Four in-person interviews were conducted by EPA on February 25, 2009 with Mr. Dave Buckley (MassDEP Project Manager), Mr. Mike Brogin (facilities manager of the Ashland House), Mr. Dave Foster (Town of Ashland Public Facilities Director), and Mr. Malcolm Smart (member of the Ashland Board of Health). Mr. Buckley reported that some incidents of trespassing have occurred at the landfill site. Evidence of dumping was observed during the Site inspection. Both Mr. Brogin and Mr. Foster reported that increased flooding has occurred around the railroad tracks and Trolley Brook area, and that the flooding has sometimes affected the downtown area. No additional concerns or major issues were raised during these interviews.

EPA conducted two additional interviews on March 6, 2009 with Pastor Charlie Legassey, principal of the Metro West Christian Academy, and Mrs. Gail Melancon, a resident of the Town of Ashland who has a VMS in her home. Pastor Legassey did not express any major concerns regarding the Site, and in general was pleased with the level of communication from the MassDEP and the EPA concerning activities at the Site and around the town. Mrs. Melancon reported that she was generally pleased with how the work to install the VMS was conducted. She did raise concerns about cracks that have occurred in her basement floor since the installation of the VMS. Mrs. Melancon expressed her desire for good communication from the MassDEP going forward concerning the maintenance and inspection of her VMS. No additional issues or concerns were raised during the interviews.

7.0 TECHNICAL ASSESSMENT

This section provides a technical assessment of the remedies implemented at the Site, as outlined in the Comprehensive Five-Year Review Guidance (EPA, 2001b). The remedies have been evaluated based on their function in accordance with decision documents, their adherence to valid risk data and scenarios, as well as any other information that could have affected the remedy's protectiveness.

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

OU #1

Yes. The results of the monitoring data review and the Site inspection indicate that the remedy is functioning as designed. Overall, the Site was well maintained and appeared to be in good condition. The issues identified during the Site inspection do not affect the overall

protectiveness of the remedy. The cap is functioning as designed and is in good overall condition. The cap remains as a protective barrier to prevent exposure to human trespassers and burrowing mammals. The groundwater diversion trench and associated drainage ways are being actively maintained and appear to be functioning as designed. The results of the groundwater monitoring data indicate that the concentrations of contaminants detected in samples collected from both overburden and bedrock wells continue to fluctuate; however, the overall trend appears to be decreasing. The most recent surface water monitoring data did not detect contaminant concentrations above the applicable EPA and MCP standards. Air monitoring data indicates that no contaminants are being transported off-site. The restored wetland areas are being actively maintained and appear to provide a functioning habitat. Finally, the potential for direct human contact to contaminated sediments has been mitigated by the Site security fences.

OU #2

No. Based on monitoring data collected to date, eight of the VMS do not achieve the minimum negative pressure based on pressure performance monitoring at one or more locations. The ESD issued in September 2006 created two remedial phases: 1) installation of VMS in buildings located over the contaminated groundwater plume, and 2) installation of a DNAPL extraction system. The first phase of the remedy has been implemented and the MassDEP is currently performing the O&M of the VMS. The second phase is currently being implemented, and therefore cannot be evaluated until its completion.

MassDEP is performing inspections of the 43 VMS concurrent with the preparation of this Five-Year Review. According to the most recent information provided by the MassDEP, 31 of the 43 systems have been inspected. All 31 systems were found to be operational. However, 8 systems did not achieve the minimum negative pressure based on performance monitoring at one or more locations. Because the inspections are on-going, no conclusions or recommendations were available from MassDEP at the time of this five-year review report. Repairs are being implemented by MassDEP where necessary to ensure that the VMS remedy remains protective of human health and the environment.

The groundwater monitoring program mandated by the ESD has not yet been implemented. The ESD mandates that the EPA will reinitiate groundwater sampling of off-site groundwater on a once per year basis. Six additional monitoring wells were installed and sampled, along with

two existing monitoring wells, in November 2006 to more accurately delineate the shallow VOC plume as mandated by the ESD.

Finally, the institutional controls mandated by the ROD have not yet been implemented. There are currently no formal controls in place to prevent the installation of drinking water wells or contact with contaminated groundwater through excavation. In order to insure that the remedy remains protective in the long-term, institutional controls need to be implemented to prevent exposure to contaminated groundwater. As described in the ESD, an informal notification process has been used whereby the Town of Ashland seeks EPA's input into construction projects located within the extent of the known groundwater plume. Although not mandated by the ESD, EPA intends to establish institutional controls to prevent future inhalation of vapors. Due to the numerous residential properties requiring controls, EPA will request that the Town of Ashland establish a zoning ordinance to provide the necessary controls. These controls will be formalized in the pending final ROD for OU#2.

OU #3

Yes. The results of the monitoring data review and the Site inspection indicate that the remedy is functioning as designed. Overall, the Site was well maintained and appeared to be in good condition. The issues identified during the Site inspection do not affect the overall protectiveness of the remedy. The cap is functioning as designed and is in good overall condition. The cap remains as a protective barrier to prevent exposure to human trespassers and burrowing mammals. The results of the groundwater monitoring data indicate that the concentrations of contaminants detected in samples collected from both overburden and bedrock wells continue to fluctuate; however, the overall trend appears to be decreasing. The most recent surface water monitoring data did not detect any contaminant concentrations above the applicable EPA and MCP standards. Air monitoring data indicates that no contaminants are being transported off-site. The restored wetland areas are being actively maintained and appear to provide a functioning habitat. Also, the requirement for coverage of wetland native species has been met for a majority of the area and other areas are close to achieving the required coverage. Finally, the potential for direct human contact to contaminated sediments has been mitigated by the Site security fences.

7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?

OU #1

No. Some of the exposure assumptions and toxicity data used at the time of the remedy selection are not still valid since the RI/FS was completed in 1985, which was prior to the existence of current EPA risk guidances. However, excavation and consolidation of contaminated soil, sediment, and sludge in the former on-site sludge disposal area and capping of the Hill area have essentially eliminated the potential for exposure to hazardous substances at OU #1. Therefore, the remedy is still protective of human health. The ROD did not establish clean-up standards beyond achieving background levels. The RAOs used at the time of the remedy selection are still valid.

Changes in Land Use of the Site and Physical Site Conditions

No changes in land use or the physical conditions of the property have occurred since the 2004 five-year review. The Site remains vacant, capped, and fenced. The residential development adjacent to the south end of the Site was approved by the Town of Ashland in 2008; however, construction has reportedly been postponed indefinitely due to poor economic conditions. Redevelopment of the landfill area of the Site as a golf course was proposed as a component of the residential development. Currently, the Town of Ashland is evaluating options of renewable energy technologies (i.e. solar and wind) for the landfill cap area.

New Contaminants and/or Contaminant Sources

No new contaminants or contaminant sources have been identified since the remedy.

Changes in Standards or TBCs

Since the ROD did not specify any chemical-specific ARARs or TBCs there were no standards to review, except for the human health risk assessment guidance described below.

Changes in Exposure Pathways, Exposure Assumptions, Toxicity Values, and Risk Assessment Methods

Excavation and consolidation of contaminated soil, sediment, and sludge in the former on-site sludge disposal area and capping of the Hill area have essentially eliminated the potential for

exposure to hazardous substances at OU #1. Therefore, changes in exposure pathways, exposure assumptions, toxicity values, and risk assessment methods, which have occurred since the time of the RI/FS and ROD, do not impact the protectiveness of the selected remedy.

OU #2

No. Some of the exposure assumptions and toxicity data used at the time of the original remedy selection are not still valid since the RI/FS was completed in 1990, which was prior to the existence of current EPA risk guidances. However, the remedy selected under the OU#2 ROD (1991) has been superseded by the 2006 ESD. The ESD required installation of vapor migration systems and DNAPL extraction wells. The installation of vapor migration systems was completed in 2007. Installation of DNAPL extraction wells is underway. A focused risk assessment in 2006 addressing vapor migration into indoor air supported the ESD. Exposure assumptions and toxicity data used at the time of the focused risk assessment are still valid. Vapor mitigation systems are intended to eliminate the potential for vapor intrusion into homes. Therefore, this portion of the remedy is designed to be protective of human health by eliminating the exposure pathway. The risk assessment of other pathways, including use of groundwater as drinking water and direct contact with groundwater in residential basements, was conducted prior to the 1991 ROD. Exposure assumptions and toxicity data used at the time of this earlier risk assessment are or are not still valid. Groundwater is not currently used as a drinking water source. Direct exposures to groundwater in basements or exposures to surface water from groundwater remain a concern. MCLs and vapor intrusion screening levels provide the basis of clean-up goals for groundwater. The RAOs used at the time of the ESD are still valid.

Changes in Land Use of the Site and Physical Site Conditions

No changes in land use or the physical conditions of the property have occurred since the ESD. The Site itself remains vacant, capped, and fenced. Groundwater is not used as a drinking water source. No new development has occurred in areas above the groundwater plume.

New Contaminants and/or Contaminant Sources

No new contaminants or contaminant sources have been identified since the ESD. The primary contaminant of concern in the ESD is TCE.

Changes in Standards or TBCs

There are no changes in standards.

Changes in Exposure Pathways, Exposure Assumptions, Toxicity Values, and Risk Assessment Methods

The EPA Office of Solid Waste and Emergency Response (OSWER) recommends in its 2003 Directive 9285.7-53 to use a hierarchy of three tiers for sources of toxicological information for human health toxicity value: Tier 1 – EPA's Integrated Risk Information System (IRIS); Tier 2 – EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs); and Tier 3 – other toxicity values including, but not limited to, peer-reviewed values from the California Environmental Protection Agency (Cal EPA), the Agency for Toxic Substances and Disease Registry (ATSDR), and the EPA Health Effects Assessment Summary Tables (HEAST).

For TCE, there is currently no toxicity value available for Tier 1 and Tier 2. However, for Tier 3, there are the Cal EPA cancer toxicity value and the New York State Department of Health (NYS DOH) non-cancer toxicity value that can be used when evaluating TCE exposures via the inhalation pathway. Consistent with the recommendation from the 2003 OSWER Directive, these values are peer reviewed and recommended for use to evaluate lifetime excess cancer risk and non-cancer hazard from TCE exposures.

Applying the Cal EPA inhalation cancer toxicity value for Nyanza OU #2, TCE indoor air concentrations corresponding to target cancer risk levels of 1×10^{-6}, 1×10^{-5} and 1×10^{-4} would be 1.2 $\mu g/m^3$, 12 $\mu g/m^3$, and 120 $\mu g/m^3$, respectively, for the residential scenario. Applying the NYS DOH inhalation non-cancer toxicity value, TCE indoor air concentrations corresponding to target non-cancer hazard index of 1.0 would be 10 $\mu g/m^3$,

Using these Tier 3 toxicity values identified above, the indoor air level of 10 $\mu g/m^3$ would correspond to EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4} and hazard goal of 1.0 for the residential scenario. Since 10 $\mu g/m^3$ is within the acceptable risk range and would be considered protective of residents, the selected action level of 2 $\mu g/m^3$ is still protective at the Site.

Therefore, no changes in exposure pathways, exposure assumptions, toxicity values, and risk assessment methods have occurred since the time of the ESD that impact the protectiveness of the selected remedy.

Although appropriate at the time of the public health risk assessment, exposure assumptions and toxicity data used prior to the 1991 ROD to evaluate drinking water risks and direct exposures to groundwater in basements are out dated. However, groundwater is not currently used as a drinking water source and MCLs used as interim clean-up criteria are protective of this pathway. Direct exposures to groundwater in basements or exposures to surface water from groundwater remain a concern. Installation of DNAPL extraction wells will serve to reduce migration of contaminants into basements, thus reducing exposures via this pathway.

OU #3

Yes, exposure assumptions and toxicity data used at the time of the remedy selection are still valid. Changes in toxicity values and risk assessment methods have occurred since the remedy selection; however, changes do not impact the protectiveness of the remedy. The remedy is still protective of human health. The ROD established a mercury clean-up goal of 1 mg/kg for sediments in the continuing source areas. The RAOs used at the time of the remedy selection are still valid.

Changes in Land Use of the Site and Physical Site Conditions

No changes in land use or the physical conditions of the property have occurred since the 2004 five-year review.

New Contaminants and/or Contaminant Sources

No new contaminants or contaminant sources have been identified since the remedy.

Changes in Standards or TBCs

The clean-up goal of 1 mg/kg for mercury was selected to be protective of aquatic organisms as well as human health and is based on the National Oceanic and Atmospheric Administration's (NOAA) Effect Range – Median (Long & Morgan, 1991).

Changes in Exposure Pathways and Exposure Assumptions, Toxicity Values, and Risk Assessment Methods

The Human Health Risk Assessment evaluated recreational exposures including swimming, boating, wading, and fishing. Exposure scenarios included exposure through accidental ingestion of and dermal contact with surface water and sediment. In addition to the recreational scenario, a residential scenario, which assumed more frequent exposure to contaminated

sediment was evaluated in bordering wetland areas. Fish ingestion exposure scenarios for the Sudbury River were evaluated for sports and subsistence fishermen. These scenarios and pathways remain valid. EPA does not publish default exposure assumptions for recreational exposures to sediment or surface water or for ingestion of fish. Therefore, standard practice involves site-specific selection of the exposure assumptions. The assumptions used are reasonable, and therefore can be considered still valid. Therefore, no changes in exposure pathways and exposure assumptions impact the protectiveness of the selected remedy.

Toxicity values are updated on an on-going basis by EPA. Since the time of the remedy selection, toxicity values for many of the contaminants evaluated in the human health risk assessment have been updated. In addition, several risk assessment methods have been revised. The risk assessment was conducted prior to the publication of current EPA risk assessment guidance Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Parts D and E) (US EPA, 2001 and 2004). In March 2005, EPA published an updated version of the Guidelines for Carcinogen Risk Assessment and a new supplement, Supplemental Guidance for Assessing Susceptibility from Early-Life Exposures to Carcinogens. These documents provide a revised method of evaluating risk to children and adolescents from carcinogens with a mutagenic mode of action, including PAHs. PAHs were detected in sediments; however, they were not considered site-related. The methodology used in the baseline risk assessment, while following standard practice of the time, differs in some aspects from accepted practices used today in risk assessment; however, changes do not impact the protectiveness of the remedy.

7.3 Question C: Has Any Other Information Come To Light That Could Call Into Question the Protectiveness of the Remedy?

OU #1

No. There are no new human health or ecological risks that have been identified. The proposed development that was to be located upgradient of the landfill has been postponed indefinitely. The Site inspection and data review did not identify any new information that would call into question the protectiveness of the remedy.

OU #2

Yes. MassDEP has inspected 31 of the VMS, 8 of which did not achieve the minimum negative pressure at one or more locations during performance testing. The minimum pressure performance standard is not a risk-based value, but rather based on the principal that at a certain negative pressure, capture of any vapors is ensured. Although the VMS are operating and generating a negative pressure field, it is not possible to determine if the field is adequate to capture all vapors for those VMS where the minimum pressure performance standard is not achieved at all monitoring points. MassDEP is actively implementing repairs where necessary and attempting to gain access to complete inspections for the remaining systems.

The implementation of the DNAPL extraction phase of the remedy is currently in progress. No evaluation can be made until the remedy is implemented.

OU #3

No. There are no new human health or ecological risks that have been identified. The proposed development that was to be located upgradient of the landfill has been postponed indefinitely. The Site inspection and data review did not identify any new information that would call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

OU #1

According to the data review, the site inspection and interviews, the remedy is currently functioning as intended by the ROD. The landfill cap area is properly maintained and institutional controls are in place to prevent access to the OU #1 Site. Groundwater data indicates a downward trend and surface water data indicates all detected compounds are at concentrations below EPA and MCP criteria; thus, preventing a risk from exposure.

OU #2

According to the data review, the Site inspection and interviews, portions of the remedy are not completed (i.e. DNAPL remedy); therefore, a determination of its functionality cannot yet be determined. Groundwater monitoring beyond the samples collected in November 2006 has not been conducted in the last five years and needs to occur in order to evaluate the current status

of groundwater contaminant plume and its potential impact to receptors. Institutional controls have not yet been established.

In regard to the vapor intrusion mitigation portion of the OU#2 remedy, the 31 inspected systems are fully operational, however, eight VMS units did not achieve the minimum negative pressure performance standard at one or more locations, and are currently under being evaluated and repaired where necessary to increase the negative pressure readings.

OU #3

According to the data review, the Site inspection and interviews, the remedy is currently functioning as intended by the ROD. The wetland areas and drainageways are properly maintained. Wetlands vegetation growth is continuing with periodic monitoring and maintenance. Surface water data indicates all detected compounds are at concentrations below EPA and MCP criteria; thus, preventing a risk exposure.

8.0 ISSUES

This section provides a summary of the issues identified during this fourth five-year review. Recommendations and follow-up actions are presented in Section 9.0.

Table 8-1
Issues
Nyanza Chemical Waste Dump Superfund Site
Ashland, Massachusetts

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Two rusted and bulged drums were observed outside the storage shed.	N	Y
Minor damage to the perimeter fence was noted near the South Gate.	N	Y
A groundwater monitoring program for OU #2 as mandated by the ESD has not yet been implemented.	N	Y
Eight of the vapor mitigation systems installed as part of OU #2 did not achieve the minimum negative pressure when inspected.	Y	Y
The DNAPL extraction portion of the remedy has yet to be implemented.	N	Y
Institutional controls mandated by the ESD for OU #2 have not yet been implemented.	N	Y

Five-Year Review Report

Fourth Five-Year Review
for
Nyanza Chemical Waste Dump Superfund Site
Ashland, Massachusetts

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