Remedial Design Work Plan

Town of Salina Landfill
Town of Salina, New York
Site No. 734036

CHA Project Number: 6967

Salina Landfill

Prepared for:

Town of Salina
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CERTIFICATION

I, the undersigned, certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly prepared Remedial Design Work Plan for the Town of Salina Landfill located in the Town of Salina, New York, in accordance with the Division of Environmental Remediation (DER) Draft DER-10 Technical Guidance for Site Investigation and Remediation (December 2002).

Based upon my personal activities and my direct supervision of the persons directly responsible for preparing this Remedial Design Work Plan, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

For Clough Harbour & Associates LLP:

(Professional Seal)

Keith J. Ziobron
Printed Name of Certifying Engineer

Signature of Certifying Engineer

Date of Certification

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Registration Number

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Registration State

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Company

Associate
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LIST OF ACRONYMS & ABBREVIATIONS

ADF	Average daily flow
AMSL	Above Mean Sea Level
ASTM	American Society of Testing and Materials
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
AWQC	Federal Ambient Water Quality Criteria
CAA	Clean Air Act
CFR	Code of Federal Regulations
CHA	Clough Harbour & Associates LLP
CMU	Concrete Masonry Unit
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DOT	Department of Transportation
EC	Environmental Control
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
ESCP	Erosion and Sediment Control Plan
GPS	Global Positioning System
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HDPE	High Density Polyethylene
HVAC	Heating, Ventilation, and Air Conditioning
IC	Institutional Control
kV	Kilovolt
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
METRO	Metropolitan Syracuse Wastewater Treatment Plant
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSP	New York State Plane
OCRRA	Onondaga County Resource Recovery Agency
OCDWEP	Onondaga County Department of Water Environment Protection
OLCC	Old Ley Creek Channel
OSHA	Occupational Safety and Health Act
OM&M	Operation Monitoring and Maintenance
PACT	Powdered Activated Carbon Treatment
PAH	Polycyclic Aromatic Hydrocarbon

PCB	Polychlorinated Biphenyl's
PPE	Personal Protective Equipment
PPM	Parts Per Million
PRAP	Proposed Remedial Action Plan
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RAR	Remedial Alternatives Report
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAC	State Assistance Contract
SBR	Sequencing Batch Reactor
SCG	Standard, Criteria, and Guidance
SDWA	Safe Drinking Water Act
SPDES	State Pollution Discharge Elimination System
SVOC	Semi- Volatile Organic Compound
SWMP	Soil & Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TAGM	Technical & Administrative Guidance Memorandum
TMP	Tax Map Parcel
TOC	Total Organic Carbon
TOGS	Technical & Operational Guidance Series
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USEPA	United State Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

Clough, Harbour & Associates LLP (CHA) was retained by the Town of Salina to perform a Remedial Investigation and Feasibility Study (RI/FS) and to perform Remedial Design services relative to the final remedial construction at the former Town of Salina Landfill. The landfill has been designated a Class 2 Inactive Hazardous Waste Site (Site No. 7-34-036) by the New York State Department of Environmental Conservation (NYSDEC) and is also considered a subsite to the Onondaga Lake National Priorities List (NPL) site by the United States Environmental Protection Agency (USEPA).

1.1 PURPOSE & SCOPE OF THE WORK PLAN

The purpose of this work plan is to outline the major elements of the remedial design for the Town of Salina Landfill and to provide a basis of discussion prior to completing the full remedial design. Defining the objectives of each remedial element early in the design process allows sufficient time for each organization involved in implementing the remedy time to ask questions and ensure that all parties involved in the remedial and redevelopment phases have a similar understanding of the project. The application of the focused principals of put forth in this reduce the project costs by avoiding potential re-design efforts and to avoiding potentially costly delays in the project schedule.

1.2 ORGANIZATION OF REPORT

The work plan is divided into eight major sections. Section 1 identifies the Town of Salina Landfill project and describes the purpose and organization of the report. Section 2 provides a description of the site, the history of the site, and the nature and extent of contamination on the site. Section 3 presents a discussion of the pre-design tasks associated with the project. Section 4 of the report provides a conceptual description of each element of the remedial action at the Town of Salina Landfill. A Quality Assurance Project Plan (QAPP) is included in an Appendix to this document. Section 6 presents a list of required permits and/or substantive permit requirements. An outline for the Operation Monitoring and Maintenance (OM&M) Plan is presented in Section 7, while the project schedule is listed in Section 8.

2.0 SITE BACKGROUND

This site has been the subject of extensive previous investigations, including an RI/FS. The information presented in the remainder of this section is summarized from either the RI/FS or the ROD issued by NYSDEC in March 2007.

2.1 SITE DESCRIPTION

In 1994, Onondaga Lake, its tributaries and the upland hazardous substance sites which were found to be releasing or threatening to release contamination to the Lake was added to the EPA's Superfund National Priorities List (NPL). The NYSDEC determined that the Town of Salina Landfill is contributing such contamination and, therefore, is considered a "Sub-Site" of the Onondaga Lake NPL site.

The Town of Salina Landfill site, approximately 55 acres in size, is located in the Town of Salina, Onondaga County, New York. It is designated a Class 2 Inactive Hazardous Waste Disposal Site by NYSDEC (New York Registry No. 7-34-036). The Site is bounded by the New York State Thruway to the north and by Route 11 (Wolf Street) to the east. An Onondaga County Resource Recovery Agency (OCRRA) Transfer Station is located immediately to the west of the landfill. Ley Creek, a Class B stream, runs through the approximate eastern half of the Site and along the southern border of the approximate western half of the Site. The eastern half of the Site is bounded to the south by the banks of a separate tributary, known as the Old Ley Creek Channel (OLCC). A portion of Ley Creek was moved in the early 1970s to its current location. Landfilled materials have been identified both north and south of Ley Creek in the land area located between the current Ley Creek and the OLCC (see Figure 1 of the ROD, presented in Appendix A of this Work Plan).

The sediments, surface waters and banks of Ley Creek under and downstream of the Route 11 bridge, as well as the sediments, surface waters, and banks of the OLCC are collectively a separate Class 2 New York State inactive hazardous waste disposal site known as the "Old Ley Creek Channel Site" (Site Number 734074). Further investigation of the Old Ley Creek Channel site is necessary and will ultimately be completed by others.

A 48-inch abandoned sewer line runs across the Site. A 48-inch corrugated metal pipe (CMP) culvert is located in the eastern part of the Site, and drainage ditches are located along the western, northern, and eastern borders of the Site (see Figure 1). Storm water from the Site drains to Ley Creek via the drainage ditches and the culvert.

The land comprising the Site is currently owned by five parties. The Town of Salina owns 29 acres of the Site, comprising approximately the western half of the Site. The eastern part of the Site (from the Town's property line to west of Route 11) is privately owned. East Plaza, Inc. owns the portion of the Site located between the current Ley Creek and old Ley Creek. Onondaga County owns a strip of land trending east-west across the Site. Niagara Mohawk owns a strip of land trending east-west across the Site. The Onondaga County Resource Recovery Agency owns the property immediately west of the Site.

The Salina Landfill is located within an area zoned as an Industrial District. Land located immediately to the south and to the west of the Site is also zoned as an Industrial District. The land directly east of the Site, on the opposite side of Wolf Street, is zoned both as a Highway Commercial District and a One-Family Residential District. The land located to the north of the Site, on the opposite side of the New York State Thruway, is zoned as Open-land District, Planned Commercial District, and One-Family Residential District. Based on the Code of the Town of Salina, land within each zoning district has specific intended uses.

The Town is considering other options to the current industrial zoning of the landfill property. These may include use of the property for passive recreational purposes (park, walking trails, etc.). There is also the potential for commercial development at and around the vicinity of the landfill. Any written proposals submitted to NYSDEC for the future use of the Site will be considered for incorporation into the remedial plans, as appropriate. It should be noted that the area is served by municipal water.

2.2 SITE HISTORY

The site is a municipal landfill that was used for the disposal of domestic, commercial, and industrial waste from prior to 1956 until 1974. Between 1971 and 1974, the landfill operations continued with little or no control over the refuse haulers that were dumping in the landfill. Some of the wastes disposed of in the landfill included paint sludge, waste paint thinner, polychlorinated biphenyl (PCB)-contaminated wastes in the form of oil-saturated sorbents used in floor cleanups, buffing sludge, and fly ash by General Motors, and drummed wastes (potentially containing included 2-butanone, toluene, xylene, and solder flux, among other substances) by Carrier Corporation.

Reaching its capacity, the landfill was officially closed sometime in late 1974 or early 1975, pursuant to an order by the NYSDEC. In September 1981, the Town awarded a contract to cover the

landfill with a two-foot thick clay-type soil cap. Once the soil was placed, the area was hydro-seeded to establish a vegetative cover. That project was completed in November of 1982.

A more detailed history of the site operations is presented in Section 1.2 of the RI/FS and in the March 2007 ROD.

On October 29, 1997, the Town of Salina entered into an Order on Consent with the NYSDEC to perform the RI/FS, remedial design, and remedial action for the Site. On November 17, 1997, the Town also entered into a State Assistance Contract under the 1986 Environmental Quality Bond Act of New York State. This contract stated that the Town would be reimbursed 75% of the eligible costs during the RI/FS. This contract may be amended for the remedial design and remedial action costs.

The RI started on June 29, 1998. Two phases of sampling occurred over two summers. An RI report was submitted to NYSDEC by the Town, through its consultants, in May 2000. The report was reviewed by the EPA and NYSDEC, and then revised by the Town's consultants. The RI Report was approved in March 2001. The Town submitted a Draft FS Report in January 2001. The report was reviewed by the EPA and NYSDEC, and then revised by the Town's consultants. The FS Report was approved in May 2002.

In January 2003, NYSDEC and USEPA released a Proposed Plan describing the remedial alternatives considered for the Site and identifying the preferred remedy with the rationale for the preference. The primary elements of the preferred remedy included constructing impermeable caps over the landfill areas north and south of Ley Creek, constructing groundwater/leachate collection trenches north and south of Ley Creek, and pumping the collected groundwater/leachate to the Metropolitan Syracuse Wastewater Treatment Plant (METRO) for treatment.

Comments received during the public comment period indicated that Onondaga County has a policy not to accept wastewater from inactive hazardous waste sites for treatment at METRO. The Town of Salina and the County participated in extended negotiations for an agreement to allow the landfill's groundwater/leachate to be treated at METRO (with or without pretreatment). No agreement was reached. Therefore, two on-site groundwater/leachate treatment alternatives were evaluated in a September 2006 Addendum to the May 2002 Town of Salina Landfill Feasibility Study Report (hereinafter "FS Addendum"). A revised Proposed Plan was released to the public for comment in December 2006.

2.3 PREVIOUS REPORTS & INVESTIGATIONS

As noted previously, the RI started on June 29, 1998 and two phases of sampling occurred over two summers. An RI report was submitted to NYSDEC in May 2000. The RI Report was approved in March 2001. A number of previous investigations had also been performed to assess the environmental condition of the Town of Salina Landfill and these were summarized and presented in Section 1.2.3 of the RI/FS. The extensive and voluminous results from the environmental sampling taken in connection with these studies will not be presented as part of this Work Plan. Selected data presented in the ROD are included in Appendix A and Appendix B.

Figures 2, 3, and 4 of the ROD present a summary of groundwater data; surface water, sediment, and leachate sample locations, and; a summary of sediment data, respectively. Figure 5 of the ROD presents a geologic cross-section, and Figure 6 presents surface soil sample SVOC concentrations. Figure 7 of the ROD shows conceptual contaminant migration pathways. Each of these figures is presented in Appendix A of this Work Plan.

Table 1 from the ROD is presented in Appendix B and show a summary of concentration data from the contaminants of concern for surface soils, subsurface soils, sediment, groundwater, and leachate

2.4 IDENTIFICATION OF SGCs

A comprehensive discussion of what New York State regulations refer to as Standards, Criteria, and Guidance, or SGCs is presented in Section 11.1 of the RI/FS. Federal regulations refer to SGCs as Applicable or Relevant and Appropriate Requirements (ARARs). The discussion of ARARs and SGCs from the RI/FS is summarized here.

A discussion of the three major types of SCGs, location-specific, chemical-specific, and action-specific, is presented in the following sections.

2.4.1 Location-Specific ARARs/SCGs

Location-specific SCGs are restrictions placed on the type of activities to be conducted based upon site-specific characteristics or the site's location. The local characteristics of the site must be evaluated with regard to potential adverse effects that remedial activities may have on existing features (e.g., wetlands, floodplains, endangered species habitats, historically significant features,

etc.). These SCGs provide a basis for assessing restrictions during the formulation and evaluation of potential site-specific remedies.

2.4.1.1 Wetlands

Given the site's status as an inactive hazardous waste disposal site, it is understood that Federal Section 404 permits administered by the Army Corp of Engineers are not required. However, NYSDEC requires that the substantive requirements of state permits be considered and met.

The National Wetland Inventory (NWI) maps identified the location of three wetlands, including Ley Creek, within or adjacent to the study area and four wetlands within 0.5 miles of the site. In addition, narrow strips (20-60 feet) of wetlands are present along the northern and western boundaries of the landfill that were not identified on the NWI maps. Figures 3-3 and 3-4 of the RI depict wetlands on and adjacent to the site. Therefore, federal wetland regulations are considered SCGs.

No wetlands mapped by the New York State Department of Environmental Conservation (NYSDEC) were identified within the study area.

To date, a formal wetlands delineation has not been conducted; this delineation will be conducted during the remedial design phase of the project, as described further below. These SCGs will be considered during this formal wetlands assessment. In addition, the NYSDEC's guidance document, entitled *Freshwater Wetlands Regulations, Guidelines on Compensatory Mitigation,* dated October 1993, will be considered a SCG (NYSDEC 1993).

The Corps of Engineers will require that a wetland delineation and comprehensive functional assessment and impact analysis be completed during the design phase project as part of their issuance of a permit for disturbance of the wetlands.

2.4.1.2 Surface Water

Ley Creek flows along the southern boundary of the landfill. The entire section of Ley Creek adjacent to the landfill is identified as Class B water, and therefore, is protected under 6 NYCRR Part 608, Use and Protection of Waters. These regulations require permitting of actions that disturb the stream or stream bank. However, in this instance, since the stream bank is considered to be part

of the subject Superfund site, only the substantive requirements for a permit need to be met when carrying out on-site Superfund actions.

The best usages of Class B waters are defined as primary and secondary contact recreation and fishing. Class B waters are considered suitable for fish propagation and survival. Human ingestion would only be incidental during recreation, as Class B water bodies are not considered potable water sources. Federal ARARs for this location also include the Fish and Wildlife Coordination Act (16 USC 661 et seq.; 40 CFR 122.49), which requires the coordination of various federal and state regulatory agencies in the event of control or structural modification to a surface water body.

2.4.1.3 Floodplains

Portions of the site, including some disposal areas, are located within the 500-year floodplain as shown on Figure 11-2 of the RI/FS. Therefore, Executive Order 11988, Protection of Floodplains is considered an ARAR and must be considered for potential remedial actions located within the floodplain.

New York State regulates activities in floodplains and floodways under 6 NYCRR Part 500, Floodplain Management Regulations and Development Permits. Disposal at the Town of Salina Landfill occurred within the 100-year and 500-year floodplains before FEMA delineated the floodplain. In addition, the Consent Order for the site (NYSDEC 1997) supercedes the requirements under 6 NYCRR Part 500 (See Section XIX, E of the Consent Order). For these reasons, this SCG is not considered applicable. It is, however, considered relevant and appropriate and will be taken into account during the evaluation of potential remedial actions and during remedial design.

During the remedial design, a floodplain assessment will be performed to reduce or avoid the adverse effects of a 500-year event, as well as to protect against the potential spread of contaminants and the long-term disabling of remedial treatment systems. The assessment will include:

- A description of the proposed action,
- The effects of the proposed action on the floodplain,
- A description of the other remedial alternatives considered and their effects on the floodplain; and
- Measures to mitigate potential harm to the floodplain if there is no practicable alternative to locating in or affecting the floodplain, including impacts to the proposed remedial action from flooding events.

NYSDEC is working in conjunction with the Federal Emergency Management Agency (FEMA) concerning the fact that a portion of this site is located in a regulated flood way. The Town of Salina Landfill project will be evaluated by NYSDEC to determine if the remedial action would result in an increase in the base flood elevations.

2.4.1.4 Habitat Critical to Endangered or Threatened Species

No state or federally listed threatened or endangered species were identified on-site during the ecological assessment. In addition, no "special concern species" were identified on-site. Therefore, potential remedial actions are not restricted by requirements relative to ecological habitat preservation (e.g., the Endangered Species Act of 1973).

2.4.1.5 Archaeological/Historical Sites

The Town of Salina Landfill is not in an area where potential remedial action could cause irreparable harm, loss, or destruction of significant artifacts. Therefore, ARARS related to historical or archaeological sites do not apply. Should scientific, pre-historical, or historical artifacts be found at the site, then this ARAR would become applicable.

2.4.2 Chemical-Specific ARARs/SCGs

Chemical-specific ARARs/SCGs set health or risk-based concentration limits or ranges for various environmental media for specific substances. These requirements provide protective site cleanup levels or a basis for the calculation of cleanup levels. These ARARs/SCGs are also used to indicate an acceptable level of discharge, to determine treatment and disposal requirements, and to assess the effectiveness of the remedy. The chemical-specific ARARs/SCGs identified for the Town of Salina Landfill are discussed below by media.

2.4.2.1 Groundwater

New York State Groundwater Standards: The aquifer underlying the site is designated as Class GA groundwater. The best usage of Class GA waters is as a source of potable water supply (6 NYCRR Part 701.15). Therefore, the Class GA groundwater standards are intended for protection of human health where groundwater is used as drinking water. Numerical groundwater standards and guidance values are presented in 6 NYCRR Part 703 and in the NYSDEC's Technical and Operational

Guidance Series (TOGS) 1.1.1 document, entitled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 1998). These groundwater standards and guidance values are listed in Tables 4-1, 4-2, 4-3, and 4-4 of the RI. The Class GA groundwater standards are equivalent to criteria established by the New York State Department of Health (NYSDOH) for public water supplies. The NYSDOH criteria were promulgated in 10 NYCRR Chapter I (State Sanitary Code) Subpart 5-1.

USEPA Drinking Water Standards: These federal standards include the Safe Drinking Water Act (SDWA) promulgated by the National Primary Drinking Water Standards (40 CFR Part 141) for the regulation of contaminants in all surface waters or ground waters utilized as potable water supplies. The primary standards include both Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs). MCLs are enforceable standards for specific contaminants based on human health factors and the technical and economic feasibility of removing contaminants from the water supply. MCLGs are non-enforceable standards that do not consider the feasibility of contaminant removal. The SDWA also includes secondary MCLs (40 CFR Part 143) that are non-enforceable guidelines for those contaminants that may adversely affect the aesthetic quality of drinking water, such as taste, color, and odor. The constituents addressed in the SDWA are also addressed in the New York State groundwater standards and guidance values described above.

New York State Groundwater Effluent Limitations: The NYSDEC's Division of Water regulates point source discharges to Class GA groundwater primarily through the use of effluent limitations that have been established statewide. The effluent limitations are set at concentrations that should prevent contaminants from exceeding New York State ambient groundwater standards and guidance values. These numerical values are also presented in the NYSDEC's TOGS 1.1.1 document (NYSDEC 1998).

Federal Ambient Water Quality Criteria: In accordance with Section 304(a) of the Clean Water Act, USEPA has developed the Federal Ambient Water Quality Criteria (AWQC) for priority toxic pollutants. AWQCs are not legally enforceable, but may be referenced by states when developing enforceable water quality standards. AWQCs are available for both the protection of human health from exposure to contaminants in drinking water and for the protection of aquatic life.

2.4.2.2 Surface Water

New York State Surface Water Criteria: These standards and guidance values are set to protect the surface water quality of New York State water bodies. The values are derived according to the

scientific procedures described in 6 NYCRR Part 702. Numerical surface water standards and guidance values are presented in 6 NYCRR Part 703 and in the NYSDEC's TOGS 1.1.1 document (NYSDEC 1998). Adjacent to the landfill, Ley Creek has been identified as a Class B surface water body by the NYSDEC. The water quality of a Class B surface water should be suitable for primary and secondary contact recreation. These standards and guidance values are listed in Table 4-5 of the RI.

Federal Ambient Water Quality Criteria: This federal ARAR, as described above, is also applicable to surface water.

2.4.2.3 Sediment

New York State Sediment Guidance: The NYSDEC's *Technical Guidance for Screening Contaminated Sediments* (NYSDEC 1999), is considered a SCG. This guidance document is intended for use in identifying areas of sediment contamination and evaluating the potential risks posed by the contamination. However, the values listed in the document, and derived in accordance with the guidance, do not necessarily represent the final sediment cleanup levels for the site. Table 4-6 of the RI contains the listed guidance values and site-specific values that were calculated based on the average organic content of the sediments. Other commonly used screening values (Jones et al. 1997; Persaud et al. 1993; Long et al. 1995; Long and Morgan 1990) were also used in the Ecological Risk Assessment (ERA) to supplement the NYSDEC guidance.

2.4.2.4 Soil

New York State Recommended Soil Cleanup Objectives: These objectives have been prepared by NYSDEC in a revised Technical and Administrative Guidance Memorandum (TAGM) 4046 issued on November, 24 1994 (NYSDEC 1994). This guidance document outlines the basis and procedure for determining soil cleanup levels at state Superfund sites. Soil cleanup objectives are based on the protection of human health and groundwater quality, and are dependent on soil total organic carbon (TOC) content for organic compounds. TAGM 4046 also includes eastern U.S. native soil concentration ranges for metals. Tables 4-7, 4-8, and 4-9 of the RI list the TAGM 4046 cleanup standards. In the ERA, screening values developed by Efroymson et al. (1997a, 1997b) and the USEPA Region III (USEPA 1995b) were also considered SCGs.

2.4.3 Action-Specific ARARs/SCGs

Action-specific ARARs/SCGs are triggered by particular activities that are selected to accomplish the remedy; they govern the design, construction, and operation of remedial actions. Action-specific ARARs/SCGs provide a basis for assessing the implementability and effectiveness of the potential remedial alternatives. Remedial activities potentially subject to action-specific ARAR/SCGs include:

- Site grading, excavation, and capping
- Removal and off-site disposal of solid and hazardous waste
- Groundwater collection and discharge

Major action-specific ARARs/SCGs that were considered are summarized below.

New York State Solid Waste Facilities Management Regulations: The requirements of 6 NYCRR Part 360 regulate all aspects of solid waste management facilities, including construction, operation, and closure. This regulation contains prescriptive requirements for the final cover system. The most pertinent requirements of 6 NYCRR Part 360 are those relating to closure and post-closure procedures. The regulations state that all regulated facilities must develop a closure plan defining the nature and extent of current and potential release or migration of contaminants from the site. A closure investigation report must be submitted as part of this requirement. Leachate and gas collection systems may also be required under circumstances where gas or leachate poses a risk to health, safety, or property. In addition, a 30-year post-closure monitoring and maintenance plan is required.

State regulations for solid waste landfill closure, found in 6 NYCRR Part 360, are more stringent than federal requirements in Subtitle D of RCRA.

Because the Town of Salina Landfill ceased normal operation sometime in late 1974 or early 1975, it should have been closed according to the regulations in effect at that time. The version of NYCRR Part 360 in effect at that time states that municipal landfills must be closed using "a final compacted cover of at least two feet of a suitable cover material" (NYCRR Part 360.2(a)(4)). The NYSDEC's guidance document entitled, *Sanitary Landfill, Planning, Design, Operation, Maintenance* (NYSDEC 1973), is also considered a SCG for landfill closure during that period.

New York State Hazardous Waste Regulations: 6 NYCRR Parts 370-374 are considered SCGs and affect the treatment, storage, and disposal of hazardous waste originating from the site. In most

cases, these regulations are more stringent and more prescriptive than the equivalent federal ARARs in RCRA Subtitle C. 6 NYCRR Part 375 governs the investigation and remediation of inactive hazardous waste sites. These regulations provide the framework for conducting this feasibility study.

Clean Water Act and New York State Water Quality Regulations: The Clean Water Act (40 CFR Part 122) and the New York State Water Quality Regulations for Surface Waters and Groundwaters (6 NYCRR Parts 700 to 705) apply to remedial alternatives that involve groundwater collection, treatment, and discharge to surface water or groundwater. The National Pollution Discharge Elimination System (NPDES) permitting program is considered an ARAR. The equivalent State Pollution Discharge Elimination System (SPDES) permitting program is considered a SCG.

State and Federal Wetlands Permits: As noted above, given the site's status as a Superfund site, it is understood that Federal Section 404 permits administered by the Army Corp of Engineers are not required. However, NYSDEC requires that the substantive requirements of state permits be considered and met.

Clean Air Act (CAA) and New York State Air Quality Regulations: Alternatives that involve excavation and potential air emissions from treatment facilities are subject to the National Air Quality Standards for Total Suspended Particulates under the CAA. State requirements will include specific provisions under the applicable state air quality regulations (6 NYCRR Parts 200, 201, and 257).

Occupational Safety and Health Act (OSHA): Federal OSHA requirements that regulate worker safety and employee records must be followed during all site work.

Department of Transportation (DOT) Rules for Transportation of Hazardous Materials: If materials containing hazardous wastes are to be transported offsite, DOT general and manifest requirements apply.

Toxic Substances Control Act (TSCA): Materials containing 50 parts per million (ppm) or greater of PCBs are subject to regulations under TSCA relative to their storage, disposal, and marking.

3.0 DESCRIPTION OF PRE-DESIGN TASKS

Based upon our knowledge of the site and project familiarity, we anticipate that a number of tasks will need to be completed prior to commencing with the remedial design process. These tasks include items that need be resolved prior to moving ahead with the design while others include additional investigation that will be required for the design.

3.1 UTILITY RELOCATION EVALUATION

There are several existing Niagara Mohawk Power Company (now, National Grid) facilities that bisect the landfill property. At this time, it is unknown whether complete relocation of all above-ground and underground electric and gas lines is required or whether it is possible to integrate some of the existing utilities into the proposed closure plan. The obvious benefits of integration of existing utilities into the design of the remedy include a reduced level of exposure to displace wastes and waste residues, as well as the reduced cost of the implementation of the remedy. This pre-design evaluation of utilities will involve the following tasks:

3.1.1 Property Research

CHA will investigate the existence of easements and/or property rights associated with the 115kV transmission line, the 115kV tap to the south to Crouse Hinds, existing electric distribution facilities that run east-west through the property, and the existing 12" gas line that bisects the property. This research will be completed prior to initiating discussions with National Grid.

3.1.2 115 kV Line Relocation Feasibility (lattice towers)

Running primarily east-west through the parcel, this line has one structure that is within the confines of the proposed landfill cap. The easternmost and westernmost structures appear to be outside the limits of waste and thus will not be considered for relocation. The middle structure, however, is within the limits of waste and is also the tap point for the 115kV wood pole structure tap line that runs south to feed industrial customers.

The following options will be evaluated relative to the fate/inclusion of this structure relative to the remedy:

- Rebuild the structure in place with new concrete footers that will protrude above the elevation of the proposed landfill cap. The new structure will be a new lattice tower similar to what exists today. This option will include "booting" the membrane liner from the proposed landfill cap to the concrete footers.

- Modification of the existing structure base, including new concrete footers and modifications to the existing steel at the base of the tower to again achieve a top of concrete elevation that is above the proposed landfill cap. This option will include "booting" the membrane liner from the landfill cap to the concrete footers.

- Leaving the existing structure in place and simply "booting" the membrane liner from the landfill cap to the existing steel tower members.

3.1.3 115kV Line Relocation Feasibility (wood poles)

Running primarily south from the structure identified in Item 2 above is an 115kV wood pole line with switches, this unit that serves an industrial customer to the south of the landfill. Based on the importance of this line and the customer base which it serves, CHA will evaluate the following options for this line:

- Rebuild the entire line adjacent to the existing line while replicating the existing switching capability in the existing construction. The new line would be evaluated utilizing both wood pole and steel pole construction (with concrete footers). "Booting" the membrane liner from the landfill cap to each pole or structure would be proposed for all poles within the confines of the landfill cap.

- Leave the existing line in place and "boot" the membrane liner from the landfill cap to each of the existing poles within the line.

Under both options listed above, the landfill cap design would facilitate maintenance access for National Grid to the line. This would result in the negotiation of a new maintenance easement with National Grid.

3.1.4 34.5kV Line Relocation Feasibility

Running primarily east-west through the property is an existing wood pole line. CHA assumes that these are existing electric sub-transmission lines that are utilized to create a loop feed in this area. CHA will evaluate the following options for these lines:

- Rebuild the entire line adjacent to the existing line while replicating the existing switching capability in the existing construction. The new line would be evaluated utilizing both wood pole and steel pole construction (with concrete footers). "Booting" the membrane liner from the landfill cap to each pole or structure would be proposed for all poles within the confines of the landfill cap.

- Leave the existing line in place and "boot" the membrane liner from the landfill cap to each of the existing poles within the line.

3.1.5 Existing Natural Gas Line

Running east-west through the property is an existing natural gas line through the southern half of the parcel. There is not likely to be a feasible alternative for the relocation of this line outside of the limits of the landfill. CHA will, however, evaluate the following two options for this gas line:

- Relocating the line outside the limits of the landfill in its entirety. This relocation would involve several options for valve installation to allow National Grid to continue to serve its existing customer base.

- Modifying the landfill cap design along a corridor (assumed 24 feet width) along the entire length of the gas line within the proposed cap. This modified cap design would allow National Grid access to the gas line.

Under all the options listed above, CHA is proposing to complete a feasibility study independent of National Grid. Following this evaluation, CHA will then meet with National Grid to present the findings of the evaluation. CHA expects that National Grid will then charge a fee to either complete an independent evaluation of the lines or to review the evaluation completed by CHA.

3.2 SURVEY

3.2.1 Boundary and Topographic Survey Update on Landfill Site

CHA previously completed a boundary and topographic survey of the landfill site, but this survey is nearly ten years old and needs to be updated for 2 reasons: the landfill may have experienced settling over the last 10 years so the surface elevations identified in 1998 may be higher than those which exist today; surface water drainage ways may have accumulated sediment over the last 10

years so elevations may be higher than identified in 1998. Updating of the topographic information will be crucial to the remedial design, particularly relative to balancing cuts and fills on grading plans.

The elements of this task are listed below:

1. Perform record research at the Onondaga County Clerk's Office and other municipal offices for information including, but not limited to, deeds, filed maps, street line monumentation data, easements, etc.

2. Perform a field survey of existing conditions on the properties identified as the Salina Landfill, using instruments and procedures consistent with local survey standards.

3. Perform boundary line tasks (update previous boundary work performed by CHA) as necessary to place record title information on the mapping.

4. Horizontal and vertical control will be established on the site using previous work CHA has performed on or near the site. Horizontal values will reference NAD 83, NYSP Central Zone, expressed in US Survey feet. Vertical values will reference NAVD 88, expressed in US Survey feet. Control will be established following accepted standards and procedures.

5. Horizontal and vertical control points shall be placed in locations with the intent that they be accessible throughout the construction phase. A minimum of five horizontal points and five vertical points (benchmarks) shall be set and identified on the completed mapping.

6. By utilizing electronic total stations coupled with data collectors, CHA field crews will perform a field topographic survey on the project site, locations shall include, but not be limited to locations of the following:

    - Buildings and visible surface improvements
    - Asphalt and concrete limits
    - Curbs, sidewalks and retaining walls
    - Trees, bushes and ornamental vegetation
    - Pavement markings (traffic, parking, etc)
    - Traffic signage and appurtenances
    - Visible utility surface features (utility poles, catch basins, manholes, valves, etc.)
    - Finished Floor elevations of buildings within the project limits

7. Topographic survey information will be gathered within the following limits:

    - Northerly to the New York State Thruway
    - Easterly to the US Route 11
    - Westerly to the existing County transfer station facility
    - Southerly to the limits as identified previously

8. CHA will contact utility and municipal service companies operating in the area to request record information. Existing utilities will be located as surface evidence allows, depths obtained from surface activities combined with record information supplied by service organizations (often referred to as confidence level a1 by New York State Department of Transportation [NYSDOT]). No CHA personnel will enter manholes or catch basins to obtain measurements (defined as confined space by OSHA).

9. CHA will utilize AUTODESK® civil/survey software to prepare the mapping at a scale convenient for subsequent design tasks, with contours generated at one-foot intervals.

10. Deliverables will be as follows:

    - Digital copy of the mapping in ACAD® 2006 format
    - Copy of the AUTODESK® mapping and DTM database

3.2.2 Survey Activities for Potential Off-Site Treatment Plant

Because of the estimated high costs associated with constructing the Leachate Treatment Facility on the landfill, namely the costs of a deep foundation system, the feasibility of siting the Leachate Treatment Facility off-site will be investigated. While it is unknown at this time whether or not this is possible, if this option is considered further, a boundary/topographic survey and subdivision services associated with an off-site plant. This task will not be completed should the plant be constructed on the landfill site.

3.3 WETLANDS DELINEATION

Wetlands were generally identified on and around the landfill during the Remedial Investigation, however, a full wetland delineation will be completed as part of the design. CHA will complete the following elements of this task relative to delineating the existing wetlands on the landfill site:

1. A field investigation of the project site will be completed to identify and delineate federal jurisdictional wetlands pursuant to the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual. Wetlands will be identified based on the presence of vegetation typically adapted to wet conditions (hydrophytes), hydric soils, and the presence or evidence of hydrology. Wetland boundaries will be demarcated with vinyl flagging. Each flag will be given a letter designation and number to facilitate survey and future site confirmation by USACE.

It is anticipated that the NYSDEC will accept the federal delineation as their boundary given that the wetlands generally occur at the toe of landfill slope.

Data from field sample points will be collected in support of the wetland flagging. Photographs will be taken to document site conditions.

2. Upon the conclusion of the field work, a Wetland Delineation Report outlining methodology and results and will be prepared and submitted to both USACE and the NYSDEC. The report will consist of the following:

   - Site location map and supporting resource maps
   - Wetland delineation map illustrating surveyed wetland boundary, data points, and transect lines
   - Representative site photographs
   - Wetland data sheets for each vegetative community up and down slope of the wetland boundary
   - Supporting narrative

   Following submission of the Wetland Delineation Report, we will conduct one joint site visit with USACE and the NYSDEC to field verify the delineation.

3.4 GEOTECHNICAL INVESTIGATION

Prior to the design of the Leachate Treatment Plant or to the Leachate Collection System, a geotechnical investigation will be completed to facilitate the design of the plant foundation and design of the cut-off wall along Ley Creek. As such, the following investigations are proposed:

3.4.1 Leachate Treatment Plant Investigation

It is understood that the Leachate Treatment Plant will either be constructed on the closed landfill or on an adjacent property. Once the site or alternate sites are selected, the geotechnical investigation will proceed. More specifically, the following geotechnical services will be performed to evaluate subsurface conditions and provide geotechnical recommendations:

1. Based on our experience, the subsurface conditions and the depths of landfill debris across the project site vary significantly. Because of the presence of the landfill material and the fact that a final location has not yet been determined for the proposed Leachate Treatment Plant, deep foundation systems may be required to support the structures. A qualified drilling contractor will be retained to advance a total of 12 borings at each candidate site to an average depth of 75 feet at the following locations:

- One boring at each of the three proposed pump stations
- One boring at the proposed 150,000 gallon equalization tank
- One boring at the location of the air strippers
- Two borings at the location of the SBR tanks
- One boring at the location of the gravity sludge thickener
- Two borings at the location of the process building
- One boring at the location of the 150,000 gallon storage tank
- One boring at the location of the Parshall flume

If bedrock is encountered, a five-foot rock core will be taken in two of the borings for the proposed Leachate Treatment Plant. The borings will be grouted to the existing surface upon completion.

2. The following equipment will be utilized to perform monitoring during the subsurface investigation:

   - A gas meter equipped to measure methane levels throughout the drilling operations to ensure the safety of all on site personnel.
   - A photoionization detector equipped to measure for the presence of contamination in the soil samples collected during the drilling investigation.

3. Soil samples will be collected continuously in each boring until the borehole has been advanced beyond existing fill material into natural soil and at standard 5 foot intervals thereafter. Samples will be screened in the field for visual, olfactory, and photoionic evidence of contamination. All excess soil cuttings will be drummed for disposal by the Owner. Based on the field screening, up to four soil samples will be selected and submitted to an appropriately certified laboratory for analysis of polychlorinated biphenyls (PCBs) in accordance with the remedial action plan for the project site to assist the owner with determining disposal options. The soil samples will be packed on ice for transport to the laboratory along with a completed chain of custody. Laboratory analysis will be performed on a standard ten-day deliverable schedule. It is anticipated that no restoration of pavement, concrete, etc. will be necessary.

4. Two temporary piezometers will be installed to observe and record groundwater levels. Water level observations will be made at least 24 hours after the installation to determine a static groundwater level.

5. A geotechnical engineer that has successfully completed the Occupational Safety & Health Administration's (OSHA) 40 hour Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training will supervise the subsurface investigation to ensure proper drilling and sampling methods are utilized. The engineer will wear required PPE as designated in the site Health & Safety Plan and will classify samples and prepare field logs

documenting subsurface conditions.

6. The borings will be staked by measuring from existing features with a handheld GPS unit.

7. A qualified laboratory will be subcontracted to perform testing on selected samples collected from the borings during the subsurface investigation. Proposed laboratory testing will include index testing to aid in soil classification and correlation with engineering properties. The testing will include Atterberg Limits, grain size analysis and water content determination testing. It is estimated that four soil samples will be submitted for laboratory testing.

3.4.2 Collection Trench/Cutoff Wall Investigation

A Leachate Collection System will be designed to intercept leachate flowing into Ley Creek which runs through the landfill. It is anticipated that the system will include leachate extraction wells at regular intervals constructed behind an alignment of water tight sheeting. A force main pipe system will be designed to convey leachate to the waste water treatment plant that is currently planned to be constructed at the landfill site.

CHA will perform a geotechnical investigation along the planned alignment of the leachate collection system in order to gather additional information for design. The investigation will include the following:

As previously stated, the subsurface conditions across the project site vary significantly. A qualified driller will be retained to advance a total of 20 borings at the project site.

- Sixteen borings will be advanced at intervals of approximately one boring every 300 feet along the proposed alignment of sheeting on both the north and south banks of Ley Creek.
- Four borings will be advanced at intervals of approximately one boring every 300 feet along the western border of the landfill adjacent to the wetlands and existing drainage ditch.
- The borings will be advanced to an average depth of 50’ or refusal. If bedrock is encountered in the borings, a 5-foot rock core will be taken in two of the borings.
- Groundwater level observations will be recorded during drilling operations and the borings will be grouted to the surface upon completion.
- Three temporary piezometers will be installed to observe and record groundwater levels. Water level observations will be made at least 24 hours after the installation to determine a static groundwater level.

After both investigations are complete, a Geotechnical Engineering Report that will include the following will be prepared:

- Brief description of proposed project
- Description of field investigation program
- Description of site subsurface and geological conditions
- Typed boring logs and boring location plan
- Recommendations for foundation type, soil design parameters, floor slab construction, groundwater control, site preparation, and other construction considerations

3.5 EVALUATION OF GROUNDWATER RECHARGE

The expected groundwater flow rates into the proposed leachate collection trenches were estimated during the feasibility stage of the project. However, since there have been some modifications to the trench layout since that time, the analysis relative to groundwater recharge will be updated. In addition to utilizing the hydraulic conductivity data previously gathered from the existing monitoring wells, CHA will also examine the actual recharge area up-gradient of the landfill in attempt to evaluate the potential amount of leachate that will be collected for treatment. While a certain volume of water may be able to pass through the void spaces in the soil and waste within the landfill, it will only do so if the recharge up-gradient of the landfill is sufficient, particularly since the infiltration through the landfill surface will be virtually eliminated by the installation of a cap.

No additional field investigation will be conducted as part of this task. It is important to understand that any evaluation that does not involve significant long-term investigations and analysis of data will have limits on the accuracy of the predicted leachate generation rates. While most modeling techniques work well for virgin, uniform soils, flow through heterogeneous waste materials are more difficult to predict.

3.6 CONSTRUCTION TRAFFIC ANALYSIS

The following tasks will be completed by CHA to conduct a truck route evaluation to transport trucks between the Salina Landfill and the local interstate system. Based upon the amount of materials and pieces of equipment that will need to be delivered to the project site, we are anticipating several thousand truck trips will be generated over the course of the project. The evaluation is intended to look at the best alternative routing for the truck traffic that will minimize off-site impacts.

CHA will meet with the New York State Department of Transportation and Onondaga County Department of Transportation to review the proposed truck route. It is also expected that there will also be one public meeting in the Town of Salina to present the proposed truck route.

CHA will review up to three potential truck routes. At this time CHA has identified the following truck routes:

- Landfill site to US Route 11 south to Seventh North Street to Interstate 81
- Landfill site to US Route 11 north to Interstate 81
- Landfill site to Factory Avenue to NYS Route 298 to NYS Route 635 to New York State Thruway

A field review will be conducted for the potential routes and identify all traffic control devices and gather roadway information including, but not limited to, roadway widths, speed limits, and roadway geometry. Field measure will be made for all overhead bridge clearances on the potential routes. In addition, weekday AM (7-9 am) and PM (4-6 pm) peak period traffic counts will be collected at the intersection of US Route 11 and Factory Avenue.

CHA will prepare a Truck Route Evaluation Report that will be suitable for Town and agency review and will include the following:

1. Written text, including appropriate graphics, to present the existing conditions of the roadways.

2. Description of the potential truck routes, including photographs.

3. A summary of the expected impacts of each potential truck route and a recommendation as to the preferred truck route.

While not directly related to the truck traffic analysis, CHA will also attend up to two (2) meetings with the New York State Thruway Authority to coordinate the proposed work along the south side of the Thruway (Interstate 90). The proposed remedy for the site includes the removal of impacted sediments from the drainage ditch along the north side of the landfill as well as the lining of the trench. This work will require the temporary removal of the fencing from the Thruway Authority's property to complete the work and final restoration.

3.7 END USE PLANNING

The Town is considering using the site as part of their municipal park system with consideration of many uses, in part: hiking trails, scenic or jogging paths, athletic fields, tennis courts, picnic areas, tubing or sledding hills, mountain bike trails, snow skiing, nature conservancy and/or skate park. Adequate municipal parking would also be required. Based on conditions observed and our understanding of the site, any or all of these future uses may be feasible. Such a future use would

need to be integrated into the final design of the remedy. The following elements will be incorporated into this task:

- First, CHA will facilitate a one day programming session during which we will meet with and interview both the Town leadership and select citizens to discuss the Town's unmet needs. It may also be advisable to include a representative, or representatives from the School district, and organized community groups, as any playing fields constructed on the landfill site could supplement their needs.

- CHA will then review the information derived from the programming session and site visit and compile a brief summary or statement of unmet needs which will be used as a basis for the concept design alternatives for the reuse of the site. This document will be distributed to Town Leadership and other interested parties for comment to ensure that our understanding of the Towns goals for the site are accurate.

- Next, CHA will develop two to three alternate Beneficial Reuse Plan concepts for review by the Town. The alternative development strategies will, in all likelihood, consist of a combination of different planning alternatives combined with a menu of items which are programmatically required.

- CHA will also develop concept level cost estimates for each development alternative.

- Finally, we will present the alternatives developed by CHA to the Town and the NYSDEC in a narrative report which summarizes the work referenced above. We will also meet with the Town to present the reuse options that we have developed for the site along with our recommended development alternative.

4.0 CONCEPTUAL REMEDIAL DESIGN

Per the NYSDEC's March 2007 ROD for the site, the selected remedy will include the following:

- Excavation of contaminated sediments in the western drainage ditch;
- Construction of groundwater/leachate collection trenches north and south of Ley Creek (The northern and southern collection trenches will be approximately 2,900 feet long and 1,260 feet long, respectively) ;
- Consolidation of the excavated sediments and the soils and wastes (from the excavation of the collection trenches) on the landfill areas;
- Construction of 6 NYCRR Part 360 caps over the landfill areas north and south of Ley Creek;

- Lining the drainage ditches located along the northern and eastern borders of the Site;
- Engineered drainage controls and fencing;
- Installation of an on-site 150,000-gallon storage tank to hold excess water volume stemming from storm events;
- Treatment of the collected contaminated groundwater/leachate at an on-Site treatment plant;
- Discharge of treated effluent to Ley Creek;
- Institutional controls (such as restrictive covenants or environmental easements) to prohibit residential use of site property and the installation and use of groundwater wells, as well as to protect and ensure the integrity of the caps, groundwater/leachate collection trenches, and engineered drainage controls;
- Maintenance of the caps and groundwater/leachate collection trenches; and
- Long-term monitoring.

Figure 8 of the ROD, presented in Appendix A of this Work Plan, depicts the locations of the major components of this remedy. Also presented in Appendix A is Figure 12-8 of the RI/FS, which shows a typical cross section of the 6 NYCRR Part 360 geomembrane cap.

This section of the work plan discusses the major elements of the conceptual remedial design for the Town of Salina Landfill. Many of the conceptual design components are subject to change as the remedial design evolves.

4.1 GRADING AND FINAL COVER SYSTEM

CHA will prepare a closure plan for the landfill consistent with 6 NYCRR Part 360 requirements. It is assumed that standard, established technologies used for cover system design may be sufficiently adapted to allow for a post-closure re-use of the site.

The closure plan design documents will include design drawings, a design report, and technical specifications.

CHA's closure design system will include the following elements:

- Landfill covers system drainage elements.

- A geomembrane barrier within the cover system that will also serve as a barrier to landfill gas from impacting post-closure construction at the site. The interface of the cover system

with building foundations will be considered. Geomembrane will be terminated along the right-of-way for National Grid's gas main located near the northern limits of the proposed cover system. This area will be covered with a compacted low permeability soil cover system.

- Passive gas venting system as detailed under Task 3.2.
- A Leachate Collection System as detailed under Task 3.5.
- Cover system barrier protection and topsoil layers designed to be integrated into the site plan for post-closure construction.
- An engineer's opinion of construction costs related to the final closure cover system construction.

CHA will develop a final set of closure plan documents based on the NYSDEC review of the closure plan.

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4.2 LANDFILL GAS COLLECTION SYSTEM

A passive gas collection system will be designed in accordance with 6 NYCRR Part 360 to passively vent landfill gas to the atmosphere. The system will be integrated into the post-closure site development. The gas venting layer will be 12 inches in thickness and have a minimum coefficient of permeability of $1x10^{-3}$ centimeters per second. CHA has also assumed that the gas venting risers will be spaced at a maximum separation of one vent per acre in accordance with State regulations.

4.3 STORMWATER CONTROLS

Appropriate stormwater controls will be included in the landfill closure design. These controls are anticipated to include vegetation on the landfill surface, lined drainage swales, rip-rap, diversion drains to reduce the potential for subsurface scouring of the landfill cap soils, etc.

Because the number of acres of wetlands that will be disturbed during the closure construction have not yet been determined, it is unknown whether or not mitigation will be required.

4.4 EROSION AND SEDIMENT CONTROLS

CHA will prepare the Notice of Intent (NOI) for the SPDES Construction Activity Permit, a Storm Water Pollution Prevention Plan (SWPPP), and an Erosion and Sediment Control Plan (ESCP) in

accordance with the New York State guidelines for the Town's use and submission to the NYSDEC. The temporary erosion and sediment controls are anticipated to include such items as silt fencing, rock check dams, turbidity curtains in Ley Creek, temporary settling basins, etc.

4.5 LEACHATE COLLECTION SYSTEM

A leachate collection system will be designed to intercept leachate flowing into Ley Creek from the landfill north and south of the creek. It is anticipated that the system will include leachate extraction wells at regular intervals constructed up-gradient from an alignment of water tight sheeting. A header pipe and/or force main pipe system will be designed to convey leachate from each recovery well to the leachate treatment plant that is currently planned to be constructed at the landfill site. The recovery well system will be designed to develop a lineal capture zone such that a ground water gradient trough is developed between Ley Creek and the landfill.

CHA will model projected quantities of leachate from the landfill once it is capped. The Leachate Collection System will be designed using this information together with information gathered during previous investigations at the site.

4.6 LEACHATE TREATMENT PLANT

CHA will provide professional engineering services relative to the proposed Leachate Treatment Plant Facility, including preparation of Engineering Report and Basis of Design Report, SPDES permit application for discharge to Ley Creek, final design documents with plans and specifications, and provide bidding assistance for the proposed Town of Salina Landfill Leachate Treatment Facility.

Design Assumptions:

Based upon recent discussions with the Town of Salina, the NYSDEC and the Onondaga County Department of Water Environment Protection (OCDWEP), the proposed Salina Landfill Leachate Treatment Facility will include the following characteristics:

- Average daily flow (ADF) and peak flow capacity of 60,000 gallons per day (gpd)
- 10 extraction wells located along Ley Creek
- Influent pump station with submersible pumps
- 150,000 gallon equalization tank with aluminum dome cover
- 2 air strippers to reduce toxic organic concentrations

- 2 sequencing batch reactor (SBR) tanks with powdered activated carbon treatment (PACT)
- Gravity sludge thickener with aluminum dome cover
- 2 intermediate pump stations
- Process building containing 2 sand filters, reverse osmosis modules, belt filter press, dewatered sludge conveyor and storage dumpster, office, lab, rest room, electrical and instrumentation room, emergency generator, and maintenance shop
- 150,000 gallon treated effluent storage tank with aluminum dome cover
- Parshall flume for flow measurement
- Concrete headwall for treated discharge into Ley Creek

Specifically, this Leachate Treatment Facility will include the following:

1. Process Building:
    - Concrete Masonry Unit (CMU) building (approximately 50 feet x 75 feet, single level, flat roof) to house treatment equipment
    - 2 continuously-cleaned sand filters
    - 2 reverse osmosis modules
    - ¾ meter belt filter press with sludge feed pumps and polymer feed
    - Dewatered sludge conveyor and sludge storage dumpster
    - Office space
    - Laboratory (with portable eye wash station and without hood)
    - Restroom
    - Electrical and instrumentation room
    - Emergency generator room
    - Blower room
    - Maintenance shop
    - Chemical storage room
    - Electrical components to support the process equipment and building
    - Heating/ventilation and plumbing to support the building requirements

2. Influent Lift Station:
    - Duplex submersible pump station including wetwell and controls
    - Electrical components to support the pumps
    - Bioxide chemical addition facilities for odor control

3. Equalization Tank
    - 150,000 gallon volume
    - Glass-fused-to-steel tank
    - Dome roof
    - High speed mixers

4. Air strippers
    - 2 units

- Outside location

5. Sequencing Batch Reactor (SBR) Tanks with PACT, consisting of the following components:
   - 2 cast-in-place concrete rectangular tanks with aluminum covers for odor control
   - Electrical components to support the process equipment
   - No PAC regeneration facilities

6. Gravity Sludge Thickener
   - Cast-in-place concrete tank
   - Aluminum cover for odor control

7. Effluent Storage Tank
   - 150,000 gallon volume
   - Glass-fused-to-steel tank
   - Dome roof

8. Parshall Flume
   - Fiberglass insert set in cast-in-place concrete structure

9. Concrete Headwall/Outfall
   - Located along shoreline at Ley Creek discharge point

CHA will perform the following tasks relative to the remedial design for the leachate treatment plant:

1. Engineering Report and Basis of Design Report:

   To more clearly establish the project design for the NYSDEC review, CHA will prepare an Engineering Report and Basis of Design Report. These reports will present proposed process equipment and will contain figures illustrating the preliminary layout out of the unit processes, building locations, wastewater treatment plant (WWTP) hydraulics, tank and equipment configurations, and yard piping.

   The Engineering Report will contain the following:

   - Project description (written narrative)
   - Justification for proposed treatment facilities
   - Preliminary sizing calculations of treatment units
   - Hydraulic calculations
   - Process flow schematic drawing (11 x 17 format)

- Layout of proposed site (11 x 17 format) indicating general tank configurations, general equipment layout, and approximate building location
- Construction cost estimate
- Proposed project schedule

The Basis of Design report will contain the following:

- Final process flow schematic (11 x 17 format)
- Layout of proposed site (11 x 17 format)
- Final sizing of treatment units
- Final hydraulic calculations
- Manufacturer and equipment data

A review meeting will be held with the Town and the NYSDEC at the completion of each of the draft reports and comments will be incorporated into the final version of the reports.

2. Preliminary and Final Design

CHA will provide professional engineering services to complete the preliminary and final design of the WWTP components outlined in the Design Assumption Section of this proposal. It is assumed that Wick's Law will apply and the following four (4) prime construction contracts will be included for the treatment plant:

- General Contract
- Electrical Contract
- Heating, Ventilation, and Air Conditioning (HVAC) Contract
- Plumbing Contract

4.7 UTILITY INFRASTRUCTURE

The proposed Leachate Treatment Plant will require a number of utilities for operation. CHA will design and layout an electrical service, an emergency generator, and telephone service for the treatment plant. CHA will also include a power source for mechanical and electrical equipment within the treatment plant, a power service for site lighting around the treatment plant, and design the instrument and controls for the plant. Finally, CHA will also design and layout an electrical service for the Leachate Collection System as well as the instrumentation and controls for the collection system.

4.8 VAPOR EXTRACTION SYSTEM FOR ON-SITE STRUCTURES

Because the Leachate Treatment Plant may be installed on the landfill surface, CHA has budgeted time to design a sub-slab depressurization system for the treatment plant. The design drawings will include the following:

1. Details showing the schematic layout (with dimensions) of the proposed sub-slab ventilation piping
2. A cross-section of the vent piping and gravel bedding system.
3. Detail showing the connection of the vapor barrier to the concrete foundation.
4. An elevation view of the blower system.

The project specifications are anticipated to include the following materials:

1. Polyvinyl chloride (PVC) piping
2. Sand or gravel venting layer material beneath the vapor barrier and concrete slab
3. Geotextile fabric for separation of venting layer and subgrade material
4. Vapor barrier material and joint sealing materials
5. Blower system(s), including silencers, valves, knock-out drum, noise-dampening enclosure, and other appropriate components. The blower system will have an explosion proof rating. The required electrical service required for the blower unit will also be included.
6. Gauges or other instruments (e.g. manometer) at the far reaches of the piping network to measure the vacuum generated beneath the slab. If possible based upon the internal layout of the building, CHA will attempt to include a valve system on the pipe network below the slab so that each pipe run can be throttled appropriate to balance the vacuum levels beneath various locations beneath the slab.

4.9 DESIGN SEQUENCE

For tasks 4.1 through 4.8, the design will be completed in four phases: at 30%, 60%, 90% and 100%. The deliverables for each phase are outline below.

4.9.1 Preliminary Design (30%)

Based upon approval of the Engineering Report and Basis of Design Report, CHA will embark on the preliminary design phase. The preliminary design submission will be at approximately the 30% complete phase and will include:

- Preliminary grading
- Preliminary stormwater features

- Preliminary utility layout
- Preliminary layout of leachate collection trench
- Tank configurations, equipment layout, building locations and preliminary floor plans
- Final hydraulic profile
- Final process flow schematic
- Process and Instrumentation Drawing(s)

Building systems, instrumentation, plumbing, heating, ventilation, air conditioning and electrical plans for the Leachate Treatment Plant will not be addressed in the preliminary design phase.
At each submission stage, six (6) sets of 11 x 17 drawings will be provided to the Town and the NYSDEC, in addition to relevant design information. Review comments received will be incorporated into the next submission.
CHA will offer our opinion of revisions that may be necessary to the previously prepared construction cost estimate.

4.9.2 Final Design (60% to 100%)

Based upon the approved preliminary design documents, CHA will prepare final design drawings and specifications in CSI format which set forth the requirements of the project, including the necessary bidding information, general, supplemental and special conditions of the contract, and additional information needed for a complete set of Bidding Documents. CHA will use our standard front end documents to prepare the specifications. The contract documents will be provided to the Town for coordination with the Town attorney. CHA will incorporate comments received from the Town attorney into the final documents.

It is anticipated that three submissions will be made during this phase (at 60%, 90% and 100% completion), as indicated below:

At the 60% phase, the following items will be completed:

- Detailed grading plans
- Detailed plans for Leachate Collection System
- Detailed stormwater drainage plans
- Detailed tank configurations, showing plan view and sections
- Detailed equipment layouts
- Building locations and floor plans
- Hydraulic Profile and Process Instrumentation Drawing
- Preliminary Yard Piping Plans
- Established foundation design for tanks and buildings (including mat foundation supported by piles or caissons)

- Preliminary architectural design for associated buildings
- Opinion of revisions that may be necessary to the previously prepared construction cost estimate

At the 90% phase, the following items will be completed:

- Finalized civil drawings including site plan, yard piping, hydraulic profile, Process and Instrumentation drawing, erosion control and sediment plan
- Finalized process drawings including tank configurations showing plan view and sections and details
- Finalized equipment layouts showing plan view and sections and details
- Finalized building locations and floor plans
- Finalized foundation design for tanks and buildings
- Finalized electrical and instrumentation design
- Finalized architectural design for associated buildings
- Finalized mechanical and plumbing design for associated building, including HVAC systems (natural gas/electric heating systems, wall louver/exhaust fan ventilation, air conditioned office space, and a hood for local exhaust for the lab space).
- Front-End and Technical Specifications (CHA boilerplate will be used for the front-end documents)
- Opinion of revisions that may be necessary to the previously prepared construction cost estimate
- Storm Water Pollution Prevention Plan (SWPPP)

At each submission stage, six (6) sets of 11 x 17 documents will be provided to the Town and the NYSDEC. Review comments received from the Town and the NYSDEC will be incorporated into the contract documents. Review comments received from the Town and the NYSDEC will be incorporated into the final contract documents. The 90% plans will be revised once, based upon receipt of a complete set of comments from the Town and the NYSDEC.

4.10 PREPARATION OF PROJECT MANUAL AND SPECIFICATIONS

After receipt of final approval of Closure Design drawings from the NYSDEC, CHA will prepare the project manuals for the landfill closure construction project. The manuals will include documentation for bidding advertisement, bid forms, contract award, and assistance in development of a construction contract for closure of the Town Landfill through the use of a general contractor. The technical specifications prepared by CHA for the landfill closure will also be incorporated into the project manual.

CHA will prepare a project manual and technical specifications necessary for construction of the landfill closure. The construction project manual will include:

- General Conditions
- Special Conditions
- Supplementary Conditions
- Bidding Forms
- Technical Specifications
- Scope of Work
- Formal Contract

4.11 CONSTRUCTION COST ESTIMATE

With the 60% and 90% construction documents, CHA will prepare an updated opinion of probable construction cost for the work designed by CHA. The final cost estimate will be broken down by the prime construction contracts.

5.0 QAPP

A Quality Assurance Project Plan (QAPP) for the design of the Remedy for the Salina Landfill site has been developed to specifically document the procedures and protocols that will implemented and applied during the course of the design project. The QAPP is included in Appendix C. Note that no sampling and analysis is anticipated during the remedial design portion of the project.

6.0 PERMIT REQUIREMENTS

A discussion of the permit requirements the design, construction and operation of the remedial actions was presented previously this Work Plan in section 2.6.3 – Action Specific ARARs /SCGs.

7.0 OPERATION, MONITORING & MAINTENANCE PLAN OUTLINE

6 NYCRR Part 360 requires development of a complete Post Closure Monitoring and Maintenance Operations Manual (PCMMOM) for the closed landfill. CHA will prepare the required manual that will include detailed instructions and schedules for monitoring and maintenance activities to be performed at the site during the 30 year post-closure period prescribed by 6 NYCRR Part 360.

While the exact content will be based upon the elements of the final remedial design for the project, the following outline provides a basis for the anticipated content for the PCMMOM. Additional items will be added or deleted from this outline to coordinate with the actual elements of the remedial construction.

It is anticipated that a separate, detailed operations and maintenance (O&M) manual will be prepared for the specific components of the leachate treatment plant.

1.0 Introduction
- 1.1 Site Description
- 1.2 Planned Use of Property During Post-Closure
- 1.3 Emergency Contacts Phone Numbers

2.0 Landfill Facility Monitoring Program
- 2.1 Description of Environmental Controls
- 2.1 Monitoring Point Locations
  - 2.1.1 Groundwater Monitoring Points
  - 2.1.2 Surface Water Points
  - 2.1.3 Gas Monitoring Points
  - 2.1.4 Leachate Treatment Plant Intake
  - 2.1.5 Treatment Plant Discharge
- 2.2 Sampling and Monitoring Schedule
- 2.3 Sampling & Monitoring Methodology
  - 2.3.1 Groundwater Sampling Procedures
  - 2.3.2 Surface Water Sampling Procedures
  - 2.3.3 Gas Monitoring Procedures
  - 2.3.4 Treatment Plant Monitoring Procedures

3.0 Site Maintenance Program
- 3.1 Cover System
- 3.2 Gas Venting System
- 3.3 Leachate Extraction System
- 3.4 Leachate Treatment System
- 3.5 Drainage System (Stormwater and Erosion & Sediment Controls)
- 3.6 Vectors
- 3.7 Existing Structures
- 3.8 Post-Closure Use of Landfill

4.0 Record Keeping & Reporting Requirements

5.0 Resource Requirements
- 5.1 Personnel & Qualifications
- 5.2 Equipment
- 5.3 Subcontracted Services

6.0 Contingency Plan
- 6.1 Anticipated Response to Likely Problems
- 6.2 Action Levels
- 6.3 Summary of Corrective Measures
- 6.4 Notification Procedures

8.0 SCHEDULE

The following table provides a proposed schedule for completion of the Town of Salina Landfill project. The overall progress of the project will be dependent upon a number of factors including, but not limited to, NYSDEC review and approval timeframes, time of year at which the final design documents are complete, preparedness of the developer to begin construction, weather conditions at the time of construction, etc.

While the specific dates may be shifted slightly due to administrative or construction delays, it is important that certain site remediation and development activities follow one another in rapid succession.

Table 1. Estimated Project Schedule

Task	Description	Start	Estimated Finish
Task 1	Administrative tasks	July 2007	March 2009
Task 2	Pre-design programming	September 2007	December 2007
Task 3	Remedial Design	December 2007	December 2008
Task 4	Permitting tasks	December 2007	December 2008
Task 5	Bidding Phase Services	December 2008	March 2009

APPENDIX A
Figures from the RI/FS or ROD

- Figures 1 through 8 of the ROD
- Figure 12-8 of the RI/FS

N

NEW YORK STATE THRUWAY

SOUTHERLY EDGE OF PAVEMENT

SOUTHERLY EDGE OF PAVEMENT

60" SAN

60" SAN

60" SAN

10" BUCKEYE

10" BUCKEYE

10" BUCKEYE

10" BUCKEYE

POND

ABAND MH

48"ABANDONED SAN

ABAND MH

48"ABANDONED SAN

ABAND MH

48"ABANDONED SAN

ABAND MH

ABAND MH

MH

SEASONAL PERCHED WATER WITH REEDS

WOODED AREA

WOODED AREA

WOODED AREA

WOODED AREA

WOODED AREA

LEY CREEK

OLD LEY CREEK

LEY CREEK

WOLF STREET

U.S. ROUTE #11

PAVED ROAD WAY

POLE

GAS

NOTE: OLD LEY CREEK IS NOT PART OF THE SITE. IT IS A SEPERATE CLASS 2 INACTIVE HAZARDOUS WASTE SITE.

LEGEND:

- TOPOGRAPHIC CONTOUR
- MANHOLE
- STORM SEWER
- SANITARY SEWER
- TREE
- ELECTRIC POLES
- UNDERGROUND GAS
- OVERHEAD UTILITIES
- DRAINAGE DITCH
- APPROXIMATE WETLANDS AREA
- WOOD LINE
- UNPAVED ROADWAY
- EDGE OF CREEK

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 200 ft.

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Lawler, Matusky & Skelly Engineers, LLP

Environmental Science & Engineering Consultants

FIGURE 1

SALINA LANDFILL SITE MAP

TOWN OF SALINA LANDFILL

N

NEW YORK STATE THRUWAY

SOUTHERLY EDGE OF PAVEMENT

60" SAN.

10" BUCKEYE

	98
VOCs	0
SVOCs	0
PEST.	0.015
PCBs	0

MW-2

	98
VOCs	25
SVOCs	5
PEST.	0
PCBs	0.180

MW-1

MW-0

	98
VOCs	41
SVOCs	3
PEST.	0.031
PCBs	0

MW-0D

	98
VOCs	0
SVOCs	0
PEST.	0
PCBs	0

NW SHELBY

B-10

NE SHELBY

MW-14

	98
VOCs	3
SVOCs	9
PEST.	0
PCBs	0

B-11

POND WATER ELEV. XXXX ON 11/30/98

	98
VOCs	128
SVOCs	22
PEST.	0
PCBs	0.430

40" ABANDONED SAN.

MW-3

	98
VOCs	94
SVOCs	2
PEST.	0.027
PCBs	0

SEASONAL PERCHED WATER WITH REEDS

	98
VOCs	140
SVOCs	18
PEST.	0
PCBs	0.980

	98	99
VOCs	152192	122383
SVOCs	451	313
PEST.	0.053	0
PCBs	0	0

MW-9

WP-7

WP-6

B-21

U.S. ROUTE #11

8" SAN. PAVED ROAD WAY

26"-48" SAN.

B-12

SE SHELBY

MW-15

MW-10

B-24

B-23

MW-8

	98
VOCs	63
SVOCs	16
PEST.	0.055
PCBs	1.600

WOLF STREET

SW SHELBY

	98
VOCs	0
SVOCs	0
PEST.	0
PCBs	0

MW-12D

MW-12

B-13

B-22

WP-5

LEY CREEK

WOODED AREA

	98
VOCs	13
SVOCs	0
PEST.	0.096
PCBs	0

	98
VOCs	0
SVOCs	0
PEST.	0
PCBs	0

MW-7

	98
VOCs	218
SVOCs	6
PEST.	0.020
PCBs	0

MW-5D

MW-5

MW-6

WP-1 MW-4 WP-2 WP-3 WP-4

GRANGE STR.

OLD LEY CREEK

LEY CREEK

	98
VOCs	0
SVOCs	0
PEST.	0
PCBs	0

	98
VOCs	0
SVOCs	0
PEST.	0
PCBs	0.270

	98
VOCs	88
SVOCs	2
PEST.	0
PCBs	1.000

LEGEND

- WP-XX — WELL POINT LOCATION
- MW-XX — MONITORING WELL LOCATION
- SHELBY — SHELBY TUBE LOCATION
- B-XX — BORING LOCATION
- X ——— X' — PROFILE CROSS SECTION

NOTE: CONCENTRATIONS IN UNITS OF UG/L

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 200 ft.

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FIGURE 2
SUMMARY OF GROUNDWATER DATA
TOWN OF SALINA LANDFILL

I:\8987\DRAWINGS\REMEDIALINVESTIGATION\ PG4-1.DWG 5/11/00 2:15PM JFT PLOT:1101

N

NEW YORK STATE THRUWAY

SOUTHERLY EDGE OF PAVEMENT

SW/SED–25

SW/SED–21

SW/SED–20

U.S. ROUTE 11

WOLF STREET

WASTE WATER TREATMENT PLANT

TRANSFER STATION

LEY CREEK

WOODED AREA

SEASONAL PERCHED WATER WITH NEEDS

LCH–6

LCH–2

LCH–1

LEY CREEK

SW/SED–22

OLD LEY CREEK

SW/SED–23

BEAVER CREEK

7th NORTH STREET

SW/SED–24

GRAPHIC SCALE

125 0 62.5 125 250 500

(IN FEET)

1 inch = 250 ft.

LEGEND

▲ SW/SED–XX	SURFACE WATER & SEDIMENT SAMPLE LOCATION
o LCH–XX	LEACHATE SAMPLE LOCATION

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FIGURE 3
SURFACE WATER, SEDIMENT AND LEACHATE SAMPLE LOCATIONS
TOWN OF SALINA LANDFILL

I:\VA332\DRAWINGS\REMEDIAL INVESTIGATION\FIG2-7.DWG 05/11/00 2:15 PM JFT PLOT 1 TO 1

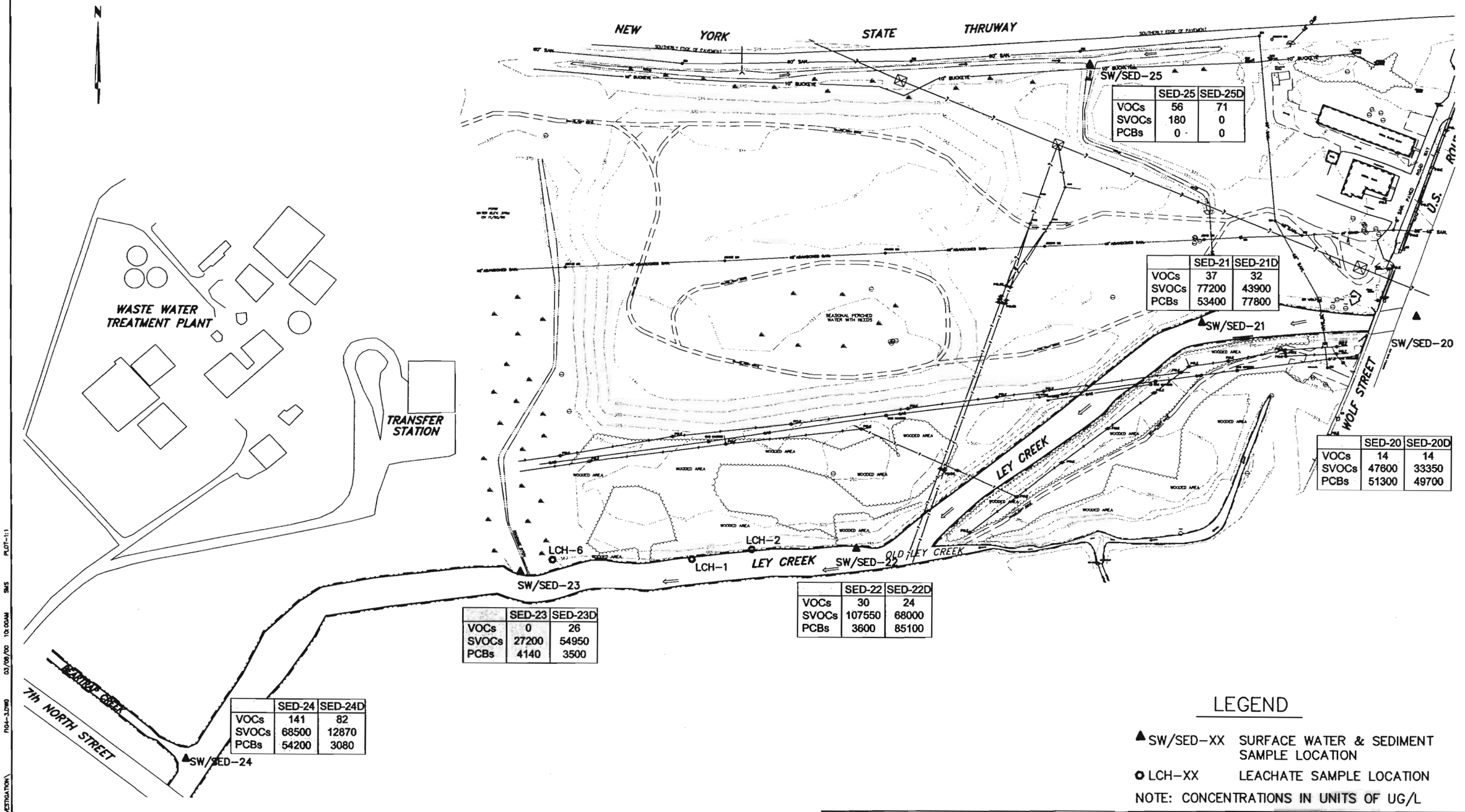

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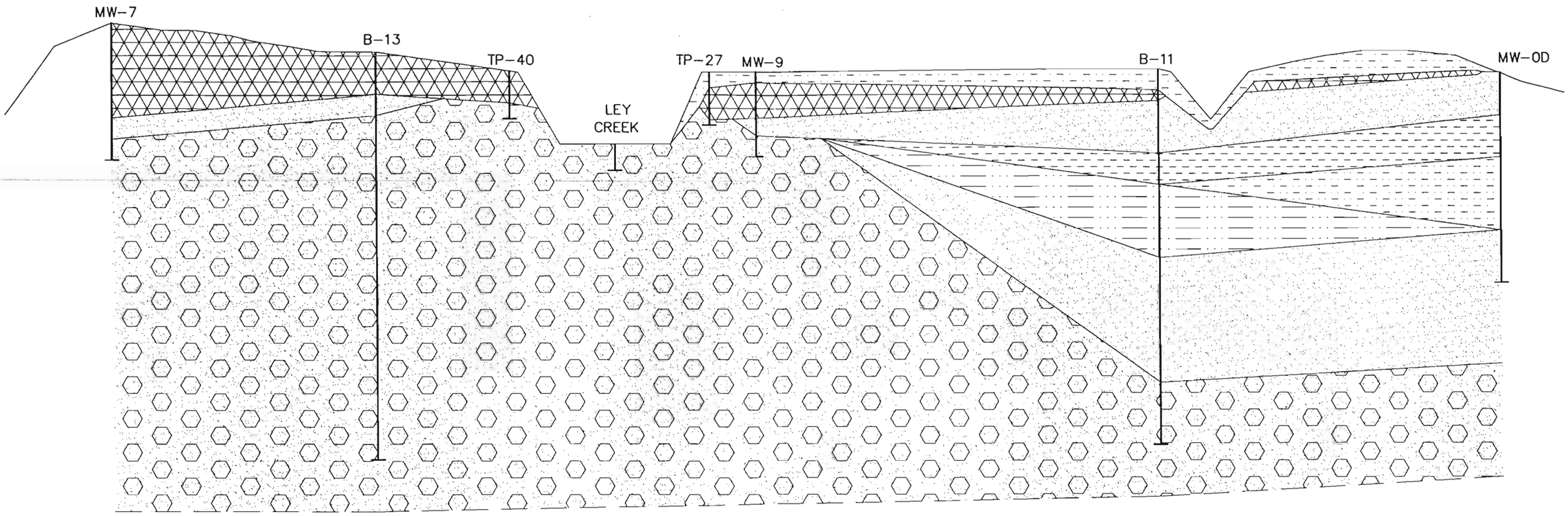
FIGURE 4
SUMMARY OF SEDIMENT DATA
TOWN OF SALINA LANDFILL

C

C'



SCALE

HORIZONTAL: 1"=80'

VERTICAL: 1"=20'

LEGEND

SAND

SILT AND CLAY

SAND AND SILT

CLAY

DEBRIS/WASTE

TILL

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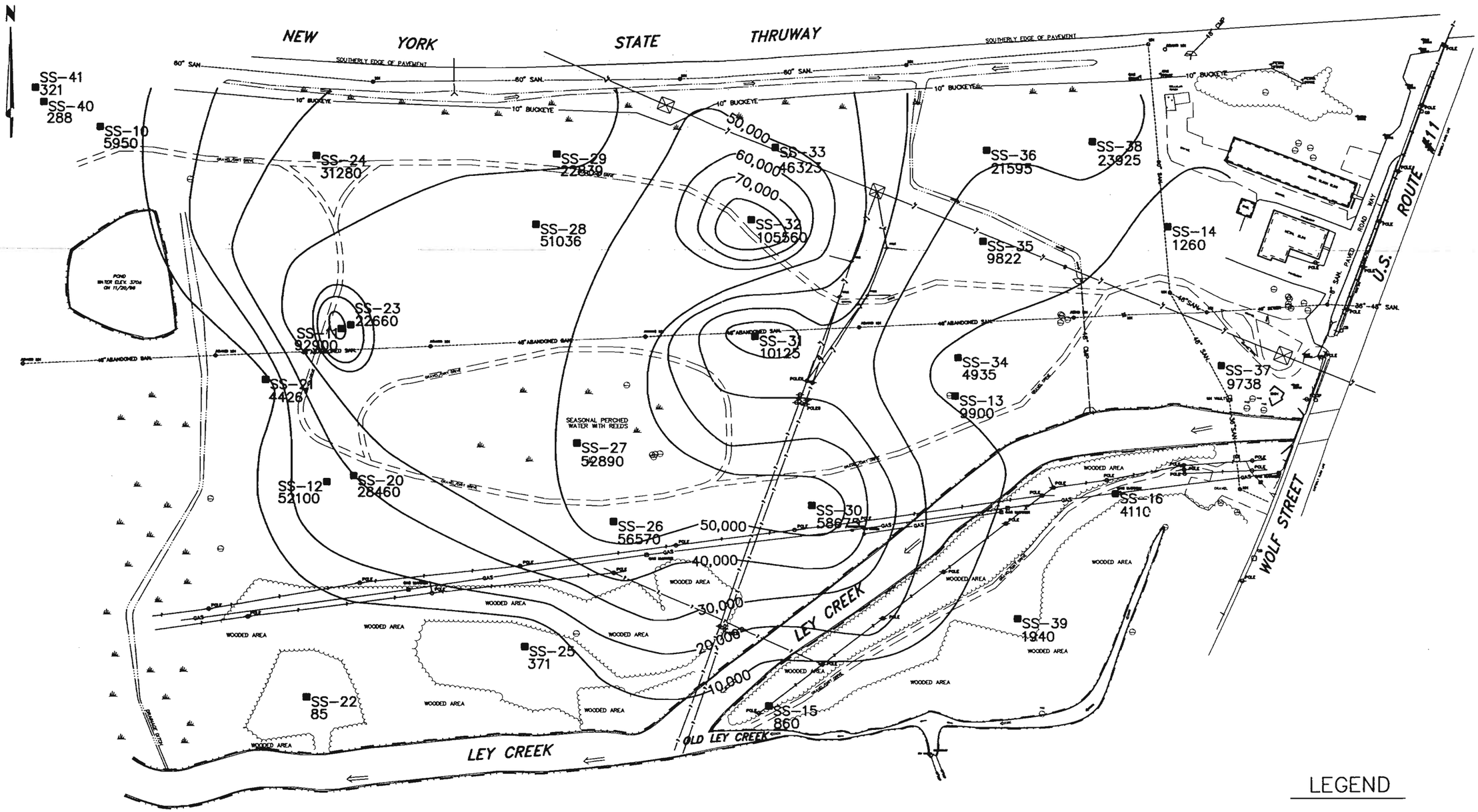
FIGURE 5
GEOLOGIC CROSS-SECTION
C-C'
TOWN OF SALINA LANDFILL



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 200 ft.

LEGEND

■SS-XX SURFACE SOIL SAMPLE LOCATION

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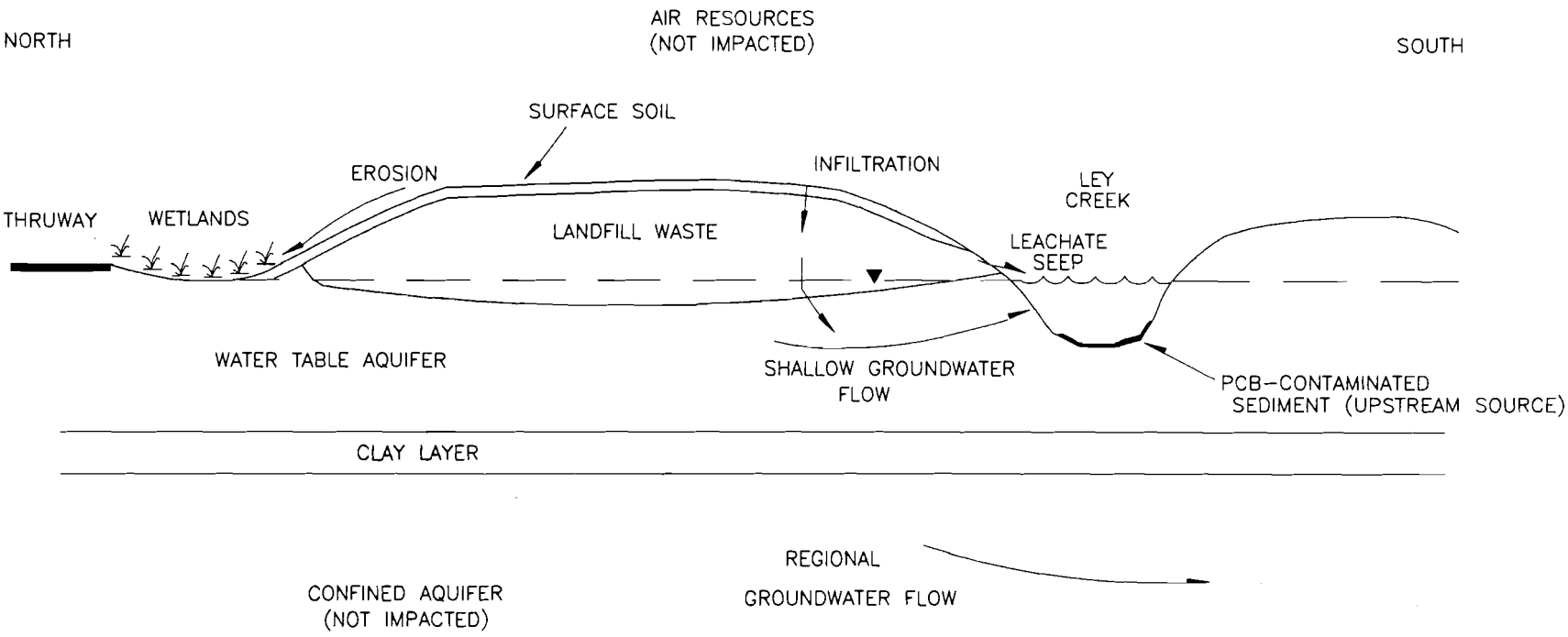
FIGURE 6

SURFACE SOIL SAMPLE SVOC CONCENTRATIONS

TOWN OF SALINA LANDFILL

L:\16432\DRAWINGS\REMEDIAL INVESTIGATION\FIG2-VOLDWG 04/17/00 2:15 PM JFT PLOT 1 TO 1



LEGEND

— ▼ — WATER TABLE

——► CONTAMINANT MIGRATION PATHWAYS

NOT TO SCALE

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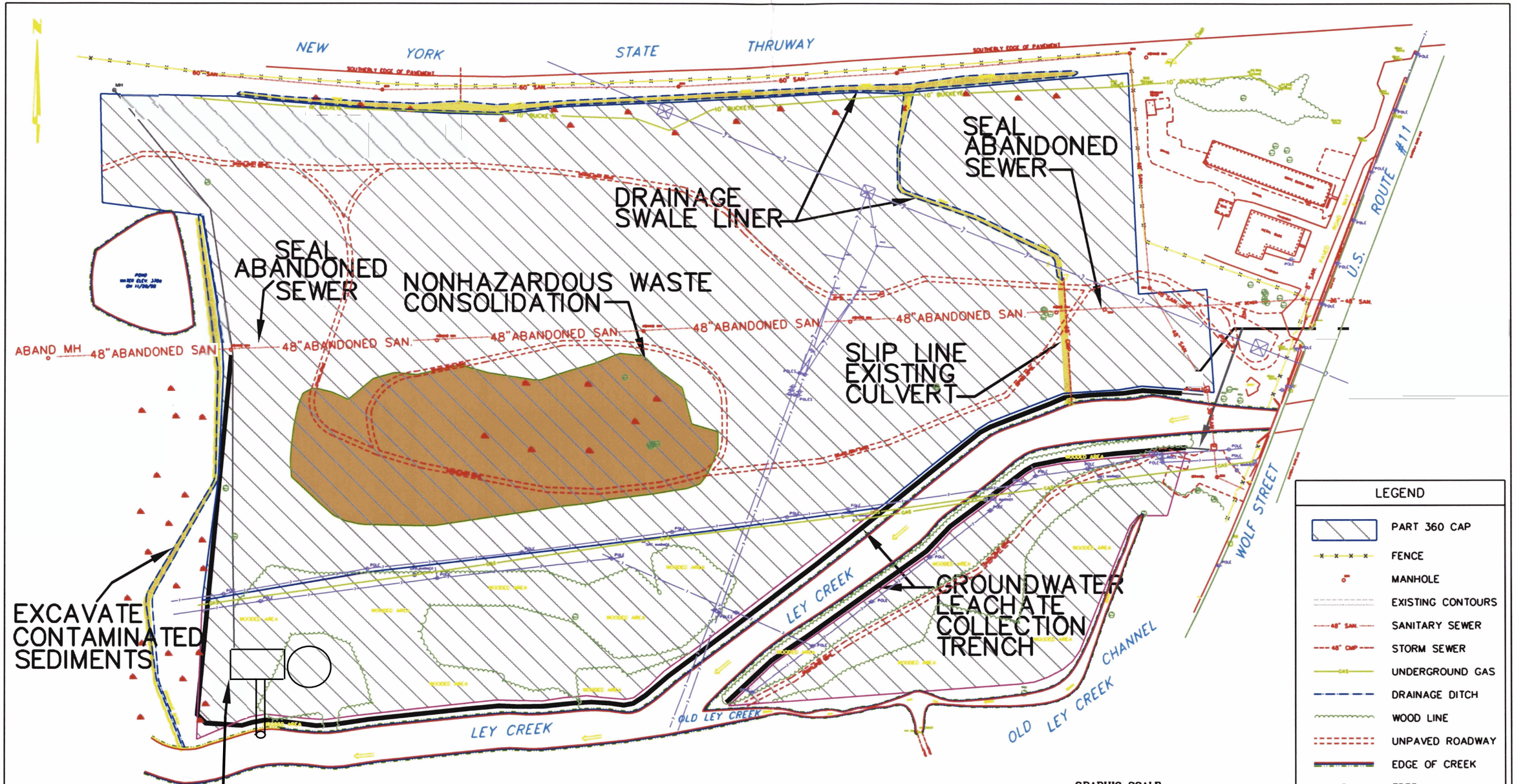
FIGURE 7
CONCEPTUAL CONTAMINANT MIGRATION PATHWAYS
TOWN OF SALINA LANDFILL

I:\1696\DRAWINGS\REMEDIALINVESTIGATION\ FIG5-1.DWG 5/24/00 3:37PM JT PLOT:1701



ON-SITE STORAGE TANK, TREATMENT PLANT & DISCHARGE

NOTES:

1. OLD LEY CREEK IS NOT PART OF THE SITE. IT IS A SEPARATE CLASS 2 INACTIVE HAZARDOUS WASTE SITE.
2. LOCATIONS OF REMEDIAL COMPONENTS ARE APPROXIMATE AND SUBJECT TO CHANGE DURING REMEDIAL DESIGN.
3. ALTERNATIVE 2 – PART 360 CAP NORTH AND SOUTH OF LEY CREEK, GROUNDWATER COLLECTION NORTH AND SOUTH OF LEY CREEK.
4. NON-HAZARDOUS WASTE CONSOLIDATION FROM EXCAVATION OF LEACHATE COLLECTION TRENCHES

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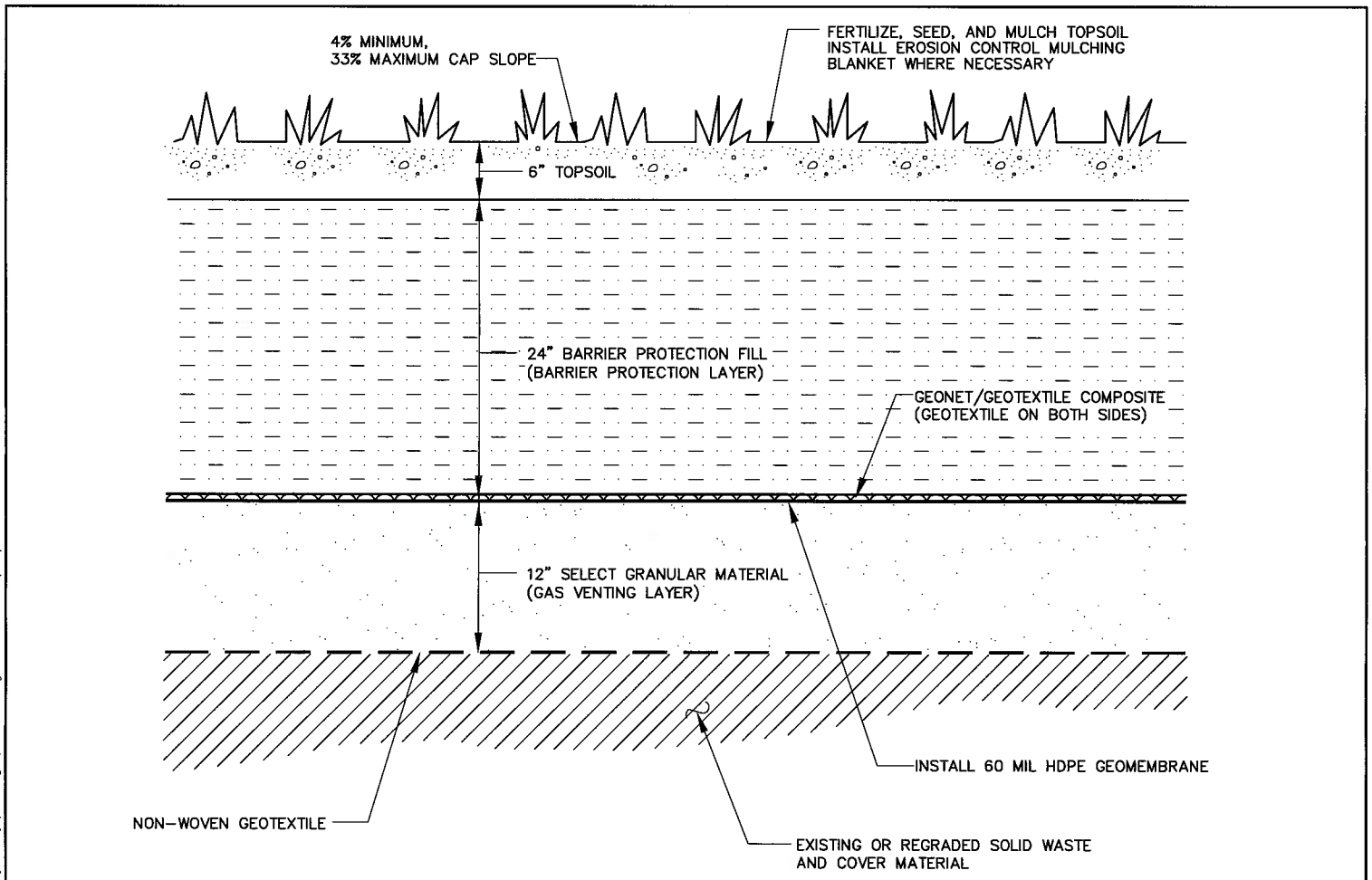
LMS Lawler, Matusky & Skelly Engineers, LLP
Environmental Science & Engineering Consultants

FIGURE 8

ALTERNATIVE 2

TOWN OF SALINA LANDFILL



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Environmental Science & Engineering Consultants

CHA CLOUGH, HARBOUR & ASSOCIATES LLP
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

FIGURE 12-8
TYPICAL CROSS SECTION OF 6NYCRR PART 360 GEOMEMBRANE CAP
TOWN OF SALINA LANDFILL RI/FS

File: M:\6967\Feasibility Study\Drawings\FIG12-8.dwg Scale: 1 4/29/02 9:55:33 AM User: 330

APPENDIX B

Tables

- Table 1of the ROD

Table 1
Nature and Extent of Contamination

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (mg/kg)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (mg/kg) *
Surface Soils	Semivolatile Organic Compounds	Benzo(a)anthracene	ND to 88.0	21 of 27	0.224
		Benzo(a)pyrene	ND to 87.0	23 of 27	0.061
		Benzo(b)fluoranthene	ND to 13.9	14 of 27	1.1
		Benzo(k)fluoranthene	ND to 3.7	8 of 27	1.1
		Indeno(1,2,3-cd)pyrene	ND to 5.0	4 of 27	3.2
		Dibenzo(a,h)anthracene	ND to 0.95	19 of 27	0.014
		Chrysene	ND to 9.1	20 of 27	0.4
Surface Soils	Inorganics	Arsenic	ND to 7.0	8 of 27	1.1
		Barium	ND to 530	17 of 27	61.85
		Beryllium	ND to 0.48	7 of 27	0.16
		Cadmium	ND to 17.3	11 of 27	1.0
		Chromium	ND to 127	27 of 27	10
		Cobalt	ND to 17	6 of 27	8.55
		Copper	ND to 103	12 of 27	18.45
		Iron	4,800 to 18,800	27 of 27	20000
		Lead	ND to 1,163	13 of 27	28.6
		Manganese	273 to 557	1 of 27	492.0
		Mercury	ND to 1.5	18 of 27	0.100
		Nickel	11 to 70	26 of 27	37.3
		Selenium	ND to 23	20 of 27	2.0
		Silver	ND to 8	12 of 27	1.1
		Thallium	ND to 3.6	10 of 27	1.1
		Vanadium	ND to 22	2 of 27	21.15
		Zinc	39 to 1,733	27 of 27	20.0

* - NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (mg/kg)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (mg/kg) *
Subsurface Soils	Volatile Organic Compounds	1,1-Dichloroetane	ND to 377	1 of 8	200
		1,2-Dichloroethene (total)	ND to 766	1 of 8	300
		2-Butanone	ND to 420	2 of 8	300
		Acetone	ND to 1,600	3 of 8	200
		Ethylbenzene	ND to 9,700	1 of 8	5,500
		Toluene	ND to 147,949	1 of 8	1,500
		Xylene (Total)	ND to 45,362	1 of 8	1,200
Suburface Soils	Semivolatile Organic Compounds	Benzo(a)anthracene	ND to 16.0	6 of 8	0.224
		Benzo(a)pyrene	ND to 11.7	7 of 8	0.061
		Benzo(b)fluoranthene	ND to 22.2	6 of 8	1.1
		Benzo(k)fluoranthene	ND to 8.6	1 of 8	1.1
		Indeno(1,2,3-cd)pyrene	ND to 5.2	1 of 8	3.2
		Dibenzo(a,h)anthracene	ND to 1.5	1 of 8	0.014
		Chrysene	ND to 15.4	7 of 8	0.4
		Phenol	ND to 0.5	1 of 8	0.030
Subsurface Soils	Polychlorinated Biphenyls **	Aroclor-1248	0.087 to 420	8 of 8	10.0*
Sediment	Inorganics	Arsenic	5.3 to 6.7	1 of 2	6.0
		Cadmium	5.3 to 6.7	2 of 2	0.6
		Copper	13 to 28	1 of 2	16.0
		Mercury	ND to 0.15	1 of 2	0.15

* - NYSDEC TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels

** - Values listed reflect the combined guidance for "Total PCBs" - Approximate Background

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ug/l)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (ug/l) *
Groundwater	Volatile Organic Compounds	1,1,1-Trichloroethane	ND to 2,822	3 of 19	5.0
		1,2-Dichloroethene	ND to 26,742	5 of 19	5.0
		Acetone	ND to 3,100	1 of 19	5.0
		Benzene	ND to 29	4 of 19	1.0
		Chlorobenzene	ND to 23	2 of 19	5.0
		Chloroethane	ND to 136	4 of 19	5.0
		Toluene	ND to 92,774	4 of 19	5.0
		Vinyl Chloride	ND to 1,059	3 of 19	2.0
		Xylenes (Total)	ND to 17,900	4 of 19	5.0
Groundwater	Semi-Volatile Organic Compounds	1,4-Dichlorobenzene	ND to 10	4 of 19	3.0
		Naphthalene	ND to 36	2 of 19	10.0
Groundwater	PCBs	Aroclor 1248	ND to 1.6	6 of 19	0.09
Groundwater	Inorganics	Arsenic	ND to 73.6	2 of 19	25
		Barium	ND to 1,687	1 of 19	1,000
		Cadmium	ND to 34.0	12 of 19	5
		Iron	701 to 56,000	19 of 19	300
		Lead	ND to 52.2	2 of 19	25
		Manganese	33.4 to 7,633	14 of 19	300
Leachate	Volatile Organic Compounds	Benzene	ND to 4	1 of 3	1**
		Chlorobenzene	ND to 22	2 of 3	5**
Leachate	Pesticides/ PCBs	Aroclor 1248	0.7 to 1.0	3 of 3	0.09**
Leachate	Inorganics	Aluminum	1,051 to 12,131	2 of 3	2,000**
		Barium	460 to 1,501	1 of 3	1,000**
		Chromium	42 to 125	2 of 3	50**
		Iron	31,183 to 156,000	3 of 3	300**
		Lead	29 to 198	3 of 3	25**
		Manganese	412 to 1,000	3 of 3	300**

* - TOGS 1.1.1 Standards or Guidance Values for Class B Surface Waters

** - No Promulgated Standards for Leachate, TOGS 1.1.1 Standards or Guidance Values Used

APPENDIX C
QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

Town of Salina Landfill
Town of Salina, New York
Site No. 7-34-036

CHA Project Number: 6967

Prepared for:

Town of Salina
201 School Road
Liverpool, NY 13088

Prepared by:

CLOUGH HARBOUR & ASSOCIATES LLP
441 South Salina Street
Syracuse, New York 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

September 5, 2007

SIGNATURE PAGE

Approved By: _____ Date: September 10, 2007
Christopher Burns, Ph.D.
CHA Project Manager

Approved By: _____ Date: _____
John Grathwol
NYSDEC Project Manager

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION

Clough Harbour & Associates LLP (CHA) has been retained by the Town of Salina to complete a Remedial Design (RD) for the former Town of Salina Landfill. The Town of Salina Landfill is located off Route 11 in the Town of Salina. The landfill is approximately 55 acres in size. The landfill opened in 1960 and stopped accepting waste in 1975. During the period the landfill was open, in addition to accepting municipal solid waste, the landfill also accepted hazardous wastes including paint sludge, paint thinner, PCB-contaminated wastes, and contaminated sediment dredged from the adjacent Ley Creek. A soil cover was placed over the landfill in 1982. In 1996, the New York State Department of Environmental Conservation (NYSDEC) designated the Town of Salina Landfill as a Class 2 Inactive Hazardous Waste Site, and it is also considered a subsite to the Onondaga Lake National Priorities List (NPL) site by the United State Environmental Protection Agency (USEPA).

This Quality Assurance Project Plan (QAPP) addresses the major quality assurance/quality control (QA/QC) considerations and guidelines for the field activities and engineering design to support the RD at the Town of Salina Landfill. For this phase of the project, no sampling and analysis of samples is anticipated.

The objectives of this phase of the project consist of the following:

- Conduct pre-design field studies including boundary and topographical survey, wetlands delineation, and geotechnical engineering investigation.

- Conduct pre-design evaluations of options for utility relocation, evaluation of groundwater recharge flow rates, an analysis of construction traffic alternatives, and an analysis of potential end-use alternatives.

- Prepare a design for removal of contaminated sediments from drainage ways, construct a

groundwater collection and treatment system, and construct a landfill cover system.

The schedule for performance of this RD is from July 2007 to March 2009. During this time period the following will occur:

- Prepare the RD Work Plan
- Complete Pre-design site studies
- Complete a conceptual and final remedial design
- Prepare an Engineer's cost estimate of the probable construction costs
- Prepare a project manual and specifications suitable for obtaining bids on the project

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The responsibilities of the project personnel are described below.

- *NYSDEC Project Manager – (John Grathwol)* Provides oversight of the contract, and all program activities. Reviews final project QA objectives, needs, problems, and requests. Approves appropriate QA corrective actions as needed. Ensures compliance with NYSDEC QA/QC policies.

- *Project Manager – (Chris Burns)* Directs project and provides technical expertise to accomplish program objectives. Ensures that project tasks are successfully completed within the projected time periods and projected budget. Oversees all remedial investigation activities, subcontractor management, technical support, and supervises and schedules field activities.

- *Quality Assurance Officer – (Margaret Rudzinski)* Responsible for preparation and approval of QAPP. Responsible for performing quality assurance audits and ensuring that any necessary corrective actions are implemented.

- *Remedial Design Task Manager – (Scott Smith)* Coordinates oversight of the overall remedial design, including specialty design services.

- *Field Engineers/Scientists* - Perform tasks identified in work plan in accordance with designated procedures. Adhere to procedures within health and safety plan. Provide technical QA assistance on site to accomplish project objectives including making suggestions for corrective actions.

3.0 QA OBJECTIVES FOR MEASUREMENT

The overall data quality objectives (DQOs) for measurement of data are to ensure that data of known and acceptable quality are provided; that all measurements will be made to yield consistent results representative of the media and conditions measured; and all data will be reported in units consistent with those of other agencies and organizations to allow comparability of data.

For field QC data, CHA field personnel shall follow the guidelines in the Standard Operating Procedures (SOPs) for installation of soil borings relative to the geotechnical engineering investigation and delineation of wetland boundaries.

4.0 SAMPLING PROCEDURES

As mentioned above, there are no plans to collect and analyze any samples during the RD phase of the project. Pre-design field activities including a geotechnical investigation and a wetland delineation will be conducted in accordance with the Health and Safety Plan.

5.0 SAMPLE CUSTODY

Sample custody is a vital aspect of any sampling program. For the pre-design field studies, soil samples will be collected as part of the geotechnical engineering investigation. Samples must be

traceable by Chain-of-Custody procedures from the time of sample collection until the time data are utilized for any major decision. As such, evidence of collection, shipment, and storage must be documented. The sample custody procedures to be implemented on this project are as follows.

The field engineer initiates sample Chain-of-Custody with preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized. Immediately following sample collection, each sample container will be marked with the following information:

- Sample Code
- Project Number
- Date/Time
- Sample Type
- Sampler's Initials

The sample code will indicate the site location, media sampled, and sample station.

For this phase of the project, the custody record will consist of the boring logs. Samples will be retained in storage until the project is constructed.

6.0 CALIBRATION PROCEDURES

Calibration procedures, calibration frequency, and standards for field measurement variables and systems shall be in accordance with the manufacturer's recommendations for the equipment. The field equipment will be calibrated twice each working day, once at the start and once in the middle of each day, unless otherwise specified by the equipment manufacturer's recommendations.

The instruments that will be used to make measurements in the field during the project site investigation include the following:

- Photoionization detector (for monitoring in accordance with the HASP).
- GPS survey units

Documentation of field equipment calibration will be completed using an equipment calibration log. The equipment calibration log shall be completed according to the frequency of calibration previously stated and will include the following information when appropriate.

- Type and identification number of equipment
- Calibration frequency and accepted tolerances
- Calibration dates
- Identification of individual(s) and/or organization(s) performing the calibration
- Reference standards used for each calibration
- Calibration data
- Certifications or statements of calibration provided by manufacturers and external agencies, and traceable to national standards
- Information on calibration acceptance and failure

7.0 ANALYTICAL PROCEDURES

As stated above, no laboratory analysis of samples is anticipated during the RD phase of the project. Should any analyses be required, they will be performed according to NYSDEC Analytical Services Protocol (ASP), October 1995 revision. The NYSDEC ASP has specific requirements regarding Laboratory QA/QC procedures which will be followed on all samples collected and analyzed. The deliverables for any laboratory data generated will be in ASP Category B format.

8.0 DATA REDUCTION, VALIDATION AND REPORTING

Both objective (measured) and subjective (descriptive) data are subject to data review. All data

collected in the field shall be documented following the procedures detailed in CHA's SOPs. Objective data shall be reviewed at the time of collection to ensure that the correct codes and units have been included. After the field data have been reduced into tabular form, the data shall be reviewed for anomalous or inconsistent values by the Project Manager. Any anomalous or inconsistent data shall be resolved or clarified by evaluating the raw data, equipment calibration logs, etc., and consulting with field personnel. Subjective field or technical data shall be evaluated by the Project Manager for reasonableness and completeness in use. Periodic field reviews of subjective data collection shall be conducted if deemed necessary.

9.0 INTERNAL QUALITY CONTROL

No analytical data is intended to be collected. Normally internal quality control involves the use of a number of control samples including field duplicates, equipment rinsate blanks, trip blanks, matrix spike/matrix spike duplicates, and method blanks. This is not applicable to this phase of the project.

10.0 PERFORMANCE AND SYSTEMS AUDITS

Audits shall be performed to ascertain whether the QA/QC Plan is being correctly implemented, and to review and evaluate the adequacy of the field and laboratory performance, where applicable for field activities. At least one unannounced performance audit will be conducted during field activities. Follow-up audits will be conducted should inconsistencies or problems be identified. The audits, to be conducted by the CHA Quality Assurance Officer or the CHA Project Manager, will assess the effectiveness of the QA program, identify non-conformance, and verify that identified deficiencies are corrected. Audits, at a minimum shall evaluate:

- Project responsibilities
- Sample handling and custody procedures
- Document/data management control
- Sample identification

- Corrective action procedures

The results of all audits shall be reported according to the procedures outlined in Section 14.0.

11.0 PREVENTIVE MAINTENANCE

Preventive maintenance of equipment is essential if project resources are to be used cost effectively. Preventive maintenance of field equipment is necessary to minimize down time and ensure accuracy of measurement systems. Preventive maintenance typically consists of two main components: routine scheduled maintenance and having critical spare parts or backup equipment available.

All instruments will be maintained according to the manufacturer's recommendations. Minimal instrument downtime is experienced through the use of service contracts and through the availability of back-up equipment. In addition, support equipment, such as vehicles, is periodically inspected to maintain performance standards necessary for all site activities.

Logs will be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instrument, tool, or gauge. Records produced shall be reviewed, maintained and filed by the operators at the laboratory and by the data and sample control personnel when and if equipment, instruments, tools or gauges are used at the site. The project QA Officer may audit these records to verify completeness and adherence to these procedures.

While on site, the Field Coordinator is responsible for ensuring that all equipment is in good working order, and that backup equipment is available if needed.

12.0 PROCEDURES TO ASSESS PARCC PARAMETERS

Routine procedures to be used for measuring precision, accuracy, representativeness, completeness, and comparability (PARCC) include the use of replicate analysis, matrix spikes, and procedural

blanks. Replicate matrix spikes and method blanks are analyzed routinely through the ASP program. Assessment of PARCC parameters is not applicable to this phase of the project.

13.0 CORRECTIVE ACTIONS

If the validity of any data should become suspect during performance of the QA/QC procedures found in the preceding sections of the QA/QC Plan, then corrective actions will be initiated. The project QA Officer has primary responsibility for taking corrective action. Some of the types of problems and the corrective actions to be taken are listed below. The actual trigger, as well as the form of the appropriate corrective action is dependent on the specific method/procedures, time at which the error was detected, and the type of error that has occurred. The following procedures have been established to assure that conditions averse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated and corrected.

Corrective actions are usually addressed on a case-by-case basis but may be initiated when:

- Predetermined acceptance standards are not attained
- Procedures or data complied are determined deficient
- Equipment or instrumentation is found faulty
- Samples and test results are questionably traceable
- Quality assurance requirements have been violated
- Designated approvals have been violated
- System, performance, or management audits show deficiencies

Following is a description of some of the types of problems and corrective actions that can be taken.

<u>Performance/Systems Audits</u>

If problems are detected by the Field Coordinator during any audit:

- The Field Coordinator will immediately notify the field/lab person responsible and inform them of any action(s) he has taken.
- The Field Coordinator and the responsible field lab person shall correct the problem, and then notify the Project QA Officer.
- The Project QA Officer will then prepare and send a problem/action-taken memo to the program manager and the Field Coordinator.

Loss of Data

The Field Coordinator shall investigate the problem, and then perform one or more of the following actions:

- If the loss occurred in the field, a staff member will be sent to the site to correct the problem. If a major problem is then discovered, the staff member will contact the Project QA Officer for additional instructions.

- If the loss occurred in-house, the field coordinator shall correct the problem.

- If the problem is limited in scope, the problem/action taken is documented; the Field Coordinator then prepares and sends a problem/action memo to the NYSDEC.

- If a large quantity of data is affected, the problem/action taken is documented; the Field Coordinator then prepares and sends a problem/action-taken memo to the NYSDEC.

Significant QA Problems

In general, the Field Coordinator will identify technical problems. Following this, there is a series of actions that may be taken:

- The Field Coordinator prepares and sends a problem memo to the NYSDEC and the Site QA Officer; if the problems are significant, the action is determined collectively.

- The action taken is documented.

14.0 QUALITY ASSURANCE PROJECT REPORTS

Review of the appropriateness and adequacy of the QA Program is ongoing. Inspections and audits shall be conducted during the course of the work assignment, as detailed in section 10.0. Within twenty (20) working days of the completion of the audit, the CHA QAO shall prepare and submit an audit report, with copies forwarded to the NYSDEC. The report shall address, at a minimum, the following aspects:

- Staff qualifications
- Equipment maintenance records
- Equipment calibration records
- Protocol adherence
- Documentation practices
- Sample traceability and control
- Data traceability and document control
- Record keeping practices
- Review and validation practices
- Computation practices
- QC data and practices
- QA compliance

If necessary, the report shall include a plan for implementing the corrective actions to be taken (including a schedule of action) as well as measures to prevent recurrence. The reply shall also

address revisions, where required of the QA/QC Plan. The QA Officer will ascertain the effectiveness of the corrective actions (by re-audit or other verification) and issue a final audit report detailing corrective actions and closing the audit.

CHA will prepare an audit report summary and submit the results to the NYSDEC after the closure of each audit. Once an audit is complete, a final QA report shall be prepared to summarize the following:

- QA management
- Measures of the data quality from the project
- Summary of quality problems, quality accomplishments, and corrective actions taken
- Summary of QA performance and system audits
- Data quality assessments
- Documentation of QA related training
- Status of the QA/QC Plan