

Removal of contaminated soils or mixed waste

RKK-SoilFreeze Technologies LLC, the United States, offers patented Isocell™ technology for safe removal and off-site treatment of contaminated soil/groundwater, mixed wastes or unexploded ordnance. The innovative ground freezing technology involves freezing the entire contaminated mass at the site. Selected small frozen blocks are removed from the ground, coated with a protective film and/or insulation and transported off-site for treatment or disposal. A few applications of Isocell technology are listed below:

- Coal tar contaminated soil;
- High-level radiation contamination;
- Soft sludge and sediments from mixed waste treatment ponds;
- Mixed wastes such as landfill debris and radiation contamination; and
- Unexploded ordnance and other sensitive material.

Some of the benefits offered by Isocell ground freezing for contamination removal include:

- Works in all ground conditions: This technique works just about anywhere a steel freeze pipe can be installed. Exact placement of the freeze pipe is not essential as freezing penetrates far into all materials.
- Reduces instability and criticality: The cooling effect of ground freezing significantly reduces volatility and instability of most materials. It also solidifies very soft or sticky materials such as sludge or tar. At mixed waste sites involving high level radiation, the freezing process greatly reduces potential criticality.
- Enhances worker safety: The contamination or even unexploded ordnance is locked into place by the freezing process, thereby reducing the risk to workers from air vapours or accidental explosions. Moreover, the freeze pipe can be installed by employing remote-control methods like robotics.
- Flexible installation: The freeze pipe (typically 3 inch in diameter) can be installed around obstruction (debris, ordnance, etc.) of virtually any size or shape in the ground. Geophysics or other methods to identify the size, shape and depth of the obstructions are important to place the freeze pipe as close to the obstruction as feasible. Depending on the sub-surface conditions, the following methods can be used to install the freeze pipe: auger drilling, mud rotary drilling, driving, vibrating and pushing.
- Cost-competitive: Compared with other retrieval technologies, freezing technology is less costly in many cases. Costs depend on site conditions, site size and other factors.

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