



Corrective Measures Study (CMS) Columbia Manufacturing Company (CMC) Restoration Project Westfield, Massachusetts



Project Overview

The CMC site is located at One Cycle Street in the City of Westfield, Massachusetts and occupies an area of approximately 23.7 acres. The property was first developed in the late 1800s by the American Bicycle Company. Manufacturing activities began at the site in 1897 and have continued, under several different owners, largely uninterrupted and relatively unchanged to the present day. While the facility is most widely known for bicycle production during its long history, many other products, including: mopeds, lawnmowers, motorcycles, munitions shells, and school furniture have also been produced by the facility.

In 1980, following enactment of the Resource Conservation and Recovery Act (RCRA), the facility first entered into the RCRA program after filing a Notification of Hazardous Waste Activity, a General Information form, and a Hazardous Waste Permit Application. In 1988, nearly 100 years after manufacturing first began the United States Environmental Protection Agency (USEPA) conducted its inspection of the site and created an inventory of solid waste management units (SWMUs) that, in the opinion of the Agency, represented potential for release of hazardous materials into the environment. The results of the Agency's inspection were published by an USEPA subcontractor, A.T. Kearney, Inc. (A.T. Kearney), in a document entitled *RCRA Facility Assessment Report*. In the report, A.T. Kearney listed 47 SWMUs and recommended that the facility ownership (MTD Products Inc. [MTD] and CMC) further investigate these SWMUs to determine if the process materials and wastes managed at the site posed a risk to human health or the environment.



Site Location Map

The RCRA Corrective Action process officially began in 1993 when MTD, CMC, and USEPA entered into a legally binding agreement (Consent Decree) to investigate the SWMUs and remediate/restore the property in a manner protective of human health and the environment. As with many sites in the early days of the RCRA Corrective Action process, the site assessment work at CMC progressed slowly. From 1993 until 2000, efforts at the site focused primarily on ongoing site environmental studies and regulatory procedure. The overall focus of these mid-90s studies centered on work planning, contaminant migration, risk assessment studies, and report preparation.

However, important change arrived in 2000, when the USEPA received direction and additional funding from Washington, DC to implement what was termed the Government Performance and Response Act (GPR). GPR was intentionally designed to be more results-oriented and held affected facilities and regulators more accountable for meeting and achieving agreed upon performance objectives. As part of this aggressive clean-up plan, the USEPA established a goal of controlling human exposures and groundwater releases at over 2,200 sites by 2005. The CMC facility was one of the sites addressed by this initiative.



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To better accomplish the ambitious goals of the GPRA program, RCRA Corrective Actions were significantly streamlined and amended to encourage collaboration and provide facilities and regulators with more flexibility in the manner corrective measures were implemented. This new focus on results and accountability was outlined in the Agency's 2003 guidance document entitled [*Results-Based Approaches and Tailored Oversight Guidance*](#).

The release of this 2003 guidance document marked a significant shift in manner and approach that the facility and USEPA employed. Subsequent to this time frame, more holistic approaches were developed at the CMC site to identify contaminant source areas, address the human health and environmental risks of these contaminant source areas and develop interim corrective measures (ICMs) to respond to them in an expedited manner. In concert with USEPA oversight, remedial goals were developed and aligned, priorities were established, and money was allocated to quickly and efficiently address the residual contaminant source areas and risks identified across the site. From 2003 forward, site restoration activities have been proceeding on a continuous basis, culminating with the recent demolition and recycling of most of the older buildings across the property.

During this time frame, a myriad of ICMs have been conducted and completed at the CMC site, including the following:

- Excavation and off-site disposal of contaminated sediments present within each of two former wastewater lagoons
- Closure and dismantlement of former metal plating operations conducted at the facility.
- Excavation and off-site disposal of metals-affected soils beneath the former chrome and zinc plating buildings.
- Removal of aboveground storage tanks (ASTs) and underground storage tanks (USTs) associated with various production activities and the fuel oil storage and delivery systems.
- Excavation and off-site disposal of affected soils associated with ASTs and USTs and buried piping associated with the fuel oil storage and delivery systems.
- Construction and operation of a system designed to recovery hydrocarbons floating on the surface of the water table.
- Installation, maintenance, and monitoring of a groundwater recovery system to control the movement of groundwater present along Cycle Street thereby preventing the volatile organic compound (VOC) plume from migrating beneath the residential neighborhood.
- Transport and discharge of recovered groundwater to the local City of Westfield publicly owned treatment works (POTW).
- Aggressive *in situ* treatment of contaminated groundwater in the vicinity of identified sources areas, where chemical concentrations represented a potential risk, using gas phase oxidation (ozone sparging) and liquid phase oxidation (catalyzed sodium persulfate).



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- Aggressive *in situ* treatment of contaminated soil beneath the former vapor degreaser, where residual chemical concentrations represented a continuing source to groundwater, using liquid phase oxidation (catalyzed sodium persulfate).
- Targeted excavation and stabilization/solidification of contaminated soils along building footers and foundations following demolition.

All of these clean-up activities were conducted as ICMs to achieve Massachusetts-based performance goals, minimize risks to human health and the environment, and restore the site to a condition whereby natural processes could effectively complete the clean-up process. All told, a total of 15,000 cubic yards of contaminated soil (the equivalent volume of soil equal to 9 football fields, 1-foot deep) have been either removed or rendered harmless. In addition, 41 million gallons of contaminated groundwater has been withdrawn and transported off the site while an additional 3 million gallons of groundwater have been treated in place (the equivalent volume of 68 Olympic swimming pools of water).

This CMS has been prepared as a means to communicate and inform the general public about the progress made and status of these various corrective measures and to afford the local community with an opportunity to ask questions and provide comments on the final clean-up measures proposed for the CMC property.

Through the corrective actions taken at this site by MTD and USEPA, most of the significant environmental risks at the site have now been addressed. Only three areas of the facility require long-term attention, including the following:

1. The groundwater located along the northern portion of the site adjacent to Cycle Street,
2. The groundwater located immediately beneath the southern and central portion of the active site and extending across South Meadow Road beneath adjoining agricultural fields, and
3. Subsurface soils containing elevated levels of total petroleum hydrocarbons (TPH) derived from historic fuel oil releases.

USEPA and MTD have determined that site restoration goals have been achieved and that final site clean-up can be achieved by natural attenuation processes. USEPA and MTD have also determined that the long-term remedial measures proposed for the site are protective of human health and the environment and consistent with long-term future uses that can be reasonable envisioned for the property.

Site Location and History

The CMC site consists of a 23.7 acre parcel located at One Cycle Street at the southeastern edge of a heavily developed portion of the City of Westfield, Massachusetts. The site is bounded to the north by residential properties bordering Cleveland, Lozier, and Toledo Avenues and to the west by a railroad



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embankment. The majority of the land to the south and east is primarily agricultural and used for the cultivation of shade tobacco. South Meadow Road parallels the eastern property line of the site and separates the facility from these shade tobacco fields.

The Little River meanders along the eastern edge of the tobacco fields and joins with the Westfield River, approximately one-half mile northeast of the site. Storm water at the facility is captured in a storm water collection system and conveyed to the Little River.

Brick manufacturing buildings have been constructed on the CMC property dating back to the late 1800s and early 1900s. The metal warehouse building, constructed in 1969, is the only recent example of modern construction on the site.

Over the history of the site, the primary item manufactured at the plant has been bicycles. There have been other products manufactured at the facility over shorter periods of time, including: mopeds, lawnmowers, motorcycles, munitions (shells only), and school furniture.

Bicycle production operations first began in 1897 under the ownership of the American Bicycle Company, who operated as the Westfield Manufacturing Company. In 1905, Pope Manufacturing Company purchased the facility from American Bicycle Company and continued manufacturing bicycles. Pope Manufacturing expanded operations to include the production of the Pope motorcycle, bicycles for the United States Army, and shell casings for munitions earmarked for the Russian government. Manufacture of children's bicycles began in 1919. During World War II, emphasis shifted to wartime products, including: motorcycles and shell casings for high explosive ordnance which were produced in mass for the U.S. government. School furniture production began in the mid-1950s.

In 1960, the company was incorporated under the name of the Columbia Manufacturing Company. A subsequent merger in 1967 with MTD transformed the company into a division of MTD. MTD continued operating the site for the next 20 years, until 1987, when CMC executives acquired the business from MTD and began operations as Columbia Manufacturing, Inc. Columbia Manufacturing, Inc. continues to operate the business and manufacture school furniture through the current day. However, in 2005 Columbia Manufacturing, Inc. purchased the property from MTD and in 2007 transferred ownership to Cycle Street Realty, LLC. The primary manufacturing operations at the plant include various machining operations, metal cleaning, electroplating, painting, assembly and distribution.

Ownership History

- American Bicycle Company – 1897 to 1905
- Pope Manufacturing Company – 1905 to 1960
- Columbia Manufacturing Company – 1960 to 1967
- MTD Products, Inc – 1967 to 1987
- Columbia Manufacturing Company – 1987 to 2005
- Columbia Manufacturing, Inc – 2005 to 2007



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The regulatory history of the CMC site is lengthy and complex. Key regulatory milestones, relevant to restoration and redevelopment of the CMC facility are summarized as follows:

- 1980 – MTD filed a Notification of Hazardous Waste Activity, a General Information form, and a Hazardous Waste Permit Application for the facility.
- 1985 – USEPA requested submittal of a RCRA Part B Permit Application.
- 1988 – USEPA and its subcontractor conducted an inspection of the site which led to the development of the 1989 RCRA Facility Assessment (RFA) Report.
- 1991 – USEPA filed a complaint in the United States District Court, Massachusetts District against MTD and CMC seeking relief under RCRA and the Solid Waste Disposal Act.
- 1993 – Consent Decree signed by the affected parties and formally initiated the RCRA Corrective Action process.

Environmental Investigations and Studies

In 1988, USEPA, under contract with A.T. Kearney, conducted a RCRA Facility Assessment (RFA) of the property and identified 47 areas, also referred to as SWMUs, at the facility where solid wastes were being managed (ref. RCRA Facility Assessment, May 1989 and SWMU Inventory). In 1991, USEPA issued an Order (Consent Decree 91-30044-F) that required MTD and CMC to investigate these SWMU areas and characterize and clean them up, as appropriate. The Order was finalized in August 1993, thus initiating the formal RCRA Corrective Action process.

Consistent with the requirements of the Order, between 1993 and 1999, MTD and its technical consultants were involved in a number of environmental studies focused on characterizing site environmental conditions. These studies, collectively referred to as the RCRA Facility Investigation (RFI) were specifically designed to characterize the environmental condition of the surface soil, subsurface soil, and groundwater at each of the 47 SWMU areas and determine which of these areas posed a risk to human health and the environment and required clean-up measures.

Sampling results from each of these studies were subsequently compared to soil and groundwater clean-up goals established by the Massachusetts Department of Environmental Protection (MA DEP) and/or USEPA. SWMU areas in which chemical constituents were identified at levels above these default standards were designated as potential areas of concern (AOCs) and retained for further evaluation.



SWMU and AOC Location Map



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The information obtained from these initial RFI studies showed that, in order to achieve the overall clean-up goals of the RCRA Corrective Action Program, certain areas of the site would require remedial response measures. These areas of the CMC facility include the following:

- Soils and sediments associated with the former wastewater lagoons, the Fire Pond, and the Reflection Pond (constituents of concern [COCs] include TPH, VOCs and metals).
- Soils associated with former electroplating operation (metals).
- Soils associated with the fuel oil delivery system (TPH).
- Soils associated with former vapor degreaser operations (VOCs).
- Select ASTs and USTs (TPH).
- On-site and off-site groundwater located along Cycle Street, north of the facility (VOCs).
- On-site and off-site groundwater located beneath the facility and extending to the east underneath the shade tobacco fields (VOCs and metals).

In addition to the process areas listed above, tetrachloroethene (PCE) was found in the groundwater near the former electroplating operation and wastewater treatment area. PCE is not associated with any of the identified manufacturing processes and is outside the scope of the Consent Decree. While a considerable amount of effort has gone into investigating this release and restoring the groundwater, final resolution is being addressed with USEPA separately.

Site Restoration Activities

After the environmental condition at the property had been thoroughly characterized, USEPA and facility representatives met and agreed to establish short-term and long-term clean-up goals for the site and establish priorities that could be directly tied to the overall goals and objectives of the RCRA Corrective Action Program. Following the *Results-Based Approaches and Tailored Oversight Guidance*, published by the USEPA in September 2003, a more holistic remedial strategy and approach was adopted for the site to identify potential risk areas, establish priorities and implement ICMs, where appropriate. Short-term remedial objectives focused on identifying and mitigating potential risk areas where human health could be reasonably affected via direct contact with COCs. In addition, implementing remedial measures to minimize migration of contaminants in the groundwater beyond the facility property line where considered a priority.

Consistent with these remedial goals, a series of targeted clean-up measures were initiated, even as additional and concurrent environmental studies continued. These initial clean-up activities were focused on the following areas of the CMC facility:

- Excavation and off-site disposal of contaminated soil present within each of two former wastewater lagoons.



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- Excavation and off-site disposal of contaminated sediment present within the former Reflecting Pond and Fire Pond.
- Closure and dismantlement of former metal plating operations conducted at the facility.
- Excavation and off-site disposal of metals-affected soils beneath the former plating building and alleyway.
- Removal of ASTs and USTs associated with various production activities and the fuel oil storage and delivery systems.
- Construction and operation of a system designed to recovery hydrocarbons floating on the surface of the water table.
- Installation, maintenance, and monitoring of a groundwater extraction system to control the movement of groundwater present along Cycle Street thereby preventing the VOC plume from migrating beneath the residential neighborhood.
- Transport and discharge of recovered groundwater to the local City of Westfield POTW.

Completion of these initial clean-up actions satisfied the USEPA's 2005 GPRA goals for the site by effectively managing and controlling possible human exposure and contaminant releases to groundwater. From 2005 to the present, additional site clean-up activities have been focused on achieving further reductions in the observed concentrations of VOCs in groundwater and addressing residual source area materials, particularly in those areas where the potential for migration of these contaminated materials was felt to be the greatest. These additional clean-up activities have included work in the following areas:

- Excavation and off-site disposal of affected soils associated with ASTs and USTs and buried piping associated with the fuel oil storage and delivery systems.
- Aggressive *in situ* treatment of contaminated groundwater in the vicinity of identified sources areas, where chemical concentrations represented a potential risk, using gas phase oxidation (ozone sparging) and liquid phase oxidation (catalyzed sodium persulfate).
- Aggressive *in situ* treatment of contaminated soil beneath the former vapor degreaser, where residual chemical concentrations represented a continuing source to groundwater, using liquid phase oxidation (catalyzed sodium persulfate).
- Demolition and deconstruction of former brick manufacturing buildings.
- Ongoing capture and recovery of VOC-affected groundwater along Cycle Street to promote migration control of possible groundwater movement into residential areas.
- Excavation and treatment of affected soils located adjacent to and underneath former building foundations and footers that were previously inaccessible before demolition activities.
- Placement of a soil cover on the areas of the site not already covered by existing asphalt or concrete.



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Consistent with the USEPA's *Results-Based Approaches and Tailored Oversight Guidance*, these various clean-up activities have been conducted as ICMs accelerating the clean-up time frame and greatly minimizing or eliminating potential risks to human health and the environment. These ongoing clean-up activities have also restored the property to a condition where natural processes can now effectively complete the clean-up process.

All told, MTD has spent more than 10 million dollars restoring the property and reducing or eliminating the risk to human health and the environment. Through MTD's efforts, a total of 15,000 cubic yards of contaminated soil (the equivalent area of 9 football fields, 1-foot deep) have been either removed or rendered harmless through treatment. In addition, 41 million gallons of contaminated groundwater have been withdrawn and transported off the site while an additional 3 million gallons of groundwater have been treated in-place (the equivalent volume of 68 Olympic swimming pools of water).

Site Clean-up Goals (Media Protection Standards [MPS])

A key component in the evaluation of the data collected during these numerous investigations and clean-up measures is a thorough and extensive evaluation of human health and ecological risk considerations. During the implementation of interim actions performed on affected soil at the site, clean-up levels developed by the State of Massachusetts (Method 1 Standards) that are protective of residential exposures to affected soil, were utilized to guide all soil excavation and treatment activities. Such measures were consistent with the Massachusetts Contingency Plan (MCP; 310 CMR 40). The MCP sets forth three methods for the development of MPS. These standards represent concentrations of hazardous substances at which no further remedial response actions are required based upon the risk posed by these chemicals. The standards are protective of public health, public welfare, and the environment (*i.e.*, represent a condition of "no significant risk"), given the exposures assumed, and are measurable. Method 1 standards are, by nature, generic, and are derived in a manner to be protective at a wide range of disposal sites across the state. Flexibility also exists under the MCP to use more site-specific risk characterization approaches under Method 2 (default Method 1 equations with site-specific inputs) and Method 3 (comprehensive site-specific risk evaluations). With the possible exception of a few locations adjacent to and underneath existing building foundations and footers, the ICMs conducted by MTD on site soil have achieved these Method 1 residential soil standards.

Site-specific, risk-based MPS for groundwater have also been considered and developed for the site, consistent with the MCP. Under the MCP, three approaches are available for development of MPS for groundwater based on potential exposures to groundwater.

- **Category GW-1:** Concentrations based on the use of groundwater as drinking water, either currently or in the foreseeable future.
- **Category GW-2:** Concentrations based on the potential for volatile material to migrate into indoor air.
- **Category GW-3:** Concentrations based on the potential environmental effects resulting from contaminated groundwater discharging to surface water.

As with soil, the MCP also allows flexibility to use more site-specific risk characterization to develop MPS for groundwater using site-specific information. Category GW-2 is most appropriate for the majority of groundwater at the CMC site, in that, groundwater in the area is not currently used, nor is it reasonably



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anticipated to be used, as a drinking water source. GW-3 standards will be evaluated for groundwater in the vicinity of the Little River. Site-specific MPS have been developed for the primary VOCs detected in the groundwater (PCE, trichloroethene [TCE], and degradation products). Category GW-2 Standards in combination with the site-specific standards apply to groundwater which is considered shallow and where there is currently (or may in the future be) a residential or industrial structure built at the land surface. The GW-2 Standards and the site-specific standards are intended to address the potential for migration of volatile vapors into indoor air from hazardous substances in groundwater. Groundwater concentrations which are below site-specific or GW-2 standards for protection of indoor air exposures would not be expected to pose a risk to resident or industrial worker populations. Site-specific GW-2 standards are provided in the following table

Primary Constituents of Concern
Groundwater Target Concentrations

CONSTITUENT	NORTH END GROUNDWATER (protective of residential exposure to vapors in indoor air)	SOUTH END GROUNDWATER (protective of facility workers exposure to vapors in indoor air)	SOUTH END GROUNDWATER (protective of ecological receptors in surface water of Little River)
VOCs			
<i>cis</i> -1,2-dichloroethene (DCE)	14	33	50
PCE	1.2	2.8	30
TCE	0.8	1.9	5.0
Vinyl chloride	0.013	0.052	50
TPH	5.0	5.0	5.0
Inorganic Constituents			
Cadmium	Not Applicable	0.009	0.009
Chromium	Not Applicable	0.3	0.3
Copper	Not Applicable	0.09	0.09
Nickel	Not Applicable	0.2	0.2
Zinc	Not Applicable	0.9	0.9

Long-term Actions and Contingencies (Final Corrective Measures)

An extensive list of possible clean-up methods were considered and evaluated to address these three areas requiring ongoing corrective measures. The general categories of clean-up techniques evaluated include the following:

- No action
- Activity and use limitations (AULs)
- In-place treatment measures
- Removal/Disposal
- Capping
- Monitored natural attenuation (MNA)

Individual clean-up methods were each evaluated for their inherent ability to meet the corrective measures objectives including their ability to achieve MPS (Clean-up Goals).

Based upon the information provided in the CMS, USEPA recommends the following corrective measures actions for the three site areas requiring remedial actions:

1. **North End Groundwater:** The remedial action recommended for affected groundwater located along the northern property boundary is continued operation of the groundwater recovery system with MNA. This response measure is deemed appropriate in view of the long history of active groundwater recovery and *in situ* source area treatment that has occurred. Natural attenuation relies primarily on the various physical, chemical, and biological processes that act on contaminants without human intervention to meet clean-up goals. MNA processes will be routinely monitored by collecting periodic groundwater samples from a series of dedicated monitoring wells installed along Cycle Street, both on the property and in the residential neighborhood to the north. Groundwater samples will be analyzed for the chemicals previously found in this area until clean-up goals are achieved. For North End Groundwater remedy, residential clean-up goals have been established as most relevant and appropriate.

All monitoring wells will be securely enclosed and locked to prevent tampering or vandalism. Institutional controls shall also be set forth to prohibit installation of drinking water wells within the area where chemicals are known to occur in groundwater at levels above residential clean-up goals.

As part of this remedial action, groundwater recovery will be discontinued when the routine groundwater monitoring results show that VOC levels no longer pose a risk. This remedial action also provides for a contingent remedy to be developed and implemented should routine groundwater monitoring results show that natural attenuation is not achieving the desired remedial action objectives over a reasonable time frame.



Distribution of TCE
North End Groundwater – May 2009

2. **Site-wide Soil:** A significant portion of the TPH-affected subsurface soil has already been addressed at the facility through ICMs involving excavation, treatment, and/or disposal. In spite of these efforts, additional areas of TPH-affected subsurface soil have been identified and will remain on the site. This soil is primarily located along former utility corridors or adjacent to building foundation structures or footings where additional soil removal would compromise the structural integrity of the buildings. The most recent interim corrective action selected to address the TPH-affected subsurface soil was placement of a permanent soil cover over the areas not already covered by asphalt or concrete. The remedial action for site-wide soil is maintenance of the existing soil cover – vegetative, asphalt, or concrete. This alternative was selected because it would maintain the barrier between the known areas of TPH-affected soil and any reasonable potential exposure pathway to humans.

This remedial action also anticipates inclusion of institutional controls and use limitations along with ongoing inspection and maintenance requirements for the soil cover in the areas where a soil cover is present to contain chemicals detected above clean-up goals for as long as this condition exists.

Restrictions on future residential development and information notices for construction workers concerning contact with the soils in these specified areas will also be addressed by this action.

This remedial action was selected because it provides a proven and reliable means of maintaining a barrier to possible human exposures or environmental releases. Maintenance of the soil cover can also be reasonably implemented at the CMC site and will achieve the clean-up objectives and requirement for this area of the site.

3. **South End Groundwater:** The remedial action recommended to address the VOC-affected groundwater and metals –affected groundwater located beneath the CMC facility and extending in a southerly direction across South Meadow Road, beneath the tobacco fields, is MNA. Land use restrictions are already in place for the nearby tobacco fields. Thus, reasonable exposure pathways for human exposure and environmental releases do not exist. Natural attenuation will rely upon the physical, chemical, and biological processes that will act on the observed groundwater impacts without human intervention to meet site clean-up goals. These processes will be monitored by routinely collecting groundwater samples from a dedicated series of monitoring wells installed along South Meadow Road, both on the property and in the tobacco fields to the east. Groundwater samples will be analyzed for the chemicals previously found in the area until clean-up goals are achieved. For the South End Groundwater, industrial clean-up goals have been established.

All monitoring wells will be secured and locked to prevent tampering or vandalism. Institutional controls will also be established to prohibit installation of drinking water wells in the area where chemicals are present in the groundwater above clean-up goals.



**Distribution of TCE
South End Groundwater – May 2009**



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As an integral part of this remedial action, a contingent remedy will be implemented if long-term groundwater monitoring results show that natural attenuation is not achieving the desired remedial action objectives over a reasonable timeframe.

Operations, Maintenance, and Monitoring (OM&M) (Corrective Measures Implementation)

The corrective Measures Implementation Workplan (CMIWP) describes the corrective measures construction, OM&M activities associated with the final corrective measures for the MTD site. The CMIWP provides details on the following information:

- **Summary of Final Corrective Measures** – provides an overview of the final corrective measures, including objectives.
- **OM&M** – provides details for soil cover inspections and maintenance as well as the long-term groundwater monitoring program.
- **Changes to Corrective Action** – provides the basis for modifying the final corrective measures, conditions that would trigger consideration of a contingent remedy, and the requirements for terminating corrective measures.
- **Reporting** – provides a summary of the reports recommended to document OM&M activities
- **Schedule** – provides a schedule for the next five years of activities
- **Public Involvement Plan** – the public has had input to corrective action remedy selection; maintenance of records at MA DEP and USEPA are provided for ongoing public involvement.

To confirm that the final corrective measure remain protective and will achieve the final clean-up targets, groundwater samples will be collected on a routine basis. North End Groundwater will be evaluated by collecting groundwater samples on a semiannual basis from 48 groundwater monitoring wells located on and off the property. The monitoring network for South End Groundwater will include semiannual sampling from an additional 32 monitoring wells.

In addition, the soil cover, which is intended to provide a barrier between the affected subsurface soil and human populations, will be inspected on an annual basis. During the soil cover inspection, the inspector will visually observe the soil cover for deficiencies. Specific items that will be noted include significant erosion or rutting and the condition of the vegetative cover. A deficiency requiring repair is defined as a breach in the soil cover where direct contact can be made with the underlying subsurface soil. Photographs will be taken of observed defects and a written or electronic log will be kept documenting the general conditions of the cover.

During the OM&M period, an annual summary report will be prepared at year-end following the last monitoring event for each year. Each annual monitoring report will be submitted by March 1 of the following calendar year. The annual reports will include a certification that maintenance of corrective actions and AULs is being continued.