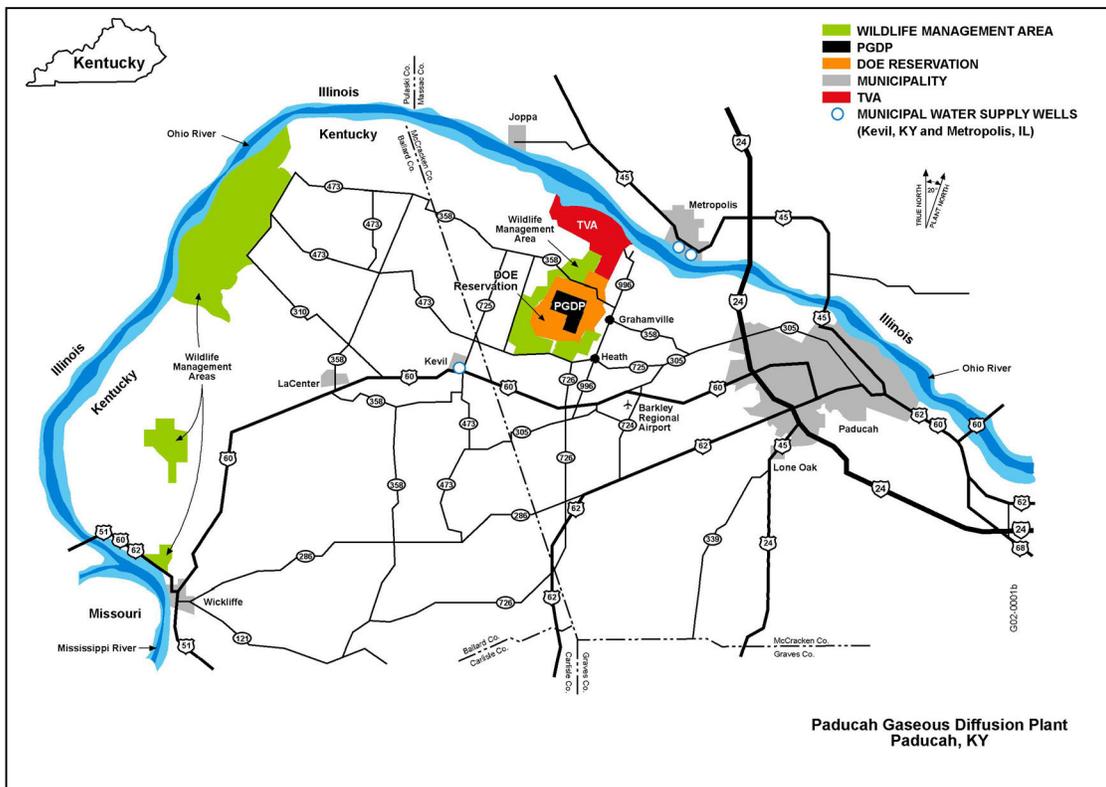


Fig. 1. Site location.

The major groundwater resource at PGDP is called the Regional Gravel Aquifer (RGA). The RGA is considered the uppermost aquifer at PGDP and historically served as a source of water to local residents. This aquifer originates near the southern boundary of PGDP, underlies nearly all of the secure area of the plant, and continues north to the Ohio River. The general flow direction of groundwater in the RGA is toward the north-northeast, where the aquifer discharges to the Ohio River.

Currently, the United States Enrichment Corporation (USEC) operates the uranium enrichment plant at PGDP. This corporation was established on October 24, 1992, when the President signed the Energy Policy Act of 1992. The charter of USEC under this act is to provide profitable and competitive uranium enrichment services. USEC has leased the uranium enrichment production facilities from DOE since July 1, 1993, but DOE has retained the non-leased facilities and is responsible for the decontamination and decommissioning (D&D) and cleanup for environmental conditions that existed before July 1, 1993. Privatization of USEC was complete on July 28, 1998.

2.2 INITIAL RESPONSE AND REMAINING CHALLENGES

In response to the discovery of trichloroethene (TCE) and technetium-99 (⁹⁹Tc) in residential wells north of the PGDP in 1988, DOE immediately provided a temporary alternate water supply to affected residences and sampled all surrounding residential wells. Following this initial response, DOE and EPA entered into an Administrative Consent Order (ACO) that required monitoring residential wells potentially affected by contamination, providing alternative drinking water to residents with contaminated wells, and investigating the nature and extent of off-site contamination.

The ACO activities delineated two off-site groundwater contamination plumes, referred to as the Northwest and Northeast Plumes; identified several potential on-site source areas requiring additional investigation; and resulted in several interim activities. Upon signature of the FFA in February 1998, the FFA parties declared the ACO

requirements satisfied and terminated the ACO because the remaining cleanup would be continued under the authority of the FFA. A series of remedial investigations/ feasibility studies (RI/FSSs) was conducted under the FFA, including completing the evaluation of all major contaminant sources impacting groundwater and surface water. In accordance with the ACO and FFA, DOE actions have primarily focused on reducing potential risks associated with off-site contamination. Examples of the significant actions initiated and completed to date include the following:

- Extended municipal water lines as a permanent source of drinking water to affected residents to eliminate exposure to contaminated groundwater (1995).
- Constructed and implemented groundwater treatment systems for both the Northwest and Northeast Plumes to reduce contaminant migration (1995 and 1997, respectively).
- Imposed institutional controls (fencing and posting) to restrict public access to contaminated areas in certain outfall ditches and surface water areas (1993).
- Constructed hard-piping to reroute surface runoff around highly contaminated portions of the North-South Diversion Ditch to reduce potential migration of surface contamination (1995).
- Removed and disposed of “drum mountain,” a contaminated scrap pile potentially contributing to surface water contamination to eliminate potential direct-contact risks to plant workers and reduce off-site migration (2000).
- Excavated soil with high concentrations of polychlorinated biphenyls (PCBs) in on-site areas to reduce off-site migration and potential direct-contact risks to plant workers (1998).
- Applied in situ treatment of TCE-contaminated soils at the cylinder drop test site using innovative technology (i.e., the LASAGNA™ technology) to eliminate a potential source of groundwater contamination (2002).

- Removed petroleum-contaminated soil from SWMU 193 to eliminate a potential source of groundwater contamination (2002).
- Completed installation of a sediment control basin to control the potential migration of contamination during the removal action and initiated removal and disposal of approximately 54,000 tons of scrap metal to eliminate potential direct contact risks to plant workers and a source of surface water contamination (2002).
- Completed hardpiping and initiated installation of a detection basin and excavation of the on-site portions of the North-South Diversion Ditch, which will remove a source of potential direct-contact risk to plant workers and surface water contamination (2003).
- Completed two key groundwater technology studies, including a field demonstration to evaluate the technical constructability of a permeable treatment zone and a treatability study to evaluate the effectiveness of the six-phase heating technology for in situ treatment of dense, nonaqueous-phase liquid (DNAPL) at C-400 (2003)

Appendix 1 of the SMP contains a summary of the status of all actions taken to date that have been documented through a Record of Decision (ROD) or Action Memorandum. This appendix also serves to meet the requirement of Section X.A of the FFA, to submit an annual Removal Action Report describing a summary of removal actions performed during the previous FY. More detailed information on the status of each OU is available in the FFA Semi-Annual Progress Report. In addition to the completed actions, DOE has an ongoing integrated environmental monitoring program that assesses contaminant effects and depicts trends in effects over time. Results from this program are reported in the Annual PGDP Environmental Reports.

The aforementioned response actions are steps in reducing site risks. While no known imminent threats currently exist, as verified by conclusions in the Agency for Toxic Substances and Disease Registry's Health Assessment, and in a report from the Commonwealth of Kentucky entitled *Report of the Commonwealth of Kentucky's Task Force Examining State Regulatory Issues at the Paducah Gaseous Diffusion Plant*, several major challenges remain. As depicted in Fig. 2, these challenges include legacy waste, DOE Material Storage Areas (DMSAs), PCBs and radionuclides in creeks and soils, off-site organic compound plumes, burial grounds, and on-site sources of groundwater contamination.

This SMP outlines a strategy to achieve significant reduction of potential risks at the site through a series of aggressive response actions, as is further explained in Section 3. The characterization and disposition of materials in the DMSAs and legacy waste are not covered by the FFA. However, a recently negotiated Agreed Order, with Kentucky, which became effective October 1, 2003, supports the option to defer final closure, post-closure, and groundwater corrective actions for DMSAs and legacy waste storage areas and on-site disposal facilities (S- and T-Landfills) to response actions selected and implemented as part of the appropriate OU under the FFA. Any such scope that is incorporated into the FFA will be included in future annual updates to the SMP.

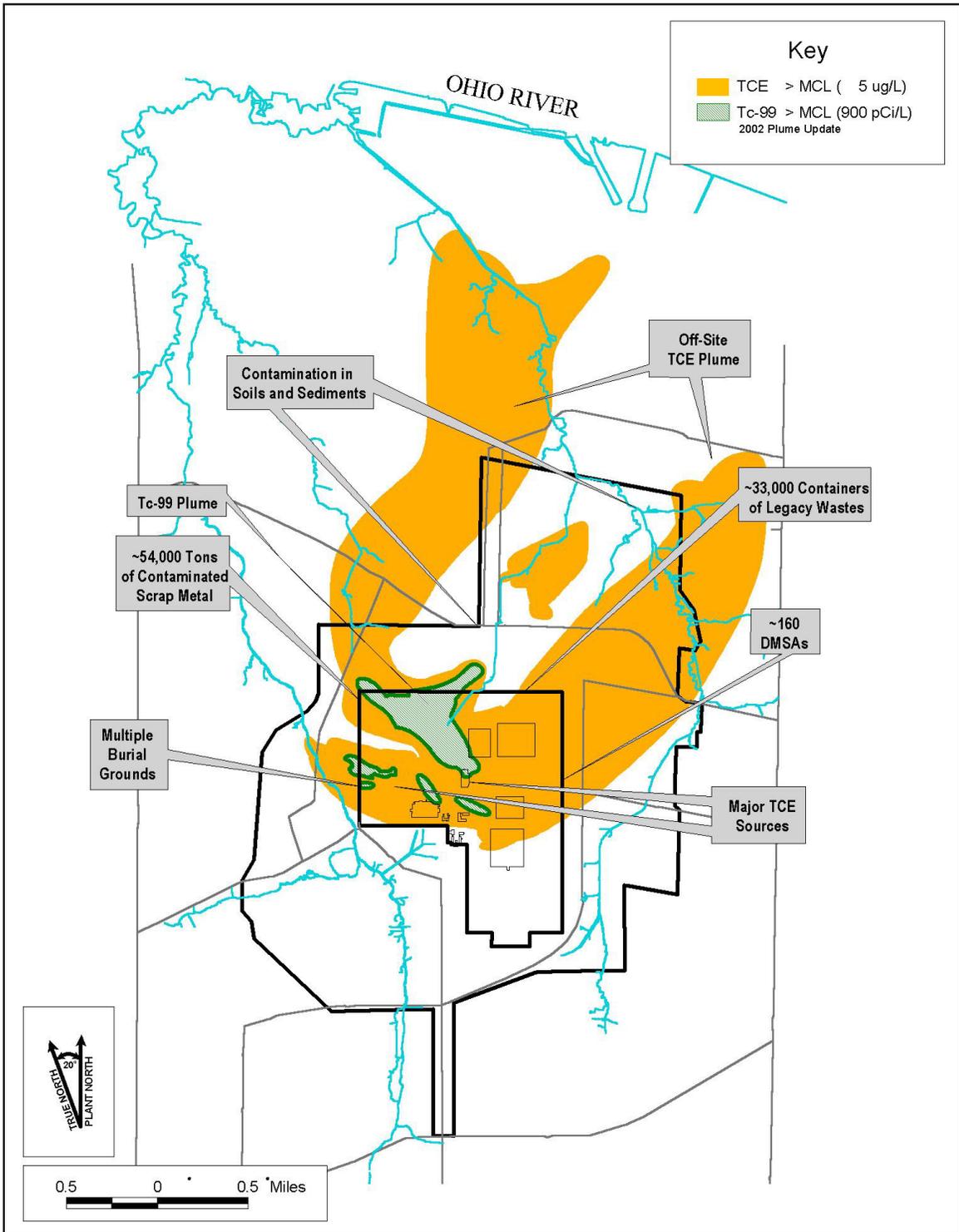


Fig. 2. Major site challenges.

3. RISK-BASED APPROACH

The LOI establishes a phased approach with a series of early actions being accomplished through implementation of five strategic cleanup initiatives prior to plant shutdown, followed by a second phase of cleanup activities implemented after plant shutdown.

The five strategic cleanup initiatives will be implemented using a risk-based approach to ensure that areas posing the greatest potential risks are addressed first and that the selected response actions achieve overall protectiveness under current and reasonably anticipated future use patterns (i.e., end state goal). The risk-based approach considers site-specific factors such as land use, types of contaminants, exposure pathways, and locations of potentially affected receptors (i.e., industrial workers, recreational users, residents, and ecological receptors) to establish a site conceptual risk model. Information generated from this model is used to develop site cleanup objectives, which serve as guiding principles for creating more detailed remedial action objectives (RAOs) to focus OUs on specific site problems.

In summary, the following components are key elements of the risk-based strategy:

- **End state:** Define the end state goal that will achieve protectiveness under current and reasonably anticipated future land uses.
- **Exposure pathway analysis:** Develop a site conceptual exposure model to define exposure pathways leading from the sources to the potentially affected receptors, consistent with the current and reasonably anticipated future use patterns.
- **Site cleanup objectives:** Based on the results of the exposure pathway analysis, develop site cleanup objectives protective of potentially affected receptors that are consistent with the end state goal.
- **OUs:** Establish projects with clearly defined scope, schedule, and exit strategies that

achieve site cleanup objectives in a timely and cost-effective manner.

- **Prioritization:** Prioritize the OUs using risk-based criteria to ensure that the areas posing the greatest risks are addressed first.
- **Implementation:** Implement risk-based projects that provide the greatest opportunity for achieving significant risk reduction.
- **Site-wide baseline risk model:** Develop a baseline risk model to support prioritization and monitor risk reduction progress toward achieving site cleanup objectives and the end state goal.

The RAOs used in remedy selection for each OU will be included in the appropriate CERCLA decision document and subjected to stakeholder input in accordance with the requirements of CERCLA and RCRA.

3.1 END STATE

The end state goal of the site cleanup strategy is to maximize use of on- and off-site locations consistent with current and reasonably anticipated future use patterns. When selecting actions to achieve this goal, many factors, such as site contamination, technology limitations, and cost-effectiveness, must be considered.

For the purpose of the site cleanup strategy, the current and reasonably anticipated future land uses are referred to as the end state, which will be achieved after the active plant ceases operation; therefore, accurately defining current and reasonably anticipated future land use is essential to implementing response actions protective of human health and the environment.

As depicted in Fig. 3, the current and reasonably anticipated future land uses at and adjacent to the PGDP consist of: industrial areas located primarily inside the security fence, recreational areas located outside the security fence, and off-site residential areas. Several factors were considered in establishing the land use assumptions under this strategy, including current and past land

use, existing lease commitments, future industrial missions planned at the site, the nature of site contamination, and stakeholder input.

anticipated future land use because the extent to which DOE can address site contamination has a significant influence on the potential future use of DOE property. The primary contaminants of

concern at the PGDP are radionuclides, organic solvents, and PCBs. Of these, both the radionuclides and PCBs are persistent in the environment and are unlikely to degrade to less hazardous contaminants within a short period of time. While organic solvents can be expected to degrade under many conditions, organic solvents released at PGDP have contaminated the uppermost aquifer (RGA), where degradation is slow. Additionally, the organic solvent TCE, a liquid that is heavier than water, has migrated downward to the aquifer and formed areas of high concentration that are resistant to degradation, thereby creating long-term sources of groundwater contamination that can remain for hundreds of years. These pooled areas of organic solvents, called dense non-aqueous phase liquids (DNAPL) can be extremely difficult to locate and remediate.

In addition to existing lease agreements, the planned DUF₆ conversion plant, and site contamination, input from both internal and external stakeholders continues to be considered through public meetings, workshops, and briefings. In general, a large majority of stakeholders have indicated they support an industrial/commercial presence at the site to preserve existing jobs and to continue contributing to the regional economy.

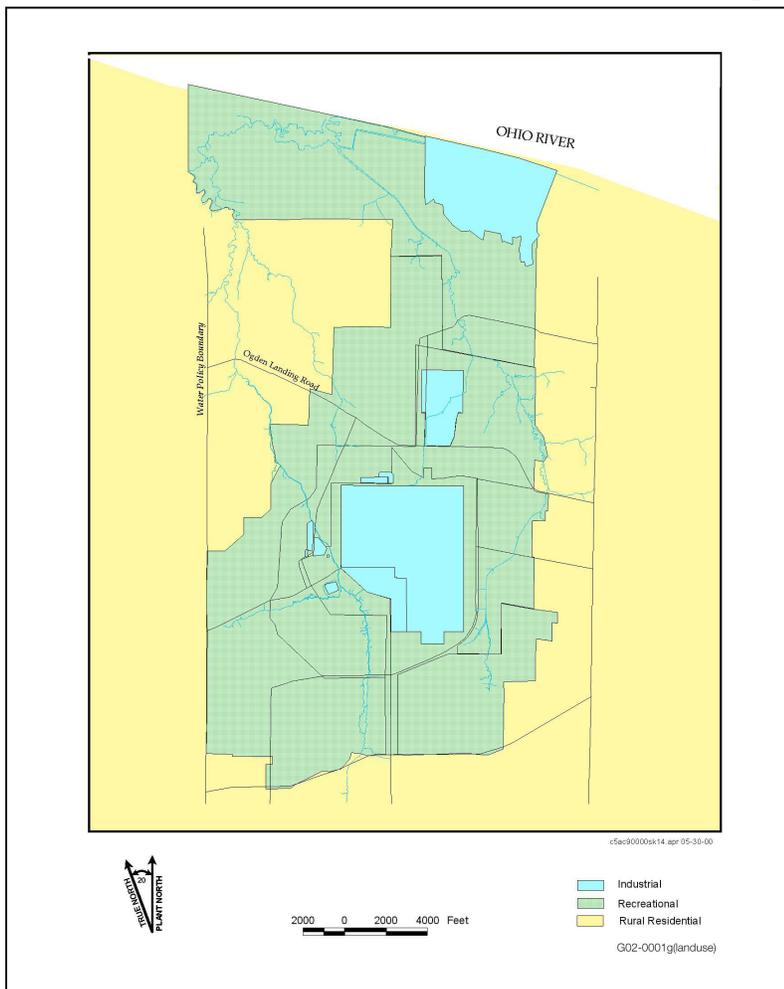


Fig. 3. Current and reasonably anticipated future land use at PGDP.

Lease agreements have a major impact on land use. As noted earlier, PGDP is an active uranium enrichment facility surrounded by a wildlife management area. DOE has lease agreements with USEC for plant operations and with KDFWR for use by WKWMA. In addition to the lease agreements, DOE has also awarded a contract to construct and operate a depleted uranium hexafluoride (DUF₆) conversion plant at PGDP. An Agreed Order outlining certain management requirements for the DUF₆ cylinders was signed by DOE and Kentucky and became effective on October 2, 2003.

Site contamination is an important factor when determining current and reasonably

3.2 SITE CLEANUP OBJECTIVES

To achieve the end state goal discussed in Section 3.1, specific site cleanup objectives have been developed as part of the risk-based strategy. The site cleanup objectives serve as guiding principles for creating more detailed RAOs to focus OUs on site-specific problems. Defining the

site cleanup objectives for the PGDP requires consideration of the land use, exposure pathways, and the potentially affected receptors. The point of exposure represents the most likely location where a potential receptor can come in contact with contaminated media. Therefore, defining the points of exposure that properly correspond to current and reasonably anticipated future land use is essential to establishing cleanup objectives that effectively protect human health and the environment. Based on the current and anticipated future land use, on-site industrial workers, recreational users, and off-site residents are the primary human receptors having the greatest potential for exposure to site contamination originating from the PGDP. The primary pathways of exposure are 1) the groundwater pathway for the off-site residents, 2) the surface water pathway (i.e., surface water and sediments) for recreational users (assumed to be primarily local residents), and 3) direct contact with waste, soils, and sediments for industrial workers.

Site Cleanup Objectives	
▶	Protect residential receptors from exposure to contaminated groundwater in areas off DOE property.
▶	Protect recreational users from exposure to contaminated surface water, sediments, and biota in areas outside the security fence.
▶	Protect industrial workers from exposure to waste and contaminated soils and sediments in areas inside the security fence.

The selected response actions must attain protectiveness at the points of exposure. The National Contingency Plan (NCP) (CERCLA implementing regulations), defines protectiveness in terms of risk-based levels and states that acceptable health-based exposure levels for known or suspected carcinogens are concentration levels that represent an excess upper bound lifetime cancer risk between 10^{-4} to 10^{-6} . For systemic toxicants, EPA guidance defines a hazard index of 1 as an acceptable health-based exposure level.

As noted in EPA's Directive 9355.0-30, cleanup levels can be based on applicable or

relevant and appropriate requirements- (ARARs-) when a chemical-specific ARAR exists or a calculated risk-based concentration. When an ARAR cannot be cost-effectively achieved because of site-specific conditions (e.g., DNAPL), certain options may be available, including technical impracticability and interim measure waivers, as well as alternate concentration limits. Pursuing any such options requires appropriate CERCLA documentation.

To attain protective levels, a response action can target removal/treatment of the source of contamination, focus on the migration pathway, restrict certain actions of the receptor to limit exposure, or use a combination of the above. The CERCLA risk range and ARAR-based standards are used for developing cleanup levels. Although risk exceeding 10^{-6} may meet cleanup standards or otherwise not require the performance of a response action, Section XII of the FFA requires that an evaluation of alternatives (i.e., an FS) be conducted to address any release when the following conditions are present:

- The baseline risk assessment shows that the potential cumulative cancer risk to an individual exposed to a release under current or future land use using reasonable maximum exposure is greater than 10^{-6} .
- The baseline risk assessment shows that the potential hazard to an individual exposed to a release under current or future land use using reasonable maximum exposure results in a hazard quotient greater than 1.
- A determination is made that the release has caused adverse environmental impacts.
- Maximum contaminant levels, non-zero maximum contaminant level goals, or other chemical-specific ARARs are exceeded.

The evaluation of remedial alternatives and selection of response actions will be conducted using the CERCLA nine criteria defined in 40 *Code of Federal Regulations* 300.430(e)(9)(iii).

3.3 OPERABLE UNITS STRATEGY

The site cleanup strategy is a two-phased approach that consists of a series of early actions implemented during plant operations and a second series of actions implemented after the plant ceases operations. The primary objectives of the first phase, which includes actions associated with the five operable units, is to prevent both on-site and off-site human exposure that presents an unacceptable risk, ensure safe environmental conditions for industrial workers during ongoing plant operations, and complete actions that provide the greatest opportunity for risk reduction. The second phase of site cleanup will be implemented after the plant ceases operation. This phase will include the D&D of the operating gaseous diffusion plant (GDP), as well as other deferred actions, and completion of the Comprehensive Site Operable Unit (CSOU). The CSOU will evaluate the residual risks remaining from all previously implemented actions and will be used as the basis for determining whether any additional actions are necessary for achieving protectiveness consistent with the future end-state objectives associated with post-plant-shutdown conditions.

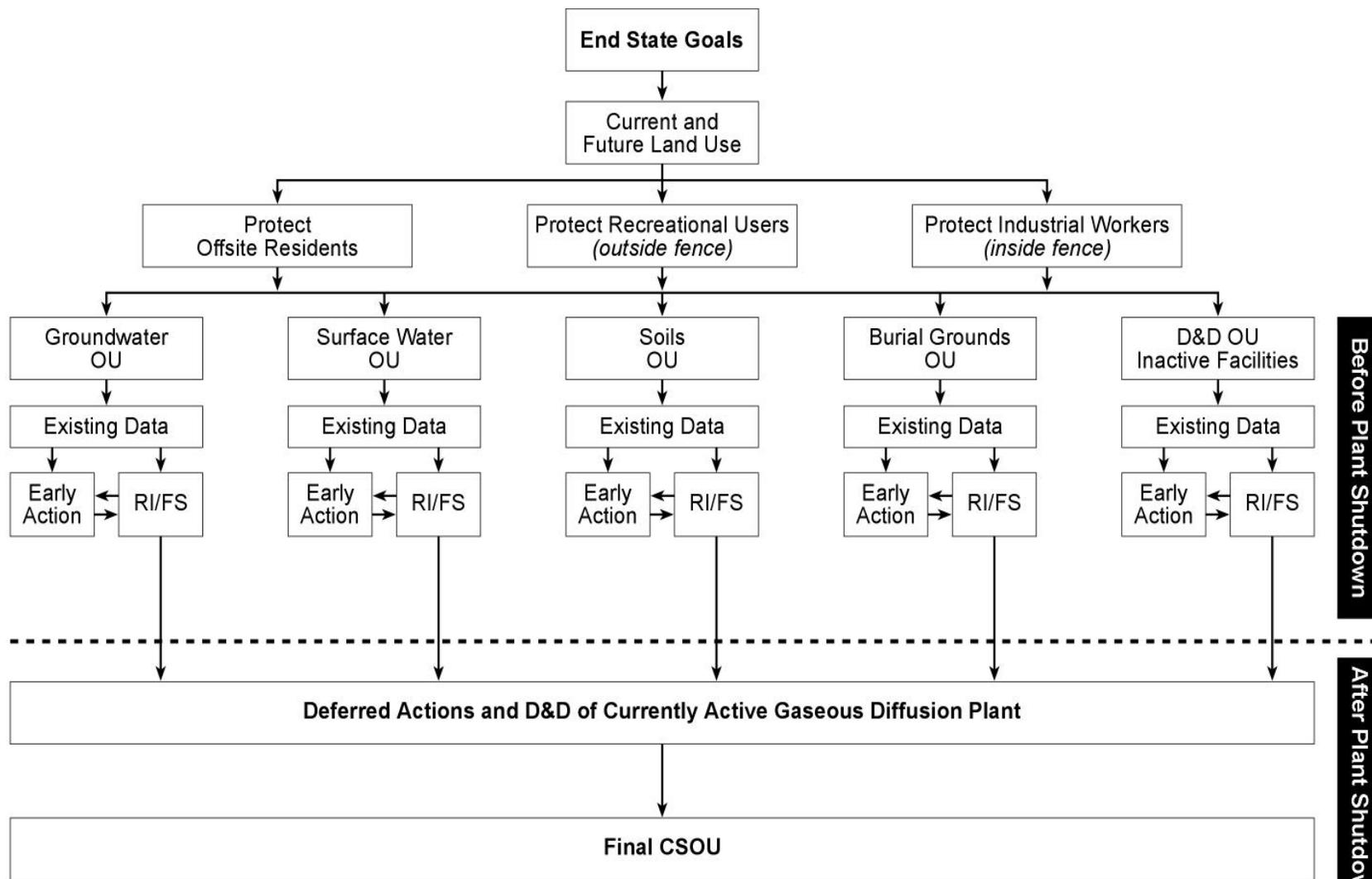
Site cleanup objectives have been developed consistent with the end state goal, as presented in Section 3.2. The site cleanup objectives serve as guiding principles for creating more detailed RAOs and for focusing OUs on specific site problems. As depicted in Fig. 4, cleanup activities will be implemented both before and after plant shutdown and consist of a focused evaluation of five potential OUs with an emphasis on identifying and implementing early actions.

Prior to the FFA, the solid waste management units (SWMUs) and areas of concern (AOCs) were segregated under the RCRA Permit into approximately 30 Waste Area Groupings (WAGs) based on common characteristics (e.g., geographic locations or contaminants). As a better understanding of site conditions was gained through the various WAG investigations, EPA, KNREPC, and DOE concluded it would be more effective if the existing WAGs were grouped into broader OUs, thereby providing a more comprehensive framework to assess risks, identify

and prioritize response actions across the site, and develop integrated remedial solutions.

The OUs were established by developing a site conceptual risk model for each source area (SWMUs/AOCs). This process included an evaluation of contaminant types and concentration, release mechanisms, exposure pathways, points of exposure, and receptors based on current and reasonably anticipated future land use. The source areas were then grouped considering the primary exposure pathways and receptors that may be impacted by contamination at or migrating from the area (i.e., identify primary risk contribution). For example, all sources suspected as being primary risk contributors to off-site residents via the groundwater pathway were grouped under a single groundwater OU. Similarly, the surface water OU contains source areas posing the greatest risks to recreational users. The soils, D&D, and burial grounds OUs contain the sources posing the greatest risks to on-site industrial workers via direct contact.

Section XI.2. of the FFA specifies that the SWMUs and AOCs contained in Appendix B of the agreement be segregated into potential OUs in the SMP to facilitate effective planning and RI/FS scoping. Appendix 2 of the SMP contains lists of SWMUs and AOCs sorted by potential OU. These lists show that some SWMUs and AOCs are placed in more than one potential OU because of the nature of the contamination present. Additionally, some SWMUs and AOCs are not listed because they will be addressed under another regulatory program. (Section IV.F. of the FFA states that treatment, storage, and disposal units for which KNREPC has regulatory authority and has issued a RCRA Hazardous Waste Permit establishing that operating, closure, or post-closure standards shall not be subject to the agreement.) Furthermore, some units have already been assigned no further action or are being addressed under other regulatory programs, permits, or enforcement orders. The Agreed Order supports the option to defer final closure, post-closure, and groundwater corrective actions for areas addressed under the Agreed Order to response actions selected and implemented as part of the appropriate OU under the FFA. Any such scope that is incorporated into the FFA will be included in future annual updates to the SMP.



G03-0139 End State Goals

Fig. 4. OU strategy.

3.3.1 Pre-GDP Shutdown

The FFA states one purpose of the agreement is to expedite response actions with minimal delay. Sections X and XIV of the FFA contain considerable flexibility for implementing early response actions through removal and interim remedial actions to achieve significant risk reduction quickly, expedite total site cleanup, or respond to immediate risks. The primary goal of the site cleanup strategy is to demonstrate a bias for action, with emphasis on identifying and implementing early actions that provide significant risk reduction, including implementation of projects that promote mortgage reduction opportunities to free up funding for potential acceleration of other work.

PGDP has been subject to extensive RI characterization since the CERCLA ACO in 1988. Consequently, a considerable amount of data is available for each OU. The existing data have been subject to an ongoing risk evaluation, which has resulted in the identification of a series of early actions. These early actions are focused in nature and represent a significant step toward reducing potential site risks. However, these actions are not intended to provide comprehensive solutions for the entire site or particular OU. Therefore, additional RI/FS evaluation may be necessary.

When additional data are determined to be necessary, existing data will be evaluated in RI/FS work plans to define data gaps and direct the field sampling plan. In accordance with the FFA, these investigations will include a baseline risk assessment, which examines both site risks and the potential for risks from commingled releases from other sources. These assessments will support the ongoing development of the site-wide risk model and enhance DOE's ability to develop integrated remedial solutions. Integrated assessments of both the groundwater OU and surface water OU will be completed consistent with the FFA and earlier versions of the SMP.

Some OUs contain active units associated with the operating GDP (e.g., electrical switchyards). Access restrictions, operating hazards, or potential for recontamination, prevent those units from being fully characterized or remediated until they cease operation. Therefore,

prior to plant shutdown, RI/FS activities will be focused, with an emphasis on the migration pathways leading from the OUs. This will determine whether there is an ongoing release posing an imminent threat that warrants early action. The extent of the investigation and necessary response actions for such areas will be determined on a case-by-case basis after consideration of the site-specific conditions. In cases where the RI/FS process determines that there is no unacceptable direct contact risk or potential for off-site migration, additional action may be deferred until the Final CSOU.

3.3.2 Post-GDP Shutdown

Post-GDP shutdown activities will include D&D of the currently operating GDP, as well as deferred actions for contamination not posing a risk warranting an early action, and completion of the Final CSOU. In accordance with the LOI, six months prior to plant shutdown, the parties will initiate negotiations to reach agreement on enforceable completion dates for the second phase of site cleanup.

In accordance with Section XIII.B of the FFA, the Final CSOU evaluation, will occur following completion of D&D of the currently operation GDP and deferred actions. As part of the Final CSOU evaluation, the future land use assumptions discussed previously will be reassessed and modified, if necessary, to ensure consistency with any reuse initiatives that may be considered at that time. The scope of the Final CSOU will include a site-wide baseline human health and ecological risk assessment to evaluate the residual risks and will identify any additional actions as necessary to ensure long-term protectiveness based on exposure assumptions consistent with final end-state conditions.

3.4 SITE PRIORITIZATION

DOE uses a combination of factors to prioritize work being implemented under the EM program at PGDP. These include risk-based criteria, compliance with other programs, mortgage reduction, and demonstrated progress toward completing the EM mission.

The risk-based prioritization criteria incorporate the general program management principles of the NCP, which emphasizes the use of early actions to address imminent threats and to reduce migration of off-site contamination. Consistent with those principles, the following risk-based prioritization criteria are used as guidelines, in conjunction with the other previously mentioned factors, to prioritize response actions.

Risk-Based Prioritization	
▶	Mitigate immediate threats, both on- and off-site.
▶	Reduce further migration of off-site contamination.
▶	Address sources contributing to off-site contamination.
▶	Address remaining sources contributing to on-site contamination.
▶	Implement the final site-wide action to address D&D of the plant and address remaining sources of contamination.

The prioritization criteria have been applied to each of the OUs at PGDP. A prioritized list of projects within each OU is presented in Table 1 of Section 4.

3.5 RISK ASSESSMENT AND EVALUATION

Integral to the risk-based cleanup approach at PGDP are the methods used to complete screening and baseline risk assessments and risk evaluations, including the development of risk-based screening levels and cleanup levels. This section briefly discusses how these are integrated into the risk-based strategy. Additional information, including tables of risk-based action and no action screening values, background concentrations, and selected regulatory values, are in the PGDP risk methods documents.

The overall integration of the risk assessment and OU strategies is depicted in Fig. 5. Following are the major risk assessment activities:

- Develop a site-wide risk baseline against which progress toward the end state goal can be measured.
- Evaluate existing baseline and screening risk assessments to support early action decisions.
- Complete baseline risk assessments to support decisions and to assist in planning the completion of the final comprehensive baseline risk assessment.
- Complete the final comprehensive baseline human health and ecological risk assessment as part of the Final CSOU to examine cumulative effects from remaining contamination and to support the final decision.

DOE established an integrated environmental monitoring program that consists of data collection under multiple regulatory programs. These data will be used when completing the RI/FS and Final CSOU cumulative baseline risk assessments (Fig. 6) because they are critical to the consideration of the trends in ecological risk throughout site cleanup.

When completing each of the risk assessment activities, both ARARs and risk-based levels (e.g., ACLs) will be considered. Methods used to calculate the risk-based levels, including probabilistic risk assessment, are explained in the PGDP risk methods documents. When applying the cleanup levels during a response action, the concepts of co-contamination and field screening will be used.

3.6 WASTE DISPOSAL STRATEGY

Also integral to the completion of the cleanup strategy is cost-effective disposition of wastes generated under the FFA. Based on the nature of the wastes, both on- and off-site disposal options

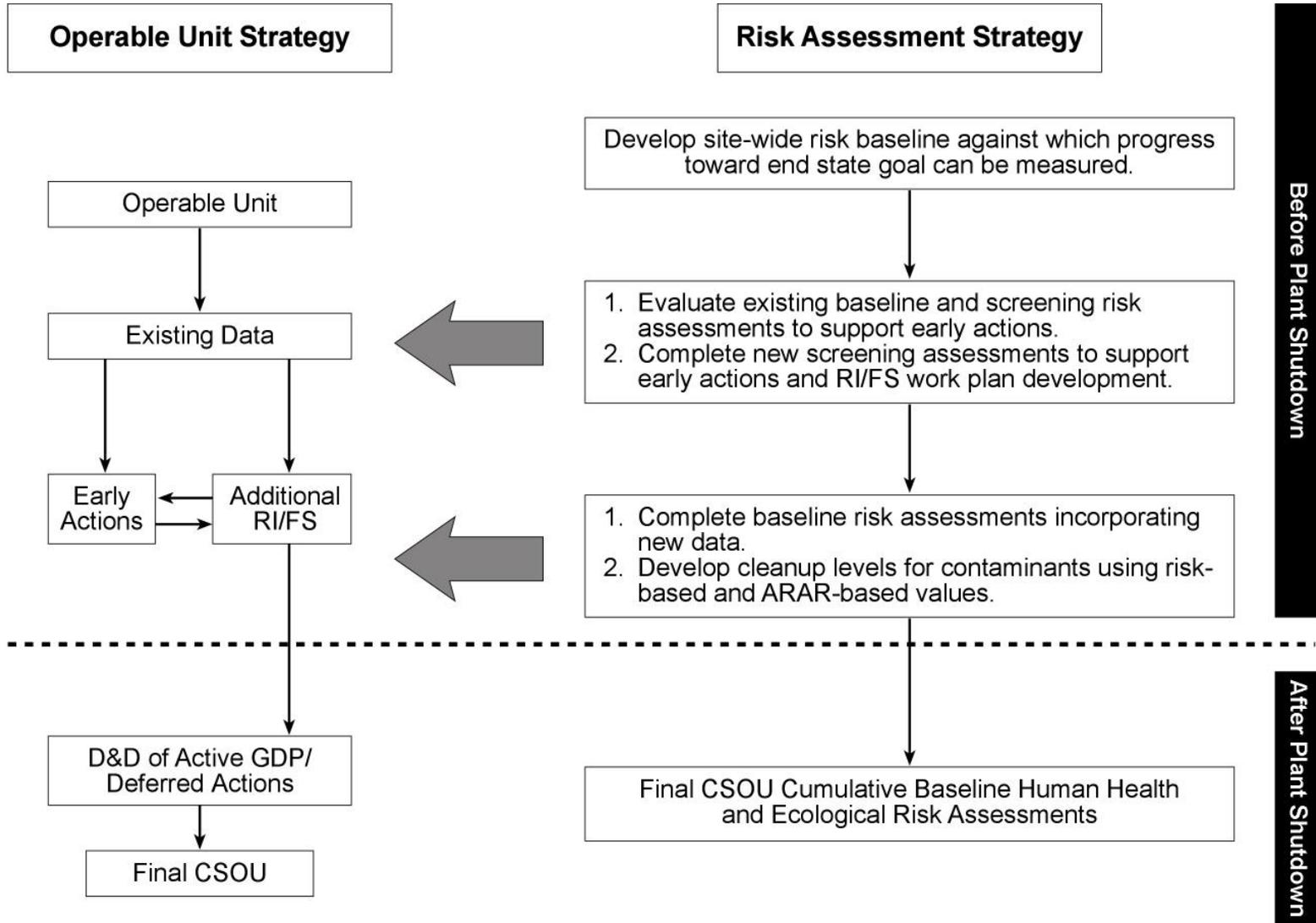


Fig. 5. Integrated risk strategy.

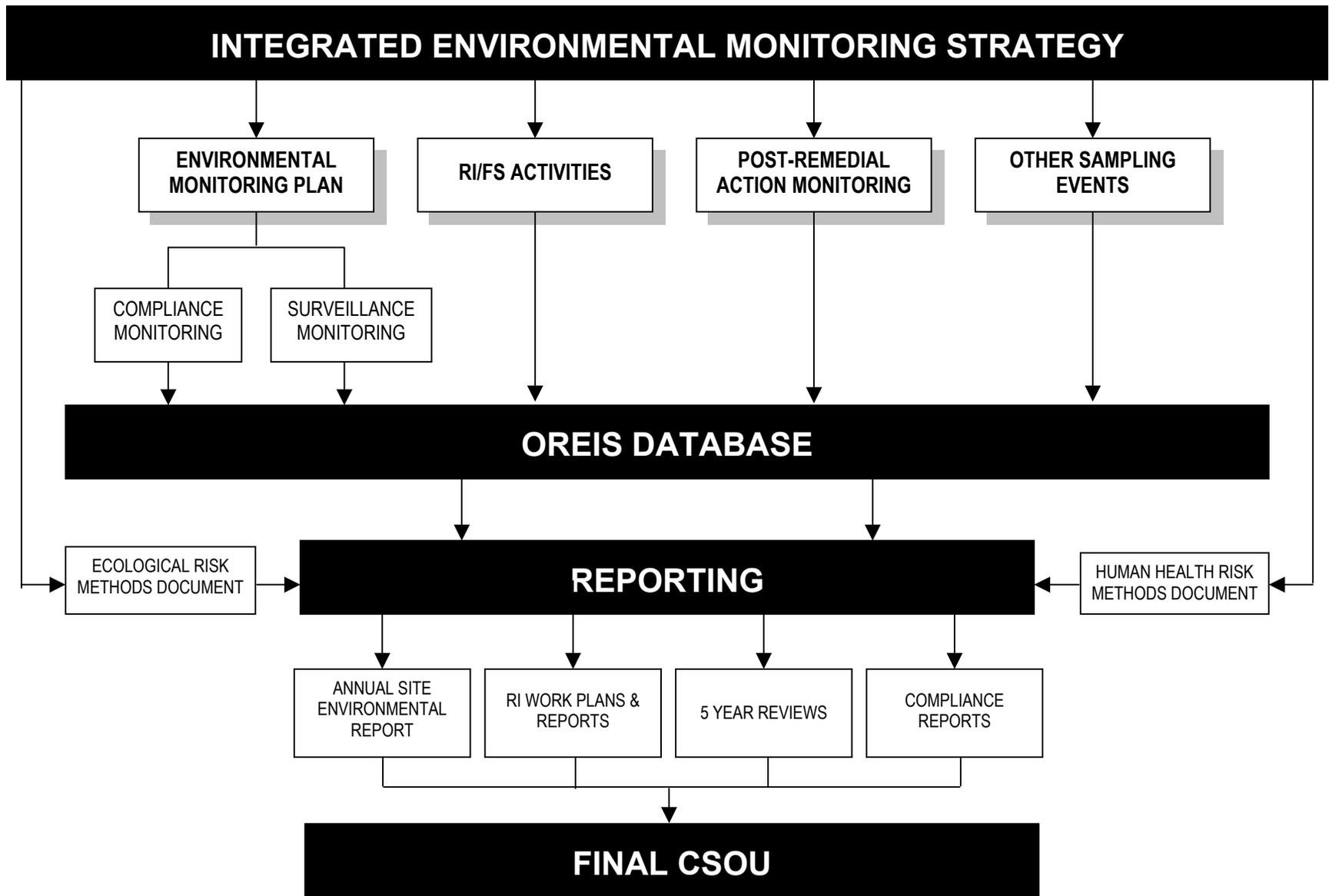


Fig. 6. Integrated environmental monitoring strategy.

may be evaluated during the remedy selection process. For the purpose of developing planning assumptions, waste generated under FFA response actions that meets the approved waste acceptance criteria (e.g., non-RCRA hazardous) are assumed to be disposed in the C-746-U Landfill. To support implementation of this strategy, KNREPC issued a permit modification on October 3, 2003, for certain waste generated from the Scrap Metal and the North-South Diversion Ditch Projects. KNEPC is processing another permit modification authorizing the disposal of spill residue wastes in the U-Landfill. This modification will accommodate all nonhazardous CERCLA wastes generated under the FFA that meet the waste acceptance criteria. Should this permit modification not be approved in a timely manner, the unavailability of the U-Landfill will have a significant impact on DOE's ability to meet the schedules and milestones proposed in Section 4 of the SMP, resulting in the need to adjust the schedules and milestones and/or revise response action decision documents.

Actual waste disposition determinations will be made on a project-by-project basis with the disposal method proposed in the appropriate CERCLA

document. Uncertainty about the U-Landfill's future availability and the corresponding cost impacts of pursuing alternate disposal options (e.g., off-site disposal) will be evaluated in the alternatives analysis and documented in the appropriate CERCLA decision document.

Consistent with EPA's on-site determination for disposal of scrap metal and North/South Diversion Ditch (Sections 1 and 2) waste, the U-Landfill will be considered "on-site" provided the wastes are generated during a CERCLA action at the DOE reservation at Paducah and/or its corresponding areas of contamination. Wastes generated under the FFA that require off-site disposal will be shipped to an approved off-site waste disposal facility in accordance with Section IV.G of the FFA. Mixed waste generated by actions under the FFA will be regulated by the approved Site Treatment Plan.

As part of the pre-plant-shutdown activities and depending on the scope of actions under consideration and corresponding waste volumes, an on-site CERCLA disposal cell will be evaluated to support the site-wide waste disposal program for cleanup activities.

4. SCOPE AND SCHEDULES

This section outlines the scope, schedule, and objectives for each OU implemented as part of the Pre-GDP shutdown phase of site cleanup. The schedules are used as the basis to establish key milestones that will serve as enforceable timetables and deadlines and long-term completion goals under the FFA. Post-GDP shutdown activities will include D&D of the currently operating GDP, deferred actions not posing a risk warranting an early action followed by the Final CSOU. In accordance with the LOI, six months prior to plant shutdown, the parties will initiate negotiations to reach agreement on enforceable completion dates for the second phase of site cleanup.

This revision of the SMP amends the FY 2003 Annual SMP (D2) version submitted for review in May 2003. It officially incorporates the provisions of the SMP Agreement signed by DOE, EPA, and KNREPC on April 14, 2003; terms of the LOI signed by DOE and Commonwealth of Kentucky in August of 2003; and input from various meetings with Kentucky and EPA. Specifically, this revision of the SMP incorporates enforceable milestones for FY 2004, FY 2005, and FY 2006 and enforceable completion dates for the five strategic initiatives based on the approach outlined in the LOI.

To support the long-term planning process associated with implementation of the FFA, DOE has a lifecycle baseline (LCB) that serves as the strategic roadmap for completing site remediation. Many of the areas subject to remediation have not yet undergone complete characterization or the remedy selection process; therefore, planning assumptions were developed based on current understanding of site problems and potential cleanup alternatives. These planning assumptions are used to help estimate the necessary resources needed to achieve site cleanup and are not meant to be predecisional. Planning assumptions will be updated as new information is generated from ongoing investigations and technology evaluations. When the actual scope of a response action is defined and included in the appropriate CERCLA decision document after public comment, the

schedule assumptions and milestones will be revised as appropriate. Throughout the planning process, it is DOE's intent to work closely with the regulators to obtain input on the assumptions used. The SMP update specifically includes regulatory input that led to the SMP Agreement of April 14, 2003, as well as input obtained during a series of followup discussions conducted through October 2003.

4.1 SCOPE

The objective of the pre-plant-shutdown activities is to implement projects that prevent human exposure to both on- and off-site contamination that presents an unacceptable risk, ensure safe environmental conditions for industrial workers during ongoing plant operations, and provide opportunities to achieve significant risk reduction. The strategic cleanup initiatives incorporated into the SMP from the LOI are intended to achieve these objectives.

The most important sources targeted have been identified as major contributors to off-site contamination during consultation with the stakeholders and include the following:

- TCE sources associated with C-400,
- TCE sources associated with the Southwest Plume,
- scrap metal yards, and
- North-South Diversion Ditch Sections 1 and 2.

The pre-plant-shutdown scope also includes D&D of C-410 and C-340 Facilities, as well as 15 other inactive facilities. These projects demonstrate visible progress toward completing the EM mission and provide mortgage reduction opportunities that will potentially free up funding to accelerate additional work as well as addressing potential site risks.

Throughout pre-plant-shutdown activities, the cleanup program will evaluate existing data and determine whether additional data are required to complete investigations and implement response actions pursuant to the strategic initiatives.

Additionally, consistent with the FFA, these activities will include baseline risk assessments of the multiple sources contributing contamination to the groundwater and surface water OUs as part of the integrated assessment of the PGDP. If any investigation indicates that a response action is warranted according to the criteria in CERCLA, then an evaluation of cleanup alternatives will be conducted, and response actions will be selected and implemented as necessary.

4.2 SCHEDULE

The FFA requires the annual SMP to include a list of commitments and long-term projections, developed in a manner consistent with the FFA and SMP prioritization criteria, that identifies the submittal dates for deliverables that correspond to work activities for FY+1 and FY+2, as well as any outyear enforceable commitments. The agreement specifically states that the SMP should identify ROD milestones for FY+1 and FY+2, and ROD targets by FY quarters for FY+3 and beyond for all potential OUs, CSOUs, and remedial action OUs. The agreement further states the targets for FY+3 and beyond are not enforceable and will be used by all parties for planning purposes only.

When project-specific scoping for a given OU has not been conducted and a detailed schedule based on actual agreed upon scope has not been finalized within the appropriate CERCLA document, planning assumptions are used to estimate implementation timeframes and milestones under the FFA. A generic WAG schedule is used to support outyear projections, as agreed to by the FFA parties

4.2.1 Generic WAG Schedule

A generic WAG schedule was developed to estimate implementation timeframes and milestones for outyear projects that have not undergone project-specific scoping. The generic WAG schedule, which is presented at a summary level in Fig. 7, reflects the lifecycle process a potential OU would undergo if it were subject to the entire CERCLA remediation process under the FFA. The generic WAG schedule incorporates the FFA scheduling protocols, such as the document

review and approval timeframes contained in Appendix F of the FFA, as well as other scheduling requirements.

The generic WAG schedule is not based on a specific scope and, once project-specific scoping is conducted for a given OU, the schedule for implementation may be shorter or longer depending on the complexity of the problem being addressed and the selected response action. For example, the FFA contains several streamlining provisions that may shorten a project's schedule by allowing for expedited actions through removal and interim remedial actions

4.2.2 Enforceable Commitments

The FFA currently states enforceable timetables and deadlines under the agreement will be limited to FY, FY+1, and FY+2, and completion dates for surface water and groundwater OUs. The FFA specifies the current FY commitments shall be included in Appendix C of the FFA, while the FY+1, FY+2, and outyear enforceable commitments shall be included in the SMP. In developing the enforceable timetables and deadlines, DOE considered the 18 factors contained in Section XVIII.A of the FFA. Appendix 3 of the SMP contains proposed enforceable timetables and deadlines, including milestones defined for FY 2004 through FY 2006, as well as long-term projections used as target dates only. The milestones for FY 2004 and FY 2005 have been agreed upon by the principals as part of the SMP Agreement of April 14, 2003, and the FY 2006 milestones are newly proposed and reflect the continuation of the FY 2005 work scope.

Section XVIII.C of the FFA specifically identifies outyear completion dates for surface water and groundwater OUs as enforceable timetables and deadlines under the agreement. The LOI identifies completion dates for the five strategic initiatives, which are intended to replace the groundwater and surface water completion dates as the new outyear enforceable milestones under the FFA. Once the SMP has been approved, an FFA modification will be processed to officially replace the current groundwater and surface water completion dates with the new outyear completion dates. Completion is defined as the selection and construction of a response

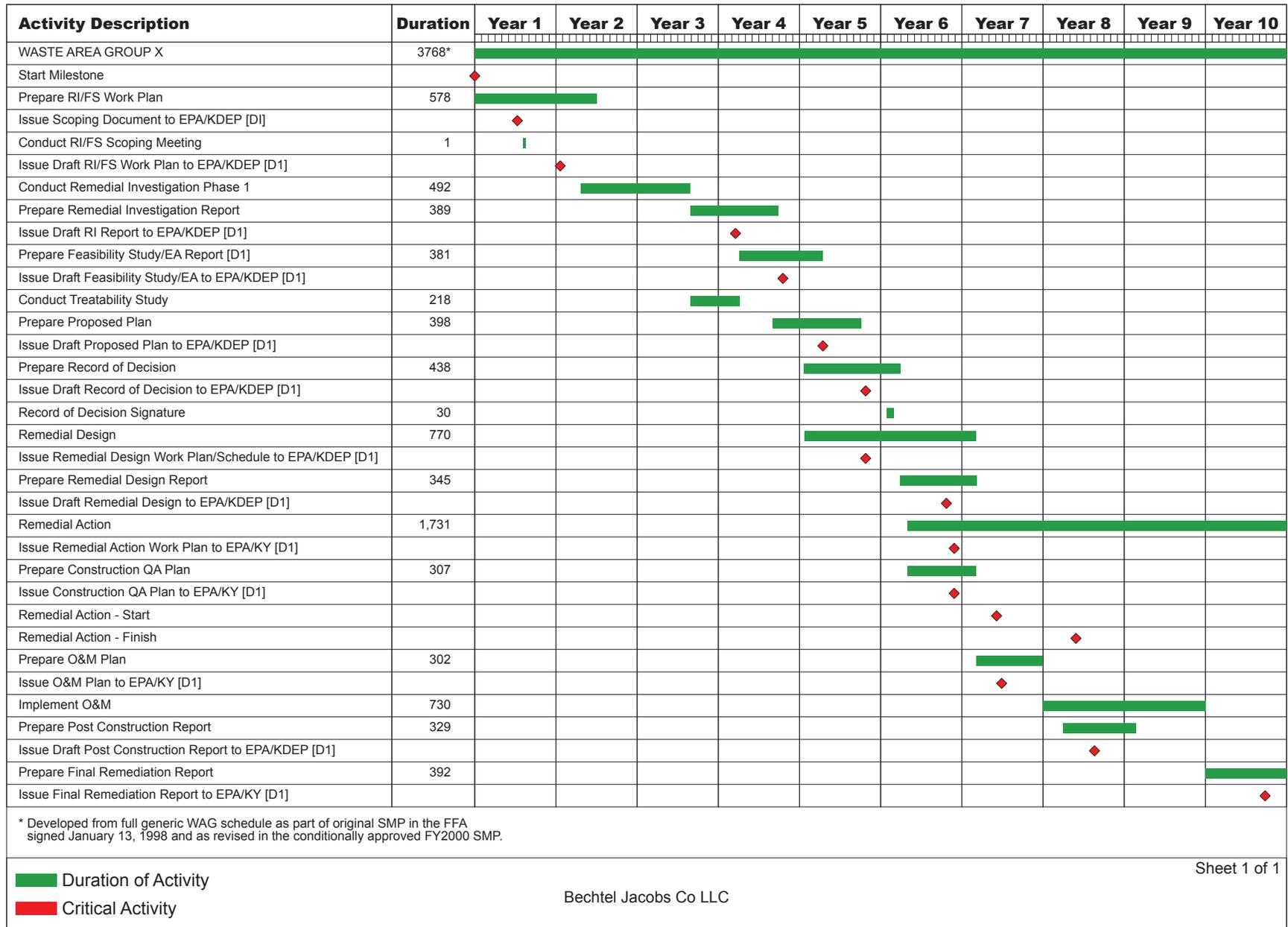


Fig. 7. Generic WAG schedule.

action. Such completion shall be documented in Remedial Action Completion and/or Removal Action Completion Reports. Any operation and maintenance of the constructed response actions will be documented in an Operations and Maintenance (O&M) Plan. The FFA parties recognize that long-term O&M activities, such as groundwater treatment and/or monitoring, may extend for several decades beyond the completion dates represented by Appendix 3.

The completion date for some projects has been projected based on the generic WAG schedule. Once these projects undergo remedy selection and project-specific scoping, the completion milestones will be revised to incorporate the project-specific schedule that is approved in the appropriate CERCLA document.

Based on certain planning assumptions and anticipated funding levels, the Amended FY 2003 SMP (May 2003) estimated completion of site cleanup by 2030. However, agreements reached in the LOI with Kentucky resulted in an 11-year acceleration of cleanup activities for the Pre-GDP shutdown phase, with a new proposed completion date of 2019. EPA was not a signatory to the LOI. EPA's review and approval with the terms of the LOI, as incorporated into the SMP, will be established upon their review and approval of the SMP.

Figure 8 presents a comparison between the schedule contained in the Amended FY 2003 SMP (May 2003) and the accelerated schedule included in the LOI. The accelerated completion dates listed are based upon scope assumptions presented in the LOI and input from several strategic planning sessions between DOE and the regulators. These scope assumptions are summarized in Appendix 4 to the SMP. Should the actual scope of the strategic initiatives differ from the assumptions in Appendix 4, it will be necessary to make adjustments to the completion milestones.

4.2.3 Projected End State Conditions

As mentioned above, the planning assumptions have been developed to help estimate the resources needed to implement the SMP. These assumptions include the end state conditions

that are assumed to exist at program completion. The end state goal is to maximize use of on- and off-site locations consistent with current and reasonably anticipated future land use patterns.

To achieve the end state goal, the strategic cleanup initiatives will focus on the site cleanup objectives presented in Section 3.2. When selecting actions to achieve this goal, many factors, such as site contamination, technology limitations, and cost-effectiveness, must be considered. Table 1 contains a summary of all currently anticipated projects that will be implemented as part of the strategic cleanup initiatives, proposed scope, corresponding site cleanup objectives, target completion dates, and end state scope assumptions. The target completion dates in Table 1, which correspond to the summary schedules in Fig. 8, are provided only as long-term planning projections. The enforceable timetables and deadlines associated with the subject schedules are discussed in Section 4.2.2 and are provided in Appendix 3 of the SMP and in the FFA, as appropriate. The actual scope, selected remedies, and end state determinations will be addressed on a project-by-project basis and will be proposed in the appropriate CERCLA document.

When the end state has been achieved at completion of the various response actions, Section XXX of the FFA requires DOE to conduct 5-year reviews if contamination remains at the site above levels that allow for unlimited use and unrestricted exposure. To support this process, a surveillance and maintenance program will be implemented to ensure compliance with cleanup objectives and ensure the implemented response actions continue to provide long-term protectiveness. Additional information regarding long-term surveillance and maintenance is provided in the approved PGDP land use control assurance plan and in the land use implementation plans prepared as part of response action documentation.

Proposed FY 2004 SMP Schedules

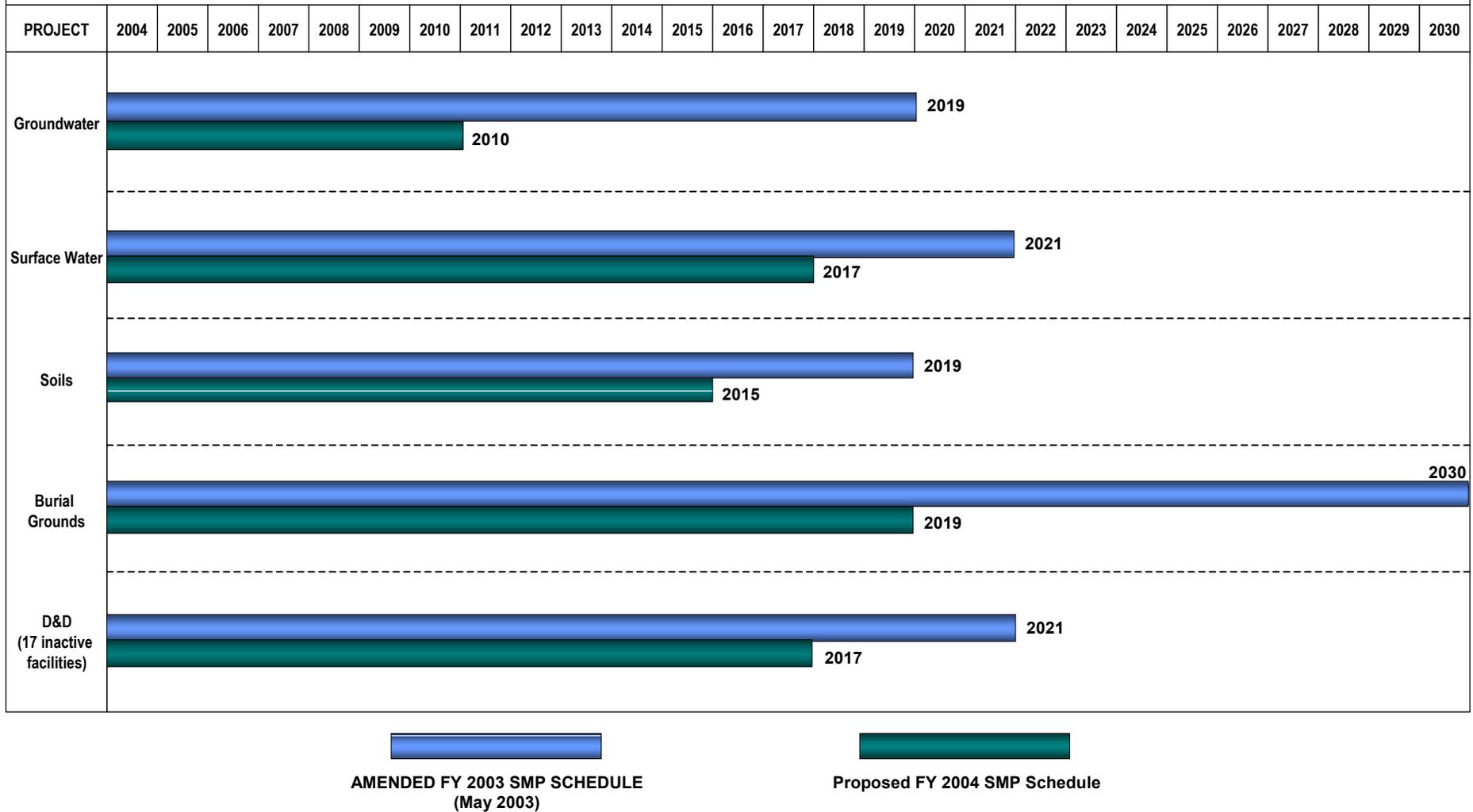


Fig. 8. Proposed FY 2004 SMP Schedule.

Table 1. SMP strategic cleanup initiatives

Operable unit	Prioritized projects	Scope	Site cleanup objective	Projected end-state scope assumption ^a
Groundwater OU	Southwest Plume/Sources	Includes a site investigation, baseline risk assessment, evaluation and selection of remedies, and implementation of actions as necessary, for TCE groundwater contamination located near the C-720 building, oil landfarm, C-747 burial ground, and storm sewer leading from the C-400 building to Outfall Ditch 008, as well as the Southwest Dissolved Phased Plume.	<ul style="list-style-type: none"> • Protect off-site residents by preventing exposure to contaminated groundwater. • Protect on-site industrial workers and recreational users by preventing exposure to contaminated groundwater. • Shorten the remediation timeframe for the off-site plumes by reducing contaminant mass in source areas. 	<ul style="list-style-type: none"> • Groundwater use prohibited. • Major DNAPL sources contributing to off-site contamination addressed (i.e., areas near C-400 and C-747 burial ground) • Alternate source of water supplied to affected residents until contaminant levels fall below those restricting use. • Natural attenuation of dissolved-phased plumes with long-term monitoring.
	C-400	Includes completion of the 6-phase treatability study followed by remedy selection and full-scale implementation of a DNAPL source reduction action at the C-400 area.		
	S&T Landfills	Includes a site evaluation to determine the source of groundwater contamination located in the vicinity of the S&T Landfills.		
Surface Water OU	Scrap Metal	Characterize, package, transport, and dispose of 54,000 tons of contaminated scrap metal ingots in accordance with the signed Action Memo and approved Removal Action Work Plan.	<ul style="list-style-type: none"> • Protect on-site industrial workers from direct contact exposure to contaminated scrap and soils. • Protect recreational users by preventing off-site migration of contaminated surface water and sediments. 	<ul style="list-style-type: none"> • Major contaminant sources potentially contributing to surface water addressed (e.g., NSDD, Scrap Metal Yards). • Off-site releases mitigated and “hot spots” in on-site ditches, outfalls, and Bayou and Little Bayou addressed. • Long-term monitoring. • Excavation and access/use restrictions in place at some locations, as appropriate.
	North-South Diversion Ditch, Sections 1 and 2	Implement actions in the signed ROD, including elimination of discharges at plant fence by plugging culverts that lead off-site; installation of a surge basin and rerouting of storm water flow to C-616 Water Treatment Facility; and excavation of unacceptably contaminated soils/sediments inside fence and install cover.	<ul style="list-style-type: none"> • Protect recreational users from exposure resulting from off-site migration of contaminated surface water and sediments. • Protect on-site industrial workers from direct contact exposure to contaminated soils and sediments. 	
	Surface Water (on-site) ^b	Conduct a site investigation, baseline risk assessment, evaluation and selection of remedies, and implementation of actions as necessary to address hot spots associated with internal ditches, outfalls, Sections 3, 4, and 5 of the North-South Diversion Ditch, and storm sewer system, including evaluation of whether additional sediment controls are needed.	<ul style="list-style-type: none"> • Protect recreational users from exposure resulting from off-site migration of contaminated surface water and sediments. • Protect industrial workers from direct contact exposure to contaminated soils and sediments. 	

Table 1. SMP strategic planning assumptions (continued)

Operable unit	Prioritized Projects	Scope	Site cleanup objective	Projected end-state scope assumption^a
	Surface Water (off-site) ^b	Conduct a site investigation, baseline risk assessment, evaluation and selection of remedies, and implementation of actions as necessary to address Little Bayou and Bayou Creeks.	<ul style="list-style-type: none"> • Protect recreational users from exposure resulting from off-site migration of contaminated surface water and sediments. 	
D&D OU	Inactive DOE Facilities	Includes D&D of the C-410, C-340, and remaining 15 inactive facilities through a series of non-time-critical removal actions, sequenced in accordance with the LOI.	<ul style="list-style-type: none"> • Protect on-site industrial workers from direct contact exposure. • Demonstrate visible progress toward completion of the EM mission. • Reduce mortgage costs. 	<ul style="list-style-type: none"> • C-410, C-340, and 15 other inactive DOE facilities demolished and dispositioned down to grade/building slab. • Underlying soils addressed as part the D&D of the remaining gaseous diffusion plant. • Excavation and access restrictions in place at certain identified locations, as appropriate.
Burial Grounds OU	Burial Grounds OU	Conduct a remedial investigation, baseline risk assessment, evaluation and selection of remedies, and implementation of actions as necessary.	<ul style="list-style-type: none"> • Protect industrial workers from direct contact exposure to contaminated soils and sediments. • Protect industrial workers from direct contact exposure to contaminated soils and sediments. • Protect off-site residents by preventing exposure to contaminated groundwater. 	<ul style="list-style-type: none"> • In-situ stabilization/capping of burial grounds. • Excavation prohibited and access to some areas restricted, as appropriate. • Installation of an integrated groundwater monitoring system. • Re-evaluation of long-term effectiveness of the in-situ stabilization/ capping remedy as part of the D&D of the operating gaseous diffusion plant to determine whether additional actions are warranted.

Table 1. SMP strategic planning assumptions (continued)

Operable unit	Prioritized Projects	Scope	Site cleanup objective	Projected end-state scope assumption^a
Soils OU	Soils OU	Conduct a site investigation, baseline risk assessment, evaluation and selection of remedies, and implementation of two removal actions as necessary to address hot spots associated with contaminated surface soils beneath the scrap yards, outside DMSAs, and remaining accessible areas of the plant inside the security not affected by plant operations.	<ul style="list-style-type: none"> Protect on-site industrial workers from direct contact exposure to contaminated soils and sediments. 	<ul style="list-style-type: none"> On-site surface soil “hot spots” addressed in accessible areas not impacted by plant operations. Excavation and access restrictions in place at certain identified locations, as appropriate. Remaining residual soil contamination addressed as part of the D&D of the remaining gaseous diffusion plant with evaluation as part of the Final CSOU.

^a All projected end state assumptions, except for those in residential areas, refer to the status of DOE-owned property and are only for planning purposes. See the LOI for additional detailed scope assumptions. Final end state determinations will be addressed in the appropriate CERCLA decision documents.

^b Surface water (on-site) and surface water (off-site) were referred to as Surface Water Phase I Assessment and Surface Water Phase II Assessment, respectively, in the SMP Agreement of April 14, 2003. References to Phases I and II have been deleted here to better describe the scope of planned activities.

CERCLA = Comprehensive Environmental Response, Compensation and Liability Act.

CSOU = comprehensive site operable unit.

D&D = decontamination and decommissioning.

DMSA = DOE Material Storage Area.

DNAPL = dense, nonaqueous-phase liquid.

DOE = U.S. Department of Energy.

EM = Environmental Management

GDP = gaseous diffusion plant.

LOI = Letter of Intent.

OU = operable unit.

ROD = record of decision.

TCE = trichloroethene.

APPENDIX 1
ACTIONS TAKEN TO DATE

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OU SUMMARY

	WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status
1	WAG 26/Groundwater	Emergency removal action	N/A	Provided temporary water to local residences whose private wells are contaminated by TCE and ⁹⁹ Tc.	Complete
2	WAG 26/Groundwater	Removal action	August 30, 1994	Extended municipal water line to residents affected by off-site groundwater contamination.	Construction Complete/Operational
3	WAG 26/Groundwater (Northwest Plume)	IRA	July 23, 1993	Hydraulic containment and treatment of high concentrations of off-site TCE contamination in the Northwest Plume.	Construction Complete/Operational
4	WAG 26/Groundwater (Northeast Plume)	IRA	June 15, 1995	Hydraulic containment and treatment of high concentrations of off-site TCE contamination in the Northeast Plume.	Construction Complete/Operational
5	WAG 25/Surface water (NSDD)	IRA	March 28, 1994	Instituted action to treat certain plant effluent and control the migration of contaminated sediment associated with the NSDD.	Construction Complete/Operational
6	WAGs 18 & 25/Surface water and sediment (Surface Water/Ditches)	IRA	N/A	Institutional controls (fencing/posting) for off-site contamination in surface water, outfalls, and lagoons.	Construction Complete/Operational
7	WAG 24/Scrap (Scrapyards)	IRA	N/A	Installation of sediment controls to mitigate surface water/sediment runoff from scrapyards.	Construction Complete/Operational
8	WAG 22/Waste and soil (SWMU 2--Burial Ground)	IRA	September 11, 1995	Installation of an impermeable cap to reduce leachate migration from surface infiltration.	Deferred
9	C-750-A, -B, and -C Underground Storage Tanks	N/A	N/A	Tank removal	Complete
10	WAG 7/Soil (C-746-K Landfill)	IRA	N/A	Enhanced existing cap to reduce leachate migration from surface infiltration.	Complete
11	AOC 124 WAG 17/Soil (Concrete Rubble Piles)	Removal action	N/A	Excavated soil associated with AOC 124	Complete

OU SUMMARY

	WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status
12	WAG 23/Soil	Removal action	September 11, 1997	Excavated PCB-contaminated surface soils to reduce risks to plant industrial workers	Complete
13	SWMU 91/Soil	IRA	August 10, 1998	In situ treatment of TCE-contaminated soils using the LASAGNA™ technology.	Complete
14	WAGs 1&7/Surface water and sediment	IRA	August 10, 1998	Installed rip-rap along creek bank to prevent direct contact, implemented institutional controls, and long-term monitoring.	Complete
15	WAG 24 , WAG 14, and SWMU 99/Scrap	Non-time-critical removal action	September 26, 2001	Removal and disposition of scrap metal with enhanced sediment control measures.	Sediment control basin constructed. Mobilization complete and fieldwork started.
16	SWMU 193/Soil	Time-critical removal action	February 19, 2002	Remove petroleum-contaminated soils	Complete
17	SWMU's 76 and 519/Soil	Time-critical removal action	July 1, 2002	Remove empty sulfuric acid tanks, size reduce for containerization, and disposal.	Tanks are removed and containerized. Waiting sampling results prior to shipment for disposal.
18	SWMU 478/Infrastructure (C-410)	IRA	August 3, 2002	Remove process equipment and piping	Waiting on approval of the D2 RAWP prior to work being initiated.
19	SWMU 59/Sediment	Removal action	September 25, 2002	Remedial action for Sections 1 and 2 of the NSDD	Design complete and fieldwork initiated.

AOC = area of concern.

IRA = interim remedial action.

NSDD = North-South Diversion Ditch.

PCB = polychlorinated biphenyl.

RAWP = Remedial Action Work Plan.

SWMU = solid waste management unit.

TCE = Trichloroethene.

WAG = waste area grouping.

APPENDIX 2
SOURCE AREA BY OPERABLE UNIT

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Solid Waste Management Units Sorted by Operable Unit

No.	Groundwater OU SWMUs
1	C-747-C Oil Land Farm
2	C-749 Uranium Burial Ground
4	C-747 Contaminated Burial Ground
7	C-747-A Burial Ground
9	C-746-S Residential Landfill
10	C-746-T Inert Landfill
11	C-400 TCE Leak Site
26	C-400 to C-404 Underground Transfer Line
30	C-747-A Burn Area
40	C-403 Neutralization Tank
47	C-400 Technetium Storage Tank Area
91	UF6 Cylinder Drop Test Area
99	C-745 Kellogg Building Site
183	McGraw UST
193	McGraw Construction Facilities (Southside Cylinder Yards)
194	McGraw Construction Facilities (Southside)
201	Northwest Groundwater Plume
202	Northeast Groundwater Plume
203	C-400 Sump
204	Dykes Road Historical Staging Area
209	C-720 Compressor Shop Pit Sump
210	Southwest Groundwater Plume
211	C-720 TCE Spill Site Northwest
533	TCE Spill Site from TCE Unloading Operations at C-400
No.	Surface Water OU SWMUs
8	C-746-K Inactive Sanitary Landfill
12	C-747-A UF ₄ Drum Yard
13	C-746-P Clean Scrapyard
14	C-746-E Contaminated Scrapyard
15	C-746-C Scrapyard
16	C-746-D Scrapyard
17	C-616-E Sludge Lagoon
18	C-616-F Full-Flow Lagoon
21	C-611-W Sludge Lagoon
22	C-611-Y Overflow Lagoon
23	C-611-V Lagoon
42	C-616 Chromate Reduction Facility
58	North-South Diversion Ditch (Outside)
59	North-South Diversion Ditch (Inside)
60	C-375-E2 Effluent Ditch (KPDES 002)
61	C-375-E5 Effluent Ditch (KPDES 013)
62	C-375-S6 Southwest Ditch (KPDES 009)
63	C-375-W7 Oil Skimmer Ditch (KPDES 008)
64	Little Bayou Creek
65	Big Bayou Creek
66	C-375-E3 Effluent Ditch (KPDES 010)
67	C-375-E4 Effluent Ditch (C-340 Ditch)
68	C-375-W8 Effluent Ditch (KPDES 015)
69	C-375-W9 Effluent Ditch (KPDES 001)

Solid Waste Management Units Sorted by Operable Unit (continued)

No.	Surface Water OU SWMUs (continued)
70	C-333-A Vaporizer
71	C-337-A Vaporizer
82	C-531 Electric Switchyard
83	C-533 Electric Switchyard
84	C-535 Electric Switchyard
85	C-537 Electric Switchyard
93	Concrete Disposal Area East of Plant Security Area
102	Plant Storm Sewer
105	Concrete Rubble Pile (3)
106	Concrete Rubble Pile (4)
107	Concrete Rubble Pile (5)
108	Concrete Rubble Pile (6)
109	Concrete Rubble Pile (7)
113	Concrete Rubble Pile (11)
129	Concrete Rubble Pile (27)
168	KPDES Outfall Ditch 012
171	C-617-A Lagoons
175	Concrete Rubble Pile (28)
185	C-611-4 Horseshoe Lagoon
199	Big Bayou Creek Monitoring Station
205	Eastern Portion of Yellow Water Line
526	Internal Plant Drainage Ditches
No.	Soil OU SWMUs
1	C-747-C Oil Land Farm
11	C-400 TCE Leak Site
12	C-747-A UF ₄ Drum Yard
13	C-746-P Clean Scrapyard
14	C-746-E Contaminated Scrapyard
15	C-746-C Scrapyard
16	C-746-D Scrapyard
19	C-410-B HF Neutralization Lagoon
20	C-410-E Emergency Holding Pond
26	C-400 to C-404 Underground Transfer Line
27	C-722 Acid Neutralization Tank
28	C-712 Acid Neutralization Lagoon
31	C-720 Compressor Pit Water Storage Tank
32	C-728 Clean Waste Oil Tank
38	C-615 Sewage Treatment Plant
40	C-403 Neutralization Tank
41	C-410-C Neutralization Tank
47	C-400 Technetium Storage Tank Area
56	C-540-A PCB Staging Area
57	C-541-A PCB Waste Staging Area
74	C-340 PCB Transformer Spill Site
75	C-633 PCB Spill Site
76	C-632-B Sulfuric Acid Storage Tank
77	C-634-B Sulfuric Acid Storage Tank
78	C-420 PCB Spill Site
79	C-611 PCB Spill Site

Solid Waste Management Units Sorted by Operable Unit (continued)

No.	Soil OU SWMUs (continued)
80	C-540 PCB Spill Site
81	C-541 PCB Spill Site
86	C-631 Pumphouse and Cooling Tower
87	C-633 Pumphouse and Cooling Tower
88	C-635 Pumphouse and Cooling Tower
89	C-637 Pumphouse and Cooling Tower
92	Fill area for dirt from the C-420 PCB Spill Site
98	C-400 Basement Sump
99	C-745 Kellogg Building Site
101	C-340 Hydraulic System
135	C-333 PCB Soil Contamination
137	C-746-A Inactive PCB Area
138	C-100 Southside Berm
153	C-331 PCB Soil Contamination (West)
154	C-331 PCB Soil Contamination (Southeast)
155	C-333 PCB Soil Contamination (West)
156	C-310 PCB Soil Contamination (West Side)
158	Chilled-Water System Leak Site
159	C-746-H3 Storage Pad
160	C-745 Cylinder Yard Spoils (PCB Soils)
161	C-743-T-01 Trailer Site (Soil Backfill)
162	C-617-A Sanitary Water Line (Soil Backfill)
163	C-304 Building/HVAC Piping System (Soil Backfill)
164	KPDES Outfall Ditch 017 (Soil Backfill)
165	C-616-L Pipeline & Vault Soil Contamination
166	C-100 Trailer Complex Soil Contamination
167	C-720 Whiteroom Sump
169	C-410-E HF Vent Surge Protection Tank
170	C-729 Acetylene Building Drain Pits
172	C-726 Sandblasting Facility
176	C-331 Recycled Cooling Water Leak Northwest Side
177	C-331 Leak East Side
178	C-724-A Paint Spray Booth
179	Plant Sewer System
180	Outdoor Firing Range (WKWMA)
181	Outdoor Firing Range (PGDP)
183	McGraw UST
192	C-710 Acid Interceptor Pit
193	McGraw Construction Facilities (Southside Cylinder Yards)
194	McGraw Construction Facilities (Southside)
195	Curlee Road Contaminated Soil Mounds
196	C-746-A Septic System
198	C-410-D Area Soil Contamination
200	Soil Contamination South of TSCA Waste Storage Facility
203	C-400 Sump
204	Dykes Road Historical Staging Area
209	C-720 Compressor Shop Pit Sump
212	C-745-A Radiological Contamination Area
213	OS-02
215	OS-04

Solid Waste Management Units Sorted by Operable Unit (continued)

No.	Soil OU SWMUs (continued)
217	OS-06
223	OS-12
226	OS-15
229	OS-18
488	PCB Contamination Area by the C-410 Trailer Complex
492	Contaminated Soil Area, North of Outfall 10
493	Concrete Rubble Piles Near Outfall 001
518	Field South of C-746-P1 Clean Scrap Yard
520	Scrap Material West of C-746-A
531	Aluminum Slag Reacting Area
533	TCE Spill Site from TCE Unloading Operations at C-400
541	Contamination area by Outfall 011
No.	Burial Ground OU SWMUs
2	C-749 Uranium Burial Ground
4	C-747 Contaminated Burial Ground
5	C-746-F Burial Ground
6	C-747-B Burial Area
7	C-747-A Burial Ground
30	C-747-A Burn Area
145	Residential/Inert Landfill Borrow Area
489	Septic Tank, North of C-710
517	Rubble and Debris Erosion Control Fill Area
No.	D&D OU SWMUs
33	C-728 Motor Cleaning Facility
55	C-405 Incinerator
378	G-340-01
379	G-340-03
380	G-340-04
381	G-340-05
434	S-340-01
477	C-340 Metals Plant
478	C-410/420 Feed Plant
480	C-402 Lime House
482	C-415 Feed Plant Storage Building
494	Ash Receiver Area in C-410/420
495	C-410/420 Ash Receiver Shed
496	C-410/420 F2 Filters in Northeast Mezzanine
497	C-410/420 F2 Cell Neutralization Room Vats
498	C-410/420 Sump at Column C&D-1&2
499	C-410/420 Sump at Column H-9&10
500	C-410/420 Sump at Column U-10&11
501	C-410/420 UF ₆ Scale Pit Sumps A&B
502	C-410/420 Sump at Column U-9
503	C-410/420 Sump at Column G-1
504	C-410/420 Sump at Column L-10
505	C-410/420 Sump at Column A-3N
506	C-410/420 Sump at Column Wa-9
507	C-410/420 Condensate Tank Pit
508	C-410/420 Settling Basin
509	C-410/420 Drain Pit

Solid Waste Management Units Sorted by Operable Unit (continued)

No	D&D OU SWMUs (continued)
510	C-410/420 Sump at Column P&Q-2
511	C-410/420 Sump at Column Q&R-2
512	C-410/420 Sump at Column R-2
513	C-411 Cell Maintenance Room Sump
514	C-340 Magnesium Fluoride Reject Silo
515	C-340 "Dirty" Dust Collection System
516	C-340 Derby Preparation Area Sludge Collection System
521	C-340 Saw System Degreaser
522	Pit - Ground Floor at B-7 - B-9
523	Pit - Ground Floor at F-6 - F-11
524	Pickling Spray Booth Sump at B-10 & 11
529	C-340 Powder Plant Sump at Ground Floor Level

D&D = decontamination and decommissioning.
 KPDES = Kentucky Pollutant Discharge Elimination System.
 OU = operable unit.
 PCB = polychlorinated biphenyl.
 PGDP = Paducah Gaseous Diffusion Plant.
 SWMU = solid waste management unit.
 TCE = trichloroethene.
 TSCA = Toxic Substances Control Act.
 UST = underground storage tank.
 WKWMA = West Kentucky Wildlife Management Area.

APPENDIX 3
ENFORCEABLE TIMETABLES AND DEADLINES; TARGET DATES

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ENFORCEABLE TIMETABLES AND DEADLINES; TARGET DATES

Subproject	Deliverable	Enforceable Timetable and Deadlines ^a		Long-Term ROD Target Dates ^{a,b}	Current Status
		FY 2004 – FY 2006	Outyear		
Groundwater OU (Southwest Plume and Sources)	D1 Sampling and Analysis Plan	10/30/03			Sampling and analysis plan completed and submitted for review on 10/27/03.
	D1 Site Investigation/Risk Assessment Report ^c	1/03/05			
	D1 Proposed Plan	7/02/05			
	D1 ROD	1/03/06			
	D1 Remedial Action Completion Report		9/30/10		
Groundwater OU (C-400)	D1 Proposed Plan	1/30/04			Treatability study completed. Proposed plan under development.
	D1 ROD	8/3/04			
	D1 Remedial Design Work Plan	1/30/05			
	D1 Remedial Design Report	7/14/05			
	D1 Remedial Action Work Plan	8/13/05			
	D1 Remedial Action Completion Report		9/30/10		
S- and T-Landfills	D1 Site Evaluation Report	9/30/05			Sampling and analysis plan submitted for review.
Decontamination and Decommissioning (17 Inactive Facilities)	D1 Removal Action Completion Report		9/30/17		CERCLA decision documents completed and field work addressing infrastructure at C-410 initiated and ongoing.
Surface Water OU – NSDD (Sects. 1 and 2) ^{d,e}	Complete (Phase I) Fieldwork	6/02/04			CERCLA decision documents completed and field work initiated and ongoing.
	D1 Remedial Design/Remedial Action Phase II Work Plan	2/03/04			
	Remedial Action Phase II – Field Start	9/01/04			
	D1 Remedial Action Completion Report	5/16/05			
Surface Water OU (Scrap Metal)	CERCLA decision documents completed.				Fieldwork initiated and ongoing.
Surface Water OU (On- and Off-Site)	D1 Sampling and Analysis Plan	4/30/04			Scoping for sampling and analysis plan initiated.
	Removal Notification	7/22/05			
	D1 Site Investigation/Risk Assessment Report ^c	5/26/05			
	D1 Action Memorandum	5/11/06			
	D1 Removal Action Completion Report		9/30/17		
Soils OU	D1 Removal Action Completion Report		9/30/15		

ENFORCEABLE TIMETABLES AND DEADLINES; TARGET DATES

Subproject	Deliverable	Enforceable Timetable and Deadlines ^a		Long-Term ROD Target Dates ^{a,b}	Current Status
		FY 2004 – FY 2006	Outyear		
Burial Grounds OU ^f	D1 Remedial Investigation/Feasibility Study Work Plan	6/30/05			
	D1 ROD			2nd Quarter – 2009	
	D1 Remedial Action Completion Report		9/30/19		

Note:

^a Dates incorporate the review and approval timeframes presented in Appendix F of the FFA. Dates also assume submittal of both D1 and D2 versions of primary documents with regulatory approval occurring after D2 submittal and no schedule extensions.

^b Not enforceable dates. Used for planning purposes only.

^c The sampling and analysis plans and the site investigation/risk assessment reports for the Groundwater OU (Southwest Plume and Sources) and Surface Water OU (on-site) subprojects will be treated as primary documents for purposes of the FFA review/approval/dispute procedures.

^d The phases listed for this project are as shown in the approved ROD. As described in the approved ROD, Phase I includes construction of a surge basin and hard piping, and Phase II includes the excavation of waste from Sects. 1 and 2 of the NSDD.

^e The D1 Remedial Action Completion Report for NSDD (Sects. 1 and 2) will be issued 120 days after completion of fieldwork, which excludes waste disposition.

^f Note that investigation of SWMU 4 as a source of groundwater contamination is included in Groundwater OU (Southwest Plume and sources).

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act.

FFA = Federal Facilities Agreement.

FY = fiscal year.

NSDD = North-South Diversion Ditch.

OU = operable unit.

ROD = record of decision.

SWMU = solid waste management unit.

APPENDIX 4
SCOPE DEFINITION
OPERABLE UNIT STRATEGIC INITIATIVES

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SCOPE DEFINITION OPERABLE UNIT STRATEGIC INITIATIVES

Overview

On April 14, 2003, the principals from the U. S. Department of Energy (DOE), U. S. Environmental Protection Agency (EPA), and Commonwealth of Kentucky entered into a dispute resolution agreement for the Site Management Plan (SMP) that defines enforceable milestones for fiscal years (FY) 2003, 2004, and 2005. The agreement stated that the parties would conduct good-faith negotiations to develop a complete scope of work and milestones for the remaining outyear activities by September 15, 2003. In August 2003, DOE and Kentucky entered into a Letter of Intent (LOI) to promote accelerated cleanup, develop integrated planning and funding requests, meet commitments under the Federal Facilities Agreement (FFA), and settle all identified enforcement and compliance issues. This document does not modify or supercede the April 14, 2003, SMP Agreement or LOI, but is intended to further outline the scope and planning assumptions associated with those agreements. EPA was not a signatory to the LOI. EPA's review and approval of the terms of the LOI as incorporated into the SMP will be established upon its review and approval of the SMP.

The LOI defined five strategic initiatives with the following completion dates:

- Groundwater Operable Unit (OU) Strategic Initiative with completion by 2010,
- Burial Grounds OU Strategic Initiative with completion by 2019,
- Decontamination and Decommissioning (D&D) OU Strategic Initiative with completion by 2017,
- Surface Water OU Strategic Initiative with completion by 2017, and
- Soils OU Strategic Initiative with completion by 2015.

The attached summaries identify the scope, planning assumptions, and uncertainties for the five strategic initiatives. The information contained in the attached summaries was used as the basis for the draft FY 2004 SMP update. The scope assumptions have been established based on the current understanding of site conditions. The actual scope of any given remedy associated with the strategic initiatives will be developed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and documented in the appropriate decision document, which is subject to public participation in accordance with the FFA. If the actual scope significantly differs from the planning assumption contained below, the schedules and milestones contained in Appendix 3 will require adjustment.

Groundwater Operable Unit

The scope of the groundwater OU includes investigation, a baseline risk assessment, evaluation of removal/remedial alternatives, and selection and implementation of actions necessary to achieve protection of human health from exposure to groundwater contamination that could result in unacceptable risk. The strategy includes a phased approach consisting of the following steps: (1) prevention of human exposure; (2) reduction, control, or minimization of groundwater source areas contributing to off-site contamination; and (3) evaluation and selection of long-term solutions for the off-site dissolved-phase groundwater plumes and remaining groundwater sources. The projects associated with implementation of this strategy include the C-400 source area; Southwest Plume and its sources; off-site plumes and

remaining sources; and S- and T-Landfills. The scope assumptions and project uncertainties are defined as shown in the paragraphs below.

C-400 Area

The scope associated with this project includes the evaluation of the six-phase treatability study, followed by remedy selection and implementation. Assuming the treatability study (TS) is successful, the scope assumptions for this project will include full-scale implementation of the six-phase technology with an estimated operations and maintenance (O&M) period of approximately 6 months. The actual O&M period for completing the project will be defined considering a combination of factors, including the performance data associated with cumulative mass removal rates generated from the ongoing TS and actual implementation of the action (e.g., when mass removal achieves steady state). The specific criteria will be included in the appropriate CERCLA decision document and/or work plans. Project uncertainties that could potentially affect the scope and schedule include the extent/volume of dense, nonaqueous-phase liquid (DNAPL) releases at C-400 and the duration of the O&M period for full-scale implementation of the six-phase technology. The April 14th SMP agreement established a submittal date for the D1 proposed plan of January 30, 2004, which is 30 days after issuance of the TS report. The LOI established a project completion date of 2010.

Southwest Plume and Its Sources

The scope associated with this project includes a site investigation, baseline risk assessment, and remedy selection for the following areas: the C-720 area, Oil Landfarm, groundwater releases located near the C-747 burial ground, storm sewer system leading from the C-400 building to Outfall Ditch 008, and Southwest Plume. The scope assumptions for this project include treatment using six-phase technology at major DNAPL source(s) contributing to off-site contamination—an area located near the C-747 burial ground [Solid Waste Management Unit (SWMU) 4]. Project uncertainties that could potentially affect the scope and schedule include the source of DNAPL contamination, extent and volume of DNAPL releases, O&M period for operation of the six-phase technology, and whether additional sources (C-720 and/or Oil Landfarm) and the dissolved-phase plume will warrant action. The April 14th SMP agreement established a submittal date for the D1 sampling and analysis plan of October 30, 2003. The LOI established a project completion date of 2010.

Off-Site Plumes and Remaining Sources

The scope associated with this project includes a baseline risk assessment documented in a remedial investigation (RI)/feasibility study (FS) report, followed by remedy selection for both the Northwest and Northeast Plumes and remaining groundwater sources that were previously documented in the site-wide groundwater FS. The strategy for the off-site plumes includes a combination of components, including continuation of the water polity to prevent human health exposure, treatment at major DNAPL sources contributing to the off-site contamination, and monitored natural attenuation. The DNAPL source removal actions being considered for the C-400 areas and Southwest Plume source are an integral part of off-site plume remediation. Subsequent to the early source actions, any additional sources and the dissolved phased plumes will be evaluated and supplemental action implemented as necessary, as part of the D&D of the currently operating GDP.

BURIAL GROUNDS OPERABLE UNIT

The scope of this project includes an RI, baseline risk assessment, evaluation of remedial alternatives, remedy selection, and implementation of actions as necessary for protection of human health and the environment for the following burial grounds: C-749 (SWMU 2), C-404 (SWMU 3), C-747 (SWMU 4), C-746-F (SWMU 5), C-747-B (SWMU 6), C-747-A (SWMUs 7 and 30), the residential/inert borrow area and old North-South Diversion Ditch (NSDD) disposal trench (SWMU 145), and additional disposal areas that might exist beneath the scrap yards. The strategy for this project includes a phased approach as outlined below.

Phase I: Accelerate investigation and action at burial grounds posing a current potential off-site groundwater risk as part of Phase I activities. Implement mitigating actions as necessary for protection of plant workers during the ongoing plant operations.

Phase II: Evaluate the long-term effectiveness of existing remedies installed during Phase I and take additional actions as necessary to achieve protectiveness consistent with the future end-state objectives associated with post-shutdown plant conditions. Consistent with the LOI, soil covers are assumed for all burial grounds with the exception of SWMU 3, which already has a Resource Conservation and Recovery Act cap. The evaluation of groundwater action at the C-747 burial ground (SWMU 4) is to be accelerated by inclusion of that scope in the Southwest Plume/Source Project, which assumes DNAPL treatment using six-phase technology. An integrated groundwater monitoring system is also assumed to collect data on the effectiveness of the in situ caps, which will be reevaluated for long-term effectiveness as part of the final comprehensive site-wide OU during D&D of the operating gaseous diffusion plant (GDP). Project uncertainties that could potentially affect the scope and schedule include the amount and scope of RI characterization needed (e.g., test pits, angular borings) and whether additional actions beyond capping will be required at C-749 (SWMU 2) and C-747 (SWMU 4). The April 14th SMP agreement established a submittal date for a D1 RI/FS work plan of June 30, 2005. The LOI established a project completion date of 2019 based on the above scope assumptions.

S- and T-Landfills

The scope associated with this project includes a site evaluation to determine the source of groundwater contamination located in the general vicinity of the subject landfills. Both landfills are permitted landfills and have been closed in place with Subtitle D caps. The scope assumptions assume no additional action will be required beyond the current Subtitle D caps. The April 14th SMP agreement established a submittal date of September 30, 2003, for the sampling plan for the site evaluation. Should the site evaluation determine that the S- and T-Landfills have groundwater releases that warrant additional investigation, those activities will be incorporated into the RI scheduled under the Burial Grounds OU, which includes an investigation of the burial ground (SWMU 145) directly beneath the S- and T-Landfills.

Surface Water Operable Unit

The scope of this project includes investigation, baseline risk assessment, evaluation of removal/remedial alternatives, remedy selection, and implementation of cleanup actions for hot spots associated with the following areas: internal plant ditches, outfall ditches, and Sections 3, 4, and 5 of the NSDD. The scope also includes evaluation of whether additional sediment control measures are needed, as well as actions for potential legacy releases associated with the storm sewer system and Bayou and Little Bayou Creeks.

The strategy includes a phased approach consisting of the following steps: (1) prevention of human exposure to contamination presenting an unacceptable risk; (2) prevention or minimization of further off-site migration; (3) reduction, control, or minimization of surface water sources contributing to off-site contamination; and (4) evaluation and selection of long-term solutions for off-site surface water contamination to protect human health and the environment. The projects associated with implementation of this strategy include Scrap Metal; NSDD Sections 1 and 2, Surface Water Phase I (On-Site), and Surface Water Phase II (Off-Site). The scope assumptions and project uncertainties are defined in the paragraphs below.

Scrap Metal

The scope assumptions for this project include disposition of ~54,000 tons of scrap metal, which assumes disposition of 100% of aluminum ingots and classified scrap at the Nevada Test Site, on-site storage of nickel ingots, and disposal of the remaining scrap at the U-Landfill. The scope also assumes the Soils OU will remove hot spots in the upper 1 ft of surface soils beneath the scrap as necessary, and any subsurface investigation, as necessary, will be conducted as part of the Burial Grounds OU. The regulatory schedule for this project is defined by the signed action memorandum and approved removal action work plans.

NSDD Sections 1 and 2

The scope and schedule for implementing this project are defined by the signed record of decision and approved remedial action work plans.

Surface Water Phase I (On-Site)

The scope associated with this project includes a site investigation (SI) to identify hot spots in ditches and outfalls using field screening techniques [radioactive walkover surveys, polychlorinated biphenyl (PCB) test kits, etc.], including NSDD (Sections 3, 4, and 5). The SI scope also includes evaluation of whether additional sediment control measures are needed, as well as actions for potential legacy releases associated with the storm sewer system. The results will be documented in a baseline risk assessment/SI report and non-time-critical removal action documentation. The scope assumptions include hot-spot removal of ~4,200 linear feet of soils/sediment in the NSDD (Sections 3, 4, and 5); hot-spot removal consisting of ~20,350 yd³ of soils/sediment from Ditches 001, 002, 008, 010, 011, and 015; and replacement of ~1,310 linear feet of storm sewer (C-333-A, C-340, and C-337-A). Project uncertainties that could potentially affect the scope and schedule include whether the proposed field screening techniques are adequate to identify other contaminants of concern (e.g., metals) and whether additional sediment control basins will be required (e.g., 008, 011). The April 14th SMP agreement established a submittal date of April 30, 2004, for a D1 sampling and analysis plan.

Surface Water Phase II (Off-Site)

The scope of this project includes an investigation, baseline risk assessment, and remedy selection and implementation for Bayou and Little Bayou Creeks. The scope assumptions assume excavation of ~12,000 yd³, with 90% disposal in the U-Landfill. Project uncertainties that could potentially affect the scope and schedule include whether the planned level of effort for RI characterization is sufficient. The schedule for initiating this project is sequenced to occur after completion of Surface Water Phase I (On-Site) and with completion by 2017, as defined by the LOI.

Soils Operable Unit

The scope of this project includes investigation, baseline risk assessment, evaluation of removal alternatives, remedy selection, and implementation of removal/remedial actions as necessary. The strategy includes a phased approach consisting of two initial removal actions implemented during plant operations and a final remedial action implemented as part of the final D&D of the GDP. The first early removal action will be implemented immediately following completion of the scrap metal and outside DOE Material Storage Areas (DMSAs) projects, addressing the potentially contaminated underlying surface soils. The second removal action will focus on the identification and mitigation of additional soil hot spots associated with radionuclide and PCB contamination from the remaining plant areas that are accessible and not impacted by plant operations. The objective of these initial removal actions will be to ensure protection of plant workers within industrial areas during the continued operation of the GDP. The scope assumptions are that the action memorandum will identify hot-spot criteria consistent with a target cleanup level of 10^{-4} risk for interim and removal actions, and any necessary characterization will be conducted in real-time conjunction with removal during the remedial action fieldwork. The first removal action assumes removal of $\sim 16,000$ yd³ of soils associated with the scrap yards and outside DMSAs, with 80% disposal in the U-Landfill. The second removal action includes identification and characterization of PCBs and radionuclide contamination using field screening techniques (e.g., radioactive walkover surveys, PCB test kits, etc.) for remaining areas of the plant and assumes removal of $\sim 74,000$ yd³ of soil from areas that are accessible and not impacted by plant operations. The LOI established a completion date of 2015. The project uncertainties include whether the planned level of effort for characterization is sufficient and whether hot spots associated with other contaminants of concern (e.g., metals) are present at concentrations warranting removal.

Decontamination and Decommissioning Operable Unit

The scope of this project includes D&D of the C-410 and C-340 facilities as well as the other 15 inactive DOE facilities, assuming the use of CERCLA removal actions implemented in accordance with the FFA. The D&D strategy includes implementation of a phased approach, sequenced as follows: (1) stabilization, removal, and disposition of the infrastructure at C-410 (e.g., process piping, equipment, stored material); (2) stabilization, removal, and disposition of the infrastructure at C-340; (3) demolition and disposition of the C-410 and C-340 structures to grade/building slab; and (4) D&D of the remaining 15 inactive DOE facilities to be scheduled as needed to balance resources. This strategy is intended to take advantage of a trained workforce during infrastructure removal as well as to maximize opportunities for achieving cost-efficiencies and economies of scale through coordination of structure demolition at C-410 and C-340. The scope assumptions include off-site disposal of infrastructure/process equipment and on-site disposal in the U-Landfill of facility structures. The scope assumes removal of structures down to grade/building slab and that the underlying soils will be addressed as part of final comprehensive site OU during D&D of the operating GDP. Project uncertainties include total waste volume and U-Landfill capacity associated with Cells 1–5. The LOI established a project completion date of 2017.