

DIRECT PUSH TECHNOLOGY FACT SHEET

FINDETT CORP. SUPERFUND SITE

ST. CHARLES, MISSOURI – EPA REGION 7

FEBRUARY 2023

What is Direct Push Technology?

Direct push technology (usually referred to as DPT) is a technology that allows for sampling of soil and groundwater beneath the ground surface. It is also used for collection of geochemical, geophysical, and hydrogeological data below ground. DPT was originally developed for agricultural and geotechnical soil evaluation, but its use quickly spread into environmental applications. DPT has been used at environmental sites since the 1980s and became a standard environmental site characterization technology in the 1990s. DPT has been used to conduct sampling at thousands of sites nationwide, including Superfund sites, underground storage tanks, emergency responses such as pipeline breaks, and Phase II environmental site assessments conducted prior to purchasing industrial properties. When used with appropriate quality control protocols, the data obtained from DPT can be of very high quality. DPT is a very cost-effective method for conducting soil and groundwater sampling at contaminated sites.



Photo of typical Geoprobe Systems DPT rig in use at a site in Region 7. Photo by EPA Region 7.

How does DPT work?

A probe is pushed into the ground using hydraulic pressure, hence its name “direct

push.” The DPT rods push to the depth desired to be sampled with the sampling unit mounted at the bottom of the string of rods being pushed into the ground. DPT units can range from small cart-carried rigs to very large truck or track-mounted rigs. A very wide variety of tools can be used with DPT, including groundwater samplers, soil samplers, direct-reading analytical instruments for detecting potential contaminants, and geophysical instruments such as electrical conductivity and hydraulic profiling of the subsurface. DPT is also used in remediation of sites to inject oxidants and nutrients for bioremediation. Once the DPT work is complete, the hole is plugged with an impermeable material, such as bentonite, to prevent any contamination from the DPT hole impacting soil or groundwater.

Where is DPT used?

DPT is used in every state in the United States and its territories for environmental site characterization and remediation. DPT use is approved in every EPA region in the U.S., as well as U.S. territories. DPT is also widely used internationally for environmental, agricultural, and geotechnical applications.

What are the benefits of using DPT?

EPA wrote a guidance document in 2005 that provided several benefits of using DPT. These include: 1) faster sampling capability that helps to provide more data, thereby improving site decision-making; 2) lower cost when more data is needed; 3) greater variety of equipment and methods, resulting in greater flexibility in meeting project goals; 4) capability of collecting depth-discrete groundwater samples to locate contaminated layers; 5) better vertical profiling capability; and 6) less investigation-derived waste generated, thereby saving additional

time and money while minimizing the potential for exposure to hazardous substances. When used with a mobile laboratory, real-time field detectors, or rapid analyses, quicker field decisions can be made as to where to take additional samples and install permanent monitoring wells. DPT data is critical in determining where to place monitoring wells and which zones in the subsurface should be monitored.

Besides the EPA guidance, most states have their own guidance and many professional organizations, such as the Association Society for Testing and Materials and the Interstate Technology and Regulatory Council, have published guidance and standards for DPT use in industrial and regulatory settings.

Are there limitations to using DPT?

There are limitations to using DPT. It cannot penetrate bedrock, and thus is only useful until bedrock is encountered. Another limitation is that the DPT sample is a single event sample, and so DPT alone cannot take the place of permanent monitoring wells to conduct long-term groundwater monitoring.

How is DPT used at the Findett Site?

DPT has been used for over 20 years at the Findett Corp. Superfund Site and has been very useful in providing information to characterize the site through soil and groundwater sampling. DPT has also been used since 2014 to reduce soil and groundwater contaminants near the Ameren Substation. It will continue to be a useful tool to refine the conceptual site model, better define contaminated zones in the subsurface, and

provide a way to inject non-hazardous solutions in targeted areas to reduce contaminant concentrations in groundwater.

Contact Information

Clint Sperry

Remedial Project Manager (SEMD/REMB)
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7157 or 1-800-223-0425
sperry.clint@epa.gov

Tonya Howell

Remedial Project Manager (SEMD/REMB/FFPC)
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7589 or 1-800-223-0425
howell.tonya@epa.gov

Pamela Houston

Community Involvement Coordinator (ORA/OPA)
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7699 or 1-800-223-0425
houston.pamela@epa.gov

For more information:

There are hundreds of technical papers, guidance documents, standard operating procedures and other documents with information of the use of DPT at environmental sites. Some of the more prominent guidance include: EPA's *Groundwater Sampling and Monitoring with Direct-Push Technologies*, OSWER No. 9200.1-51 EPA 540/R-04/005, August 2005; *Expedited Site Assessment Tools for Underground Storage Tank Sites*, EPA 510-B-16-004, October 2016; and *The Use of Direct-Push Well Technology for Long-term Environmental Monitoring in Groundwater Investigations*, ITRC (Interstate Technology & Regulatory Council), March 2006.

Diagram of a typical DPT rig (courtesy Geoprobe Systems):

