



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
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September 26, 2016

Ms. Tracey Duncan  
Federal Facility Agreement Manager  
United States Department of Energy  
Portsmouth/Paducah Project Site Office  
5501 Hobbs Road  
Kevil, KY 42053

RE: EPA Non-concurrence: Milestone Modification Request for Submittal for the D1 Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building (PPPO-02-3751665-16) dated September 6, 2016. Paducah Gaseous Diffusion Plant, Paducah, Kentucky, EPA ID KY8890008982, McCracken County, KY

*References:*

1. Personal Communication from David Dollins (DOE-PGDP) to Julie Corkran (EPA Region 4). September 22, 2016. PGDP Weekly Groundwater Update Call. RE: Status of the development of the D1 Proposed Plan for Phase IIb.
2. Electronic mail correspondence from Tracey Duncan (DOE-PGDP) to Julie Corkran (EPA Region 4). September 16, 2016. *Milestone modification request for submittal of the D1 Revised Proposed Plan for the VOC Contamination at the C-400 Cleaning Building.*
3. Electronic mail correspondence from Julie Corkran (EPA Region 4) to Tracey Duncan (DOE-PGDP) and Brian Begley (KDEP). September 14, 2016. RE: *Milestone modification request for submittal of the D1 Revised Proposed Plan for the VOC Contamination at the C-400 Cleaning Building.*
4. EPA Extension Request: Comments on the D2 SMP for FY2016. September 14, 2016.
5. DOE-Environmental Management Consolidated Business Center. Final (July 21, 2016) and Draft (April 26, 2016) Requests for Proposal for the Paducah Deactivation and Remediation Contract. DE-SOL-0008746.
6. DOE –PGDP PowerPoint (June 2016): C-400 Remediation Strategy. Presentation by David Dollins, DOE-PGPD, June 30, 2016.
7. DOE-PPPO PowerPoint (June 2016): *Paducah Site Cleanup Priorities – FFA Senior Managers Discussion.* Presentation by Robert Edwards, DOE-PPPO, June 20, 2016.
8. EPA Approval: Treatability Study Report for the C-400 Interim Remedial Action Phase IIb Steam Injection Treatability Study at the Paducah Gaseous Diffusion Plant (DOE/LX/07-2202&D2). June 9, 2016.
9. DOE-PGDP: *SMP Prioritization* presentation and PGPD Site Lead Briefing to the FFA Managers. April 27-28, 2016.
10. DOE-PPPO: *Paducah Site Cleanup Priorities.* DOE-PPPO and EPA Superfund Division Director FFA Senior Managers Discussion, Atlanta, GA. April 21, 2016.

*References, continued:*

11. *Paducah Federal Facility Agreement – Resolution of U.S. Department of Energy Notification of Invocation of Informal Dispute on the Groundwater Operable Unit Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant* (DOE/LX/07-1263&D2), October 31, 2013.
12. DOE. *Record of Decision for the Volatile Organic Compound Contamination at the C-400 Cleaning Building* (DOE/OR/07-2150&D3), August 9, 2005.
13. DOE. *Proposed Remedial Action Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building* (DOE/OR/07-2144&D2), March 2004.
14. Correspondence from M. Stanislaus (EPA-OSWER) to I. Triay (DOE-EM). *Coordination on GPRA Measures*. July 12, 2010.
15. *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER Directive 9283.1-33*, June 26, 2009.

Dear Ms. Duncan,

The purpose of this letter is to respond to the Department of Energy's (DOE) request for a modification of the enforceable milestone date for submittal of the draft (D1) *Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Building*. The DOE's milestone modification request was made pursuant to Section XXIX – *Extensions-* of the Paducah Gaseous Diffusion Plant (PGDP) Federal Facility Agreement (FFA). The good cause cited by DOE for the milestone modification is Section XXIX (B) (6): *Any other event or series of events mutually agreed to by the Parties as constituting good cause*. The specific event or series of events identified by DOE is consideration by Senior Managers from EPA and the Kentucky Department for Environmental Protection (KDEP) of the Department of Energy (DOE)-Portsmouth/Paducah Project Office (PPPO) proposal (*Refs 6, 7, 9, 10*) for site-wide reprioritization of work at the Paducah Gaseous Diffusion Plant, including work to be performed under the Federal Facility Agreement and Site Management Plan (SMP). The DOE seeks to extend the current enforceable milestone date for submittal of the draft Proposed Plan by 120 days from September 27, 2016, to January 25, 2017.

**Background**

***Interim Remedial Actions to Address Principal Threat Sources at the C-400 Complex***

SWMUs 11 (C-400 Leak Site) and 533 (TCE Spill Site from TCE Unloading Operations at C-400) comprise the C-400 Action Subproject under the Groundwater Operable Unit in the PGDP SMP. Consistent with the requirements of the August 2005 *Record of Decision for the Volatile Organic Compound Contamination at the C-400 Cleaning Building* (*Ref 12*), the DOE has implemented a series of interim actions to address principal threat source material (PTSM) in the Upper Continental Recharge System (UCRS) and the Regional Gravel Aquifer (RGA) resulting from historical spills (SWMUs 11 and 533) south and southeast of the C-400 Building (*Refs 12, 13*). Phase I and Phase IIa response actions at SWMUs 11 and 533 have successfully mitigated TCE in the UCRS and the upper RGA. Phase IIb, the interim response action that is the subject of the current milestone modification request, is implementation of steam-enhanced extraction to address TCE PTSM in the lower RGA. In 2015, DOE conducted a Steam Treatability Study (TS) in the lower RGA that all three of the FFA

Parties agreed was highly successful. On May 27 and June 9, respectively, KDEP and EPA approved the TS Report. In the approval letter (*Ref 8*), EPA advised DOE that:

*“EPA supports moving forward with design and full-scale implementation of Steam Enhanced Extraction (SEE) at the Phase IIb area – with or without a complete understanding of the sub-surface contamination beneath the C-400 Building.”*

The FFA Parties have established an enforceable out-year milestone for the Interim Remedial Action Completion Report for all Subprojects (including the C-400 Action Subproject) in the Groundwater Operable Unit at PGDP: that date is September 30, 2032. Although undefined volatile organic compound sources contributing to the groundwater plumes at the PGDP may exist beneath the C-400 Building (and other facilities at the plant), that possibility does not obviate the need to address known, defined, sources of volatile organic compounds that are contributing to groundwater contamination. Continued timely cleanup of the defined Phase IIb PTSM, located up-gradient of the C-400 Building, through interim response actions is consistent with the expectations under CERCLA and the NCP that actions to address sources are necessary to prevent further migration of contamination. Interim responses are appropriate incremental actions to restore groundwater to beneficial use when they are compatible with, and enhance the long-term effectiveness of, any future final remedy, per EPA guidance (*Ref 15*). Timely implementation of the Phase IIb interim response action for PTSM in the lower RGA is consistent with a phased approach, as part of a larger integrated cleanup plan under the FFA, to reach the final cleanup decision for groundwater cleanup at the PGDP.

***The PGDP is “No” for the “Contaminated Groundwater under Control” Environmental Indicator under the Government Performance and Results Act***

The off-site plumes of groundwater contamination at the PGDP are reported to be the largest in the DOE Complex and the C-400 Complex (which includes the Phase IIb area) is the primary source of off-site TCE contamination (*Ref 6*). The PGDP is currently designated as “No” for the “Contaminated Groundwater Migration under Control” Environmental Indicator (EI) under the Government Performance and Results Act (*Ref 14*). The Phase IIb response action is just one action in a continuum of response actions that have already occurred, and will occur in the future, to address sources of contamination to groundwater and reach our joint goals of achieving “yes” for this GPR Act EI and a final cleanup decision for the Groundwater Operable Unit at this Superfund site. Delays in addressing known, fully characterized, volatile organic sources to the groundwater contamination are not consistent with the joint goals of the FFA Parties for restoration of groundwater at the PGDP Superfund site.

***The FFA Parties established the date for the D1 Proposed Plan in a 2013 Dispute Memorandum of Agreement***

In 2013, the DOE, KDEP and EPA negotiated and signed an Informal Dispute Memorandum of Agreement (MOA) for the Phase IIb Proposed Plan (*Ref 11*). The 2013 MOA established a trigger and time interval for setting the specific date on which the D1 Proposed Plan would be submitted to EPA and KDEP. The trigger identified in the MOA was EPA and KDEP approval of the Steam Treatability Study (TS) Report and the time interval within which DOE agreed to complete the D1 Proposed Plan for submittal was 120 days. EPA approved the TS report on June 9 (after KDEP), thus triggering the 120 time period for DOE to complete preparation of

the D1 Proposed Plan and establishing the enforceable milestone date of September 27, 2016, for submittal to EPA and KDEP. The milestone trigger and time interval are also established in the approved FY2015 SMP.

***EPA's expectations for timely submittal of the Phase IIb Proposed Plan were communicated on repeated occasions since June of 2016***

In addition to EPA's June 9 Treatability Study Report approval letter, EPA has communicated (verbally and in writing) our expectations that DOE would meet the enforceable milestone date of September 27 for submittal of the Phase IIb Proposed Plan and continue activities in the near-term to address PTSM at the PGDP. These expectations have been communicated by the Superfund Division Director and FFA Manager during DOE presentations of the PPPO reprioritization proposal (*Refs 6, 7, 9, 10*) and by the FFA Manager during weekly Groundwater Project calls and monthly FFA Manager Meetings. EPA also reminded DOE of the enforceable milestone date in our D2 SMP extension letter (*Ref 4*).

***DOE-PPPO's Site Cleanup Priorities Proposal Delays Mitigation of Principal Threat Source Material at Spill Sites up-gradient of the C-400 Building by at least 10 years***

The DOE milestone modification letter requests a 120 day delay for submittal of the D1 Proposed Plan for Phase IIb. However, in an alternative proposal to EPA and KDEP, DOE has proposed to delay cleanup of Phase IIb PTSM in the RGA by at least 10 years.

In April and June of 2016, the DOE presented a proposal to EPA Region 4 to reprioritize site cleanup priorities, schedules, and milestones under the tri-party FFA. The DOE proposal pushes out the enforceable milestone dates for completing cleanup activities at this National Priorities List Superfund site beyond 2032 (*Refs 7, 9*). In the proposal, DOE focuses anticipated future (level) funding and contractual effort over the next ten years on activities other than FFA environmental cleanup. DOE has identified activities such as accelerated deactivation activities (e.g., C-400, Freon removal from Uranium Enrichment Process Buildings, TC-99 Removal Study), infrastructure optimization, and clean parcel property transfers as some of their (non-FFA) priorities at the PGDP over the next ten years (*Refs 5, 7, 9*).

In exchange for delaying previously agreed upon FFA cleanup schedules and milestones, the DOE offers a conceptual proposal to focus over the next ten years on conducting a Remedial Investigation (RI) for the C-400 Complex, including potential contamination that may exist beneath the C-400 Building slab. The "Complex" is defined in the PPPO proposal and DOE procurement documentation as all areas bounded by: Virginia Avenue to the north, 11<sup>th</sup> Street to the east, 10<sup>th</sup> Street to the west, and Tennessee Avenue to the south. The proposal for C-400 Complex Final Action includes "integration" of the Phase IIb scope of work (a small defined area up-gradient and to the southeast of the C-400 building footprint) into the final cleanup of the larger C-400 Complex. However, the DOE proposal does not forecast a tentative Remedial Action Field Start for the final cleanup (including Phase IIb) until the 2025 timeframe (*Refs 6, 7*). A map illustrating the relationship between the C-400 Complex, the C-400 Building, and the Phase IIb area, is attached (*Enclosure 1*).

The DOE proposes to “accelerate” a final source action for the C-400 Complex (Refs 6, 7). The SMP approved by EPA and KDEP and currently in effect for cleanup activities is the FY2015 SMP. This SMP does not include a schedule with deadlines and milestones for completing the CERCLA investigation, remedy selection, and cleanup activities for the C-400 Complex and sub-slab contamination. Nor does the approved FY2015 SMP address demolition of C-400 Complex as a removal action, as required by the FFA, to achieve a final cleanup. All of this work is “new” scope that DOE is proposing to add to a future SMP with schedules and milestones (*Ref 7*) as a substitute for continuing progress on existing work scope, schedules, and milestones for most priorities in the current FY2015 SMP.

EPA does not view a 10+ year delay in the response action to address TCE PTSM in the Phase IIb area (up-gradient of the C-400 Building) as an “acceleration” of cleanup. Also, EPA does not agree that this delay is appropriate or necessary to support tri-party negotiation of an investigation and cleanup schedule for the C-400 Building Complex for incorporation into a future SMP. DOE’s proposed delay is not consistent with the PGDP FFA Section III. Purposes of Agreement. B.11. “*Expedite the remediation process to the extent necessary to protect human health and the environment.*”

***DOE submitted the modification request 21 days prior to the enforceable milestone date***

DOE submitted the milestone modification request to EPA and KDEP on September 6, 2016. In the milestone modification request, received just 21 days prior to the September 27 document due date, DOE asserts that they will need time to prepare the D1 Proposed Plan once feedback is received from the FFA Senior Managers on the DOE-PPPO reprioritization proposal. Specifically, DOE requests a 120 day extension citing as “good cause” the desire to receive feedback from the October 12, 2016, FFA Senior Managers meeting to discuss the DOE reprioritization proposal on a path forward for the C-400 Complex.

- Normal FFA schedule logic in the PGPD SMP establishes a generic time interval of 45 days between approval of the Feasibility Study and submittal of the D1 Proposed Plan.
- The 120 day timeframe negotiated in the 2013 MOA submittal for development and submittal of the D1 Proposed Plan is generous at more than 2.5 times the normal FFA schedule logic of 45 days.

Therefore, it is not clear why DOE would need 240 total days (120 days afforded by the 2013 MOA and SMP + 120 additional days afforded under a milestone modification request), which is over five (5) times the normal FFA schedule logic, to complete and submit this work product in support of sustained cleanup progress at the PGPD.

***DOE declined an EPA proposal to consider a shorter milestone extension***

In response to DOE’s identification of the need for feedback from the October 12 meeting in order to complete and submit the D1 PP as “good cause” for the milestone extension request, EPA asked DOE on September 14 to consider a shorter milestone extension period (to October 26) that provided DOE two weeks beyond the forthcoming FFA Senior Managers Meeting (October 12) to finalize the document for distribution to the regulatory agencies (*Ref 3*). EPA’s proposal was predicated on the assumption that DOE had been working in good faith since KDEP and EPA approval of the

Treatability Study to draft and submit the D1 Proposed Plan with the intent to comply with the enforceable milestone date.

On September 16, DOE declined EPA's proposal, stating that: *"The team does not believe a shorter extension would give us sufficient time to implement all the actions necessary to submit a quality document, assuming a decision is made on October 12 to move forward with Phase IIb."* (Ref 2). The DOE Project Manager for the C-400 Project subsequently confirmed to EPA and KDEP on September 22 that DOE had never "turned on" the contractor to develop the D1 Proposed Plan (Ref 1). A reasonable person would conclude from this series of events that DOE's current request to move the D1 Proposed Plan milestone from September 27, 2016, to January 25, 2017, has not been submitted to EPA and KDEP in good faith.

### ***Phase IIb Scope of Work is not included in the Final RFP for the 2017-2027 PGDP D&R Contract***

The Draft Request for Proposal (RFP) and Performance Work Statement (PWS) for the follow-on Deactivation and Remediation (D&R) contract at the PGDP (Ref 5) was published on April 28, 2016. The period of performance for the new D&R contract is 2017-2027. The draft PWS explicitly included the Phase IIb TCE interim response action scope of work (Enclosure 2), stating:

*The Contractor shall perform all activities to complete the ongoing remediation of the C-400 sources (Phase IIb), including but not limited to: a) Design, construction, testing, and operation of the treatment system; b) Sampling and analyses necessary to operate and demonstrate effectiveness of the treatment; c) Shutdown and removal of the treatment system (including any components remaining in place from Phase IIa); d) Development and submittal of all regulatory documents and reports; e) Demobilization; f) Site restoration; and g) 100% compliant waste disposal.*

EPA also reviewed the Final RFP and PWS that was published on July 21 (Ref 5). Despite EPA's communication to DOE that near-term cleanup of Phase IIb TCE PTSM is an EPA priority, the Final PWS states:

*The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation, including any sampling and analysis plans necessary to complete the investigation and reach a final remediation Record of Decision (ROD) addressing all COCs instead of an Interim ROD addressing only the TCE contamination.*

The Final PWS does not include any CERCLA decision documentation, or CERCLA documentation for implementation of Phase IIb steam enhanced extraction, through the 2027 period of performance (Enclosure 3). DOE's intent not to continue with remediation of Phase IIb TCE PTSM is clear from the July 2016 PWS. A reasonable person would conclude from this series of events that DOE has not operated in good faith regarding the September 6, 2016, Milestone Modification Request to move submittal of the D1 Proposed Plan by 120 days to January of 2017.

### **Non-concurrence on the Milestone Modification Request**

The FFA Parties did not achieve an approved Site Management Plan (SMP) update for Fiscal Year (FY) 2016. Pending EPA and KDEP approval of a revised SMP, the FY 2015 SMP approved by

EPA and KDEP remains in effect [FFA Section XVIII (A) - *Site Management, Timetables and Deadlines, Budget Planning and Execution, Cost and Productivity Savings*]. The FY2015 SMP includes the enforceable milestone for the Phase IIb D1 Proposed Plan triggered by EPA and KDEP approval of the Treatability Study Report.

Section XX(G)(1) - *Review/Comment on Draft/Final Documents* - of the FFA establishes the requirement for DOE to complete and transmit each D1 Primary Document to EPA and KDEP on or before the corresponding deadline in the Site Management Plan.

Section XXIX(A) - *Extensions* – provides a mechanism for extending an enforceable milestone, stating: *Either a timetable and deadline or a schedule including schedules within a Work Plan, shall be extended upon receipt of a timely request for extension and when good cause exists for the requested extension.*

If DOE never authorized the contractor to develop the D1 Proposed Plan (*Ref 1*) despite the enforceable milestone date being triggered on June 9, then it is not clear why DOE waited until three weeks before the deadline to submit a milestone modification request. EPA understood that DOE was working in good faith to meet the milestone until the DOE Project Manager advised during the September 1 weekly Groundwater Project call that DOE might seek an extension. While a DOE assertion that the September 6 milestone modification request meets the definition of “timely” in Section XXIX might be sustained, DOE’s actions do not meet the spirit of “timely” in support of three-party communication and cooperation to ensure that response actions are expedited with a minimum of delay to protect human health and welfare and the environment, and to provide for effective public participation, per FFA Section III – *Purposes of Agreement*. In retrospect, a reasonable person might conclude that early notification by DOE in July or August of DOE’s need for a milestone modification to produce a quality document was not necessary as it appears that DOE never intended to submit the D1 Proposed Plan for Phase IIb, as evidenced from the events presented in the *Background* section of this letter.

The EPA does not agree with DOE’s assertion that “*evaluation of DOE’s site cleanup priorities proposal*” constitutes good cause to extend by 120 days the enforceable milestone date for the D1 revised Proposal Plan. EPA advised DOE on many occasions, since introduction by DOE-PPPO in April of this year of the DOE site cleanup priorities proposal, that delay of the Phase IIb D1 Proposed Plan was not acceptable. Timely mitigation of volatile organic compound sources to the massive groundwater plumes at the PGPD, including sources up-gradient of and beneath C-400 and other known or suspected major groundwater sources (e.g., SWMUs 211A and 211B, certain Burial Grounds), is necessary to ensure sustained progress towards a final cleanup decision for the Groundwater Operable Unit at the PGDP Superfund Site. Specifically, the interim response actions to address TCE PTSM up-gradient of the C-400 Building implemented to date, and the additional interim action that is the subject of this letter to address PTSM in the RGA in the Phase IIb area, are consistent with the NCP and EPA guidance (*Ref 15*), and the PGDP Groundwater Strategy to utilize a phased approach to groundwater investigation and remediation.

Therefore, the EPA does not concur on DOE’s proposed 120 day milestone modification for the D1 Proposed Plan for Phase IIb interim action to address volatile organic compound (TCE) principal threat source material in the Regional Gravel Aquifer from spill sites up-gradient of

the C-400 Cleaning Building. If DOE has prepared a D1 Proposed Plan for Phase IIb, DOE should submit that Primary Document deliverable to the EPA and the KDEP by the enforceable milestone date of September 27, 2016. If you have any questions about this correspondence, please do not hesitate to contact me at (404) 562-8547 or via electronic mail at [corkran.julie@epa.gov](mailto:corkran.julie@epa.gov).

Sincerely,



Julie L. Corkran, Ph.D.  
Federal Facility Agreement Manager  
Superfund Division

*Enclosures*

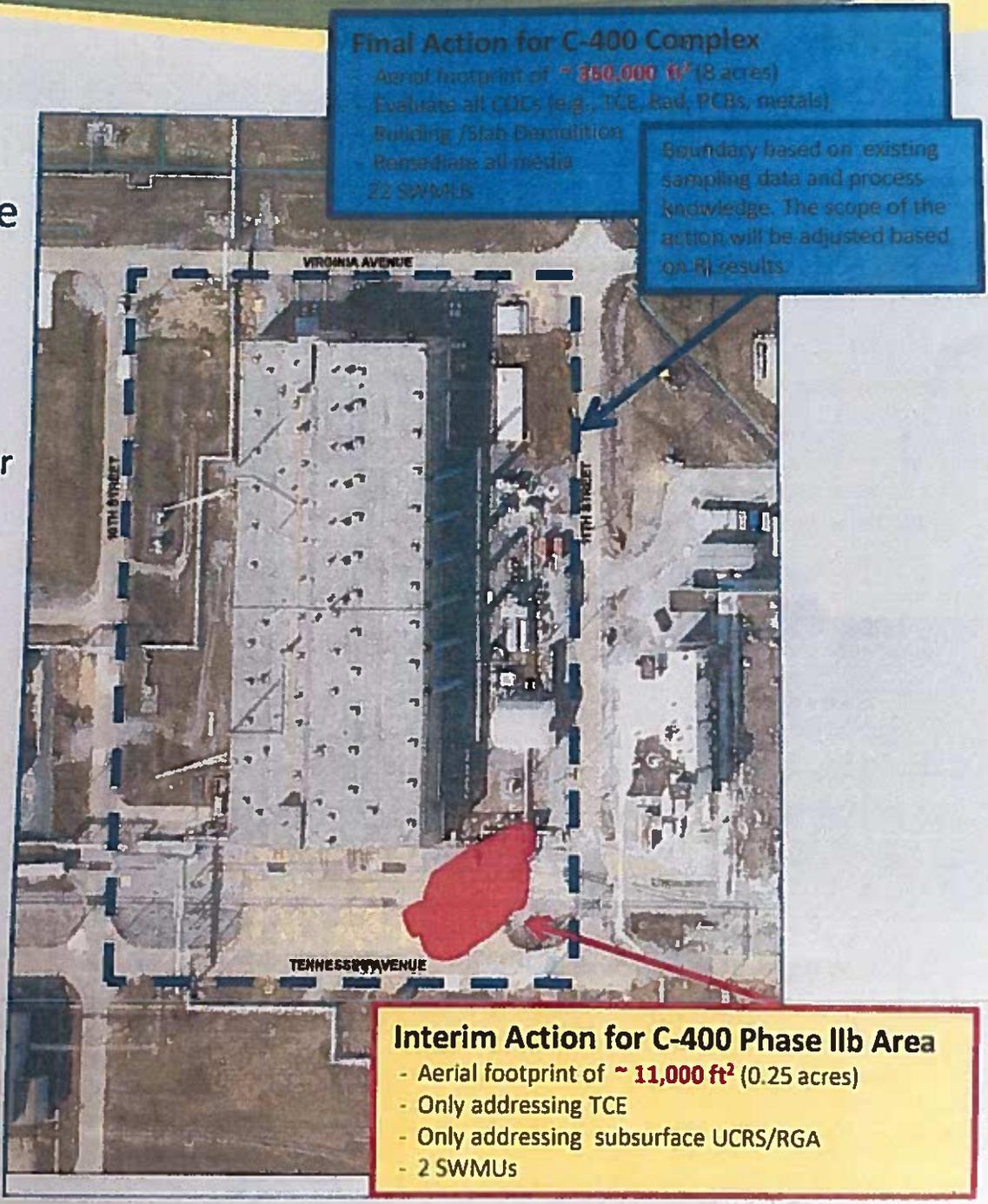
- 1: Context Maps of the Phase IIb Area*
- 2: Draft RPF: Phase IIb scope of work excerpt*
- 3: Final RPF: C-400 Complex scope of work excerpt*

Electronic copy:

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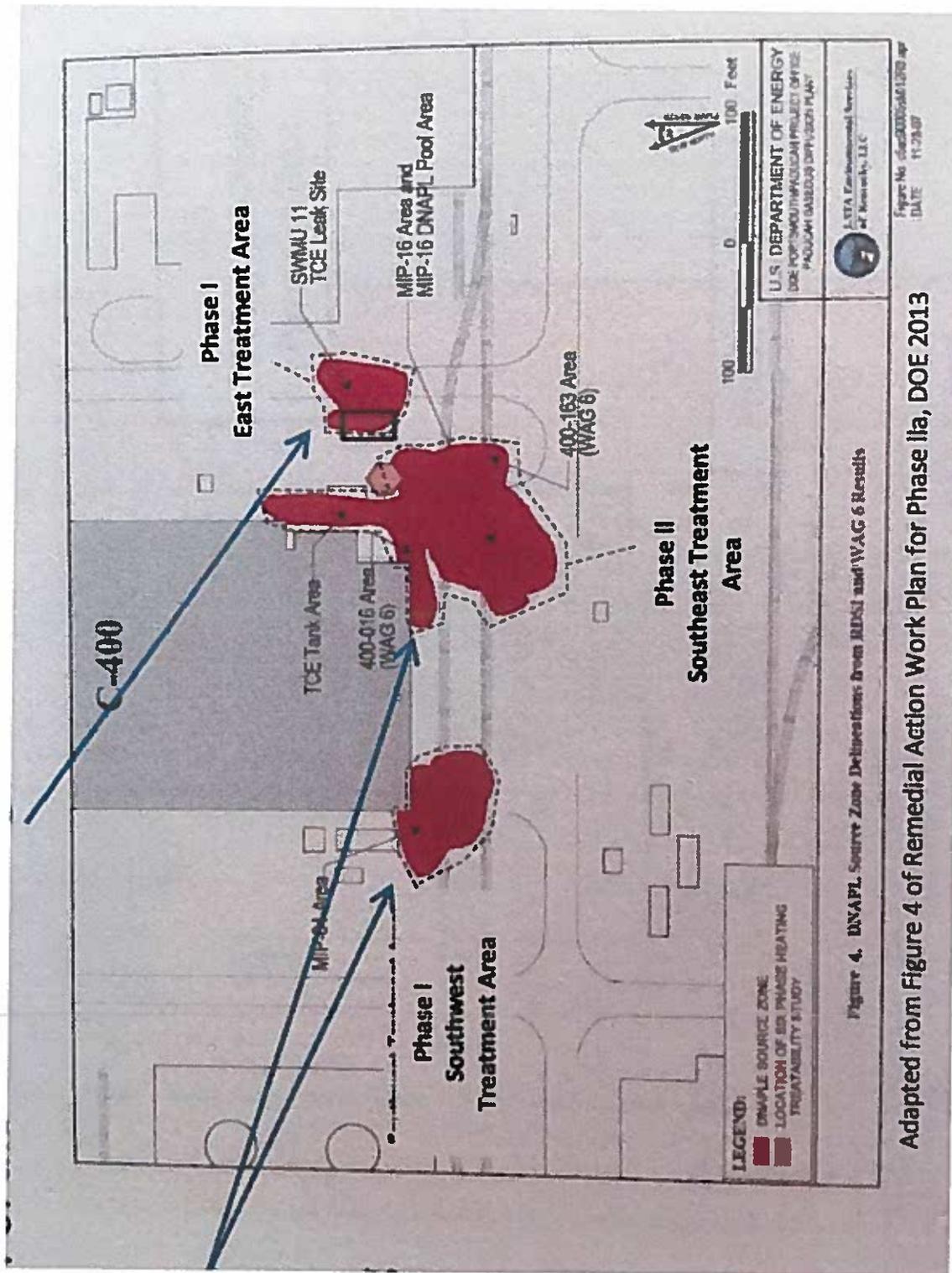
**Enclosure 1: Context Maps of the Phase IIb Area**

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Aerial Photograph (ESRI 2016), as adapted to illustrate Phase IIb Source Area (2016)

Dashed blue line: C-400 Complex.



Adapted from Figure 4 of Remedial Action Work Plan for Phase IIa, DOE 2013

Phases I, IIa and IIb up-gradient of the C-400 Building. Note: The figure illustrates the footprint of the completed Phase IIa cleanup of TCE in the UCRS, not the Phase IIb lower RGA target zone for steam enhanced extraction of TCE PTSM.

**Enclosure 2: Draft RFP for PGPD Solicitation DE-SOL-0008746  
Phase IIb Scope of Work Excerpt  
April 26, 2016**

<b>Table C.2.EM.PA.0040.A005.02.DR.02-2 SWMUs 211 A Remediation Milestones/Schedule</b>	
<b>Milestone</b>	<b>Date</b>
60% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
90% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
DI Remedial Action Work Plan for SWMU 211A	Consistent with the SMP and the approved CPB
Field Start for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
DI Post Construction Report	Consistent with the SMP and the approved CPB
DI Operation and Maintenance Plan	Consistent with the SMP and the approved CPB
Complete waste disposition for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
DI Remedial Action Completion Report(s) for SWMU 211A	Consistent with the SMP and the approved CPB

**EM.PA.0040.A005.03.DR C-400 SOURCE REMEDIATION**

TCE was discovered in residential wells north of the Paducah Site in 1988. The Administrative Consent Order site investigation delineated two off-site groundwater contamination plumes, referred to as the Northwest and Northeast Plumes, and identified several potential on and off-site source areas requiring additional investigation and action. An additional on-site plume has been found to the southwest of the Paducah site. In addition, a series of Remedial Investigation/Feasibility Studies (RI/FS) were conducted under the FFA, including the evaluation of all potential major contaminant sources impacting groundwater and surface water. The project continues to evaluate ongoing potential sources of contamination. In accordance with these investigations, DOE implemented interim actions that focused on reducing potential risks associated with off-site contamination.

The Southwest and Northwest Plumes all have TCE and <sup>99</sup>Tc contaminants. The Northeast Plume has TCE contamination. A preliminary study has been completed on the viability of utilizing natural attenuation as a final remedy. The preliminary study showed that aerobic degradation is occurring in the Regional Gravel Aquifer.

**EM.PA.0040.A005.03.DR.01 C-400 Phase IIb**

The C-400 Cleaning Building has historically been found to be a major source of TCE in the Northwest and Northeast Plumes. TCE and other related Volatile Organic Compounds (VOC) have been found in the vadose zone from the surface down to the water table. Concentrations of TCE up to 11,055,000 µg/kg in the soil have been found. Concentrations of TCE in groundwater in the C-400 area have been recorded as high as 1,400,000 ppb. Significant quantities of TCE have been released to the environment.

An interim Record of Decision selecting Electrical Resistance Heating (ERH) was signed in August 2005. Additionally, a Remedial Design Support Investigation

(RDSI) was completed in August 2006 further defining the location of TCE Dense Non-Aqueous Phase Liquid (DNAPL) source material near C-400. Additional remedial actions may be necessary to complete removal of TCE sources. This may include utilization of other technologies and the development and submittal of additional CERCLA documents.

The C-400 IRA will be completed in two Phases. Phase I focused on two treatment areas; one on the southwest corner of the C-400 area and one in 11<sup>th</sup> Street east of C-400. Phase II focuses on a treatment area in the southeast corner of the C-400 area. As a result of lessons learned during Phase I operations, specifically the inability to adequately heat the deep RGA, Phase II was further divided into two sub-phases; Phase IIa and Phase IIb. Phase IIa utilized electrical resistance heating (ERH) in the Upper Continental Recharge System (UCRS) and upper Regional Gravel Aquifer (RGA). The target depth of treatment for ERH in Phase IIa was 20 to 60 feet below ground surface (bgs). Phase IIb is to use an alternate treatment method approved by the FFA parties through appropriate CERCLA documentation for approximately 55 to 95 feet bgs. Phase I and Phase IIa are complete.

In 2015, DOE completed a treatability study for implementation of steam treatment in the Phase IIb region. Utilizing the results of the Treatability Study, a revision to the ROD to select Steam Treatment for the Phase IIb region has been completed. The Contractor shall complete all applicable CERCLA documentation for Phase IIb, including the 30%, 60%, 90%, CFC design packages, the RAWP, a post construction report, and a RACR. The RACR shall include the results of all phases of the C-400 source remediation activities (Phase I, Phase IIa, and Phase IIb). The initial deliverables submitted to DOE shall be of sufficient quality, depth, thoroughness, and format to support DOE approval.

The Contractor shall perform all activities to complete the ongoing remediation of the C-400 sources (Phase IIb), including but not limited to:

- a) Design, construction, testing, and operation of the treatment system;
- b) Sampling and analyses necessary to operate and demonstrate effectiveness of the treatment;
- c) Shutdown and removal of the treatment system (including any components remaining in place from Phase IIa);
- d) Development and submittal of all regulatory documents and reports;
- e) Demobilization;
- f) Site restoration; and
- g) 100% compliant waste disposal.

All wastes excavated or generated during this project and all site restoration and demobilization activities shall be completed prior to submitting the DI RACR to the regulatory agencies. All wastes excavated or generated up to 90 days prior to the end of the Contract must be disposed of prior to the end of the period of performance.

As a result of the successful completion of the active treatment of the C-400 Groundwater Sources (Phase I, Phase IIa, and Phase IIb) the Contractor shall perform long-term monitoring of the source areas for one year under the project and then incorporate additional years of monitoring into the Paducah Site EMP. All data shall be included in the FFA Semi-annual Report and the CERCLA 5 Year Site Review.

<b>Table C.2.EM.PA.0040.A005.03.DR.01-1 C-400 Phase IIb Requirements Documents</b>	
<b>Document Number</b>	<b>Title</b>
DOE/OR/07-2150&D2/R2	Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, July 2005
DOE/OR/07-2151&D2/R2	Land Use Control Implementation Plan: Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, February 2008
DOE/LX/07-1260&D1	Technical Performance Evaluation for Phase I of the C-400 Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, August 2011
DOE/LX/07-1294&D2	Treatability Study Work Plan for Steam Injection, Groundwater Operable Unit, at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, February 2014
DOE/LX/07-1295&D2/R1	Treatability Study Design, Design Drawings and Technical Specifications Package for the C-400 Interim Remedial Action Phase IIb Steam Injection Treatability Study at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, July 2014
DOE/LX/07-2202&D1	Treatability Study Report for the C-400 Interim Remedial Action Phase IIb Steam Injection Treatability Study, December 2015

<b>Table C.2.EM.PA.0040.A005.03.DR.01-1 C-400 Phase IIb Milestones/Schedule</b>	
<b>Milestone</b>	<b>Date</b>
30% Design Package	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
60% Design Package	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
90% Design Package	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 RAWP	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.

Table C.2.EM.PA.0040.A005.03.DR.01-1 C-400 Phase IIb Milestones/Schedule	
Milestone	Date
Begin field construction (actual field work does not include mobilization)	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 RACR	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.

**EM.PA.0040.A005.10.DR.01 C-400 Building Subsurface Groundwater Source Remediation**

The Contractor shall complete an investigation, including any and all sampling, to determine the nature and extent of any TCE contamination that might extend beneath the C-400 Cleaning Building, beyond the currently known TCE or other contaminants source areas around C-400. The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation, including any sampling and analysis plans necessary to complete the investigation. The Contractor shall work to gain DOE and regulatory agency approval of the CERCLA documentation, including the results of the investigation. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation (e.g., revised or new Proposed Plans, Records of Decision, Explanations of Significant Differences, Design Packages, Remedial Design Work Plans, Remedial Action Work Plans, etc. necessary to complete remediation of any TCE contamination that extends beneath the C-400 Cleaning Building. The Contractor shall work to gain DOE and regulatory agency approval of the applicable CERCLA documentation.

The Contractor shall complete the remediation of TCE contamination that extends beneath the C-400 Cleaning Building, beyond the currently known TCE source areas around C-400 while the C-400 Building is still in place. The Contractor shall maximize the synergies associated with the implementation of the C-400 Phase IIb Remediation (see Section C.2 EM.PA.0040.A005.03.DR.01) utilizing existing equipment and systems where possible. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

Table C.2.EM.PA.0040.A005.10.DR.01-1 C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE INVESTIGATION Milestones/Schedule	
Milestone	Date
C-400 Subsurface Investigation Report	2 years after completion of Transition
Modify necessary CERCLA documentation to support Remediation of C-400 subsurface TCE contamination	4 years after completion of Transition

**Enclosure 3: Final RFP for PGPD Solicitation DE-SOL-0008746  
C-400 Complex Scope of Work Excerpt  
July 21, 2016**

<b>Table C.2.EM.PA.0040.A005.02.DR.02-1 SWMUs 211 A&amp;B Remediation Requirements Documents</b>	
<b>Document Number</b>	<b>Title</b>
DOE/LX/07-1268&D2/R2/A1	Addendum to the Remedial Design Work Plan for Solid Waste Management Units 1, 211-A, and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Sampling and Analysis Plan, February 2015
DOE/LX/07-1288&D2/A1	Addendum to Final Characterization Report for Solid Waste Management Units 211-A and 211-B Volatile Organic Compound for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, December 2015
PPPO-02-3287657-16	Final Characterization Notification for Solid Waste Management Unit 211-A and Solid Waste Management Unit 211-B at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, December 17, 2015

<b>Table C.2.EM.PA.0040.A005.02.DR.02-2 SWMUs 211 A Remediation Milestones/Schedule</b>	
<b>Milestone</b>	<b>Date</b>
D1 Remedial Design Work Plan for SWMU 211A	Consistent with the SMP and the approved CPB
30% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
60% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
90% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
D1 Remedial Action Work Plan for SWMU 211A	Consistent with the SMP and the approved CPB
Field Start for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
D1 Post Construction Report	Consistent with the SMP and the approved CPB
D1 Operation and Maintenance Plan	Consistent with the SMP and the approved CPB
Complete waste disposition for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
D1 Remedial Action Completion Report(s) for SWMU 211A	Consistent with the SMP and the approved CPB

**EM.PA.0040.A005.10.DR C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE REMEDIATION**

**EM.PA.0040.A005.10.DR.01 C-400 Building Subsurface Groundwater Source Remediation**

The C-400 Cleaning Building has historically been found to be a major source of TCE in the Northwest and Northeast Plumes. TCE and other related Volatile Organic Compounds (VOC) as well as <sup>99</sup>Tc have been found in the vadose zone from the surface down to the water table. Now that the facility has been returned to DOE, all of the

contaminants of concern (COCs) in the soils surrounding and underneath the buildings and groundwater need to be determined. The C-400 Complex is being defined as the area bounded by the streets Virginia Avenue to the north, 11<sup>th</sup> Street to the east, 10<sup>th</sup> Street to the west, and Tennessee Avenue to the south.

The Contractor shall complete a full investigation of the C-400 Complex, including any and all regulator documents and sampling, to determine the nature and extent of all COCs in the groundwater, soils surrounding the buildings, and beneath the buildings. The investigation includes all slabs, soils, and groundwater within the area specified above (C-400 Complex). The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation, including any sampling and analysis plans necessary to complete the investigation and reach a final remediation Record of Decision (ROD) addressing all COCs instead of an Interim ROD addressing only the TCE contamination. The Contractor shall work to gain DOE and regulatory agency approval of the CERCLA documentation, including the results of the investigation. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation (e.g., Remedial Investigation/Feasibility Study (RI/FS) Work Plan, RI/FS, Proposed Plan, Records of Decision, Design Packages, Remedial Design Work Plans, Remedial Action Work Plans, etc. necessary to complete remediation within the C-400 Complex, which would include any contamination that extends beneath the C-400 Cleaning Building. The Contractor shall work to gain DOE and regulatory agency approval of the applicable CERCLA documentation. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

Upon completion of the remediation, the Contractor shall prepare the Remedial Action Completion Report (RACR). The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

<b>Table C.2.EM.PA.0040.A005.10.DR.01-1</b>	
<b>C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE INVESTIGATION</b>	
<b>Milestones/Schedule</b>	
<b>Milestone</b>	<b>Date</b>
D1 C-400 Complex RI/FS Work Plan	Within 6 months after completion of Transition
Begin field RI activities	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 RI/FS	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.

<b>Table C.2.EM.PA.0040.A005.10.DR.01-1</b>	
<b>C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE INVESTIGATION</b>	
<b>Milestones/Schedule</b>	
<b>Milestone</b>	<b>Date</b>
D1 Proposed Plan	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Record of Decision	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Remedial Action Work Plan	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
Complete the remediation of COC contamination throughout the C-400 Complex including contamination that extends beneath the C-400 Cleaning Building.	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP
D1 RACR	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.

#### EM.PA.0040.A008.41.DR SURVEILLANCE AND MAINTENANCE

##### EM.PA.0040.A008.41.DR.01 Surveillance and Maintenance of Facilities

The Contractor shall perform routine surveillance and maintenance of all DOE-owned facilities assigned to the Paducah D&R Contractor in FIMS and identified in Section J, Attachment J-18. The Contractor shall perform all S&M activities associated with these facilities through the end of the Contract. While not an all-inclusive list, examples of S&M activities are: system monitoring, routine inspections, calibrations, certifications, corrective maintenance, facility repairs necessary to maintain the integrity of the facility, combustible removal, cleanup of spills/leaks, control of loose contamination and airborne particles, isolation of utilities, etc.

Additionally, the Contractor shall minimize the size/footprint of occupied facilities to the greatest extent practical. The goal of this action is to reduce utility and S&M costs and maximize productivity of personnel. The Contractor shall submit annually a Site Facility Occupational Status Report that documents which facilities are occupied and the plans associated with the unoccupied. The report shall include a plan and schedule to reduce the number of occupied facilities by 20% over the life of the contract while meeting all PWS requirements and tasks. A facility shall be considered occupied, consistent with DOE Orders and the Life Safety Code (NFPA-101), if the facility is occupied by personnel on a regular basis (more than just making rounds or walk-throughs of the facility). If operations are performed in a facility, it shall be considered occupied. The Contractor shall implement that plan to the extent