INNOVATIVE SOIL AND GROUNDWATER REMEDIATION

ART SINGLE-POINT AS/VE TECHNOLOGIES

The traditional air sparging and vapor extraction (AS/VE) remedial option has been implemented at sites worldwide. The AS/VE remedy is based on air injection into the formation via a sparging point and recapturing of the volatized contaminants via vapor extraction from another location. The two points may be tens of feet apart. AS/VE was successful in attaining site closure at volatile compound impacted sites that fit within specific geological formations. However, at many sites, significant risks to human health and the environment were encountered, mainly attributed to difficulties in capturing all air injected in the subsurface. Challenges and limitations associated with the traditional design of the AS/VE alternative include:

1. Migration of free products and contaminated plumes to clean areas.
2. Intrusion of contaminated vapors into structures resulting in serious health risks.
3. Extensive drilling, construction and increased maintenance demand costs due to large numbers of sparging and extraction points along with associated trenching.

Accelerated Remediation Technologies Inc. (ART) is introducing an enhanced AS/VE design that:

- Combines advantages of air sparging, soil vapor extraction and associated aerobic degradation processes in one remedial point.
- Eliminates or minimizes risks associated with traditional AS/VE design including ***vapor intrusion and air flow channeling,***
- Allows for addition of amendments to facilitate chemical treatments or oxidation of contaminants,
- Increases subsurface flushing due to larger air flow,
- Reduces potentials for contaminant concentrations rebound,
- Attains site closure in a shorter time, and
- Offers less intrusive installations and lower overall project costs.

As detailed in the following figure, the ART sparging well consists of two screened zones separated by a solid (blind) section. The lower screen is positioned near the bottom of contamination. The upper screen intersects the water table with the length based on several design parameters including water table fluctuations, sparging pressures, impacted vadose zone length, locations of additional treatment points and other site specific variables. An innovative, specially designed packer will be strategically positioned in the solid riser portion, between the two screen zones, to force injected air to exit the well out of the lower screen. The vapors are then captured through the upper screen along with additional vapors from the vadose zone, thus reducing or eliminating vapor intrusions issues. The preferred well diameter is four inches but other well sizes may be accommodated. Adequate understanding of site formation and geological characteristics is necessary for final positioning and dimensions of screens and solid riser sections.

The packer is produced by ART and is made of steel and rubber in an arrangement that depends on design requirements. The packer is held in position by rigid piping that also delivers air (and amendments, if needed) to the lower screen for injection into the formation.

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In summary, the ART sparging system relies on proven concepts with a design that reduces risks commonly encountered with traditional air sparging. By utilizing the same point to sparge and extract vapors, deliver amendments and enhance degradation, significant costs saving and increased control of the processes is expected. The treatment zone offers increased process control, larger screen surface areas for AS and SVE zones, and aggressive soil flushing effect, decreasing the potential for contaminants rebound.

The ART Technologies have been proven at very challenging sites to treat chlorinated solvents, hydrocarbons and recalcitrant compound impacted soil and groundwater worldwide. The technology can be retrofitted to existing systems or can be employed as a new site solution.
For further information, contact **Dr. Mohamed Odah at (913) 438-4384 ext. 102.**

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