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TRANSMITTAL OF THE FINAL OPRABLE UNIT 5 FEASIBILITY STUDY REPORT - CHANGE PAGES AND VOLUME 1 FOR THE ADMINISTRATIVE RECORD - (ALSO CONTAINS RESPONSES TO COMMENTS)

07/20/95

DOE-1244-95
DOE-FN EPAS
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RESPONSES

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Department of Energy
Fernald Environmental Management Project
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JUL 20 1995

DOE-1244-95

Mr. James Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, IL 60604-3590

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE FINAL OPERABLE UNIT 5 FEASIBILITY STUDY REPORT - CHANGE PAGES AND VOLUME 1 FOR THE ADMINISTRATIVE RECORD

Reference: Letter, James A. Saric (U.S. EPA) to Jack Craig (DOE-FN), "Approval of the Revised OU 5 Feasibility Study Report," dated June 21, 1995

This letter transmits change pages for the Operable Unit 5 Feasibility Study (FS) Report as well as replacement covers, spines, and title pages marked Final for all three volumes; instructions for inserting all replacements are provided. ***Bold italics*** have been used within the report text and at the top of tables to indicate revisions due to responses to the final round of comments. This package is being sent to all holders of the draft final (i.e., March 1995) FS Report.

The Department of Energy, Fernald Area Office (DOE-FN) initiated a number of additional revisions to enhance the accuracy and clarity of the document, most of which are marked by bold italics and/or "DOE" in the margins. These revisions include:

- Table of Contents and Acronym List - revised for accuracy
- Executive Summary - revised to agree with the final Proposed Plan; neither of these use the bold italics
- Table 2-12 - revised the remediation value for lead in soil from 26 mg/kg (background) to 400 mg/kg (ARAR value); this value (provided under the Revised Interim Soil Lead Guidance for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sites and Resource Conservation and Recovery Act, 1976 (RCRA) Corrective Action Facilities) was overlooked. The approach for determining soil Preliminary Remediation

Levels (PRLs) includes selecting the lower of a risk-based Preliminary Remediation Goal (PRG) or a soil ARAR. A risk-based PRG could not be calculated for lead because an Environmental Protection Agency (EPA) reference dose was not available, so the PRL defaults to the ARAR value.
- Table 2-14 - changed the unit of measure for total uranium to mg/L
- Figure 2-15 - corrected the "Uranium PRLs" colored overlay; in the March 1995, FS it was the same as the "Other COCs" overlay.
- Table 4-11 - revised to agree with the final Proposed Plan
- Section 5.4 - revised text for Long-Term Effectiveness and Permanence discussions on pages 5-87, 5-120, and 5-147 for consistency with the final Proposed Plan
- Figure 6-2 - there were two designations for alternative case 4C-9; one was changed as appropriate to 4C-8.
- Figure B.1, Waste Management Flow Chart - revised for greater accuracy
- Table H.2-5 - corrected footnote "a" to reflect that the table denotes COCs that contribute 99 percent or more of the total ILCR and HI, rather than 95 percent.
- Section L.9.2.1 - corrected the text to agree with Figure L-9-3.

A new Volume 1 of the FS Report is being transmitted to both agencies under separate cover; this is the Administrative Record copy. All redlining, italics, comment numbers, and line numbering have been removed and the headers and figures have been changed to read Final. This duplicates the procedure followed with the Final Operable Unit 5 Remedial Investigation Report last March.

Included with this deliverable are responses to U.S. EPA comments on cost estimating in the draft FS Report (November, 1994) submitted to DOE-FN on May 4, 1995. Although most of the comments required no action, those that do will be addressed later in detailed design documents.

If you have any questions, please contact Robert Janke at (513) 648-3124 or Kathi Nickel at (513) 648-3166.

Sincerely,

Johnny Reising

for Jack R. Craig,
Fernald Remedial Action
Project Manager

FN:RJJanke

Enclosures: As Stated

cc w/enc:

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Volume 1:
EPA's Administrative Record
OEPA
FEMP's Administrative Record
DOE-FN (2 copies)
Operable Unit 5 file record storage copy

RESPONSES TO U.S. EPA COMMENTS ON THE NOVEMBER 1994 DRAFT OPERABLE UNIT 5 FS REPORT

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #: 1
Comment: The Component Cost Summary tables do not break out specific costs associated with treatment processes, drilling, well construction, and pump installation. These items should be broken out separately instead of being lumped into a broad construction category.
Response: The requested level of cost estimate detail is not consistent with the overall level of detail provided in Appendix K. The Component Cost Summary provides the construction costs of major cost elements consistent with the cost elements used for the risk budget and contingency analysis. Additional construction cost details are available in backup cost documentation which was not included in the FS in the interest of minimizing the size of the document.
Action: The requested level of cost estimate backup will be provided in detailed design documents for the Operable Unit 5 remedy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #: 2
Comment: The document states that each Great Miami Aquifer (GMA) extraction well will require its own separate control building. However, no rationale is provided as to why this is a requirement. A rationale for this requirement should be provided.
Response: Page L-9-8, Section L.9.2.3 of the Final Draft Operable Unit 5 Feasibility Study states, "A control building would be provided at each recovery well for power distribution and control circuitry." The control building would provide secure protection from the environment.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #: 3
Comment: The text provides no description of the drilling method to be used. It is recommended that drilling be completed using reverse circulation drilling methods. Use of reverse circulation would greatly reduce drilling cuttings containment costs.
Response: The Great Miami Aquifer Groundwater Extraction Component description is conceptual in nature and provided primarily for the purposes of cost estimating. The selection of a well drilling method is not consistent with the level of engineering detail provided in other component descriptions and component cost estimates. Well drilling methods will be determined during detailed design of the extraction system.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #: 4
Comment: The groundwater treatment system proposed appears to be very conservatively designed. The system specifies treatment processes for total suspended solids (TSS) and organics with high removal efficiencies, even though these contaminants appear in relatively low concentrations. It is unclear what benefit would be achieved by providing this level of treatment for TSS and organics. The only discharge limits specified in the documents reviewed are for total uranium and dissolved oxygen. The U.S. Department of Energy (DOE) should specify the anticipated influent concentrations of TSS and organics, treatment system operating requirements, and the effluent discharge concentration limits.

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Response: The groundwater treatment system description is conceptual in nature and provided primarily for the purposes of cost estimating. The conceptual engineering description is based upon available groundwater characterization data and conservative assumptions. The need for total suspended solids and organics removal and treatment system operating requirements will be verified during detailed design. Contaminant discharge limitations will be included in the Draft Operable Unit 5 Record of Decision, Section 9.1.5 and Table 9-4.

Action: None required.

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

Comment: The groundwater treatment system is proposed to be designed for a flow rate of 6,300 gallons per minute (gpm), which is the total weighted average of pumping from 4 separate recovery well systems. Since the project may be developed in stages, the recommendation is made to implement the treatment system in three 2,100-gpm modules. With this large design flow rate, it is important to allow for flexibility of operation, but not overdesign of the required treatment process. The modular approach appears reasonable, however, the influent water quality and level of treatment required should be considered carefully to avoid an overly conservative design.

Response: As stated in the Final Proposed Plan for Operable Unit 5, the preferred remedial alternative for groundwater is to extract uranium-contaminated groundwater at a maximum rate of 4000 gpm until the existing and proposed drinking water standards (20 ppb) for uranium are attained in the aquifer. Portions of the recovered groundwater exhibiting the highest uranium concentrations would be treated through an expansion of the existing AWWT facility. The expansion would entail the addition of water treatment capacity using available space within Building 51. The remaining portion of recovered groundwater would be discharged directly to the Great Miami River. The expanded treatment capacity would be sized to ensure that the uranium concentration in the effluent discharge to the Great Miami River would not exceed 20 ppb and the uranium mass discharged annually from the FEMP would not exceed 600 pounds. It is anticipated that the AWWT expansion will be constructed in one stage, depending upon the availability of funds.

Action: None required.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-8 Line #: 2 - 15
Original Specific Comment #: 1

Comment: The report provides limited specific well construction details. Each extraction well is to be constructed of 316 stainless steel casing and wire wrapped screen. Inasmuch as a significant cost savings could be recognized (possible up to 20 percent of the total well construction costs) if carbon steel casing were substituted for 316 stainless steel, a rationale for the need for stainless steel casing should be provided.

Response: The Great Miami Aquifer groundwater extraction system description is conceptual in nature and provided primarily for the purposes of cost estimating. Final selection of construction materials will be made during detailed design.

Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-8 Line #: 2 - 15
Original Specific Comment #: 2
Comment: The specifications state that each extraction well will be 16 inches in diameter. Increases in discharge (Q) are nominally affected by increase in well bore diameter. For example, doubling the diameter of a production well provides an increased Q of about 11 percent. If the proposed extraction wells are specified to be 16 inches in diameter solely to accommodate pumps, this is not necessary, as smaller diameter pumps are capable of delivering the required Q (see specific comment 3 below).
Response: The Great Miami Aquifer groundwater extraction system description is conceptual in nature and provided primarily for the purposes of cost estimating. Detailed well design will be based upon the results of ongoing pumping tests and estimates of required per well pumping rates.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-8 Line #: 17
Original Specific Comment #: 3
Comment: The text states that each well will be equipped with a 12-inch diameter, submersible pump. The text should provide a rationale as to why 12-inch diameter pumps are necessary. An 8-inch diameter, submersible, multi-stage pump is more than capable of delivering the required Q. Smaller diameter pumps would require smaller diameter wells, thus reducing materials and labor costs during construction.
However, a more important consideration is the initial use of submersible pumps. Both pumping efficiency and service life of submersible pumps compare unfavorably with line shaft pumps that have motors mounted at the well head.
Response: The Great Miami Aquifer groundwater extraction system description is conceptual in nature and provided primarily for the purposes of cost estimating. Detailed well design, including pump selection, will be based upon the results of ongoing pumping tests, groundwater remediation modeling, and hydraulic analysis of the groundwater piping network.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-8 Line #: 28 - 35
Original Specific Comment #: 4
Comment: The report discusses the required header piping for the GMA extraction system; however, no information regarding construction material, size, or total footage is provided. Hence, cost reasonableness cannot be evaluated. The text should be revised to include the omitted information.
Response: The Great Miami Aquifer extraction component description is conceptual in nature and provided primarily for use in cost estimating. Construction details, including material, size, and footage, are included in cost estimate backup documentation which was not included in the FS in the interest of minimizing the size of the document.
Action: The requested level of cost estimate backup will be provided in detailed design documents for the Operable Unit 5 remedy.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-9 Line #: NA
Original Specific Comment #: 5
Comment: Figure L-9-3 shows typical extraction well depths of 90 to 115 feet. However, the text states that the wells would have total depths of 100 to 160 feet (paragraph L.9.2.1). This discrepancy should be corrected.
Response: Agree. The text is in error. A corrected page L-9-8 will be provided as a change page as part of the package making the draft final FS the FINAL.

Action: The text will be revised to state, "Wells would be constructed using a 60-to 75-foot length of 16-inch outer diameter (OD) 316 stainless steel casing, and up to 40 feet of 16-inch OD stainless steel, wire-wrapped well screen. The total well depth will be 90 to 115 feet depending on contaminant plume depths."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix L Page #: L-9-10 Line #: NA
Original Specific Comment #: 6
Comment: Section L.9.4 discusses construction of monitoring wells. The specifications require 4-inch diameter, stainless steel well casings. The text should provide justification for 4-inch diameter monitoring wells and stainless steel casings rather than PVC casings.
Response: The Great Miami Aquifer Groundwater Extraction system description is conceptual in nature and provided primarily for the purposes of cost estimating. Detailed monitoring well design will be based upon the results of ongoing pumping tests.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix K Page #: K-3-41 Line #: NA
Original Specific Comment #: 7
Comment: The total cost shown is $40,033,500 for the 20-parts-per-billion (ppb) scenario. Using a conservative approach accounting for well construction; power consumption; and engineering design and specifications for the extraction wells, pumps, and installation, and monitoring wells, an estimated cost of $7,372,000 was delivered during the review. The following cost items were not accounted for: operations and maintenance of equipment and labor, piping, roadways, electrical controllers, and structures (other than extraction wells). It is unclear how the unaccounted-for cost items would total $32,661,500.
Response: The total cost for the 20 ppb Great Miami Aquifer extraction scenario as shown in the Draft Final Operable Unit 5 FS is $23,945,000. Of this total $7,216,900 is for construction, $8,070,662 is for operations and maintenance over 27 years, $1,271,945 is for post-remediation operations and maintenance (e.g., long-term groundwater monitoring and decontamination and demolition of the extraction system), $3,858,364 is for the risk budget, and $3,527,174 is for contingency.
Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix K Page #: K-3-42 Line #: NA
Original Specific Comment #: 8
Comment: The total cost shown for the 3-ppb cleanup scenario is $103,611,400. Accounting for the same cost items as in the above specific comment, a cost of $23,070,000 was derived during the review. The same cost items were unaccounted-for as in the above comment. It is unclear how the unaccounted-for cost items would total $80,541,400.
Response: The total cost for the 3 ppb Great Miami Aquifer Extraction scenario as shown in the Draft Final Operable Unit 5 FS is $103,611,400. Of this total; $8,112,959 is for construction, $60,530,538 is for operations and maintenance over 75 years, $1,316,926 is for post-remediation operations and maintenance (e.g., long-term groundwater monitoring and decontamination and demolition of the extraction system), $14,341,887 is for the risk budget, and $19,309,077 is for contingency.
Action: None required.

Commenting Organization: U.S. EPA
Commentor: Saric
Section #: Appendix L Page #: L-10-27
Line #: 7 - 23
Original Specific Comment #: 9

Comment: The proposed treatment system design included filtration of TSS and adsorption of organic compounds. Both treatment processes increase the cost of the treatment system and provide marginal benefit as described below.

Filtration: The document states that the filtration system would consist of multi-media filter vessels, followed by bag filters. This appears to be a high level of treatment for a small concentration of TSS (1 to 9 parts per million [ppm]). Possibly, the multi-media filters could be eliminated with the use of bag filters only. An explanation should be provided for the anticipated benefit of this level of treatment for TSS.

Adsorption: The document states that carbon adsorption units would be used to remove "possible organic contaminants," even though "currently available data does not indicate a significant concentration of organics." the high construction, operation, and disposal costs associated with the carbon adsorption units should be justified. No discharge limit for organics is presented, but the influent concentration is expected to be less than 10 ppb. the activated carbon would adsorb and remove some small amount of organics, which requires the activated carbon to be disposed of and not regenerated. If organics need to be removed, an alternative treatment process would be air stripping. The effluent aeration facility will provide some level of organics removal through volatilization of volatile organic compounds.

Response: The groundwater treatment system description is conceptual in nature and provided primarily for the purposes of cost estimating. The conceptual engineering description is based upon available and assumed groundwater characterization data. Due to the uncertainty involving groundwater characterization, conservatism was engineered into the treatment system description. Groundwater characterization, the need for total suspended solids and organics removal and treatment system operating requirements will be verified during detailed design.

Action: None required.

Commenting Organization: U.S. EPA
Commentor: Saric
Section #: Appendix K Page #: K-3-46
Line #: NA
Original Specific Comment #: 10

Comment: The sub-total construction costs of $33,294,063 for the 6,300-gpm system remediating to 20 ppb of uranium appears to be high, but it is difficult to compare costs without further breakout of project components. This overall cost results in a cost of approximately $3.7 per gallon per day of treatment capacity, which is 2 to 3 times the cost of conventional treatment plants. the sub-total remediation operations and maintenance (O&M) costs of $225,805,898 for 25 years results in a cost of $2.74 per 1,000 gallons treated, which is 3 to 5 times the cost of conventional treatment plants. Although the cost estimates on conventional treatment plants do not include the special handling of radioactive materials and associated disposal costs, additional information should be provided to document the higher construction and O&M costs.

Response: The 6300-gpm groundwater and wastewater treatment scenario was deleted from the Draft Final Operable Unit 5 FS. It was replaced with a 700-gpm groundwater and wastewater treatment scenario. It is important to note that the estimated construction and operations and management (O&M) costs include more than just the groundwater treatment system. Included are:

- Construction and O&M costs for the AWWT slurry dewatering facility
- O&M costs for the AWWT facility
- Construction and O&M costs for a 700-gpm expansion of the AWWT groundwater treatment capacity

More detailed cost data is included in the cost estimate backup documentation which was not included in the FS in the interest of minimizing the size of the document.

Action: The requested level of cost estimate backup will be provided in detailed design documents for the Operable Unit 5 remedy.

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