UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

May 2, 2014

4WD-FFB

Rachel Blumenfeld
United States Department of Energy
Portsmouth/Paducah Project Site Office
P.O. Box 1410
Paducah, Kentucky 42002

RE: **EPA Conditional Concurrence of the Five-Year Review of Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, KY (DOE/LX/07-1289&D2)**

Dear Ms. Blumenfeld,

The Environmental Protection Agency (EPA) has reviewed the *Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1289&D2).* EPA has additional comments on this D2 version of the Five-Year Review, which are enclosed. In accordance with the Federal Facility Agreement (FFA) Section X.X.I. Finalization of Documents, EPA is issuing a conditional concurrence on this Primary Document.

The condition which must be satisfied for EPA concurrence is for the Department of Energy (DOE) to revise this Primary Document as specified in EPA's comments [Enclosed]. The revised Five-Year Review (styled as a D2/R1), satisfying the condition set forth above, shall be submitted by the DOE on or before June 2, 2014 for EPA approval. EPA comments regarding the Primary Document that must be satisfied in subsequent documents are enclosed and specified accordingly.

If you have any questions or require additional information, please contact me at (404) 562-8513.

Sincerely,

Jennifer Tufts

Digitally signed by Jennifer Tufts
DN: cn=Jennifer Tufts, o=US EPA Region 4, ou=Federal Facilities Branch, email=tufts.jennifer@epa.gov, c=US
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Jennifer Tufts
Remedial Project Manager
Federal Facilities Branch

Five-Year Review for Remedial Actions as the Paducah Gaseous Diffusion Plant, Paducah, KY (DOE/LX/07-1289&D2)

General Comment

Several of DOE's responses to comments regarding the protectiveness determinations state, "There have been no substantive changes in EPA Guidance or site conditions since the 2008 Five-Year Review; therefore the protectiveness determinations should remain the same as in the approved 2008 Five-Year Review." However, there have been several EPA Office of Solid Waste and Emergency Response (OSWER) directives provided since the 2008 Five-Year Review including, *Recommended Evaluation of Institutional Controls: Supplement to the 'Comprehensive Five-Year Review Guidance'*, September 2011, OSWER Directive 9355.7-18; *Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews*, September 2012, OSWER Directive 9200.2-111; and *Assessing Protectiveness of Sites for Vapor Intrusion, Supplement to the "Comprehensive Five-Year Review Guidance"*, November 2012, OSWER Directive 9200.2-84. The guidance documents further clarify how five year reviews should be conducted and include recommended statements depending on the circumstances of the site. In addition, DOE was informed by EPA on several occasions since the 2008 Five-Year Review that EPA would undertake a more thorough review of the 2013 Five-Year Review than was done for past Five Year Review documents. Due to the aforementioned Five-Year-Review guidances and more thorough review of current protectiveness of each remedy (i.e. exposure assumptions, cleanup levels, and/or RAOs that may no longer be valid) EPA believes several protectiveness determinations should be modified to reflect current status of the remedy. The recommended modifications are stated below as conditions.

EPA Region 4 Conditional Concurrence is contingent on the following comments being addressed in the Five-Year Review Document:

1. The protectiveness determination for the Cylinder Drop Test Area (SWMU 91) is that it is protective (page xxiii). By implementing the Lasagna technology at SWMU 91 which was a source action for TCE, DOE achieved the RAO of 5.6 mg/kg average TCE soil concentration with an average soil concentration of 0.38 mg/kg and a maximum soil concentration of 4 mg/kg. Although the RAOs were met, the approach of establishing the point of exposure (POE) for human health to contaminated groundwater at the fence line is inconsistent with the current EPA approach of establishing the POE at the SWMU boundary. EPA recommends that DOE determine the TCE soil concentration that may be present in soils that would be protective of groundwater at the SWMU boundary. This approach was used at SWMU 1 to determine TCE concentrations that are protective of groundwater. Using the point of exposure at the fence line is not appropriate resulting in an RAO that is no longer valid. Although there is currently no exposure to groundwater, a soil cleanup level that is protective of groundwater must be calculated in order to be protective in the long-term.

Until a TCE soil cleanup level is determined that is protective of groundwater at the SWMU boundary, the protectiveness determination should be "protective in the short-term".

The Protectiveness Statement should be revised to: "The remedy for the Cylinder Drop Test Area is protective of human health and the environment in the short-term. Exposure pathways that could result in unacceptable risk are being controlled through DOE access controls. This project is not a final action and was not designed to return the areas to unrestricted use and unlimited exposure. In order for the remedy to be long-term protective, a TCE soil cleanup level that is protective of groundwater at the SWMU boundary should be determined and additional action as part of the CSOU should be evaluated. Such action could include selection and implementation of land use controls, and/or monitoring."

2. The protectiveness determination for C-400 Building (Bldg.) Interim Remedial Action which selected Electrical Resistance Heating (ERH) for treatment of the VOC source(s) is that it will be protective (page xxiv). EPA does not agree with the protectiveness determination. As stated on page 9-7, ERH technology was not successful in remediating the middle and lower RGA and treating/removing VOCs (namely TCE) to the maximum extent practical. The FFA parties are currently evaluating alternative remedies for the RGA that will be evaluated and documented in a separate FFS and ESD. Also, the nature and extent of TCE source(s) in the C-400 Bldg area has not been fully characterized, in particular in the area beneath the C-400 building.

Given that significant contaminant sources will remain post the ERH remedy completion, a successful RGA remedy has not been determined, and contamination has not been fully characterized below the C-400 Bldg, the protectiveness determination should be "protective in the short term". Although there is currently no exposure to groundwater, a remedy that successfully addresses TCE sources surrounding and below C-400 Bldg. must be implemented to be protective in the long-term.

The protectiveness statement should be revised to: "The IRA for the VOC contamination at C-400 Bldg. is protective of human health and the environment in the short-term. In the interim, LUCs for this action include property record notices and deed restrictions, administrative controls, and access controls. This action, in combination with other CERCLA response actions and existing controls (alternate water supply, monitoring, etc.), has adequately addressed known exposure pathways that could result in unacceptable risks originating from C-400. However, in order for the remedy to be protective in the long-term, a final remedy that successfully addresses VOC sources surrounding and below building C-400 must be implemented to ensure protectiveness."

3. The protectiveness determination for the Fire Training Area is that it is protective (page xxv). EPA does not agree with the protectiveness determination. As indicated on page 14-1 of the FYR Report, the 1998 ROD (DOE/OR/06-1470&D3) documented that the selected remedy was "no further action (outside of maintaining institutional controls)". It

is unclear how the ICs which include security fencing, prevention of unauthorized entry, and worker exposure are currently implemented and monitored. These access controls are likely being implemented outside of CERCLA as LUCs, and DOE has repeatedly resisted identifying such controls as CERCLA LUCs despite that they are being relied on for ensuring protectiveness. On page 14-3, the text states that "DOE remains in control of the property. . .therefore, the exposure assumptions used in the ROD remain valid". However, in the event that DOE is no longer in control of the property, the remedy would no longer be protective. Without additional and more robust LUCs that are a remedy component identified in a CERCLA decision document, the protectiveness determination should be "protective in the short term".

The protectiveness statement should be revised to: "The remedy for the Fire Training Area is protective of human health and the environment in the short-term. Exposure pathways that could result in unacceptable risk are being controlled. This project is not a final action and was not designed to return the areas to unrestricted use and unlimited exposure. In order for the remedy to be protective in the long-term, additional and more robust LUCs that are identified as a remedy component in a CERCLA decision document are needed to ensure protectiveness."

4. The protectiveness determination for the On-site Sediment Removal is that it is protective (page xxvi). EPA does not agree with the protectiveness determination. The RAOs were met which were to ensure that direct contact risk for the current industrial worker at the on-site ditches falls within the EPA risk range, and the direct contact risk for the current industrial worker and recreational user at the NSDD falls within EPA risk range. The risk to a future industrial worker has not been calculated and presented. Without a risk evaluation for future industrial uses or unrestricted uses, LUCs or additional action are warranted. According to page 16-5, engineering and temporary access controls were evaluated and discontinued, so long-term LUCs are not embodied in the CERCLA decision document. Until LUCs are identified as a remedy component in a CERCLA decision document or a LUCIP (approved by EPA) is in place, the protectiveness determination should be "protective in the short-term".

The protectiveness statement should be revised to: "The remedy for the Surface Water On-site Sediment Removal is protective of human health and the environment in the short-term due to excavation of contaminated sediment/soil and placement of clean soil to meet the cleanup goal; however, additional remedial actions under the SWOU need to be evaluated for long-term protectiveness."

5. The protectiveness determination for the C-749 Uranium Burial Ground, SWMU 2, is that it is protective (page xxvi). EPA does not agree with the protectiveness determination. The RAOs for the interim action were to mitigate migration of uranium and TCE and prevent disturbance or contact with buried waste which would be accomplished with a multilayered cap. The cap would have decreased the gamma direct exposure rate to background levels and further decreased the likelihood of onsite workers and animals to contact with buried wastes. The cap was not installed because it was determined that the buried waste was

saturated in groundwater. DOE has documented that there are several types of principal threat wastes in SWMU 2 that are sources to groundwater contamination and present a significant risk to human health should exposure occur. According to page 17-3, institutional controls that prevent inappropriate use of the property, and intrusive activities that could expose buried waste are being implemented through DOE ownership of the property as opposed to LUCs identified as a remedy component in a CERCLA Record of Decision. However, in the event that DOE is no longer in control of the property, the remedy would no longer be protective. No deed restriction has been filed or other durable LUCs have been implemented to ensure long-term protectiveness in the event containment is the final remedy selected for this burial ground. As stated on page 17-3, there is no LUCIP associated with a decision document. DOE has submitted a Draft FS to the FFA parties in order to develop and evaluate a final CERCLA remedial action for SWMU 2. Until the final remedy is selected, implemented and LUCs (if necessary) are identified in the ROD, the protectiveness determination should be "protective in the short term".

The protectiveness statement should be revised to: "The remedy for the C-749 Uranium Burial Ground is protective of human health and the environment in the short-term. Exposure pathways that could result in unacceptable risk are being controlled through DOE access controls. This earlier remedy is not a final remedial action and was not designed to fully address the risks to human health and the environment from the buried wastes nor return the areas to unrestricted use and/or unlimited exposure. The selected remedy for the C-749 Uranium Burial Ground was an interim action, and a final CERCLA action is planned under the BGOU decision documents to ensure long-term protectiveness."