Winthrop Landfill Site
Winthrop, ME

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

THE SUPERFUND PROGRAM *protects human health and the environment by locating, investigating, and cleaning up 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 ground-water to productive use.*

YOUR OPINION COUNTS: OPPORTUNITIES TO COMMENT ON THE PLAN

EPA will be accepting public comment on this cleanup proposal from April 23, 2019 through May 23, 2019. You don't have to be a technical expert to comment. If you have a concern, suggestion, or preference regarding this Proposed Plan, EPA wants to hear from you before making a final decision on how to protect your community. EPA also is requesting public comment concerning its wetland and floodplain findings. See page 6 for more details. Comments can be sent by mail, e-mail, or fax. People also can offer oral or written comments at the formal public hearing. If you have questions about how to comment, or if you have specific needs for the public hearing or questions about the facility and its accessibility, please contact Darriel Swatts (see below).

CLEANUP PROPOSAL SNAPSHOT

This Proposed Plan outlines EPA's preferred method for addressing sediment contamination which was not addressed in EPA's 1985 Record of Decision (ROD) selecting a cleanup remedy for the Site. The proposed approach includes:

- Cover system (constructed as part of the pilot study);
- Surface water and sediment monitoring;
- Maintenance of the cover system; and
- An institutional control to be placed on the cover system area to prevent any excavation or other disturbance.

The estimated total cost for this proposed change is $415,000.

Public Informational Meeting immediately followed by a Formal Public Hearing

Both will be held at:
Tuesday, April 23, 2019 at 7 pm
Winthrop Town Office
17 Highland Ave
Winthrop, Maine 04364

continued >

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April 2019

SEMS Doc ID 634457

SUMMARY OF THE PROPOSED PLAN

This Proposed Plan adds to the cleanup remedy for the Winthrop Landfill Superfund Site. The initial 1985 cleanup remedy included landfill and groundwater components to address risks associated with each. The cleanup approach selected for the Site included extension of an alternate water supply to area residents; prohibition of groundwater withdrawal; construction of a cap over the entire landfill; deed restrictions; sampling of monitoring points; and establishment of performance standards for each contaminant in groundwater with a contingency for groundwater extraction and treatment. The 1985 remedy did not include a sediment remedy.

In 1993, EPA determined that a groundwater extraction and treatment system (GWETS) was necessary to address groundwater contamination and invoked the contingency remedy. The GWETS became operational in March 1995. The GWETs was successful in achieving groundwater performance standards for all identified contaminants except for arsenic. EPA and the Maine Department of Environmental Protection (MEDEP) determined that the GWETS was not effective in reducing arsenic levels in groundwater and it was decommissioned in early 2008. Monitoring of groundwater, surface water, and sediment continued. While groundwater and surface water have been meeting their respective performance standards, high levels of naturally-occuring arsenic, mobilized by landfill groundwater, were being detected in sediment where it precipitated, or seeped out at several locations: Annabessacook Lake, Hoyt Brook, Sphagnum Bog, and Cattail Marsh (see Site Map on next page). The 2013 draft Focused Feasibility Study found that only the sediments at Hoyt Brook presented an actionable human health and the action to address human health would also address any ecological risk. EPA and MEDEP initiated a pilot study in 2015 at Hoyt Brook to determine whether the most comprehensive alternative presented in the draft Focused Feasibility Study would be successful. Results from the pilot study indicate it has been successful in preventing risk of exposure to arsenic-contaminated sediment.

Based on this information, EPA is proposing to amend the 1985 ROD to add a sediment remedy. This Proposed Plan[1] outlines EPA's preferred method for addressing sediment contamination. The proposed approach includes:

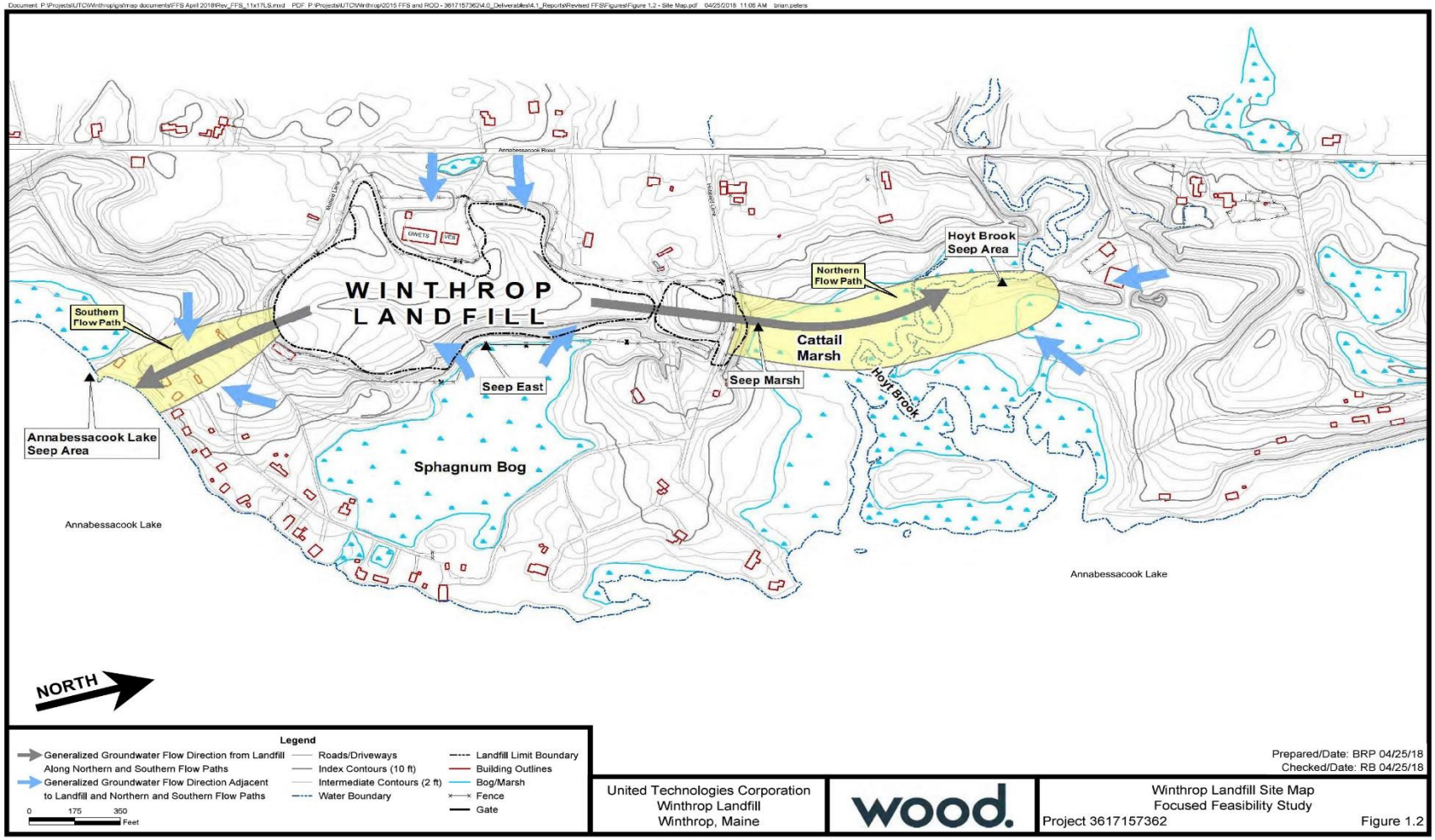
- Cover system constructed as part of the pilot study;
- Surface water and sediment monitoring;
- Maintenance of the cover system; and
- An institutional control to be placed on the cover system to prevent any excavation or other disturbance of.

The estimated cost for this proposed change is $415,000.

SCOPE AND ROLE OF THIS PROPOSAL

Following the 2013 submittal of a draft Focused Feasibility Study, a document that evaluated five alternatives for addressing the risk associated with arsenic in the Hoyt Brook stream bank sediment, EPA proposed that a pilot study be conducted to evaluate whether the most comprehensive alternative (Alternative 5, see Constructed Profile figure) presented in the draft Focused Feasibility Study would be successful. EPA proposed this approach, in part, because a previous attempt to address the elevated arsenic concentrations in Hoyt Brook had not been successful.

[1] In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act, the law that established the Superfund program, this document summarizes EPA's cleanup proposal for a change to the cleanup approach currently implemented at the Winthrop Landfill Superfund Site. For detailed information on the options evaluated for use at the Site, see the Winthrop Landfill Focused Feasibility Study available for review at EPA's 5 Post Office Square office in Boston or online at https://www.epa.gov/superfund/winthrop.



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United Technologies Corporation
Winthrop Landfill
Winthrop, Maine

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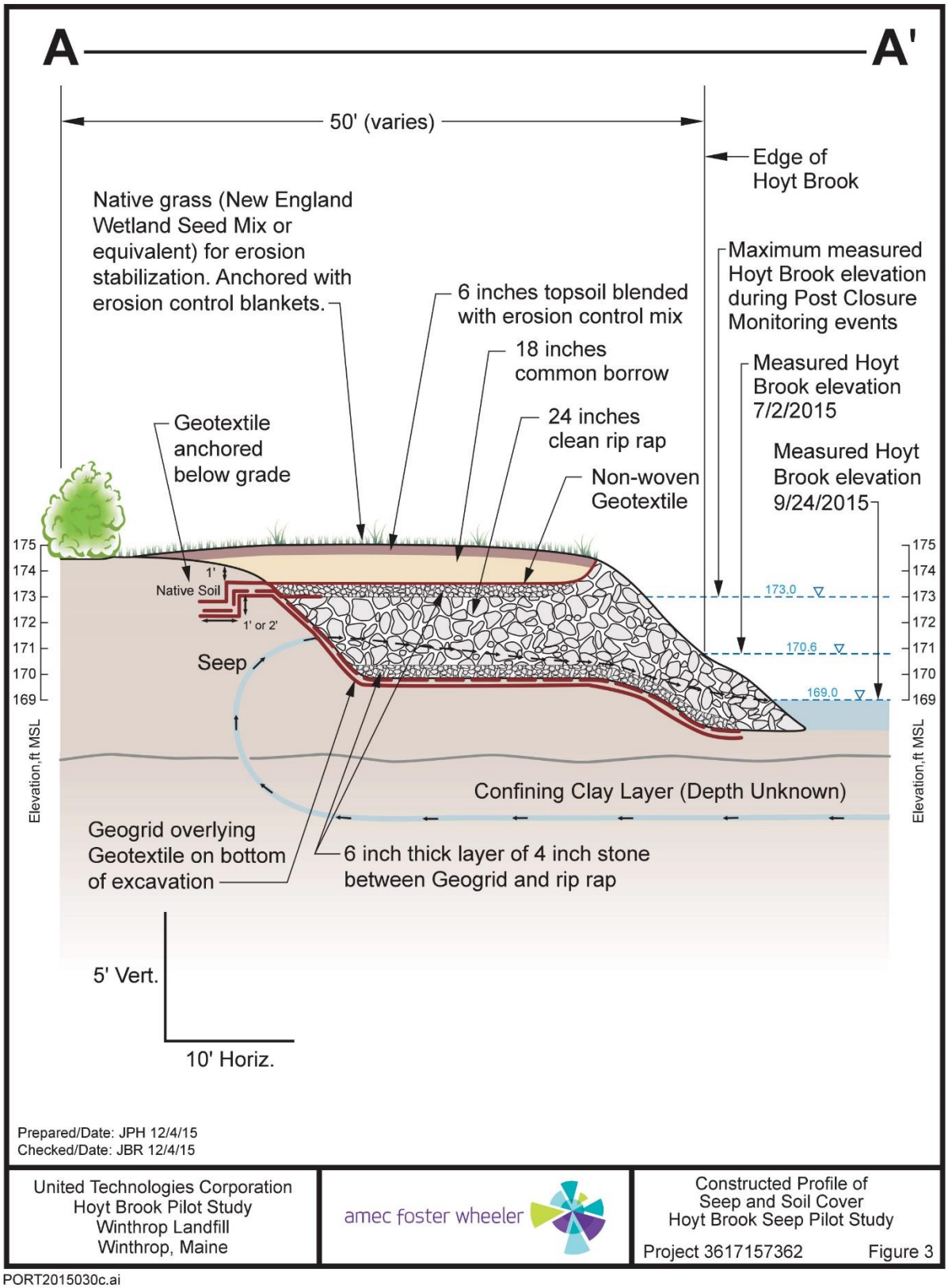
Winthrop Landfill Site Map
Focused Feasibility Study
Project 3617157362 Figure 1.2



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United Technologies Corporation Hoyt Brook Pilot Study Winthrop Landfill Winthrop, Maine	amec foster wheeler	Constructed Profile of Seep and Soil Cover Hoyt Brook Seep Pilot Study Project 3617157362 Figure 3

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This previous attempt occurred in 1997 when arsenic in concentrations above its performance standard was detected in Hoyt Brook sediment, in an area where groundwater seeps discharged. At that time, the area was remediated using hand tools by first excavating the contaminated sediment, and then placing a geotextile fabric and riprap (large stones) over the excavated portion to bring the excavated area back to its original grade. The goal was to prevent any possible future exposure to sediments in this area. After a short amount of time, the remediated area became inundated through groundwater discharge and the rip rap was covered with new arsenic-contaminated sediment quickly. Exceedances of the arsenic performance standard were again observed within a year of the excavation of contaminated sediment due to ongoing deposition of arsenic in the seep area.

Following that unsuccessful remediation effort, a number of remedial alternative technologies were screened to potentially address the ongoing source of arsenic-contaminated groundwater that discharges to the Hoyt Brook Seep Area. The alternatives were described in a 2006 Engineering Evaluation/Cost Analysis and included seven (7) Landfill Source Area alternatives that would address the groundwater migration at the Landfill, and two (2) Groundwater Flow Path alternatives that would address the groundwater prior to discharge to the Seep Area. Alternatives to address arsenic-impacted sediment were also evaluated. Due to uncertainties regarding effectiveness, the degree of difficulty to implement, and the estimated costs (where available) to implement the Landfill Source Area alternatives and the Groundwater Flow Path alternatives, none of the remedial alternatives for groundwater treatment were retained. As a result, only remedial alternatives that minimized direct exposure to existing or future arsenic-impacted sediments were developed in the draft 2013 Focused Feasibility Study. See section 3.2 of the 2019 final Focused Feasibility Study for a more detailed discussion.

During the process of finalizing the draft Focused Feasibility Study, in August 2015, EPA, MEDEP, and UTC determined that a pilot study could provide additional information regarding the remedial concept for three (3) of the five (5) alternatives in the draft Focused Feasibility Study. Alternatives 3, 4 and 5 included a drainage layer that would channel the groundwater seep into Hoyt Brook and varying levels of cover material over the drainage layer. A pilot study could help determine if directing the seep into Hoyt Brook impacted surface water quality or cause new seep areas to appear and whether the cover material would become contaminated with arsenic over time. To proceed with the pilot study, EPA, MEDEP, and UTC issued a fact sheet and held a public meeting to present the pilot study concept to the Town of Winthrop community. The fact sheet explained why action was needed in Hoyt Brook, and the components and objectives of the pilot study, which was the most-comprehensive alternative in the draft Focused Feasibility Study (Alternative 5). At the public informational meeting, EPA provided additional details about the pilot study and answered questions from community members. After a positive response at the informational meeting, the Hoyt Brook cover system was constructed in August-September 2015, followed by two and half years of monitoring. In 2018, EPA and MEDEP agreed that all four stated objectives of the pilot study had been achieved:

1) the cover system has not become contaminated with arsenic during the monitoring period,
2) new seeps have not emerged outside the remediation area,
3) the cover system remains stable from erosion and flooding, and
4) the remediation has not resulted in exceedances of performance standards in surface water or sediment.

The scope of this proposal is to present and seek public comment on the alternatives considered to address contaminated sediment at the Site. The Proposed Plan outlines and is also seeking comment on EPA's rationale for selecting its preferred alternative which includes: the cover system constructed during the pilot study, surface water and sediment monitoring, maintenance of the cover system, and implementation of an institutional controls in the form of land use restrictions to ensure the continued integrity and protectiveness of the cover system. The maintenance and monitoring for this proposed remedy will be incorporated into the site wide monitoring plan that includes monitoring of the landfill and other seep areas.

A CLOSER LOOK AT EPA'S CLEANUP APPROACH

The 2019 final Focused Feasibility Study identifies all of the options EPA considered for cleanup. The study evaluated different combinations of cleanup alternatives to restrict access to, contain, remove, and/or treat contamination to protect human health and the environment by preventing risk of exposure from site-related contaminants in sediment.

Based upon the alternatives evaluated in the Focused Feasibility Studies, and the successful implementation of the pilot study, EPA is proposing the following long-term cleanup approach for sediment.

Cover System

The cover system was constructed during the pilot study and implemented in general accordance with Alternative 5 which included excavation of sediment contaminated with arsenic at levels above the Protective Concentration Limits (PCL) and placement of a Drainage Layer overlying the excavated area; an Armored Layer overlying the Drainage Layer; and a Vegetative Layer overlying the Armored Layer.

Maintenance

The cover system will be inspected every year and repaired as needed. Qualitative observations will be made in the vicinity of the remediated area to identify any new seeps and areas of staining or flocculation, and to confirm that there is no visual evidence of exposed sediment seep impacts (staining) and that vegetation has been successfully established. These inspections will be made concurrently with the annual Landfill cap inspections (May 2017 Cover System photo at left).

Monitoring

- One upstream co-located surface water and sediment sample;
- One downstream co-located surface water and sediment sample taken from the downstream edge of mixing zone, which is 100 feet from the downstream edge of the remediation area;
- One surface water sample at the confluence of Hoyt Brook with Annabessacook Lake; and
- Sediment samples will be collected just beyond the edge of the riprap both upstream and downstream to ensure that the cover system does not create new outbreaks of seeps beyond the armored area.

These surface water and sediment samples are proposed to be collected at a frequency of once every two and a half years, consistent with the frequency of ongoing sitewide monitoring.

Institutional Controls

To ensure the protectiveness of the cover system, an institutional control in the form of a land use restriction shall be placed on the remediated area to prevent any excavation or other disturbance of the cover system.

The estimated total present value[2] of this proposed cleanup approach, including monitoring, maintenance, and institutional controls is approximately $415,000. Each component of the proposed cleanup approach is discussed in the final Focused Feasibility Study in greater detail.

POTENTIAL COMMUNITY IMPACTS

Impact to the surrounding community by the proposed cleanup plan is expected to be minimal. The Hoyt Brook is in a wooded area on private property and not easily accessed. The Brook is used for seasonal, occasional small boat recreation such as kayaking and canoeing. EPA and MEDEP will work with the Town and affected property owners to ensure that activities are consistent with community needs for the area. Ongoing monitoring will occur at least every two and one-half years, and the cover system will be inspected annually along with the landfill inspections. Maintenance, as needed, will be conducted with hand tools and small equipment as necessary. Only light truck traffic will be associated with such activities during that time.

Wetland Impacts

The pilot study and EPA's preferred alternative include activities that impact wetlands. Section 404 of the Clean Water Act, Executive Order 11990 (Protection of Wetlands) and related regulations require EPA to make a determination that there is no practicable alternative to conducting work that will impact wetlands. EPA determined that because significant levels of contamination existed in wetlands within the Site's cleanup areas, there was no practicable alternative to conducting work in these wetlands. This loss of wetland and linear floodplain area is less than 0.11 percent of the total existing wetland and floodplain area at the Site when considering Sphagnum Bog, Cattail Marsh, and the wetland areas adjacent to Hoyt Brook and Annabessacook Lake. In these circumstances, EPA focuses on conducting cleanup work to minimize impacts to wetlands.

The implementation of the pilot study was performed by using best management practices to minimize harmful impacts on the wetlands, wildlife or habitat. There was a temporary impact caused by the creation of an access path to the area to be remediated and the wetlands were restored consistent with the requirements of federal and state wetlands protection laws. Non-native woody grass planted in the soil layer over the riprap will be inspected and monitored annually for expected growth. Any areas needing reseeding will be addressed as needed.

Floodplain Impacts

The pilot study and EPA's preferred alternative include activities that resulted in the occupancy and modification of the floodplain. Executive Order 11988 (Floodplain Management) and related regulations require EPA to make a determination that there is no practicable alternative to taking an action that results in occupancy and modification of the floodplain. EPA has determined there is no practicable alternative to occupancy and modification of the floodplain in the Hoyt Brook Seep Area.

Floodplain requirements focus on avoiding to the extent practical the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. The construction of the cover system as part of the pilot study increased the elevation of the bank along the remediated area by approximately 18 inches. The addition of the drainage layer, armored layer, and vegetative layer resulted in the permanent occupancy and modification of the floodplain and an estimated volume of 5,700 gallons of floodplain capacity were lost. The combined loss of wetland and linear floodplain area is less than 0.11 percent of the total existing wetland and floodplain area at the Site when considering Sphagnum Bog, Cattail Marsh, and the wetland areas

[2] "Present value" is the amount of money set aside today to ensure that enough money is available over the expected life of the project, assuming certain economic conditions (e.g., inflation).

adjacent to Hoyt Brook and Annabessacook Lake. The minimal amount of floodplain loss should not impact the overall floodplain storage capacity at the Site.

EPA is seeking public comment on its determination that the floodplain and wetlands impacts at the Hoyt Brook seep area due to the pilot study and EPA's preferred cleanup alternative are minimal and do not require wetland compensation or creation of additional flood storage. It has been calculated that an estimated area of 1,440 ft^2 of wetlands and 5,700 gallons of floodplain capacity have been lost. This loss of wetland and linear floodplain area is less than 0.11 percent of the total existing wetland and floodplain area at the Site when considering Sphagnum Bog, Cattail Marsh, and the wetland areas adjacent to Hoyt Brook and Annabessacook Lake (1,250,000 square feet or about 29 acres). This relatively small area of wetland and floodplain loss has only a minimal impact on Hoyt Brook's floodplain storage capacity and wetland habitat. These areas will be monitored annually to ensure that no adverse flooding impacts are observed.

SITE DESCRIPTION

The Winthrop Landfill Superfund Site is in Winthrop, Kennebec County, Maine. The Site consists of a municipal landfill and an adjacent private landfill that are the source of groundwater contamination. These contiguous parcels have a total surface area of approximately 20 acres, and are situated east of Annabessacook Road, approximately two miles away from the town center. A six-acre cattail marsh (Cattail Marsh) and Hoyt Brook are located to the north. An 11-acre sphagnum bog (Sphagnum Bog) is located directly to the east of the Site. East of Sphagnum Bog are a number of homes situated along the western shore of 1,420-acre Annabessacook Lake, a large controlled reservoir which is located in the upper reaches of the Cobbossee Watershed. South of the landfill are more seasonal and year-round homes.

Groundwater flow from the Site primarily discharges 500 feet to the south of the landfill to Annabessacook Lake, and secondarily 500 feet to the north of the landfill to Hoyt Brook which discharges into Annabessacook Lake. There are approximately 20-30 seasonal and year-round homes in close proximity to the landfill (within 300 to 400 feet).

LAND USE

Historical Land Use

The Site was first excavated in the 1920s as a sand and gravel pit. A portion of the Site was then operated as the Winthrop Town Dump, accepting residential and industrial waste for disposal from 1930 to 1982. Disposal of hazardous wastes occurred in the northern portion of the Site from the early to mid-1970s. Until the mid-1970s, wastes were also burned periodically. From the mid-1970s to 1982, the southern portion of the Site operated as a sanitary landfill. After 1982, the Site has been and continues to be inactive.

It is estimated that over three million gallons of chemical wastes, consisting mostly of organic compounds, were disposed of at the Site. Free liquid wastes were dumped and burned periodically and wastes in drums were also dumped. Residential homes near the Site originally obtained their drinking water from private residential wells. In 1980, VOCs were detected in a residential well south of the Site. Subsequent sampling detected Site-related contaminants in groundwater to the northeast, east, and south of the Site.

ENVIRONMENTAL INVESTIGATIONS AND CLEANUP ACTIONS TO DATE

The Site was formally included on the National Priorities List on September 8, 1983. EPA issued a Record of Decision on November 9, 1985 selecting the cleanup approach to be implemented throughout the Site. The cleanup of the Site was performed as follows:

1984-1987	Public water distribution system installed to all private residences
Oct 9, 1985	Town of Winthrop enacts Ordinance prohibiting groundwater withdrawal and certain excavation within the Site
November 9, 1985	EPA issues ROD
March 1986	Quarterly monitoring program begins
Oct 1987	Fence installation and cap construction completed
April 3, 1991	Town of Winthrop revises its Ordinance to prohibit all groundwater use and excavation within the Site
March 10, 1993	EPA and MEDEP Decision Document (sets performance standards)
Oct 1993	Explanation of Significant Differences for Soil Vapor Extraction
Oct 1994	Operation of the SVE begins
March 1995	Operation of the GWETS begins
Oct 1996	Exposed arsenic-contaminated sediment excavated from Annabessacook Lake
Dec 1997	Arsenic-contaminated sediment excavated from Hoyt Brook
Nov 2002	GWETS is shut down and rebound evaluation monitoring begins
Dec 7, 2004	Town of Winthrop places Environmental Covenant on landfill
June-July 2006	Evaluation of sediment occurrence, toxicity testing, and surface water and sediment delineation at points of exposure
Nov 2006	Supplemental Hoyt Brook delineation sampling for arsenic
Feb 2007	Explanation of Significant Differences for discontinuation of GWETS
July 2007	Wetland delineation at Hoyt Brook seep
Sept 2008-Jan 2009	Arsenic profiling (horizontal and vertical) at Hoyt Brook seep
Sept 2009	Annabessacook Lake algae survey and sampling
Summer 2010	Sampling of algae in surface water at Annabessacook Lake seep
Summer 2011	Sediment sampling at Annabessacook Lake seep for arsenic toxicity testing
Summer 2011	Sampling of algae in surface water at Annabessacook Lake seep
Aug 2015	Hoyt Brook Pilot Study initiated
Summer 2016	Sampling of algae in surface water at Annabessacook Lake seep
2018	Completion of 2015 Pilot Study
April 2019	Final Focused Feasibility Study

CURRENT & FUTURE LAND USE

Land use at the Site and adjacent properties has not changed appreciably since EPA's involvement began in the 1980s and is not expected to change in the foreseeable future. Annabessacook Lake is used for recreational purposes, such as swimming, fishing, and boating. Hoyt Brook is used occasionally for recreational boating via canoe or kayak within the vicinity of the Site. A Town of Winthrop ordinance prevents the use of groundwater and limits excavation to residential use in the area surrounding the landfill and requires residents use the public water supply. The covered landfill area of the Site was the subject of interest for a solar development, but the Site did not prove to be a good location due to its relatively small size.

WHY ADDITIONAL CLEANUP IS NEEDED

Although most components of the 1985 ROD remedy, as modified, have been completed, elevated levels of arsenic are present in groundwater at the Site. The Site is in an area of very high naturally-occurring arsenic.

It is now known that the natural microbial activity associated with the degradation of organic waste placed in landfills, such as that contained in the Winthrop Landfill, can cause an aquifer to become anaerobic/reducing for a period of decades to centuries. The presence of anaerobic/reducing conditions in groundwater causes the naturally-occurring arsenic in surrounding soil and rock to mobilize into groundwater through a chemical process. When arsenic-laden groundwater then discharges at a surface water body, the chemical process reverses and the arsenic precipitates out of solution and accumulates in sediment. At the Hoyt Brook Seep Area the precipitating arsenic builds up over time in the sediment adjacent to and surrounding the groundwater seeps, and arsenic concentrations continually increase.

Because natural sources of arsenic are present throughout the aquifer, it is not feasible to lower downgradient concentrations simply through removal of arsenic in upgradient areas; treated groundwater leaving the area beneath the Landfill would simply be re-contaminated as it moves through the flowpath to seep areas. Even more problematic, from the perspective of a removal technology, is that the supply of arsenic is effectively unlimited, so that arsenic which is removed from any point in the aquifer will continually be offset by the addition of newly mobilized arsenic.

EXP0SURE PATHWAYS & POTENTIAL RISK

The existence of contamination at a particular site does not mean the environment or people are currently at risk. Risk is created only if there can be exposure to the contamination. Exposure can occur when people or other living organisms eat, drink, breathe or have direct skin contact with contaminated material. Based on existing or reasonably anticipated future land use at a site, EPA develops different possible exposure scenarios to determine potential risk, appropriate cleanup levels for contaminants, and potential cleanup approaches.

Threats to Human Health

Human health and ecological risk assessments were prepared for the Winthrop Landfill Site during the initial (pre-ROD) investigation. The human health risk assessment considered risks associated with contaminants detected in groundwater, surface and subsurface soils, and surface water as described in 1985 ROD. Both carcinogenic and non-carcinogenic risks were evaluated. The ROD concluded that potential threats to human health and the environment could primarily occur via ingestion of contaminated groundwater, physical contact with wastes, discharge of contaminants to surface waters, and migration of contaminated groundwater off-site. Ingestion of contaminated groundwater was determined to be the primary threat to human health. Cleanup goals were established in a 1993 Decision Document for all site contaminants based upon Federal and State drinking water standards. Specifically, the established cleanup goals consist of Alternate Concentration Limits (ACL) for groundwater and PCL for surface water and sediment.

In 2006, and as updated in 2014 and 2018, EPA performed risk screenings and evaluations of human health risks posed by Site-related contaminants in sediment at various points of exposure, including the Annabessacook Lake, Hoyt Brook, Sphagnum Bog, and Cattail Marsh seep areas.

EPA's risk assessments found that at Cattail Marsh and Sphagnum Bog, the human health risk to exposure from arsenic in sediment was acceptable indicating no action was required in those seep areas. At Annabessacook Lake, arsenic concentrations in sediment did result in an unacceptable risk to human health through direct contact and incidental ingestion. However, these sediments are considered inaccessible because the contaminated sediments are continually submerged throughout the recreational season which limits the likelihood of recreational users being exposed to the sediment. As a result, the

Annabessacook sediments do not trigger the need for a cleanup action. These areas will continue to be monitored as part of the site wide monitoring plan for the Site required by the 1985 ROD.

For the Hoyt Brook seep area, EPA's 2006 risk assessment and 2014 update found an unacceptable risk to human health from direct contact and incidental ingestion due to the levels of arsenic found in exposed sediment. The 2018 update of the risk assessment found no unacceptable human health risk at the Hoyt Brook seep area. The 2018 risk assessment was based on sampling data collected after excavation of arsenic contaminated sediment as part of the pilot study, and arsenic concentrations in sediments were considerably lower. The concentrations of arsenic in Hoyt Brook sediment will likely increase over time. With the cover system in place and properly maintained, the contaminated sediment should remain inaccessible and should not present a future exposure risk. See section 1.7.1 of the 2019 final Focused Feasibility Study for further discussion of the human health risks at the Site.

Threats to the Environment

As further discussed in the 2019 Focused Feasibility Study, screening-level ecological risk evaluations conducted prior to the pilot study found that there was no population level risk that warrants any additional action at the seep areas. These areas will continue to be monitored as part of the site wide monitoring plan for the Site.

There may be an impact to the benthic community in sediment in the area of the Hoyt Brook Seep Area. However, any remediation to address the human health risk at the Seep Area will also address ecological risk from arsenic-contaminated sediment. There currently is no actionable ecological risk from arsenic in surface water.

Also evaluated was the potential ecological risk in Hoyt Brook from any remedial alternative that would channel the seep water directly into the Brook, possibly creating a localized area in which water is toxic to aquatic life due to dissolved and bioavailable arsenic. Studies concluded that arsenic concentrations would be above the PCL but well below established chronic and acute surface water quality criteria for the protection of aquatic life, therefore discharge of seep water to Hoyt Brook would not likely pose a risk to aquatic organisms.

During performance of the pilot study, a mixing zone was established within Hoyt Brook adjacent to the remediated stream bank and extending 100 feet. Beyond the mixing zone, arsenic concentrations are required to meet sediment and surface water PCLs and to continue to meet National Recommended Water Quality Criteria (NRWQC) for protection of aquatic life. The mixing zone applies to arsenic and not to any other contaminants.

CLEANUP ALTERNATIVES

Once possible exposure pathways and potential risk have been identified at a site, cleanup alternatives are developed to address the identified risks and achieve the site-specific Remedial Action Objectives, also known as cleanup objectives.

The cleanup objectives for this Site set forth in the 1985 ROD are summarized below:

- Protect public health by providing uncontaminated water supplies for residents in the areas surrounding the Landfill;
- Protect public health by minimizing the potential for human contact with contaminants in the Landfill and potentially in soils beyond the Landfill;
- Protect the environment by minimizing the potential for discharge to Annabessacook Lake, Hoyt Brook, the Sphagnum Bog, and the Cattail Marsh of contaminants already in the groundwater and contaminants which continue to be released from the Landfill; and
- Minimize further degradation of groundwater resources.

The first two and last cleanup objectives have been achieved through the extension of public water supply to the area surrounding the Landfill, capping of the Landfill, and protection of the groundwater resources through the Town ordinance. The third objective was not fully achieved. As described above, the GWETS was not successful at preventing the migration of arsenic contaminated groundwater, which is the source of impacted sediment at the Hoyt Brook and other Seep Areas. Therefore, the 2019 Focused Feasibility Study set new cleanup objectives for the Hoyt Brook Area which are summarized below:[3]

- Prevent direct human exposure by incidental ingestion of and dermal contact with sediment containing arsenic; and

- Prevent releases of arsenic from the Hoyt Brook Seep Areas that would result in surface water levels above federal and state water quality criteria for the protection of aquatic life.

A detailed description and analysis of alternatives developed to meet these cleanup objectives and reduce risks from sediment both before and after the pilot study is presented in the 2019 Focused Feasibility Study. The site-specific cleanup levels, as set in the 1993 Decision Document and listed in its Table 6, remain unchanged[4]. The Focused Feasibility Study is available for public review (see page 15). Below is a summary of the post-pilot study cleanup alternatives considered:

Alternative 6: No Further Action

A No Action or No Further Action alternative is required by the Superfund law to be evaluated and is used as a baseline for comparison to other cleanup alternatives. Under this alternative, there would be no additional monitoring at the Hoyt Brook Seep Area beyond what is required by previous decision documents. Also, there would not be institutional controls to prevent excavations or any disturbance of the cover system or maintenance of the cover system to repair any disturbances that occur over time. This alternative would not change the ongoing operation and maintenance of the Landfill cap, sitewide monitoring, and five-year reviews.

The estimated total present value of this alternative is $0.

Alternative 7: Cover System, Long-Term Monitoring, Maintenance, and Institutional Controls

This Alternative includes the cover system constructed as part of the pilot study, long-term monitoring, maintenance of the cover system, and institutional controls to prevent disturbance of the cover system. The cover system prevents direct exposure to arsenic-contaminated sediment. Qualitative observations will be made in the vicinity of the cover system to identify any new seeps and areas of staining or flocculation, and to confirm that there is no visual evidence of exposed sediment seep impacts (staining) and that vegetation is successfully established. These inspections will be made annually, concurrently with the Landfill cap inspections. Repairs to the cover system will be performed as necessary. Both sediment and surface water samples will be collected every two and a half years and compared to the performance standards for the Site. Finally, an institutional control in the form of a land use restriction shall be placed on the remediated area to prevent any excavation or other disturbance of the cover system.

The estimated total present value cost of this alternative is $415,000.

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[3] These cleanup objectives summaries are not a substitute for the Remedial Action Objectives as presented in the 1985 ROD or 2019 Focused Feasibility Study. They are summaries intended to be helpful for the public. See pages 15-16 of the 1985 ROD and page 2-9 of the 2019 Focused Feasibility Study for the full language of the Remedial Action Objectives.

[4] At that time, arsenic was recognized as being a ubiquitous, naturally-occurring compound, for which background concentrations often exceed health-based guidelines. The PCL for arsenic in sediment was set at 31,000 ppb (or 31 ppm). The PCL for arsenic in surface water was to be set as a background concentration, not less than 0.77 ppb and not to exceed 30 ppb in surface water or groundwater. Subsequently, in 1995, the Agencies approved a PCL of 5 ppb for arsenic in surface water based on background levels.

THE NINE CRITERIA FOR CHOOSING A CLEANUP PLAN

EPA uses nine criteria to evaluate cleanup alternatives and select a final cleanup plan. EPA has already evaluated how well each of the cleanup alternatives developed for the Winthrop Landfill Site meets the first seven criteria in the Focused Feasibility Study. Once comments from the state and the community are received and considered, EPA will select the final cleanup plan.

1. Overall protection of human health and the environment: Will it protect you and the plant and animal life on and near the site? EPA will not choose a cleanup 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? The cleanup plan must meet this 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: Using treatment, does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?

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 (e.g., treatment equipment, space at an approved disposal facility) available?

7. Cost: What is the total cost of an alternative over time? EPA must select a cleanup plan that provides necessary protection for a reasonable cost.

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

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

CLEANUP ALTERNATIVES COMPARISON

Alternatives 6 and 7, summarized above, were compared with each other to identify how well each alternative meets EPA's evaluation criteria. The following discussion and table present a general comparison summary of the alternatives. Detailed evaluations and comparisons of the alternatives are included in the 2019 Focused Feasibility Study.

1. Overall Protection of Human Health and the Environment

Alternative 6, the no action alternative, would not be protective because no monitoring or maintenance of the cover system would be performed. It does not provide any additional means of protecting human health or the environment. Alternative 7 ensures protection of human health and the environment by additional monitoring of the cover system to confirm sediment and surface water performance standards are being met, and by maintenance and institutional controls to ensure the cover system remains stable and undisturbed.

2. Compliance with ARARs

Alternative 6 does not include additional monitoring to ensure compliance with the performance standards for arsenic in sediment and surface water; therefore, compliance with federal and state water quality standards as a means of measuring the performance of the soil cover will be more difficult to determine. Without additional monitoring and maintenance of the remediated area, Alternative 6 does not meet state hazardous waste post-closure requirements that require measures be put in place to ensure the integrity and functionality of the cover system. It also means invasive species could grow and endanger growth of the planted native species. Alternative 7, through additional monitoring for exceedances of federal and state water quality standards in the Brook, in sediment at the upstream and downstream edges of the cover system, and at the edge of the mixing zone will ensure the cover system is performing as designed and remains protective. Continued long-term maintenance and monitoring, along with institutional controls will protect the functionality and integrity of the cover system as required by state hazardous waste post-closure requirements. Invasive species will be detected and removed through periodic maintenance. Any repairs will be implemented in a manner to minimize adverse impacts on wetlands and erosion control measures will be used as necessary to protect wetland and surface waters. Should repair be necessary, it is not expected to result in further elevation of the remediated area, and therefore not adversely impact the floodplain.

3. Long-Term Effectiveness and Permanence

No Further Action, Alternative 6, provides fewer long-term benefits because the cover system will not be maintained, and additional monitoring will not be performed. Alternative 7 provides long-term effectiveness and permanence through additional monitoring, maintenance, and institutional controls.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Neither alternative reduces toxicity, mobility, or volume through treatment.

5. Short-Term Effectiveness

Because no further action will be taken, Alternative 6 does not cause short-term impacts to workers, the community, or the environment. Both Alternatives currently achieve RAOs following the implementation of the pilot study. Alternative 7 may have short-term impacts to workers and the environment if repair of the cover system is required. These impacts, if any, are expected to be minimal and of very short duration given that any repairs to the area would be small; likely carried out on foot and with hand tools and a small amount of material.

6. Implementability

Alternative 6 does not require any further action and is therefore implementable. Alternative 7 is readily implementable as the additional monitoring and maintenance is standard, routine technology and the area is easily accessed. Any maintenance that will be required can be performed in the same manner in which the cover system was successfully constructed.

Both alternatives are administratively feasible. Alternative 7 will require an access agreement and a land use restriction to ensure the long-term success of the cover system.\]

7. Costs

The estimated costs for these alternatives are as follows:

Alternative 6, No Further Action:	$0
Alternative 7, Cover System, Long Term Monitoring, Maintenance, and Institutional Controls:	$415,000

8. State Acceptance

Maine Department of Environmental Protection has been actively involved with the review of the Focused Feasibility Study and the implementation of the Hoyt Brook pilot study. MEDEP has had substantive discussions with EPA regarding the Site and the cleanup approach.

9. Community Acceptance

Community acceptance will be evaluated based on the feedback received during the public hearing and the public comment period.

TABLE 1: COMPARISON OF ALTERNATIVES

Nine Criteria	Winthrop Landfill Remedial Alternatives	
	Alt 6	*Alt 7*
Protects Human Health & Environment	Y	Y
Meets Federal & State Requirements	N	Y
Provides Long-Term Protection	N	Y
Reduces Mobility, Toxicity & Volume through Treatment	N	N
Provides Short-Term Protection	Y	Y
Implementable	Y	Y
Cost	0	$415,000
State Agency Acceptance	To be determined after the public comment period	
Community Acceptance	To be determined after the public comment period	

Alt 7 EPA's preferred alternative
Y Meets or exceeds criterion
N Does NOT meet criterion

This table is not a substitute for the detailed alternatives analysis included in the Focused Feasibility Study. It is an evaluation summary intended to be helpful for the public.

WHY EPA RECOMMENDS THIS CLEANUP PROPOSAL

EPA believes the proposed cleanup plan for the Winthrop Landfill Superfund site achieves the best overall balance among EPA's nine criteria (excluding State and community acceptance which will be considered following public comment) used to evaluate the alternatives presented in the Focused Feasibility Study. In addition, EPA believes that this proposed cleanup approach is protective of human health and the environment and will ensure that site-specific cleanup objectives will continue to be met.

EPA's preferred cleanup approach, Alternative 7, provides both short and long-term protection of human health and the environment; attains applicable Federal and State environmental laws and regulations; utilizes permanent solutions and uses land use restrictions to prevent unacceptable exposures in the future to the remaining site-related wastes that will be contained on-site. As discussed above, this cleanup approach does not reduce the toxicity, mobility, and volume of arsenic through treatment.

EPA has determined that the floodplain and wetlands impacts at the Hoyt Brook seep area due to the pilot study and EPA's preferred cleanup alternative are minimal and do not require wetland compensation or creation of additional flood storage. This loss of wetland and linear floodplain area is less than 0.11 percent of the total existing wetland and floodplain area at the Site when considering Sphagnum Bog, Cattail Marsh, and the wetland areas adjacent to Hoyt Brook and Annabessacook Lake (1,250,000 square feet or about 29 acres).

NEXT STEPS

After the public comment period, EPA expects to review and evaluate all comments received on this proposal and will issue a ROD amendment for sediment. This ROD amendment, modifying the 1985 ROD, will be a written document that describes the chosen cleanup plan, and includes a summary of responses to any public comments (the Responsiveness Summary). Once signed, this document will then be made available to the public on the EPA website for the Winthrop Landfill Site. EPA will announce the final decision on the cleanup plan through the local media and via EPA's website.

FOR MORE INFORMATION

The Administrative Record, which includes all documents that EPA has considered or relied upon in proposing this cleanup plan for the Winthrop Landfill Superfund Site, is available for public review and comment at the following location:

EPA Records and Information Center
5 Post Office Square, First Floor
Boston, MA 02109·3912
617·918·1440

Information is also available for review online at:
https://www.epa.gov/superfund/winthrop

Or call or contact:

Almerinda Silva
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WHAT IS A FORMAL COMMENT?

This Proposed Plan has been *prepared in* accordance *with EPA's statutory and regulatory responsibilities.* See *40 CFR 300.430(f)(2). This Proposed Plan* meets *the public participation requirements under CERCLA delineated in the National Contingency Plan (NCP).* See *40 CFR 300.43S(c)(2)(ii)*

EPA will accept *public comments during* a *30-day formal comment period. EPA considers and uses these comments* to *improve* its *cleanup approach. During the formal com*ment *period, EPA will accept written* comments via *mail,* email, *and fax. Additionally, verbal* comments may be *made during the formal Public Hearing on April 23, 2019 during which* a *stenographer will record all offered comments during the hearing. EPA will* not *respond* to *your comments* at *the formal Public Hearing.*

EPA will hold a *brief informational meeting prior* to *the start of the formal Public Hearing on April 23, 2019. 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, in* a *document referred* to as *the* Amended *Record* of *Decision.* The *Responsiveness Summary and Amended Record of Decision will be* made *available* to *the public on-line* and at *the EPA Records Center. EPA will* announce *the final decision on the cleanup plan through* the *local media and* via *EPA's website.*

SEND US YOUR COMMENTS

Provide EPA with your written comments about the Proposed Plan for the Winthrop Landfill Superfund Site. Please email (Silva.almerinda@epa.gov), fax (617·918-0246) or mail comments, postmarked no later than May 23, 2019 to:

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