WORK PLAN FOR THE REMEDIAL SYSTEM OPTIMIZATION

AT

FORT EDWARD LANDFILL

Fort Edward Landfill
Fort Edward, New York
(Site Code* #**558001)***
(WA # D006130-22)

April 2012

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7017

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Certification:

I,  , certify that I am Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

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1.0 INTRODUCTION

The goal of this New York State Department of Environmental Conservation (NYSDEC) Work Assignment (WA) is to optimize the current Remedial Design for the control of groundwater leachate from the closed Fort Edward Landfill to the extent necessary to protect human health and the environment, escape of hazardous constituents, leachate, contaminated run-off, landfill gasses, or hazardous waste decomposition products from the facility.

The work plan outlines the necessary tasks that will be required to prepare a Remedial System Optimization Report which will document the proposed improvements of the existing capture and treatment system to improve its effectiveness and reduce overall operating costs without increasing risks to human health and the environment.

1.1 PURPOSE AND OBJECTIVES

The purpose of this Engineering Services Standby Contract WA is to prepare a Remedial System Optimization Report that will evaluate improvements to the existing groundwater/leachate collection system to:

- Attain the Remedial Action Objectives of the site
- Upgrade the existing processes considering changes in site environmental conditions and improved technilogical options
- Reduce the site's total lifecycle cost to implement the remediation strategy
- Incorporate sustainability considerations into the remediation efforts

1.2 SITE DESCRIPTION AND BACKGROUND INFORMATION

The former municipal landfill site is located in the Town of Fort Edward, New York (Figure 1). General Electric (GE) dumped approximately 850 tons of PCB-containing scrap capacitors at this landfill. This waste represents approximately 79% of the total hazardous waste identified at this site. As a result of the 1980 "Seven Site Agreement" with the NYSDEC, GE produced a report in 1983 recommending encapsulation of the landfill within a slurry wall and cap; however, operation continued until 1991 and the proposed remedy was not initiated. Due to extended operation of this landfill and the given problems associated with a similar encapsulation remedy taken at the adjacent Kingsbury Landfill (Site 5-58-008), the 1983 Remedial Design proposal was modified. The modified remedy included the construction of an impermeable landfill cap and a leachate collection system, plus the construction of a pre-treatment building with final treatment in three constructed wetland cells. [From: NYSDEC Registry of Inactive Hazardous Waste Disposal Sites, April 2002]

2.0 WA SCOPE OF WORK

The purpose of the Fort Edward RSO Work Assignment is to implement the necessary tasks required to prepare a Remedial System Optimization Report. The final remedy includes continued operation of an optimized version of the existing treatment system.

The RSO will include the following tasks: initial sampling, verification and evaluation of the capture of the landfill plume, review of remedial system design documents, and evaluation of the system operation design specifications through a RSO Report.

2.1 INITIAL SAMPLING

Once all of the groundwater collection wells and the collection trench are operational, an initial sampling of the treatment system will be completed by Aztech Technologies, Inc. to determine the treatment efficiencies that are being achieved by the existing treatment system. These sampling locations will be the following:

- Recovery Well #1
- Recovery Well #2
- Recovery Well #3
- Recovery Well #4
- Recovery trench
- System influent
- Clarifier effluent
- System effluent
- Constructed Wetland Treatment Cell #1 effluent
- Constructed Wetland Treatment Cell #2 effluent
- Constructed Wetland Treatment Cell #3 effluent
- Combined treatment cells effluent collection sump
- Polishing pond effluent

Each sample will be analyzed for the following laboratory parameters:

Sample Analytes (italicized red font indicates parameter included during previous sampling event):

- *Volatile Organic Compounds (VOCs)*
- *Contract Laboratory Program (CLP) Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, Zn)*
- *Mercury (Hg)*
- *Phenols*
- *Polychlorinated Biphenyls (PCBs)*
- Nitrate
- Nitrite
- Sulfur
- Ammonia
- Sulfate

- Sulfide
- TOC
- *TSS*
- *TDS*
- Methane
- COD
- BOD
- Phosphorous
- Hardness
- Alkalinity
- ORP, pH, DO, CO_2, temperature, conductivity, turbidity

Monitoring Wells

Sample Analytes (italicized red font indicates parameter included during previous sampling event):

- *VOCs*
- *CLP Metals*
- Hg
- Phenols
- *PCBs*
- *Odor*
- *Color*
- Nitrate
- Nitrite
- Sulfur
- Ammonia
- Sulfate
- Sulfide
- TOC
- TSS
- TDS
- Methane
- COD
- BOD
- Phosphorous
- Hardness
- Alkalinity
- ORP, *pH*, DO, CO_2, *temperature, conductivity, turbidity*

The results of the analysis will be tabulated and the effective removal efficiency of the primary treatment contaminants of concern will be calculated. The removal efficiencies will be calculated across each of the individual treatment processes to determine the unit processes that are not functioning as originally designed and to focus the optimization efforts to those processes.

2.2 VERIFICATION AND EVALUATION OF THE CAPTURE OF THE LANDFILL PLUME

The location of each of the monitoring wells will be surveyed by Shumaker to determine their exact location and get the wells on one consistent Site Plan. The survey in association with a groundwater level survey will be used in combination with the results of the June 2011 fifth-quarterly groundwater monitoring report to determine if the system is effectively capturing the groundwater plume at the former landfill.

Based upon the results of the analysis, HRP will evaluate the potential areas for improvement of capture, as necessary.

2.3 REVIEW OF REMEDIAL SYSTEM DESIGN DOCUMENTS

A review of the design documents and the construction documents/as-builts will be reviewed to determine the design rationale for each of the existing systems treatment units. This review will be the basis of the Remedial System Optimization to determine if the treatment system is functioning as initially designed.

2.4 REMEDIAL SYTEM OPTIMIZATION

2.4.1 DYE TESTING

Dye Testing by Aztech Technologies, Inc. is proposed to determine the effective retention time of the constructed wetland treatment cells. The intent of the dye testing is to determine the exact contact time that is present within the treatment cells. Based upon a preliminary review of the treatment system sampling results, the polishing pond appears to be providing the primary treatment of the entire system for metals removal. It appears that there may be short-circuiting within the Constructed Wetland Treatment System (CWTS) as the influent to each of the cells is located at the same side of the treatment cell as the effluent. By recording the time a non-toxic dye is introduced in the treatment building and introduced into the CWTS as well as recording the time that the dye is observed in the CWTS collection sump, an overall retention time may be determined. Comparing this observed time with the retention time that may be utilized over the entire surface area of the CWTS. Based upon these observations and calculations, HRP will evaluate a reconfiguration of the influent location.

2.4.2 GAS VENTING SYSTEM EVALUATION

The existing gas venting system will be evaluated for its effectiveness. The system will be analyzed to determine if the existing vents are operating as designed. A proposed remedial design will be evaluated and a cost for any repair options will be presented.

2.4.3 *SYSTEM EVALUATION REPORT*

A System Evaluation Report will be prepared as part of this work assignment following completion of the testing documented above. The report will provide a description of the field activities; present data collected, and provide an analysis and interpretation of the existing functionality and effectiveness of the treatment system as a whole.

The RSO will further outline both the effectiveness and the efficiency of each individual treatment unit. Based upon the evaluation, HRP will provide a list of technologically sound improvements and modifications to treatment processes. Each improvement will be provided with a cost for construction/implementation as well as a summary of improved functionality and or emissions.

An evaluation of the operation and maintenance costs of the existing system and the proposed optimized system will be tabulated. This data will be combined in a summary table with the recommended optimization tasks and a Present Worth analysis will be determined. A pay-back period will then be calculated to determine the cost benefit of implementing each of the recommendations.

The RSO will review and evaluate the compliance sampling frequency and location for both groundwater and the surface water discharge. The RSO will outline the protocols, procedures and evaluation metrics for performing future RSO evaluations.

An Intermediate RSO (60%), Draft RSO (90%), and a Final RSO will be provided. The each draft of the RSO will incorporate comments from the NYSDEC Project Manager.

3.0 PROJECT MANAGEMENT

HRP has the responsibility of the overall management of this project and will respond to any NYSDEC requests.

3.1 PROJECT SCHEDULE AND KEY MILESTONES/REPORTS

The project schedule for this work assignment is outlined below. Key milestones are identified to monitor work progress. The following milestones will be applicable for this project:

Milestone	Description	Anticipated Completion Date
Milestone 1:	Supplement Initial Sampling	May 15, 2012
Milestone 2:	Site Survey/Groundwater Level Survey	May 15, 2012
Milestone 3:	Landfill Plume Evaluation	June 15, 2012
Milestone 4:	Review of Design Documents	May 31, 2012
Milestone 5:	Dye Testing	May 15, 2012
Milestone 6:	Gas Venting System Evaluation	June 15, 2012
Milestone 7:	Intermediate RSO	July 20, 2012
Milestone 8:	Draft RSO	August 24, 2012
Milestone 9:	Final RSO	September 14, 2012

3.2 PROJECT BUDGET

An estimated project budget has been approved by the NYSDEC. This budget provides details, on a task by task basis, of labor, expenses, and subcontractor costs necessary to complete the project.

3.3 PROJECT PERSONNEL

A list of the project personnel of the prime consultant and subcontractors responsible for performance of the site investigation has been submitted to the NYSDEC for approval. Primary project staffs are listed below:

Personnel	*Company*	*Title for this Work Assignment*	*Responsibility*
Adam G. Fox, PE, (Project Manager)	HRP Engineering, P.C. (Prime Consultant)	Project Manager	Overall management of the work assignment
Brian Washburn, PE, LEP Manager)	HRP Engineering, P.C.	Senior Project Manager	Responsible for QA/QC on the work assignment
John Moss (Senior Project Geologist)	HRP Engineering, P.C.	Senior Project Geologist	Review of Groundwater and Plume Capture
Jeff Pelczar (Project Geologist)	HRP Engineering, P.C.	Project Geologist	Responsible for the review of groundwater data and capture system
Diane Tran (Project Engineer)	HRP Engineering, P.C.	Project Engineer	Review of the treatment system components and cost estimation

Subcontractors for this project will include:

- Shumaker Consulting Engineering & Land Surveying, P.C