TECHNICAL ASSISTANCE REQUEST
ASHTABULA CLOSURE PROJECT
ACP 03-03-3

FIELD DEPLOYMENT OF DIRECT PUSH TECHNOLOGY FOR TCE PLUME DELINEATION AND EVALUATION OF OFF-SITE MITIGATION CONTROLS

SECTION 1 -- APPROVALS FOR TECHNICAL ASSISTANCE

_____	_____
Contractor Site Representative	OST/HQ Program Manager
_____	_____
DOE Site Manager	OST/HQ Office Director
_____	
DOE OH Manager	

SECTION 2 -- BACKGROUND AND PROBLEM DESCRIPTION:

The groundwater at the ACP site is contaminated to above drinking water standards and the soil above cleanup levels with trichloroethylene (TCE), uranium (U) and technetium (Tc). The current baseline for the soil in the Former Evaporation Pond (FEP) Waste Management Unit (WMU), previously referred to as the Corrective Action Management Unit (CAMU), is *in-situ* bioremediation to remove the TCE followed by excavation and shipment off-site to Envirocare as low level waste (LLW). Although the bioremediation is expected to reduce TCE in soil, two issues exist: 1) Whether the kinetics of *in-situ* treatment will fall within the time constraints for site closure; and 2) The TCE in the groundwater is not expected to fall below maximum concentration levels (MCLs) for drinking water. The cleanup criteria for groundwater, established to allow termination of the OEPA RCRA Permit and ODH license is 5 ug L^{-1} for TCE, 30 pCi L^{-1} for U and 90 pCi L^{-1} for Tc.

As a result of these issues, a TA request was issued by the site that sought evaluation, recommendations, development, and application of a process to treat source material of approximately 6,600 cubic yards of soil/sediment contaminated with organic solvents (TCE), Tc-99, and U in the FEP and associated groundwater plume. A TA Team was assembled at the ACP in late June to address uncertainties associated with remediation of the FEP area and groundwater. As a result of this TA meeting a final report was issued, "*Recommendations to Address Contaminated soils, Concrete, and Corrective Action management Unit/Groundwater Contamination at Ashtabula, Ohio*" that addressed these areas and made recommendations for follow-on activities.

SECTION 3 -- SCOPE:

The scope of this TA for the ACP is derived from recommendations contained in the TA report with consideration given to the work, which RMIES performed since the TA report was issued. The recommendations for groundwater and the FEP were combined since characterization and remediation could not realistically be separated in this area.

1. First, the team recommended that direct-push technology be used to further characterize the site including the FEP source area and plume to support the design and optimization of the remedial system. There is a need to simultaneously better define lithology, determine which wells can be abandoned and where new wells may be needed, enhance the conceptual site model, and design a monitoring strategy using multiple, real-time measurements (e.g. SCAPS Cone Penetrometer, beginning late fiscal year 2002).

   Since the TA report was issued, additional groundwater wells were installed and additional work was completed to characterize the site including the FEP area using direct push technology in order to enhance the conceptual site model. Technical Assistance is still needed to implement additional direct push technologies to delineate the groundwater plume within the FEP.

   Technical Assistance is also needed to develop multiple real-time measurement technologies such as a field GC, which can be used to optimize excavation of the FEP. The FEP will have to be carefully excavated in lifts or layers, and the dig face of each lift will have to be characterized to minimize commingling of TCE- and radiological-contaminated soils or contamination of clean overburden.

2. Second, the team recommended that the site accelerate excavation (excavate the FEP and 18 inch line in FY-03), thereby eliminating two years of HRC injection that would otherwise be coupled with expensive monitoring and research studies. Excavation would remove technetium-99 (Tc-99) and most of the TCE and U source terms. The excavated material could be treated quickly with soil vapor extraction for the TCE, which is classified as 'characteristic' and shipped to off-site disposal as LLRW at the Nevada Test Site (NTS).

   Recently, RMIES began development of a life cycle cost analysis of the different remediation alternatives including development of a conceptual design for the proposed ex-situ soil vapor extraction alternative. RMIES has also issued a letter to NTS which requested that NTS confirm that the TCE treated soils may classified as 'characteristic' and shipped to NTS as LLRW. Technical Assistance is still required to support the evaluation of the remediation alternatives and disposal options for the TCE treated soils.

3. Third, the team provided the following groundwater remediation recommendations:

   a) Installation of a down gradient drain (Geodrain) or a siphon (Geosiphon) pipe from the bottom of the source excavation to the bottom of the nearby escarpment after the source material is removed. This gravity induced pumping of the surrounding aquifer should pull most of the residual contaminated groundwater to one location for treatment or discharge. The drain water could be treated using the existing wastewater treatment facility, if necessary. When the drain or siphon is installed, the previous characterization data could be used to decide if additional lateral horizontal wells from the excavated area might improve control of the residual contaminant plume. The excavation area could also be backfilled

with high permeability material and amendments (e.g. reductants & phosphate). Other options, such as passing drain water through an amendment containing system at the drain outlet prior to release are feasible.

b) The next step, which could be scheduled to take place at the end of fiscal year 2004, would be to monitor the Geodrain for one year in order to establish trends in groundwater contaminants of concern. If monitoring data indicates a need, the site should consider amendments to reduce residual on-site groundwater contamination levels to allow license termination (e.g. reductants, HRC). If additional amendments are deemed necessary, the site should investigate research and development activities that will provide the best alternatives (such as NABIR, EMSP, SERDP, ESTCP, and others). As part of the long-term strategy, the site could transition the groundwater plume to Monitored Natural Attenuation (MNA).

c) Finally, the site should also consider a risk-based assessment, especially for the residual uranium contamination. The current approach of biostabilization or any *in-situ* stabilization approach will have to depend on reduction or adsorption *in-situ*. The stabilized (reduced and adsorbed) U is likely to reoxidize and become more mobile at least transiently throughout the plume on long-term basis. Given the lack of risk receptors and the intended permanent industrial use for the site this risk-based assessment of the plume might greatly reduce remediation and monitoring needs and allow the site to terminate the ODH license.

Currently, RMIES is evaluating groundwater remediation strategies including MNA, and the regulatory and technical issues associated with developing and achieving risk-based assessments for alternative cleanup levels to aid in acceleration of site closure activities. Therefore, Technical Assistance is still needed to assist with the evaluation of the groundwater remediation alternatives and the risk-based assessments.

4. Fourth, although not part of the initial recommendation emanating from the TA report, the site has requested that bioremediation technical experts be used to provide a third party evaluation of the current bioremediation effort talking place on site. The experts would come from national laboratories such as the Oak Ridge National Laboratory and the Idaho National Engineering and Environmental Laboratory.

SECTION 4 -- SCHEDULING REQUIREMENTS:

Consistent with the present site remediation schedule, DOE-ACP has identified this TA as a top priority and is requesting immediate TA support. The estimated duration of work resulting from this TA is 12-18 months. The major element in this TA request is the need for technical experts to provide sustained support to assure that any appropriate recommendations can be successfully implemented. This support will focus on the following areas in a sequential but integrated basis beginning as soon as possible:

1. Assistance with Characterization activities for the WMU (e.g., CPT, MIP, Fiddler, field GC, etc.)
2. If justified based upon cost benefit analysis, assistance with design for excavation and *ex-situ* treatment of soil prior to off-site disposal
3. Assistance with the evaluation, design and optimization of the groundwater remediation strategies (e.g., Geodrain or Geosiphon, MNA, etc.)
4. Evaluate monitoring data for amendment need or selection
5. Assist in risk assessment
6. Provide links to R&D for amendment selection, design review, readiness reviews, and provide source documentation for precedence, functional design criteria, etc.

SECTION 5 -- BENEFITS:

The primary potential benefits of this TA will be:

1. Reduction in uncertainty to achieve the 2006 closure date by immediately addressing regulatory issues associated with groundwater cleanup and site closure, potentially reducing schedule and therefore cost
2. Reduction in disposal cost for the estimated 6,600 cubic yards (cy) of excavated WMU soils as LLW ($135/cy) vs. MLLW ($540/cy) could be in excess of $1 million as a result of *ex-situ* soil treatment to remove TCE.
3. Enhanced ability to support accelerated closure of the site.

The cost estimate to fund this TA for a 12-18 month window support is about $75K, and it is anticipated that a cost saving of over $1 million or more should result from TA recommendations in the areas listed above.

SECTION 6 -- DELIVERABLES:

Deliverables will include support documentation for the areas identified in Section 4 to support characterization, excavation, and remediation of the FEP. This information will be presented to DOE and Contractor management in a sequential manner as tasks are initiated. It is anticipated that during completion of various stages of the project status that reports will be prepared and issued to DOE and contractor management.