EPA Characterization Test Cell (CTC)

Purpose

The Characterization Test Cell (CTC) is being designed to conduct experiments in source identification, source control, site characterization and remediation of contaminants in the subsurface. The EPA is interested in identifying more rapid and inexpensive techniques for locating and assessing subsurface contamination from organic and inorganic pollutants. To support this goal, the proposed CTC has three primary research objectives: (1) studies of site characterization methods for hazardous waste site investigations using ground water monitoring, soils investigations, and geophysics; (2) studies of natural attenuation and engineered remediation systems; and (3) production of data sets for validation of statistical methods and computer models. The CTC will be filled with sand, gravel and clay to approximate different aquifer conditions, and will have a circulation system to provide a simulation of ground water flow.

Design Summary

The CTC, as currently designed, will have interior dimensions of 30 feet wide by 40 feet long, by 10 feet deep. The cell will be constructed of nonmetallic materials to allow use of electromagnetic geophysical techniques during experiments. The CTC will have multiple layers of containment to preclude the release of contaminants to the environment. The first layer will be a PTFE (Teflon) liner that will be in contact with the water, aquifer materials and contaminants. The second layer, which also provides structural strength, is concrete with nonmetallic reinforcement. This concrete will have a 3 foot thick bottom slab and 2 ½ foot thick side walls. Below the concrete will be a geomembrane liner containment system. The current design also calls for a cut-off wall composed of bentonite that would be installed to a clay layer in the subsurface. This cut-off wall would extent to a depth of approximately 30 feet. The area enclosed by this cut off wall would be dewatered to keep the geomembrane containment system dry. An internal flow system, comprised of piping, pumps, and tanks will be installed in the cell and on an adjacent concrete pad to provide for filling and draining the cell, as well as for flow within the cell during experiments. A storage tank designed to hold the volume of fluid used in an experiment will be available to dewater the cell in case of an emergency. A mobile laboratory will be parked at the site and used to perform chemical analyses. The CTC is to be sited at the existing National Environmental Technology Test Site (NETTS) at Port Hueneme, CA.

Features of Current Design for CTC:

- Concrete Tank, lined with PTFE (Teflon) membrane (10 by 30 by 40 feet)
- Geomembrane liner containment system, with access pipes for testing and drainage.
- Bentonite slurry cut-off wall (Encloses area 160 x 160 feet)
- Area of tank and equipment exposed at surface after construction is 2,800 square feet

- Area around tank will be resurfaced with asphalt to match existing conditions
- Storage Tank available on equipment pad to dewater tank in case of emergency
- Equipment pad for pumps and tanks drains back to concrete tank in case of leakage.

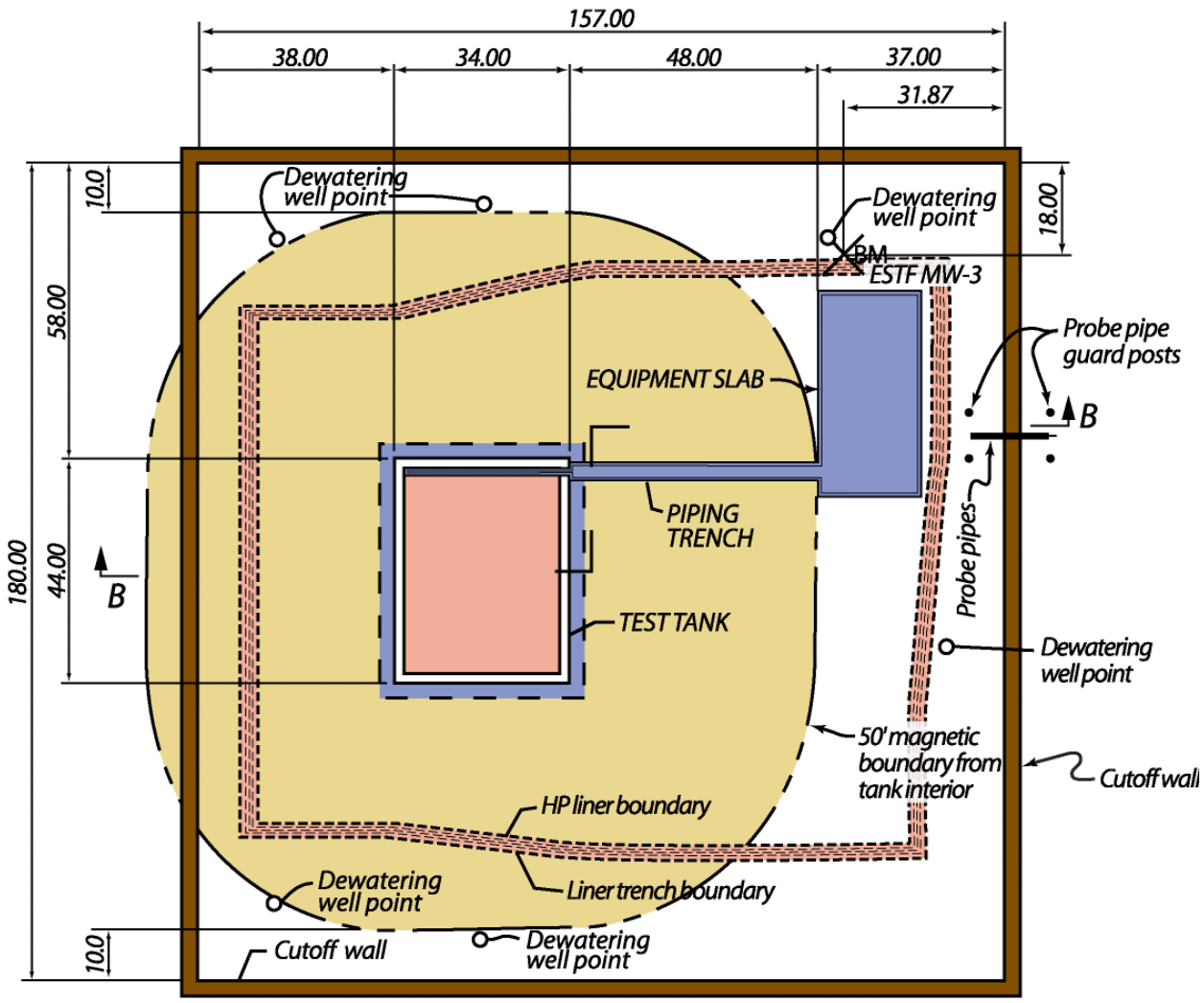

Figure 1: Plan view of CTC.

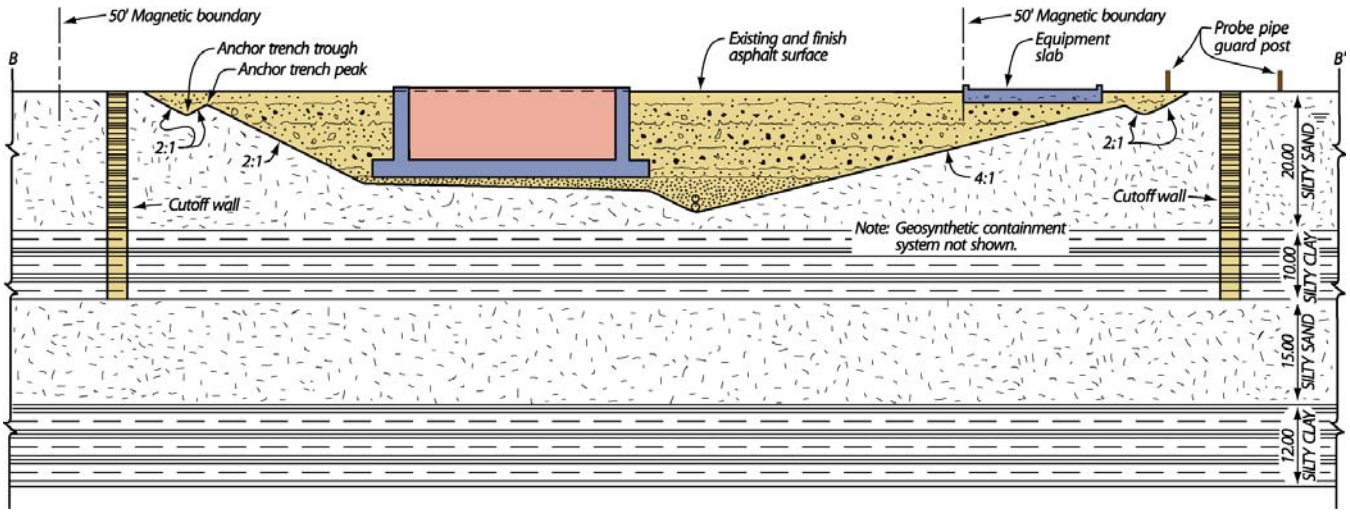

Figure 2: Cross section of CTC.