

FACTS on REMEDIATION

Beede Site

Steam Enhanced Extraction

(Thermal Treatment Technology)

Deep soil and groundwater contamination can be challenging to clean up. As a result, at the Beede Site, multiple technologies are being employed to achieve the cleanup goals.

At the Beede Site, the clean up includes groundwater extraction and treatment, thermal treatment of deeper soils in the area of the former lagoon, and excavation and off-site disposal of shallow soils and sediment. In this summary, we review the initial step in the clean up of deeper soils at the Site, using a technology known as “Steam Enhanced Extraction” or “Thermal Treatment Remediation.”

Thermal Treatment Remediation was recently completed at the former Lagoon area on the Beede Site and we are happy to report that soil cleanup goals set by the US Environmental Protection Agency for that area have been achieved.

What is Steam Enhanced Extraction (SEE) and How Does it Work?

SEE is the removal of contamination from soil using steam. By raising the temperature of the subsurface, the steam turns contaminants in the soils into vapors, liquids, and petroleum residuals that can then be extracted from the subsurface using a vacuum system followed by above ground treatment.

SEE includes the installation of a network of steam injection and extraction wells across the treatment area. Here is a picture of the well network of injection and extraction wells at the former lagoon area at the Beede Site:



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The steam pushes water contaminated with vapors and oil to dedicated extraction wells for removal and treatment with an above ground treatment system. In the end, the contaminants are removed from the subsurface soils as: 1) vapors, 2) liquids (contaminated water), or 3) petroleum residuals in the contaminated water.

Meeting Clean Up Standards at the Beede Site With SEE

The EPA selected SEE as part of the remedy for the Beede Site because it identified SEE as a technology to remove the type of contamination that is present at the Site.

The original plan anticipated that the SEE system would operate for 150 days. The timing for the SEE system operation was intended to avoid operating in winter temperatures. In the end, the SEE system operated for more than 240 days (to ensure optimum contaminant removal), using 188 steam injection wells to inject over 2.8 millions gallons of water as steam. The SEE technology was successful as it removed more than 150,000 pounds of contaminants (including 136,000 pounds or approximately 17,000 gallons of oil) from a network of 31 extraction wells.

All of the water that was extracted was recovered, treated, and put back into the immediate aquifer. The operating information and system monitoring results confirmed the success of the SEE technology in meeting or exceeding the clean up goals for the former lagoon area.

Soil samples taken in February 2016, confirmed that target soil cleanup standards, which were established by the EPA in the Record of Decision (ROD) for the former lagoon area were achieved. Over 109 samples were taken during the course of treatment to demonstrate attainment with the applicable clean up standards.

The results of this sampling program have been provided to and were reviewed by EPA in consultation with NHDES. The EPA will share the SEE results and analysis at a Plaistow Board of Selectmen meeting in the Spring of 2016.