

# THE NRG REPORT

## NORFOLK'S INVOLVEMENT AT THE NORTH CARVER LANDFILL

### UNCLOSED MASSACHUSETTS LANDFILLS

Norfolk Ram Group, LLC (Norfolk) is an experienced provider of assessment and remediation activities at unclosed landfills throughout the state of Massachusetts. Norfolk also provides landfill oversight services for local town boards. Below is a current list (as of April 2003) of unclosed landfills, provided by the Massachusetts Department of Environmental Protection (DEP), located throughout Massachusetts. If you would like to know more about the services that Norfolk can provide, please contact Mark S. Bartlett at (508) 747-7900, extension 131, or visit us online at [WWW.NORFOLKRAM.COM](http://WWW.NORFOLKRAM.COM). You can also gain additional information pertaining to the status of Massachusetts' landfills by contacting Brian Holdridge at the DEP's Bureau of Waste Prevention, Division of Planning and Evaluation, at (617) 292-5578.

#### Ash Landfill Names

Bondis Island - Agawam  
Carver-Marion-Wareham - Carver  
Ward Hill Neck - Haverhill  
Peabody Monofill Assoc. - Peabody  
Wheelabrator Saugus - Saugus  
Shrewsbury - Shrewsbury

#### Combustion Facility Names

Pioneer Valley Resource Recovery - Agawam  
SEMASS Resource Recovery - Rochester  
Covanta Haverhill Associates - Haverhill  
Wheelabrator North Andover - North Andover  
Wheelabrator Saugus - Saugus,  
Wheelabrator Millbury - Millbury



Norfolk Ram Group, LLC (Norfolk) was contracted by the Town of Carver, in order to perform assessment, remediation, operation, and maintenance services at their North Carver Landfill facility. Norfolk's personnel have been providing Professional Engineer and Licensed Site Professional (LSP) oversight services for the site, specific to the remediation of a contaminated groundwater plume emanating from the landfill and the landfill closure design. Currently, Norfolk is overseeing the closure and capping of the contaminated site, with urban fill closure materials being generated primarily from "Big Dig" construction-related projects. These soils are required to meet Department of Environmental Protection (DEP) regulation standards for online landfills. Norfolk's Brian V. Moran is serving as LSP for this Tier 1A site, while Mark S. Bartlett, P.E. is serving as principal-in-charge and engineer of record.

Norfolk's personnel review soil submittals, which outline the nature of the materials proposed for the landfill, their chemical quality and their proposed volume. The soils are currently being utilized for shaping and grading purposes, upon which an engineered cap will be built as part of the DEP's landfill closure requirements.

Norfolk's personnel are currently providing *in-situ* field screening for volatile organic compounds (VOCs), total polynuclear hydrocarbons (TPH) and metals. Based upon the field screening results, the materials are either deposited in the landfill or segregated for follow-up analytical testing. This level of oversight was required by the Town in order to better ensure the consistency of the materials being brought to the landfill for capping purposes, and to ensure compliance with DEP policy number COMM-97-001, which regulates contaminant levels that may be accepted at unlined landfills, such as the North Carver site.

Norfolk is using an Ultraviolet Fluorescence (UVF) analyzer to field screen soils for TPH. The UVF field screening material enables Norfolk to quickly and inexpensively evaluate incoming soils for compliance with the DEP Policy. Norfolk is also using X-Ray Fluorescence (XRF) analyzer technology, in order to screen the concentrations of heavy metals found within the soil. As a field-screening test, XRF technology can

detect up to 20 different elements, but then needs to be compared to the corresponding analytical data, which was gathered for the same materials at the corresponding location.

The DEP has performed extensive investigations at and around the North Carver Landfill in response to the identification of impacted private, residential water supplies back in the mid-1980's. Subsequent to the DEP's investigation, a groundwater remediation system was constructed by an outside contractor, which was subsequently turned over to the Town of Carver. Norfolk has worked extensively with the Town, in order to develop closure options for the landfill, in an effort to further mitigate ongoing groundwater contamination problems. Through their ongoing

operation and maintenance activities at the site, Norfolk's personnel have explored several options in connection with the construction of the landfill cap. At one time, the Town was to receive clay from the Big Dig Project, in order to cap and close the landfill. No longer an option, the current capping alternative is to be conducted by a private firm who is closing the landfill at no expense to the Town, in exchange for the ability to utilize urban fill for the project. It is estimated that this

approach is saving the Town of Carver approximately \$2 million. Approximately 150,000-cubic yards of material will be placed at the site in preparation for the final engineered cap.

The proposed schedule for the completion of the urban fill placement is August 2003, with the landfill cap being constructed thereafter for final closure. Per the DEP, the Town of Carver is ultimately responsible for the monitoring of the water quality for the following 30 years.

For more information pertaining to the UVF and XRF technologies, please review the articles on the reverse side of this newsletter, or contact Norfolk's Brian V. Moran at (508) 429-2368, extension 12. For more specific information pertaining to the landfill, or other engineering services that Norfolk provides, please contact Norfolk's Mark S. Bartlett at (508) 747-7900, extension 131, or visit us online at [www.norfolkram.com](http://www.norfolkram.com).

*Norfolk personnel have been providing Professional Engineer and Licensed Site Professional (LSP) oversight services for the site, specific to the remediation of a contaminated groundwater plume emanating from the landfill and the landfill closure design.*

## UVF TECHNOLOGY

Ultraviolet Fluorescence (UVF) technology is a *very selective detection method*, which is extremely useful when testing for various types of environmental contaminants (*i.e.*, total petroleum hydrocarbons, polyaromatic hydrocarbons, polychlorinated biphenyls, *etc.*). Utilizing UVF technology, operators can *accurately test aromatic hydrocarbons in soil and water* while on-site. Included software also aides operates in learning how to use the UVF technology, as well as how to report the results.

Norfolk Ram Group, LLC (Norfolk) utilizes UVF technology to field screen petroleum contamination at various site locations. With its actual analysis time of less than 5 seconds, UVF technology is an efficient way of determining contamination levels in soils. And with costs at 1/10 of those of laboratory methods (approximately \$20.00 per sample), UVF technology is an extremely cost-effective tool for the environmental scientists.

If you would like to know more about UVF technology, or Norfolk's services in general, please contact Brian V. Moran at (508) 429-2368, extension 12, or visit us online at [www.norfolkram.com](http://www.norfolkram.com).

Norfolk Ram Group, LLC is a full-service environmental and civil engineering consulting firm specializing in environmental compliance, permitting, assessment, design/build remediation, and civil engineering.

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## XRF TECHNOLOGY

Energy dispersive X-ray fluorescence (XRF) is a *method of detecting metals and other elements, such as arsenic and selenium, in soil and sediment*. First developed as a tool to detect lead in household paints and dust, XRF technology has now broadened and adapted its scope to include the analysis and monitoring of air and metals at industrial and/or hazardous waste sites. The instrument provides data in the field, which can be utilized to identify and characterize contaminated sites while guiding remedial actions. XRF analyzers have more recently been developed to examine and detect metal concentrations in water.

The XRF analyzer works on a process known as photoelectric effect. Energy is transmitted in the form of X-rays, and the phenomenon is referred to as X-ray fluorescence. Qualitative analysis of the element is performed by observing the energy level of the characteristic X-ray, while measuring the intensity of the corresponding X-ray performs the quantitative analysis.

The XRF system is comprised of two basic components: the radioisotope source and the detector. The detector is subsequently available in two types, gas-filled and solid-state, each with its own advantages and limitations for particular circumstances. Most instruments weigh less than 30 pounds and have 8-10 hours of battery-operated capability. Operators with one to two days of training can analyze samples on-site and within 5 minutes.

To perform an analysis using an XRF tool, a soil sample is positioned in *front of the plastic film measurement*

*window of the probe*. The measurement of the sample is then initiated by depressing a trigger or start button located on the XRF tool. By depressing the start button or trigger, the element is exposed to the radiation source for a number of seconds. The unit is equipped with software that *integrates the peaks of the counts in order to produce a readout of concentrations of analytes, and usually, the standard deviation for each analyte*. The XRF analyzer can be operated in both the *in-situ* and intrusive mode, depending on the type of analysis being performed.

The XRF is subject to a number of known interferences namely, matrix, moisture, sampling, chemistry, and detector resolution effects. The operator of the XRF analyzer must take into consideration each of these effects when utilizing the tool for sample analysis.

Even with its known interferences, the XRF is a useful tool with many advantages for the environmental scientist. Besides its portability and ability to produce sample results in less than 5 minutes, the XRF can analyze as many as 35 elements simultaneously, in a single reading. The samples are also not altered or destroyed during the analysis, allowing the operator to send the sample on for more stringent laboratory testing. With little or no sample preparation required, and no waste generated, the XRF analyzer provides for a quick and cost-effective way to analyze metals and other non-metallic elements.

If you would like to know more about XRF technology, or Norfolk's services in general, please contact Brian V. Moran at (508) 429-2368, extension 12.



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