3-409.4

832

Department of Energy

Ohio Field Office
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155

MAR 19 1997

DOE-0672-97

Mr. Thomas J. Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Schneider,

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT RESPONSE TO FEBRUARY 4, 1997, OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE TECHNOLOGY SPECIFIC WORK PLAN FOR THE ORGANIC EXTRACTION PROJECT- REVISION 0.0

This letter transmits the U.S. Department of Energy, Fernald Environmental Management Project's (DOE-FEMP) responses to comments contained in Ohio Environmental Protection Agency's (OEPA) February 4, 1997 letter, which granted conditional approval of the Technology Specific Work Plan (TSWP) for the Organic Extraction Project. A copy of the comment response document and revised TSWP pages are provided as enclosures. Upon completing review of these comment responses, DOE-FEMP requests that the OEPA provide written concurrence of approval of the revised TSWP and attached comment response document.

Please contact Robert Danner at (513) 638-3167 if you wish to discuss any aspects of the comment responses or modifications to the TSWP.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Danner

Enclosure: As Stated

1

cc w/enc:

S. Fauver, EM-42/GTN
P. Harris, OEPA
J. Saric, USEPA
AR Coordinator/78

cc w/o enc:

J. Sattler, DOE-FEMP
S. Beckman, FDF/52-3
T. Hagen, FDF/65-2
R. Heck, FDF/52-3
R. Kasparek, FDF/16-2
T. Walsh, FDF/65-2

TECHNICAL REVIEW COMMENTS ON "MIXED WASTE CHEMICAL TREATMENT PROJECT TECHNOLOGY SPECIFIC WORK PLAN ORGANIC EXTRACTION PROJECT" REVISION 1.0 FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

General Comments

Commenting Organization: Ohio EPA — Commentor: Budich
Section #: 1.2 — Page #: 5 — Line #: NA
Original Comment #: 1

Comment: On Page 5 of the work plan it is stated that following vapor and/or solvent extraction Perma-Fix will review the waste characterization data for the orginal waste when making the determination of whether RCRA metals are present in concentrations above the LDR treatment standard. This would then be the basis for whether or not the waste would be subject to precipitation/stabilization. Ohio EPA DHWM's concern is the potential for previously bound metals to be released during solvent extraction. If this were to happen, then the orginal waste characterization would not be acceptable for making this determination. Also, the potential release of any bound metals in the waste matrix will effect metals concentrations in the organic waste stream generated by the solvent extraction process. FEMP must provide additional information regarding the potential for the release of bound metals during the solvent extraction process. This information must address any revisions to waste characterization or handling that may be required.

Response: Past experience with the Terra-Kleen process under USEPA's Site Program has shown that TC metals are non-soluble in the proprietary solvent. The Terra-Kleen process was evaluated for metal transport in three different soil matrices during the Site Demonstrations. As a result of these tests, no quantifiable changes in metal concentrations nor TCLP characteristics were found. To demonstrate the effect of the Terra-Kleen proprietary solvent on FEMP wastes, both radiological and metal samples will be collected during Phase I treatment to show metal leaching and/or transport is not a factor in the waste matrix itself or in the residual solvent generated from the treatment process.

Action: The text on Page 5 of the TSWP has been revised to state radiological and TC metal samples will be collected during the Phase I demonstration to show the proprietary solvent has no effect on metal transport in the treated waste or residual solvent generated from the treatment process.

Commenting Organization: Ohio EPA — Commentor: Budich
Section #: 3.1.2.1 — Page #: 16 — Line #: NA
Original Comment #: 2

Comment: Page 16 states that the drum lift at the screen hopper is capable of lifting either 55-gallon or 85-gallon drums. It also discusses procedures to address any 110-

gallon overpack drums. On Page 2, section 1.1 the plan states that some smaller (30-gallon) and some larger (4'x4'x7' boxes) containers are included in the waste inventory planned for the project. Ohio EPA DHWM requests additional information on how these containers will be addressed during waste preparation.

Response: Agree. Some 30-gallon and some larger (4'x4'x7' boxes) containers are included in the waste inventory planned for the project and will require special handling during waste preparation activities conducted in Plant 6. The manner in which these containers will be managed is largely dependent on the potential generation of fugitive dust emissions during dumping operations. To minimize potential fugitive dust emissions, debris will be manually separated from the box or 30-gallon container prior to dumping. Separated debris will be shredded and returned to the waste stream from which it came as described in Sections 3.1.2.1 and 3.1.2.2. Once debris has been manually removed, a drum grapple will be used to lift and place any 30-gallon containers into 55-gallon containers that can be directly lifted and dumped by the screen hopper. Emissions from the screen hopper will be vented to atmosphere through a HEPA collected exhaust system as shown in Figure 3-3A. White metal boxes will be either manually unloaded or dumped using a box turner; after which the waste material will be placed within 55 gallon containers that can be handled by the screen hopper in Plant 6. Waste dumping operations will be conducted within an enclosure unit that is vented to atmosphere through a HEPA exhaust system.

Action: Section 3.1.2.1, Pg -16- has been revised to reflect the manner in which 30-gallon and 4'x4'x7' white metal boxes will be handled during waste preparation activities. A copy of the appropriate change page (Pg. -16-) showing the requested revisions is attached.

Commenting Organization: Ohio EPA Commentor: Budich
Section #: NA Page #: NA Line #: NA
Original Comment #: 3

Comment: In several sections of the plan, it is stated that liquid waste (solvent or solvent/water mixtures) will be collected and evaluated for disposition through the AWWT or through the FEMP Liquid Mixed Waste Bulking Project. Ohio EPA DHWM requests information regarding the decision making process for the final disposition of this waste. FEMP may provide a list of the criteria used to make this decision or reference any previously submitted document where this information may be found.

Response: Agree. The option to treat project wastewaters either through the AWWT or the FEMP Liquid Mixed Waste Bulking Project is presented in the TSWP. Project wastewaters will only be discharged to the AWWT under the following conditions:

(1). Characterization of the wastewater indicates it is not TSCA regulated and is non-hazardous for TC organics/metals and F-listed constituents.

These wastewaters would only be discharged if the discharge could be conducted in compliance with the FEMP NPDES Permit (Ohio EPA Permit No. 1IO00004*ED). In this instance, the project discharges would be reviewed and approved under site procedure EP-0005 entitled "Controlling Aqueous Wastewater Discharges into the Wastewater Treatment System" as described on Page -69- of the ARAR Table; or

(2). Characterization indicates the wastewater is RCRA hazardous for TC metals and/or organics only (no F-listing applicable), and its discharge would comply with the criteria established in the Wastewater Treatment TSWP previously submitted to and approved by Ohio EPA on April 17, 1996.

Any TSCA regulated or F-listed project wastewaters will not be evaluated for discharge to the AWWT, but rather would be bulked on-site for disposition under the FEMP Liquid Mixed Waste Bulking Project.

Action: No action required.

Commenting Organization: Ohio EPA Commentor: Budich
Section #: 3.1.2.3.3 & 3.1.2.3.5 Page #: 25 & 26 Line #: NA
Original Comment #: 4

Comment: Page 25, section 3.1.2.3.3, Solvent Extraction states "When the solvent end point concentration has been achieved, the waste material will be rinsed with clean utility water to remove the residual solvent." Page 26, section 3.1.2.3.5, Sampling and Analysis for PCBs and RCRA organics states "The second type of sampling and analysis activity will be compliance sampling to prove that the treatment standards applicable under TSCA and RCRA LDR have been met, before any water rinse or RCRA metals stabilization processing takes place." It appears that the first sampling procedure concerns the extraction solvent and the second procedure involves sampling of the waste matrix. However, it is unclear as to when the water rinse will occur. FEMP must provide clarification as to when the waste matrix will be water rinsed.

Response: Agree. The sampling referenced in the second and third paragraphs of Section 3.1.2.3.3 describes the process control sampling that will be conducted by Terra-Kleen to determine when a waste has undergone a sufficient number of solvent extraction cycles to successful meet its matrix target level. Once Terra-Kleen has determined the waste matrix target level has been achieved, a second sampling effort--described in Section 3.1.2.3.5, will be initiated to demonstrate that the waste meets its corresponding TSCA and/or RCRA LDR treatment standards prior to stabilization. Only after the process control and compliance based sampling efforts described above are complete and; Terra-Kleen has determined the waste may be subject to stabilization, will the waste be rinsed with water to remove excess solvent. Wastes which are determined not to required stablization will also be sampled to demostrate compliance with TSCA and/or RCRA LDR treatment standards prior to rinsing.

Action: Text will be added to Section 3.1.2.3.3, Pg 25 to clarify that the water rinse will not occur until after TSCA and RCRA LDR samples show the waste can be stabilized and/or directly re-packaged for off-site shipment.

Commenting Organization: Ohio EPA Commentor: Budich
Section #: NA Page #: NA Line #: NA
Original Comment #: 5
Comment: This project will be conducted in two main locations, Building 80 and Plant 6. Ohio EPA requests information on the methods used to transport the extraction vessels between locations and any safety or spill control procedures that will be implemented.

Response: Agree. Waste will be transferred by FDF personnel who are trained to move waste in accordance with the site procedures described in Section 3.1.5.3 of the TSWP. Free liquids will be drained from the waste prior to the initial loading of extraction vessels in Plant 6 and after treatment in Building 80. Extraction vessels will also be valved shut during any transfer operations. The site's existing spill response procedures will be invoked in the event of a spill or release as described in Section 3.1.5.5.

Action: No action required.

Commenting Organization: Ohio EPA Commentor: Budich
Section #: 8.0 Page #: 88 Line #: NA
Original Comment #: 6
Comment: Page 88, Section 8, ALARA Considerations, Daily Housekeeping states... "recovered contaminated water will be stored in the contaminated water storage tank and reused in the treatment process." However, page 33, section 3.1.2.4.4, Contaminated Water Storage states "This water will be contaminated with EPA-listed waste codes, and therefore will not be reused in the stabilization process." The latter reference pertains to the organic sludge tank in Plant 6 but is unclear as to which contaminated water storage tank is being addressed in the first reference. These references appear to conflict with each other and FEMP must provide clarification as to whether contaminated wastewater is intended for reuse in the process.

Response: Agree. The tank referenced in Section 8.0, Page 88 is the same contaminated water tank that is located in Plant 6 and referenced in Section 3.1.2.4.4, Page 33. Wastewaters collected in this tank will not be re-used in the stabilization process since they may contain listed waste constituents. Rather these wastewaters will be collected and evaluated for treatment through the Liquid Waste Bulking Project or AWWT in accordance with the criteria described in comment response #3 above.

Action: The text on Page 88 will be revised to reflect the fact that contaminated water collected in the contaminated water tank at Plant 6 will not be re-used as part of the stabilization process because it potentially contains listed constituents.

Rather these waters will be collected and evaluated for potential discharge to the AWWT or Liquid Waste Bulking Project. A redline copy of Page 88, showing the appropriate changes is attached.

Step 3 - Metals Precipitation/Stabilization

In the third process step, extraction vessels that have completed the organic extraction step will be brought back to Plant 6 where Perma-Fix will review the waste characterization data for the original waste and determine whether RCRA metals are present in concentrations above the LDR treatment standard. To demonstrate the effect of the Terra-Kleen proprietary solvent on FEMP wastes, both radiological and metal samples will be collected during Phase 1 treatment to show metal leaching and/or transport is not a factor in the waste matrix itself or the residual solvent form the treatment process. If RCRA metals are below the treatment standard, the waste will be removed from the extraction vessel, drained of residual rinse water, and repackaged into White Metal Boxes (WMBs) for storage and shipment to Envirocare. If necessary, a non-hazardous water-absorbent media will be added to the waste to absorb free water. If RCRA metals are above the LDR treatment standard, the waste will be removed from the extraction vessel, repackaged into 55-gallon mixing drums and subjected to precipitation/stabilization treatment. After the metals treatment has been completed, the mixing drums will be emptied into a plastic-lined WMB and the stabilized waste cured into a low-strength waste/grout monolith inside the box. Recovered liquids will be bulked for management and disposal through the FEMP Mixed Waste Liquid Bulking Project.

All movement of waste containers, extraction vessels, and necessary supplies and equipment between buildings at FEMP will be performed by FDF personnel using established site procedures. Also, FDF personnel will perform all waste container handling that takes place inside Plant 6 or Building 80, except for those activities that occur internal to the Perma-Fix or Terra-Kleen processes.

The Terra-Kleen process reduces the concentrations of PCBs and RCRA organics to levels below regulatory requirements established under TSCA and the RCRA LDR treatment standards. The Perma-Fix process then precipitates the RCRA metals and stabilizes the material such that final waste forms shipped to Envirocare of Utah will meet the LDR treatment standards and the site-specific WAC for disposal at Envirocare. Effluents and residuals of the Terra-Kleen process will meet the WAC for the TSCA Incinerator at the Oak Ridge, Tennessee K-25 Site, or the FEMP Advanced Wastewater Treatment (AWWT) Facility. Generation of secondary wastes such as contaminated equipment, used anti-contamination clothing, spent respirator cartridges and empty containers shall be minimized by a combination of techniques, including generation avoidance, contamination prevention, and decontamination, recertification and reuse.

Terra-Kleen has demonstrated their process during a treatability study conducted at Terra-Kleen's testing facility in Okmulgee, Oklahoma; during a pilot scale demonstration at Naval Air Station North Island in San Diego, California; and during a full scale operations at Naval Communication Station Stockton, California. Descriptions of these demonstrations are provided in Appendix E. Perma-Fix has demonstrated their process during ongoing mixed waste chemical treatment projects at the Fernald Site. Reference 1 describes that work.

This Organic Extraction Project will be conducted in three phases.

Phase I Project planning activities and approvals by FDF, DOE-FN, U.S. EPA, and OEPA.

The drum lift at the screen hopper is capable of lifting either 55-gallon or 85-gallon drums. When 110-gallon overpack drums are encountered, an attempt will be made to remove non-leaking inner containers from the outer overpack. If the inner container leaks, it may be bagged to contain leaks or the waste may be transferred manually to a replacement container, that can be safely lifted and dumped at the screen hopper. Some 30-gallon and some larger (4'x4'x7' boxes) containers are included in the waste inventory planned for the project and will require special handing during waste preparation activities conducted in Plant 6. The manner in which these containers will be managed in largely dependent on the potential generation of fugitive dust emissions during dumping operations. To minimize potential fugitive dust emissions, debris will be manually separated from the box or 30-gallon container prior to dumping. Separated debris will be shredded and returned to the waste stream from which it came as described in Sections 3.1.2.1 and 3.1.2.2. Once debris has been manually removed, a drum grapple will be used to let and place any 30-gallon containers into 55-gallon containers that can be directly lifted and dumped by the screen hopper. Emissions form the screen hopper will be vented to atmosphere through a HEPA collected exhaust system as shown in Figure 3-3A. White metal boxes will be either manually unloaded or dumped using a box turner; after which the waste material will be placed within 55-gallon containers that can be handled by the screen hopper in Plant 6. Waste dumping operations will be conducted within an enclosure unit that is vented to atmosphere through a HEPA exhaust system.

Empty containers and lids will be inspected and cleaned, if necessary, to ensure compliance with the RCRA empty container rule promulgated in 40 CFR 261.7 (Ohio Administrative Guide [OAC] 3745-51-07); and TSCA empty container requirements promulgated in 40 CFR 761.79(a); and placed in an Empty Container Storage Area to await disposition by FEMP site personnel. Any rinse waters generated in container cleaning will be collected, and pumped to the organic sludge holding tank in the same manner as the excess liquids which were removed from the containers. These wastes will be bulked for ultimate disposition under the FEMP Liquid Mixed Waste Bulking Project.

After the waste containers have been opened, the excess liquid removed, and the overpack containers separated from the waste, the waste containers are grouped by the operators at the Deheading and Inspection Station into CWGs.

In the next step of the waste preparation process, macro solids (over 2 inches in any dimension) will be separated from the waste by passing the waste through a bar screen in a screening hopper as shown in Figure 3-3A. Each drum in a CWG is clamped in an engineered hydraulic drum lift, lifted to the top of the screen hopper, and its contents dumped onto the bar screen. Large chunks of waste may be broken on top of the screen by operators using demolition hammers. Macro solids retained by the bar screen are raked down a chute onto a sorting table where solids sorting begins. Waste that passes through the bar screen is dispensed from the bottom of the screen hopper through a discharge valve into a previously prepared extraction vessel. This vessel is lined with a geotextile fabric to impede release of fines from the vessel during extraction. The geotextile bags have a porosity which is large enough to allow satisfactory vapor and solvent extraction, but small enough to retain the material being processed.

stream temperature is reduced by direct contact with a chilled liquid. The air stream temperature is reduced to approximately 40 degrees F. Most of the water vapor and all but a very small percentage of the volitale and semi-volatile organics are condensed and physically removed from the air stream in this unit. Near the end of the vapor extraction cycle, the stripper air discharge can be diverted through a filtration train consisting of a particulate prefilter, a HEPA filter, and a granular activated carbon filter. The discharge of the filter train is recycled back to the process array by way of the vapor extraction blower and the catalytic reheater. Typically, the vapor extraction cycle will be concluded when the organic content of the air stream returning to the process array contains less than matrix target concentration. This end point criterion may be adjusted by Terra-Kleen as necessary to reflect variations in the raw waste entering the process. Matrix target concentrations and testing methods are summarized in Section 3.1.3 and in Table 3-4. The recovered liquids from the knockout drum, and the stripper unit will be collected in the VOC waste tank for disposition through the FEMP Liquid Mixed Waste Bulking Project.

3.1.2.3.3 Solvent Extraction

After the vapor extraction step has been concluded, the vapor extraction lines are closed and the solvent extraction lines are opened. With the bottom drain valve of each extraction vessel closed, clean solvent from the Clean Solvent Tank is injected into the inlet connection until the waste in the vessel is completely immersed in the solvent. Typically, the waste will remain completely immersed in the first solvent wash for 24 hours, at which time the solvent effluent valve of each extraction vessel will be opened, and the PCB and RCRA organic laden solvent will be drained from the vessel and pumped into the solvent reclamation system. Each succeeding solvent wash will last for approximately 8 hours. Figure 3-3B is a schematic diagram of the Terra-Kleen solvent extraction system. Figure 3-5 shows the layout of the Terra-Kleen process in Building 80.

Terra-Kleen bases the number of extraction cycles on the physical properties and contaminant concentrations in the untreated wastes and the PCB and RCRA organic concentrations in the extracted solvent. Extraction cycles continue at 8-hour intervals until the PCB and RCRA organic concentrations in the drained solvent from each waste medium indicate a waste matrix concentration of less than the matrix target level, as measured by Terra-Kleen personnel using gas chromatography (GC) equipment in a mobile laboratory located near Building 80.

Once Terra-Kleen has determined the waste matrix target level has been achieved, a second sampling effort will be initiated to demonstrate the waste meets applicable TSCA and/or organic RCRA LDR treatment standards. After these process control and compliance based sampling efforts are complete, the waste material will be rinsed with clean utility water to remove residual solvent. The rinse effluent will be collected in a tank and transferred by FDF to storage and ultimate disposition, either through the AWWT or through the FEMP Liquid Mixed Waste Bulking Project.

Workers. The process and project design have the following features to aid in ALARA compliance. Occupational and environmental ALARA reports will be prepared by FDF as a stand-alone documents.

Containment and Shielding: Waste and waste constituents will be handled in steel containers as much as possible (process equipment, mixing drums, and FDF containers). Treated waste will exhibit a significant degree of self-shielding due to the mass of reagents added in the treatment step.

Exclusion Zone: All critical treatment activities will be conducted within an exclusion zone. Only authorized personnel who have completed the required training and are properly suited out in personal protective equipment will be permitted to enter the exclusion zone. Appropriate impervious coverings will be used to prevent penetration of contaminants into the floor.

Protective Equipment: All personnel working within the exclusion zone will wear anti-Cs prescribed on the PPE page of the appropriate RWP.

Mechanized Handling: Most waste transport, lifting and dumping outside the process area will be done with fork lift trucks fitted with hydraulically-actuated drum tippers. Movement of drums inside the process area will be manually by gravity roller conveyor. Lifting and dumping of drums will be engineered equipment designed for that purpose. Contact handling of waste is limited to debris sorting and the actual mixing step of the Process.

Wet Dust Suppression: At locations where dust evolution is anticipated, atomizing water sprays will be used as needed to minimize dust generation.

Pneumatic Dust Collection: Above the spray zone in areas of potential dust generation, we will use flexible point source dust collection ducts to capture dust from the air and convey it to a central prefilter/HEPA filtration system. The discharge of the HEPA filtration system will be outside the building.

Daily Housekeeping: Daily housekeeping will be performed in the work area at the end of each shift. This will include wet cleanup of visible material on equipment surfaces and floors. A minimal quantity of water will be used, and recovered contaminated water will be stored in the contaminated water storage tank. These waters will not be reused in any treatment process but rather, will be evaluated for disposition through the AWWT or FEMP Liquid Mixed Waste Bulking Project. HEPA wet vacs will be used instead of brooms for floor cleanup.

9. References

Fernald Environmental Management Project, Mixed Waste Chemical Treatment Project, General CERCLA Work Plan, Document #8ADD9-2200-002, Revision 0, November 1995