Remediation Technologies That Require Permitting With ORCAA

Aeration – Aeration technology utilizes injection of air into extracted ground water to volatilize dissolved hydrocarbons and enhance aerobic biodegradation. The process is typically conducted within an aeration tank equipped with air injection tubing or slotted piping connected to an external blower. Aeration of impacted ground water will produce off-gas vapors that will require additional treatment through adsorption or oxidation equipment.

Air Stripping – Air stripping technology also volatilizes dissolved hydrocarbons from extracted ground water. The impacted water is routed through an air stripper, which typically consists of a tank or tower containing packing material or a series of perforated trays. Water is pumped into the stripper and sprayed over the packing material/trays while air is blown up through the bottom. Hydrocarbons are volatilized while water moves toward the bottom of the stripper. As with aeration, air stripping will also produce off-gas vapors that will require additional treatment through adsorption or oxidation equipment.

Air Sparging (AS) – AS consists of injecting air into ground water below the water table. Volatile hydrocarbons are transferred from the dissolved-phase to the vapor-phase for recovery. AS has the additional benefit of increasing the dissolved oxygen content of ground water and facilitating aerobic biological degradation of petroleum hydrocarbons and the co-metabolic biodegradation of co-located chlorinated VOCs. Implementation of AS would require installation of several injection wells (screened within the saturated zone) across the contaminated site, and delivering air to the wells using a blower or compressor. AS wells can be either vertical wells or horizontal wells. Vapor recovery will also need to be implemented to capture volatilized compounds generated from the AS process. Therefore, AS systems are typically installed in conjunction with a soil vapor extraction (SVE) system. SVE wells can also be installed as either vertical or horizontal wells. The selection of vertical or horizontal wells and the spacing and construction of such wells would require the performance of site-specific pilot testing in order to facilitate property system design and operation. If selected for the cleanup action, remedial pilot testing should be conducted at the contaminated site to evaluate the effective radius of influence of injected air and determine the appropriate spacing for AS injection wells.

Continued – Remediation Technologies That Require Permitting With ORCAA

Soil Vapor Extraction (SVE) – SVE technology can be implemented alone or coupled with other technologies such as ground water extraction or AS. This technology would require installation of extraction wells (or trenches) screened within the vadose zone where impacts are present in soil. SVE technology may also utilize appropriately constructed monitoring wells for either vapor or vacuum monitoring or for active extraction. Using vacuum blower equipment, a vacuum is applied to the SVE wells to extract volatile hydrocarbons from the subsurface. Those volatile compounds are present in soil gas either through normal volatilization or as the result of AS. The extracted vapors require treatment prior to atmospheric discharge. If selected for the cleanup action, remedial pilot testing should be conducted for this technology to evaluate the effective radius of influence for extraction and determine the appropriate well spacing.

Air Pollution Controls - Vapor effluent treatment technologies include granular activated carbon (GAC), thermal oxidation (therm-ox), or catalytic oxidation (cat-ox). GAC is typically applicable to lower air effluent discharges while therm-ox and cat-ox are more applicable to higher mass loadings. Assuming that vapor concentrations would be significantly elevated during the initial phase of remediation, a therm-ox or cat-ox would be more suitable and more cost-effective than using GAC adsorption equipment for vapor treatment.