DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER

6 Oct 17

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Mr. Angeles Herrera
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Ms. Tina LePage
Waste Programs Division
Arizona Department of Environmental Quality
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Phoenix, AZ 85007

Subject: Former Williams Air Force Base, ST012 Liquid Fuels Storage Area Path Forward (Your Letter, 21 Sep 17)

Dear Ms. Herrera and Ms. LePage,

Thank you for your 21 September 2017 letter on the ST012 Revised Draft Final Remedial Design and Remedial Action Work Plan. We are encouraged with your understanding, "*that the Air Force wants to initiate EBR as described in the 2017 RD/RA Work Plan to begin addressing subsurface contamination at the site and to obtain data on which to base future contracts*". The Air Force's primary objective is to gain remedial progress while collecting the data needed to optimize remedy implementation and meet the ST012 cleanup goal timeframe. It is also an indication of our progress during informal dispute that the EPA and ADEQ are willing to support, albeit with qualification, the Air Force's proposal to proceed with EBR.

Three attachments are provided to this letter in support of our response: Attachment 1 – Response to Elements Requested for Work Plan, Attachment 2 – Air Force Corrections to Agency Statements Made in 21 September 2017 Letter, and Attachment 3 – Revisions to Final Work Plan Based on September 2017 Agency Comment Letters.

The Air Force agrees with your statements that EBR will be useful to degrade dissolved contamination at the site and acknowledges there are technical uncertainties. However, given the Air Force commitment to iterative phased implementation and assessment of remedial progress, we do not agree with any further continuation of the 18-month delay in the remedy. We believe the best approach to achieving the remedial objectives is through advancing remedy implementation and continuing to use the additive information to resolve the technical uncertainties, thus benefitting remedial progress.

The primary purpose of the EBR remedy component is to address the dissolved contaminants, such as benzene, that are the subject of the site's remedial action objectives. Determining the effectiveness of EBR in addressing the dissolved contamination, and advancing the understanding of the relationship of the dissolved contamination with remaining LNAPL, will be achieved by proceeding with the Work Plan. This progress and associated additive information will enlighten all of us on the necessary actions to achieve the remedial action objectives to which the Air Force is committed.

Your letter states that the Agencies have repeatedly raised concerns over the last two years, but we regret that you state this has been to no avail. The Air Force has gone through great effort in implementing additional site characterization, monitoring and data collection efforts, documenting and discussing technical concerns and considerations, providing iterations of the revised Work Plan, and delaying remedy implementation at the Agencies' request. We believe it is time to proceed with the remedy.

Our preference is to proceed in a constructive and cooperative manner with an orientation towards action while maintaining protection of human health and the environment. We may both have concerns in this regard and should be careful to manage our efforts accordingly. To indicate, as stated in your letter, that the SEE system was not of sufficient design is to diminish our prior cooperative efforts and agreements on the implementation of a highly aggressive and innovative technology. SEE implementation greatly benefitted cleanup of the site as a result of our cooperative efforts. However, by mutual agreement, SEE was considered too problematic for implementation in certain areas where LNAPL was known to exist, areas where now the Agencies are using LNAPL presence as an indicator of insufficient design or characterization, e.g., under Sossaman Road and on adjacent properties. For the large-scale SEE implementation effort completed at the site, these areas posed unacceptable safety risks and would have resulted in significant interruptions of property usage. The Air Force has consistently committed to examine these areas during EBR remedy implementation. The need for future optimized or alternate remedial action in these or other recalcitrant areas will be evaluated and, if appropriate, implemented in coordination with EPA and ADEQ.

As indicated above, the Air Force concludes proceeding with EBR implementation without further delay is the most beneficial path for remedial progress at ST012. We do not believe the indication of formal dispute in your letter is the best use of our mutual resources nor the best path forward for advancement of the ST012 remedy. Prior to future technical discussions or any further consideration of elevating the dispute, the Air Force requests a conference call between Dr. TerMaath, Ms. Malone and Mr. Manzanilla within the next 7-10 days to discuss the overall path forward at site ST012. Of course, I remain available to both of you for additional information or discussion.

Sincerely,

PHILIP H. MOOK, JR., P.E.
Chief, Western Execution Branch

cc:
Dr. Steve TerMaath
Administrative Record File

Attachments
1. Response to Elements Requested for Work Plan
2. AF Corrections to Agency Statements, 21 Sep 17 Ltr
3. Revisions to Final Work Plan Based on Sep 2017 Agency Comment Ltrs

Attachment 1
Response to Elements Requested for Work Plan, your 21 Sep 17 letter

The Air Force technical team reviewed the request for incorporation of elements into the Revised Draft Final Addendum 2. The major consideration in our response is the critical need to continue remediation of the site without further delay. Site conditions support proceeding with the remedy agreed upon by our three agencies.

1. Site Characterization
1a. Site Characterization
AF Response – The Site is characterized sufficiently in all three zones to support remedy implementation and site monitoring. Additional data (e.g., COC content of the LNAPL) will be collected during implementation and considered for remedy optimization.

1b. EBR Baseline Data
AF Response – An additional round of baseline sampling is included in the EBR work plan. Preliminary results of re-baseline samples will be made available prior to EBR implementation, with formal reporting to follow.

2. Plan for Evaluation of Remedy Performance
2a. Use a predictive model with defensible input parameters
AF Response – RD/RAWP Appendix E provides predictive evaluations of EBR performance based on a NAPL mass that exceeds the current mass estimate and based on reasonable assumptions of enhanced bioremediation performance. Actual implementation will provide additional data to confirm or modify assumptions and future model runs will have input from actual site data to evaluate remedy performance.

2b. Estimates for Time of Remediation must be provided for all 3 zones
AF Response – RD/RAWP Appendix E includes modeling in all three zones. Further evaluation will be completed once data from actual EBR is generated.

2c. Specific Milestones must be developed from predictive modeling
AF Response - Milestones are included in the Revised Draft Final Addendum 2 and Decision Tree (Appendix J). Additional modelling is not necessary to support implementation. Future model runs will have input from actual site data to evaluate remedy performance and time of remediation.

2d. Field Tests required and have not been conducted
AF Response - An EBR Field Test was conducted using two single well tracer tests (push pull tests) to evaluate appropriate delivery and dosing for EBR under the anaerobic scenario. The rationale for conducting both tests in LSZ wells was included in the EBR Field Test Plan and the results are included in the Revised Draft Final Addendum 2. Degradation rates in all three zones will be calculated based on actual site data during EBR implementation. It is not warranted to delay the remedy for further field tests.

3. Plan for monitoring
3a. Each of the 32 treatment ovals must have a monitoring well
AF Response – Extraction wells are suitable for monitoring once sulfate is distributed and extraction terminates. Therefore, sufficient monitoring points currently exist.

3b. Measure sulfate in monitoring wells and compare to model predictions
AF Response – Sulfate will be monitored and compared to model predictions in order to achieve the desired distribution.

3c. Measure COCs in groundwater and LNAPL. Conduct borings for LNAPL analysis if LNAPL not recoverable.
AF Response – COCs will be measured in groundwater and NAPL (if available). A robust data set exists based on SEE, Phase 1 and Phase 2 well installations. Additional borings to monitor COC content in soil may be considered following future EBR phases.

4. Containment for long term protectiveness using recirculation
AF Response – Plume containment is an objective of the Revised Draft Final Addendum 2, however, it will be established through a combination of initial hydraulic containment and establishment of EBR at the plume perimeters. Initial EBR injections will occur in upgradient and cross gradient locations to gather EBR data (including hydraulic and analytical parameters) that will be evaluated to assess and modify, if necessary, plume containment during perimeter downgradient injections. Data to date do not show any indication of contaminant migration. Sections 3.2.3 and 4.2.6 of Revised Draft Final Addendum 2 acknowledge the potential for recirculation, if necessary, based on actual site operational data.

Attachment 2
Air Force Corrections to Agency Statements Made in 21 September 2017 Letter

Several inaccurate statements are included in the 21 September 2017 letter. Corrections to these statements have previously been issued in Air Force correspondence and BRAC Cleanup Team Meetings yet they continue to be perpetuated. The following table provides a list of the misstatements and a record of the previous Air Force responses.

9/21/2017 EPA/ADEQ STATEMENT	AF response	Location of AF Response
Estimates of time of remediation that exceed a century	AF non-concurs. EPA/ADEQ calculations for this time of remediation scenario were based on a series of ultra-conservative inputs not representative of EBR.	AF Review of 22 May 2017 Praxis Environmental Technologies, Inc. memorandum dated 16 Aug 2017
Draft Proposed Plan Statement on SEE removing most of the LNAPL. It was a common understanding of the team and reflected in the RDRAWP.	This statement is not in the FFS, Final Proposed Plan, RODA or RD/RAWP. It was not reflected in the RD/RAWP transition criteria.	FFS, Final PP, RODA, RD/RAWP, July 2016 AF presentation to ADEQ/EPA and subsequent AF correspondence
Transition Criteria had not been attained	AF attained transition criteria, and transition accomplishments presented from late 2015 through Spring 2016.	March 2016 BCT presentation, AF presentations and correspondence April 2016-September 2017
Benzene concentrations of 270,000 ug/L recently	This was discussed and corrected in BCT conference calls and in AF RTCs.	RTC to EPA comments on FVM 4 issued correction to the results for well LSZ51. The actual result was 3,600 ug/L. The draft Third Quarter 2016 Report presents the correct 3,600 ug/L value.
100-500 ug/L transition criteria for EBR to meet the RODA timeframe.	5,500 ug/L is identified as the transition criteria for starting EBR. 100-500 ug/l is the criteria for transition directly to MNA, i.e., MNA can meet the RODA time frame.	Final RD/RAWP (for basis of 100-500 ug/L criterion). 5,500 ug/L identified in November 2015 through May 2016 BCT presentation (based on RD/RAWP model).
10% of peak criteria not attained, vapor at 25% (3000 lb/day), thousands of gallons of LNAPL	12% of peak was achieved and it was demonstrated that contamination from outside TTZ was contributing. The 10% criterion was noted in RD/RAWP to be subject to evaluation for appropriateness (such as evaluation of contribution from outside TTZ). The established criterion is for total mass. Individual criteria for LNAPL and vapor do not exist in the RD/RAWP.	March 2016 BCT presentation. January through March 2016 Performance Report. Final RD/RAWP.

9/21/2017 EPA/ADEQ STATEMENT	AF response	Location of AF Response
94.5% of targeted amount of steam injected	Concur-However, site had reached target steam temperatures in all zones in the TTZ. Therefore, additional steam injection not required. Steam injected was a guideline to be considered and not a full transition criterion. During RD/RAWP review, EPA commented amount of steam injection was not to be considered as a criterion during RD/RAWP review.	March 2016 BCT presentation, AF presentations and correspondence April 2016-September 2017. Final RD/RAWP, Response to Comments
Site is incompletely characterized	Site is adequately characterized and conditions are favorable for starting EBR.	February 2017 BCT presentation. The data presented in Feb 2017 from additional characterization supports the decision to implement EBR.
Nine million pounds of LNAPL remain	AF has recalculated the mass estimate based on SEE operation mass removal, and site data April 2016-July 2017. Mass estimate is 449,086 gallons (2,950,498 pounds) and within the range of 483,000 gallons (3,173,310 pound) specified in the RD/RAWP for treatment by EBR.	Revised Draft Final EBR Work Plan (Appendix A)
Work Plan does not establish criteria for evaluating remedy success or determining whether alternate remedial action is warranted.	Criteria for evaluating remedy success or determining whether alternate remedial action is warranted is included in the work plan and in the Decision Tree.	Revised Draft Final EBR Work Plan (Appendix J, Decision Boxes: Transition Criteria Achieved? and Degradation Trends Support Transition Criteria can be Achieved in a Reasonable Timeframe or can be Further Optimized)

Attachment 3
Revisions to Final Work Plan Based on September 2017 Agency Comment Letters

The September 2017 comments on Addendum 2 submitted by ADEQ and EPA are being carefully considered. The Final Addendum 2 will include the revisions listed below. During implementation, further adjustments and modifications will be considered based on the Decision Matrix and/or resolution of technical issues as the remedy progresses, and when adopted documented in Plan Addenda and Field Work Variances.

We acknowledge that many technical issues require attention during remedy implementation but are concerned with iterative generation of new comments and perpetuation of errors or misstatements that have been previously corrected. A group of EPA comments on the Revised Draft Final Addendum 2 were on report sections/appendices that have not changed since the draft and draft final versions, yet multiple new comments were generated. These new comments on previously reviewed sections are not constructive or warranted. Many of the remaining September 2017 comments have been previously discussed and AF responses have been provided. The AF acknowledges the differences of opinion between our agencies on technical interpretation, yet these differences do not justify further delay of remedy implementation. Proceeding with implementation, collecting/evaluating actual site data and advancing site cleanup is much more beneficial than continuing the theoretical scientific analysis and debate. This approach is consistent with the July 2017 EPA Superfund Task Force Recommendations goals: provide recommendations on an expedited timeframe on how the agency can restructure the cleanup process, realign incentives of all involved parties to promote expeditious remediation, reduce the burden on cooperating parties, incentivize parties to remediate sites, encourage private investment in cleanups and sites and promote the revitalization of properties across the country.

Revisions to be incorporated in Final Addendum 2

1. Add TPH to Table 5-1 for groundwater/perimeter wells and edit Section 4.2.6 to TPH (EPA general comment 1n).
2. Change maximum sulfate concentration from 320 mg/L to 160 mg/L to address potential solubility limits at colder temperatures (EPA Comment 5a). Increase injection durations as necessary to deliver the same mass.
3. Revise wording that EBR system would be left in-place in standby while MNA is evaluated (EPA comment 7).
4. Clean up QAPP discrepancies noted in EPA comment 15.
5. Fix terminology of equipment on Figure 3-1 to match the text (EPA comment 11).
6. Fix tense of wording (EPA comment 16).
7. Update notes on Table 5-1 (EPA comment 17).
8. Correct crosswalk (EPA comment 31).
9. Fix reference (EPA comment 34).
10. Reword sentence (ADEQ comment 1).
11. Revise wording (ADEQ comment 5c.)
12. Revise wording (ADEQ comment 6).
13. Revise wording (ADEQ comment 13).
14. Correct Table 5-1 to include additional wells on figures (ADEQ comment 15c).
15. Update Section 5.4 (ADEQ comment 20).
16. Make change requested in ADEQ comment 21.
17. Add note to figures (ADEQ comment 22).
18. Reword decision matrix (ADEQ comment 23a).