



# Proposed Plan

Troy Mills Landfill Superfund Site  
Troy NH

## Your Opinion Counts!

**EPA is accepting public comment on this cleanup proposal from July 21 to August 19, 2005.** If you have comments regarding EPA's proposed cleanup plan for the Site, we want to hear from you before making a final decision.

EPA recently completed a multi-million dollar drum removal action at the Troy Mills Landfill Superfund Site in Troy, New Hampshire. This work included the excavation and off-site disposal of 7,692 buried drums and 26,244 tons of contaminated soil. In addition, a two-foot permeable soil cap has been constructed to prevent potential contact with residual contaminated soils in the former drum disposal area. Sections of the adjacent solid waste landfill which were used as staging areas for the site cleanup were also covered and restored.

After further study of the Site, EPA proposes the following cleanup plan to address remaining groundwater and residual soil contamination. EPA's plan includes the following major components:

Maintaining the newly constructed permeable soil cap over the drum disposal area to allow precipitation to flow through the cap and facilitate the cleanup of the groundwater. The cap is being vegetated to provide stability and prevent erosion.

Allowing naturally occurring processes to continue reducing contaminant concentrations in the groundwater.

Capturing any potential free product, called light non-aqueous phase liquid (LNAPL), in the existing series of interceptor trenches constructed by EPA in 2003. The LNAPL will be disposed of off-site.

Establishing institutional controls that restrict the use of contaminated groundwater for drinking water purposes; restrict excavation activities in the area of the cap; and require notification of any changes in the use of the land.

Implementing a comprehensive monitoring and sampling program to evaluate groundwater, surface water, sediment and wetlands at the site to ensure that natural attenuation processes are continuing as expected.

Monitoring and maintaining the cap.

This proposed cleanup plan was developed in cooperation with the New Hampshire Department of Environmental Services (NHDES). A closer look at the proposed cleanup plan can be found on page 4.

## Public Hearing for the

### Proposed Cleanup Plan

7:00 - 9:00 p.m., Thursday, August 18, 2005

Meadowood Assembly Hall  
Bowkerville Rd., Fitzwilliam

**To provide formal comment, you may offer oral comments during the public hearing or send written comments post-marked no later than August 19, 2005 to:**

**James Chow**  
**U.S. EPA**  
**1 Congress St., Suite 1100 (HBO)**  
**Boston MA 02114**  
**E-mail: [chow.james@epa.gov](mailto:chow.james@epa.gov)**

For more information about the proposed plan, meetings, or should you have specific needs or questions about the facility and its accessibility, please contact EPA Community Involvement Coordinator Angela Bonarrigo (toll free): 888 372-7341 x 81034.

*In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, (Section 117) the law that established the Superfund program, this document summarizes EPA's cleanup proposal. For detailed information on the options evaluated for use at the site, see the Feasibility Study available for review on-line at [www.epa.gov/region01/superfund/sites/troymills](http://www.epa.gov/region01/superfund/sites/troymills) or at the information repositories at the Gay-Kimball Library in Troy and at EPA's 1 Congress Street Office in Boston.*

## Troy Mills Landfill Site History

The following is a brief summary of the regulatory history of the site.

1967-1968:

Troy Mills Inc. (TMI) begins using a 2-acre portion of the 270-acre parcel for drum disposal. A weekly average of 15-20 55-gallon drums of hazardous waste are disposed.

1978:

The New Hampshire Department of Health and Welfare (NHDOH) issues TMI a permit to operate a solid waste landfill. The permit specifically excludes the disposal of waste solvents, oils, plastisols, and other liquid wastes. TMI reportedly ceased drum disposal activities.

1980:

TMI begins site investigation activities under State order to evaluate impacts to soil, groundwater, and surface water from the drum disposal area.

1981-1998:

TMI performs numerous environmental investigations under State oversight to evaluate the nature and extent of contamination and impact coming from the drum disposal area.

1998:

TMI submits a proposal to contain the buried drums within a permeable cap and slurry wall, and operate a groundwater treatment system to keep contaminated groundwater from migrating off-site.

2000:

TMI requests to defer the cleanup activities due to corporate and financial difficulties.

2001:

TMI files for Chapter 11 (reorganization) bankruptcy and discontinues disposal activities at the solid waste landfill.

2003:

- The Site is added to the National Priorities List (Superfund).
- EPA installs three LNAPL interceptor trenches on the Site.
- TMI's bankruptcy status is converted to Chapter 7 (dissolution) bankruptcy.

2004-2005:

EPA excavates and removes 7,692 drums, sludge and contaminated soil from the Site, conducts additional investigations, and evaluates cleanup alternatives for addressing remaining residual contamination at the site.

2005:

EPA prepares this proposed plan for public comment.

## Why is Cleanup Needed?

The Troy Mills Landfill Superfund Site is a two-acre former drum disposal area located approximately 1.5 miles south of the center of Troy. It is surrounded primarily by undeveloped woodlands, a gravel access road to the west and a former railroad bed currently used as a walking, all terrain vehicle and snowmobile trail to the east. Rockwood Brook flows alongside the western border of the Site and continues north to Sand Dam Pond where the Town of Troy's recreational swimming area is located. The nearest residences are approximately ½ mile from the Site (see Figure 1).

The two-acre Superfund Site abuts an eight-acre former State-permitted solid waste landfill in the southeast corner of a larger 270-acre property. Between 1967 and 1978, drummed waste including solvents, plasticizers, vinyl resins, inks, lacquers and adhesives were disposed of in the drum disposal area.

The ownership status of the Site and surrounding property is uncertain as the current legal owner, Troy Mills, Inc., has been dissolved under Chapter 7 bankruptcy proceedings.

In 2003, EPA began a drum removal action at the two-acre Superfund Site. The first phase of activity included installation of three LNAPL interceptor trenches to capture free product floating on the groundwater. Prior to the installation of the trenches, free product was discharging along with the groundwater to a nearby wetland, located downgradient of the Site and referred to as the Rockwood Brook Wetland Study Area. The trenches have been constructed to capture and contain the free product while allowing groundwater to travel underneath. The free product that accumulates in the trenches is periodically removed with absorbent materials or vacuumed out and disposed of at an off-site facility. The trenches have been continuously maintained since they were installed in late 2003.

The second phase of the removal action resulted in the excavation of 7,692 buried drums, removal of 29,924 gallons of flammable liquid waste and 3,099 cubic yards of sludge, and excavation of 26,244 tons of heavily contaminated soil which were transported off-site for disposal at permitted facilities. Residual soils were left in place in the former drum disposal area.

In 2005, to prevent people from coming into direct contact with the residual contaminated soils that remain below the ground surface in the former drum disposal area, EPA constructed a two-foot thick, permeable soil

*continued on page 4*

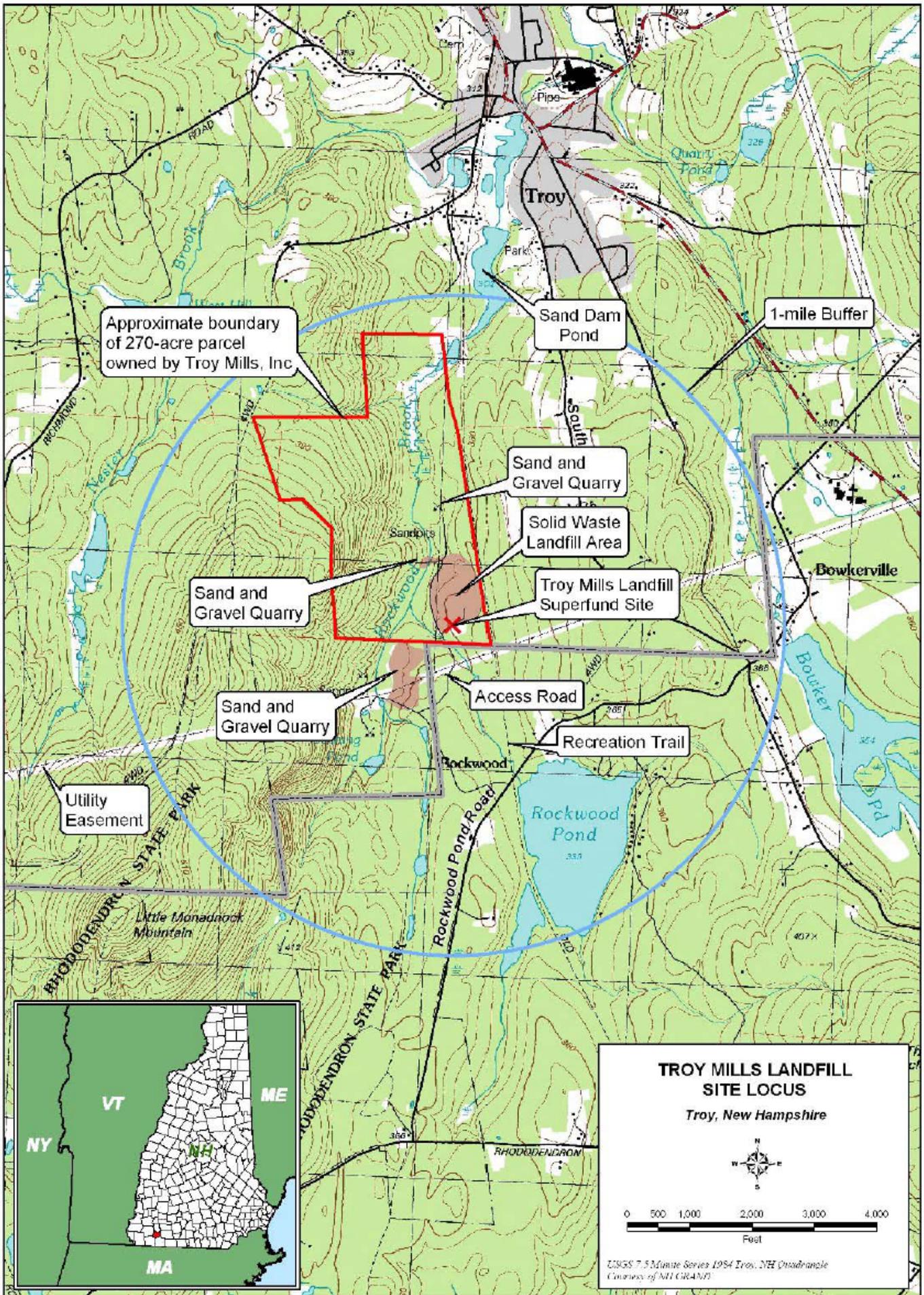


Figure 1

*continued from page 2*

cap over these soils. The cap consists of a minimum of 18 inches of sand covered with six inches of topsoil. The surface is being vegetated with grass seed to provide stability and prevent erosion. Sections of the adjacent solid waste landfill which were used as staging areas during the removal activities were also covered and are being restored.

Also in 2005, EPA completed further studies at the Site and prepared a Remedial Investigation Report. This document discusses the nature and extent of residual contamination found at the Site and assesses potential risks that this contamination may present to public health or the environment now or in the future. As part of these studies, EPA collected and analyzed surface water and sediment samples from nearby Rockwood Brook and the surrounding wetland, referred to as the Rockwood Brook Wetland Study Area. EPA also evaluated current and historic groundwater data, collected air and soil samples from locations throughout the Site, and evaluated analytical data collected over the course of the drum removal action.

The Remedial Investigation found a plume of groundwater contamination; approximately 5-7 acres in size, which included the area beneath the two-acre drum disposal area. Organic contaminants such as alkylbenzenes, chlorinated solvents, phthalates and toluene are the primary contaminants of concern in the groundwater. However, the Remedial Investigation indicates that most of these organic contaminants are biodegrading naturally. This investigation also confirms that removing the buried drums from the former disposal area has eliminated a significant source of ongoing contamination to the groundwater. As a result, EPA expects that the groundwater contaminant levels will continue to decrease over time through natural attenuation. Further, the permeable cap currently in place over the former drum disposal area is allowing precipitation to infiltrate the groundwater, thus further aiding the natural processes already occurring.

Naturally occurring metals such as iron and manganese are soluble in groundwater and, as with many landfills, become more mobile in the presence of organic contaminants in the groundwater. These metals then travel with the groundwater and eventually discharge at the ground surface as leachate. Laboratory analyses of leachate collected prior to the installation of the trenches indicated a potential risk to future recreational users coming into contact with the leachate. However, the Remedial Investigation found that the LNAPL interceptor trenches are working effectively to reduce contamination. In addition, leachate samples from the wetland indicate that contaminant concentrations have dropped below levels that pose a potential risk. While metals do not naturally biodegrade, they are expected to become less mobile.

A summary of the potential risks from the residual contamination found at the Site follows:

### **Current Risks**

- The groundwater contaminants do not pose a current risk to human health as there are currently no drinking water wells located within the contaminated groundwater plume.
- There are no unacceptable risks to people who are using Rockwood Brook, Sand Dam Pond, the former railroad bed or other Site areas for recreational activities.
- EPA's assessment of the leachate-impacted wetlands found no contaminant concentrations at levels that pose a potential risk to human health and the environment under current use scenarios. However, if residential development of portions of the 270-acre property in proximity to the Site occurs, more intensive recreational use of the site may follow.
- Residual soil located under the two-foot cap in the former drum disposal area does not present a current risk to human health. However, should the cap be damaged, or intrusive activities (such as excavation) occur in this area, there is a potential risk associated with coming into contact with this residual soil.

### **Future Risks**

- Should the use of the 270-acre property change, resulting in more intensive recreational use, there is a potential risk associated with coming into contact with contaminated soils in the wetland area.

# A Closer Look At EPA's Proposal...

After careful study of the remaining contamination at the Troy Mills Landfill Site, EPA proposes the following cleanup plan to reduce risks associated with groundwater, soil, sediment, and leachate contamination:

## Groundwater

EPA's proposed plan incorporates *Alternative GW-2: Monitored Natural Attenuation of Groundwater along with Institutional Controls*. Alternative GW-2 protects human health by preventing or controlling potential exposures to contaminated groundwater through institutional controls until naturally occurring processes return the groundwater to safe drinking water levels.

Institutional controls include establishing a Groundwater Management Zone (GMZ), consistent with State of New Hampshire regulations, to prevent the installation of any groundwater supply wells within the 5-7 acre contaminated groundwater plume area. The GMZ boundary will be surveyed and recorded by placing a restriction on the deed of the property (Figure 2).

In addition, EPA will implement a groundwater monitoring program, including periodic sampling and analysis of monitoring wells located both inside and outside of the proposed GMZ area, to confirm that natural attenuation processes are occurring as expected. The groundwater monitoring program will also include periodic sampling and analysis of wetland soil, wetland surface water, and Rockwood Brook sediment and surface water to confirm that contaminated groundwater is not discharging into and impacting these areas.

In addition, if there is a change in the use of the land near the Site, EPA will re-evaluate potential risks to human health at that time.

## LNAPL / Leachate

EPA's proposed plan incorporates *LC-2: LNAPL Interceptor Trenches*. Alternative LC-2 protects human health and the environment by capturing LNAPL before it discharges along with the groundwater to a drainage ditch along the western edge of the landfill. Under this alternative, EPA will continue to maintain and operate the existing series of interceptor trenches until LNAPL levels decline and contaminant concentrations in leachate no longer pose an unacceptable risk. An LNAPL / leachate monitoring program will also be implemented.

## Soil

EPA's proposed plan incorporates *FDDA-2: Former Drum Disposal Area: Permeable Cap*. Alternative FDDA-2 protects human health by preventing exposure to residual soil contamination in the former drum disposal area by maintaining the recently constructed permeable cap. The permeable cap allows precipitation to infiltrate the groundwater. Continued use of the cap is expected to facilitate and expedite the cleanup of the groundwater through natural attenuation. The cap will be inspected regularly and if it is found to be damaged, EPA will take measures to repair it. Land use restrictions will also be put in place to restrict activities that could damage the cap. In addition, the groundwater will be monitored, as described in alternative GW-2, to confirm that the remedy is working effectively.

## Five-Year Reviews

The entire remedy will be subject to a comprehensive review every five years. The purpose of the review is to evaluate the effectiveness of the remedy and to ensure that it remains protective of human health and the environment over time. EPA may implement additional actions if the review finds that the remedy is not protective.

## Cost

The estimated cost of EPA's proposed cleanup plan is \$2.9 million (cost projections are for 30 years).

### Why Does EPA Recommend this Proposed Cleanup Plan?

Based on current information, EPA believes the proposed cleanup plan achieves the best balance among the criteria used to evaluate alternatives. The proposed cleanup plan provides both short-term and long-term protection of human health and the environment and is cost effective.

During the comment period, EPA welcomes your comments on the proposed cleanup plan as well as the other technical approaches that EPA evaluated. These alternatives are summarized on the next page. For additional information, please consult the Feasibility Study, available at the Gay-Kimball Library in Troy and at EPA's Records Center in Boston or on line at: [www.epa.gov/region01/superfund/sites/troymills](http://www.epa.gov/region01/superfund/sites/troymills)



## Four Kinds of Cleanup

EPA looked at four different technical approaches to determine the best way to reduce the risks at the Troy Site.

**Take no action:** Leave the Site as it is.

**Contain contamination:** Leave contamination in place, cover or contain it to prevent exposure to, or spread of, contaminants, and monitor Site conditions. This method reduces risks from exposure to contamination, but does not destroy or reduce it.

**Move contamination off site:** Remove contaminated material and dispose of it or treat it elsewhere.

**Treat contamination on-site:** Use a chemical or physical process on the Site to destroy or remove the contaminants. Treated material can be left on-site. Contaminants captured by the treatment process are disposed of in an off-site hazardous waste facility.

EPA's proposed cleanup plan for the Troy Site incorporates two of the four options noted above to reduce risks and protect human health and the environment. Specifically, the proposed plan will:

- Establish and maintain institutional controls to prevent the installation of drinking water wells and to protect the permeable cap from being disturbed.
- Contain contamination by maintaining the permeable cap that was constructed over the former drum disposal area.
- Allow naturally occurring biodegradation of organic contaminants to continue to reduce contaminant concentrations in groundwater.
- Monitor Site conditions over time.

### Cleanup Levels

EPA, in consultation with the state of New Hampshire, has established site-specific cleanup goals called Preliminary Remediation Goals (PRGs) for groundwater and leachate. These PRGs are protective of human health and the environment based upon the exposure scenarios evaluated in the Remedial Investigation. The PRGs are described in Chapter 2 and Table 2-5 of the Feasibility Study.

## Cleanup Alternatives Considered for the Troy Mills Landfill Site

A Feasibility Study reviews the alternatives that EPA considers for cleanup at a Superfund site. The options, referred to as "cleanup alternatives," are different combinations of technical approaches to restrict access to, contain, move, or treat contamination to protect public health and the environment. EPA evaluated the following alternatives to address contaminated groundwater, leachate, and residual soil contamination in the former drum disposal area. During the comment period, EPA welcomes comments on the proposed cleanup plan as well as these other alternatives.

### Groundwater Cleanup Alternatives:

#### **Alternative GW-1: No Action**

Under this alternative, nothing would be done to address the contamination that exists in the groundwater, except to reassess the situation at least every five years. EPA is required to look at no action, which provides a baseline for comparison of other alternatives.

- Estimated Cost: \$12,400

#### **GW-2: Monitored Natural Attenuation and Institutional Controls**

Under this alternative, institutional controls in the form of deed restrictions and a GMZ would be put in place to limit potential future use of contaminated groundwater until groundwater cleanup levels are reached. Natural degradation processes would continue to reduce contaminant levels. Monitoring would be conducted to assess the effectiveness of the natural processes until cleanup levels are achieved. Additional information on this preferred alternative can be found on page 6.

- Estimated Cost: \$2.2 million

#### **GW-3: Monitored Natural Attenuation combined with In-Situ Remediation**

Under this alternative, natural degradation would be retained as the primary remedy component to reduce groundwater contaminant levels along with long-term monitoring. However, additional in-situ treatment technologies would be implemented to address those contaminants that would not readily biodegrade. The evaluation of the appropriate in-situ treatment technology would require treatability studies in order to select and design the appropriate system. Institutional controls would also be required to limit future use of contaminated groundwater until groundwater cleanup levels were reached. Monitoring would be conducted to assess the effectiveness of the natural and in-situ processes until cleanup levels are achieved.

- Estimated Cost: \$2.8 million

#### **GW-4: Groundwater Extraction and Treatment**

Under this alternative, extraction wells or subsurface drains would be utilized to capture contaminated groundwater. An on-site groundwater

*continued on page 8*

treatment facility would be constructed to treat extracted groundwater. The treated groundwater would be discharged into the ground or to the surface. Additional studies would be required to design the groundwater extraction and treatment system. Institutional controls would also be required to limit future use of contaminated groundwater until groundwater cleanup levels were reached. Monitoring would be conducted to evaluate groundwater quality until cleanup levels are achieved.

- Estimated Cost: \$6.6 million

## **LNAPL / Leachate Cleanup Alternatives:**

### ***LC-1: No Action***

Under this alternative, nothing would be done to address the LNAPL contamination that exists in the leachate, except to reassess the situation at least every five years. EPA is required to look at no action, which provides a baseline for comparison of other alternatives.

- Estimated Cost: \$12,400

### ***LC-2: LNAPL Interceptor Trenches***

Under this alternative, the LNAPL interceptor trenches installed by EPA in 2003 would continue to be used and maintained until contaminant concentrations in the leachate reached cleanup levels. Monitoring of leachate would be conducted. Additional information on this preferred alternative can be found on page 6.

- Estimated Cost: \$593,000

### ***LC-3: Extraction Wells***

Under this alternative, shallow extraction wells would be utilized to actively remove free floating product and contaminated groundwater. A treatment facility would be constructed to treat the extracted LNAPL and groundwater. The treated groundwater would then be discharged on site. Additional studies would be required to design the LNAPL extraction and treatment system. Monitoring of leachate would be required.

- Estimated Cost: \$2.2 million

## **Former Drum Disposal Area Capping Alternatives:**

### ***FDDA-1: No Action***

Under this alternative, nothing would be done to prevent exposure to residual contaminated soil in the former drum disposal area, except to reassess the situation at least every 5 years. EPA is required to look at no action, which provides a baseline for comparison of other alternatives.

- Estimated Cost: \$12,400

### ***FDDA-2: Permeable Cap***

Under this alternative, the permeable cap constructed by EPA in 2005 over the former drum disposal area would be retained. Institutional controls would also be required to prevent activities that would disturb the cap and monitoring of the site would occur as long as a potential risk from the backfilled soils under the cap are present. Additional information on this preferred alternative can be found on page 6.

- Estimated Cost: \$67,720

### ***FDDA-3: Impermeable Cap***

Under this alternative, EPA would construct an impermeable cap over the former drum disposal area. Further design studies would be required to determine whether or not the current permeable cap would have to be first excavated or could be retained. Institutional controls would also be required to prevent activities that would disturb the impermeable cap and monitoring of the site would occur as long as a potential risk from residual soils under the cap are present.

- Estimated Cost: \$1.1 million

## **Potential Impacts To The Community**

Since the proposed remedy does not include any additional construction on the site, the main impact on the community will be limitations placed on reuse of the area. The site is privately owned, but is accessible to recreational users. The documented site risks do not pose any limitation on the current recreational uses of the area, as long as the permeable cap and the LNAPL trench system are protected. Maintenance of the permeable cap, monitoring activities, and operation of the LNAPL collection trenches are not expected to affect the community.



## **The Nine Criteria For Choosing a Cleanup**

Nine criteria are used to evaluate the cleanup alternatives and select a remedy. Of the nine, protection of human health and the environment and compliance with ARARs are considered threshold requirements that must be met by the selected remedy. EPA balances its consideration of alternatives with respect to long term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short term effectiveness; implementability; and cost. State and community concerns are modifying criteria and may prompt EPA to modify the preferred alternative or choose another alternative. Following are definitions of the nine criteria.

**1. Overall protection of human health and the environment:** Will it protect people and the plant and animal life on and near the site? EPA will not choose a plan that does not meet this basic criterion.

**2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** Does the alternative meet all federal and state environmental statutes, regulations and requirements? EPA will not choose a plan that does not meet this basic criterion.

**3. Long-term effectiveness and permanence:** Will the effects of the cleanup plan last or could contamination cause future risk?

**4. Reduction of toxicity, mobility or volume through treatment:** Does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material through treatment?

**5. Short-term effectiveness:** How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents or the environment?

**6. Implementability:** Is the alternative technically feasible? Are the right goods and services (i.e. treatment machinery, space at an approved disposal facility) available for the plan?

**7. Cost:** What is the total cost of an alternative over time?

**8. State acceptance:** Do state environmental agencies agree with EPA's proposal?

**9. Community acceptance:** What objections, suggestions or modifications does the public offer during the comment period?

## **Evaluation of Alternatives**

EPA uses nine criteria to balance the advantages and disadvantages of various cleanup alternatives. As described below, EPA has evaluated how well each of the cleanup alternatives meets the first seven criteria. Once comments from the state and the community are received EPA will evaluate all nine criteria and select the final cleanup plan.

### **1. Overall Protection of Human Health and the Environment**

#### **Groundwater Cleanup:**

Alternative GW-1 would not provide any protection of human health because there would be no action taken to address or monitor the risks posed by groundwater contaminants. There are no unacceptable ecological risks associated with the Site.

Alternatives GW-2, GW-3, and GW-4 all will achieve the cleanup objectives and will be equally protective of human health and the environment in the long term. Alternative GW-2 may require the most time to achieve groundwater cleanup levels as it relies solely on natural processes. However, alternatives GW-3 and GW-4 would require approximately 1-3 years of treatability studies, engineering design effort, and construction before the alternatives would be fully implemented. Meanwhile, natural attenuation of contaminants would continue to occur. All three of these alternatives will require institutional controls to prevent the use of contaminated groundwater for drinking water.

#### **LNAPL / Leachate Cleanup:**

Alternative LC-1 would not provide any protection of human health because there would be no action taken to address or monitor the risks posed by the leachate.

Alternatives LC-2 and LC-3 will achieve the cleanup objectives and will be equally protective of human health and the environment in the long term. Alternative LC-2 may require more time to achieve leachate cleanup levels. Alternative LC-3 may require less time to achieve cleanup levels as it actively extracts and treats contaminated leachate; however, this alternative would require approximately 1-3 years of treatability studies, engineering design effort, and construction before the extraction system would be operational.

#### **Former Drum Disposal Area Cap:**

Alternative FDDA-1 would not provide any protection of human health because there would be no action taken to address potential risks posed by the drum disposal area residual soils, since the existing cap would not be maintained and site conditions would not be monitored.

Alternative FDDA-2 and FDDA-3 will both achieve the cleanup objectives and will be equally protective of human health and the

environment in the long term. Both cap alternatives provide a soil cover that prevents dermal contact with underlying residual contaminated soils. These alternatives will also require institutional controls to prevent activities that disturb the cap.

## **2. Compliance with Applicable or Relevant and Appropriate Environmental Requirements (ARARs)**

### ***Groundwater Cleanup:***

Alternative GW-1 would not meet federal/state cleanup requirements for this site.

Alternative GW-2 meets all appropriate federal/state cleanup requirements. Alternatives GW-3 and GW-4 would both require pre-remedial engineering design studies, but would be designed and implemented to meet all appropriate federal/state cleanup requirements. Alternative GW-4 would require compliance with additional requirements that apply to the discharge of treated groundwater.

### ***LNAPL / Leachate Cleanup:***

Alternative LC-1 would not meet federal/state cleanup requirements for this site.

Alternative LC-2 and LC-3 would be designed and implemented to meet all appropriate federal/state cleanup requirements. Alternative LC-3 would require compliance with additional requirements that apply to the discharge of treated leachate and groundwater.

### ***Former Drum Disposal Area Cap:***

Alternative FDDA-1 would not meet federal/state cleanup requirements for this site.

Alternative FDDA-2 has already been constructed and it meets all appropriate federal/state cleanup requirements. Alternative FDDA-3 would be designed and implemented to meet all appropriate federal/state cleanup requirements. To remain in compliance over time, both alternatives would implement institutional controls and cap monitoring procedures.

## **3. Long-Term Effectiveness and Permanence**

### ***Groundwater Cleanup:***

Alternative GW-1 does not provide long-term effectiveness or a permanent solution.

Alternatives GW-2, GW-3, and GW-4 all will provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently restore

groundwater to drinking water cleanup levels in a reasonable timeframe. Each of these alternatives will also utilize institutional controls to prevent the use of groundwater for drinking water until cleanup levels are achieved.

### ***LNAPL / Leachate Cleanup:***

Alternative LC-1 does not provide long-term effectiveness or a permanent solution.

Alternatives LC-2 and LC-3 will provide long-term effectiveness and permanence as each of these alternatives would be expected to permanently reduce contaminant levels in the leachate to safe levels.

### ***Former Drum Disposal Area Cap:***

Alternative FDDA-1 would not provide long-term effectiveness or permanence.

Alternatives FDDA-2 and FDDA-3 both will provide permanence as each of these alternatives provides a permanent barrier that prevents contact with underlying residual contaminated soil. Institutional controls, regular inspections and cap maintenance would also be implemented as part of alternatives FDDA-2 and FDDA-3 to ensure their long-term effectiveness. Alternative FDDA-2 is more effective in facilitating the proposed groundwater cleanup alternative as the permeable cap allows re-oxygenation and flushing of groundwater to occur.

## **4. Reduction of Toxicity, Mobility, or Volume Through Treatment**

### ***Groundwater Cleanup:***

Alternative GW-1 would not reduce contaminant toxicity, mobility, or volume through treatment.

Alternative GW-2 would not reduce contaminant toxicity, mobility, or volume through treatment.

Alternative GW-3 and GW-4 rely on treatment technologies to reduce contaminant toxicity, mobility and volume. Alternative GW-3 relies on facilitating in-situ treatment processes, while alternative GW-4 relies on active treatment process.

### ***LNAPL / Leachate Cleanup:***

Alternative LC-1 would not reduce contaminant toxicity, mobility, or volume through treatment.

Alternative LC-2 would not reduce contaminant toxicity, mobility, or volume through treatment.

*continued on page 11*

Alternative LC-3 would provide for permanent and irreversible reduction in contaminant toxicity, mobility and volume through extraction and treatment of contaminated free floating product. However, alternative LC-3 would require time to complete treatability studies, engineering design efforts, and construction before this system is operational.

**Former Drum Disposal Area Cap:**

Alternatives FDDA-1, FDDA-2, and FDDA-3 would not reduce contaminant toxicity, mobility, or volume through treatment.

## 5. Short-Term Effectiveness

**Groundwater Cleanup:**

Alternative GW-1 would not achieve address potential groundwater risks. As alternative GW-1 involves no actions, no short-term impacts would be posed to on-site workers, the community, or the environment.

Alternatives GW-2, GW-3, and GW-4 are expected to mitigate potential groundwater risks in less than five years. Alternative GW-2 would have limited short-term impacts to on-site workers and the community resulting from periodic monitoring activities. Alternatives GW-3 and GW-4 would have more significant short-term impacts to on-site workers, the community, and the environment from the construction and operation of treatment systems, along with impacts related to periodic monitoring activities.

**LNAPL / Leachate Cleanup:**

Alternative LC-1 would not address potential leachate risks. As alternative LC-1 involves no actions, no short-term impacts would be posed to on-site workers, the community, or the environment.

Alternatives LC-2 and LC-3 are expected to mitigate potential leachate risks in less than one year.

Alternative LC-2 would have limited short-term impacts to on-site workers and the community resulting from periodic monitoring activities. Alternative LC-3 would have more significant short-term impacts to on-site workers, the community, and the environment from the construction and operation of an extraction and treatment system, along with minor impacts related to periodic monitoring activities.

**Former Drum Disposal Area Cap:**

Alternative FDDA-1 would not address potential residual soil risks. As alternative FDDA-1 involves no actions, no short-term impacts would be posed to on-site workers, the community, or the environment.

Alternatives FDDA-2 and FDDA-3 would be expected to mitigate potential direct contact risks to residual soils in less than one year upon completion of the cap. However, as alternative FDDA-2 would retain the existing permeable cap that was installed by EPA in 2005, it is already preventing potential direct contact risks and would have no additional short-term impacts to on-site workers, the community, or the environment. Alternative FDDA-3 would have more significant short-term impacts to on-site workers, the community, and the environment from the construction and operation of a permeable cap.

## 6. Implementability

**Groundwater Cleanup:**

Alternative GW-1 is the easiest to implement because no remedial actions are required.

Alternative GW-2 is easily implementable as it allows natural attenuation processes to address groundwater contamination. Institutional controls to prevent the use of contaminated groundwater for drinking water and implementation of a long-term monitoring program are also easily implementable.

Alternatives GW-3 and GW-4 are implementable but more complex as they require the completion of treatability studies, engineering design efforts, and construction before the various treatment systems can be operated. Both of these alternatives would also involve the implementation of institutional controls and long-term monitoring programs which are easily implementable.

**LNAPL / Leachate Cleanup:**

Alternative LC-1 is the easiest to implement because no remedial actions are required.

Alternative LC-2 is easily implementable as it makes use of the LNAPL interceptor trenches that were installed by EPA in 2003. Alternative LC-2 also includes a long-term monitoring program which is easily implementable.

Alternative LC-3 is implementable but more complex as it requires the completion of treatability studies, engineering design efforts, and construction before the extraction and treatment system can be operated. Alternative LC-3 also includes a long-term monitoring program which is easily implementable.

**Former Drum Disposal Area Cap:**

Alternative FDDA-1 is the easiest to implement because no remedial actions are required.

*continued on page 12*

Alternative FDDA-2 is easily implementable as it makes use of the permeable cap that was installed by EPA in 2005. Alternative FDDA-2 also includes institutional controls which are easily implementable.

Alternative FDDA-3 is implementable but more complex as it requires constructing an impermeable cap over the former drum disposal area. Additional engineering design effort would be required to determine whether or not the permeable cap, either partially or wholly, would need to be excavated before constructing the impermeable cap. Construction of an impermeable cap may impact the ability and implementability of the preferred groundwater alternative. Alternative FDDA-3 also includes institutional controls which are easily implementable.

## 7. Cost

### **Groundwater Cleanup:**

Alternative GW-1 has no capital costs and the cost associated with the required five-year reviews is low. The cost for alternative GW-1 is \$12,400

Alternative GW-2 has no capital costs but would have costs associated with implementing institutional controls and a long-term monitoring program. The cost for alternative GW-2 is \$2.2 million.

Alternatives GW-3 and GW-4 require significant design, construction, and operation costs in addition to costs associated with implementing institutional controls and a long-term monitoring program. The cost for alternative GW-3 is \$2.8 million and the cost for alternative GW-4 \$6.6 million.

### **LNAPL / Leachate Cleanup:**

Alternative LC-1 has no capital costs and the cost associated with the required five-year reviews is low. The cost for alternative LC-1 is \$12,400.

Alternative LC-2 has no capital costs as it would utilize the existing LNAPL/leachate trenches, but would have costs associated with removal and disposal of LNAPL and a long-term monitoring program. The cost for alternative LC-2 is \$593,000.

Alternative LC-3 would require significant design, construction, and operation costs in addition to costs associated with a long-term monitoring program. The cost for alternative LC-3 is \$2.2 million.

### **Former Drum Disposal Area:**

Alternative FDDA-1 has no capital costs and the cost associated with the required five-year reviews is low. The cost for alternative FDDA-1 is \$12,400.

Alternative FDDA-2 has no capital costs as it would utilize the permeable cap constructed by EPA in 2005, but would have costs associated with implementing institutional controls and routine inspection and maintenance of the cap. The cost for alternative FDDA-2 is \$67,720.

Alternative FDDA-3 has significant capital costs associated with constructing an impermeable cap in addition costs associated with implementing institutional controls and routine inspection and maintenance of the cap. The cost for alternative FDDA-3 is \$1.1 million.

## 8. State Acceptance

EPA has collaborated closely with NHDES in performing the recently completed removal activities and in overseeing the RI and FS. NHDES has reviewed the proposed cleanup plan, and any additional state comments will be addressed in the final cleanup decision document. The State will submit its concurrence or lack of concurrence with the proposed remedy for inclusion in EPA's final cleanup decision document following the public comment period.

## 9. Community Acceptance

Community acceptance will be evaluated based on comments received. During the 30-day formal comment period, EPA will accept written comments and hold a formal public hearing to accept formal verbal comments.

The following table presents a further comparison of the cleanup alternatives.

### Comparison of Alternatives

NINE CRITERIA	GROUNDWATER CLEANUP				LNAPL / LEACHATE CLEANUP			FORMER DRUM DISPOSAL AREA CAP		
	GW-1 NO ACTION	GW-2* MNA	GW-3 MNA & IN-SITU TREATMENT	GW-4 PUMP & TREAT	LC-1 NO ACTION	LC-2* INTERCEPTOR TRENCHES	LC-3 EXTRACTION SYSTEM	FDDA-1 NO ACTION	FDDA-2* PERMEABLE CAP	FDDA-3 IMPERMEABLE CAP
PROTECTION OF HUMAN HEALTH & THE ENVIRONMENT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MEETS FEDERAL & STATE REQUIREMENTS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PROVIDES LONG TERM PROTECTION	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
REDUCES TOXICITY, MOBILITY & VOLUME THROUGH TREATMENT	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROVIDES SHORT TERM PROTECTION	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
IMPLEMENTABLE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
COST +	\$12,400	\$2.2 M	\$2.8 M	\$6.6 M	\$12,400	\$593,000	\$2.2 M	\$12,400	\$66,720	\$1.1 M
STATE ACCEPTANCE	TO BE DETERMINED AFTER THE PUBLIC COMMENT PERIOD									
COMMUNITY ACCEPTANCE	TO BE DETERMINED AFTER THE PUBLIC COMMENT PERIOD									

MEETS OR EXCEEDS CRITERIA    
  PARTIALLY MEETS CRITERIA    
  DOES NOT MEET CRITERIA

\* EPA'S PREFERRED ALTERNATIVE

+ TOTAL PRESENT WORTH COST, ESTIMATED OVER 30-YEAR PERIOD.

## What is a Formal Comment?

To make a **formal** comment you need only speak during the public hearing on **Thursday, August 18, 2005** or submit a written comment during the comment period, which ends on **August 19, 2005**.

Federal regulations require EPA to distinguish between "formal" and "informal" comments. While EPA uses your comments throughout the cleanup process, EPA is **required to respond to formal comments on the proposed plan in writing only**. EPA will not respond to your comments during the formal hearing on **Thursday, August 18, 2005**.

The fact that EPA responds to formal comments in writing only does not mean that EPA cannot answer questions. Once the meeting moderator announces that the formal hearing portion of the meeting is closed, EPA can respond to informal questions.

EPA will review the transcript of all **formal** comments received at the hearing, and all written comments received during the formal comment period, before making a final cleanup decision. EPA will then prepare a written response to all the **formal** written and oral comments received.

Your formal comment will become part of the official public record. The transcript of comments and EPA's written responses will be issued in a document called a Responsiveness Summary when EPA releases the final cleanup decision.

## Next Steps

This fall, EPA expects to have reviewed all comments and signed a Record of Decision document describing the chosen cleanup plan. The Record of Decision and a summary of responses to public comments will then be made available to the public at the site information repositories listed here, as well as on EPA's Troy Mills Landfill Superfund Site web site noted on this page.

## For More Information

### Site Contacts

If you have any questions about the Troy Mills Site or would like more information, you may call or write to:

James Chow, Remedial Project Manager  
US EPA  
One Congress Street, Suite 1100 (HBO)  
Boston, MA 02114-2023  
(617) 918-1394  
chow.james@epa.gov

or

Angela Bonarrigo, Community Relations  
US EPA  
One Congress Street, Suite 1100 (HBS)  
Boston, MA 02114-2023  
(617) 918-1034  
bonarrigo.angela@epa.gov

### Information Repositories

*This publication summarizes a number of reports and studies. All of the technical reports and studies prepared to date for the site are available at the following information repositories:*

Gay-Kimball Library  
10 South Main Street  
Troy NH 03465  
(603) 242-7743

EPA Records Center  
1 Congress Street  
Boston, MA 02114

*Please call to schedule an appointment*  
(617) 918-1440

Information is also available for review on the world wide web:

**[www.epa.gov/region01/superfund/sites/troymills](http://www.epa.gov/region01/superfund/sites/troymills)**

All documents may be downloaded and printed.  
Adobe Acrobat Reader is required.



public comment sheet (continued)



---

---

---

---

---

---

---

---

---



Fold, staple, stamp, and mail



---

---

---

place  
stamp  
here

Mr. James Chow  
US EPA  
1 Congress Street, Suite 1100 (HBO)  
Boston , MA 02114-2023