LNAPL-2

Evaluating LNAPL Remedial Technologies for Achieving Project Goals

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EXECUTIVE SUMMARY

Light, nonaqueous-phase liquid (LNAPL) management (LNAPL assessment and remediation) presents some of the greatest challenges to corrective action and cleanup at petroleum manufacturing, storage, and handling facilities such as refineries, bulk product terminals, gas stations, airports, and military bases. Once in the subsurface, LNAPLs can be difficult to adequately assess and recover and thus can be a long-term source of

- risk and exposure issues (e.g., vapor, groundwater and soil contamination)
- acute-risk concerns (e.g., explosive conditions)
- LNAPL mass concerns (e.g., regulations that require recovery of "free-product," "free-phase hydrocarbon," or "liquid-phase hydrocarbon"; for aesthetics or mass reduction reasons; or for potential LNAPL migration)

Over the past few decades, LNAPL remedial technologies have evolved from conventional pumping or hydraulic recovery systems to a variety of innovative, aggressive, and experimental technologies. Thus, selecting the LNAPL remedial technology best suited for an LNAPL site can be daunting. Further, not all LNAPL sites pose the same concerns and risks and, therefore, may not warrant the same level of management. The simple concept is to first identify the specific concerns the particular LNAPL site conditions pose and then set a course of LNAPL management that specifically addresses those concerns. When those concerns are abated, unless other concerns arise, the LNAPL management effort has succeeded.

This guidance provides a framework to help stakeholders select the best-suited LNAPL remedial technology for an LNAPL site and will help the regulator and others understand what technologies apply in different site situations. Seventeen LNAPL remedial technologies are considered in this guidance, some of which are more innovative or less proven as an LNAPL remedial technology than others. The framework advocates selecting LNAPL remedial technologies to achieve specific LNAPL remedial objectives that are set to address the specific LNAPL concerns identified at the LNAPL site. This guidance also discusses regulatory practices which may foster better completion of LNAPL remediation, including the important step of developing an adequate LNAPL conceptual site model to guide the setting of LNAPL remedial objectives and remedial technology selection. It is anticipated that use of this guidance will facilitate regulatory oversight of LNAPL remediation, streamline remedial technology selection and regulatory approval, enhance communication between stakeholders, and facilitate closure of LNAPL remediation projects.