Key Factors in the Successful Commercialization of Three High-Resolution Site Characterization (HRSC) Technologies

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Background. The author has been involved in the development and commercialization of three high-resolution site characterization (HRSC) technologies that are in widespread use today. Experience gained from development and commercialization of those technologies shows that there are several common factors that are critical for successful commercialization of environmental technologies.

Activities. In the 1980s, soil samples were collected using open split-spoon samplers advanced inside of hollow stem augers. Early direct push rigs used open samplers, which were susceptible to cross contamination since those samplers were repeatedly advanced from the ground surface to the targeted sampling depth. In the early 1990s, Precision Sampling, a California Direct Push Contractor co-founded by Murray Einarson, developed and patented a dual-tube soil coring system called Envirocore™, that cased the probe hole as it was advanced. Soil samples were collected via a sampler attached to the inner sampling rods. The outer sampling rods were retracted only after the deepest sample was collected, thereby eliminating the potential for cross contamination of the samples. Precision used Envirocore as a proprietary technology and began limited sales of the system to the public. In 1994, Precision's patent was successfully challenged by Geoprobe, which discovered "prior art" in the form of a 1970 document that described a sampling system very similar to Envirocore, but which had never been produced. Geoprobe subsequently introduced its own dual-tube soil sampling system, which has become a standard soil sampling technology in the environmental site assessment industry.

In the 1990s, academic researchers documented the strong vertical variability in hydraulic head and chemical concentrations at contaminated sites. That knowledge was gained from the installation of multilevel monitoring wells that facilitated collection of groundwater samples and measurement of hydraulic head at many depths in the same borehole. In the late 1990s, while at Precision Sampling, Murray Einarson developed and patented the CMT™ Continuous Multichannel Tubing monitoring system. Einarson licensed Solinst Canada to manufacture, market, and sell the CMT tubing to domestic and international customers. Since its introduction in 1998, the CMT system has become the biggest selling multilevel groundwater monitoring system, with over 5,000 systems installed around the world.

In 2011, Einarson and colleague Dr. Adrian Fure conceived of an adaptation of standard laser-induced fluorescence (LIF) technology that would allow LIF to detected chlorinated solvent DNAPL and other non-naturally fluorescing NAPLS. Einarson and Fure teamed with Dakota Technologies and U. Guelph (Canada) on an ESTCP-funded applied research project to develop and test the new technology, referred to as DyeLIF™. The technology was validated and is now commercially available from Dakota Technologies.

Lessons Learned. Experienced gained from these commercial ventures shows several "common denominators" in the success of the HRSC technologies. First, there must be a genuine need for the new technology. Second, the advantages of the new technology should be obvious and easy to communicate. Third, a strong, visible industrial partner is essential for marketing, product support and product improvement. Patent protection is arguably less important, but was and still is an important factor for all three technologies.