LH

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE
436 Dwight Street • Springfield, Massachusetts 01103 • (413) 784-1100

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

OCT 23 2007

Town of Amherst
Department of Public Works
586 South Pleasant Street
Amherst, MA 01002
Attention: Guilford Mooring, Supt.

Re: Amherst-DSWM-Landfill
Old Amherst Landfill
Route 9 (South Side)
Interim Comprehensive Site Assessment
Permit Approval
07-008-001
BWPSW23
Transmittal #W072576

Dear Mr. Mooring:

The Department of Environmental Protection (the Department) has completed review of the Interim Comprehensive Site Assessment (Interim CSA) report for the Old Amherst Landfill (the "Old Landfill", hereinafter referred to in this document as "the landfill"), located south of Route 9 (Belchertown Road) in Amherst. The Interim CSA Report was prepared by Tighe & Bond, Inc. (T&B), on behalf of the Town of Amherst (the Town), in accordance with the Department's approvals of the CSA Scope-of-Work.

Landfill History

The landfill was operated from the 1930s until its closure in 1986, when an impermeable soil cap and associated vegetative support layer was installed over the entire landfill in accordance with engineering plans approved by the Department. The total capped area of the landfill occupies an area of at least 21 acres, although the exact acreage of the cap was not provided in the report. A junkyard, Amherst Recycling, had occupied approximately 4 acres adjacent to the southwestern portion of the landfill; this property was acquired by the town and included in the landfill capped area. The most recent municipal solid waste (MSW) fill area of the landfill is Phase I, the mounded area in the

northwestern corner.

Summary of Comprehensive Site Assessment

Updated site maps were prepared, showing the location of all monitoring and sampling locations. CSA environmental assessment activities were performed both outside the landfill perimeter, and within the landfill perimeter. CSA assessment activities performed outside the landfill perimeter consisted of the following:

- Groundwater samples were obtained during one monitoring round from twelve existing groundwater monitoring wells, one existing bedrock geothermal well, and one newly-installed monitoring well;
- A groundwater contour and flow map was prepared from groundwater elevation data;
- Surface water samples were obtained during one monitoring round from nine surface water locations around the landfill;
- Groundwater and surface water samples were analyzed for the parameters outlined at 310 CMR 19.132(h)(1-3), including RCRA 8 metals (as total metals), volatile organic compounds (VOCs) by EPA Method 8260(including Tentatively Identified Compounds, or TICs), and Pesticides by EPA Method 8081A;
- Sediment samples were obtained during one monitoring round from the nine surface water locations around the landfill and were analyzed for the parameters outlined at 310 CMR 19.132(h)(1-3), including RCRA 8 metals and volatile organic compounds (VOCs) by EPA Method 8260 (including TICs);
- Seven landfill gas (LFG) monitoring wells were installed around the perimeter of the landfill;
- LFG monitoring for combustible gas (%Lower Explosive Limit, or %LEL, as methane), %oxygen, total VOCs, and hydrogen sulfide was performed at the seven LFG monitoring wells and at 30 LFG monitoring points along the western perimeter of the landfill; and
- One surficial soil sample from the sand pit area just south of the landfill (the sand pit area) was collected and analyzed for total RCRA 8 metals and VOCs by EPA Method 8260;

The results of the CSA monitoring and sampling performed outside the perimeter of the landfill were the following:

- The Town previously completed private well surveys in 2003 and 2004 for the areas within a half-mile of the landfill by comparison of Assessor records to Water Department records. The surveys revealed that all residences and other buildings within a half-mile of the landfill are serviced by the Amherst public water system, except for the following: a private well at 126 Belchertown Road, located upgradient (east) of the landfill, which has been sampled historically as part of the Town's sampling program for the New Landfill (no landfill

impact seen); and a private well located at 163 Wildflower Ave, used only for a non-contact geothermal heating system at that residence (not used as a drinking water source);

- The groundwater map indicated that groundwater flow is generally from east to west in the landfill vicinity. T&B states that groundwater flow from the landfill does not extend south of monitoring well 1-03, which is located approximately 1,000 feet south of the landfill (i.e., groundwater does not flow from the landfill towards the Lawrence Swamp public supply wells, which are located over one mile to the south);
- VOCs were generally non-detectable (ND) in all groundwater monitoring wells. Trace levels of several VOCs at levels well below the Department's Bureau of Waste Site Cleanup (BWSC) GW-1 groundwater standards were present in monitoring wells 3-68 and 3-80 located west of the landfill adjacent to the Hop Brook wetlands. Monitoring well 6-89, located in the sand pit area immediately south of the landfill, contained a trace of toluene, well below the GW-1 standard. All seven monitoring wells located from well 1-03 to the south, towards the Lawrence Swamp public supply wells, were ND for all VOCs, including TICs. The Lawrence Swamp public supply wells are regularly monitored according to the Department's Division of water Supply (DWS) requirements, and have shown no impact from the landfill;
- Pesticides were ND in all groundwater monitoring wells;
- Metals and indicator parameters were elevated in monitoring wells located downgradient (west) of the landfill, with exceedances of the Department's GW-1 and GW-3 groundwater standards in several monitoring wells, primarily for lead and chromium. Wells PGW-6, adjacent to the western perimeter of the landfill, and well 3-68, adjacent to the Hop Brook wetlands to the west, appeared to show the most impact for metals and indicator parameters. It should be noted that metals analyses were for total metals, which can produce artificially high analytical results due to possible turbidity of the samples;
- All surface water samples were ND for all VOCs, except for a trace of the VOC chlorobenzene (1.3 micrograms/liter, or ug/l) at sampling location SW-6 (a visibly impacted wetland area along the KC Trail), this level is well below the USEPA National Recommended Water Quality Criteria (WQC) surface water standard of 35,200 ug/l for chlorobenzene and the Department's Drinking Water standard of 100 ug/l for chlorobenzene;
- Surface water samples were at or below the WQC surface water standards for metals and indicator parameters at all sampling locations, except for iron at four locations (SW-1, the visibly-impacted inlet to Gull Pond; SW-2, a shoreline sample along Gull Pond; SW-6; and SW-7, a kettle-hole pond northwest of the landfill), and for lead at location SW-6, which slightly exceeded the WQC standard of 3.2 ug/l, but is less than the Drinking Water standard of 15 ug/l for lead. It should be noted that metals analyses for the surface water samples were performed as required for total metals, however the Department

now requires dissolved metals analyses for surface water samples, as the WQC standards are now based on dissolved metals analyses (total levels generally show higher levels than dissolved);

- The downstream surface water sample from Hop Brook showed slightly elevated levels of iron, manganese and barium versus the upstream sample. The level of iron in the downstream Hop Brook sample was at the WQC (Non-priority) chronic standard of 1.00 mg/l. All other RCRA 8 metals were ND in both upstream and downstream samples;
- Sediment samples were below the Department's Revised Stage I Freshwater Sediment Screening Criteria (SSC) guidelines, except for the following: sediment sample SED-6, at the SW-6 location, which contained arsenic at 53 milligrams/kilogram, above the SSC guideline of 33 mg/kg; sediment sample SED-7, which contained mercury at the SSC guideline of 0.18 mg/kg; and sediment sample SED-8, at the SW-8 location near groundwater monitoring well 3-68, which contained copper at 370 mg/kg, above the SSC guideline of 150 mg/kg;
- Sediment samples were ND for VOCs, except for traces of naturally-occurring TICs in several samples, and traces of single VOCs in samples SED-4 (the upstream sample on Hop Brook), SED-6, SED-7, and SED-8. There are no SSC guidelines for these VOCs, however the trace levels were well below the Department's S-1 soil standards for the compounds;
- Landfill gas (LFG) was ND at all seven perimeter LFG monitoring wells, although wells PGW-5 (southern perimeter, near sand pit area) and well PGW-7 (northwest corner) showed somewhat decreased oxygen levels in subsurface soils); and
- LFG was ND at all of the shallow LFG monitoring probes along the western perimeter, except for SG-21 and SG-22 at the northwest corner along the landfill perimeter, which contained over 100% LEL. Probes 50 feet and 75 feet outside of SG-21 and SG-22, however, were ND for LFG.

The following CSA assessment work was completed within the perimeter of the landfill, to assess the potential for post-closure uses of the landfill:

- The four existing LFG vents, within the northwest mound (Phase I) area of the landfill cap were monitored for LFG (%LEL, %oxygen, total VOCs, and hydrogen sulfide);
- Ambient air monitoring for LFG, %oxygen, total VOCs, and hydrogen sulfide) was performed at breathing zone height (5 ft) on a 100-foot grid across the entire landfill and sand pit area, at a total of 209 monitoring locations;
- A total of 43 test holes were dug through the landfill cap;
- At each test hole, the type and depth of cover soils, including the impermeable soil layer and the vegetative support (topsoil) layer, were characterized and recorded;
- At each test hole, the soil gas within the test hole above the

impermeable soil layer (i.e., the soil gas within the topsoil layer) was monitored for %LEL, %oxygen, total VOCs, and hydrogen sulfide;

- At six representative test holes, samples of the impermeable soil layer were collected and analyzed for hydraulic conductivity; and
- At seven representative test holes, samples of the topsoil layer were collected and analyzed for total RCRA 8 metals and VOCs by EPA Method 8260.

The results of the CSA monitoring and sampling performed within the perimeter of the landfill were the following:

- LFG was ND in the four LFG vents monitored;
- All 209 ambient air monitoring locations showed no measurable levels of %LEL or hydrogen sulfide; and showed atmospheric levels of oxygen. Ambient air monitoring at locations 1 through 31, located over the Phase 1 area, showed traces of total VOCs, from 0.1 parts-per-million (ppm) to 0.3 ppm, the remainder of the monitoring locations showed 0.0 ppm;
- The physical characterization of the test holes in the cap showed the following:
  - The entire cap thickness was equal to or greater than 24 inches in all test holes except #62 (near the northeast corner), which was 19" thick;
  - The impermeable layer of the cap was described generally as a silt and clay soil, with some test holes consisting of very fine sand and silt;
  - The impermeable layer was less than 6 inches in thickness in 9 of the 43 test holes, with the minimum thickness being 4 inches;
- LFG monitoring of soil gas within the test holes above the impermeable soil layer showed that all test holes showed no measurable levels of %LEL or hydrogen sulfide; and showed atmospheric levels of oxygen. LFG monitoring of test holes at stations 1, 14, 25 and 30, located over the Phase 1 area, showed traces of total VOCs, from 0.2 ppm to 0.5 ppm, the remainder of the test hole monitoring locations showed 0.0 ppm;
- The hydraulic conductivity of the six impermeable layer soil samples ranged from 3.4×10^{-4} centimeters/second (cm/sec) to 2.7×10^{-6} cm/sec, averaging 1.5×10^{-4} cm/sec; and
- The seven topsoil samples of the cap showed background levels of RCRA 8 metals, with no exceedances of the Department's S-1 or RCS-1 soil standards.

Recommendations by T&B

T&B recommends the following additional assessment work to complete the Final CSA for the landfill:

- The installation of one additional upgradient groundwater monitoring well and seven additional downgradient groundwater monitoring wells;
- Groundwater sampling of the eight additional monitoring wells and fourteen existing monitoring wells for one additional monitoring round;
- Surface water sampling of the eight previous surface water locations for one additional monitoring round;
- LFG monitoring of the seven LFG monitoring wells for one monitoring round; and
- Completion of a Final CSA report as specified in the LAC Manual, Pages c-26 through c-29.

DEPARTMENT DETERMINATIONS

Personnel of the Department have reviewed the Interim CSA report and permit application for the landfill in accordance with MGL c. 111 s. 150A, MGL c. 30A, 310 CMR 19.000, the Department's publication Landfill Technical Guidance Manual (the LAC), revised in May, 1997, and the Department's publication Standard References for Monitoring Wells (WSC-310-91). The Department has determined that the Interim CSA report is acceptable in accordance with MGL c. 111, s. 150A and MGL c. 30A. The Department has determined that the following assessment work shall be performed to complete the Final CSA Report:

1. The private well survey shall be updated for the previous survey area within a half-mile of the landfill, and the survey area shall also be extended to the Fort River, west and northwest of the landfill, and to Hop Brook, west and southwest of the landfill. The survey shall be performed as previously, by comparison of Assessor records to Water Department records, and shall be completed and submitted to the Department within 2 months of the date of this permit approval.

2. The proposed eight new groundwater monitoring well locations are acceptable. The following additional groundwater monitoring wells shall also be installed: a water-table well adjacent to the western perimeter of the landfill, between LFG monitoring wells PGW-6 and PGW-7; a water-table well adjacent to the western perimeter of the landfill, south of monitoring well PGW-6; a shallow, water table monitoring well adjacent to existing well 3-681; a bedrock monitoring well adjacent to existing well PGW-6; and a bedrock monitoring well adjacent to existing well 2-85.

3. All necessary precautions shall be taken during installation of all deep (confined and bedrock) monitoring wells to avoid potential cross-contamination at depth, including grouting of the annular space of all deep monitoring wells, above the bentonite seal, to a sufficient distance above the water table.

4. All new groundwater monitoring wells outlined above in Condition 2 shall be surveyed to establish valid elevation datum. Groundwater elevations shall be measured at all site monitoring wells during the monitoring round, and a groundwater contour map shall be prepared from this data.

5. Groundwater samples shall be obtained from the fourteen additional monitoring wells and fourteen existing monitoring wells for one additional monitoring round. Groundwater monitoring wells shall be sampled in accordance with the procedures outlined in the Department's publication Standard References for Monitoring Wells (WSC-310-91). Sampling can alternatively be performed in accordance with the USEPA publication Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated July 30, 1996.

6. Surface water samples shall be obtained for one additional monitoring round from the eight previous surface water locations and also from the following locations: one location in Owens Pond; one location in the pond west of Gull Pond; two locations on the stream outlet of Gull Pond; one additional location in the SW-6 wetland area; and one location in the wetland near proposed monitoring well 6-06/7-06.

7. Groundwater and surface water samples shall be analyzed for the parameters outlined at 310 CMR 19.132(h)(1-3), including RCRA 8 metals (as dissolved metals), and VOCs by EPA Method 8260 (including Tentatively Identified Compounds, or TICs), with lower VOC detection limits for surface water.

8. Sediment samples shall be obtained for one additional monitoring round from previous sampling locations SED-1, SED-4, SED-5, SED-6, SED-7, and SED-8, and from the new surface water location near proposed well 6-06/7-06, and shall be analyzed for the parameters outlined at 310 CMR 19.132(h)(1-3), including RCRA 8 metals and VOCs by EPA Method 8260. Two additional sediment samples shall be obtained for one additional monitoring round from the area of SED-6 and shall be analyzed for RCRA 8 metals.

9. All VOC analyses by EPA Method 8260 shall be performed as outlined in 310 CMR 19.132(h)(1-3), specifically methyl ethyl ketone, methyl isobutyl ketone, and acetone shall be included, and unknown peaks having intensities greater than 5

times the background intensity shall be identified.

10. Quality Assurance/Quality Control Plan (QA/QC) protocols for all environmental monitoring should generally follow those outlined in the Department's LAC and Standard References manuals.

11. Two new landfill gas (LFG) monitoring wells shall be installed to a depth of 10 feet at the following locations: one well between well PGW-6 and PGW-7; and one well south of well PGW-6. The wells shall be constructed as outlined on page 4-15 of the LAC manual.

12. Monitoring of the existing and new LFG wells and all existing LFG monitoring points shall be performed during one monitoring round. LFG monitoring shall be performed as outlined on p. 4-16 and 4-17 of the LAC manual for % Lower Explosive Limit (% LEL), % oxygen, and hydrogen sulfide. If LFG levels exceed 25% LEL at the property line, the Department shall be notified within 24 hours, as outlined in 310 CMR 19.132(4)(h), and the Town shall either monitor the residence(s) near the exceedance or monitor LFG monitoring wells closer to the residences for the same parameters. If LFG levels exceed 10% LEL within any building, the Department shall be notified within two hours, as outlined in 310 CMR 19.132(4)(g), and the Town shall take immediate action to protect public health and safety.

13. A Final CSA Report shall be submitted to the Department <u>within 6 months of the date of this permit approval.</u> The Final CSA Report shall contain the following information:

    (A) Updated basemaps, depicting the locations of all: groundwater monitoring wells; surface water and sediment sampling locations; street names; private wells, public wells; and existing and new LFG monitoring points/wells.
    (B) Construction details for monitoring wells;
    (C) Tabular summaries of all analytical and monitoring data performed as part of the CSA, including LFG monitoring data;
    (D) Laboratory data sheets for the second CSA monitoring round;
    (E) The groundwater contour map for the second CSA monitoring round;
    (F) The information outlined in the LAC, p. C-26 through C-29;
    (G) A baseline risk assessment, as outlined in the LAC, c. 8; and
    (H) A proposal for post-closure maintenance and monitoring requirements for the landfill for the 30-year post-closure period.

14. Appropriate Health & Safety (H&S) measures shall be utilized for all assessment work at the landfill.

Potential Post-Closure Uses

To date, the Department has received inquiries from various entities within the Town relative to the development of: soccer fields; a new Department of Public Works (DPW) facility; and a relocated transfer station. The CSA assessment work performed within the perimeter of the landfill indicated that post-closure use of significant portions of the landfill may be possible. The landfill cap is at least 24 inches thick in almost all areas, with generally a 6-inch thick impermeable layer, and the topsoils of the cap appear to represent clean, "background" soil conditions. Field monitoring of ambient air at breathing zone height above the surface of the landfill cap, and in the topsoil above the impermeable layer of the cap, did not show measurable levels of methane (%LEL) or hydrogen sulfide, and showed atmospheric levels of oxygen. T&B has stated that no post-closure use of the Phase 1 area would be sought by the Town, as that was the last (most recent) area of solid waste placement before the landfill closed.

If the Town wishes to seek post-closure use(s) for the landfill, a post-closure use permit application which complies with the requirements of 310 CMR 19.143 must be submitted to the Department for review and approval, prior to any such use, which must contain:

A. Specific plans, including written descriptions, figures showing exact locations of any proposed usage(s), and engineering plans and specifications, for any proposed uses;
B. A written SOW for completion of a Quantitative Risk Assessment, in accordance with the LAC, Chapter 8, sections IV & V for the specific post-closure use(s) proposed, as well as a written SOW for compound-specific air monitoring for any use proposed on the landfill.

Pursuant to 310 CMR 19.037(5), any person aggrieved by the issuance of this approval, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A and C. 30A not later than thirty [30] days following notice of this decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30 A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the permit by a court of competent jurisdiction, the permit decision shall remain effective or become effective at the conclusion of the 30 day period.

Any aggrieved person intending to appeal the decision to the superior court shall provide notice to the Department of said intention to commence such action. Said Notice of Intention shall include the Department File Number (07-008-002) and shall identify

with particularity the issues and reason(s) why it is believed the approval decision was not proper. Such notice shall be provided to the Office of General Counsel of the Department and the Regional Director for the regional office which made the decision.

The appropriate addresses to which to send such notices are:

General Counsel
Department of Environmental Protection
One Winter Street-Third floor
Boston, MA 02108

&

Regional Director
Department of Environmental Protection
436 Dwight Street - 5th Floor
Springfield, MA 01103

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the public health or environmental impact of the permitted activity.

The Department reserves the right to require additional investigatory or remedial work for the landfill, including the installation of additional monitoring wells or alternative remedial measures, if monitoring results indicate such a need. If you should have any questions or comments regarding this correspondence please contact Larry Hanson of this office, at #413-755-2287.

Sincerely,

Daniel Hall
Section Chief
Solid Waste Management

cc: Amherst Town Manager - Laurence Shaeffer
Amherst Health Dept. - Epi Bodhi, Director
Amherst Water Dept. - Robert Pariseau
Amherst Leisure Services - Director
Amherst Department of Conservation & Recreation - David Ziomek
T&B, Inc. - Jeffrey Thelen
DEP/WERO/DWS - Katherine Skiba
Elsie Fedderman