REMEDIAL ACTION REPORT

VOLUME 1 – TEXT

ETE SANITATION AND LANDFILL SITE STATE SUPERFUND REMEDIATION NYSDEC SITE NO. 9-61-005

Town of Gainesville, Wyoming County

PREPARED BY:

NYSDEC REGION 9
DIVISION of ENVIRONMENTAL REMEDIATION

David A. Paterson, Governor **Alexander B. Grannis**, Commissioner

JULY 2008

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VOLUME II

APPENDICES

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REMEDIATION

REMEDIAL ACTION REPORT

ETE SANITATION AND LANDFILL CLOSURE CONSTRUCTION NYSDEC SITE NO. 9-61-005 GAINESVILLE (T), WYOMING COUNTY CONTRACT NO. D005972

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SECTION 1
INTRODUCTION – NOTICE OF COMPLETION

1.1 PURPOSE

This Remedial Action Report (RAR) presents the observations and data collected during the Remedial Action (RA) construction at the ETE Sanitation and Landfill Site (NYSDEC Site No. 9-61-005) under the terms and conditions of Contract No. D005972. This report documents that the RA was completed in conformance with the New York State Department of Environmental Conservation (NYSDEC) approved remedial design report, remedial design drawings and specifications, and Record of Decision (ROD). This RAR contains information regarding the site activities, construction techniques, quality assurance/quality control testing, construction difficulties and their resolution, and changes in the work. A summary of the institutional control and post construction site management are also contained in this document.

1.2 LOCATION

The ETE Sanitation and Landfill (ETE Landfill) site is located in a rural agricultural area off of Broughton Road in the Town of Gainesville, Wyoming County, New York, as shown in Figures 1 and 2. The landfill disposal area is approximately seven (7) acres in size and is situated on two parcels. These parcels consist of a 20.57 acre parcel (SBL 121-1-54) that is owned by the estate of the defunct ETE Sanitation and Landfill Corporation (ETE Corporation) and a 4.91 acre parcel (SBL 121-1-55) that was subdivided from a larger site parcel previously owned by the defunct ETE Corporation. This parcel is owned by a local private resident and portion of the landfill disposal area extends onto this parcel. This privately held parcel also serves as the existing site access to the landfill disposal area. Tax map information and approximate wastefill limits are depicted on Figure 1-3. Available tax map and deed information concerning these two parcels is contained in Appendix A.

The landfill site is surrounded by woodlands along the northern, eastern and western boundaries which separate the landfill from the undeveloped agricultural land. The southern boundary, which is situated on the private, undeveloped parcel, is bordered by Broughton Road. This roadway runs east/west. Route 19 runs north to south to the west side of the landfill. Two constructed ponds are located within the site boundary contained in the two parcels. The south pond is located on the privately held parcel along the southern property line of the ETE Corporation parcel; the north pond (also known as the leachate collection pond) is located between the landfill disposal area and the northern property line.

1.3 SITE HISTORY

According to the 1994 Preliminary Site Investigation Report, the ETE Landfill site was owned and operated by ETE Corporation from 1972 - 1979. The site may have been in operation prior to 1972. The ETE Landfill site was a non-permitted private landfill which accepted municipal and industrial waste from surrounding towns in Wyoming County. The ETE Corporation declared bankruptcy in 1979 after a complaint was brought against the corporation for defying a New York State Supreme Court Order to cease all landfill operations.

The landfill was in violation of NYSDEC regulations for sanitary landfills for the entire time of its operation. A number of violations cited by NYSDEC included refuse burned onsite; refuse not spread, compacted or covered; refuse protruding through the cover soils; insufficient grading, uncontrolled release of leachate, and blowing litter.

Almor Corporation of Warsaw, New York disposed approximately 150 tons of leaded paint sludge onsite. Plating wastes from Mallory Timers in Warsaw, New York may also have been disposed onsite. Additional industrial waste included halite (salt) and possibly other salts produced by Morton Salt.

The NYSDEC and New York State Department of Health (NYSDOH) conducted a number of site inspections between 1987 and 1990 during which soil, surface water, waste and tap water samples from nearby residences were collected and analyzed for hazardous waste compounds. A Preliminary Site Assessment (PSA) of the site was performed in 1990. As a result of the PSA, approximately 25 drums were removed in a drum removal activity completed in September 1991. Drums were found to contain leaded paint sludge and industrial solvents including 1, 2 dichloroethane, carbon tetrachloride, trichloroethane, and 2-butanone. A Phase Two PSA was completed in February 1994. The PSA included collection of onsite sediment, leachate, and soil samples in addition to the installation and sampling of seven groundwater monitoring wells.

Over all, the investigations confirmed the presence of hazardous waste at the site and that waste constituents are being released to the environment. In addition, local groundwater is consumed by people in the area. Because of the continuing releases to the environment and the potential threats to public health, the site was listed as Class 2 (indicates a significant threat and the need to take action) in March 1995. Since the Department was not able to identify responsible parties who could undertake additional investigations, work was begun using the State Superfund in August 1997.

To further evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to public health and the environment posed by the presence of hazardous wastes, the NYSDEC conducted a Remedial Investigation/Feasibility Study (RI/FS) of the site between March and June 1998. A final RI/FS report was issued September 1998. the results of the RI indicated that approximately seven acres of the site contain landfilled wastes, with a maximum thickness of 15 feet. A portion of the waste was believed to extend under the northern slope of the south pond.

Based upon the information presented in the RI/FS, the NYSDEC identified a selected remedy. The selection of the remedy is contained in March 31, 1999 ROD and included the following:

- Permanent drainage of the south pond,
- Consolidation of wastefill, regrading wastefill and capping of the wastes,
- Excavation of impacted soils outside the cap limits
- Improved storm water drainage, and
- Long term monitoring of the site.

Remedial design for the selected remedy was completed in July 2000. A contract for the remedial construction was to be following competitive bidding; however, the owner of the

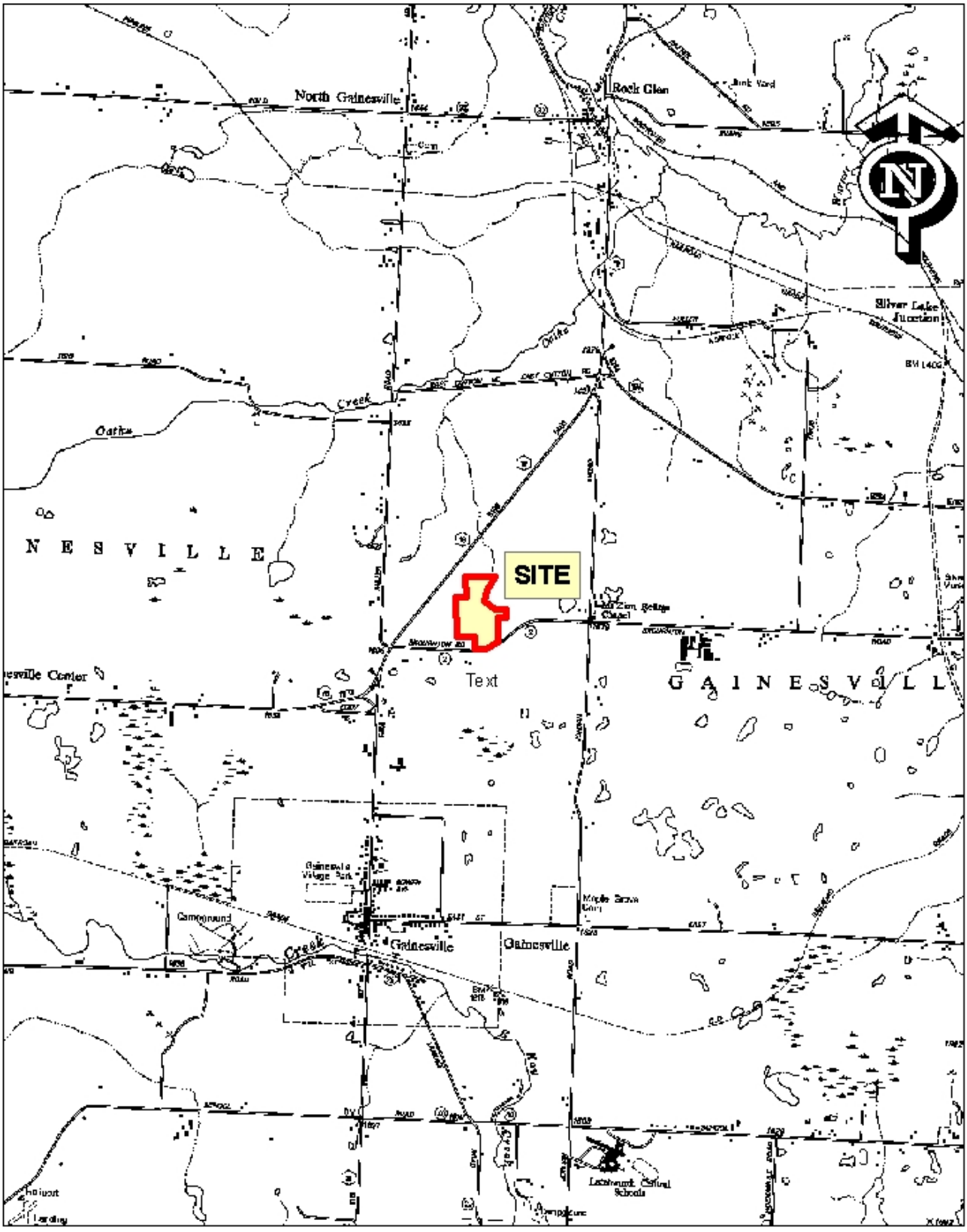
privately held parcel would not allow NYSDEC access to complete the remedial construction. An order was subsequently issued by the Wyoming County Supreme Court allowing the NYSDEC access to complete the remedial action in December 2005. The construction project was competitively bid, and a contract was awarded for remedial action construction in 2006. The remedial action construction was substantially complete by September 2007.

1.4 REPORT ORGANIZATION

The report is organized into eight sections and ten appendices:

- Section 1 includes the introduction and project background;
- Section 2 provides a sequential narrative of the construction activities;
- Section 3 provides documentation that performance standards have been met, and summarizes the implementation of the construction quality control plan;
- Section 4 presents a summary of the pre-final and pre-certification inspections;
- Section 5 includes references to as-built drawings;
- Section 6 presents a summary of institutional and engineering controls employed at the site;
- Section 7 presents a summary of the post-construction operation, maintenance and monitoring plan;
- Section 8 includes the notice of completion and the remedial action report certification;
- Section 9 includes a summary of the remedial construction costs; and
- Section 10 includes references used in the generation of this report.

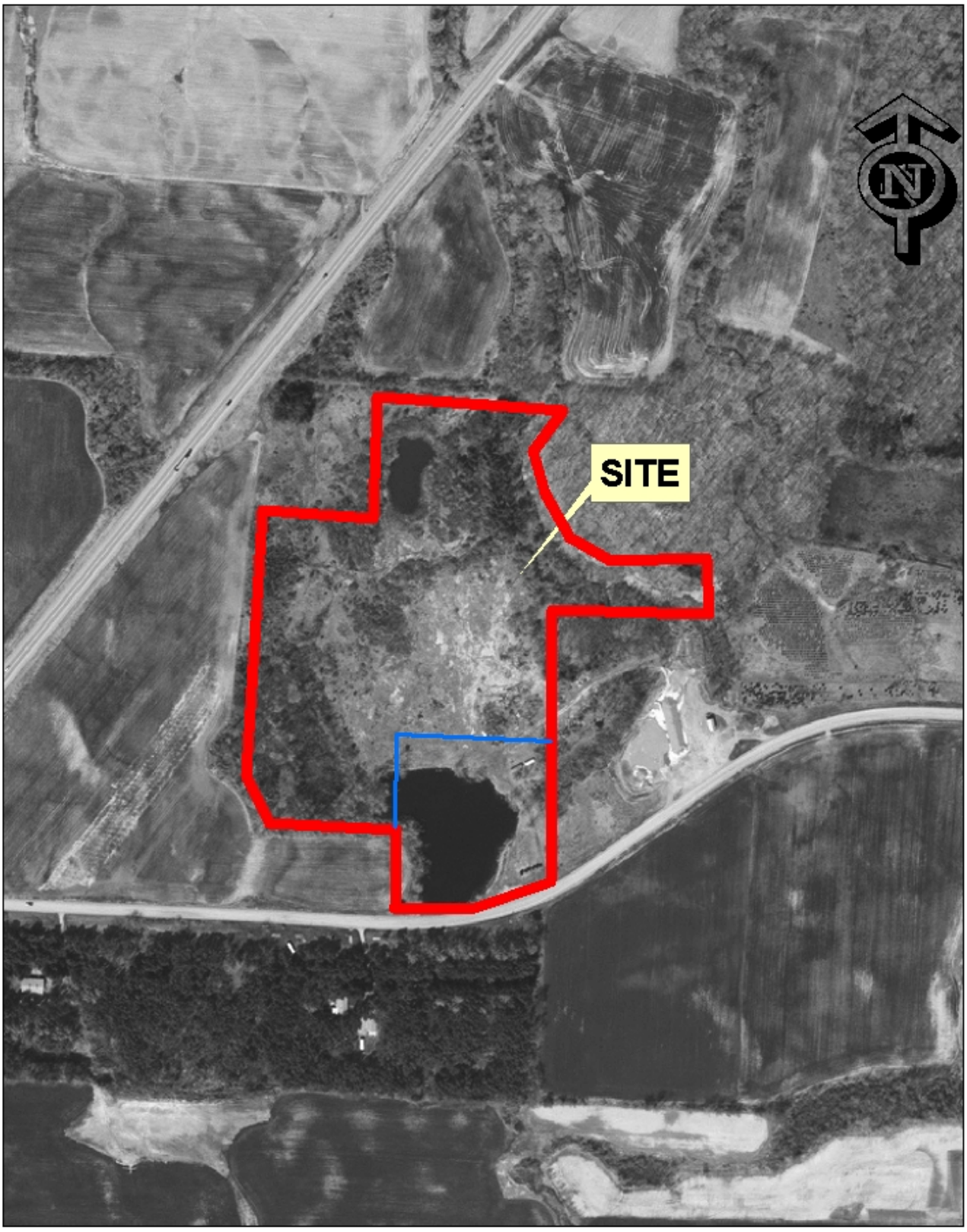
Appendices A through L contain as-built documentation, drawings, test results, and photographs needed to document remedial action construction.



ETE Landfill Site

Figure 1-1

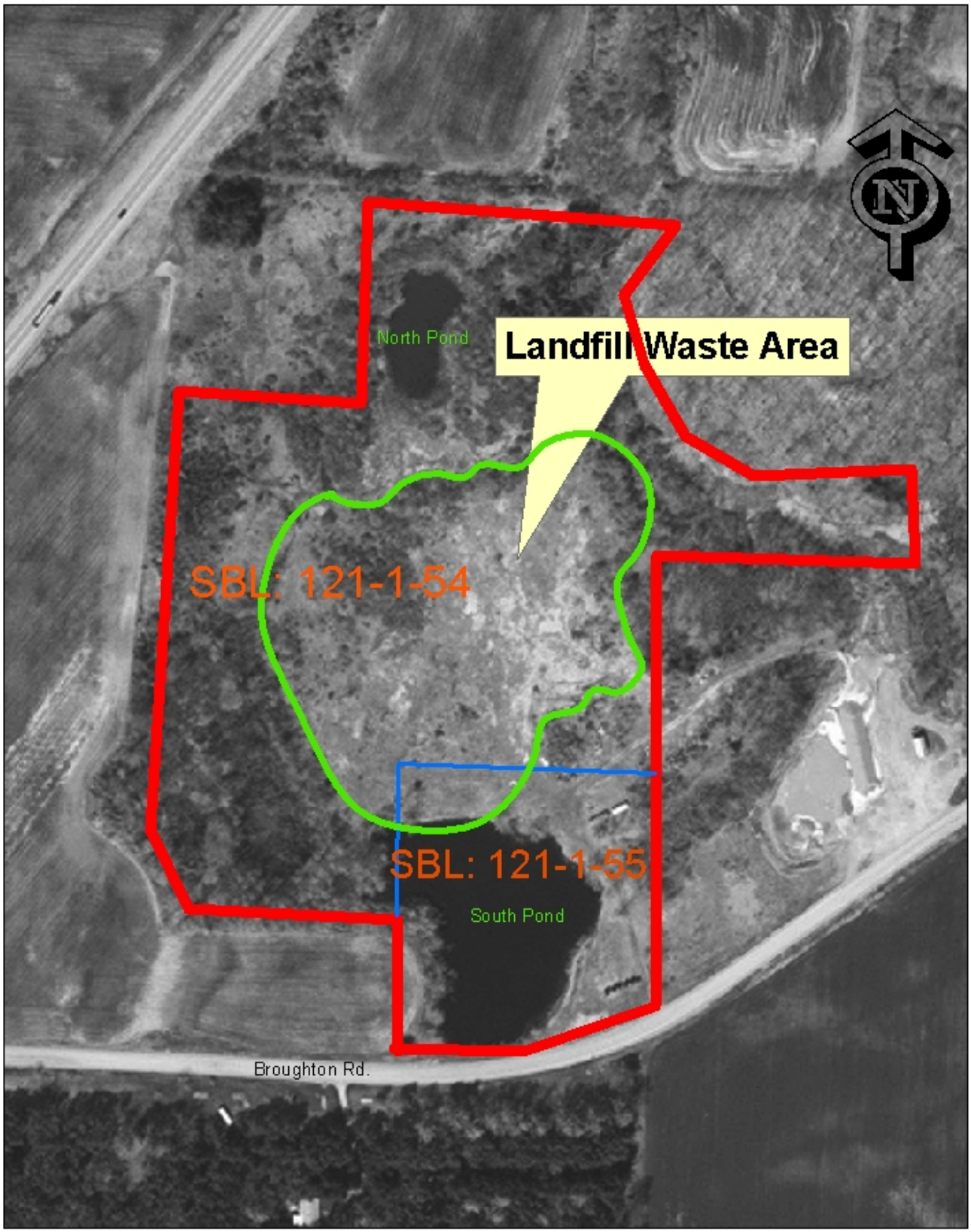
Site Location Map



ETE Landfill Site

Figure 1-2

Site Plan



ETE Landfill Site

0 170 340 510 680 Feet

Figure 1-3 Tax Map Information and Wastefill Limits

SECTION 2
CONSTRUCTION ACTIVITIES

2.1 INTRODUCTION

This section includes a narrative description of the construction activities undertaken during the remedial action at the ETE Landfill site. The purpose of this section is to describe the materials, methods, and sequence of activities performed during remedial action construction; and to report significant dates, methods, equipment, materials, and the sequence of each phase of the construction process. Daily work reports, prepared by NYSDEC, describing the work performed during each day of construction activities are provided in Appendix B.

2.2 CLOSURE CONSTRUCTION

The NYSDEC approved remedial design and approved field changes for the ETE Landfill site consisted of the following:

- Clearing and grubbing the Site prior to remedial construction activities.
- Permanent drainage the south pond to prevent infiltration of waters through the landfill wastes.
- Temporary drainage of the north pond, excavation of impacted sediments, and placement impacted sediments in the landfill under the cap area.
- Excavation of contaminated soils adjacent to the southeast portion of the landfill and placement impacted soils in the landfill under the cap area.
- Excavation of impacted soils between the north pond and placement impacted soils in the landfill under the cap area.
- Installation of a multi-layered capping system with a geomembrane barrier layer to minimize the infiltration of precipitation, and prevent exposure to the site waste.
- Installation of a passive landfill gas venting system
- Expansion and re-construction of the north pond including the construction of an overflow structure.
- Installation of limited site security measures consisting of a gate across the access road, a barrier adjacent the access road gate, and a barrier berm across a former site access path.
- Stormwater drainage improvements and erosion control measures.

2.3 PROJECT RESPONSIBILITIES

NYSDEC

The NYSDEC was responsible for the administration, financing and field construction oversight of the RA. The NYSDEC contracted directly with Camp, Dresser & McKee (CDM) for the remedial design, and with Patrick Concrete Constructors (Patrick) for remediation construction. NYSDEC was responsible for documenting and certifying that the RA was completed in accordance with the approved remedial design report and ROD. NYSDEC has prepared this Remedial Action Report.

Camp, Dresser & McKee (CDM)

CDM, as the engineer of record, was the remedial design engineer responsible for the preparation of all plans and specifications for the RA.

URS Corporation (URS)

URS was retained to complete several design modifications to the CDM cap design. At the request of the NYSDEC, URS completed design evaluations and drawing revisions to incorporate a cap drainage layer relief drain and a cap storm water interceptor berm.

Patrick Concrete Constructors, Inc. (Patrick)

Patrick, as the prime contractor, was responsible for all remedial construction activities, including ensuring that the appropriate health and safety procedures were followed. Patrick subcontracted several elements of the work. A list of the major subcontractors and the work elements they performed is noted below.

Activities	Patrick Subcontractors
Health and Safety	Great Lakes Environmental Safety Consultants
Clearing and grubbing	Eastwood Landscaping, Inc.
Surveying	Grover & Bates Associates
Geotechnical testing of soils	SJB Services, Inc.
Chemical analysis of soils	Paradigm Environmental Services
Geotextile material supplier	Skaps Industries, Inc
Groundwater monitoring well abandonment, gas vents	SJB Services, Inc.
Gas vent layer supplier	Skaps Industries, Inc.
Gas vent layer installer	Chenango Contracting, Inc.
Geonet composite supplier	Tenax Corporation
Geonet composite installer	Chenango Contracting, Inc.
Geomembrane supplier	Poly-Flex, Inc.
Geomembrane installer	Chenango Contacting, Inc.
Scrap metal handler	Ed Arnold and Sons, Inc.
Waste tire handler	Modern Disposal Service, Inc.

2.4 CONSTRUCTION SCHEDULING AND SEQUENCING

The final engineering design was completed in 2000 and was ready for competitive bidding. The work involved access onto the privately held portion of the landfill site. The owner of the site would not allow the DEC to enter the property to complete the work. The DEC file a petition with the Supreme Court of Wyoming County to seek legal access to the site in order to implement the approved remediation plan. A legal order was issue by the court in December 2005 which allowed the DEC access to the privately held property for the purposes of implementing the approved remediation plan. Following the issuance of the order by the court, the DEC proceeded with the advertising, bidding and award of the remedial construction project in 2006.

Construction activities associated with the implementation of the remedial actio commenced on August 31, 2006**,** and were substantially complete on September 25, 2007. An as-built project schedule is contained in Appendix C. Work completed during late summer/fall/winter 2006 period included site preparation, clearing and grubbing, drainage of the south pond, pre-construction surveying, topsoil stripping and stockpiling, excavation of borrow from the west side of the landfill, and initial phases of the cap subgrade preparation. Work was halted in mid-December 2006 for the winter shutdown period. Work at the site resumed in May 2007. The work during the 2007 construction season included continuation of subgrade preparation and soil borrow from the west side of the site, drainage of the north pond, contaminated sediment removal from the north pond, removal and consolidation of other contaminated soils and wastes, finalizing the cap subgrade, placement of the multi-layered cap system, excavation of borrow soil from the north pond area to increase the size of the north pond, grading of the west side of the site to maintain positive surface water drainage from the site, construction of an outlet structure for the north pond, and installation of permanent erosion control features. Work remaining after substantial completion included the hydro-seeding and the installation of erosion control matting.

2.5 HEALTH AND SAFETY

2.5.1 Health and Safety Officer

Health and safety monitoring was conducted by various designated Patrick personal acting as the Health and Safety Officer (HSO). The HSO was responsible for conducting air monitoring, and ensuring that all workers onsite adhered to the NYSDEC approved site-specific Health and Safety Plan (HASP). The responsibilities of the HSO included execution of the air monitoring program, as specified in the HASP daily health and safety meetings; operating and maintaining community real time monitoring, and documenting air monitoring records. In addition to the above, independent health and safety audits were performed by a Great Lakes Environmental Safety Consultant safety specialist to evaluate compliance with the HASP and OSHA safety requirements at construction sites.

2.5.2 Air Monitoring

The HSO performed daily, real-time monitoring of volatile organic compounds (VOCs) and total particulates (dust). Real-time monitoring was performed continuously throughout workdays at the perimeter of the active work area where intrusive construction activities were occurring.

Initially, monitoring for VOCs was conducted within the breathing zones of high-risk workers during work activities in which they could be potentially exposed to vapors, using a photoionization detector (PID). There were no elevated readings and a personal protection of

Level "D" was assigned. Ambient VOC levels were also monitored around the perimeter of the site at least every two hours during intrusive construction activities.

Monitoring for total airborne particulates was performed at three locations each day that intrusive work was being done within the exclusion zone. Monitoring occurred at two locations downwind of intrusive construction activities and one up wind. Monitoring was performed with a Mini-Rae dust meter for real time data and aerosol cassettes were taken for documentation monitoring.

With the exception of a single incident, the air monitoring results revealed no sustained elevated levels for the monitored parameters. The single incident involved dust levels above the established action level for upgrading personal protective equipment. Fugitive dust levels at one of the down wind dust monitoring stations during site grading of waste materials and sediment resulted in sustained levels above the action prescribed in the HASP. Additional measures to control fugitive dust were subsequently implemented.

Due the volume of data, the air monitoring data from the dust monitors is not included as an attachment in an appendix.

2.5.3 Health and Safety Measures

Site specific training by the HSO was required for all site personnel to working at the Site. The site personnel were informed of the site-specific HASP including health and safety hazards, safety precautions, and personal protective equipment (PPE) requirements. Daily safety meetings were conducted by the HSO, usually before work began for the day. All site personnel were required to attend.

Patrick subcontract safety inspections to a third party, Great Lakes Environmental & Safety Consultants, do weekly safety checks of the site. Following each visit by the safety consultant, safety reports were prepared and issued to Patrick and the NYSDEC. Copies of these reports are contained in Appendix D.

Other health and safety measures included dust suppression. A water truck was employed during grading construction phases to control dust emissions. Water was sprayed on soil/fill and roadways during grading to minimize offsite dust migration and exposure to dust by construction workers.

2.5.4 Decontamination Facilities and Measures

In September 2006, a worker decontamination (decon) trailer and a temporary water tank were set up onsite. The water storage tanks for decontamination were filled with water from potable water sources, as needed. All wash waters and decon wastes were collected and disposed under the landfill cap.

2.6 SITE PREPARATION

2.6.1 Mobilization

Patrick's clearing subcontractor, Eastwood Landscaping, mobilized to the Site on August 31, 2006 to clear the site project area for the remediation work and for Patrick to mobilize onto the

site. Patrick mobilized onsite on September 11, 2006; and demobilized at the end of the 2007 construction season, on October 5, 2007.

2.6.2 Temporary Field Office and Facilities

During the mobilization phase, Patrick established field offices for their use and for the NYSDEC inspection personnel, and a temporary decontamination trailer. Connection of utilities was delayed due to the remote location of the site. Full utilities were installed by October 31, 2006.

2.6.3 Erosion and Sediment Control

Silt fencing and other sediment control measures were installed around the Site, as necessary and required, in September 2006. The silt fence was checked and repaired, and debris that collected along the fence was removed, as needed. Additional silt fencing was installed throughout the construction period, as needed. The north pond was initially used for trapping sediment in storm water runoff. As the pond was drained and impacted sediment removed, and the landfill materials were covered with borrow soil, the northern pond area was used for site sediment control. Any subsequent accumulated sediment in the north pond was left in place, since the sediment no longer originated from impacted soils or exposed waste.

2.6.4 Clearing and Grubbing

The Site was cleared of trees brush from August 31 to September 11, 2006 by Patrick's subcontractor, Eastwood Landscaping. Cutting of trees was accomplished using chain saws and chipping of trees and brush was completed using a chipper. Some trees cut from areas that did not contain waste and needed to be removed for the remediation work were of lumber quality. The logs of these trees were salvaged and taken offsite to a Patrick owned saw mill. Wood chips and brush generated while clearing the Site were disposed of in the landfill. Patrick grubbed the site of tree stumps and roots after the work areas were cleared. The grubbed stumps and roots (grubbings) were staged for final disposition at a later date. The grubbings were eventually placed in the eastern area of the expanded north pond area as wildlife habitat enhancement measure.

2.6.5 Construction Entrance and Parking Areas

The construction entrance and parking area were installed in September 2006. Bank run gravel was placed for the construction entrance, equipment and material laydown, and parking areas. Concrete median barriers and 6-foot high security fencing with a locking gate were installed along the Broughton Road entrance. Additional concrete median barriers were placed on pathway from an adjoining parcel to secure the site from unwanted vehicular trespass. No other site security measures were needed or implemented.

2.7 MONITORING WELL ABANDONMENT

In accordance with the approved remedial action plan, several existing monitoring wells at the site were abandoned. The abandoned monitoring wells consist of the following: MW-1S, MW-1D, MW-4, MW-8S, MW-8D, PZ-3. The monitoring wells were abandoned in accordance with NYSDEC-approved procedures by over drilling the wells to the well depth and grouting the boring to the ground surface. Abandonment of the monitoring wells was completed during May 2007. An error in the design plans revealed that MW-7S and MW-7D were to be

decommissioned, and MW-8S and MW-8D were to be retained. A review of the draft post-closure operation, maintenance and monitoring plan revealed that MW-7S and MW-7D were included in the post-closure monitoring program. MW-8S and MW-8D were situated in the landfill cell, and were not part of the post-closure monitoring program. These wells were subsequently decommissioned instead.

PZ-1 and PZ-2 could not be located. After searching, depressions in the soil were found where PZ-1 and PZ-2 were designated on the drawings. It is presumed that they were previously decommissioned.

During the course of the work, the riser extensions and protective casings for existing monitoring wells MW-6S, MW-7S and MW-7D were damaged during construction and required repair. Patrick cut the well risers below the ground level, installed a 2" PVC coupler and a new riser pipe to each well. A replacement protective casing was cemented with concrete around each repaired monitoring well.

2.8 GRADING AND SUBGRADE PREPARATION

2.8.1 Topsoil Stripping and Stockpiling

Topsoil required for the cap system was initially to be sourced from the borrow areas at the site. Prior to bidding, it was uncertain if sufficient topsoil for cap construction was available from the borrow areas. The contract included a provision for importing topsoil if adequate quantities were not available from the onsite borrow areas. After the start of construction and clearing was completed, the amount of topsoil available at the site was reassessed. The existing waste area appeared to have soil that was suitable for cap topsoil purposes. Patrick requested that the soil covering the waste area be stripped and stockpile for later use as topsoil. The available topsoil quality soil from the waste area was stripped and stockpile along with the topsoil stripped from the borrow areas.

2.8.2 Grading and Subgrade Preparation

Site grading and subgrade preparation included grading the Site to conform to the design grades, in accordance with the approved subgrade grading plan. Rough grading of the site included the excavation of a drainage channel west of the landfill to drain waters previously filling the south pond, expansion of the basin north of the landfill and preparing the subgrade of the landfill for the placement of the capping systems. Because topsoil stripping from the waste was not considered in the design plans, the subgrade contouring was revised to account for the removal of this soil by lowering the subgrade across the landfill cap area by approximately six inches. Additional minor revisions to the subgrade were implemented in the field, mainly in areas that required fill soil to achieve subgrade. Fill areas and volumes were minimized to the extent practical and feasible, while maintaining grade contouring requirements (minimum 4 percent slope and maximum 33 percent slope). Though there were some minor grading plan changes, the intent of the overall grading plan was essentially unchanged.

Subgrade preparation involved consolidation of contaminated sediments from the north pond, wastes found outside the cap perimeter, impacted soils from designated areas, soils from the west ditch excavation and the excavation that expanded the north pond. Because of the variable nature of soil materials, no compaction testing or soil property testing program was implemented for the consolidated materials. This was in accordance with the approved Final Design.

2.8.3 Waste and Contaminated Sediment Relocation

Site work included the excavation and consolidation of waste, impacted soils from designated areas and contaminated sediment situated outside the cap limits of the landfill. Areas containing waste included waste and debris located at the southeast section of the landfill. Most of the waste and debris were at the surface. Waste white goods and metal debris were segregated and collected by a scrap metal operator (Ed Arnold and Sons, Darien, New York). The balance of waste at the site was excavated and consolidated under the landfill cap area. An 18-inch thick layer from scrap/debris area was also excavated and consolidated under the landfill cap area as part of the contract requirements. The scrap/debris area, as well as scattered areas of the site, contained waste tires. Approximately 400 waste tires of various sizes were collected and stockpiled. It was determined by NYSDEC project personnel that it would be more appropriate to dispose of the tires at an offsite permitted disposal facility. A change order was issued to Patrick to collect, stockpile, and dispose of the waste tires at a permitted offsite disposal facility. The tires were picked by Modern Disposal Service of Lewiston, New York and disposed of at their NYSDEC permitted landfill in Lewiston, Niagara County, New York.

An additional area requiring excavation of impacted soils included the area between the existing landfill and north pond. An approximate 18-in thick layer of suspected impacted soil was excavated from this area and consolidated under the landfill cap area. Upon completion of soil removal from this area, confirmation soil samples were collected by Patrick and sent to a laboratory for analysis of chemical contaminants of concern to assure that all impacted soils were removed and consolidated under the landfill cap. The results of the confirmation sampling and sampling locations are contained in Appendix E.

Following the drainage of the north pond, sediments in the pond were excavated and consolidated under the landfill cap. Upon completion of sediment removal from this area, confirmation soil samples were collected by Patrick and sent to a laboratory for analysis of chemical contaminants of concern to assure that all impacted sediments and soils were removed and consolidated under the landfill cap. The results of the confirmation sampling and sampling locations are contained in Appendix E.

The design plans included the removal of wastes situated under water in the south pond. Upon drainage of the south pond, with the exception of a few scrap metal items, there was no waste situated in the south pond area. Therefore, no waste removal activities were required in this area.

During the course of the landfill subgrade preparation, general soil mining and drainage grading outside the cap limits of the landfill, two pockets of buried waste were discovered. One pocket was situated along the south east perimeter of the cap and the other along the south west perimeter of the cap. Because of the existing grading design, cap limits and available synthetic cap materials purchased for the landfill cap, the waste in these pockets were excavated and consolidated under the landfill cap. Once the wastes outside the cap limit were excavated, the areas were backfill with soil from the borrow area, and compacted in place. The quantities of waste excavated and soil placed back to achieve grade were tracked for measurement and payment purposes.

2.8.4 Soil Borrow and Site Drainage Grading

Soils required for cap subgrade preparation and cap cover was derived from on-site borrow areas. Topsoil was stripped from all borrow areas and some areas of the existing waste fill that had cover and soil suitable for use as topsoil. The bulk of the borrow soil came from the excavation of the "west" drainage ditch which served as a permanent measure to keep the south pond permanently drained and provide a path for upland storm water runoff diversion around the landfill. Some additional borrow soil was also obtained from the "east" ditch. The quantity of soil from drainage earthwork was a portion of soil needed for the remediation construction. The balance of borrow soil was obtained from the expansion of the north pond.

The overall soil balance for the earthwork portions of the site construction required adjustment during construction. The design topographic survey contained some inaccuracies in that a ridge of soil along the "west" ditch was obscured by tree cover, leading to inaccuracies in the aerial topographic mapping in this area. This mapping error lead to a surplus of borrow soil available at the site. However, some other factors lead to an increase in the amount of borrow soil needed to complete the work. It was believe that some additional soils were required to achieve cap subgrade. As the relocated waste and borrow soil was placed over the wastefill, the surcharge weight from the subgrade soil may have caused some settlement of the wastefill in that the wastefill may have not been compacted very well or had settled completely. Additional soil was required to backfill two areas that contained waste outside the cap footprint. The first layer of soil covering the synthetic cap materials required screening to remove stone/rock above 3 inches in size. Because much of the borrow soil at the site was glacial till type soil, it contained a relatively large fraction of stone above the gradation requirement. Screening of the soil resulted in the removal of a considerable amount of stone that could not be placed against the synthetic cap materials. Additional mining of borrow soil was required to account for the volume of stone screened from the screened borrow soil. This lead to an overall increase in the soil balance and final quantity of soil required for the job. A change order was required to accommodate the payment of additional soil excavation.

Some of the screened stone was used in place of quarried stone used for erosion protection along drainage ways at the site. The screened stone was suitable for this purpose. Use of this screened stone was offset the cost to purchase quarried stone used for erosion protection.

2.9 CAP CONSTRUCTION

2.9.1 Geomembrane Landfill Cover System

The Final Design included covering the landfill Site with a multi-layered geomembrane landfill cover system. The geomembrane landfill cover system consists of the following from top to bottom in accordance with the Final Design:

- Six-inch topsoil layer;
- Six-inch soil barrier protection layer consisting of on-site borrow soils (no permeability requirements);
- Twelve-inch soil layer soil barrier protection consisting of screened on-site borrow soils with a gradation requirement of 3 inches and less (no permeability requirements);
- Geonet composite drainage layer (double sided);

- Forty mil linear low density polyethylene geomembrane (textured and smooth);
- Combination geotextile – geonet composite gas venting layer;
- Six-inch sub-base soil layer with a gradation requirement of 3 inches and less.

The geomembrane was composed of a linear, low-density polyethylene (LLDPE) sheet membrane. The topsoil layer was stabilized with a turf-type grass and wildflower seed mixture.

2.9.2 Landfill Gas Vents

Nine gas vents were installed on the landfill prior to installation of the cover system components. The gas vents consist of six-inch diameter PVC pipe that extended into the waste a minimum of eight feet. The base of the vent that extended into the waste was perforated with holes. The base portion was backfilled with a fine granular aggregate to allow gas to migrate to the vent. The vents extended above the subgrade and through the landfill geomembrane cover system. The top of the gas vent was terminated with an inverted "U" to prevent rainwater from entering the vent. The vents were installed at locations identified on the Final Design plans.

2.9.3 Gas Venting Layer

The subgrade of the landfill was covered with a non woven geotextile layer of consisting of 8 ounce per square yard non-woven polypropylene fabric. The geotextile came in 15-foot wide rolls and was laid out in one foot over lapping fashion with the seams heat bonded in the field to prevent separation and gaps in the geotextile gas vent layer. In addition to the geotextile, 6.7-foot wide panels of Tenax double sided geonet composite were networked between the gas vents and the edge of the landfill cap as show on the as built drawings. The addition of the geonet strips were an addition to the final design plans to ensure positive venting of landfill gas through the gas vents.

2.9.4 Geomembrane

A 40-mil LLDPE geomembrane was installed over the gas venting layer. The geomembrane was delivered in 23-foot wide rolls, and installed in a series of panels. The geomembrane barrier layer was laid out in panels and welded together. Each panel was fused to an adjoining panel using a thermal fusion welding process (double wedge hot shoe). This welding device thermally fused panels together, leaving a channel for non-destructive testing of the seams by the geomembrane installer. Boots were installed around each gas vent. The geomembrane installed was either smooth or textured depending on the application. Smooth membrane was used on the gently sloped top areas, and textured membrane was used on the steeper side sloped areas along the northern end of the landfill area.

2.9.5 Geonet Composite Drainage Layer

A geonet drainage composite was installed on top of the geomembrane barrier layer to drain cover soil pore water and ensure stability of the slopes. The geocomposite was installed in a similar fashion as the geomembrane. The geocomposite was delivered in 6.7-foot wide rolls and installed in a series of panels. Geocomposite panels were joined together by strapping the netting together with nylon ties every five lineal feet of panel edge and continuous sewing the top layer of geotextile fabric covering together. Drainage of water transmitted along the geonet layer, is accommodated through a relief under drain installed at the bottom of the long gentle slope of the landfill and before reaching the top of the steep slope. The under drain was sloped to divert

accumulated water in the geonet to the surface run off ditch to the east and west of the landfill. The installed geonet drainage composite was a double-sided nonwoven geotextile fabric/geonet composite.

2.9.6 Cover Soil Layer

Once the geomembrane/geonet layers were installed, they were covered with an 18-inch thick layer of cover soil sourced from the on-site borrow areas. The cover soil was placed in two lifts. The initial lift was a 12-inch thick layer of soil from on-site borrow areas. The soil in this layer was screened to less than 3 inches to remove larger stones that could potentially damage the synthetic cap materials when placing this soil layer. The subsequent 6-inch layer of on-site borrow soil was not screened and was placed over the screened soil layer. The total cover soil layer lift thickness was verified using grade markers.

2.9.7 Topsoil Layer and Seeding

A six-inch layer of topsoil was placed directly over the cover soil layer. The topsoil was material stripped from the site prior to grade work. The topsoil layer was spread loosely with a bulldozer, and the lift thickness was verified using grade markers. The entire site was hydroseeded with a slurry containing seed, paper-based and wood fiber mulches, and starter fertilizer applied in one operation.

2.9.8 Cap Relief Underdrain

Prior to issuance of the bid documents, a design revision consisting of cap drainage layer relief underdrain was added to the cap system. The relief underdrain was not part of the final approved remedial design. The relief underdrain was not included in the final design issued by CDM. This detail was added to the final design by URS at the request of the NYSDEC to ensure the stability of the soil cap veneer along the steeper sloped portion of the landfill cap along the northern edge of the landfill cap area. The relief underdrain was position at the down-slope end of the gently sloped cap area before the cap grades transitioned to the steeper sloped area. The purpose of the cap underdrain was to relieve water build-up in the geonet composite drainage layer. This measure so helps eliminate the possibility of soil saturation and pore pressure build-up in the cover soils along the steeper sloped portion of the cap. The build-up of pore pressure in this soil layer could potentially result in a cap soil veneer failure. The underdrain consists of a swale-like depression in the cap subgrade where the drainage waters would accumulate. A corrugated HDPE drainage pipe with drainage slots was installed in the swale and bedded with washed pea gravel. The entire drainage pipe/pea gravel under drain is covered with a non-woven geotextile to limit the intrusion of soil fines into the pea stone bedding. The under drain pipe discharges into the surface run off ditches to the east and west of the landfill.

2.9.9 Access Restrictions

As a site security measure, a locking gate was installed across the site access driveway off Broughton Road to prevent unauthorized vehicle entry to the site. The location of the gate was repositioned to an area where the adjoining grades along the entrance road dropped off steeply. The plans did not include any fencing to preclude vehicles from driving around the gate. A line of boulders culled from the soil mining operations was installed adjacent to each end of the gate so as to prevent vehicles from driving around the gate. These measures limit vehicular access to the main access driveway off of Broughton Road entrance. The access road from the adjoining property previously owned by the Town of Gaineville, now owned by a local farmer, was

eliminated. Instead, a soil berm was constructed across the former access road and adjoining area so as to create a physical barrier to prevent unauthorized vehicle access. The soil berm ties into an existing mound at the southern end of the berm and into a wooded area at the northern end of the berm. This measure will help unauthorized vehicle access to the site from the driveway originating on the adjacent property. Follow-on development of the adjoining property by the farmer has completely eliminated this access road and any ability for vehicular access from the adjoining property. The balance of the site features precludes unauthorized vehicle access, so no additional security measures were proposed or added. The security measures put in-place do not prevent casual trespass by foot.

2.10 NORTH POND RECONSTRUCTION AND WETLAND RESTORATION - MITIGATION

The remediation of the Site involved removal of sediments from the north pond and the expansion of the pond to mitigate some of the loss of pond habitat eliminated from the permanent draining of the south pond. The south and north ponds were constructed ponds that involved the placement of earthen berms to dam off water in a natural swale/trough that previously existed at the site prior to the landfill. The area between the north and south ponds was subsequently filled with the waste that constituted the landfill at the site.

The habitat value of each pond was limited to open water pond areas with minimal to no areas containing wetland plants. The north pond was heavily infested with common reed (phragmites). Though no habitat improvements were considered into the remediation design, some habitat enhancements through field changes were incorporated into the reconstructed and expanded northern pond. The reconstructed pond includes the construction of an outfall weir and stabilized chute. The elevation of the outfall weir was lowered by one foot to make the pond shallower so as to allow increased area for shallow submergent and emergent wetland habitat. As an additional habitat enhancement, the grubbed stumps, roots and related topsoil were place in the shallow side of the new north pond to provide structure and conditions for submergent wetland plantings. The shallow area was expanded to an area occupying approximately one third of the reconstructed pond. Additionally, a load of soil containing cattails plants that established in the area formerly occupied by the south pond was taken from the south pond area and placed in the expanded shallow area of the north pond to help establish cattail plants in the reconstructed north pond.

2.11 VARIATIONS FROM CONTRACT DOCUMENTS

2.11.1 Stripping of Topsoil

After the clearing and grubbing of the site, Patrick assessed the existing soil cover over the waste area and determined that there was sufficient quantity and quality of soil that could be used as topsoil in the constructed cap system. The NYSDEC allowed Patrick to strip the soil from the covered landfill area prior to preparing the subgrade. The contract and scope of work did not consider stripping of any soil from the existing covered waste areas since it was previously determined that this material was present in sufficient quantity and quality to incorporate it into the work plan. Patrick suggested this measure and avoided the purchasing topsoil as part of cap construction. Stripping, stockpiling and placement of the topsoil was reimbursed under the uncontaminated soil excavation pay item. It was also agreed not to purchase topsoil for the cap if sufficient onsite quantities of suitable topsoil existed for the cap area.

2.11.2 Landfill Subgrade Elevation Change

Corresponding to the agreement to strip and reuse topsoil from the cap area, the cap subgrade elevation was lowered approximately 6-inches to compensate for the stripping of topsoil from the existing waste area. There was no monetary adjustment for this field change.

2.11.3 Tire Collection and Disposal

As work progressed several hundred tires were found through out the site. Because of the quantity of tires, the difficulty they present in grading the cap area, and potential issues that could potentially develop during post-construction site maintenance, it was determined that most appropriate method of managing the waste tires was to dispose them at an permitted offsite disposal facility rather than inter them in the existing landfill under the cap area. The NYSDEC requested that Patrick collect the waste tires and transport them offsite for disposal at a permitted disposal facility. In accordance with contracting requirements, Patrick acquired 3 quotes for tire disposal. The waste tire disposal low bid was awarded to Modern Disposal, and the waste tires were transported their landfill in Lewiston, New York. Modern Disposal Lewiston landfill is a NYSDEC permitted solid disposal facility. This was considered extra work. Cost for this work was addressed in Change Order 1.

2.11.4 Rip-Rap Erosion Control Material

With the screening of approximately 12,000 cubic yards of onsite soils, a large quantity of screened stone/rocks was available onsite. The NYSDEC directed Patrick to use the screened stone/rocks for erosion control as a substitute for the imported quarried stone specified in the contract documents. A credit for the cost of stone was applied to the NYSDEC.

2.11.5 North Pond Habitat Enhancements

The remedial design and bid documents did not include any provisions for any habitat enhancements to the north pond reconstruction. However, several field modifications to the reconstructed pond were implemented to increase the habitat value of the reconstructed pond. The elevation of the weir was lowered by one foot to make the pond shallower so as to allow increased area for shallow submergent and emergent wetland habitat. As an additional habitat enhancement, the grubbed stumps, roots and related topsoil were place in the shallow side of the reconstructed north pond to provide structure and hydrologic conditions for submergent wetland plantings. There was no monetary adjustment for this change.

2.12 CONSTRUCTION ISSUES AND PROBLEMS

2.12.1 Geonet Slippage and Tearing

Following the placement of the geonet composite drainage layer, the subsequent task included covering the geonet layer with cover soil. To protect the geonet layer from mechanical damage and crushing during the placement of cover soil, a 3-foot layer of screened soil was placed along the equipment travel lanes. Following the placement of a travel lane from the southeast end of the cap area, a series of wrinkles/folds in an exposed section of geonet adjacent to the travel lane was observed. Patrick was notified of the wrinkles/folds. There was the concern that there was a tear and slippage of the geonet under the travel lane cover soil. Patrick was directed to investigate the cause of the wrinkles. Patrick subsequently exposed the geonet at a later date when it was feasible to evaluate the cause of the wrinkles/folds. After uncovering a

strip of cover soil, it was confirmed that the geonet had slipped along the geomembrane surface, causing an approximate 100 foot tear in the geonet along one of the seams. The slippage and subsequent tearing caused the geonet to bunch up and form the wrinkles/folds.

The repair of the wrinkled/folded geonet involved exposing the defect, removing cover soil to make a patch, removing the wrinkled/folded section and installing a patch. With the exception of the area containing the wrinkled/folded geonet, the entire landfill cap surface was covered with the cover soil. This prevented the ability to reposition the geonet and repair the tear. The repair of the tear and wrinkled/folded geonet involved the removal of cover soil along the tear until each end of the tear terminated. The wrinkled portions of the geonet were trimmed away, and new geonet composite was installed over the area containing the exposed geomembrane. After the geonet patch was installed and the repair was deemed acceptable, the cover soil layer was placed back over the repair area.

SECTION 3
CONSTRUCTION STANDARDS AND QUALITY CONTROL

3.1 INTRODUCTION

The construction monitoring activities used to document and verify the remedial action construction presented in the Final Design Report and Construction Quality Assurance/Quality Control (QA/QC) Plan are reviewed in this section. This section provides a description of tasks conducted in order to record and confirm the grading of existing cap soils and cover soils; the raising and abandonment of monitoring wells; installation of geomembrane barrier layer; and placement of toe drain and ditch armoring stone. Daily work reports describing the work performed during each day of construction are provided in Appendix B. Records of test reports and documentation for constructed elements of the remedial action are contained in respective appendices.

3.2 CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL

The Patrick Project Manager was responsible for the coordination and management of all work performed during the construction phase. NYSDEC provided full-time construction oversight. Some portions of QC were provided by Patrick subcontractors. QA/QC was performed to ensure compliance with the plans, specifications, and engineering requirements referenced in the Contract Documents. The NYSDEC Project Inspectors communicated directly with the Contractor's superintendent, and kept the NYSDEC Project Manager informed of these communications. The NYSDEC Project Inspector communicated regularly with the NYSDEC Project Engineer regarding site activities, quality control testing, and corrective actions required. The NYSDEC Project Inspector and Project Engineer reviewed QA/QC activities, such as testing of borrow material sources, grade controls, thickness verification, and cover soil material testing for conformance to construction standards.

3.3 SHOP DRAWING REVIEW AND APPROVAL

Prior to the start of construction activities, and before installation of construction materials and equipment, a series of work plans, shop drawings, and product information was submitted by Patrick to NYSDEC for review, in order to determine compliance with specifications. A list of shop drawings and submittal reviewed by NYSDEC is contained in Appendix F. Patrick was not allowed to proceed with construction or installation of specific materials without review and express authorization by NYSDEC. NYSDEC reviewed Patrick submittals for general conformance with the specifications. Upon authorization by NYSDEC, Patrick was allowed to proceed with certain work elements or installation of specific materials or equipment. Materials and equipment not meeting specification requirements were not allowed onsite and were not installed. All installed materials received approval from NYSDEC. Items that constituted substitutions of specified items required acceptance by NYSDEC.

3.4 SURVEY CONTROL

Survey control, layout, and record survey documentation for RA construction at the Site was performed by a Patrick subcontractor, Grover & Bates Associates, a State of New York-licensed

surveying firm. Patrick personnel were responsible for grade control during construction. Survey control, both horizontal and vertical, was provided by Grover & Bates Associates. A construction baseline and coordinate system was developed, prior to the start of construction activities. Grover & Bates completed the layout of all pertinent construction features including setting grades, setting membrane limits, layout of the west ditch and the reconstructed north pond. Grover & Bates also performed field surveying to document the quantity of soils excavated and place on the landfill. Record drawings include record survey drawings provided by Grover & Bates. These record survey drawings were used to prepare the project as-built drawings.

3.5 GRADING AND SUBGRADE PREPARATION

Subgrade preparation involved fine grading of the existing landfill cover soils, contaminated soils excavation and contaminated sediments from the north pond to provide a suitable base for placing the geomembrane cap. Subgrade areas were compacted with smooth drum roller to provide a smooth, uniform, compacted sub-base for landfill cover system capping materials. After rolling the subgrade Patrick proceeded to remove any rocks and debris that might damage the geosynthetics.

3.6 GEOMEMBRANE CAP

3.6.1 Landfill Gas Venting Layer

Before the gas venting layer was installed, a series of gas vents were installed at prescribed locations and depths indicated on the plan drawings.

Prior to installing the gas venting layer the subgrade was inspected and approved by the NYSDEC inspector and Chenango Contracting's inspector.

The landfill gas venting layer is a network of geonet vent strips consisting of a tri-planer double sided geonet composite between the 9 gas vents and to the edges of the landfill cap as show on the as built drawings. Over the geonet composite network, a continuous layer of 8 ounce per square yard geotextile was installed over the entire subgrade. The geotextile panels were over lapped one foot and field sewn by Chenango Contracting (Chenango).

3.6.2 Geomembrane

Quality Assurance/Quality Control (QA/QC) for geomembrane installation consisted of a rigorous testing and inspection program that was implemented by the manufacturer (Poly Flex) and geomembrane installer (Chenango).

Poly Flex provided the manufacturing quality assurance data prior to shipment to the site. The manufacturer QA data, contained in Appendix G-1, was reviewed by the NYSDEC Project Engineer. Upon approval of the material, the geomembrane was shipped to the site for installation by Chenango, the geomembrane installer.

Chenango reviewed pre-certification geomembrane QA test results, inspected the subgrade for geomembrane installation, performed all field QC testing, obtained samples of seams for destructive QC testing, and prepared daily work reports. Following the completion of geomembrane installation, Chenango prepared record drawings depicting the geomembrane panel layout and sample locations. Field destructive test results were verified through offsite laboratory

testing. The results of the field and destructive testing, the field inspection logs, Chenango's daily work reports, and certification of subgrade acceptance are provided in Appendix G-2. The as-built drawing of the panel layout is included in Appendix G-2. The as-built limits of the geomembrane were recorded by instrument survey performed by Grover & Bates, and incorporated into as-built record drawings. Refer to Section 6 for additional discussion on as-built record drawings

NYSDEC personnel were onsite at all times during the geomembrane installation to oversee the geomembrane installation, document geomembrane construction activities, and observe field testing of seams.

The liner was installed in accordance with the approved Construction QA/QC Plan. Prior to placement of the geomembrane, Chenango inspected the subgrade to ensure that the surface was suitable for installation of the geomembrane. Acceptance of the subgrade by Chenango is provided in Appendix G-2. As each panel was installed, NYSDEC inspector visually inspected the installation. Also, NYSDEC monitored QC testing completed by Chenango, including pressure testing along double wedge seams and vacuum testing along extrusion welded seams and patches.

QC testing was completed in accordance with the specifications. Prior to startup of membrane seaming each day, Chenango completed trial seams. The trial seam logs are contained in Appendix F-2. Non-destructive testing of the seams was accomplished by pressurizing the channel and monitoring the pressure gauge. The results of these tests are contained in Appendix G-2. On occasion, a non-destructive test failed. Failed tests typically required isolating the location of the faulty seam and repairing the seam by an extrusion welding process. Seam repair logs are also contained in Appendix G-2. Additional QC testing of the seams involved destructive tests. At intervals prescribed in the specifications, test seam coupons were cut from the installed membrane along the seams. Test specimens were cut from the coupon panel for destructive testing by Chenango and by a third party (TRI/Environmental, Inc) for independent testing. The results of the geomembrane destructive test results and independent test results in Appendix G-2. There were no instances where the test results did not pass the criteria.

At the panel seams where the test coupons were obtained, a patch panel was extrusion welded in-place. The patch panel welds were tested by soaping the weld seams and applying a vacuum to the weld using a vacuum box device. Patches with faulty seams would result in soap bubbles forming at the faulty seam. Any faulty seams would be repaired and retested.

Prior to the initiation of sequential cap construction activities and tasks, NYSDEC reviewed the geomembrane installation QA/QC documentation to ensure that the geomembrane was installed to project standards. Subsequent cap installation was allowed to proceed only when the QA/QC documentation supported conformance with the project standards. Any areas requiring attention were corrected before subsequent cap installation was allowed.

The geomembrane manufacturers warrantee documents for this material is contained in Appendix G-3.

3.6.3 Geonet Composite Drainage Layer

A composite geonet drainage layer was placed on top of the geomembrane. A double-sided composite tri-planer geonet was placed over the smooth and textured geomembrane. Tenax provided the manufacturing quality assurance data prior to shipment to the site. The manufacturer

QA data, contained in Appendix H-1, was reviewed by the NYSDEC Project Engineer. Upon approval of the material, it was shipped to the site for installation by Chenango, the geonet installer. QA/QC documentation for this layer was not required by the QA/QC Plan. There were no quality assurance requirements for the geonet other than routine monitoring of the installation.

The geonet and geotextile manufacturers warrantee documents for these material are contained in Appendix H-2.

3.6.4 Cover Soil Layer

A nominal 18-inch thick cover soil layer was placed over the drainage layer and geomembrane. Prior to, and during installation of the cover soil layer, the soil was sampled and tested to determine the suitability for use (source QA). In accordance with the specification, quality assurance testing, consisting of particle size analysis (ASTM D422), conducted on soil from the onsite screening process at a frequency of one test every 5,000 cubic yards to determine the suitability of the material. The physical property test results are contained in Appendix I.

Field QA consisted of in-place layer thickness control using grade markers consisting of cardboard tubes with markings that displayed the required respective soil layer thickness. The grade markers were placed on a 50 foot grid dimension required by the survey control documentation.

The first lift of cover soil placed on the geosynthetic cap materials were onsite soils screened to 3 inches and less to protect the geosynthetics. The lift thickness was 12-inches of the screened soil. The soil was placed in a manner where trucks were always on a minimum depth of 3 feet of soil and the layer was never less than the final 12-inches. The thickness of this layer during placement was monitored with the grade markers.

The second lift of cover soil above the geosynthetic cap consisted of the onsite borrow soils that did not have a specific gradation exclusion requiring screening of the soil There was no testing of these soils. This second lift consisting of six inches of unscreened site soil was placed in a manner where trucks were always on a cover soil travel lane with a minimum thickness of 3 feet. The thickness of this lift was monitored using the grade markers.

3.6.5 Topsoil Layer

A nominal six-inch topsoil layer was placed over the cover soil to support the establishment of vegetative growth. In accordance with the specification, QA testing consisting of particle size analysis by method ASTM D-422, soil classification by method ASTM D-2487, and soil pH by method ASTM D-4922 was conducted on topsoil at a frequency of one test per 10,000 cubic yards to determine the suitability of the material.

Since the topsoil was derived from the site, no chemical contaminant testing of the topsoil was conducted. The physical property test results are contained in Appendix J.

The thickness of this layer during placement was monitored with grade markers.

3.7 CONSTRUCTION PHOTOGRAPHS

A photolog was compiled by the NYSDEC during the construction, and is provided in Appendix K to record the progress of work and to provide additional documentation for constructed project elements.

Several oblique aerial photos of the site prior to remedial construction are included in Appendix K.

SECTION 4
PRE-FINAL AND FINAL INSPECTIONS

4.1 PRE-FINAL INSPECTION

A Substantial Completion inspection of the Site by the NYSDEC and Patrick was conducted on September 25, 2007. As a result of the inspection the following items required correction:

- Removal ruts on west side of cap.
- Remove ruts between the cap and the north pond
- Remove debris ends of the berm (east and west).
- Additional erosion control matting on the northwest corner of the cap.
- Place 6" rip rap at east and west ends fo the berm to slow water flow.
- Redistribute 6" rip rap around MW-6.
- Hydroseed west and north ends of the north pond.
- Remove roll offs
- Remove equipment, fuel tank, etc.
- Seed the laydown areas (including Keenan property), southeast swale and topsoil stockpile area.
- Disconnect electric service
- Disconnect phone service
- Remove site trailers
- Remove silt fence on Keenan property
- Install the gate along Keenan access road
- Place rocks on either side of the gate
- Create a berm between the Keenan and Broughton properties
- Remove jersey barriers
- Remove excavator extension stick
- Remove portable toilet facilities
- Submit as-built drawings
- Submit as-built schedule

4.2 FINAL INSPECTION

Following the completion of punch list items identified during the substantial completion inspection, a final inspection of the Site was conducted by the NYSDEC and Patrick on November 1, 2007. With the exception of some topsoil grading and restoration, the remedial construction and punch list items were determined to be complete and final.

SECTION 5
RECORD DRAWINGS

5.1 INTRODUCTION

Record drawings to reference post-remedial Site conditions are presented in Appendix K. The electronic file copies of the CDM Final Design Drawings were updated by the NYSDEC to reflect as-built conditions. The NYSDEC prepared as-built record drawings are contained in Appendix J. The record drawings contain as-built Site grading and capping features. Site grading and capping features were recorded via instrument survey by Grover and Bates Associates, a subcontractor to Patrick Concrete Constructors. Grover and Bates Associates is a New York State-licensed land surveyor. The record survey prepared by Grover and Bates Associates were incorporated into the record drawing set contained in Appendix L. The electronic record survey drawing files were used by NYSDEC to update the CDM Final Design drawing files and URS Revised Final Design Drawings. Where required, the CDM Final Design Drawings/URS Revised Final design Drawings were augmented by field measured or observed data.

SECTION 6
ENGINEERING AND INSTITUTIONAL CONTROLS

6.1 ENGINEERING CONTROLS

As detailed in this RAR, the ETE Landfill disposal area and site were remediated through the implementation of engineering controls and actions. The NYSDEC approved remedial design for the ETE Landfill site consisted of the following engineering control measures:

- Permanent drainage of the south pond to prevent infiltration of waters through the landfill wastes.
- Temporary drainage of the north pond, excavation of impacted sediments, and placement impacted sediments in the landfill under the cap area.
- Excavation of contaminated soils adjacent to the southeast portion of the landfill and placement impacted soils in the landfill under the cap area.
- Excavation of impacted soils between the north pond and placement impacted soils in the landfill under the cap area.
- Installation of a multi-layered capping system with a geomembrane barrier layer to minimize the infiltration of precipitation, and prevent exposure to the site waste.
- Installation of a passive landfill gas venting system.
- Expansion and re-construction of the north pond including the construction of an overflow structure.
- Installation of limited site security measures consisting of a gate across the access road, a barrier adjacent the access road gate, and a barrier berm across a former site access path.
- Stormwater drainage improvements and erosion control measures.

The multi-layered geomembrane landfill cover system place over the seven (7) acre landfill cap area consists of the following from top to bottom in accordance with the Final Design:

- Six-inch topsoil layer;
- Six-inch barrier protection layer consisting of on-site soil borrow soil (no permeability requirements);
- Twelve-inch soil barrier protection layer consisting of screened on-site borrow soils with a gradation requirement of 3 inches and less (no permeability requirements);
- Geonet composite drainage layer (double sided);
- Forty mil linear low density polyethylene geomembrane (textured and smooth);
- Combination geotextile – geonet composite gas venting layer;
- Six-inch sub-base soil layer with a gradation requirement of 3 inches and less.

The geomembrane was composed of a linear, low-density polyethylene (LLDPE) sheet membrane. The topsoil layer was stabilized with a turf-type grass and wildflower seed mixture.

6.2 INSTITUTIONAL CONTROLS

Institutional controls are implemented from an administrative perspective to preserve the integrity of the engineering controls and prevent use of a site that may endanger public health or the environment. Typical institutional controls include requirements for routine monitoring and maintenance, prohibitions from using groundwater, and development/land use restrictions emplaced through deed restrictions or environmental easements. These measures are utilized where responsible party has entered into an agreement or participated in a cleanup program. However, in this situation, aside from the parcel that is owned by a local resident who purchased the parcel long after the waste disposal occurred, the larger parcel containing the bulk of the waste and landfill cap area is owned by a defunct corporation with no known successors or assignees. As such, there are no entities to pursue an administrative order which would include provisions for institutional controls, such as deed restrictions or environmental easements.

The site is currently on the Inactive Hazardous Waste Site Registry as a Class 2 site. The Site may be reclassified to Class 4. The institutional control to be implemented for the ETE Landfill Site will be through maintaining the site on NYSDEC Inactive Hazardous Waste Registry Site List. The restrictions imposed on registry sites, and associated liability with registry sites will serve to restrict use and development of the Site.

SECTION 7
OPERATION, MAINTENANCE AND MONITORING

Because the remediation involved the containment of wastes at the site, engineering controls were implemented. The engineering controls will require periodic maintenance and monitoring as prescribed in the Operation, Maintenance and Monitoring (OMM) Plan (a separate, standalone document). The OMM Plan is a comprehensive maintenance and monitoring plan that contains prescribed inspection, maintenance and monitoring activities specific to the Site.

SECTION 8
CERTIFICATION

8.1 NOTICE OF COMPLETION

NYSDEC monitored the closure construction according to generally accepted practices. Based on the field observations made by QC personnel, laboratory and field test data, the record drawings, and data provided by the Contractor, the construction observed at the site generally complied with the Contract Documents and the Remedial Action Plan approved by the NYSDEC.

8.2 LIMITATIONS

This Remedial Action Report was prepared by NYSDEC. This report applies specifically to the remedial action construction of the ETE Sanitation Landfill Site, in accordance with generally accepted engineering and construction practices, and requirements prescribed in DER 10. No warranty, expressed or implied, is made.

The observations and monitoring described in this report were made under the conditions stated. Conclusions made in this report were based on these observations and data obtained from both field and laboratory tests that were obtained from randomly spaced samples. Variations on material properties between test samples and locations may occur.

8.3 CERTIFICATION

The following page contains a certification statement issued by NYSDEC that the Site Remedial Action was constructed in accordance with the approved Final Design Report, approved design revisions, and approved field changes to the design.

REMEDIAL ACTION REPORT
ETE Sanitation and Landfill Site
NYSDEC Site No. 9-61-005
Town of Gainesville,
Wyoming County, New York

CERTIFICATION STATEMENT

I hereby certify[1], under penalty of law and as a Professional Engineer licensed in the State of New York that this document and all attachments were prepared by the New York State Department of Environmental Conservation (NYSDEC) under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, 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 knowing violations.

The purpose of this document, the Remedial Action Report, is to present documentation that the Remedial Action for the ETE Sanitation and Landfill Site, NYSDEC Site No. 9-61-005, Town of Gainesville, Wyoming County, New York was completed in substantial conformance with the NYSDEC approved Final Design Report (Camp, Dresser and McKee, 2000), approved design revisions, and approved field changes to the design. Construction activities were personally witnessed by me or by NYSDEC construction inspection personnel under my direct project supervision. NYSDEC construction inspection personnel were present daily during each construction phase, and documented the observations and data that are presented in this Remedial Action Report.

Eugene W. Melnyk, P.E.
State of New York Professional Engineer
No. 071847-1

New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

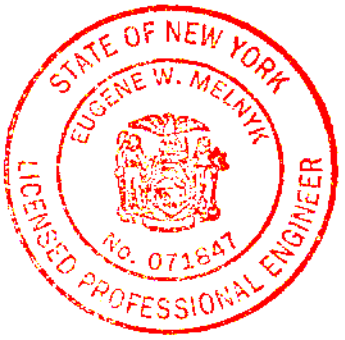
1. Certification/Certify means to state or declare a professional opinion of conditions whose true properties cannot be known at the time such certification is made, despite appropriate professional evaluation. The professional opinion made is based on limited observations and widely spaced tests. This certification of conditions in no way relieves any other party from meeting requirements imposed by contract or other means, nor does it warranty/guarantee the conditions of the constructed product.

REMEDIAL ACTION REPORT
ETE Sanitation and Landfill Site
NYSDEC Site No. 9-61-005
Town of Gainesville,
Wyoming County, New York

CERTIFICATION STATEMENT

I hereby certify[1], under penalty of law and as a Professional Engineer licensed in the State of New York that this document and all attachments were prepared by the New York State Department of Environmental Conservation (NYSDEC) under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, 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 knowing violations.

The purpose of this document, the Remedial Action Report, is to present documentation that the Remedial Action for the ETE Sanitation and Landfill Site, NYSDEC Site No. 9-61-005, Town of Gainesville, Wyoming County, New York was completed in substantial conformance with the NYSDEC approved Final Design Report (Camp, Dresser and McKee, 2000), approved design revisions, and approved field changes to the design. Construction activities were personally witnessed by me or by NYSDEC construction inspection personnel under my direct project supervision. NYSDEC construction inspection personnel were present daily during each construction phase, and documented the observations and data that are presented in this Remedial Action Report.



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SECTION 9
REMEDIATION CONSTRUCTION COSTS

9.1 BID TABULATION

The ETE landfill remediation was competitively bid. Sealed bids were received from three contractors. A summary of the bids is presented below.

BIDDER	**BID SUM**
Patrick Concrete Constructors	$2,188,061
Ontario Specialty Contracting	$2,877,196
Zoladz Construction	$4,065,297

The low bidder was Patrick Concrete Constructors (Patrick), and the contract to complete the remedial action was subsequently awarded to Patrick.

9.2 FINAL CONSTRUCTION COST SUMMARY

The bid items, final measured quantities, bid item values, final item costs, and change orders for the remedial action construction is presented below.

ITEMIZED PROPOSAL					WORK COMPLETED	
Item	Work Description	Unit price	Bid Quantity	Contract Amount	Actual Quantity	Actual Cost
1	Site Preparation	$40,000 LS	1 Lump Sum	$40,000	100%	$40,000
2	Site Services	$1,500/DAY	215 DAYS	$322,500	215 DAYS	$322,500
3	Excavation of Contaminated Soil	$15.75/CY	10,800 CY	$170,100	10,595 CY	$166,871.25
4	Excavation of Uncontaminated Soil	$9.50/CY	42,000 CY	$400,900	42,000 CY	$400,900
5	Gas Vent Geotextile Layer	$0.40/SF	323,500 SF	$129,400	323,500 SF	$129,400

6	40 mil LLDPE Membrane	$0.50/SF	323,500 SF	$161,750	323,500 SF	$161,750
7	Composite Drainage Net	$1.15/SF	323,500 SF	$327,025	323,500 SF	$327,025
8	Crushed Stone Roadway	$40.00/SY	900 SY	$36,000	900 SY	$36,000
9	Asphalt Roadway	Deleted	N/A	N/A	N/A	N/A
10	Landfill Gas Vents	$2,075/EA	9 EA	$18,675	9 EA	$18,675
11	Toe Drain	$45.00/LF	2,250 LF	$101,250	2,250 LF	$101,250
12	North Pond Outlet Structure and Embankment	$35,000 LS	1 Lump Sum	$35,000	100%	$35,000
13	9 inch thick rip-rap*	$32.50/SY	1,870 SY	$60,775	1,411 SY	$45,857.50
14	6 inch thick rip-rap*	$30.00/SY	290 SY	$8,700	100 SY	$3,000
15	Erosion Control Matting	$1.45/SY	27,200 SY	$39,440	27,200 SY	$39,440
16	Hydroseeding**	$2.70/SY	82,980 SY	$224,046	55,320 SY	$149,364
17	Health and Safety Monitoring	$450.00/DAY	150 Days	$67,500	41 DAYS	$18,450
			SUB - TOTALS	$2,188,061.00		$2,040,482.75
CO-1	Misc. Extra Work	Various Items		$102,022.29		$101,736.65
			TOTAL	**$2,290,083.29**		**$2,142,219.40**

Notes:

* - a credit for stone material was used to modify the quantity placed.

Unit Key:

LS = Lump Sum; CY = Cubic Yard; SF = Square Foot; LF = Lineal Foot; EA = Each;
CO – Change Order

SECTION 10
REFERENCES

1. Record of Decision, ETE Sanitation and Landfill Site, Gainesville, Wyoming County, New York; New York State Department of Environmental Conservation, March 1999.

2. Final Design Report, ETE Sanitation and Landfill Site, Gainesville, Wyoming County, New York; Camp Dresser and McKee Associates, July 2000.

3. Contract Documents, ETE Sanitation and Landfill, Gainesville, Wyoming County, New York; Camp Dresser and McKee Associates, July 2000; and as amended by Addendums 1 dated December 16, 2005, Addendum 2 dated March 20, 2006 and Addendum 3 dated March 22, 2006.

APPENDIX A
SITE TAX MAP AND DEED INFORMATION

APPENDIX B
DAILY WORK REPORTS

APPENDIX C
AS-BUILT CONSTRUCTION SCHEDULE

APPENDIX D
HEALTH AND SAFETY INSPECTION REPORTS

APPENDIX E
SOIL CONFIRMATION TEST RESULTS

APPENDIX F
SHOP DRAWING LIST

APPENDIX G
GEOMEMBRANE QA/QC DOCUMENTATION

G-1 - Geomembrane Manufacturer's QA Documentation

G-2 – Geomembrane Contractor Installation QA/QC Documentation and Third Party Destructive Test Results

G-3 – Geomembrane Warrantee Information

APPENDIX G-1
GEOMEMBRANE MANUFACTURERS QA DOCUMENTATION

APPENDIX G-2
GEOMEMBRANE CONTRACTOR INSTALLATION QA/QC DOCUMENTATION AND THIRD PARTY DESTRUCTION TEST RESULTS

APPENDIX G-3
GEOMEMBRANE WARRANTEE INFORMATION

APPENDIX H
GEONET MANUFACTURERS QA DOCUMENTATION

H-1 – Geonet and Filter Fabric Manufacturer's QA Documentation

H-2 – Geomembrane and Filter Fabric Warrantee Information

APPENDIX H -1
GEONET AND FILTER FABRIC MANUFACTURERS QA DOCUMENTATION

APPENDIX H -2
GEONET AND FILTER FABRIC WARRANTEE INFORMATION

APPENDIX I
COVER SOIL PHYSICAL TEST RESULTS

APPENDIX J
TOPSOIL PHYSICAL TEST RESULTS

APPENDIX K
CONSTRUCTION PHOTOLOG

APPENDIX L
RECORD DRAWINGS