SUPERFUND

Peterson/Puritan, Inc. Superfund Site

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM *protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.*

BACKGROUND:

The U.S. Environmental Protection Agency (EPA) is in the process of conducting a Remedial Investigation/Feasibility Study (RI/FS) at the southern portion of the Peterson/Puritan, Inc. Superfund Site (Site) which EPA refers to as Operable Unit 2 (OU-2) located in Cumberland and Lincoln, Rhode Island. EPA has prepared this fact sheet to explain the results of the Remedial Investigation (RI) portion of this process to community members.

The purpose of the RI is to characterize the nature and extent of contamination at the Site. The RI was recently completed, and includes human health and ecological risk assessments.

The purpose of the Feasibility Study (FS) is to evaluate alternatives for cleaning the contaminated areas of the Site. The FS for this portion of the Site is ongoing with an expectation for preparing a Proposed Plan for public review by the Spring of 2013. At that time, EPA will meet with the public to present the results of the FS and outline the preferred cleanup alternative for OU-2.

This fact sheet includes the following:

- a description of the Site;
- a summary of the RI results, including the risk assessments;
- a description of ongoing FS activities and next steps; and
- information on the Site community relations activities.

Additional technical information, including the RI Report and Risk Assessments, are available for review online at: http://www.epa.gov/region1/superfund/sites/peterson

SITE DESCRIPTION:

The Peterson/Puritan, Inc. Superfund Site is located along the Blackstone River in the towns of Cumberland and Lincoln, Rhode Island. The Site occupies about 500 acres and is approximately two miles long by 1,500 to 2,000 feet wide. The area became a Superfund Site in 1983 after it was discovered that groundwater supply wells along the Blackstone River had been contaminated and had to be taken offline in 1979. The reason the Site was included on the National Priorities List (NPL) was because exposure to contaminated groundwater posed a potential threat to human health and the environment.

Due to the large size of the Site and the number of contaminant sources discovered during early investigations, EPA divided the Site into two areas known as operable units in 1990. OU-1 includes the northern portion of the Site, encompassing an industrial park in the vicinity of Martin Street in Cumberland and extending south to include the former Quinnville wellfield in Lincoln. RI/FS activities at OU-1 were completed in the 1990s, and the selected remedy addressing contaminated groundwater in the vicinity of Martin Street has been in operation since 1997.

EPA is now focusing on OU-2, which is located in the southern portion of the Site and includes the former Quinnville Wellfield, where OU-1 and OU-2 overlap. Other major components of OU-2 include the inactive J.M. Mills Landfill; the 30-acre Unnamed Island, located in the Blackstone River just downstream of the J. M. Mills Landfill; a former waste transfer station (also identified as

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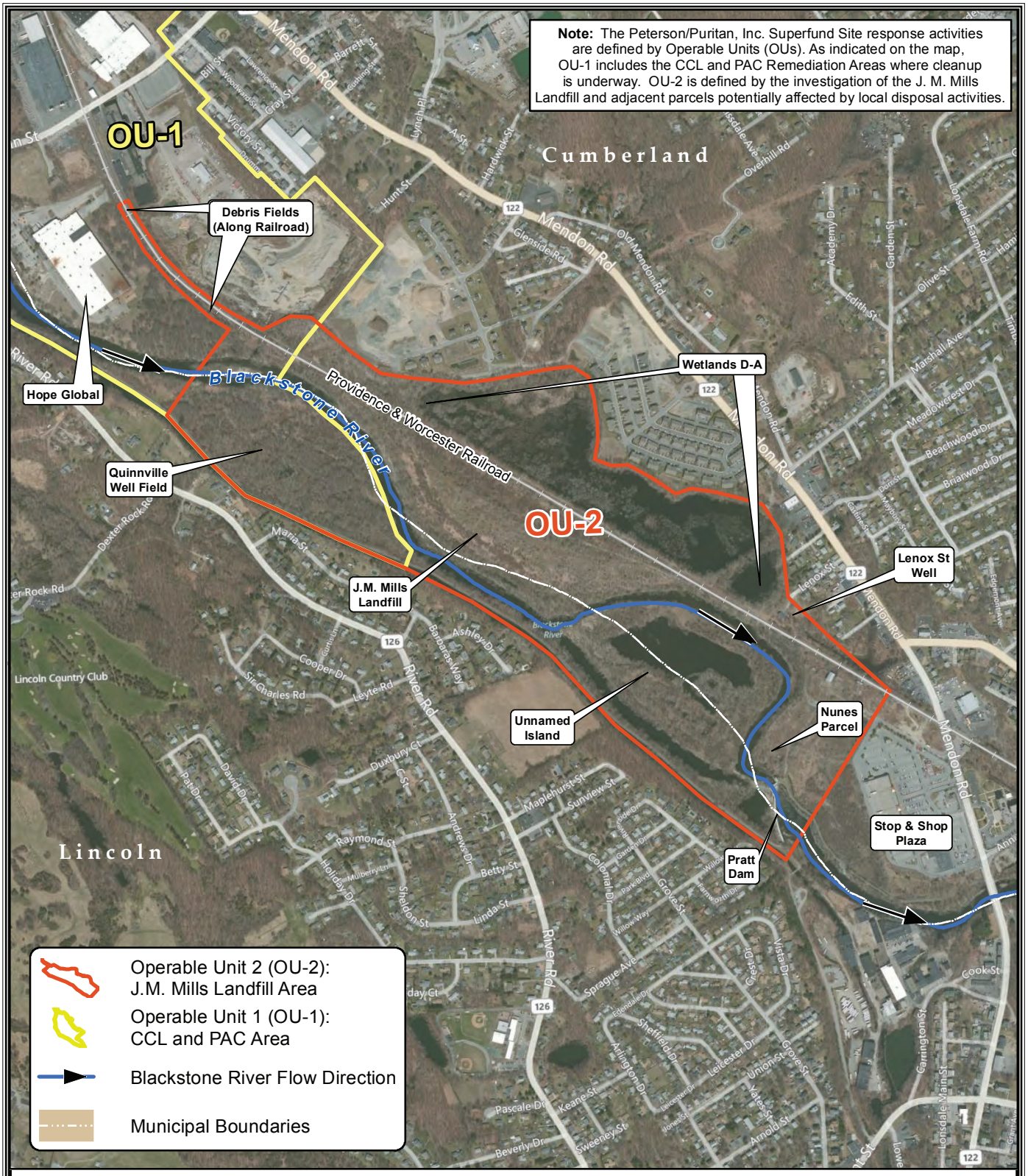

Figure 1

Peterson/Puritan, Inc. Superfund Site Operable Unit 2 (OU-2)

Cumberland & Lincoln, Rhode Island

EPA

EPA Region 1 GIS Center Map Tracker ID 8590 June 29, 2012 Data Sources: Aerial Photo Base Map - Bing Maps; Municipal Boundary, Railroad - USGS/RIGIS, 1989; River & Flow Direction - National Hydrography Dataset, 2007;

the Nunes Parcel) north and adjacent to the Stop & Shop Plaza on Mendon Road; the Providence and Worcester Railroad line; debris fields along the railroad line; the wetlands to the east of the inactive J. M. Mills Landfill; the Blackstone River; and the former Lenox Street municipal water supply well. The southern boundary of the Site includes the Pratt Dam.

The 36-acre J. M. Mills Landfill, which accepted mixed municipal and industrial waste from 1954 through 1986, contains the bulk of the waste in OU-2. The J. M. Mills Landfill is about 85 feet high from base to summit and is bordered on the west side by the Blackstone River and tightly on the east side by the Providence and Worcester Railroad tracks. At the start of the RI, surface waste was visible on both the former transfer station and on the Unnamed Island. Subsurface investigations during the RI subsequently revealed that buried waste is also present in those two areas.

The 24-acre Quinnville Wellfield in Lincoln and the Lenox Street municipal well in Cumberland were used as public drinking water supplies until 1979, when they were ordered closed by the Rhode Island Department of Health in response to the discovery that the water was contaminated with volatile organic compounds (VOCs). These water supply wells remain inactive today. However, the Blackstone Valley aquifer within the confines of the Superfund Site is designated as a potential future drinking water resource. There are also municipal drinking water supply wells outside of the boundaries of the Site. The Cumberland Water Department withdraws groundwater from the aquifer at the Manville Wellfield, approximately four miles upstream from the Site. The Lincoln Water Commission (LWC) no longer withdraws water from the aquifer. However, slightly more than a mile downstream from the Site in Lonsdale, and in the same aquifer, the LWC maintains its Well No. 4 on standby status. Operation of Well No. 4 ceased in 2004. As many as three private drinking water wells are known to be currently in service in the vicinity of Lenox Street in Cumberland.

REMEDIAL INVESTIGATION (RI) SCOPE AND RESULTS:

The results of the OU-2 investigations are included in an RI report which presents a description of the nature and extent of contamination in the various site media sampled, including groundwater, surface water, soil, sediment, and air.

The expectation for landfills in EPA's Superfund cleanup program is that typically engineering controls, such as containment, will be used for waste that poses a relatively low long-term threat where treatment is impracticable. Waste in Superfund landfills usually is present in large volumes and is a heterogeneous mixture of municipal waste frequently co-disposed with industrial and/or hazardous waste. Because treatment usually is impracticable, EPA generally considers containment (installation of a protective cap) to be the appropriate response action, or the "presumptive remedy," for the source areas of municipal landfill sites. Using a presumptive remedy approach, EPA determined that the J. M. Mills Landfill contained hazardous waste based on evidence from the historic records describing the disposal of hazardous materials at the Site, as well as the detection of soil and groundwater contamination that supports the likelihood for the presence of such wastes. Therefore, a capping remedy would likely be implemented at the J. M. Mills Landfill and as such it was not necessary to extensively sample this source area during the remedial investigations. The Nunes Parcel will also follow this approach since it was determined that this property was also predominantly a landfill. Samples of groundwater, surface water, soil, sediment, and air were collected and analyzed in the areas surrounding the J. M. Mills Landfill, the Nunes Parcel, and throughout the remainder of the Site.

All of the media, including groundwater, surface water, sediments, and soils, at the Site were found to contain detectable concentrations of a variety of contaminants. Some contaminants were found in several parts of the Site, while others were less widely distributed. For example, groundwater in various parts of the Site was found to be contaminated with VOCs, polycyclic aromatic hydrocarbons (PAHs), a type of semi-volatile organic compound (SVOCs); non-PAH SVOCs; pesticides; and metals. Conversely, groundwater was found to be contaminated with polychlorinated biphenyls (PCBs) at only a few locations. Although many different contaminants were found over a wide area of the Site, in certain locations the concentrations of these contaminants did not exceed levels of concern.

Like the groundwater, soils and sediment at OU-2 were found to be contaminated with VOCs, PAHs, non-PAH SVOCs, pesticides, metals, and PCBs. In certain areas of the Site, the contaminant levels were found to be low, and for certain contaminants detected at a number of locations within the boundary of the Site, the presence of these contaminants were probably due in part to deposition of contamination derived from unrelated sources in the Blackstone River valley.

Surface water quality at the Site varies depending on the water body under consideration. For example, the main channel of the Blackstone River had mostly low to undetectable levels of most contaminants that were analyzed, although during a high-flow event, concentrations of several PAHs and metals (e.g., lead) were higher than they were under lower flow conditions. Conversely, in several cases, inlets along the river and ponds on the Unnamed Island had higher concentrations of PAHs, and the only detections of PCBs were in two inlets along the Blackstone River.

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENTS:

As the data from the investigations became available, work began on the human health and ecological risk assessments as well as on the RI report. The risk assessments use the data from the RI report to identify which parts of the Site pose potentially unacceptable risks to human health or the environment. The risk assessments are an important component of the RI/FS and provide EPA a basis for cleaning up the Site.

BASELINE HUMAN HEALTH RISK ASSESSMENT (BHHRA):

The BHHRA for the Site was prepared in 2009 based on data from previous site investigations conducted in phases between 2003 and 2005. The goal of the BHHRA is to evaluate potential human health risks resulting from the exposure to site-related contaminants. A similar evaluation was performed specific to the Unnamed Island in 2010 following the collection of additional soil samples on the island.

The risk assessments included evaluation of human exposures to contaminants in soil, sediment, groundwater, surface water, indoor/outdoor air, landfill leachate, and fish tissue. Receptors included recreational users, trespassers, commercial/site workers, construction workers, and potential future residents, as appropriate to the various areas of the Site. Exposure pathways included inhalation, dermal (skin) contact, and ingestion of contaminants. Calculations were performed to assess the risks/hazards for each receptor appropriate to the various areas/exposure points at the Site. The calculation results were then compared to EPA's risk criteria to determine if the level of risk/hazard warrants cleanup.

RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT:

Results of the risk assessment are summarized below in Table 1. The BHHRA identified the potential risk to human health for future residents and commercial workers exposed to soil and indoor air at the Nunes Parcel and future residents exposed to soil and groundwater in the neighboring RIDEM Soil Removal Area. For both of these areas, as well as the Unnamed Island, Quinnville Wellfield, and Southern Bank/Pratt Dam areas, the BHHRA also identified risks to construction workers due to lead in soil. Risks were identified for a recreational user due to ingestion of fish from the Blackstone River (discussed further below). Finally, while the Quinnville and Lenox Street municipal wells remain closed and do not supply water to the communities, risks were identified for potential future residents based on exposure to site-wide groundwater. The groundwater contaminants that comprise the greatest risk to human health at the Site are arsenic, benzene, PAHs, vinyl chloride, and other metals. In addition, exceedances of RIDEM's residential direct exposure and soil leachability standards were also noted at various locations within the Site. Further refinement of this assessment, as may be needed, will be presented at the completion of the FS.

BASELINE ECOLOGICAL RISK ASSESSMENT (BERA):

The BERA was prepared for the Site in 2009 based on data from previous site investigations conducted in phases between 2003 and 2005. Following evaluation of these previous studies, an effects-based investigation conducted by Arcadis in 2005 included a fish community survey, fish tissue sampling, a benthic invertebrate survey, sediment toxicity testing, and habitat assessment studies, which formed the basis of the BERA evaluation. The goal of the BERA is to evaluate potential ecological risks posed to ecological communities resulting from the exposure to site-related contaminants. A similar evaluation was performed specific to the Unnamed Island in 2010 following the collection of additional soil samples on the Unnamed Island.

The risk assessments included evaluation of ecological exposures to contaminants in soil, sediment, and surface water. Receptors included birds, mammals, benthic invertebrates, amphibians, and fish, as appropriate to the various areas of the site. Calculations were performed to assess the risks for each receptor appropriate to the various areas/exposure points at the Site. Sediment toxicity testing was also performed in multiple water bodies in and around the Site. The calculation results were then compared to EPA's risk criteria, and supplemented with the toxicity testing results, to determine if the level of risk/impact warrants cleanup.

RESULTS OF THE ECOLOGICAL RISK ASSESSMENT:

Results of the risk assessment are summarized below in Table 2. The BERA identified the potential for adverse ecological impacts to birds from metals in soil across the Site and adverse to small mammals feeding at the J. M. Mills Landfill. In addition, the BERA has also identified the potential for severe/adverse ecological risk to fish, amphibians, and benthic invertebrates (e.g., worms/larvae living in sediment) exposed to surface water and sediment in many of the Site ponds, primarily due to metals in each medium. No unacceptable site-related ecological risks were identified in Wetlands A through D or in the main channel of

SUMMARY OF HUMAN HEALTH RISKS

Exposure Point	Receptor Evaluated					Actionable Risk Summary
	Recreational User	Trespasser	Commercial/Site Worker	Construction Worker	Resident	
Southern Bank/Pratt Dam	x	x		x		Construction Worker (inhalation/ingestion of lead in soil/dust)
Nunes Parcel/RIDEM Removal Area	x	x	x	x	x	Construction Worker (inhalation/ingestion of lead in soil/dust); Commercial Worker (dermal contact/ingestion of PAHs, pesticides, dioxin, and arsenic in soil; inhalation of VOCs in indoor air [from soil]); Future Resident (dermal contact/ingestion of PAHs, PCBs, pesticides, dioxin, and arsenic in soil; inhalation of VOCs in indoor air [from soil])
Quinnville Wellfield	x	x	x	x		Construction Worker (inhalation/ingestion of lead in soil/dust)
Debris Fields	x	x				No actionable risk
Wetlands A-D	x	x				No actionable risk
J. M. Mills Landfill	x	x	x			Presumptive Remedy
Blackstone River Fishing	x					Recreational User (ingestion of PAHs, PCBs, pesticides and arsenic in fish tissue)
Site-wide Groundwater					x	Future Resident (dermal contact/inhalation/ ingestion of VOCs, PAHs, PCBs, pesticides, and metals in groundwater)
Unnamed Island	x	x		x		Construction Worker (inhalation/ingestion of lead in soil/dust)

SUMMARY OF ECOLOGICAL RISKS

Exposure Point	Receptor Evaluated							Actionable Risk Summary
	Omnivorous Birds	Piscivorous Birds	Omnivorous Mammals	Piscivorous Mammals	Benthic Macroinvertebrates	Amphibians	Fish	
Terrestrial Habitat								
Southern Bank/Pratt Dam	x		x					Birds (ingestion of BEHP and metals in soil)
Nunes Parcel/RIDEM Removal Area	x		x					Birds (ingestion of BEHP and metals in soil)
Quinnville Wellfield	x		x					Birds (ingestion of BEHP and metals in soil)
Wetlands A-D	x		x					Birds (ingestion of BEHP and metals in soil)
J. M. Mills Landfill	x		x					Birds (ingestion of BEHP and metals in soil); Mammals (ingestion of metals in soil)
Unnamed Island	x		x					Birds (ingestion of BEHP and metals in soil)
Aquatic Habitat								
Blackstone River		x		x	x	x	x	No actionable risk
Wetlands A-D					x	x	x	No actionable risk
Ponds on Unnamed Island		x		x	x	x	x	Invertebrates, amphibians, and fish (exposure to metals and PAHs in surface water and/or sediment)
Ponds Adjacent to River					x	x	x	Invertebrates, amphibians, and fish (exposure to metals and PAHs in surface water and/or sediment)

the Blackstone River. Again, any further refinement as to the findings of this assessment, if necessary, will be presented at the completion of the FS.

CONCERNS IDENTIFIED FOR EATING FISH FROM THE BLACKSTONE RIVER:

The Blackstone River is a valuable recreational resource, and in the vicinity of OU-2, is a popular fishing area due to the abundance and variety for "resident" (native to the Blackstone River) fish species. Resident fish include largemouth bass, white sucker, bluegill, and pumpkinseed. Trout is also stocked in this waterway by the State. Stocked fish, however, are less likely to have been impacted by chemicals found in the waterway due to their shorter residence time in the river environment. The collection and chemical analysis of resident fish (excluding trout) was performed as part of the study along a portion of the Blackstone River, several ponds within OU-2, and also from upstream "reference" surface water stations, where the Site would not have contributed contaminants. Sampling of reference areas was performed in order to separately evaluate the effects of Site-based contamination from river-wide effects. While chemical concentrations in fish tissue varied depending on the species and sample location, the most notable contaminants detected in the fish tissue include PCBs, PAHs, pesticides, and metals.

In summary, the study found that people who catch and eat the fish may be at risk from contaminants found in the fish tissues of some native, bottom dwelling and predatory species. Similar findings were documented in fish from both within the boundary of OU-2 as well as in the comparative reference areas upstream. This result further indicates that the potential cause for the associated risk in eating fish may be due to many sources within the Blackstone River watershed.

Based on the results of this study, EPA finds that eating contaminated fish may pose a risk to public health and therefore recommends against the taking of resident fish for consumption from the water bodies identified in these investigations. EPA also emphasizes that progress in water quality improvements continues to be made throughout the watershed and supports non-contact recreational uses (kayaking, canoeing, fishing) within the Blackstone River. The Rhode Island Department of Health (RIDOH) advises that, with the exception of stocked trout, fish should not be eaten from the Blackstone River. However, "catch-and-release" sport fishing can still be enjoyed in this waterway, as in other urban rivers and ponds within the State. For additional information on fish, see the RIDOH website at www.health.ri.gov/healthrisks/poisoning/mercury/about/fish/.

NEXT STEPS:

The Feasibility Study: With the RI complete, the focus is now on the completion of the FS. The FS, which is the next step in the cleanup of the Site, is an analysis of cleanup alternatives for areas of the Site where unacceptable risks to human health or the environment have been identified. These areas include, but are not specifically limited to, the J. M. Mills Landfill, the Nunes Parcel, and portions of the Unnamed Island. The remedial alternatives will be developed by first selecting technologies to address the contaminated media at the Site, then combining those technologies into site-wide cleanup alternatives. The FS will provide a detailed evaluation of cleanup alternatives, including the presumptive remedy approach to address the landfills.

The Proposed Plan: When the FS is completed later in 2012, EPA will prepare a proposed plan outlining the preferred cleanup approach for OU-2. The proposed plan will present the evaluation of the various alternatives to address contamination at the site using defined criteria. During the proposed plan phase, EPA will hold a public meeting and a hearing in the Spring of 2013 for the public to ask questions and provide comments. The dates for those meetings will be formally announced through the local news paper.

COMMUNITY INVOLVEMENT/TECHNICAL ASSISTANCE GRANT (TAG):

In December 2010, EPA awarded a technical assistance grant to the Blackstone River Watershed Council/ Friends of the Blackstone River (BRWC/ FOB). The purpose of the TAG grant is to help community groups interpret the technical information related to Site cleanup. The Council will conduct outreach and serve as a resource for the community, and help Cumberland and Lincoln residents understand the cleanup process. More information may be found on the BRWC/FOB web site at www.blackstoneriver.org.

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