

UCONN

Update

Landfill Remediation Project

INTRODUCTION

Last October, the Update reported on the public review of the **Closure Plan** for the UConn landfill and former chemical pits. At that time, the Connecticut Department of Environmental Protection (DEP) had accepted comments on the Closure Plan and anticipated issuing a decision letter later in the fall. That review was delayed by questions over how to consolidate multiple permits required for disturbance of waste materials and closure of the landfill and former chemical pits. In December 2003, DEP issued a letter commenting on the Closure Plan and requesting a revised Closure Plan, which UConn prepared and submitted in January 2004. A detailed letter responding to comments from DEP and others – including the U.S. Environmental Protection Agency (EPA) and the Town of Mansfield – was submitted together with the **Revised Closure Plan**. Additional documents are currently being prepared or under review. This includes a detailed **Wetland Mitigation Plan** and follow-up work related to stormwater management in connection with permit applications.

The article below highlights some of the changes included in the **Revised Closure Plan and Response to Comments** document. DEP is reviewing the changes, along with details of the permit applications. Other articles in this edition outline the results of the ongoing **Interim Monitoring Plan** and permits that UConn has applied for. Once all of the permits are in hand and DEP has issued a decision on the revised closure plan, UConn will contract with a Construction Manager (CM) to complete the closure work. At that time, the community will be invited to meet the CM and learn more about the construction of the cap and leachate interceptor system.

UConn Submits Revised Landfill Closure Plan

In September 2003, about 45 members of the Mansfield and UConn communities participated in an Open House on the **Draft Closure Plan** for the UConn landfill and former chemical pits. The participants talked with agency and UConn representatives, consultants and local officials, and some submitted comments on the draft plan. They also had the chance to review information in a Technical Memorandum on groundwater flow from the east and its potential impact on the project.

Comments from the public and letters from local, state and federal agencies were then considered by the Connecticut Department of Environmental Protection (DEP). In December 2003, DEP asked UConn to respond to some of these comments as part of the agency's review of

the Closure Plan. UConn sent DEP a **Revised Closure Plan** on January 26, 2004. UConn also submitted a detailed response to comments document to DEP on January 22. DEP is currently reviewing these documents and the permit applications.

While these documents were being prepared, UConn's consultants continued to work on the permits needed to start closure activities. UConn also began the process of hiring a construction manager (CM) to oversee the closure. The quarterly schedule of well sampling continued, and UConn began using a commercial laboratory to analyze all samples from residential wells. Although UConn had hoped to begin

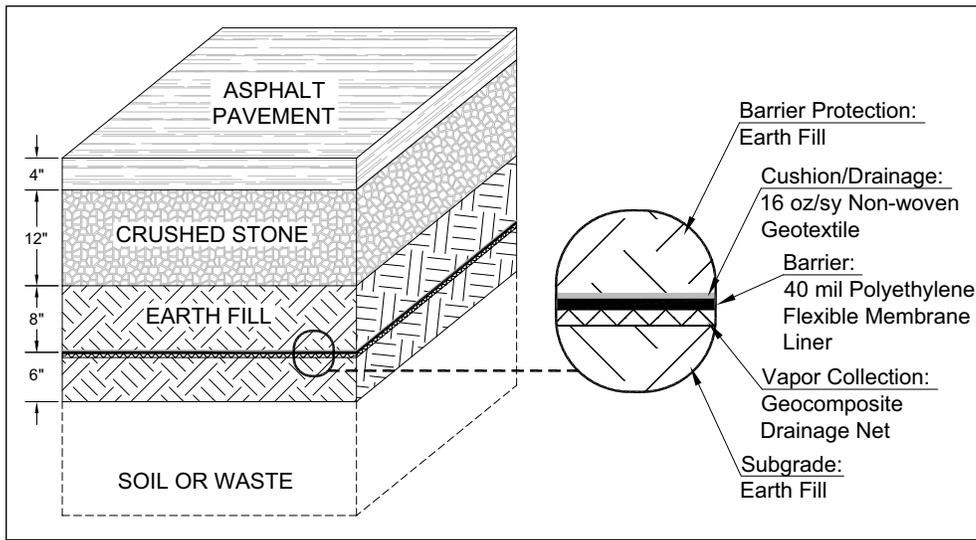
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WHAT IS THE UCONN LANDFILL PROJECT?

On June 26, 1998 the Department of Environmental Protection issued a Consent Order to the University of Connecticut. The order requires UConn to thoroughly evaluate the nature and extent of soil, surface water and groundwater pollution emanating from the University landfill, former chemical pits and an ash disposal site known as F Lot. The order also requires UConn to propose and implement remedial actions necessary to abate the pollution. The UConn Landfill Remediation Project is the process that UConn is undertaking to comply with the order.

Visit the UConn Landfill Project web site for copies of the project schedule, meeting announcements and other information.

www.landfillproject.uconn.edu



Cross-Section of proposed UConn Landfill cover system

Revised Landfill Closure Plan / cont.

work on the landfill closure in winter 2003, construction has been pushed back. Permitting, fine tuning the closure plan and developing a mitigation plan for the wetlands areas are taking more time than anticipated. Finally, plans were approved to connect six homes southwest of the study area to UConn water, as directed by DEP, and the water connections were completed on North Eagleville Road.

Refining the Closure Plan

The **Revised Closure Plan** responds to comments provided by the public, reviewers for the Town of Mansfield, DEP, and the U.S. Environmental Protection Agency (EPA). If approved by DEP, the changes in the Closure Plan will include the following steps:

- Adding alarms on the pumps that will convey leachate from the landfill **leachate interceptor trenches** to the wastewater treatment plant. A problem with a pump will trip an alarm at the UConn wastewater treatment plant, notifying the staff to check it.
- **Dewatering** the sediments and material that will be dug up from outside the perimeter of the landfill. Once these materials are placed on the landfill, they will dry out and any water coming off the landfill will be collected and pumped to the wastewater treatment plant. (See the **Glossary** on page 3 for more information on dewatering and other boldfaced terms.)
- Placing stormwater catchbasins and associated piping above the landfill liner. In the first plan, pipes that carry stormwater from the catchbasins were placed below the liner, which consists of a **flexible membrane liner (FML)**. DEP and EPA reviewers felt that placing the piping above the liner would mean fewer penetrations of the liner and easier access to the system for repairs. In the revised plan, the pipes are located above the FML liner. (See the cross-section, above.)
- Providing a detailed plan for **wetlands mitigation**. Waste and polluted sediment from the outside edges of the landfill will be dug up and placed on the landfill before it is capped. In response to requests from DEP and the Army Corps of Engineers (ACOE), UConn's consultants prepared a conceptual wetland mitigation plan and, with input from the ACOE

and DEP, are preparing a detailed plan to replace these wetlands and restore others that will be disturbed by excavation and construction activities.

The team anticipates that a detailed wetlands mitigation plan will be submitted to DEP in early April 2004.

- Supplying more information and drawings, such as a plan for the parking lot bus shelter on the landfill; how to deal with snow removal; and other technical design issues.
- Combining the waste disruption, landfill closure and post-closure use permits into one permit to be granted by DEP, which will streamline this phase of the permitting process.
- Affirming that post-closure monitoring will continue for at least 30 years. Quarterly sampling is required under the Remediation Standard Regulations (RSRs); however, UConn can petition the DEP to reduce sampling frequency after post-closure conditions are well-established. The Long-Term Monitoring Plan specifies all of the locations to be sampled.

The **Closure Plan/ Response to Comments** document lists the reviewer's question or comment, then provides a response. The responses form the basis for the changes in the Revised Closure Plan. It is helpful to read the Response Document first since it highlights the changes that were then implemented in the Revised Closure Plan.

Next Steps

This month, UConn will complete work on a revised version of the Comprehensive Hydrogeologic Investigation Report (CHIR) and Remedial Action Plan (RAP) and submit it to DEP and the key parties for final review. The RAP will be revised to include changes in the Revised Closure Plan, Supplemental Remedial Alternatives Analysis Technical Memorandum and Closure Plan/Responses to Comments. DEP will review all of these documents and issue a decision letter or letters on the plans. Final action on some of the permits will not be complete until

Chronology of Recent Submittals

Comprehensive Hydrogeologic Investigation Report and Remedial Action Plan

- Approved by DEP 6/03
- Revised plan and responses to comments to DEP 4/04

Closure Plan

- Submitted to DEP 8/03
- Reviewed by public 9/03
- Review by DEP 12/03
- Revised plan 1/04
- DEP review ongoing

Closure Plan/Response to Comments

- Comments in 9/03
- DEP review 12/03
- UConn reply 1/04
- DEP review ongoing

Interim Monitoring Program

- Round 12 submitted to DEP 1/04
- Round 13 sampling began in 2/04

Final Wetlands Mitigation Plan

- Requested by ACOE 12/03
- UConn to submit 4/04

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Revised Landfill Closure Plan / cont.

the agencies complete their review of the Final Wetland Mitigation Plan.

Copies of all documents are available for public review at the Mansfield Public Library, in the Town Manager's office and at UConn communications. Questions on the changes should be sent to Ray Frigon, DEP Project Manager, 79 Elm St., Hartford, CT 06106-5127. Mr. Frigon can be reached by phone at 860-424-3797 or email at Raymond.Frigon@po.state.ct.us.



The closure of F Lot also involved placement of a flexible membrane liner (FML), as shown in this photo. The white sandbags hold the liner in place during construction. Hay bales visible along the perimeter are part of the stormwater detention system.

DEFINING THE TERMS

Abandonment – The process of closing a well to avoid cross-contamination or the introduction of contaminants into a well that is no longer in use. The closing includes removing the steel casing and PVC materials and filling the opening with grout or cement.

Closure Plan & Closure Plan/Response to Comments – The Closure Plan for the landfill describes how the remedies for the study area will be completed. It includes information on regrading the landfill, consolidating outlying waste and installing a final cover on the landfill and regrading and capping the former chemical pits area, building a parking lot over the cover and monitoring the groundwater and surface water quality. The Response to Comments document lists changes in the plan and answers to comments made by regulators and the public. The Revised Closure Plan includes the changes described in the Response document.

Commercial laboratory – An independent, privately owned laboratory that routinely conducts analyses of soil, water and other media as a commercial business.

Analytic detection limit – The measurable value of a compound or element below which a chemical test is unable to tell if a substance is present. Detecting a substance does not necessarily mean it will have health effects.

Dewatering – (1) A process of removing water from saturated solid media, such as soils and sediment, by gravity drainage or vacuum extraction; (2) The practice of lowering groundwater levels, typically by pumping from wells, sumps, or wellpoints, to stabilize soils, reduce uplift pressures and promote dry working conditions in an excavation or trench.

Flexible Membrane Liner (FML) – A flexible, low-permeability synthetic made of various materials including polyvinyl chloride (PVC) and high density polyethylene (HDPE). Its flexibility reduces the potential for rupture in areas where ground settlement is anticipated. Typical uses include lining ponds and impoundments to minimize exfiltration, and covering landfills and waste disposal areas to minimize infiltration of rainfall and snowmelt. (See the F Lot FML liner photo on page 3.)

Interim Monitoring Program (IMP) – A quarterly well sampling program for monitoring shallow groundwater, surface water and active domestic wells in the project Study Area and around its perimeter. The Long-Term Monitoring Plan will replace the IMP.

Leachate – Liquid that has passed through solid waste and contains suspended or soluble materials in solution that came from the waste. Leachate can flow laterally and discharge from the sides of a landfill.

Leachate Interceptor Trenches (LITs) – Trenches that are filled with pipes and crushed stone or drainage sand. The trenches are constructed adjacent to landfills to collect leachate, which is then treated and discharged.

Long-Term Monitoring Plan (LTMP) – A multi-year plan to continue sampling of soil gas, surface water, shallow monitoring wells and bedrock wells in the Study Area and several adjacent private domestic wells to monitor water quality and protect human health and the environment. The results will be reported to DEP and property owners and evaluated on a long-term basis.

Remedial Action Plan (RAP) – A set of recommendations resulting from the landfill investigation: to cap the landfill and build trenches around it to capture and treat leachate; to cap the area of the former chemical pits; to continue the use of the parking lot as a cap for F lot; and to extend public water to additional homes. The plan includes operation and maintenance plans for each site; restrictions on future use; and a Long-Term Monitoring Plan to protect human health and the environment.

Wetlands Mitigation Plan – A plan that specifically addresses actions to mitigate or repair impacts made to wetlands as a result of remediation and/or construction activities.

Well Sampling Continues

Until the Closure Plan is complete, UConn continues to implement the **Interim Monitoring Program (IMP)**. This sampling program takes place four times a year. It includes groundwater, surface water and domestic wells in the project Study Area and around its perimeter. This program will be replaced by a **Long-Term Monitoring Plan (LTMP)**, which will guide sampling for 30 years after the closure work is finished.

Haley & Aldrich recently completed the 12th round of well sampling. Results of the samples were sent to homeowners and reported to the Town of Mansfield, Eastern Highlands Health District (EHHD), and the Connecticut Department of Environmental Protection (DEP). No exceedances of drinking water standards were found. The quarterly IMP report is available at the Town Manager's Office and at the EHHD office. (Homeowners each receive a report of their results. They can consult with DEP on any questions.)

All of the samples from private wells are now being sent to a commercial laboratory for analysis. Based on questions concerning the validity of some of the prior sample analysis performed by UConn's Environmental Research Institute (ERI), UConn began sending 20% of the IMP samples to a commercial state-certified laboratory in January 2003. Because ERI is no longer doing drinking water sampling analysis, UConn will continue to use commercial laboratories for this work. (An article on data quality was in the October 2003 UConn Update, which is available on the project web site.)

History of Sampling

The IMP was intended to ensure the safety of drinking water in the area around the landfill and former chemical pits while the study was underway. Since 1998, DEP, EHHD and Haley & Aldrich have collected more than 500 groundwater samples from domestic wells. The RSR drinking water protection criteria were exceeded three times, at two homes. Those homes were promptly connected to UConn water.

The LTMP will serve the same role as the IMP after the landfill and former chemical pits have been closed and the remediation is in place. The LTMP will also protect human health and the environment by evaluating the concentrations of contaminants in groundwater and surface water over time. If concentrations increase over time, UConn and DEP will re-evaluate the remediation system, expand the monitoring program and take other measures needed to protect public health and the environment.

The LTMP includes sampling at many locations, including:

- six surface water locations in the study area
- five shallow groundwater monitoring wells
- five bedrock monitoring wells (two are inactive domestic wells)
- six active domestic wells, and
- four soil gas monitoring locations

At DEP's direction, UConn is connecting six homes on Meadowood Road and North Eagleville Road to its water system (a seventh homeowner prefers to remain on well water).

The active private wells to be sampled in the LTMP are located on Meadowood Road and Separatist Road.

The results of the LTMP analysis will be available to the key parties and the public. The data will be reported four times a year, with summaries available on the project web site. The complete reports will be in the Mansfield Public Library, in the Town Manager's and EHHD offices and at UConn Communications.

Well Abandonment

The LTMP will include abandoning many of the existing monitoring wells at the landfill and private wells that are not in use because the residences were hooked up to the UConn water sys-

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The **Revised Comprehensive Hydrogeologic Investigation Report and Remedial Action Plan (RRAP)**, to be submitted to DEP in April, contains updated information on the well sampling completed for the UConn Landfill Project. Precision, accuracy, representativeness, completeness and comparability are some of the criteria summarized in Section 5 of the RRAP. Data assessment provides a "check" on the quality of the data produced by a laboratory. The table below presents some data on completeness, just one part of this assessment. It is presented here for readers' information because it gives a glimpse of the volume of data analyzed as part of the investigation. **Completeness** is a measure of the amount of data obtained from a measurement system compared to the amount expected under normal conditions. It is usually expressed as a percentage. The goal for the study was a completeness percentage of 90%. A total of 308,689 project analytical measurements were looked at, with 5,322 rejected. Samples were rejected due to failure to meet specific quality assessment criteria or failure to comply with specific analytical methods. For example, samples that were held too long in the laboratory prior to their analysis, violating the holding times dictated by the analytical method, were rejected. The review showed a completeness percentage of 98.3% for the project overall.

Number of Parameters Analyzed

Measurement or Parameter	Domestic Wells and % complete		Groundwater Wells and % complete		Soil and Sediments and % complete	
Groundwater VOCs	10,686	100%	77,240	97.1%	6,116	99.9%
Groundwater SVOCs	9,360	100%	121,971	98.3%	10,210	98.9%
Groundwater trace metals	22,297	99.8%	1,440	100%	2,46	100%

For more information on all of the parameters of the data assessment, see Section 5 of the RRAP for a review of all the parameters and results.

Permitting Underway for Landfill Closure

Once the Closure Plan for the UConn landfill and former chemical pits has been approved, the actual construction will not begin until all of the permits and certificates have been issued. UConn's consultants have filed applications for the permits needed to implement the plan. The Connecticut Department of Environmental Protection (DEP) issues most of the permits, which are listed below. The Army Corps of Engineers (ACOE) regulates issues connected with disturbing wetlands.

The ACOE Permit is intended to protect aquatic resources from development by requiring applicants to avoid wetland impacts. This permit also allows or regulates the discharge of dredged or fill material into wetlands. The Permit application was submitted to ACOE (with copies sent to DEP) in May 2003. The Corps published a public notice on July 24, 2003 indicating the project comment period would end on August 22, 2003. One comment was received from a developer on an adjacent property during the public comment period. The ACOE and U.S. Environmental Protection Agency (EPA) provided comments on the application in letters dated October 30, 2003 and October 3, 2003, respectively. DEP provided additional comments on the Permit application and additional State permit applications in a letter dated November 4, 2003. The project team responded to these comments with two submittals dated December 1, 2003 (to ACOE) and December 3, 2003 (DEP). These submittals included point-by-point responses to comments, supplemental engineering calculations and drawings and a conceptual wetland mitigation plan.

As part of the permit review process, representatives from DEP and ACOE did a site walk on March 9, 2004, to review the impacts of the landfill closure on the wetlands. UConn will supply the agencies with more sediment data along with the Final Wetlands Mitigation Plan.

In addition to reviewing the ACOE Permit application, DEP reviews and issues permits in the following category areas:

- 401 Water Quality Certificate – this is a requirement of the ACOE Permit; it assures that the discharges to a water body are consistent with the federal Clean Water Act and the Connecticut Water Quality Standards
- Inland Wetlands and Watercourses – regulates activities within and adjacent to wetlands and surface waters (streams, rivers, ponds)
- General Permit for the Discharge of Stormwater and Dewatering Wastewater from Construction Activities – regulates management of stormwater and construction dewatering waters from construction sites
- General Permit for the Discharge of Groundwater Remediation Wastewater to a Sanitary Sewer – regulates discharge of waters to a public-owned treatment works (this is required for discharge of leachate from the proposed leachate interceptor trenches)
- Flood Management Certificate – ensures that discharge of stormwater will not result in a flooding hazard
- Authorizations for Disruption of a Solid Waste Disposal Area, Closure and Post-Closure Use – regulates any activities that have the potential to disrupt solid waste, the plans for closure of solid waste disposal areas, and proposed plans for post-closure use of solid waste disposal areas

UConn will also seek a certificate of operation from the State Traffic Commission for the parking lot. Discussions are underway with Northeast Utilities to work within its easements and crossing right-of-ways. The Construction Manager will also be required to obtain building and site development permits and approvals in accordance with local, state and federal requirements.



This wetlands is part of the sediment remediation area north of the landfill



The ACOE permit governs wetlands like this one, also north of the landfill.

CLOSURE SCHEDULE

Preparation of Bid Documents	Weeks 1-4
Hire Project Construction Management	Weeks 2-3
Review Contractor Submittals	Weeks 3-11
Mobilization, Site Preparation, and Stormwater/Erosion Control	Weeks 11-16
Contaminated Sediment Removal and Relocation	Weeks 17-22
Waste Consolidation	Weeks 23-34
Construction of the LITs	Weeks 35-40
Land Reshaping and Grading	Weeks 38-42
Cover System Installation	Weeks 43-49
Road and Parking Lot Construction	Weeks 38-50
Project Completion, Demobilization and Closeout – Installation of Monitoring Wells	Weeks 51-54
Preparation of closure certification report	Weeks 55-58

Well Sampling Continues / cont.

tem. This includes homes on Hunting Lodge Road, North Eagleville Road and Meadowood Road. **Abandonment** is a term that describes closing a well as advised by DEP guidelines. Proper closure of wells helps avoid introducing new contaminants into the bedrock, and prevents cross-contamination from one bedrock fracture to another.

Abandoning the wells consists of several steps. Piping and existing well pumps are removed initially. If the well has a steel casing, it is removed. If the casing is cemented into the bedrock, the contractor cuts it off below the ground

surface along with the PVC well materials inside the well casing. (Removing as much of the PVC as possible is a goal of this process.) For older wells, which were installed without seals, the PVC materials are usually split so cement can be injected into the space around the PVC. Finally, the well and borehole are filled with cement grout. This smooth-flowing cement fills the well up to the ground surface.

Care of the wells that are part of the LTMP will be included in an operations and maintenance plan.

For more information . . .

The U.S. Environmental Protection Agency (EPA) offers good information on its web sites on municipal solid waste and landfill capping:

<http://epa.gov/tio/download/citizens/capping.pdf> – a good fact sheet on capping a landfill

<http://epa.gov/epaoswer/non-hw/muncpl/index.html> – the municipal solid waste page

The U.S. Geological Survey (USGS) also offers informative and easy-to-read information:

<http://water.usgs.gov/wid/index-resources.html>

UPDATE REVIEWERS

The following parties reviewed the copy for this edition of the UConn *Update*: Ray Frigon, CT DEP; Rob Miller, EHHD; Martin Berliner, Town of Mansfield; and members of the UConn consultant team.

COMING NEXT TIME

- **Interim Monitoring Program Results**
- **Construction Schedule**
- **Permitting Update**

WHERE WILL I FIND THE DOCUMENTS?

www.landfillproject.uconn.edu

Copies of all project documents are available at:

Town Manager's Office

Audrey P. Beck Bldg.
4 South Eagleville Rd.
Mansfield, CT 06268
(860) 429-3336

Mansfield Public Library

54 Warrenville Rd.
Mansfield Center, CT 06250
(860) 423-2501

CT Dept. of Environmental Protection

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