Ohio Field Office
Unaddressed Technology Needs

Unaddressed technology needs for the five Ohio Field Office sites — Ashtabula, Columbus, Fernald, Miamisburg, and West Valley — are presented below. They are separated by site.

Ashtabula Environmental Management Project

Improvement to Conventional Pump and Treat Process

Ashtabula has approximately 474 m^3 groundwater contaminated with trichloroethylene. Remediation utilizing conventional pump and treat technology will require an estimated 20 years. An improved technology is needed to significantly reduce the time required for remediation.

Contact: Ward Best @ 440-993-1944

Columbus Environmental Management Project

Underground Drain Line Characterization

Columbus has approximately 1.5 miles of 8" D underground ceramic drain lines that are suspect contaminated. What is needed is a monitoring system that can be inserted at above ground locations, that can move through the lines, and that can monitor for gamma emitting contaminants inside the pipe and in the nearby surrounding soil (possible leaks). A system sensitivity that permits free release per NRC criteria is needed.

Contact: Tom Baillieul @ 614-760-7372 or Sheere Davis @ 614-760-7375

Improved Facility Survey Techniques

A system for quantifying the level of radionuclide contamination of building surfaces and materials, that is also quick and reliable, is needed. The specific radionuclide should be identified. The primary contaminants of concern are TRU, fission products, U and Th.

Contact: Tom Baillieul @ 614-760-7372 or Sheere Davis @ 614-760-7375

Decontamination of Hot Cell Contents

TRU contamination of hot cells contents significantly increases waste disposal costs during remediation. A system that can decontaminate (and possibly size reduce) hot cell contents down to low level waste criteria is needed.

Contact: Tom Baillieul @ 614-760-7372 or Sheere Davis @ 614-760-7375

Fernald Environmental Management Project

***Real-time Personnel Monitor for Alpha Contamination (OH-F002*)**

Developmental efforts to apply Long-Range Alpha Detection (LRAD) technology to a personnel alpha monitor need to be continued. Initial testing indicates potential for the application of this technology to alpha detection on individuals, due to certain advantages of the technology. The use of LRAD for personnel alpha detection would reduce monitoring expenditures substantially. Further, it would increase the accuracy of alpha detection. The need currently exists, and is projected to exist until silo remediation efforts are complete.

Contact: Robert Vogel @ 513-648-4849 or Marv Gross @ 513-648-4221

Non-intrusive Location of Buried Objects(Equipment, Pipes, Tanks) (OH-F003)

There is a need to improve the process of evacuating buried objects around the site, such as drainage tile, piping, and other large objects. Knowledge of the exact location would reduce the potential for errors and would improve the safety of excavation. The devisee must be able to locate underground equipment, both metallic & non-metallic, as small as 4 inches in diameter, at depths from 6-10 feet in clay soils.

Contact: Bob Nichols @ 513-648-5180 or Marv Gross @ 513-648-4221

Technetium-99 Detector/Analyzer (OH-F004)

A need exists for a mechanism/device to quickly and reliably detect the presence of Technetium-99 in soil samples. Fernald wastes streams have identified Technetium-99 as a contaminant of interest and a secondary cleanup level contaminant. Current methods for determining the presence of Technetium-99 require analytical laboratory analysis which precludes process remediation of contaminated soils. If a rapid field analysis were available which could provide comparable analytical results, process rather than batch remediation could be accomplished. The required detection limit (WAC) for technetium-99 is 30 pCi/g or approximately 2 parts per billion of Tc-99 in soil. Separation of the Tc-99 signal in-situ, given the normally high beta background on site soil seems implausible. This is supported by testing of beta detection instrumentation that was performed on site in 1995.

Contact: Keith Nelson @ 513-648-5720 or Marv Gross @ 513-648-4221

Real-time or In-situ Soils Waste Stream Analyzer (OH-F009)

The need exists for a monitor to assess soil and other solid waste streams in real-time and/or in-situ to ensure final remediation levels and waste acceptance criteria for the on-site disposal facility. The analyzer must be able to detect and discriminate between uranium, thorium, and radium.

Contact: Keith Nelson @ 513-648-5720 or Marv Gross @ 513-648-4221

Flame Cutting of Materials Coated with Lead Based Paint (OH-F020)

The ability to flame cut metal coated with lead based paint without exposing the worker to concentrations above the permissible exposure limit is needed. The ability to volatilize the lead based paint through intense heat or a method of capturing the lead during the test is needed.

Contact: Bob Nichols @ 513-648-5180 or Marv Gross @ 513-648-4221

Safe and Efficient Process Piping and Conduit Dismantlement (OH-F010)

Equipment is needed with the capability to hold pipe or conduit, cut it on either side of where it is being held, lower the cut section to ground elevation, and finally place it in a storage/disposal container. This type of activity is necessary during the decommissioning of buildings and structures around the site. The technology would replace workers operating at heights up to 30 feet off the floor, under conditions which jeopardize worker safety and that are manually-intensive. The equipment must be able to grasp and support, while at the same time cut, ten-foot sections of schedule 40 piping up to 6 inches in diameter. This may occur at heights up to 30 feet.

Contact: Bob Nichols @ 513-648-5180 or Marv Gross @ 513-648-4221

Improved Equipment Dismantlement (OH-F027)

Improved techniques for safety and reduced costs for equipment dismantlement through reducing exposures (to physical, chemical, radiological, and thermal hazards) are needed. This is necessary for small tanks to large systems (motors, pumps, dust collectors, mills, tanks, furnaces, etc.) Current baseline involves personnel interface with physical hazards of cutting, rigging, and transporting large vessels and equipment, essentially construction in reverse, but with additional hazards of contamination and associated PPE.

Contact: Bob Nichols @ 513-648-5180 or Marv Gross @ 513-648-4221

Pneumatic Collection of Large Quantities of Super-fine Powders (OH-F029)

Silo 3 waste removal will involve dry material retrieval and collection of super-fine powders by pneumatic means. Silo 3 waste is a dry powder that needs to be retrieved for treatment and disposal. Pneumatic removal is the current baseline method. However, most of the powder's particle size is very small with a mean distribution around 0.12 to 0.15 microns and a significant fraction below 0.1 microns. A mechanism/ process to remove the large quantities (3000 m^3) of the super-fine suspended particles from the air carrier needs to be demonstrated on a small scale.

Contact: Rod Gimpel @ 513-648-4842 or Marv Gross @ 513-648-4221

Miamisburg Environmental Management Project

Treatment of Tritiated Pump Oils and Tritiated Mercury

A method to treat tritium contaminated mixed wastes is needed. The target wastes are pump oils that also contain RCRA heavy metals and mercury.

Contact: James Johnson @ 937-847-5234 or James Booth @ 937-865-4504

Real-time Cost Effective Field Screening/Characterization

A system for quantifying soil contamination directly in the field, that is quick and reliable, is needed. The contaminants of concern are plutonium-238 and thorium-232.

Contact: James Johnson @ 937-847-5234 or James Booth @ 937-865-4504

Improved Facility Survey Techniques

A system for quantifying the level of radionuclide contamination of building surfaces and materials, that is also quick and reliable, is needed. The specific radionuclide should be identified. The primary contaminants of concern are plutonium-238 and thorium-232.

Contact: James Johnson @ 937-847-5234 or James Booth @ 937-865-4504

Method for Controlling Removable Tritium Contamination Inside Piping

A method is required to stabilize tritium contamination inside piping and hold it in place during removal and size reduction activities. The process must be easy to use by field personnel, repeatable, and cost effective. It must not result in the generation of mixed waste.

Contact: James Johnson @ 937-847-5234 or James Booth @ 937-865-4504

West Valley Demonstration Project

Tool Delivery System for Waste Retrieval and Tank Mechanical Cleaning

Remotely operated equipment is required to remove radioactive waste deposits, to mechanically clean and to view operations in two high level waste tanks that are congested with columns, a structural grid work and other structural members. There is limited access to the carbon steel tanks through existing risers. Baseline equipment - long reach arms and floor-based mobile equipment deployed through tank risers - has limited ability to reach all areas within the tanks.

Contact: George Bernatz @ 716-942-4310 or Herman Moore @ 716-942-4814

TRU waste Characterization, Classification, Size-reduction/decontamination and Repackaging

Characterization technologies capable of readily characterizing on-site CH & RH transuranic materials within drums and boxes are required. In addition, technologies capable of readily performing waste classification for determining curie content on drums and boxes are required. Technologies or a system for efficient size reduction and decontamination of RH TRU will reduce the total amount of RH TRU requiring disposal. This is of particular interest since the available space for RH TRU at WIPP is limited.

Contact: John Hollinden @ 716-942-4970 or Herman Moore @ 716-942-4814