

JONES AVENUE LANDFILL STATUS UPDATE

Prepared for:



**CITY OF PORTSMOUTH,
NEW HAMPSHIRE**

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REPORT

Status Update Jones Avenue Landfill City of Portsmouth, New Hampshire

Hoyle, Tanner & Associates, Inc. has completed its status update of the Jones Avenue Landfill. The work included a site visit; review of water quality monitoring data, methane gas and settlement data; and verbal communication with State and Local officials.

The Jones Avenue Landfill occupies a 10 acre portion of 50 acres of City land at the end of Jones Avenue and abuts the Sagamore Creek to the southeast and the Portsmouth High School to the northwest. The site was used historically as a municipal landfill and open burn pit, which was abandoned in the 1970's. The landfill is monitored under the revised Solid Waste Rules Env-Sw 807.05.

During the late 1980's approximately 34,000 cubic yards of incinerator ash from the Pease Air Base was stockpiled on a two acre portion of the 10 acre landfill site. The incinerator ash was found to contain elevated levels of lead. In 1985 Hoyle, Tanner & Associates was retained by the City to begin closure design options and plans. Due to the presence of lead in the ash Hoyle, Tanner & Associates designed a full encapsulating cell system. During the Fall of 1990, the ash was relocated to a double-lined containment area consisting of geocomposite liner, overlain by a 60-mil high-density polyethylene (HDPE) liner, with a leachate collection system. The Ash Containment Area was capped to limit the infiltration of water to the subsurface. The Ash Containment Area cover design consisted of 12" of intermediate sand cover, the textured 40-mil VLDPE liner, an 18"-sand drainage layer, followed by 6" of topsoil with vegetative growth. An under-drain system was installed to assist in draining the capped landfill. The incinerator ash containment area is sealed by an overlapping "pillow case" design. A Leachate collection system with a sampling manhole was integrated into the capping system for testing and inspections. The closure construction took place in 1989 with the site officially closed in 1990.

The site contains four monitoring wells, three down gradient of the landfill along the Sagamore Creek and one upgradient near the entrance to the site. Three surface water samples are also collected along the Creek and one background sample is collected adjacent to Route 1. The groundwater elevations through the site have remained unchanged from the early design calculations by Hoyle, Tanner & Associates in May 1986 compared to static groundwater elevations determined by the City. The groundwater is moving from the northwest edge of the site by the school to the southeast edge along the Sagamore Creek.

New Hampshire Department of Environmental Services (NHDES) requires that a Groundwater Permit be obtained for the closure of a landfill and the site be monitored for 30 years. The City obtained its initial groundwater monitoring permit for the site on June 22, 1990. The permit contains the testing frequency and water quality parameters for compounds to be sampled. The water quality parameters are determined based on

a Risk Assessment of the potential pollutants and hazardous materials that might leach out from that site along with its hydrogeology.

The groundwater permits are renewed every five years with the NHDES at which time the previous five years of analytical results are evaluated. If deemed acceptable, the NHDES may cut back on the frequency and amount of chemical analyses conducted for a site. The Jones Avenue Landfill has been approved to reduce the frequency of sampling to twice a year and the required VOC sampling is conducted every two years. This procedure is typical throughout the State of New Hampshire on Landfills that show a positive track record as having no significant health risk to Humans and the Environment.

A very extensive testing schedule for the Jones Avenue site was developed for the following elements: Inorganic Metals- Silver, Aluminum, Arsenic, Barium, Calcium, Cadmium, Chromium, Copper, Mercury, Nickel, Lead and inorganic compounds such as Nitrate, Total Kjeldahl Nitrogen (TKN), Chloride, and Chemical Oxygen Demand (COD); Aesthetic Secondary Metals such as Iron and Manganese; and Volatile Organic Compounds (VOC) which cover at least 50 gasoline type byproducts such as Acetone, Toluene and Xylene.

Pesticides and other Synthetic Organic Compounds (SOC) such as 2,3,7,8 TCDD (Dioxin) and Polychlorinated Biphenyls (PCB) are airborne contaminants settling and attaching to soil particles on the ground. SOC compounds are typically not sampled for in a groundwater permit and were not required at the Jones Avenue site.

The City has maintained sixteen years of monitoring at the site. The data is submitted to NHDES within 45 days after a sampling event. The City also submits the data as part of an annual report to NHDES. Hoyle, Tanner & Associates reviewed the summary tables for all the parameters sampled at the site. The results for metals and VOC's are inconclusive for any of the elements moving out of the landfill. Levels over the Ambient Groundwater Quality Standards (AGQS) have been detected for certain metals such as Chromium, Nickel, and Lead within the first three years of the closure. However, this would be expected as the down gradient leachate within the soil particles were flushed through the soil by groundwater. There have been minor "blips" over the AGQS for different metals since then, but no trends can be correlated to any metals moving from the cap. All of the results for sampling and testing of VOC compounds over that time period show no violations of Ambient Groundwater Quality Standards.

Settlement platforms on top of the landfill cap were installed in 2002. Over that time data was collected for the settlement of the landfill five times. The data show negligible to no signs of settlement of the cap. This would be expected on an ash containment landfill 16 years old with an underlying open burn pit landfill over 30 years old. There are five methane gas monitoring probes on top of the cap along with five upgradient probes in between the landfill and the High School/ Jones Avenue. Data over the past four years show no methane presence around the site and isolated low levels at different locations from under the cap.

A visual site walk was conducted on March 16, 2007 with Ms. Silke Psula, Solid Waste Coordinator for the City of Portsmouth. The site was dry and clear of snow cover. All known monitoring wells were found and observed to be in good condition. The landfill showed no signs of vandalism or vehicle traffic over the cap. There were no signs of leachate breakout along the slopes to Sagamore Creek and no evidence of ponding on top of the cap. The leachate collection manhole was uncovered and observed to contain what appears to be clear surface water. The City has undertaken additional water quality sampling in the leachate collection manhole. The chemical analysis results from January 24, 2006 showed no presence of VOC's or metals.

The visual presence of iron bacteria was evident at the drainage ditches SW-1 and SW-3 along the Sagamore Creek. It should be noted that there is no Maximum Concentration Limit (MCL) for iron according to NHDES's Ambient Groundwater Quality Standards (AGQS). Metal debris is also present along the banks of the Creek and scattered throughout the wooded portion of the site and may be contributing to the iron presence. The metal is estimated to be 40-50 years old based on the condition of the material and the size of vegetated growth on the banks. The material is aesthetically unpleasant to look at and could cause minor cuts or bruises if people moving through this area are not careful to avoid this debris.

In conclusion, we find the site to be secure, stable and well vegetated. The City has maintained an excellent record of analytical water quality data going back 16 years. The settlement, gas, and water quality results show no major health risks at the Jones Avenue Landfill site at the present time. Hoyle, Tanner & Associates has been in contact with the New Hampshire Department of Environmental Services Solid Waste, Risk Assessment, Air Emissions and Groundwater Protection Divisions who have similar findings of the site at this time. Removal of the metal debris along the banks of the Sagamore Creek would help reduce iron concentrations in the Sagamore Creek.

Please contact us if you have any questions or would like additional information. Thank you for giving us the opportunity to work with the City of Portsmouth.

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