



Beede Waste Oil Site Plaistow

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The Beede Waste Oil/Cash Energy site (Site) consists of two parcels totaling about 40.6 acres located at 7 Kelley Road in Plaistow. Waste oil recycling operations had reportedly been conducted at the Site since 1926 and later facility operations included waste oil processing and resale, fuel oil sale, contaminated soil processing into cold-mix asphalt, anti-freeze recycling, and other related industries.

Contamination on the site originated from improper storage and handling of waste oil and other products, as well as from unlined and uncovered storage of large, contaminated soil piles. Elevated concentrations of polychlorinated biphenyls (PCBs) were first detected by NHDES in waste oil found in several above-ground storage tanks following complaints of odors in 1979. Numerous notices, letters of deficiency, administrative orders, and court orders to cease operations and perform investigation and remedial activities were issued from 1980 to 1992.

Following the cessation of commercial operations in 1994, more than 1.5 million gallons of oily liquid waste and sludge, stored in approximately 100 above-ground storage tanks and more than 1,000 drums, remained at the facility. The tanks and drums contained hazardous waste, including PCBs, metals, and volatile organic and chlorinated organic compounds. Seventeen large soil piles, totaling more than 27,000 cubic yards and containing varying levels of contamination, were also left on-site.

Between 1992 and 1998, the U.S. Environmental Protection Agency (EPA) and NH Department of Environmental Services (NHDES) (collectively, the agencies) undertook interim measures and removal actions to mitigate exposure to contamination, including containment of the oil leakage to Kelley Brook and additional Site fencing. In the summer of 1996, EPA initiated a time-critical removal action to remove much of the above ground hazardous waste. With the cooperation of NHDES and with supplemental State funding, the action was extended in 1997 to remove non-hazardous wastes, resulting in the removal and proper disposal of all tanks and drums and their contents.

Zones of contaminated soil and pools of oil floating on the groundwater table were found in the subsurface. The floating oil is referred to as light, non-aqueous phase liquid (LNAPL). The LNAPL at the Site is contaminated with solvents, PCBs and metals. EPA conducted a non-time-critical action between 1999 and 2005 to extract as much LNAPL from the subsurface as practicable, thereby reducing oil seepage to Kelley Brook and area wetlands. This action resulted in approximately 91,000 gallons of LNAPL being removed from the groundwater.

The Site was added to the National Priorities List in December 1996 and with funding from EPA, the remedial investigation/feasibility study was initiated in 1997 under NHDES management. The remedial investigation report, which characterizes Site conditions and evaluates the risks to human health and the environment, was released in February 2001. The feasibility study report, which evaluates cleanup alternatives, was released in January 2002. The proposed plan for cleanup of the Site was presented for public comment in June 2002. EPA carefully considered all comments received during the proposed plan's public comment period and, with NHDES' concurrence, selected the preferred alternative as the most appropriate remedial action for the Site. This cleanup decision is documented in the Record of Decision (ROD) that was signed on January 9, 2004. Site documents are available on both the [EPA Superfund Sites webpages](#) and on the [NHDES OneStop database using NHDES Site #198404068](#).

The ROD calls for remedial actions that will be protective for the reasonably anticipated future use of the Site. The ROD requires the excavation of sediments, soil piles and contaminated soil that is less than 10 feet below ground surface (bgs) for off-site treatment and/or disposal. Contaminated soil greater than 10 feet bgs, which is acting as a source of groundwater contamination, will be treated in-place using soil vapor extraction, and include heating the soil to enhance the removal of contaminants remaining in the deep soil. Contaminated groundwater will be extracted and treated on-site to restore it to Ambient Groundwater Quality Standards prior to release to the ground surface and infiltration back to the groundwater via specially designed basins. A groundwater management zone will be established to manage the contaminated groundwater and institutional controls will be implemented to prevent the excavation of soils greater than 10 feet in depth.

In 2006, negotiations were conducted with a group representing the major potentially responsible parties (PRPs) to reach an agreement to design and implement the remedial action. The agreement was formalized in a Consent Decree (CD) and calls for the PRPs to clean up the Site under the oversight of the agencies. On April 16, 2007, the CD was lodged in the District Court for New Hampshire and the PRPs (now "Performing Parties") initiated some of the preliminary planning work associated with the comprehensive Site cleanup plan selected in the 2004 ROD. The CD was entered by the Court on July 22, 2008, and, immediately thereafter, field work associated with several pre-design investigations and studies commenced.

From 2009 through 2011, the Performing Parties conducted pre-design investigations, with the agencies oversight, to support the design of the cleanup action. Pre-design investigations included soil and sediment investigations to further delineate the extent and volume of contaminated soil (including soil piles) and sediment that will require excavation or treatment. Several treatability studies were also conducted to determine the appropriate means to eliminate the sources of groundwater contamination and to remediate the contaminated groundwater. Field tests and laboratory analyses were conducted to determine the need for thermal enhancement of the soil vapor extraction system. The results of this treatability study indicated that thermal enhancement of the soil would effectively remove the subsurface contamination that poses a long-term threat to groundwater quality. Another treatability study was conducted to determine the best treatment technology to employ in treating the contaminated groundwater and achieve the groundwater cleanup goals. Additional field tests and infiltration tests were performed to support an extensive groundwater modeling effort to determine the design for the groundwater extraction, treatment, and discharge system.

In 2011, the sequence for the implementation of the remedial action activities was modified to accelerate the groundwater treatment component of the remedy and thereby address one of the principal threats to public health. The sequence of remedy component construction includes: 1) implementation of the groundwater treatment system; 2) implementation of the thermally enhanced soil vapor extraction system to reduce the sources of groundwater contamination at depth; 3) excavation and removal of contaminated landfill material and contaminated sediments in Kelley Brook; and 4) excavation and removal of contaminated shallow soils.

On-site remedial construction activities began in earnest in 2012. In September and October of 2012, the intersection of Danville Road and Main Street was reconfigured to better align the intersection with a new driveway to the Site. A new security gate and additional fencing on the southern portion of the Site were also installed. Where contaminated soil was located in the path of the new driveway, it was excavated and stockpiled on-site for future disposal. In late 2012, a waterline was extended to provide a reliable clean source of potable water to households near the Site whose water wells had been impacted by the Site. Groundwater quality in the vicinity of these households and on-site will continue to be sampled as necessary to monitor groundwater quality in the area.

Construction of the first phase of the remedial action (Management of Migration, or MOM, utilizing a groundwater extraction, treatment and discharge system) began in late December of 2012 and groundwater treatment was initiated in November 2013.

An on-site steam propagation test for the Phase 1 thermal system was conducted in December 2013 to provide additional information to support the final design of the thermally enhanced soil vapor extraction system which will reduce sources of groundwater contamination in the deep soil. Due to the large energy demand of the thermally enhanced system and the limitations of the natural gas infrastructure in the area, the thermally enhanced soil vapor extraction system was conducted in two phases. The design of the Phase 1 thermal system was completed in 2014 with startup beginning in May 2015 and operations continuing until February 2016. The Phase 1 target treatment zone soil volume was 32,841 cubic yards located in the vicinity of the former Site lagoon. The Phase 1 target treatment area was 87,800 square feet and targeted soils from 10-26 feet below ground surface. During Phase 1 operations, an estimated 28.7 million pounds of steam was injected into the subsurface and 6.6 million gallons of heated water was extracted and treated. An estimated total contaminant mass (vapor + liquid) of 150,066 pounds was recovered during Phase 1 thermal operations, including an estimated volume of 17,278 gallons of free phase oil.

During the Phase 1 thermal operation, a pilot test was conducted in the Phase 2 thermal area to gather information that was used to design the Phase 2 program. The Phase 2 thermal program design was completed in September 2017 with construction and system startup occurring in July 2018 and concluding in November 2019.

The Phase 2 target treatment zone soil volume was 21,456 cubic yards that is located north and east of the Phase 1 thermal treatment zone and within the former underground/aboveground storage tank area that is bound along to the northeast by a subsurface barrier wall (sheet pile). The Phase 2 target treatment area was 56,148 square feet and targeted soils from 14-26' below

ground surface. During Phase 2 operations, approximately 65 million pounds of steam was injected into the subsurface, resulting in the recovery of approximately 21,000 gal of oil and the removal of an estimated 177,000 pounds of volatile and semi-volatile organic compounds.

The design for the excavation of the former landfill, surface soils, and Kelley Brook sediments was approved by EPA in September 2021, with construction beginning in July 2022 and completed in 2023.

Implementation of the remaining source control remedy will include the excavation and off-site disposal of shallow soils (0-10 feet) which exceed ROD cleanup standards for contaminants. Designs for the remaining remedy are expected in 2024, with construction beginning in 2025.

The MOM treatment system will remain operational on Parcel 2 until groundwater cleanup levels are met throughout the Site.