Department of Energy
Idaho Operations Office
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November 30, 2005

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SUBJECT: Request to Extend the Enforceable Milestone for Submitting the Draft V-Tanks Remedial Design/Remedial Action Work Plan, Addendum 3 for Phase 2 Treatment of V-Tank Contents (FMDP-RFDP-05-132)

Dear Mr. Ceto and Mr. Koch:

This letter requests a good cause extension to the December 31, 2005, enforceable milestone for submittal of the contingent draft Remedial Design/Remedial Action Work Plan (RD/RAWP) Addendum 3 for V-Tanks Phase 2 Treatment. This milestone was originally identified in Section 6 of the Remedial Design/Remedial Action Scope of Work for the V-Tanks (TSF-09 and TSF-18, DOE/ID-11119, Revision 0, September 2004) and subsequently extended by the Agencies based on good cause in March 2005 (DOE-ID letter of February 24, 2005, EPA letter of February 28, 2005, DEQ letter of March 1, 2005). This extension request is being prepared pursuant to Part 13 of the Federal Facilities Agreement/Consent Order (FFA/CO) and is the direct result of recent events associated with the Granular Activated Carbon (GAC) fire at the V-Tank treatment facility. A corrective action plan and recovery schedule have been prepared to re-start this project and collect the necessary data to determine whether additional treatment would be required, necessitating preparation of the Phase 2 RD/RAWP Addendum. Based upon project status, the requested extension date for this milestone is May 31, 2006.

As you are aware, a fire occurred in the GAC unit of the V-Tank treatment system on August 30, 2005. This fire did not cause a release of radioactivity or personnel injury; however, it did cause a concern over the safe operation of the entire project and specifically, the air emissions control system. As a result, a management review was performed and a corrective action plan developed to implement the necessary design changes and controls to safely complete the project. Based upon this review, it was recommended that the off-gas emissions be operationally controlled according to RCRA Subpart AA, 40 CFR 264.1032(a)(1), to a limit of 3 lbs/hr rather

than using GAC treatment. Therefore, we appreciate the Agencies willingness to allow this alternative for off-gas control.

Efforts have been implemented to accelerate the air sparging and waste sampling activities, but these activities cannot be completed in time to support the December 31, 2005, milestone (see enclosed recovery schedule – Enclosure 1). In addition to the air emissions control, we are also addressing other design and safety issues, such as pump failures and seal leaks, that occurred during waste transfer operations. These design changes will be provided to the Agencies in a revision to the RD/RAWP as discussed during the weekly Waste Area Group 1 conference call.

Given this delay, data to determine whether the additional Phase 2 waste treatment is required, will not be available in time to support preparing a deliverable to meet the existing milestone. An engineering evaluation was performed using the available data and concluded that the planned treatment method of air sparging is, with a high probability of success, expected to be sufficient to treat the contaminants to the specified treatment standards. A summary of this engineering evaluation is included as Enclosure 2. Until sample data is available from the treated waste, however, a definitive decision cannot be made on whether preparation of the Phase 2 RD/RAWP Addendum and the additional Phase 2 treatment are necessary.

We are committed to safely completing the V-Tank project as quickly as possible and regret the delays caused by the fire. We request that the original logic be maintained that will allow time for waste treatment and sampling prior to determining whether additional treatment is necessary. Towards this, we are submitting this good cause extension request to adjust the Phase 2 RD/RAWP Addendum milestone to May 31, 2006.

We appreciate your timely attention to this matter. If you have any questions, please contact me at (208) 526-5793.

Sincerely,

Nolan Jensen, FFA/CO Project Manager
Idaho Cleanup Project

Enclosures

Enclosure 1

V-Tanks Remediation Recovery Schedule

Complete V-Tank Waste Treatment

- Complete Treatment System Reconfiguration and Implementation of Corrective Actions – December 19, 2005
- Complete Management Review for Operational Startup – January 3, 2006
- Complete Waste Treatment (Air Sparge and Homogenize Waste for Sampling) – January 31 2006

Treatment Verification

- Complete Waste Sampling – February 1, 2006
- Complete Sample Analysis – February 28, 2006
- Complete Sample Validation – March 24, 2006
- Agency Data Reviews – March 27 - 29, 2006
- Complete Agency Conference Call – March 30, 2006
    - Document Concurrence that the Phase 1 Treatment is Complete and Waste is RCRA Non-Characteristic

Remedial Design / Remedial Action Work Plan Addendum 3 (if necessary)

- Submit Draft RD/RA WP Addendum 3 for Phase 2 Treatment – May 31, 2006

Enclosure 2

Engineering Evaluation Summary
Effectiveness of Air Sparging on the V-Tank Waste

This white paper describes the expected effectiveness of air sparging on the consolidated V-tank wastes for meeting the required Land Disposal Restriction (LDR) F001 and F005 treatment standards. Based upon existing data, only trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,1,1-trichloroethane (TCA) require treatment. Following treatment, the waste will be sampled to verify compliance with LDR standards and confirm that the waste passes the TCLP characteristic test for eleven organic constituents as documented in EDF-4885.

Details associated with meeting the LDR treatment standards and the characteristic toxicity evaluations are provided below. If air sparging is ineffective in meeting LDR treatment standards or the consolidated waste fails the TCLP characteristic test, then further treatment of the waste will be necessary following preparation of the Phase 2 work plan.

F001 and F005 LDR Treatment Standard

Table 1 provides the estimated contaminant concentrations for the constituents specified in the OU 1-10 ROD Amendment that are required to meet the LDR F001 and F005 treatment standards. As shown in bold, only TCE, PCE, and TCA are above their respective treatment standards. Since these contaminants are volatile organic compounds (VOCs), air sparging is the appropriate technology and should be successful in treating the waste to meet LDR standards according to their relative volatilities, Henry's Law constants, and solid-liquid partition coefficients (see Table 2).

Table 1. Listed Contaminant Concentrations in V-Tank Waste, vs. Treatment Standards.

Listed Contaminant	Consolidated V-Tank Concentration (mg/kg)	Treatment Standard Listing (mg/kg)
Toluene	6.5	10
TCE	**451**	6.0
PCE	**118**	6.0
TCA	**64.3**	6.0
Carbon Tetrachloride	3.17	6.0
Methylene Chloride	6.74	30
1,1,2-Trichloro-1,2,2-Trifluoroethane	NA*	30
Trichloromonofluoromethane	NA*	30

- Fluorinated hydrocarbons that were not originally evaluated, as part of the V-tank analyses, but are assumed to be at trace contaminant levels, due to process history

Table 2. Properties of the Volatile Organic COCs Supporting Removal via Air Sparging

COC	Boiling Point (°C)	Vapor Pressure @ 20°C (mm Hg)	Henry's Law Constant @ 25°C (L-atm/mol)	Solid-Liquid Partition Coefficient K_D @ 25°C (L/kg)
TCE	86.7	60	10.3	10.4
PCE	120.8	13	17.4	29.1
TCA	74.1	100	17.3	14.9

EDF-4956 evaluated the estimated contaminant release rates for each of these VOCs at an air-sparging rate of 40 standard cubic feet per minute (scfm). The calculations conservatively assumed that the relative contaminant concentrations in the solid, liquid, and gas phases would remain in equilibrium, based upon the solid-liquid partition coefficient and the Henry's Law constants. The solid-liquid partition coefficient controls the equilibrium between the VOCs in the sludge and the water. This will probably be the limiting function in overall process efficiency. The target goal was to reduce TCE, PCE, and TCA to less than 6 mg/kg, which was calculated to be achieved in less than the 45 hours of treatment (see Figure 1).

Re-evaluation of the historical data suggests higher initial concentrations of these VOCs in the consolidated V-tank waste than originally estimated. However, these higher concentrations are not expected to dramatically change the outcome and may only add a few hours to the overall treatment process. In fact, as discussed below, off-gas monitoring data suggests that over 50% of the VOCs have already been released during waste transfer operations.

Site-specific testing of air sparging to remove PCE from V-tank wastes has been confirmed on several occasions. In the first occasion, liquefied waste samples for the V-14 tank (a PM-2A tank containing solidified waste from the V-tanks having approximately 45-50 ppm PCE) were effectively sparged in the laboratory (<0.5 ppb) in less than 25 hrs (EDF-5558). On this basis, a full-scale air-sparging treatment process was conducted on the V-14 tank containing approximately 80,000 lbs of liquefied radioactive waste with 60-100 ppm PCE. This waste was successfully air sparged to meet LDR treatment standards for PCE in less than 100 hrs of treatment (see EDF-6097). Volatilized VOCs were captured on GAC and are awaiting transport to an off-site disposal facility. These treatment processes demonstrated the effectiveness of air sparging for PCE. Although these treatments only demonstrate the effectiveness of air sparging for PCE, the evaluation is considered conservative due to the relatively high K_D for PCE as opposed to that for TCE and TCA (see Table 2).

Further evidence of the effectiveness of sparging (including TCE) is provided by the off-gas data from the initial V-tank contents removal and consolidation efforts. These data showed approximately 50% of the expected TCE, PCE, and TCA being released to the GAC off-gas control system during waste transfer and recirculation operations (per EDF-6187). This GAC is awaiting transport to an off-site disposal facility.

Based upon this information, it is believed that Phase 1 treatment will be successful in volatilizing sufficient TCE, TCA, and PCE to meet the LDR treatment standards. Success of the treatment is largely dependent upon the length of time the waste is sparged, which can be continued until acceptable results are achieved. Emissions during treatment will be controlled in accordance with RCRA Subpart AA (40 CFR 264.1032(a)(1). Operational controls will be used to limit VOC emissions to less than 3 lbs/hr. These controls will be based upon the use of off-gas monitoring (photo-ionization detection), flowmeter, relative humidity measurement, and temperature measurement. A Fourier Transform Infrared (FTIR) Spectrometer will be utilized to confirm VOC emission levels.

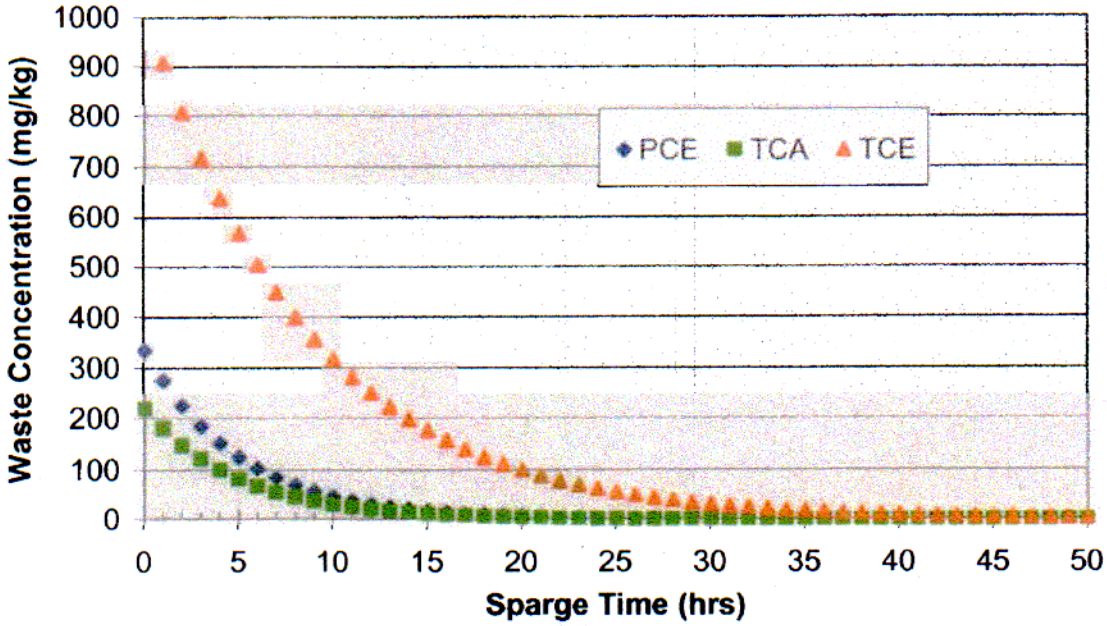

Figure 1. Projected VOC Concentrations in the V-Tank Waste During 40 scfm Air Sparging.

Characteristic Testing

The original evaluation of the V-tanks waste was complicated by the high concentrations of TCE and oil in the sludge, resulting in exceptionally high laboratory-reported detection levels (RDLs) for four VOCs and seven SVOCs that led to an inconclusive evaluation of the waste's characteristic potential. The data was re-evaluated in EDF-4885 using laboratory-supplied statistically derived and conservatively estimated Method Detection Limits (MDLs), along with historical information to develop revised concentration estimates for these eleven constituents. The re-evaluation determined that none of the constituents were present in sufficient concentrations to fail the TCLP test and that the waste should be considered non-characteristic.

Upon completion of the Phase 1 treatment, the waste will be sampled and re-analyzed to confirm that the waste passes the TCLP characteristic criteria. Removal of the high concentrations of TCE, PCE, and TCA will dramatically increase the ability of the analytical laboratory to provide data that will conclusively demonstrate that the waste passes the TCLP characteristic test. In addition, arrangement with the contracted laboratory have been put in place to be prepared to utilize higher resolution methods, if necessary, to obtain the data necessary to provide a definitive determination of whether this waste is characteristic. Depending upon these results, further treatment of the waste could be necessary and would be described in the Phase 2 work plan.

Conclusion

It is expected that air sparging alone will sufficiently treat the VOC's (i.e., TCE, TCA, and PCE) and meet the LDR standards for F001 and F005. The theoretical basis for air sparging of these contaminants has been confirmed on three different occasions on the actual V-tank waste (including the V-14 tank waste which contained V-tank waste). As previously discussed with the agencies and documented in EDF-4855, the waste is also not expected to be a characteristic waste. Therefore, further development of the RD/RAWP Addendum 3 for Phase 2 chemical oxidation treatment is not recommended to proceed until after Phase 1 air sparging is complete and sampling confirms whether additional treatment is necessary.

REFERENCES

Ashworth, Samuel C., and Darryl A. Lopez. November 2004. **Design for VOC Control for the TSF-09/18 V-Tank Remedial Action**. EDF-4956, Idaho National Laboratory, Idaho Falls, ID 83415.

Ashworth, Samuel C. May 2005. **Tank V-14 Air Stripping**. EDF-5558, Idaho National Laboratory, Idaho Falls, ID 83415.

Ashworth, Samuel C. November 20005. **V-Tank Off-Gas GAC Adsorption Unit Analysis**. EDF-6187, Idaho National Laboratory, Idaho Falls, ID 83415.

Farnsworth, Richard K. August 2004. **Reevaluation of Characteristic Toxicity Designation for V-Tank Waste, Using Existing Sample Data**. EDF-4885, Idaho National Laboratory, Idaho Falls, ID 83415.

Tyson, David R. September 2005. **Projected Waste Profile Data for Treated Tank V-14 Waste.** EDF-6097, Idaho National Laboratory, Idaho Falls, ID 83415.