

**RESPONSES TO U.S. EPA AND OEPA COMMENTS
ON THE DRAFT
REMEDIAL ACTION WORK PLAN
FOR ~~AQUIFER RESTORATION AT OPERABLE UNIT 5~~
FOR NOVEMBER 1996**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**

APRIL 1997

**U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE**

**RESPONSES TO U.S. EPA COMMENTS
ON THE DRAFT
REMEDIAL ACTION WORK PLAN
FOR AQUIFER RESTORATION AT OPERABLE UNIT 5
FOR NOVEMBER 1996**

1. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 1.3 Pg.#: Not applicable (NA) Line#: NA Code:
Original General Comment# 1

Comment: The remedial action work plan (RAWP) presents a general discussion of the aquifer restoration modules (ARM) as they are presented in the remedial design work plan (RDWP) and refers to the ARMs as they have been modified to comply with the 10-year baseline strategy. Because of this lack of specificity, it is unclear which restoration activities will actually be implemented. The work plan should clearly describe ARM components; the number and locations of wells; and all associated electrical, pipeline, and other equipment.

Response: The Final RD Work Plan module approach was based on the strategy within the Draft Baseline Remedial Strategy Report, which was designed to meet the accelerated clean-up plan (previously called the 10-year plan). Although the Draft Baseline Remedial Strategy Report was a design deliverable under the RD Work Plan, early internal drafts of the Baseline Remedial Strategy Report were used as the mechanism for the module strategy as provided in the RD Work Plan. Since its first submittal, the Baseline Remedial Strategy Report has been revised and fine-tuned, resulting in some changes to the module strategy. The Draft Final RA Work Plan, which will be submitted concurrently with the Draft Final Baseline Remedial Strategy Report, must incorporate these changes. The differences in the module strategy between the RD Work Plan and this version of the RA Work Plan include a discrete additional phase (Phase II) of the South Field Extraction System Module and a new South Field Injection System Module. The Phase II of the South Field Extraction System module includes only planned extraction wells (as opposed to both extraction and injection wells). All injection wells planned for the South Field plume are now incorporated into the new South Field Injection System module, which will be implemented if the Injection Demonstration Module proves injection to be a viable enhancement. At the time of the RD Work Plan, the need for these additional extraction/injection wells were discussed conceptually (in the RD Work Plan, Section 3.3.3); as a result of the progressive finalization of the Draft Final Baseline Remedial Strategy Report, the additional wells are now included in bonafide modules.

Most of the detail regarding individual aquifer restoration modules will be in the remedial action module design packages, which are EPA/OEPA deliverables under the RDWP. However, some additional detail can be provided in this version of the RAWP to better describe the major components of each ARM. The additional detail will be for general information purposes regarding the elements involved in each ARM, and is based on currently anticipated plans. The specifics of each element provided in the RAWP (e.g., the exact number and location of wells, the associated pipeline to be constructed, etc.) will be subject to change during the development of the individual design packages.

Action: Clarification will be provided regarding the variances between the Final RD Work Plan and the Draft Final RA Work Plan. Also, additional detail regarding the number of extraction/injection wells and associated electrical, piping, and other needs will be

added to the Aquifer Restoration Module descriptions, specifically in Sections 2.2, 2.2.1, 2.2.3, 2.2.4, 2.2.5, 2.2.6, and 2.2.7, as provided below.

The following will replace Section 2.2, p. 11, lines 10-14 (last two sentences in first paragraph):

"The module strategy presented below differs from that provided in the RD Work Plan (1996d). The RD Work Plan dictated the deliverable date for the Draft Baseline Strategy Report, which was subsequently submitted after approval of the Final RD Work Plan. Both the RD Work Plan and the Draft Baseline Remedial Strategy Report included a concurrently developed module strategy that was designed to meet the accelerated clean-up plan. Since its first submittal, the Baseline Remedial Strategy Report has been revised, resulting in some alterations to the module strategy presented in the Draft Baseline Remedial Strategy Report and the RD Work Plan. The strategy presented in this RA Work Plan reflects the latest strategy developed through the Baseline Remedial Strategy Report. The primary differences between the module strategy originally presented in the RD Work Plan versus this RA Work Plan are as follows:

- The South Field Extraction System Module now includes a discrete additional phase (Phase II), and;
- All injection wells for the South Field plume are incorporated into a new South Field Injection System Module."

The following will replace the text in Section 2.2, p. 11, lines 16-18:

"Below is a description of each activity/module and its current status. The location of each aquifer restoration module is depicted in Figures 2-2 and 2-3. Each module is comprised of two basic elements: well installation and construction of piping and associated utilities. The descriptions of the elements are based upon the current strategy in the Draft Final Baseline Remedial Strategy Report, and are presented to generally describe the elements of each component. Changes to the specific descriptions below will be documented in each of the remedial design package submittals."

Section 2.2.1, p. 11, lines 26-31 (last paragraph), will be replaced with the following:

"The design of the AWWT Facility Expansion is complete and a construction subcontract has been awarded for building the expansion. The AWWT Facility Expansion will be located within Building 51 (Figure 2-2). The expansion will be comprised of an aeration tank and blower, four multimedia filter vessels, and six ion exchange columns. The existing electrical and control systems within Building 51 will be expanded to accommodate the new treatment units. Once construction is completed, inspected, and accepted, systems testing will be conducted to ensure proper operations. After successful testing, a standard startup review (SSR) will be conducted to ensure all procedures and maintenance plans are in order; then, the expansion system will be brought online."

Section 2.2.3, p. 12 lines 23-30, and p. 13, lines 1-6, will be deleted and replaced by the following:

"The South Plume Optimization Module is comprised of two extraction wells (Wells RW-6 and RW-7) located on private property adjacent to the FEMP (Figure 2-2). A third well location (3N) (also located on private property) has been identified as an optional contingency well location to be utilized in the future, if necessary. The Draft Final Baseline Remedial Strategy Report provides the criteria to be used to determine if and when this contingency well location will be installed.

After site access easements have been obtained, construction activities will begin for the two extraction wells and the associated infrastructure. The module construction includes drilling two extraction wells, approximately 800 feet of trenching, placement of 1,800 feet of High Density Polyethylene (HDPE) piping, submersible pumps, electrical service, controls and instrumentation, and a valve house. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order then the module will be brought online."

The following will replace the text in Section 2.2.4, p. 13:

"The South Field Extraction System Module is comprised of two Phases -- Phase I and Phase II. South Field Extraction System Phase I module includes ten extraction wells. In 1996, nine of the ten extraction wells were installed on-property in the vicinity of the South Field/storm sewer outfall ditch (SSOD), as part of an EPA-approved early start initiative. The nine wells are designed to remove groundwater contamination in an on-property area where uranium contamination levels are highest (Figure 2-2). The remaining work to be completed as part of Phase I include construction and installation of the tenth extraction well, new electrical high voltage power service, approximately 6,000 feet of trenching and placement of 12,000 feet of HDPE piping, variable speed submersible pumps, new access roadways, instrumentation and controls, ten well houses and one valve house. After construction is completed, inspected, and accepted, systems testing will be conducted. Once the systems testing is complete, an SSR will be conducted to ensure all procedures and maintenance plans are in order, prior to bringing the Phase I of the module online.

The nine-well early-start South Field Extraction System was designed to support the initial 27-year base-case system presented in the Operable Unit 5 FS and ROD. As presented in the Draft Baseline Remedial Strategy Report, the proposed well field for the ten-year aquifer restoration includes additional extraction wells in the South Field area. These additional extraction wells will comprise Phase II of the South Field Extraction System Module and will be located in the area depicted in Figure 2-3. The Phase II extraction wells will be installed after Operable Unit 2 remedial activities for contaminated soils and source areas have been completed. Phase II includes installation and construction of nine additional extraction wells, approximately 1,500 feet of trenching and placement of 3,500 feet of HDPE piping, electrical service to each well, submersible well pumps, instrumentation and controls, and nine well houses. After completion, inspection and acceptance of construction, systems testing will be conducted. After systems testing is complete, an SSR will be conducted to ensure all procedures and maintenance plans are in order. After completion of the SSR, Phase II of this module will be brought online."

The following will replace the text for Section 2.2.5, p. 13 to 14:

"Groundwater injection was determined to be a potentially viable strategy for enhancing aquifer restoration in the Draft Baseline Remedial Strategy Report. To test this technology at the field scale, a five-well Injection Demonstration Module (Task 4 in the RD Work Plan), will be constructed. If successful, injection wells may be added to the aquifer restoration modules, if needed. The five injection wells will be located along Wiley Road on the southern boundary of the FEMP (Figure 2-2). The installation and construction of this module includes five injection wells, a 50,000 gallon surge tank, two 100 horsepower pumps, electrical service, approximately 5,000 feet of trenching and placement of HDPE piping, fabrication of injection well downcomers, instrumentation and controls. Once completed, the construction will be inspected and accepted, and systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. After the SSR, the module will be brought online."

The following will replace the text in Section 2.2.6, p. 14:

"The Waste Storage Area Extraction System Module will recover contaminants from the Great Miami Aquifer underlying the waste storage area (Operable Units 1 and 4). Once this area is accessible, i.e., after the waste pit material and contaminated soil has been excavated, construction of this module can be initiated within this area (Figure 2-3). The construction includes installation of ten extraction wells, 7,000 feet of trenching and placement of 14,800 feet of HDPE piping, submersible pumps, new electrical high voltage power service to the area, instrumentation and controls, and ten well houses. After construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. Once the SSR is complete, the module will be brought online."

The following will replace the text in Section 2.2.7, p. 14:

"The Plant 6 Area Extraction System Module will recover contaminants in the Great Miami Aquifer located beneath and east of Plant 6 which is located in the southeastern portion of the FEMP's former production area. The module consists of two extraction wells located in this area (Figure 2-3). After D&D of Plant 6 and excavation of underlying contaminated soil, this area will be accessible, and construction of this module can be initiated. Construction of the Plant 6 Area Extraction System Module includes installation of two extraction wells, 3,300 feet of trenching and placement of HDPE piping, electrical service, submersible pumps, instrumentation and controls, one valve house and two well houses. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. Once the SSR is complete, the module will be brought online."

The following section will be added at the end of Section 2.2:

"2.2.8 South Field Injection System Module

The South Field Injection System Module construction includes installation of five injection wells and converting four existing extraction wells to injection wells. The South Field Injection module is located in the south-central portion of the FEMP

within the South Field area (Figure 2-3). Construction of this module also includes a 100 horsepower pump, approximately 4,000 feet of trenching and placement of HDPE piping, instrumentation, and controls. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order; then, the module will be brought online."

2. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 2 Pg.#: NA Line#: NA Code:

Original General Comment# 2

Comment: Section 2.0 states that schedules for certain ARMs or portions of ARMs cannot be set because they depend on the successful completion of remedial actions for other operable units (OU). This approach is not acceptable because an enforceable schedule must be included in the RAWP. Lengthy delays in completing remedial action at other OUs could negate the time savings envisioned by the 10-year baseline strategy. DOE must commit to a date for start up of the OU 5 remedial systems (or portions thereof) even if remedial action completion at other OUs is delayed. The RAWP should be revised to propose schedules for the South Field Phase II, South Plume Optimization Phase II, Waste Storage Area, and Plant 6 modules.

Response: At the meeting with EPA and OEPA on March 18, 1997, the need for milestone dates for all of the aquifer restoration modules, including the out-year modules, was discussed. It was agreed that DOE would furnish dates for both the near-term modules and the out-year modules but, as indicated by EPA, it would be acceptable to include the necessary caveats that affect the timing of the out-year modules. Two tables have been added to the RA Work Plan that discuss the milestones for the near-term modules (AWWT Expansion, Injection Demonstration, South Plume Optimization, and South Field Extraction System Phase I), and the out-year modules (Waste Storage Area, Plant 6 Area, South Field Extraction Phase II, and South Field Injection modules). For information purposes, the interim construction-related schedule dates are also shown in the tables for each module, leading to the endpoint "commencement of operation" milestone for each module. For the near-term modules, DOE believes that the "commencement of operation" milestone should serve as the enforceable RA milestone for each module. For the near-term modules that will be shown in Table 2-1 of the RA Work Plan, these enforceable milestones would become effective upon approval of the RA Work Plan. For the out-year modules, DOE is proposing that the "commencement of operation" milestone for each out-year module become enforceable at the time that the prefinal design packages for that specific out-year module is approved. This approach for providing enforceable RA dates for the out-year modules is consistent with the process described in the approved RD Work Plan (see Section 3.5 of that document) which discusses an approach for submitting enforceable RA milestones for future restoration modules as formal addenda to the approved initial RA Work Plan. As required by Section 3.5 of the RD Work Plan, these formal RA Work Plan addenda are to be submitted for approval with the future prefinal design packages for each of the out-year modules.

The caveats for the out-year modules that were discussed categorically at the March 18th meeting are summarized below:

- All other remedial action projects scheduled within the planned aquifer restoration module areas need to be essentially complete prior to extraction/injection well installation and construction of the associated piping and electrical infrastructure.

This is necessary to provide access for direct groundwater extraction from "hot spots" that reside beneath the source areas comprising the other Operable Units. These other projects include: the OU1 Waste Pit excavations; the OU3 Plant 6 D&D in the Plant 6 Area Extraction System Module area; and the OU2 South Field excavation in the South Field Extraction System Phase II Module area.

- The actual in-the-ground performance of the groundwater remedy is highly dependent on the field-scale geochemical and hydraulic characteristics of the aquifer, which could influence the current "best estimate" predictions of aquifer response to the planned restoration activities.
- Several field-scale uncertainties remain with the planned injection demonstration technology, which affects whether or not the technology will be applied beyond the initial Injection Demonstration Module. The purpose of the Injection Demonstration is to critically examine these uncertainties and resolve the long-term viability of the technology. Whether or not the follow-up South Field Injection System Module will even be implemented depends on the outcome of the Injection Demonstration.
- The FEMP's ten-year aquifer restoration plan is a good faith effort on the part of DOE to improve dramatically on the 27 year estimate contained in the ROD (which employs conventional technologies with higher likelihood of implementation success). As such, there are uncertainties that can affect whether or not the ten-year plan can be achieved, and the composition and timing of out-year modules is heavily dependent on the level of understanding that is gained from the behavior and response of the near-term modules.

Action:

Table 2-1 will be expanded into two tables to address the near-term and out-year dates requested by EPA, and Table 2-1 will identify the enforceable "commence operations" RA date for the near-term modules. Also incorporated into Tables 2-1 and 2-2 are the refinements resulting from the latest version of the Baseline Remedial Strategy Report (see Comment 3), additional activity-related milestones (see Comment 4), and revised month-specific start-up dates (see Comment 5). Additionally, Figure 1-1 will be expanded to two Figures -- Figure 2-2 and Figure 2-3 -- to show separately the near-term and long-term module locations. The text will also be revised to describe these changes. Both the table and text revisions follow:

The following two tables will replace Table 2-1, p. 15:

TABLE 2-1
AQUIFER RESTORATION REMEDIAL ACTION SCHEDULE FOR
NEAR-TERM ACTIONS

Activity/Module	Well Installation Contract Award	Infrastructure Contract Award ^a	Complete Construction	Commence Operations
AWWT Expansion	N/A	Complete	February 27, 1998	April 30, 1998 ^c
Injection Demonstration	Complete	September 5, 1997	June 1, 1998	August 1, 1998 ^c
South Plume Optimization	November 1, 1997	January 2, 1998	July 1, 1998	September 1, 1998 ^c
South Field Extraction System Phase I	NA ^b	February 1, 1998	August 1, 1998	September 30, 1998 ^c

^aThe infrastructure contract for the groundwater extraction modules includes all construction activities other than well drilling (e.g., installation of electrical, instrumentation, pipelines, pumps and associated equipment).

^bNine of the ten Phase I South Field Extraction System Module wells were installed previously under the 1995 Project-Specific Plan for the Installation of the South Field Extraction System (DOE 1995c).

^cThe dates provided for commencing operations (start-up) are the enforceable milestones for the aquifer restoration remedial action. All other dates are provided for information purposes to demonstrate their relationship to the enforceable (commence operations) milestones.

TABLE 2-2

**AQUIFER RESTORATION REMEDIAL ACTION SCHEDULE FOR
LONG-TERM ACTIONS^a**

Activity/Module	Well Installation Contract Award	Infrastructure Contract Award ^b	Complete Construction	Commence Operations
South Field Injection System	October 1, 2002	December 31, 2002	August 1, 2003	October 1, 2003
South Field Extraction System Phase II	November 30, 2002	December 31, 2002	August 1, 2003	October 1, 2003
Waste Pit Area Extraction System	October 31, 2002	December 1, 2002	August 1, 2003	October 1, 2003
Plant 6 Area Extraction System	February 1, 2003	March 1, 2003	August 1, 2003	October 1, 2003

^aThe long-term projected dates are contingent upon completion of OU1, OU3, and OU2/OU5 remedial activities in the module areas. If these projects are delayed, then revised schedules and milestones will be submitted in addenda to this RAWP.

^bThe infrastructure contract for the groundwater extraction modules includes all construction activities other than well drilling (e.g., installation of electrical, instrumentation, pipelines, pumps and associated equipment).

The sentence on lines 8-10, p. 11, Section 2.2, will be revised to:

"The remaining components have yet to be initiated and include the South Plume Optimization Module, Phase II of the South Field Extraction System Module, the Injection Demonstration Module, the South Field Injection System Module, the Waste Storage Area Extraction System Module, and the Plant 6 Area Extraction System Module."

The following will be added after line 30 (end of the second paragraph) in Section 2.2.3, p. 12:

"If Well 3N is found to be needed, an addendum to the RAWP will be submitted to include the activities and schedule dates for the construction and operation of this well."

Section 2.2.3, p. 13, lines 8-9, will be deleted and replaced by:

"The schedule dates for this module are provided in Table 2-1 and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up)."

The following will be added at the end of Section 2.2.4, p. 13:

"The schedule dates for Phases I and II of this module are provided in Tables 2-1 and 2-2, respectively, and include the award of subcontracts for well installation (Phase II only) and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). The schedule

dates for Phase II of the South Field Extraction System Module are contingent on the completion of the source operable unit and soil remedial activities in this area, and are presented in Table 2-1. If these dates must change in the future, due to changes in the remedial action schedule for OU2 waste unit and soil remedial activities in this area, then an addendum to this RAWP will be submitted to include the revised schedule."

The following will be added at the end of Section 2.2.5:

"The schedule dates for this module are provided in Table 2-1, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up)."

The following will be added at the end of Section 2.2.6:

"The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). These dates are contingent on the completion of the source operable unit and soil remedial activities in this area. If these dates must be revised in the future due to schedule changes within the OU1 Waste Pit and OU2/OU5 Soil Excavation remedial activities, then an addendum to this RAWP will be submitted to include the new schedule."

The following will be added at the end of Section 2.2.7:

"The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). These dates are contingent on the completion of the source operable unit and soil remedial activities in this area. If these dates must be revised in the future due to schedule changes with the OU3 Plant 6 area D&D activities or related soil excavation, then an addendum to this RAWP will be submitted to include the new dates."

The following will be added at the beginning of new Section 2.2.8:

"If the Injection Demonstration Module results indicate that re-injection is a viable aquifer restoration enhancement technology, then the aquifer restoration project will implement the South Field Injection System Module. This module includes all injection wells planned to enhance uranium removal from Phases I and II of the South Field Extraction System Module. The South Field Injection System Module was not described in the OU5 RDWP because it is based on further development of the Draft Baseline Remedial Strategy Report, which was submitted later than the OU5 RDWP."

The following will be added at the end of new Section 2.2.8:

"The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). If these dates must be revised in the future due to schedule changes with the OU2 Southern Waste Unit and associated soil remediation activities, then an addendum to this RAWP will be submitted to include the new schedule."

Section 2.3, p. 14, lines 20-28 (first paragraph) will be replaced by:

"In accordance with the modular restoration strategy employed for the Great Miami Aquifer, the start-up dates of the four remedial action elements mentioned above (South Plume Optimization Module, Injection Demonstration Module, AWWT Facility

Expansion, and South Field Extraction System) are included in the remedial action schedule milestones in this RA Work Plan (Table 2-1). The other dates in Table 2-1, and all the dates in Table 2-2, are provided to show the interim construction-related schedule leading to the start-up of each module. The Waste Pit Area Extraction System Module, the Plant 6 Area Extraction System Module, Phase II of the South Field Extraction System Module, and the South Field Injection System Module have long-term schedule dates provided in Table 2-2 with the following contingencies:

- All other remedial action projects scheduled within the planned aquifer restoration module areas need to be essentially complete prior to extraction/injection well installation and construction of the associated piping and electrical infrastructure. This is necessary to provide access for direct groundwater extraction from "hot spots" that reside beneath the source areas comprising the other Operable Units. These other projects include: the OU1 Waste Pit excavations; the OU3 Plant 6 D&D in the Plant 6 Area Extraction System Module area; and the OU2 South Field excavation in the South Field Extraction System Phase II Module area.
- The actual in-the-ground performance of the groundwater remedy is highly dependent on the field-scale geochemical and hydraulic characteristics of the aquifer, which could influence the current "best estimate" predictions of aquifer response to the planned restoration activities.
- Several field-scale uncertainties remain with the planned injection demonstration technology, which affects whether or not the technology will be applied beyond the initial Injection Demonstration Module. The purpose of the Injection Demonstration is to critically examine these uncertainties and resolve the long-term viability of the technology. Whether or not the follow-up South Field Injection System Module will even be implemented depends on the outcome of the Injection Demonstration.
- The FEMP's ten-year aquifer restoration plan is a good faith effort on the part of DOE to improve dramatically on the 27 year estimate contained in the ROD (which employs conventional technologies with higher likelihood of implementation success). As such, there are uncertainties that can affect whether or not the ten-year plan can be achieved, and the composition and timing of out-year modules is heavily dependent on the level of understanding that is gained from the behavior and response of the near-term modules."

Section 2.3, p. 15, lines 1-2 (first sentence in paragraph) will be revised to:
"The schedule dates and milestones for the aquifer restoration are provided in Tables 2-1 and 2-2. These dates are presented for the award of subcontracts for the well installation, the award of subcontracts for construction of the associated infrastructure, completion of well installation and construction, and the initiation of operations (start-up)."

3. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 2 Pg.#: NA Line#: NA Code:
 Original General Comment# 3
 Comment: U.S. EPA had several comments on the 10-year baseline strategy that will significantly impact the RAWP and schedule. These issues should be resolved and the RAWP revised as necessary.
 Response: Agree. The revised RAWP incorporates the changes resulting from negotiations between the DOE, EPA, and OEPA, regarding the ten-year aquifer restoration baseline strategy. Specifically, the South Plume Optimization Module now consists of two extraction wells and a third well as a contingency. The draft RAWP discussed four off-property proposed extraction wells (1, 2N, 3N, KN), two of which were unacceptable to the property owner (Wells 2N and KN). Following the negotiations between the DOE, EPA, OEPA and the property owner, it was determined that Wells 2N and 1 will be installed at locations agreeable to the property owner (these wells are renamed as recovery wells RW-6 and RW-7, respectively). These two wells will comprise the South Plume Optimization Module, and there is no longer a need for a second phase of this module. A third well location (3N) has been identified as an optional contingency well location to be utilized in the future, if necessary. The Draft Final Baseline Remedial Strategy Report provides the criteria to be used to determine if and when this contingency well will be installed. Should that well be necessary, it will be implemented as Phase II of the South Plume Optimization Module, and an addendum to the RAWP will be prepared to supply activity dates and enforceable milestones for the construction and operation of this phase.
- As discussed in the response to Comment 1, additional changes and improvements to the baseline strategy have resulted in some changes to the module identification proposed in the RDWP. The South Field Extraction System Module now include a second phase (Phase II) that will include the extraction wells for Phase II. Also, a new South Field Injection System Module has been created that incorporates all planned injection wells designed to enhance uranium recovery from the South Field Extraction System Module. Assuming injection is a feasible technology, the South Field Injection System Module will be implemented.
- Action: As provided in the action to Comment 2, revisions will be made to Section 2.2 and Section 2.2.3, South Plume Optimization Module. Plus, a new Section 2.2.8, South Field Injection System Module, will be added.

4. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 2 Pg.#: NA Line#: NA Code:
 Original General Comment# 4
 Comment: Table 2-1 of the RAWP presents a schedule for several ARMs. The schedule does not include activity milestones, such as completion of site work, testing and acceptance, and system operation. The schedule should establish dates for this type of milestone.
 Response: Activity-related dates will be added for each aquifer restoration module, including completion of construction, and initiation of operations (start-up) after construction acceptance and testing. The start-up dates for the near-term modules are presented as the only enforceable milestones. The remaining dates for the near-term modules and all the projected dates for the long-term modules are provided to describe the schedule for the aquifer restoration remedial action.
 Action: Table 2-1 will be revised into two tables to incorporate additional activity-related schedule dates (and other dates to address Comments 2 and 5), as provided in the action to Comment 2.

5. Commenting Organization: U.S. EPA Commentor: Saric
 Section#: 2.1.4 Pg.#: NA Line#: NA Code:
 Original General Comment# 5

Comment: The table below presents timeframes for the remedial design (RD) and remedial action (RA) milestones. As shown in the table, long periods of time elapse between milestones. For example, the South Field Extraction System Phase I ARM, which consists of nine wells around the perimeter of the South Field, could be installed and operating before the projected start-up date of January 1999. Similarly, it is unclear why the South Plume Optimization Module I will require 14 months until contract award and another 11 months for well installation. An expanded schedule should be provided in the RAWP for each ARM, as well as rationales for the long timeframes.

ARM	Prefinal Design Package ^a	Months Until RA Contact Award	RA Contract Award ^b	Months Until RA Installation	Projected Start-up Date ^c
South Field Extraction System Phase I	complete	15	3-16-98	9	1/99
South Field Extraction System Phase II	TBD ^d		TBD		1/04
Advanced Wastewater Treatment	7/30/96	7	3/12/97	9	1/98
Injection Demonstration	12/1/96	10	9/5/97	3	1/98
South Plume Optimization Module I	12/1/96	14	2/10/98	11	1/99
South Plume Optimization Module II	TBD		TBD		
Waste Storage Area	11/30/01		TBD		1/04
Plant 6	11/30/01		TBD		1/04

Notes:

- a Milestone dates are based on the RDWP for RAs at Operable Unit (OU) 5 dates April 1996.
- b Milestone dates are based on the RAWP for aquifer restoration at OU 5 dates November 1996.
- c Milestone dates are based on baseline RA report for Aquifer Restoration RD dated October 1996.
- d TBD = To be determined

Response: The projected startup dates provided in the table above were from the Baseline Remedial Strategy Report (BRSR). The BRSR dates are general year-based dates and were selected to facilitate modeling and planning for the baseline scenarios. As such,

the BRSR dates were not intended to be presented as enforceable milestones. Month-specific start-up dates will be included in the RAWP (also per responses to Comments 2 and 4), and will more accurately represent the remedial action schedule.

The time between the submittal of the design package and the award of the construction contract must incorporate the EPA/OEPA review cycle, including the submittal of the revised design package with the responses to EPA/OEPA comments. Additional time between submittal of the design package and award of the construction contract for certain modules is necessary due to funding constraints and/or revised submittal dates of the design packages. For example, award of the construction contract for Phase I of the South Field Extraction System Module is on hold due to DOE funding constraints. Similarly, the period of time between submittal of the prefinal design package and the award of the construction contract for the AWWT facility included delays due to the availability of funding. The actual submittal of the Injection Demonstration and South Plume Optimization Module design packages was February 4, 1997, which shortens the time-frame between submittal of the design packages and the award of the subcontracts. Also, additional time for these modules was necessary to accommodate current negotiations with the EPA/OEPA regarding the design and the BRSR.

Action: Table 2-1 has been expanded as indicated in the action for Comment 2, and will include month-specific startup dates, as well as other dates for initiation and completion of site work, leading to the start-up of each restoration module.

6. **Commenting Organization:** U.S. EPA **Commentor:** Saric
Section#: 2.2.1 **Pg.#:** 11 **Line#:** 22 **Code:**
Original Specific Comment# 1

Comment: The text states that the existing capacity of the AWWT facility will be expanded to the maximum extent achievable within the confines of Building 51. Although this approach has been previously discussed with U.S. EPA, it should be noted that no language in the record of decision limits the capacity of the treatment system required. The enforceable requirement of the ROD is the discharge limit for uranium and not the capacity of the treatment system. DOE must provide sufficient treatment capacity to meet the discharge limit.

Response: DOE agrees with the commentor that no language in the ROD limits the capacity of the treatment system, and DOE recognizes the need to operate the system to achieve the enforceable concentration-based uranium performance standard of

20 ppb and the 600 pounds per year uranium mass limit.

Action: No revision to the RA Work Plan required.

**RESPONSES TO OEPA COMMENTS
ON THE DRAFT
REMEDIAL ACTION WORK PLAN
FOR AQUIFER RESTORATION AT OPERABLE UNIT 5
FOR NOVEMBER 1996**

7. Commenting Organization: Ohio EPA Commentor: Schneider
Section#: 2.1 (and 2.3.2) Pg.#: 9 Line#: 28 and following Code:
Original Comment# 1

Comment: On page 9, lines 28 and following there is described the submission of module-specific Remedial Action Reports at the completion of each aquifer restoration module. The text continues by stating that the aquifer restoration process will be complete after the Remedial Action Report for all modules have been approved. However, the OU 5 RD Work Plan describes the IEMP as "The Plan will also serve as the primary vehicle for determining to EPA and OEPA's satisfaction that the remedial action objectives for the Great Miami Aquifer have been attained." Ohio EPAs comment concerns the process by which the RAOs are attained. It is our concern that this process be unambiguously described in the RAWP. Describe the interface between these reports and the IEMP and outline the process and decisions that are planned for the process. Section 2.3.2 Completion of Remedial Action Activities does not address this issue either.

Response: This comment raises two OEPA concerns regarding remedial action objectives (RAOs) for aquifer restoration; 1) What vehicle will be utilized to document the achievement of remedial action objectives? and; 2) What is the process to be utilized to achieve remedial action objectives?

1) The data collected as part of the IEMP will provide the basis to determine the achievement of the Operable Unit 5 ROD established aquifer restoration RAOs (which is essentially the achievement of FRLs). To ensure that EPA and OEPA are kept informed of the ongoing progress of the aquifer restoration effort, these data will be shared with EPA and OEPA via quarterly meetings/reports and in a comprehensive annual report as outlined in the IEMP. DOE currently envisions that future IEMP reports will serve as the Remedial Action Reports identified in the draft RA Work Plan. The Remedial Action Reports (as part of the IEMP reports) will document FRL achievement in the Great Miami Aquifer and will function as certification reports for the completion of each aquifer restoration module. As noted in the IEMP, the IEMP is a living document which will be modified to address changing monitoring needs as remediation progresses. As indicated in the Draft RA Work Plan, Section 2.3.2, page 16, lines 12 through 14, the remedy performance monitoring necessary to certify completion of each module will be described in a future version of the IEMP. The role of the IEMP reporting process in fulfilling remedial action reporting needs will be clarified in the draft final RA Work Plan as indicated in the action below.

2) The process to achieve remedial action objectives for the Great Miami Aquifer has been previously described in Section 9.1.3 of the Operable Unit ROD. The following is an excerpt from the ROD describing the process. "The selected remedy consists of the following key components for regional groundwater:

- Extraction of contaminated groundwater until such time as final remediation levels are attained at all points in the impacted areas of the Great Miami Aquifer.

- Performance of an engineering study to examine the viability of applying reinjection techniques to enhance contaminant recovery from the aquifer system; application of reinjection to groundwater restoration activities where established to be economically and technically viable.
- Collection of recovered groundwater for treatment and/or discharge to the Great Miami River or reinjection (if deemed appropriate)."

As described above, the documentation of the progress toward achievement of FRLs in the Great Miami Aquifer will occur as part of the IEMP monitoring and reporting process. As explained in the responses to comments (submitted on March 7, 1997) on the draft IEMP and in Section 2.3.2 of the draft RA Work Plan, a future version of the IEMP will provide the process and protocol to be utilized to determine achievement of RAOs (FRLs) for aquifer restoration. It is DOE's intention to utilize EPA guidance such as "Methods For Evaluating the Attainment of Cleanup Standards Volume 2: Groundwater" (EPA 1992) in the development of the RAO certification process.

Action: Add the following sentence to Section 2.1, page 9, after the sentence ending on line 30: "It is currently envisioned that these Remedial Action Reports will be based on IEMP monitoring data and will be submitted as part of the IEMP reporting process."

On page 10, the second to the last box on Figure 2-1 will be modified by adding "(As part of the IEMP reporting process)".

The following will be added to Section 2.3.2, p. 16, after the sentence ending on line 14 (the end of the first paragraph):

"Achievement of the FRLs will be documented within Remedial Action Reports, which will be submitted as part of the IEMP reporting process."

The following will be added at the end of Section 7.0, p. 37:

"It is currently envisioned that the IEMP reporting process will incorporate the Remedial Action Reports that document FRL achievement and clean-up certification for each aquifer restoration remedial action module."

8. **Commenting Organization:** Ohio EPA **Commentor:** DDAGW
Section#: 3.2 **Pg.#:** 30 **Line#:** **Code:**
Original Comment# 1

Comment: This section does not address the Underground Injection Controls permits associated with injection wells. Even if these permits are not required for CERCLA remedial actions, they need to be discussed.

Response: Agree. Although section 3.0 was originally intended to include only those regulatory topics that currently have full (i.e., administrative) applicability to the remedial action, the nature of the remedial action warrants discussion of compliance with the Underground Injection Control (UIC) regulations. A section will be added in which the UIC permit program will be discussed. As with the other permits identified in Section 3.0, the substantive requirements of the UIC Permit will be addressed in the Permitting Crosswalk in the O&M Plan (Task 2 of the RD Work Plan).

Action: A subsection will be added at the end of Section 3.0, as follows:

"3.4 UNDERGROUND INJECTION CONTROL PERMIT PROGRAM

The wells used for the Injection Demonstration (Task 4 of the RDWP) and the South Field Injection System Module (if implemented) meet the definition of an underground injection well subject to Ohio regulations for the Underground Injection Control (UIC) Program (OAC 3745-34). The injection well classification in this case is determined by the intent of the injection and the source water used as injectate. The purpose of the Injection Demonstration is to facilitate and enhance groundwater extraction. Currently, only treated groundwater will be used as the injection water. As such, these wells are classified as Class V injection wells [OAC 3745-34-04(E)]. All of the planned injection well locations will be on-site. Remedial actions conducted entirely on-site are exempt, under CERCLA and the NCP [40 CFR 300.400(e)], from the administrative requirements of obtaining environmental permits. Compliance with the substantive permit requirements for well drilling and well operation will be incorporated into the design of the injection system and will be included in the Permitting Crosswalk in the O&M Plan (Task 2 of the RD Work Plan)."

9. Commenting Organization: Ohio EPA Commentor: DDAGW
Section#: General Pg.#: Line#: Code:

Original Comment# 2

Comment: The series of events described in the document are consistent with what has been described by DOE in the past, and the implementation schedule and order are logical. However, recent information from the ongoing Geoprobe™ investigation near the Knollman property will almost definitely affect the implementation of the ground water remediation program. The data from these sources are critical to the final design and implementation of the ground water remediation system. Because of this uncertainty, it is recommended that DOE postpone the finalization of this document until the Geoprobe™ investigation, and all subsequent related investigations (if required) are completed.

Response: Agree. The schedule for resubmittal of the RAWP was postponed for exactly this reason, per letter dated February 12, 1997 from J. Reising (DOE) to J. Saric (EPA) and T. Schneider (OEPA). The remedial action schedules provided in the Draft Final RA Work Plan will include any necessary revisions determined from the results of the Geoprobe™ study, as well as any from negotiations regarding the Baseline Remedial Strategy report (see response to Comment 3).

Action: As noted in the above response, and as provided in the action to Comment 2.