

# **Newhall Street Neighborhood Remediation Project**

## **Remedy Selection Plan Hamden, Connecticut**

**October 2007**



This document summarizes the State of Connecticut Department of Environmental Protection's (DEP's) Remedy Selection Plan for the Newhall Street Neighborhood Remediation Project. The public can obtain more detailed information regarding the Project from the information repositories located at the Miller Library, Whitneyville Library, and the Newhall Remediation Project Community Office, currently located at the Keefe Community Center. Information is also available on the project website at [www.newhallinfo.org](http://www.newhallinfo.org).



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## Remedy Selection Plan - Overview

The Newhall Street Neighborhood Site ("the Site") is an approximately 18-block area in the southern part of Hamden that historically consisted of wetlands and low-lying areas. From the late 1800s to the mid-1900s, industrial waste and household trash was disposed in these areas. Subsequently, homes, public buildings, and parks were built on and adjacent to the waste disposal areas.

In 2001, the Connecticut Department of Environmental Protection (DEP) issued an Administrative Order to the four parties believed to be responsible in some capacity for the placement of contaminated waste fill material. These parties, collectively known as the Responsible Parties are: the Town of Hamden (Town), the South Central Connecticut Regional Water Authority (RWA), Olin Corporation (Olin), and the State Board of Education (BOE). The four parties appealed the Administrative Order, however, through negotiation, they entered into a Consent Order (CO) with the DEP in 2003. The CO requires the Responsible Parties to investigate the nature and extent of the contaminated waste fill material, propose remedial actions, and implement the remedial actions selected by the Commissioner of the DEP.

Environmental investigations show that the historically deposited contaminated waste fill material (herein referred to as waste fill) includes: batteries, empty ammunition shells, ash, slag, coal waste, other industrial and household-type trash, as well as associated contaminated soil. The contaminants most frequently detected in the waste fill are heavy metals, including lead and arsenic, and semi-volatile organic compounds (SVOCs). Other contaminants detected, generally at the public properties, include petroleum hydrocarbons (oils), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) and pesticides.

The primary human health risk associated with the Site is from direct exposure to the waste fill. The underlying groundwater generally does not pose a health risk to the residents because the area is supplied water by a public water source, and the groundwater is not used for drinking or other domestic purposes.

In early 2005, the Responsible Parties submitted their proposals for remedial actions. The DEP issued a Proposed Remedy Selection Plan in August 2006, and solicited public comments through mid-November 2006. Numerous comments were received, ranging from a few brief statements, to recommendations for distinctively different remedial action plans. DEP's responses to the comments are provided in a separate document titled "Response to Public Comments on Proposed Remedy Selection Plan, Newhall Street Neighborhood Remediation Project, Hamden, Connecticut" dated October 2007.

**After careful consideration of the public comments, the DEP has revised the plan for remediation and the Commissioner approves this Remedy Selection Plan ("Plan") for the Newhall Street Neighborhood Site.**

**The selected remedy for residential properties (and other Non-Public Properties) located inside the Consent Order boundary is as follows:**

- Excavation of waste fill within the top four feet and off-site disposal at authorized facilities;
- Backfilling with clean soil;

- Restoring pre-existing features (landscaping, patios, fencing, driveways, etc.) if disturbed during construction;
- No individual Environmental Land Use Restrictions (ELURs). Instead, the Town of Hamden will need to create a Local Design District to insure proper management (through a special permit) of future deep excavations at properties where waste fill will remain deeper than 4 feet. Additionally, the Town has indicated it will consider a limited property tax reduction to residents located within the Local Design District (the Town would first need authority for such a tax reduction from the State Legislature); and
- A Soil Management Fund of \$2 million will be established by Olin and the DEP following completion of all remedial activities at Non-Public Properties located within the CO boundary. The Fund will be managed by the Town of Hamden. The Fund will pay for management of waste fill that may be unearthed by future deep excavations (greater than 4 feet) at residential properties where waste fill remains after remediation.

**The selected remedy for the former Hamden Middle School (and portions of the Newhall Community Center) is as follows:**

- No placement of additional waste fill (among other reasons, Olin has not demonstrated that it has the approval of the Town of Hamden to dispose material at the former Hamden Middle School property, nor has Olin demonstrated that it is capable of obtaining necessary permits for such disposal);
- Excavation of PCB-polluted soils, and off-site disposal at authorized facilities;
- Implementation of an "in-situ" (meaning "in place") treatment to promote rapid degradation of VOCs present in polluted soil;
- Capping portions of the property with an engineered control (an impermeable barrier) and then applying a clean soil cover; and
- Ensuring cap design accommodates the Town's reuse planning for this property.

The Plan allows for some flexibility given that the Town's reuse evaluation process for this property has not yet concluded.

**The selected remedy for Rochford Field and Mill Rock Park (and sewer pump station) is as follows:**

- No placement of additional waste fill;
- Capping the properties with engineered controls (impermeable barriers) and then applying a clean soil cover;
- Ensuring cap design accommodates the Town's reuse plan for this property; and
- Removal of waste fill to a depth sufficient to provide a clean utility corridor at the sewer pump station.

The Plan allows for some flexibility given that the Town's reuse evaluation process for these properties has not yet concluded.

**The selected remedy for specific residential properties located immediately west and south of the Consent Order boundary is as follows:**

- For specific residential properties located immediately west and south of the CO boundary where waste fill is present and remediation is recommended, the remedy will be the same as for the residential properties located inside the CO boundary (i.e., excavation and off-site disposal of waste fill within the top four feet, backfilling with clean soil, and restoring pre-existing features), including extension of the Town's proposed Local Design District.





## History

The Newhall Street Neighborhood Site is located in the southern portion of the Town of Hamden, Connecticut (see Figure 1). The Site is an approximately 18-block area encompassing approximately 100 acres. The Site includes 303 private properties (mostly residential) inside the Consent Order boundary, the former Hamden Middle School, portions of the Newhall Community Center, two Hamden Housing Authority residential properties, a sewer pump station, and two Town parks, Rochford Field and Mill Rock Park.

Historically, the Site consisted of wetlands and low-lying areas that were filled with industrial waste and household refuse from the late 1800s into the mid-1900s. Many of the homes in the Newhall Street Neighborhood, the former Hamden Middle School, and the two parks were built on top of this waste fill.

In 2000, waste fill was observed in soil borings at depths from 2 feet to approximately 26 feet below grade on the former Hamden Middle School property. Following the discovery of waste fill at the school, additional assessment of the area (including: review of historical maps and aerial photographs; review of Town records; soil exploration; and interviews with area residents) revealed that historical landfill activities occurred throughout the Newhall Street Neighborhood.

In July 2001, DEP issued Administrative Order No. SRD-128 (AO) to the Town, RWA, Olin, and the State BOE. The AO required the parties to investigate the extent and degree of pollution resulting from the placement of the waste fill, and to conduct appropriate remedial actions. The parties subsequently appealed the issuance of the AO.

During the course of the appeal, the Town, RWA and Olin voluntarily performed environmental investigations of different areas of the Site. The investigations revealed that waste, including batteries, empty ammunition shells, ash, slag and coal waste, as well as other industrial and household-type trash, was buried throughout the Site in varying proportions and at various locations.

During the time frame of October 2001 through May 2002, the U.S. Environmental Protection Agency (EPA) performed emergency soil removal activities at 13 residential properties to remove elevated lead contamination in the surface soils (0 to 18-inch depth interval). At all of the 13 properties, the lead concentrations exceeded EPA's Immediate Action Trigger Level of 1,200 milligrams per kilogram (mg/kg). EPA's soil removal activity at these residential properties is a temporary measure until the final clean up is performed.

In April 2003, negotiations led to issuance of a Consent Order between DEP and the four parties. Pursuant to the CO, the Responsible Parties agreed to perform environmental investigations and remediate certain areas within the CO boundary. The CO also specified that the investigation and remediation be conducted in accordance with the Remediation Standard Regulations (RSRs), (Sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies), and with DEP's oversight, review and approval.

Under the CO, the responsibilities were allocated as follows:

- **Olin Corporation** (which had acquired the assets of Winchester Repeating Arms Company in the 1930s) is responsible for the investigation and

remediation of the "Non-Public Properties" (the largely residential area within the CO boundary);

- **The Town of Hamden** is responsible for the investigation and remediation of Mill Rock Park and Rochford Field, and the sewer pump station located at the corner of Winchester Avenue and Mill Rock Road;
- **Regional Water Authority** is responsible for the investigation and remediation of the former Hamden Middle School, portions of the Newhall Community Center, and two Hamden Housing Authority residences located at 249-251 and 253-255 Morse Street; and
- **State Board of Education** responsibility will be satisfied by the use of state funds to remediate portions of the Site. To accomplish this, the DEP will split the cost of remediation of the Non-Public Properties with Olin on a 50/50 basis.

Subsequent to execution of the CO, sampling data collected at some locations along the perimeter of the CO boundary indicated that waste fill extended beyond the CO boundary. Residential property owners adjacent to the perimeter also reported observations of waste materials similar to the waste fill observed within the CO boundary. In response to this information, DEP initiated a soil investigation program outside the CO boundary.

Since late 2000, the State of Connecticut Department of Public Health (DPH) and Quinnipiac Valley Health District (QVHD) have performed many activities to address health concerns in the community, such as:

- Providing health education outreach to the community.  
For example, fact sheets were prepared to provide guidance on gardening and reducing potential exposure to the waste fill. Meetings were held with residents to answer questions about exposure pathways and health effects. Health records of residents within the CO boundary were reviewed for elevated blood lead levels, and blood lead level screenings were offered to residents of the Newhall community.
- Reviewing all analytical environmental data from the area, and recommending various interim actions to reduce exposure.  
All of DPH's recommendations for interim action have been implemented by the DEP, EPA and/or the Town, and have included time-critical soil removal, placement of interim soil cover and additional sampling.

The Responsible Parties, as well as DEP, have performed iterative environmental investigations of the Site since 2000 to determine the nature and extent of the soil and groundwater contamination at the Site. By 2006, the Responsible Parties submitted their findings and proposed remedial actions.

Olin submitted a report titled "Supplemental Investigation Report and Remedial Action Plan, Non-Public Properties Study Area, Hamden, Connecticut" prepared by Malcolm Pirnie. Olin's report recommended a remedy for the Non-Public Properties that consisted of: excavating the top four feet of material; backfilling with clean fill; applying ELURs to individual properties; and possibly reclassifying groundwater from a GA (presumed suitable for drinking without treatment) designation to GB (presumed to be degraded and not suitable for drinking).

RWA submitted a report titled "Final Investigation and Remedial Evaluation Report, Former New Haven Water Company Property, Hamden, Connecticut" prepared by Leggette Brashears & Graham, Inc. RWA's report recommended a remedy for the former Hamden Middle School that consisted of: excavating PCB polluted soil/waste; removing VOC polluted soil/waste by either excavation, an in-situ remedy, or allowing the VOCs to naturally attenuate over time; and excavating the top four feet of material or the construction of a cap property-wide.

The Town of Hamden submitted a report titled "Report on Supplemental Phase III Data Investigation and Preliminary Remedial Action Plan, Mill Rock Park, Sewer Pump Station, and Rochford Field, Hamden, Connecticut" prepared by Haley & Aldrich. The Town's report recommended excavating the upper two feet of material, constructing an asphalt cap or other engineered cap, and reclassifying the groundwater from GA to GB.

In August 2006, DEP issued the Proposed Remedy Selection Plan and solicited public comment through mid-November 2006. DEP's responses to the public comments are provided under separate cover in the document titled "Response to Public Comments on Proposed Remedy Selection Plan, Newhall Street Neighborhood Remediation Project, Hamden, Connecticut" dated October 2007.



## Why is Remediation Needed?

Connecticut's environmental regulations contain standards for remediating contaminated soil and groundwater. These standards are found in Sections 22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies, are known as the **Remediation Standard Regulations (RSRs)**, and can be found on the web at <http://www.ct.gov/dep/lib/dep/regulations/22a/22a-133k-1through3.pdf>. The RSRs establish maximum allowable contaminant concentrations in environmental media that are protective of human health and the environment, and also contain acceptable methods for remediating contamination that exceed these concentrations. The Newhall Street Neighborhood Site has been investigated and evaluated in accordance with the RSRs, and pursuant to DEP's oversight, review and approval.

The DEP is required by regulation to review the RSRs and propose revisions as necessary. The DEP is currently in the process of conducting this review and is proposing specific administrative and technical changes to the RSRs, some of which have a bearing on this Remedy Selection Plan for the Site. The proposed revisions to the RSRs that relate to this Site are discussed below.

### **Soil**

The contaminants of concern most frequently detected during the soil investigations at the Site include heavy metals, primarily lead and arsenic, and polycyclic aromatic hydrocarbons (PAHs) which are a type of semi-volatile organic compound (SVOC). PAHs are chemicals that form during incomplete burning of organic substances and are found in ash. Additional contaminants detected, though less frequently, include petroleum hydrocarbons, volatile organic compounds (VOCs) (which include solvents), PCBs, and pesticides. The VOCs and PCBs were detected primarily in the waste fill that was historically deposited at the public properties.

Much of the waste fill contains contaminants at concentrations that exceed the Residential Direct Exposure Criteria of the RSRs. As such, the primary risk to human health is from direct exposure (primarily unintentional ingestion of soil particles adhered to fingers or food items). Another, though less common exposure, is by inhalation (breathing in particles) of soil that has become airborne as dust. However, being exposed to the waste fill does not necessarily mean that people will develop health effects. Generally a person would need to be exposed to high concentrations of contaminants, and for a long period of time before illness would be possible. The RSR criteria are established to be protective of human health and the environment. The remedies outlined in this Plan are necessary to ensure that people do not come into direct contact with the waste fill on a regular and continuing basis.

The waste fill also contains contaminants at concentrations that exceed the Pollutant Mobility Criteria of the RSRs. The purpose of the Pollutant Mobility Criteria is to prevent pollution attached to soil particles from leaching to underlying groundwater. At elevated concentrations, a chemical can move, or leach, from soil to the groundwater when rainwater and snowmelt infiltrates the soil. The concentration of a pollutant in soil above this criteria is considered capable of leaching from soil into underlying groundwater. The remedies outlined in this Plan are necessary to ensure that groundwater beneath the Site will not be substantially impacted by the waste fill.

### **Groundwater**

Investigations conducted by the Responsible Parties have demonstrated that groundwater quality throughout the majority of the Site has been minimally impaired despite the presence of the waste fill in the environment for roughly 50 to 100 years. However, groundwater beneath the former Hamden Middle School property and Rochford Field is more significantly impaired due to the character of the waste fill deposited in these areas, as well as the placement of a very large volume of waste fill below the water table in these locations. Fortunately, the groundwater investigations have also shown that the direction of groundwater flow throughout a majority of the Site is to the west and southwest, away from the Lake Whitney public water supply watershed.

It is important to note that the entire Site area is supplied potable water from a public water source and the groundwater underlying the Site is not used for drinking purposes. Further, the installation of drinking water wells within the Site area is prohibited by the public health code. Therefore, there is no human health concern related to ingestion of the groundwater beneath the Site.

Groundwater located beneath the west side of the tennis courts at the former Hamden Middle School is contaminated with vinyl chloride, among other pollutants, and flows in a southwesterly direction toward residential properties. Vinyl chloride is a volatile organic compound (VOC). At certain concentrations, VOCs can migrate up through soil as a vapor and enter overlying buildings by permeating through cracks and gaps in foundation floors and walls. The concentrations of vinyl chloride detected in the groundwater at certain locations on the former Hamden Middle School property exceed the Residential Volatilization Criteria for Groundwater of the RSRs. The Volatilization Criteria for Groundwater represent the minimum concentrations in groundwater at which particular VOCs may migrate up from groundwater as a vapor, accumulate in an overlying building, and present a health risk to the building occupants. When an exceedance of the Volatilization Criteria is identified in groundwater, soil vapor above the groundwater plume can be tested to confirm the presence or absence of the VOC. The soil vapor at the nearest residential properties to the vinyl chloride plume has been tested, and to date, no exceedance of the Volatilization Criterion for vinyl chloride in soil vapor has been identified. Continued soil vapor monitoring is planned at these residential properties. The remedial actions selected for the former Hamden Middle School outlined in later sections of this Plan are designed to mitigate this issue permanently.

Currently, Connecticut's groundwater classification for the majority of the Site within the Consent Order boundary is GAA-Impaired, denoting groundwater utilized as an existing or potential public drinking water supply that may need treatment before drinking or public use. The groundwater quality classification of the extreme southwest corner of the Site near the intersection of St. Mary and Goodrich Streets is classified GB, indicating groundwater that is presumed to be degraded and not suitable for drinking without treatment. Areas to the west, south and east of the Site, extending to New Haven Harbor, also bear the GB groundwater classification, as do many residential areas in urban and suburban parts of the state.

Earlier watershed mapping by DEP in the 1980s assumed that the groundwater in the area of the Site, now known to contain waste fill, was part of the Lake Whitney drainage basin and contributed base flow to that public water supply reservoir.



As such, the groundwater in the drainage basin was classified GAA. However, as stated above, recent Site groundwater investigations have shown that the direction of groundwater flow beneath the majority of the Site is actually towards the west and southwest, away from the Lake Whitney watershed. The original drainage basin boundaries were established based upon the interpretation of topographic maps and now appear to be inaccurate based upon the recently measured groundwater elevations. In addition, the Connecticut Water Quality Standards allow for the reclassification of groundwater that is polluted as a result of intense urban, commercial, or industrial development that occurred prior to 1981. The placement of waste fill at the Site occurred from at least the 1920s to the late 1970s. Therefore, reclassification of groundwater from GAA-impaired to GB for a significant portion of the Site may be appropriate.

### ***Surface Water***

The mechanism by which surface water could be impacted by Site contaminants is through the migration of contaminated groundwater to a surface water body. The groundwater beneath a vast majority of the site generally flows toward the west and southwest (away from Lake Whitney, a public water supply reservoir). The nearest downgradient surface water body (Beaver Ponds) is located greater than ½ mile away from the Site. Although groundwater located directly within the waste is impaired, the groundwater pollution naturally attenuates prior to discharging to Beaver Ponds. Therefore, the Site does not pose a risk to Beaver Ponds.

The groundwater flow regime at the northern edge of the Site (a small area located immediately north of the former Hamden Middle School building, and the private properties located at the Augur, Harris, and Remington Street area) is to the north toward an intermittent stream that eventually drains to Lake Whitney. Analysis of groundwater collected from this area has shown the presence of barium and zinc at concentrations above background conditions, and sporadic detections of pesticides. Based on the contaminant concentrations detected, and the dilution and attenuation that will occur during the migration of groundwater toward Lake Whitney, the waste fill does not pose an unacceptable risk. The remedial actions outlined in this Plan are designed to prevent future impact to the intermittent stream. Long-term groundwater monitoring will be conducted to ensure that the remedy is effectively protecting surface water.

### ***Interim Actions***

Since 2001, several interim actions have been conducted at the Site to minimize potential short-term health risks posed by Site conditions. For example, EPA performed emergency soil removal activities at 13 residential properties to remove shallow soils where the lead concentrations exceeded EPA's Immediate Action Trigger Level. DEP, in consultation with DPH, identified other residential properties with potential short-term health risks, and instituted interim actions consisting of placing a cover of mulch, gravel, or new topsoil and grass seed over additional areas where lead concentrations in surface soils exceeded the EPA Immediate Action Trigger Level. DEP completed interim actions at 16 residential properties between 2003 and 2007 and will continue to take action as recommended by DPH until the final remediation is complete.



## Remedy Selection Plan

The remedial actions identified in this Plan were chosen by DEP as the most prudent remedy to protect human health and the environment. The remedial actions minimize the impact on individual homeowners and the neighborhood, reduce the volume and mobility of contaminants in the waste fill, and use permanent solutions to the maximum extent practicable. In addition, the Remedy Selection Plan addresses the residents' concerns regarding the use of individual Environmental Land Use Restrictions as a mechanism to limit further exposure to the waste fill that may remain at depth after remediation.

DEP's decision-making process for selecting this remedy incorporated a similar process used by the U.S. Environmental Protection Agency (EPA) to evaluate Federal Superfund sites. This decision-making process evaluates a number of criteria, including: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements; long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; cost; and community acceptance.

The Commissioner issues this Remedy Selection Plan as a partial approval, with conditions and modifications, pursuant to paragraphs B.3.e and B.8 of the Consent Order. Each Responsible Party shall implement the following remedies for their geographic area of responsibility pursuant to paragraph B.3.i. of the Consent Order.

### **Residential Properties (and other Non-Public Properties) located inside the Consent Order Boundary**

#### ***Removal of Waste Fill to Depth of 4 feet***

For privately owned properties located inside the CO boundary, the remedy is to remove, by excavation, the waste fill to a depth of four feet from the ground surface, properly dispose of the excavated material off-Site, backfill with clean soil, and restore the excavated areas to pre-remediation conditions. Examples of restoration activities include replacement of lawn areas, driveways, patios and landscaping disturbed by the excavation.

Table 1 lists the properties that, based on current data: 1) have waste fill present at depths of four feet or less; 2) have waste fill present at depths greater than four feet; or 3) need further assessment to verify the limits of the waste fill. At many of the properties, waste fill is present in only a portion of the property, therefore only that portion will be remediated.

At those properties with waste fill present at depths greater than four feet, the top four feet of waste fill will be removed, and the waste fill deeper than four feet will remain in place.

#### ***Town to Create Local Design District***

As indicated earlier, the Remedy Selection Plan does not require ELURs on any private property to achieve compliance with the Residential Direct Exposure Criteria. As an alternative, the Town of Hamden has committed to pursue the creation of a Local Design District ("District"), which is a zoning option designed

to insure that the DEP's environmental objectives are achieved while allowing flexibility for the future use, development and enjoyment of the residential properties. The purpose of the District is to ensure that waste fill that might be brought to the surface during future deep excavation is handled, managed, and disposed in accordance with a waste management protocol so that the property owner may continue to develop his or her property within the Town's zoning regulations.

Also, DEP is in the process of revising certain parts of the RSRs. One of the proposed revisions will be to establish an alternative institutional control (a building permit/zoning control such as the District) as a mechanism to ensure sufficient control of inaccessible soils where deemed appropriate by the Commissioner. Revisions to the RSRs are scheduled to be adopted in 2008. If the District is not established or this specific RSR revision is not adopted, ELURs will need to be recorded on the land records for individual properties to ensure compliance with the existing RSRs.

For properties located within the proposed District, the Town is contemplating that a special permit would be required for any excavation deeper than four feet from ground surface. Excavation deeper than four feet is typically necessary for construction of an addition to a home that requires foundation footings, construction of an in-ground swimming pool, or replacing/removing an underground storage tank. Although these activities currently require a special permit and a building permit from the Town prior to work, certain modifications to the special permit process will be needed. The proposed District designation would not alter the Town's current requirements for homeowners but would expand upon them to insure that any waste fill that remains in place greater than four feet is evaluated and handled under the waste management protocol as appropriate.

Excavation within the top four feet would not require a special permit under the proposed District. Activities within the upper four feet include common residential activities such as gardening, planting trees and shrubs, installing/repairing patios, porches or walkways, installing fences and playground equipment, or additions (including decks) without basements. Town regulation of certain types of above-mentioned construction work within the upper four feet (e.g. installation of decks) would continue to be subject to the standard building permit and zoning requirements of the Town that exists today.

The proposed District is anticipated to cover the portion of the Highwood Neighborhood Revitalization Zone east of Dixwell Avenue. A Soil Management Fund ("Fund") will be established to cover the costs of future compliance with the waste fill management protocol at residential properties that have waste fill remaining below four feet after remediation. The Fund is to be administered by the Town as part of the special permit process. The mechanics of the Fund will be established during the remedial design phase. Olin and the DEP will each pay \$1 million into the Fund immediately following completion of the remedial activities at the Non-Public Properties located inside the Consent Order boundary. The Town will manage the Fund for the residents located within the proposed District.

The Town's process to create the proposed District is for the Town, through its Planning & Zoning Commission, to amend its zoning regulations. The Town will provide public notice of a public hearing on the proposed change, a public

hearing, and final decision by the Planning and Zoning Commission<sup>1</sup>. The Town will coordinate the timing of the zoning amendment process with its reuse planning process for the area.

### **Groundwater**

The waste fill contains contaminant concentrations that exceed the Pollutant Mobility Criteria of the RSRs. However, as stated earlier, no appreciable impact to groundwater quality has been observed in the residential areas and other Non-Public Properties portions of the Site. As discussed in a previous section of this Plan, recent investigations have shown that the direction of groundwater flow throughout a majority of the Site is to the west and southwest, away from the Lake Whitney water supply watershed. As such, to comply with the Pollutant Mobility Criteria and Groundwater Protection Criteria of the RSRs, Olin (or other parties) may submit an application to the Commissioner of Environmental Protection for the reclassification of Site groundwater. If it does, the application will be subject to public notice and a hearing to ensure that the municipality and the public are provided an opportunity for comment. If an application for reclassification of Site groundwater is not submitted, Olin must commence and complete the column study outlined in DEP correspondence to Olin dated August 17, 2006 and subsequent correspondence. The purpose of the column study would be to demonstrate what levels of contamination, if any, continue to leach from the waste fill roughly 50 to 100 years after the waste was originally placed, and after the top four feet of waste fill are removed and replaced with clean soil.

With a reclassification of groundwater to GB and the adoption of proposed revisions to the Pollutant Mobility Criteria of the RSRs, compliance with the Pollutant Mobility Criteria could be achieved. The groundwater beneath Augur, Remington and Harris Streets may need to remain as GAA since groundwater in that area appears to flow toward the Lake Whitney watershed. If so, then Olin must propose a method to comply with the Pollutant Mobility Criteria in this area, if necessary, after excavation.

### **Generic Remedial Action Plan**

Olin will prepare and submit a Generic Remedial Action Plan for the residential properties and other privately owned properties to the DEP for review and approval. The Generic Remedial Action Plan will serve as a template for Olin's subsequent preparation of Property-Specific Remedial Action Plans and restoration agreements with individual property owners. The Generic Remedial Action Plan will include, at a minimum:

- a site-wide map depicting properties subject to remediation with approximate extent of fill;

<sup>1</sup> Zoning regulates building location, building height, building use(s) and signage among other things. These matters are under the purview of the Planning & Zoning Commission and are effectuated by amendments to existing zoning regulations. Notification to adjoining municipalities and the local Council of Governments is required in addition to a properly noticed public hearing before the Planning & Zoning Commission.

The Local Design District will also benefit from a cooperative effort between Planning & Zoning, the Traffic Department, and Economic Development to make streetscape improvements to local streets. These improvements may include sidewalk improvements, addition of decorative street lamps, landscaping and street tree planting. These improvements are implemented in accordance with Section 8-24 of the Connecticut General Statutes. The Mayor's office refers plans for improvement to the Planning Section of the Planning & Zoning Commission. The Planning Section then sends a positive or negative referral to the Legislative Council for its approval or denial.

- specifications for excavation and backfilling activities;
- specifications for materials needed for property restoration;
- the sequence of remediation; and
- a schedule to conduct the remediation and restoration activities.

### ***Property-Specific Remedial Action Plans***

After DEP approves the Generic Remedial Action Plan, Olin will submit a Property-Specific Remedial Action Plan for each property to the respective owner (in accordance with a schedule and sequence approved by DEP). Each property owner will have the opportunity to provide comments to Olin prior to Olin submitting the plan to DEP for review and approval. Each Property-Specific Remedial Action Plan will contain information regarding: pre-construction activities; anticipated remedial activities; property restoration; and as necessary, structural stability evaluations.

Where feasible and appropriate, it may be possible to preserve surface features such as a mature tree even though it might be overlying waste fill. Olin, after consultation with the property owner, may propose to retain such a feature in the Property-Specific Remedial Action Plan. To properly evaluate such a proposal, the plan may include additional sampling of the waste fill in the top four feet under or near the feature of interest.

With over 200 properties to remediate, the most efficient approach is for Olin to prepare and submit Property-Specific Remedial Action Plans in phased groups, possibly by neighborhood blocks. As described in greater detail in the "Next Steps" section of this Plan, Olin will propose a schedule for implementing the remedy in the most efficient manner.

### ***Structural Stability***

At some properties within the CO boundary, the structural stability of the house, or other permanent feature, has been compromised to varying degrees due to differential settlement. Differential settlement occurs when a foundation settles at different rates caused by the uneven compaction of the underlying waste fill, adversely affecting the structure. As a part of the investigation of the Site, the DEP retained structural engineers to perform preliminary structural assessments at approximately 114 homes overlying waste fill where the owner reported structural issues (cracked foundations, uneven floors, etc.). To date, significant structural damage resulting from differential settlement has been identified at 20 of the properties assessed.

As part of the preparation for implementing the approved remedy, Olin will analyze whether a house's structural stability might be compromised during the remediation and what repairs, supports, and other actions, if any, may be needed prior to or during remediation to prevent negative impacts to stability. In addition to referring to the structural assessment reports previously commissioned by the DEP, Olin must determine what stabilization measures are required, if any, to perform the remediation at each property. Olin will submit a structural analysis report to DEP for properties requiring such support as part of the Property-Specific Remedial Action Plans.

Separately, the State of Connecticut and Town of Hamden will continue to work to identify funding to allow the repair or purchase, at fair market value, of those



residences with extensive, severe structural damage as a direct result of being built on top of the waste fill. The Department was aware of significant efforts in 2007 on the part of the General Assembly delegation from Hamden to secure specific state bond funding for this purpose. Given the timing of the adoption of various budget components during the 2007 Special Session, General Obligation Bond Act Legislation was not finalized in time to be referenced in this plan.

### **Access**

For remediation to proceed on a property, Olin must be granted access by the property owner. Granting access generally means giving Olin and Olin's contractors permission (executing an "access agreement") to go onto the property to perform or inspect the remedial work (excavate, backfill, restore, etc). Under the CO, Olin is required to exercise "best efforts" to obtain access to each private property located within the CO boundary. For any property where Olin informs DEP that it has made best efforts to obtain access, but the property owner has not granted access, Olin must submit to DEP for review and approval, with a copy to the property owner, a written explanation of its efforts, and the property owner's response to these efforts. DEP will provide the property owner an opportunity to respond to Olin's submittal. DEP will then review Olin's submittal and any additional material from the property owner and will determine whether Olin has used best efforts to obtain access.

If DEP determines that Olin has exercised best efforts to obtain access, DEP will send a letter to the property owner informing them that DEP concurs Olin used best efforts to gain access, and that the property owner has 30 days to reconsider his or her denial of access. Property owners refusing access to execute the remedy on their property are in essence accepting responsibility for future management of all waste fill on their property, and that neither Olin nor the DEP will contribute to the cost of future management of waste fill on that property. The letter will inform the property owner that if after 30 days they do not grant access, the DEP intends to issue an Order to the property owner or take other appropriate action. Any such Order or other appropriate action, at a minimum, would require the property owner to refrain from any disturbance of waste fill without proper precautions and proper disposal of any excavated waste fill, and may require remediation of the waste fill. The property owner may appeal the Order and a hearing would be held. If an Order is upheld and becomes final, the law requires the Order to be recorded on the land records for the property.

If DEP determines that Olin has not exercised best efforts to obtain access, then DEP will enforce the best efforts requirement against Olin.

### **Pre-construction Activities**

Olin will perform pre-construction activities, including, but not limited to, acquisition of necessary permits, acquisition of an access agreement from each property owner, marking utility clearances, installation of necessary structural supports as determined by structural surveys, and coordination with the Town of Hamden and/or the State Traffic Commission to establish truck traffic patterns and other public roadway use during the remedial construction. Olin will schedule a meeting with each property owner (and tenants) just before construction at their property commences, to review the construction activities and schedule, and to address any concerns and questions.

### ***Temporary Relocation as Needed***

During the remediation process, temporary relocation of some residents may be necessary for safety reasons. The need for relocation will be evaluated by Olin on a case-by-case basis during development of the Property-Specific Remedial Action Plan. Examples of situations where temporary relocation would be appropriate include: temporary shut-off of utilities, and temporary lack of safe access to the residence. Again, the property owner will have the opportunity to discuss these details as well as housing accommodations with Olin during development of the plan, and at the pre-construction meeting. Olin shall address the special needs of the affected residents during remediation, for example, how children will be transported to and from school if relocation is necessary during the school year. Olin shall aim to minimize the disruption that relocation would cause to residents.

### ***Restoration***

Olin will restore areas disturbed by the remediation at each of the private properties within the CO boundary following completion of remedial activities, to at least an equivalent condition as existed before remediation. The details of restoration and repair work anticipated to be conducted at a property will be included in the Property-Specific Remedial Action Plan, and the property owner will have the opportunity to review the Plan and provide comments to Olin prior to DEP review and approval. Each property owner will have the opportunity to meet with Olin, Olin's contractors, and DEP to address any concerns prior to commencement of remedial activities. If it is not feasible to restore a property feature to an equivalent condition, such as a mature tree that must be cut down, Olin will restore the feature to as close as practicable to the original condition.

At properties where waste fill will remain in place below four feet, Olin will compact the remaining waste fill prior to backfilling the excavation with clean soil to minimize void space and the possibility of future subsidence.

The soil that will be used to backfill excavated areas will be clean, natural material, and of the appropriate grain size to ensure proper permeability and settlement. Prior to commencing remedial actions, Olin will provide written documentation to DEP listing the proposed sources of topsoil and backfill materials intended for use, and the results of analytical testing of such materials.

Olin will ensure that restoration is successful, including survival of all landscaping and plantings. After each property is initially restored, Olin will inspect the properties twice a year, for a period of two years, to confirm the success of the restoration, and will submit an inspection report to DEP and the property owner. Olin will replant, repair or replace any restored feature for which restoration was not successful during the two-year time frame (i.e., not successful due to reasons other than the standard level of care expected to be provided by the property owner, such as watering newly seeded lawn areas).

## ***Health and Safety***

The health and safety of nearby residents must be protected during remedial construction. As part of the approval process, Olin will develop a Health and Safety Plan to specify procedures to be implemented during remedial construction to protect the residents of the Newhall community. The procedures will include, but not be limited to, those necessary to control dust, odors, diesel emissions, noise, access to the work area, and traffic to, from, and within the work area.

## ***Air Monitoring***

Details of a proposed air monitoring program will be included in the Generic Remedial Action Plan that will be submitted by Olin and subject to DEP review and approval. While active removal, handling, and loading of the waste fill is being performed, Olin will implement the approved air monitoring program to monitor the impact of remediation activities on ambient concentrations of airborne particulate matter (dust). Olin will make best efforts to minimize dust generation during remedial activities and will design the air monitoring program to ensure the dust control methods are effective.

## ***Remedial Action Report***

After the remedial activities have been completed at an individual property, Olin will prepare a Remedial Action Report that summarizes the remedial and restoration actions taken at that property. Olin will provide the Remedial Action Report to the DEP and a copy of the report to the property owner. DEP will allow each property owner to provide comment on Olin's Remedial Action Report prior to DEP completing its review and, as appropriate, approval. In addition, a plan for post-remedial groundwater monitoring will be required.

## ***Management of Waste***

Olin will manage the materials excavated or otherwise removed from the remediated properties in accordance with all applicable laws and requirements. Olin will notify DEP of the locations to which any waste is taken. This Remedy Selection Plan does not authorize or approve of any waste fill to be taken to the former Hamden Middle School for disposal. See the document titled "Response to Public Comments on Proposed Remedy Selection Plan, Newhall Street Neighborhood Remediation Project, Hamden, Connecticut" dated October 2007, and the August 2006 Proposed Remedy Selection Plan for an explanation of why the Department is not approving the disposal of additional waste fill at the former Hamden Middle School (relevant provisions of both documents are incorporated here by reference).

## ***Authorization of Funds for State Share of Remedial Costs***

The State legislature needs to authorize funds for the State's 50% share of the remedial cost for residential properties and other Non-Public properties located inside the CO boundary, and the State Bond Commission must allocate such funds. This process will include DEP making detailed funding requests to the State Bond Commission.



## **Former Hamden Middle School (and portions of the Newhall Community Center)**

The Remedy Selection Plan for the former Hamden Middle School property will be implemented by the Regional Water Authority (RWA). The RWA will excavate and properly dispose of waste fill polluted with PCBs located west of the tennis courts. Also, RWA will implement an "in-situ" (meaning "in place") treatment remedy to promote rapid remediation of VOCs found in another area of waste fill also located west of the tennis courts. Further, RWA will install an engineered control (cap) to prevent direct exposure to the waste fill, and limit further degradation of the groundwater by greatly reducing the ability of precipitation (rain, snow melt) to infiltrate through the waste fill at portions of the Site where necessary. The cap will consist of an impermeable material covered with a layer of clean soil.

It should be noted that the Greater New Haven Water Pollution Control Authority (GNHWPCA) has identified certain operational needs for the sewer line that traverses the former Hamden Middle School property. RWA should consult with GNHWPCA to identify whether or not installing a cap is the most appropriate remedy above the sewer line.

Although this publicly owned property may be located within the Town's future Local Design District, an ELUR will be recorded in the Town's land records following installation of the cap. The ELUR will ensure that the waste fill will not be exposed as a result of excavation, and that the cap will be maintained in good condition.

The cap design will incorporate the results of the Town's reuse planning process for the former Hamden Middle School. The remedy for this parcel will allow for future residential use if so desired by the Town.

### ***Installation Details***

The proposed cap must be designed, installed, and maintained in strict accordance with the RSRs. Specifically, the proposed cap must be designed and constructed to:

- physically isolate polluted soil and waste fill and minimize migration of liquids through the waste fill;
- function with minimum maintenance;
- promote drainage and properly manage stormwater runoff from the capped area, and minimize erosion of or other damage to the cap;
- accommodate for settling and subsidence of the underlying soil and waste fill so as to maintain the integrity and permeability of the cap; and
- possess a permeability of less than  $1 \times 10^{-6}$  cm/second.

The waste fill at the former Hamden Middle School property is up to 25 feet deep and much is located below the water table. To prevent direct exposure to the waste fill and further degradation of the groundwater at this portion of the Site, the remedy will include removal and stockpiling of the existing clean fill (that the Town previously placed on top of the waste fill at the athletic fields), and then placement of the cap and reapplication of clean fill. The construction details of the cap will be identified in a Detailed Remedial Action Plan to be prepared by RWA and submitted to the DEP for review and approval. The Detailed Remedial Action Plan will include, but not be limited to, detailed engineering design plans, drainage/elevation considerations, a long-term maintenance and monitoring plan, ELUR requirements, and subsurface gas collection if deemed necessary. The plans for

long-term maintenance of the cap must be adequate to ensure that the integrity, design permeability, and effectiveness of the cap will be maintained.

### ***Groundwater***

As previously discussed, groundwater investigations conducted at the former Hamden Middle School property showed that groundwater is impacted due to the character of the waste fill deposited in this area, as well as the placement of a very large volume of waste fill below the water table in this location. RWA will continue to monitor groundwater at the former Hamden Middle School property during and after placement of the cap, including continued monitoring of the VOC groundwater plume, and monitoring of soil vapor in the area of the plume. Additional remedial measures may be required at the Site if on-going groundwater and soil vapor monitoring shows an exceedance of the respective Volatilization Criteria of the RSRs in the vicinity of an overlying structure.

### ***Health and Safety***

The health and safety of residents in the Newhall Neighborhood, as well as any occupants of the former Hamden Middle School buildings, must be protected during remedial construction. As part of the approval process for the Detailed Remedial Action Plan, RWA will develop a Health and Safety Plan to specify procedures to be implemented during construction. The procedures will include, but not be limited to, those necessary to control dust, odors, noise, access to the work area, and traffic to and from the work area.

### ***Air Monitoring***

Details of a proposed air monitoring program will be included in the Detailed Remedial Action Plan that will be submitted by RWA. During the remedial construction, RWA will conduct the approved air monitoring program to evaluate the impact of remediation activities on ambient concentrations of airborne particulate matter (dust). RWA will take all necessary steps to control dust generation during the remedial activities and will design the air monitoring program to ensure the dust control methods are effective.

### ***Remedial Action Report***

After the remedial activities have been completed at the former Hamden Middle School, RWA will submit a Remedial Action Report to DEP for review and approval, which summarizes the remedial actions taken. In addition, a detailed Operations and Maintenance Plan for the cap, a plan for post-remedial groundwater monitoring, and recording of an ELUR will be required.



## **Rochford Field and Mill Rock Park (and sewer pump station)**

The Remedy Selection Plan for Rochford Field, Mill Rock Park, and the sewer pump station will be implemented by the Town of Hamden. The Town will install engineered controls (caps) at the publicly owned athletic fields to prevent direct exposure to the waste fill, and limit further degradation of the groundwater by greatly reducing the ability of precipitation (rain, snow melt) to infiltrate through the waste fill. Each cap will consist of a low permeability engineered cover with a layer of clean soil on top.

It should be noted that the GNHWPCA has identified certain operational needs for the sewer pump station. The Town should consult with GNHWPCA to identify whether or not installing a cap is the most appropriate remedy for the sewer pump station.

Although the two parks and the sewer pump station may be located within the Town's proposed District, as necessary, an ELUR will be recorded in the Town's land records following installation of the caps. The ELUR will ensure that the waste fill will not be exposed as a result of excavation, and that the caps will be maintained in good condition.

The cap design will incorporate the results of the Town's reuse planning process for the Newhall Neighborhood area. At the completion of the remedy, the properties will be suitable for continued use as athletic fields and will meet residential clean-up standards.

### ***Installation Details***

The proposed caps must be designed, installed, and maintained in strict accordance with the RSRs. Specifically, the proposed caps must be designed and constructed to:

- physically isolate polluted soil and waste fill and minimize migration of liquids through the waste fill;
- function with minimum maintenance;
- promote drainage and properly manage stormwater runoff from the capped area, and minimize erosion of or other damage to the cap;
- accommodate for settling and subsidence of the underlying soil and waste fill so as to maintain the integrity and permeability of the cap; and
- possess a permeability of less than  $1 \times 10^{-6}$  cm/second.

Various other components of the caps will be identified in a Detailed Remedial Action Plan for Rochford Field, Mill Rock Park and the sewer pump station prepared by the Town and submitted to the DEP for review and approval. The Detailed Remedial Action Plan will include, but not be limited to, drainage/elevation considerations, a long-term maintenance and monitoring plan, ELUR requirements, and subsurface gas collection if deemed necessary. The plans for long-term maintenance of the caps must be adequate to ensure that the integrity, design permeability, and effectiveness of the caps will be maintained.

### ***Groundwater***

As previously discussed, groundwater investigations conducted at Rochford Field and Mill Rock Park showed that groundwater is impacted due to the character of the waste fill deposited in these areas as well as placement of a very large volume of waste fill below the water table in these locations. The Town

will monitor groundwater quality beneath Rochford Field and Mill Rock Park after the installation of the caps.

### ***Health and Safety***

The health and safety of residents in the Newhall Neighborhood must be protected during remedial construction. As part of the approval process for the engineered control, the Town will develop a Health and Safety Plan to specify procedures to be implemented during construction to protect the residents of the Newhall community. The procedures will include, but not be limited to, those necessary to control dust, odors, noise, access to the work area, and traffic to and from the work area.

### ***Air Monitoring***

Details of a proposed air monitoring program will be included in the Detailed Remedial Action Plan that will be submitted by the Town of Hamden. During the remedial construction of the caps, an air monitoring program will be conducted to evaluate the impact of remediation activities on ambient concentrations of airborne particulate matter (dust). The Town will take all necessary steps to control dust generation during the remedial activities and will design the air monitoring program to ensure the dust control methods are effective.

### ***Remedial Action Report***

After the remedial activities have been completed at Rochford Field, Mill Rock Park and the sewer pump station, the Town of Hamden must submit a Remedial Action Report for DEP's review and approval, which summarizes the remedial actions taken. In addition, a detailed Operations and Maintenance Plan for the cap, a plan for post-remedial groundwater monitoring, and recording of an ELUR will be required.

### **Residential Properties located immediately West and South of the Consent Order Boundary**

Though not subject to the Consent Order, waste fill similar to that found inside the CO boundary has been identified at some properties located outside of the CO boundary. However, there are large differences between the areas inside and outside the CO boundary with respect to the waste fill. The waste fill inside the CO boundary is generally deposited in former wetland areas and other former low-lying areas, and is relatively deep. The waste fill identified at properties located outside the perimeter of the CO boundary (with one limited exception), does not appear to have been deposited into large and deep natural depressions. Instead the waste fill is only present in small or trace percentages in the soil and contains generally low concentrations of associated contaminants.

There are approximately 29 properties located outside the CO boundary where additional soil testing is recommended by DEP to further refine the extent of soil impacted with waste fill that exceeds the Residential Direct Exposure Criteria of the RSRs. Remediation is recommended by DEP at approximately 32 properties. The remedy selected for these properties is generally the same as those taken at residential properties located inside the CO boundary, i.e., excavation as needed to a depth of four feet, proper disposal of waste fill off-site, backfilling with clean soil, restoration of disturbed features (landscaping, patios, fencing, etc.) and, as the Town will propose, inclusion in the District.



## Reuse Planning Process

In the 2006 Proposed Remedy Selection Plan, the DEP proposed that the Responsible Parties, along with the residents of the Newhall Neighborhood and a supporting team of urban planners, develop options for a coordinated, comprehensive, phased approach to remediate and reuse the public and private properties. Both DEP and Olin contributed financially for the Town to conduct the reuse planning process. The Town initiated a reuse planning process for the former Hamden Middle School in late Summer/early Fall of 2006. The reuse planning team met with local residents one-on-one, and with the public at-large at public meetings. The Town's reuse planning team presented proposals for reuse of the former Hamden Middle School building and grounds, based on citizen input, at a Town Council meeting in July 2007.

The Town has a separate reuse planning process underway for the Newhall Street Neighborhood area, which is referred to as the Highwood Neighborhood Planning Process. In Fall 2007, the reuse planning team for the neighborhood area will meet individually and in small groups with residents, business groups, local government, churches, neighborhood associations, and education associations to explore opportunities and collect input. In addition, a neighborhood survey may be conducted to gauge the concerns and interests of residents.

Following the interviews and survey, the Town's reuse planning team will hold a series of focus groups and meetings. These discussions will provide an opportunity for community comment with some discussions focusing on specific topics such as local stormwater drainage or recreation potential. The Town's anticipated schedule for this reuse planning process is to provide a plan and recommendations for the neighborhood area to the Town Council for next steps by Spring 2008.

The design and implementation of remedies pursuant to the Remedy Selection Plan will be coordinated with the Town's reuse planning process and decisions. The schedule in the Next Steps section of this document includes provisions for the DEP to modify remedies, as appropriate, to accommodate the Town's reuse plans.





## Next Steps

1. **Residential and other Non-Public Properties:** Below is a list of the significant next steps and the associated schedule for the remediation of residential and other Non-Public Properties located within the CO boundary.
  - a. The Town will conduct a public process to create a Local Design District. The Town will start the formal process to create the District upon the completion of the Highwood Neighborhood Planning Process, which the Town estimates to be in Spring and Summer 2008.
  - b. The remedial design for any portion of the area may be modified by DEP, as appropriate, to accommodate the Town's reuse planning decisions.
  - c. On or before December 1, 2007, Olin shall submit (unless another Responsible Party has submitted by the same date) a complete application to reclassify groundwater beneath the Non-Public Properties for the area south of Mill Rock Road or Olin shall notify DEP of its intent to continue performing the column study and simultaneously submit a schedule for its completion for DEP review and approval. If any application for groundwater reclassification is denied, DEP may require Olin to proceed with the column study.
  - d. On or before January 1, 2008, Olin shall submit an Implementation Plan outlining the sequence of remediation. Such Implementation Plan shall include:
    1. Proposed grouping of the locations where remedial efforts will be performed for the purpose of scheduling and sequencing the work (for instance, if Olin proposes to construct the remedy on a block-by-block basis, Olin shall propose an order it will follow);
    2. A list of all permits and approvals needed from any local, state or federal entity, and a proposed schedule for submitting all necessary applications and other supporting documentation; and
    3. A proposal for the Town to administer the Soil Management Fund, to pay for proper handling and disposal of waste fill that remains below four (4) feet on residential properties remediated within the proposed Local Design District, if such waste fill is brought to the surface during future deep excavation. Olin will consult with the Town on developing this proposal.
  - e. On or before February 1, 2008, Olin shall submit for DEP review and approval a Generic Remedial Action Plan and schedule to perform the remedial actions.
  - f. On or before 90 days from the date that DEP provides written approval of the Generic Remedial Action Plan, Olin shall submit Property-Specific Remedial Action Plans for each property for which remediation is required in the block or grouping sequenced to proceed first as described in the above referenced Implementation Plan. For each subsequent block or group of properties identified in the Implementation Plan, Olin shall submit Property-Specific Remedial Action Plans in accordance with the approved schedule submitted in conjunction with the Generic Remedial Action Plan. The Commissioner may modify the approved schedule and sequence, or other part of the remedy, as warranted to accommodate the Town's reuse planning decisions.
  - g. After DEP approval of each Property-Specific Remedial Action Plan, but

prior to commencing physical construction on any property, Olin shall meet with the property owner (and tenants if other than the property owner) to explain the details of the construction, answer questions, and obtain access to the property for the purpose of remediating and restoring the property.

- h. On or before 30 days following DEP's approval of the last block of Property-Specific Remedial Action Plans, Olin must submit a plan for post-remedial groundwater monitoring.
- i. On or before 90 days following completion of remediation and restoration of a property, Olin shall submit to DEP, for review and approval, a Remedial Action Report for each property.

Also, these other actions will be performed by the State of Connecticut.

- j. DEP will propose, and adopt as appropriate, RSR amendments to, among other things, allow institutional controls in limited circumstances (such as a Local Design District) as an alternative to existing ELUR provisions, and an alternate method of demonstrating compliance with the Pollutant Mobility Criteria.
- k. The State legislature needs to authorize funds for the State's share of the cost to remediate Non-Public Properties located inside the CO boundary.

**2. Former Hamden Middle School (and portions of the Newhall Community Center):** Below is a list of the significant next steps and the associated schedule for the remediation of the former Hamden Middle School (and portions of the Newhall Community Center).

- a. The Town of Hamden will complete the public process for reuse of the former Hamden Middle School in Fall of 2007.
- b. The remedial design for any portion of the school property may be modified by DEP as appropriate to accommodate the Town's reuse planning decision.
- c. On or before February 1, 2008, the Regional Water Authority (RWA) shall submit for DEP review and approval a Detailed Remedial Action Plan. The Detailed Remedial Action Plan must identify all permits that may be necessary to construct the remedy.
- d. Within 90 days of DEP approval of the Detailed Remedial Action Plan, or such other schedule as DEP includes in such approval, RWA shall commence construction of the approved remedy for the former Hamden Middle School and portions of the Newhall Community Center.
- e. On or before 90 days following completion of remediation at the former Hamden Middle School, RWA shall submit to DEP, for review and approval, a Remedial Action Report for the property. In addition, a detailed Operations and Maintenance Plan for the cap, a plan for post-remedial groundwater monitoring, and recording of an ELUR will be required.

**3. Rochford Field and Mill Rock Park (and the sewer pump station):** Below is a list of the significant next steps and the associated schedule for the remediation of Rochford Field, Mill Rock Park, and the sewer pump station:

- a. The Town of Hamden will complete the public process for creation of the Local Design District for the neighborhood area.
- b. The remedial design for any portion of Rochford Field or Mill Rock Park may be modified by DEP, as appropriate, to accommodate the Town's

reuse planning decision for the neighborhood area.

- c. On or before February 1, 2008, the Town shall submit for DEP review and approval a Detailed Remedial Action Plan. The Detailed Remedial Action Plan must identify all permits that may be necessary to construct the remedy.
- d. Within 90 days of DEP approval of the Detailed Remedial Action Plan, or such other schedule as DEP includes in such approval, the Town shall commence construction of the approved remedy for Rochford Field, Mill Rock Park, and the sewer pump station.
- e. On or before 90 days following completion of remediation at Rochford Field, Mill Rock Park, and the sewer pump station, the Town shall submit to DEP, for review and approval, a Remedial Action Report for the property. In addition, a detailed Operations and Maintenance Plan for the cap, a plan for post-remedial groundwater monitoring, and recording of an ELUR will be required.

**4. Residential Properties located immediately West and South of the Consent Order Boundary:**

- a. The DEP is contacting certain affected property owners outside the CO boundary to discuss performing additional investigation, if recommended, to further define the limits of soil impacted with waste fill.
- b. When remedial activities are completed inside the CO boundary, DEP will commence remediation of private properties located outside the CO boundary.
- c. The DEP will implement the same remedial plan and conduct the same restoration activity, as Olin will perform inside the CO boundary.
- d. The State legislature needs to authorize funds for DEP to remediate residential properties located outside the CO boundary.



# Table

**Table 1 - Privately Owned Properties Inside Consent Order Boundary**

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
322	Augur Street	X			Yes
323	Augur Street		X		Yes
327	Augur Street		X		Yes
329	Augur Street	X			Yes
331	Augur Street		X		Yes
333	Augur Street		X		Yes
334	Augur Street		X		Yes
337	Augur Street		X		Yes
338	Augur Street	X			Yes
339	Augur Street		X		Yes
342	Augur Street	X			Yes
84	Bryden Terrace		X		Yes
90	Bryden Terrace		X		Yes
94	Bryden Terrace		X		Yes
99	Bryden Terrace		X		Yes
105	Bryden Terrace		X		Yes
106	Bryden Terrace		X		Yes
112	Bryden Terrace		X		Yes
113	Bryden Terrace		X		Yes
117	Bryden Terrace		X		Yes
118	Bryden Terrace		X		Yes
124	Bryden Terrace		X		Yes
125	Bryden Terrace		X		Yes
130	Bryden Terrace		X		Yes
131	Bryden Terrace		X		Yes
136	Bryden Terrace		X		Yes
142	Bryden Terrace		X		Yes
213-215	Butler Street		X		Yes
217-219	Butler Street		X		Yes
221-223	Butler Street	X			Yes
229	Butler Street		X		Yes
230	Butler Street		X		Yes
231	Butler Street		X		Yes
234-236	Butler Street		X		Yes
238	Butler Street		X		Yes
237	Butler Street			X	Possible
16	Edwards Street	X			Yes
17	Edwards Street		X		Yes
21-23	Edwards Street		X		Yes
25-27	Edwards Street		X		Yes
26	Edwards Street		X		Yes
30	Edwards Street		X		Yes

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
32	Edwards Street		X		Yes
35	Edwards Street		X		Yes
38	Edwards Street		X		Yes
39	Edwards Street		X		Yes
42	Edwards Street		X		Yes
45	Edwards Street		X		Yes
48	Edwards Street		X		Yes
49	Edwards Street		X		Yes
50-52	Edwards Street		X		Yes
51	Edwards Street		X		Yes
59	Edwards Street		X		Yes
99	Goodrich Street				No
105	Goodrich Street				No
117	Goodrich Street				No
149	Goodrich Street				No
155	Goodrich Street	X			Yes
159	Goodrich Street				No
163	Goodrich Street		X		Yes
197	Goodrich Street	X			Yes
199	Goodrich Street	X			Yes
203	Goodrich Street	X			Yes
207-209	Goodrich Street	X			Yes
211-213	Goodrich Street	X			Yes
233	Goodrich Street				No
241	Goodrich Street	X			Yes
245	Goodrich Street	X			Yes
253	Goodrich Street		X		Yes
257	Goodrich Street		X		Yes
265	Goodrich Street		X		Yes
267	Goodrich Street		X		Yes
311	Goodrich Street				No
319	Goodrich Street	X			Yes
321	Goodrich Street	X			Yes
323	Goodrich Street				No
325	Goodrich Street				No
123	Goodrich Street			X	Possible
229-231	Goodrich Street			X	Possible
237	Goodrich Street				No
293	Goodrich Street				No
297	Goodrich Street				No
303	Goodrich Street			X	Possible
13	Harris Street	X			Yes
16	Harris Street		X		Yes
17	Harris Street		X		Yes
20	Harris Street		X		Yes
11	Marlboro Street				No

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
17	Marlboro Street	X			Yes
18	Marlboro Street	X			Yes
21	Marlboro Street	X			Yes
25	Marlboro Street		X		Yes
26	Marlboro Street		X		Yes
29	Marlboro Street		X		Yes
30	Marlboro Street		X		Yes
33	Marlboro Street		X		Yes
34	Marlboro Street		X		Yes
61	Marlboro Street		X		Yes
69	Marlboro Street	X			Yes
73	Marlboro Street	X			Yes
79	Marlboro Street	X			Yes
80	Marlboro Street	X			Yes
83	Marlboro Street	X			Yes
84	Marlboro Street				No
87	Marlboro Street		X		Yes
88	Marlboro Street		X		Yes
91	Marlboro Street	X			Yes
109	Marlboro Street	X			Yes
115	Marlboro Street	X			Yes
125	Marlboro Street				No
16	Marlboro Street			X	Possible
64	Marlboro Street			X	Possible
82	Marlboro Street			X	Possible
90	Marlboro Street				No
105	Marlboro Street			X	Possible
121	Marlboro Street				No
92	Morse Street	X			Yes
95	Morse Street		X		Yes
98	Morse Street	X			Yes
102	Morse Street				No
103	Morse Street		X		Yes
109	Morse Street		X		Yes
115	Morse Street		X		Yes
116	Morse Street	X			Yes
121	Morse Street		X		Yes
127	Morse Street		X		Yes
135	Morse Street		X		Yes
155	Morse Street	X			Yes
160	Morse Street				No
164	Morse Street	X			Yes
165-167	Morse Street	X			Yes
168	Morse Street	X			Yes
171-173	Morse Street	X			Yes
172	Morse Street	X			Yes

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
176	Morse Street		X		Yes
177	Morse Street		X		Yes
180	Morse Street		X		Yes
185	Morse Street		X		Yes
214	Morse Street	X			Yes
216	Morse Street	X			Yes
220	Morse Street		X		Yes
222	Morse Street	X			Yes
259	Morse Street		X		Yes
263	Morse Street		X		Yes
266	Morse Street	X			Yes
267	Morse Street		X		Yes
271	Morse Street	X			Yes
275	Morse Street	X			Yes
279	Morse Street	X			Yes
283	Morse Street		X		Yes
287	Morse Street		X		Yes
291	Morse Street	X			Yes
295	Morse Street	X			Yes
296	Morse Street	X			Yes
299	Morse Street	X			Yes
300	Morse Street	X			Yes
301-303	Morse Street	X			Yes
308	Morse Street		X		Yes
311	Morse Street	X			Yes
315-317	Morse Street		X		Yes
319-321	Morse Street		X		Yes
330	Morse Street		X		Yes
108	Morse Street				No
126	Morse Street			X	Possible
161	Morse Street				No
274	Morse Street				No
284-286	Morse Street			X	Possible
290-2	Morse Street			X	Possible
304	Morse Street				No
18	Newbury Street	X			Yes
22	Newbury Street	X			Yes
26	Newbury Street	X			Yes
421	Newhall Street		X		Yes
424	Newhall Street	X			Yes
425-431 and 449	Newhall Street		X		Yes
432-434	Newhall Street	X			Yes
438	Newhall Street	X			Yes
453	Newhall Street		X		Yes
460-462	Newhall Street				No



Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
461	Newhall Street		X		Yes
465	Newhall Street		X		Yes
466	Newhall Street	X			Yes
468	Newhall Street	X			Yes
469	Newhall Street		X		Yes
473	Newhall Street		X		Yes
474	Newhall Street	X			Yes
477	Newhall Street		X		Yes
478	Newhall Street	X			Yes
481	Newhall Street		X		Yes
484-486	Newhall Street	X			Yes
499	Newhall Street		X		Yes
507	Newhall Street		X		Yes
513	Newhall Street		X		Yes
517	Newhall Street		X		Yes
523	Newhall Street		X		Yes
596	Newhall Street		X		Yes
606	Newhall Street	X			Yes
610	Newhall Street	X			Yes
618	Newhall Street	X			Yes
622	Newhall Street				No
626	Newhall Street				No
630	Newhall Street				No
634	Newhall Street	X			Yes
642	Newhall Street	X			Yes
670	Newhall Street	X			Yes
672	Newhall Street	X			Yes
678	Newhall Street	X			Yes
452	Newhall Street			X	Possible
602	Newhall Street			X	Possible
650	Newhall Street			X	Possible
10	North Sheffield Street	X			Yes
15	North Sheffield Street				No
23	North Sheffield Street				No
26	North Sheffield Street				No
29	North Sheffield Street		X		Yes
35	North Sheffield Street		X		Yes
38	North Sheffield Street				No
41	North Sheffield Street	X			Yes
49	North Sheffield Street				No

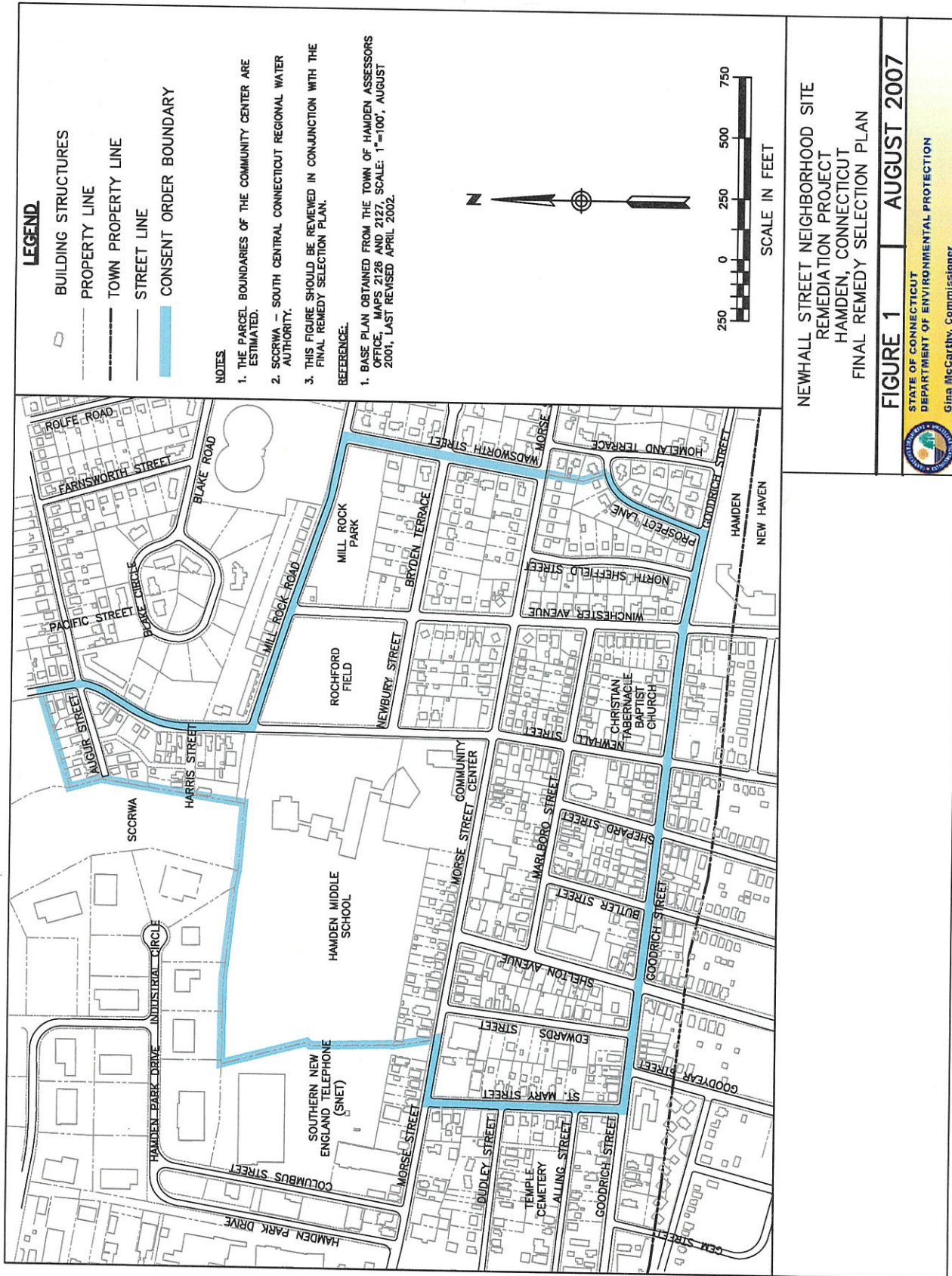
Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
50	North Sheffield Street				No
18	North Sheffield Street			X	Possible
32	North Sheffield Street			X	Possible
44	North Sheffield Street				No
56	North Sheffield Street			X	Possible
14	Prospect Lane	X			Yes
20	Prospect Lane				No
28	Prospect Lane	X			Yes
34	Prospect Lane	X			Yes
40	Prospect Lane		X		Yes
44	Prospect Lane				No
5	Remington Street				No
9	Remington Street			X	Possible
22	Remington Street		X		Yes
453	Shelton Avenue	X			Yes
457	Shelton Avenue	X			Yes
461	Shelton Avenue	X			Yes
462-464	Shelton Avenue		X		Yes
466	Shelton Avenue		X		Yes
470	Shelton Avenue		X		Yes
472	Shelton Avenue		X		Yes
476	Shelton Avenue		X		Yes
478-480	Shelton Avenue		X		Yes
481	Shelton Avenue		X		Yes
482-484	Shelton Avenue		X		Yes
488	Shelton Avenue		X		Yes
492	Shelton Avenue		X		Yes
496	Shelton Avenue		X		Yes
502	Shelton Avenue		X		Yes
508-510	Shelton Avenue	X			Yes
509-511	Shelton Avenue				No
515-517	Shelton Avenue				No
150	Shepard Street	X			Yes
156-158	Shepard Street				No
160-162	Shepard Street				No
163	Shepard Street	X			Yes
164-166	Shepard Street				No
168	Shepard Street			X	Possible
21	St. Mary Street		X		Yes
27	St. Mary Street		X		Yes

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
29	St. Mary Street		X		Yes
35-37	St. Mary Street		X		Yes
39	St. Mary Street		X		Yes
45	St. Mary Street		X		Yes
49	St. Mary Street		X		Yes
53	St. Mary Street		X		Yes
17-19	St. Mary Street	X			Yes
12	Wadsworth Street		X		Yes
20	Wadsworth Street		X		Yes
46	Wadsworth Street		X		Yes
54	Wadsworth Street		X		Yes
60	Wadsworth Street		X		Yes
950	Winchester Avenue				No
956	Winchester Avenue				No
957-959	Winchester Avenue	X			Yes
962	Winchester Avenue				No
966	Winchester Avenue				No
968-970	Winchester Avenue				No
973	Winchester Avenue	X			Yes
976	Winchester Avenue	X			Yes
979-981	Winchester Avenue	X			Yes
984	Winchester Avenue	X			Yes
985	Winchester Avenue	X			Yes
993	Winchester Avenue				No
994	Winchester Avenue				No
999	Winchester Avenue				No
1002	Winchester Avenue	X			Yes
1005	Winchester Avenue				No
1006	Winchester Avenue	X			Yes
1019	Winchester Avenue		X		Yes

Address		Fill Estimated Less than 4 feet	Fill Estimated Greater than 4 feet	Further Assessment Needed	Remediation Proposed
1027	Winchester Avenue		X		Yes
1030	Winchester Avenue	X			Yes
1035	Winchester Avenue		X		Yes
1036	Winchester Avenue				No
1048	Winchester Avenue	X			Yes
1061	Winchester Avenue		X		Yes
1067	Winchester Avenue		X		Yes
1071	Winchester Avenue		X		Yes
960	Winchester Avenue				No
965	Winchester Avenue			X	Possible
972-974	Winchester Avenue				No
1028	Winchester Avenue			X	Possible
1032	Winchester Avenue			X	Possible
1042	Winchester Avenue				No

# Figure

Figure 1 - Site Locus





## Appendices

### Appendix A

#### Summary of Site History

- 1800s ..... The Newhall Street Neighborhood area (also known as "Highwood") consisted of large farms with many wetlands, small ponds and streams. Farms were sold and subdivision of the land into smaller building lots began.
- 1866 ..... Winchester Repeating Arms (WRA) factory was established in New Haven.
- 1890s ..... Draining and filling of wetlands to eliminate mosquito breeding grounds began. Activity sanctioned by state and local health officials to eliminate health nuisance.
- Early 1900s... Town operated some public dumps on privately owned properties to continue filling wetlands and eliminate mosquito problems. Waste materials included ash, cinders, slag and other debris (batteries, bullet casings, oily materials, wood shavings) from WRA and household refuse from area residences (metal, porcelain, bottles, cans). As wetlands and low-lying areas were filled, land was subdivided for residential development and the creation of public parks. Filling of the former Hamden Middle School property began sometime prior to 1934.
- 1932 ..... Olin Corporation bought assets of bankrupt Winchester Repeating Arms.
- 1939 ..... Rochford Field was developed from a former wetland industrial dumpsite.
- 1941 ..... Mill Rock Park (formerly Rochford Field Annex) was developed from a former wetland municipal waste dumpsite.
- 1950 ..... New Haven Water Company (predecessor to RWA) sold property to the Town for future school. The Town then transferred the property to State Board of Education (BOE) for development of regional technical high school, which was never built.
- 1954 ..... State BOE transferred the property back to the Town because of need for "expensive foundations." Town began construction of Michael J. Whalen Jr. High School (currently referred to as the former Hamden Middle School), which opened in 1956.
- 1979 ..... Last documented date of filling at the former Hamden Middle School (HMS). Local residents notified Quinnipiac Health District of sunken areas on the playing field and history of disposal area. DEP soil tests detected lead and other metals.
- 1985 ..... DEP conducted additional soil tests of athletic field behind the former HMS (Newhall Street Field) for Preliminary Assessment.
- 1987 ..... Newhall Street Field added to EPA's CERCLIS and included on

## DEP's State Inventory of Hazardous Waste Disposal Sites.

- 1989 ..... Tornado exposed contaminated materials (lead in soil) at the former HMS. EPA conducted soil sampling for Screening Site Inspection.
- 1991 ..... EPA Removal Program completed Preliminary Assessment/Site Investigation for Newhall Street Field.
- 1992 ..... ATSDR from EPA's Preliminary Assessment/Site Investigation determined that the lead soil contamination at Newhall Street Field posed a health threat to children playing in areas of exposed soils through potential inhalation and ingestion of the contaminated soil. DPH stated that athletic fields that are kept covered with grass are safe for use. EPA determined that Removal Action was not appropriate because "the amount, quantity, or concentration released did not warrant Federal response."
- DEP advised Town to retain an environmental consultant and to place clean soil over athletic fields at the former HMS prior to regrading to avoid contact with contaminated soils.
- 1993 ..... Town's consultants conducted soil sampling on south side of the former HMS and found lead and black ash-like material. Plans to build school addition were suspended.
- 1994-1996..... Town's consultant prepared Cap and Closure Plan for Town for the athletic field behind the former HMS. Clean soil of 1- to 3- feet in thickness was spread over the athletic field to prevent exposure to lead contaminated soil.
- 1994 ..... EPA completed Site Inspection Prioritization for Newhall Street Field.
- 2000 ..... Consultants for Town completed Phase I and II Environmental Site Assessments for the former HMS school expansion project that confirmed presence of historic waste and soil contamination at the former HMS. In November, DEP was notified of the existence of landfill materials beneath the former HMS. DEP directed Town to sample surface soil around the former HMS buildings. Contamination found in surface soils. DEP began investigation of extent of landfill at school, parks and surrounding community.
- 2001 ..... DEP directed Town to place temporary cover material on the former HMS grounds proximal to the school building where metals and PAHs were found in surface soil. DEP tested athletic field behind the former HMS, Rochford Field, Mill Rock Park, and rights-of-way in nearby residential areas where waste is believed to be located. DEP and DPH recommend temporary closing of Rochford Field after finding waste materials at the ground surface. Town placed temporary cover over affected areas of Rochford Field and park was re-opened. EPA tested 76 private residential properties at DEP's request and began emergency removal of lead-contaminated soil from 13 properties. In July, DEP issued an Administrative Order to potentially responsible parties Olin, RWA, the Town and State BOE



ordering them to investigate and remediate pollution at the Site. All parties appealed the order and a contested case proceeding began. Town decided to relocate Hamden Middle School instead of proceeding with expansion project.

- 2002 ..... Olin, RWA and the Town voluntarily conduct independent investigations of extent of fill in different parts of the Site. EPA completed limited removal of lead-contaminated soil from 13 residential properties. DEP conducted testing on residential properties where owners observed waste.
- 2003 ..... In April, the CO between DEP and Responsible Parties Olin, RWA, the Town and State BOE was accepted as a final decision by the hearing officer. Olin submitted work plan for supplemental investigation of Non-public Properties (residential) portion of the Site.
- 2004 ..... RWA and Town submitted work plans for supplemental investigation of the former HMS and parks (Rochford Field and Mill Rock Park), respectively. DEP held open houses for public to make comments on proposed work plans for Olin, RWA and Town. DEP approved all work plans with additional conditions. Olin continued testing of non-public properties, RWA continued testing of the former Hamden Middle School, and the Town continued testing of Rochford Field and Mill Rock Park. DEP continued testing outside of the CO boundary and evaluated structural condition of homes within the boundary. Newhall Advisory Committee (NAC) was formed to advise DEP on the future clean up options and the effect on the community.
- 2005 ..... Olin, RWA and the Town submitted final investigation reports to DEP for review and approval. DEP commented and requested supplemental information. DEP held public meetings to share investigation findings with the public and discuss remedial alternatives presented by the Responsible Parties. DEP continued testing of residential properties outside of the CO boundary and held public meeting to share its investigation findings with the public. NAC continues meeting to discuss investigation progress and possible remedial alternatives. Attorneys representing residents ask DEP to delay issuing its clean up plan to allow time for mediation between residents, DEP and the Responsible Parties.
- 2006 ..... Mediation occurs but no agreements were reached. After reviewing reports from each responsible party, including supplemental reports submitted in 2006, DEP issues the Proposed Remedy Selection Plan. DEP solicits comments through mid-November 2006, comments received, and responses to comments assembled into the "Response to Public Comments, Newhall Street Neighborhood Remediation Project", dated July 2007.
- 2007 ..... After careful consideration of comments, DEP issues "Remedy Selection Plan, Newhall Street Neighborhood Remediation project", dated October 2007.



## Appendix B

### List of Acronyms and Abbreviations

AO .....	Administrative Order	HMS .....	former Hamden Middle School
AOC.....	Area of Concern or Area of Contamination	HWIR.....	Hazardous Waste Identification Rule
ATSDR .....	Agency of Toxic Substances and Diseases Registry	mg/kg.....	milligrams per kilogram
BOE.....	Connecticut Board of Education	NAC.....	Newhall Advisory Committee
CAMU.....	Corrective Action Management Unit	Olin .....	Olin Corporation
CERCLIS.....	Comprehensive Environmental Response, Compensation and Liability Information System (Identifies Sites in Federal Superfund Program)	PAHs .....	Polycyclic Aromatic Hydrocarbons
CO .....	Consent Order, specifically Consent Order No. SRD-128.	PCBs .....	Polychlorinated Biphenyls
COCs.....	Contaminants of Concern	PMC .....	Pollutant Mobility Criteria
cm/sec .....	centimeters per second (rate of flow)	PRP .....	Potentially Responsible Party
cyds .....	cubic yards	QVHD.....	Quinnipiack Valley Health District
DEC.....	Direct Exposure Criteria	RAP .....	Remedial Action Plan
DEP .....	Connecticut Department of Environmental Protection	RCRA .....	Resource Conservation and Recovery Act
DPH.....	Connecticut Department of Public Health	RSRs.....	Remediation Standard Regulations
ELUR.....	Environmental Land Use Restriction	RVC.....	Residential Volatilization Criteria
EPA.....	United States Environmental Protection Agency	RWA .....	Regional Water Authority
HASP.....	Health and Safety Plan	SVOC .....	Semi-volatile Organic Compound
		Town.....	Town of Hamden
		WRA.....	Winchester Repeating Arms



## Appendix C

### Glossary of Terms

Administrative Order (AO)	An enforcement document issued unilaterally by the DEP to a potentially responsible party, legally requiring the party to clean up contamination at a site.
Consent Order (CO)	An enforcement document agreed to between the DEP and a responsible party, in which the responsible party agrees to remediate contamination at a site. For the Newhall Site, Consent Order No. SRD-128 was agreed on between the DEP and Olin Corporation, the Town of Hamden, the RWA and the State Board of Education.
Consent Order Boundary	This is a boundary of the Newhall Street Neighborhood Site that defines which part of the neighborhood is included in the investigation and remediation according to Consent Order No. SRD-128. Other areas where landfill waste and associated pollution has been identified outside of the Consent Order boundary are also proposed for remediation.
Direct Exposure Criteria (DEC)	State clean up criteria for soil that are designed to protect the health of people who may come into contact with polluted soil. The direct exposure criteria are the concentrations of chemicals that, if present in polluted soil below the established concentration, would not create a risk to public health even if that soil were ingested. For the Newhall Site, Residential Direct Exposure Criteria apply.
Environmental Land Use Restriction (ELUR)	This is a deed restriction that is placed on a property record in the Town Clerk's office. It notifies a landowner and subsequent owners that contamination exists on the property in certain areas or depths, and restricts certain excavation that would expose contamination.
Engineered Control (cap)	An engineered control is a barrier placed over landfill materials or polluted soil that serves two purposes. First, it prevents people from coming into direct contact with the pollution and is protective of human health. Second, it prevents rainwater from entering the polluted soil and washing into the groundwater, thereby protecting groundwater and the environment.
Immediate Action Trigger Level	These are contaminant concentration levels identified by the Department of Public Health (DPH) and Environmental Protection Agency (EPA) as needing clean up to reduce the risk human exposure immediately (within 6 months). For the primary contaminants of concern identified in the Newhall Street Neighborhood, Immediate Action Trigger Levels of 1,200 milligrams per kilogram of lead (mg/kg), 150 mg/kg of arsenic, and 10 mg/kg of benzo(a)pyrene were established. These contaminant levels were used to decide which properties EPA performed removal actions on in 2001-2002, and which properties DEP performed interim clean up actions on following EPA's involvement.

Non-Public Properties	Non-Public Properties are privately-owned properties located within the Consent Order Boundary. They are primarily residential, but also include churches and some commercial buildings.
Pollutant Mobility Criteria (PMC)	State clean up criteria for soil that are designed to protect groundwater resources from substances leaching from polluted soil. Chemicals in polluted soil can move from the soil into groundwater every time it rains and rainwater trickles through the soil. The pollutant mobility criteria are the concentrations of chemicals in soil that will not harm groundwater quality if the chemicals migrate from the soil into the groundwater.
Potentially Responsible Party (PRP)	An individual or business identified by the DEP as having responsibility for the clean up of environmental contamination. Also referred to as Respondent or Responsible party.
Public Properties	Public Properties located within the Consent Order boundary including the former Hamden Middle School, portions of the Newhall Community Center, two residential properties currently owned by the Hamden Housing Authority, Rochford Field, Mill Rock Park, and the Winchester Avenue Sewer Pump Station.
Preliminary Assessment (PA)	A limited investigation performed on every CERCLIS site. PA investigations collect readily available information about a site and its surrounding area. The PA is designed to distinguish, based on limited data, between sites that pose little or no threat to human health and the environment and sites that may pose a threat and require further investigation. The PA also identifies sites requiring assessment for possible emergency response actions. If the PA results in a recommendation for further investigation, a Site Inspection is performed.
Proposed Remedy Selection Plan	The proposed plan presented in August 2006 by the DEP recommending alternatives for the remediation at the Newhall Street Neighborhood Site consistent with the State's Remediation Standard Regulations.
Responsible Parties	Also referred to as Potentially Responsible Parties or Respondents. For the Newhall Site, they are Olin Corporation, the Town of Hamden, the Regional Water Authority and the State Board of Education.
Remediation Standard Regulations (RSRs)	State clean up standards for soil and groundwater that DEP enforces to protect human health and the environment. The regulations include specific concentrations of chemicals that if present in soil or groundwater as a result of pollution would require clean up, and alternative approaches to clean up that would also protect human health and the environment.

Residential Volatilization Criteria (RVC)	State clean up standards that apply to certain pollutants found in groundwater that have the tendency to evaporate, or volatilize, from water and move through air spaces in soil, potentially entering buildings through cracks in basements. Pollutant concentrations in groundwater below the Residential Volatilization Criteria are not expected to cause adverse health effects to people who would breath in the vapors.
Site	Newhall Street Neighborhood State Superfund Site. The Site includes Public Properties (the former Hamden Middle School, portions of the Newhall Community Center, Rochford Field, Mill Rock Park, and the Winchester Avenue Sewer Pump Station) and Non-Public Properties (the largely residential areas north, south and east of the former Hamden Middle School) located inside the Consent Order boundary. Also, there are certain additional residential properties outside of the Consent Order boundary where landfill materials and associated polluted soil have been found, and such properties are addressed in this Remedy Selection Plan.
Site Inspection (SI)	The Site Inspection identifies sites that enter the EPA's National Priority List (NPL) site listing process and provides the data needed for Hazard Ranking System (HRS) scoring and documentation. SI investigators typically collect environmental and waste samples to determine what hazardous substances are present at a site. They determine if these substances are being released to the environment and assess if they have reached nearby targets. The SI can be conducted in one stage or two. The first stage, or focused SI, tests hypotheses developed during the PA and can yield information sufficient to prepare an HRS scoring package. If further information is necessary to document an HRS score, an expanded SI is conducted.

