FINAL ENGINEERING REPORT
SOUTH HILL DUMP REMEDIAL ACTION
SITE NUMBER: 712009

(T) CORTLANDVILLE (C) CORTLAND
REMEDIAL ACTION CONTRACT NUMBER: D007992

Prepared For:

New York State Department of Environmental Conservation

Division of Environmental Remediation
Remedial Bureau E
Albany, New York

Prepared By:

MACTEC Engineering and Consulting, PC
Portland, Maine

MACTEC Project Number: 3612122249

FEBRUARY 2014

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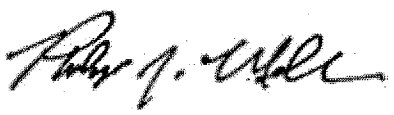

Philip J. Muller
Project Engineer

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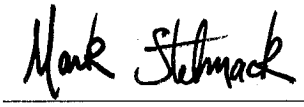

Mark J. Stelmack, P.E.
Associate Project Manager

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GLOSSARY OF ACRONYMS AND ABBREVIATION

ALTA	American Land Title Association
ARC	American Recyclers Company
ASTM	American Society for Testing and Material
bgs	below ground surface
CAMP	Community Air Monitoring Program
CCPD	Cortland County Planning Department
CQC	Contractor Quality Control
cy	cubic yards
DCE	dichloroethene
DustTRAK	DustTRAK Aerosol Monitor
ESG	The Environmental Service Group, Inc.
FO	Field Order
FS	Feasibility Study
ft	feet/foot
GPS	Global Positioning System
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
MACTEC	MACTEC Engineering and Consulting, P.C.
MBE	Minority-Owned Business Enterprise
mg/kg	milligrams per kilogram
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York Department of Environmental Conservation

GLOSSARY OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

NYSDOT	New York State Department of Transportation
PCB	polychlorinated biphenyls
pcf	pounds per cubic foot
PCO	Proposed Change Order
PE	polyethylene
PID	Photoionization Detector
ppb	parts per billion
QA	Quality Assurance
QC	Quality Control
Rev.	Revision
RFI	Request for Information
RI	Remedial Investigation
ROD	Record of Decision
SCOs	Soil Cleanup Objectives
sf	square feet
Site	South Hill Dump Site
SJB	SJB Services, Inc.
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TH Kinsella	Action Topsoil / T.H. Kinsella, Inc.
µg/L	micrograms per liter
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WBE	Woman-Owned Business Enterprise

1.0 SITE BACKGROUND

1.1 SITE LOCATION AND HISTORY

The South Hill Dump site (Site) is located in the Town of Cortlandville, Cortland County, two miles south of the Village of McGraw, on the south side of South Hill Road (Figure 1.1). Much of the property is steeply sloped. The area surrounding the Site includes wooded areas, orchards, and active and former farm fields. A mix of forested areas and apple orchards are located east of the Site. The topography in this area slopes to the south, toward an unnamed stream located approximately 1/4 mile south of the Site (MACTEC Engineering and Consulting, P.C. [MACTEC], 2006).

Two residential parcels abut the Site and are located along the southern and eastern sides of South Hill Road; the closest residence is less than ¼ mile southwest of the Site. The area west and north of the Site consists primarily of active farm land. A former apple orchard is located farther west. A mix of meadow, farm land, apple orchards, and forest area is located northeast of the Site. The Tioughnioga River is located southwest of the Site within 2 miles. The unnamed stream located south and east of the Site discharges to the Tioughnioga River via Hoxie Gorge Creek.

The Site was operated as a municipal waste disposal facility by the Town of Cortlandville from the early 1960s until 1972, although it is reported that local residents used the Site for trash disposal as early as 1949. During its years of operation, wastes were received from the Village of McGraw and the Towns of Cortlandville and Solon, as well as local industry. Access to the Site was reportedly unrestricted. It has also been reported that waste was often permitted to burn during landfill operation, and that at one time a waste oil pit may have existed. Operations are reported to have involved pushing waste over the working face of the landfill with some spreading and compaction. Cover material was reportedly spread one or more times per week. Prior to the remedial action described in this report, waste was protruding from the surface of the landfill across much of the Site, and included road construction debris, brush, stumps, tires, white metal, automobile parts, and miscellaneous industrial waste materials. Numerous decomposed drums were present across many areas of the landfill (MACTEC, 2006).

Landfill operations disturbed approximately one-third of the Site property; however, the entire Site was vegetated with grass, weeds, vines, prickers, shrubs, saplings, and trees prior to the remedial action.

In 1990, the New York State Department of Environmental Conservation (NYSDEC) conducted a Site inspection and collected soil and leachate samples. Analysis revealed the presence of chlorinated solvents and pesticides. Based on these data, the observed condition of the landfill (leachate seeps, numerous drum carcasses, etc.) and reported waste disposal history, the Site was proposed for listing on the New York State Registry in February 1991 and assigned a Class 2 designation. Class 2 Sites are defined as those which pose a significant threat to the public health or environment. In response to Site findings, the NYSDEC planned an interim removal measure (IRM) drum removal program. The purpose of the program was to characterize contents of the drums observed to contain suspect materials, and properly dispose of the drums. In March 1991 five drums of hazardous waste were removed from the Site. Analysis revealed that the drums contained trichloroethene (TCE). The waste was disposed at Frontier Chemical in Niagara Falls, New York (MACTEC, 2006).

In 1991 and 1992, the Cortland County Planning Department (CCPD) collected several surface water samples at the Site. The samples were collected from the intermittent stream at the toe of the landfill. Analytical data revealed relatively high concentrations of the solvents TCE and 1,2-dichloroethene (1,2-DCE).

In 1994, the NYSDEC collected surface water samples, sediment samples and soil samples from the Site. Analytical results revealed the presence of TCE and 1,2-DCE at concentrations slightly above NYSDEC guidance values. The samples were collected in immediate proximity to the CCPD sample locations. One sediment sample contained a relatively low concentration (9 micrograms per liter [µg/L]) of TCE. Polychlorinated biphenyls (PCBs) (at 79 µg/L) were detected in one sediment sample. Sediment sample results revealed slightly elevated concentrations of several metals including copper, mercury, nickel, and zinc. Analysis of the soil samples revealed relatively low concentrations of TCE, PCBs, cadmium, copper, and polyaromatic hydrocarbons.

Based upon the findings of the sampling programs, a Remedial Investigation (RI) was deemed necessary.

1.2 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

The RI field work was conducted by Parsons Engineering Science, Inc., of Liverpool, New York, under contract to the NYSDEC. The RI Report was completed by the NYSDEC (NYSDEC, 2003).

The RI included the following activities:

- A records search to identify the Site history, past operations and probable contaminants of concern. The records search involved a review and compilation of available State, County and Town records pertaining to the Site.
- Development of a Site base map illustrating Site topographic contours, roadways, property boundaries, and environmental sample locations.
- A test pit investigation to visually delineate the extent of subsurface contamination and characterize the shallow overburden geology.
- Collection and analysis of subsurface soil samples during the test pit investigation to identify the nature of the contamination present.
- Collection and analysis of sediment and surface water samples from visible seeps and from the intermittent stream located at the toe of the landfill.
- Installation of groundwater monitoring wells in overburden and bedrock to characterize Site geology and hydrogeology.
- Collection and analysis of subsurface soil samples during the installation of monitoring wells.
- Collection and analysis of groundwater samples to identify potential Site impacts to groundwater.
- A Fish and Wildlife Impact Analysis to identify existing or potential impacts to fish and wildlife.
- Review of Applicable Standards, Criteria, and Guidance and comparison to on-Site contaminant levels to assess the threat, if any, posed at the Site.

The RI recommended that a Feasibility Study (FS) be conducted due to the following reported concerns:

- Unregulated historic landfill operation
- Observation of existing waste protruding from the ground surface
- Reported contamination in Site soil, surface water, sediment, and groundwater
- Unfavorable geologic conditions, particularly the relatively shallow depth to fractured bedrock
- Likely existence of additional drums within the landfill; the drums may be acting as a continuing source of contamination, creating potential for long-term off-Site migration via surface water or groundwater.

An IRM was implemented on March 17, 1997. Marcor Environmental pumped 660 gallons of liquid (water reportedly containing a non-aqueous phase liquid) into a tanker truck from a test pit (TP-40) on the eastern edge of the landfill. Samples were collected for analysis to characterize the liquid for off-Site disposal. Analysis revealed the presence of 1,2-DCE, TCE, vinyl chloride, acetone, methylphenol and several inorganics including calcium, iron, magnesium and potassium. The waste was disposed at CWM Chemical Services in Model City, NY.

As a result of the RI, NYSDEC retained MACTEC to conduct an FS. The FS Report completed in 2006 included seven remedial alternatives capable of achieving the Remedial Action Objectives.

As a result of the FS, the Department issued the Record of Decision (ROD) in January 2008. The ROD presented the preferred remedial alternative which consisted of the construction of a two feet (ft) soil cover over the landfill including removal of surficial scrap metal, regrading of the landfill, establishing vegetation, and re-routing the drainage ditch to an area beyond the toe of the constructed cover system. Institutional and engineering controls, land use restrictions, and long term monitoring of groundwater, surface water, and sediment were identified as elements of the proposed site remedy (NYSDEC, 2008).

1.3 PRE-DESIGN INVESTIGATION AND REMEDIAL DESIGN

NYSDEC retained MACTEC to prepare a remedial design based on the selected remedy. As part of the remedial design, MACTEC conducted pre-design investigations in November 2009 and November 2010. In November 2009, MACTEC conducted a geophysical survey, including high resolution metal detection (electromagnetic survey) and ground penetrating radar, to locate the existing solid waste boundary. In November 2010, MACTEC conducted test pits at the northwest boundary of the Site, adjacent to South Hill Road, to complete the delineation of the limit of solid waste. These investigations resulted in the existing solid waste boundary, which is observed in the existing conditions plan and excavation plans of the contract drawings.

MACTEC completed the Remedial Design Drawings and bid documents for the Site remediation in March 2011.

1.4 PROJECT BIDDING INFORMATION AND AWARD

A mandatory pre-bid meeting was held by the NYSDEC at the Site on April 7, 2011 for potential bidders to review the existing conditions. Also, the pre-bid meeting was conducted to present the requirements for bidding the project, technical requirements of the Contract Documents, and administrative protocols to be followed during performance of the work.

An addendum was issued to the Contract Documents. Addendum Number 1 was issued on April 14, 2011. The Contract Documents, including the addendum, have been included as Appendix A.

NYSDEC received bids from five responsive bidders. Bids were opened on April 19, 2011. A summary of all bids is also provided in Appendix A. The apparent low bidder was Environmental Service Group, Inc. (ESG) of Tonawanda, New York with a total bid of $2,179,545.50. ESG's Bid Breakdown is included with the contractor submittals discussed in Subsection 2.2 of this report.

2.0 SUMMARY OF PRE-REMEDIAL ACTIVITIES

2.1 GENERAL

This subsection presents a summary of activities that occurred just prior to the remedial action.

2.1.1 Scope of Work

The project generally consisted of the following major work elements:

- mobilization
- site preparation
- site survey
- bulky waste-metal and tire removal and off-Site transportation and disposal
- drum removal and off-Site transportation and disposal
- on-site waste consolidation and subgrade preparation
- parking area waste consolidation
- winter shutdown
- subgrade preparation after winter shutdown
- landfill cover system installation
- groundwater monitoring well installation
- final site work

2.1.2 Schedule

A preconstruction meeting was held on September 6, 2011 at NYSDEC's central office located in Albany, New York. The preconstruction meeting minutes are provided in Appendix B. The preconstruction meeting clarified the roles and responsibilities of all parties involved with the project, and the Contractor established a firm project schedule. Representatives from NYSDEC, MACTEC, and ESG attended the meeting. ESG was given Notice to Proceed on August 30, 2011 (Appendix B).

ESG mobilized to the Site on September 12, 2011 with MACTEC providing full-time construction oversight. Work progressed - with occasional brief stoppages caused by wet weather conditions - through the beginning of the contract defined winter shutdown (November 15, 2011) until January 27, 2012, with the exception of a short holiday work stoppage from December 23, 2011 through January 2, 2012.

ESG resumed Site work on April 30, 2012 - two weeks beyond the contract defined end of winter shutdown. Work progressed continuously until Substantial Completion which was awarded to ESG on September 20, 2012. Final Completion was achieved on November 26, 2012.

2.2 SITE PREPARATION AND PROJECT PLAN SUBMITTALS

ESG submitted a Work Plan (Submittals 05 and 05A, Appendix C), Quality Assurance (QA)/Quality Control (QC) Plans (Submittals 03 and 03A, Appendix C), Progress Schedule (Submittals 05, 12, 12A, and 24, Appendix C), Sampling Plan (Submittals 02 and 02A, Appendix C) and Health and Safety Plan (HASP) (Submittals 01 and 01A, Appendix C) for review in response to the five day after notification of apparent low bid requirement in Section III, Article 5 of the Contract Documents. The submittals were reviewed by MACTEC to verify conformance with the Contract Documents. Upon review, the document was returned to the contractor "Approved", "Approved as Noted", "Resubmit with Revisions", "Disapproved", or "Not Subject to Approval." Contractor submittals and the submittal log are included in Appendix C.

2.2.1 Work Plan

The Work Plan provided descriptions of methods, procedures, and equipment to be used during completion of the project. The plan described the components of the major work items listed in Subsection 2.1.1.

Additional details of specific tasks were provided in subsequent submittals. MACTEC's review comments on ESG's Work Plan were provided within the official submittal response, dated July 27, 2011. ESG submitted a revised version of the work plan (Submittal 05A, Appendix C) on August 17, 2011 to incorporate review comments.

2.2.2 Contractor Quality Control Plan

ESG designated Mr. Robert Kilmer as its Contractor Quality Control (CQC) Manager for the duration of the project. Mr. Kilmer was also designated as the Contractor's Site Superintendent; thus, he did not meet the requirement outlined in Specification Section 01450, Paragraph 3.04.A.3, which states that the CQC Manager shall be independent of the Project Superintendent. However, Mr. Kilmer met the remaining CQC qualifications, and the Contractor had limited personnel on Site. Therefore, MACTEC approved Mr. Kilmer as the CQC Manager in this specific instance, and he satisfactorily performed the duties described in Specification Section 01450, Part 3 of the Contract Documents. MACTEC's review comments on ESG's Contractor QC Plan are provided within the official submittal response, dated July 27, 2011 and November 7, 2011 (Submittal 03 and 03A respectively, Appendix C).

2.2.3 Progress Schedule

ESG submitted a Preliminary Progress Schedule as part of the Work Plan (Submittal 05, Appendix C) with estimated durations for significant project items. The schedule followed the requirements of Contract Specification Section 00001. Subsequent to the pre-construction meeting, ESG submitted a revised schedule (Submittal 12) on September 9, 2012 to show the NYSDEC-approved dates for substantial and final completion. ESG submitted Revision (Rev.) 2 to the project schedule (Submittal 12A) on October 28, 2011 to include the dates specified for winter shutdown in Specification Section 01660. Then, Proposed Change Order (PCO) No. 2 was created to allow ESG to work during the winter shutdown, and Rev. 3 to the project schedule (Submittal 24, Appendix C) was submitted on November 22, 2011 to reflect work during the winter shutdown. ESG submitted additional revised schedules (Rev. 4, Submittal 70 and Rev. 5, not formally submitted with transmittal) during the project to reflect progress and formal changes (captured as PCOs). PCO No. 10 was submitted by ESG to extend the winter shutdown by 15 calendar days. PCOs are discussed in more detail in Subsection 5.2.3. Change Order Numbers 1 and 2 extended the contract 66 days from 390 days to 456 days. Rev. 7 (Submittal 70A) was provided as the "as-built" project schedule. Note: Rev. 6 was an internal progress schedule for ESG and was not submitted.

All revisions to the project schedule except Rev. 3 were approved by MACTEC. In the response to Rev. 3, MACTEC requested that ESG complete certain tasks prior to substantial completion.

2.3 HEALTH AND SAFETY

This subsection describes project activities related to health and safety.

2.3.1 General Health and Safety

ESG's HASP (Submittal 01, Appendix C) was reviewed by MACTEC to confirm that the plan followed the standard of practice within the environmental remediation field of work. ESG designated Mr. Laterio Humphrey as the Health and Safety Officer. ESG was responsible and liable for the health and safety of on-Site personnel. ESG's HASP contained specific requirements for personnel working on the Site. MACTEC's review comments on ESG's HASP were provided within the official submittal response, dated June 6, 2011. ESG submitted a revised version of the HASP (Submittal 01A, Appendix C) on June 28, 2011, to incorporate review comments. MACTEC's approved the revised HASP within the official submittal response, dated November 7, 2011.

Three safety zones were designated within the Site: the Exclusion Zone (remedial operations area), the Contamination Reduction Zone (buffer zone located between "clean" areas and the Exclusion Zone), and the Support Zone ("clean" area containing the Site office trailer and equipment storage). All personnel entering the Contamination Reduction Zone and Exclusion Zone were required to provide documentation of successful completion of the 40-hr Hazardous Waste Operations and Emergency Response course.

Mr. Humphrey conducted daily safety meetings before work activities commenced to review the scheduled work task for the day and associated safety hazards. In addition, job hazard analyses were reviewed before initiating a new task.

Personnel decontamination was accomplished by using disposable outer personnel protective equipment or dry decontamination by wiping off boots with a stiff brush.

2.3.2 Decontamination of Equipment

ESG constructed a decontamination pad which utilized a liner, aggregate base, sump pump, and a built-up perimeter soil berm, as approved in Submittal 16 (Appendix C). Equipment was decontaminated when it was demobilized from the Site. Otherwise, equipment remained in the exclusion zone, and material

deliveries and pickups were performed outside of the exclusion zone. Water used for decontamination was allowed to evaporate or was pumped onto the landfill surface and allowed to infiltrate.

2.3.3 On Site Air Monitoring

ESG utilized a Real-Time Air Monitoring Program, Documentation Air Monitoring Program, and a Community Air Monitoring Program (CAMP) in accordance with Section X, Specification 00003 and as provided in the HASP (Submittals 01 and 01A, Appendix C). Particulates and volatile organic compounds (VOCs) were continuously monitored at multiple perimeter locations at the Site during intrusive activities. Also, selected workers wore personal air monitors in the exclusion zone. Real-time air monitoring was monitored via DustTRAK Aerosol Monitor (DustTRAK) as well as visual inspection. DustTRAK was also used for perimeter documentation air monitoring. Sampling pumps with collection media were used to collect samples (documentation perimeter air monitoring and documentation personal air monitoring) for off-Site analysis for particulates, metals, and pesticides. VOCs were monitored utilizing a photoionization detector (PID). Readings were documented though electronic logs as well as through manual logs to ensure accuracy. Elaboration of air monitoring results is provided within Subsection 4.1.

2.4 PROJECT SUBMITTALS

The Contract Documents provided specifications for materials, equipment, and methods used for the project. ESG provided supplemental submittals for specific tasks and aspects of work. Each submittal was reviewed for conformance with the Contract Documents and commented on by MACTEC prior to acceptance. The submittal tracking log and contractor submittals are provided as Appendix C.

3.0 SUMMARY OF REMEDIAL ACTIVITIES

Remedial activities were completed during the dates outlined within the final Progress Schedule submitted by ESG (Rev. 5, included in Progress Meeting No. 17, Appendix D). Activities were overseen and inspected on a daily basis by MACTEC's Resident Engineer, and daily reports were prepared (by MACTEC) at the end of each day and provided to the NYSDEC via email (Engineer Observation Reports provided in Appendix E). A general summary of remedial activities is presented below including any deviations from the Contract Documents or the approved Work Plan. In addition, progress meetings were held biweekly with MACTEC, NYSDEC, and ESG representatives participating; meeting minutes are provided as Appendix D.

3.1 SITE MOBILIZATION

ESG mobilized to the Site on September 12, 2011 and completed mobilization activities during the week of September 19 - 23, 2011. During these two weeks, necessary materials were delivered to the Site to begin operations. Materials included tools and equipment, one shared office trailer with meteorological station, portable toilet, on-Site weight scale, and fencing. The office trailer was installed at the parking area (indicated as the drum staging and storage area on Contract Drawing C-103) near the entrance to the Site. The configuration of the existing temporary fencing and locking entrance gate was modified to create a fence and gate along South Hill Road. A NYSDEC-approved project sign was installed on posts between the fence and South Hill Road and remained in place during all phases of the remedial action. In addition, a New York State One Call (telephone call) was placed to identify and locate subsurface utilities on and immediately around the Site. ESG received dispensation from the New York State Department of Labor on September 28, 2011; the dispensation is included in Appendix B.

Office Trailer Installed at the Parking Area near the Entrance to the Site, Looking West

The decontamination pad was installed as part of Site mobilization on October 31, 2011 at the toe of South Hill Road, as indicated in the Site Layout Drawing (Submittal 7, Appendix C), which was a component of the Construction Work Plan. The decontamination pad was described in Subsection 2.3.2.

Also, as part of pre-remedial action activities, ESG documented the pre-construction condition of South Hill Road, by video, on October 10, 2011, as specified in Addendum No. 1. This documentation would later be compared to the post-construction condition of the road, and areas of the road would be identified for repair. The pre-remedial action video is included in Appendix B. Photographs depicting specific roadway areas repaired (with Town of Cortlandville approval) subsequent to the completion of the remedial action are included in Submittal 80, Appendix C.

3.2 SITE PREPARATION

Following mobilization, ESG installed the stabilized construction entrance with 6” of crushed stone on top of nonwoven geotextile. Also, ESG built up the entire parking area and a portion of the access road toward the landfill with six inches of compacted aggregate base over nonwoven geotextile.

The Site was relatively heavily wooded, and ESG cleared the trees with chain saws. The trees were stacked using a "thumb" attachment to the excavator, then dragged using steel cables with a dozer to the properties of two abutting owners located on the east and west sides of the site, with the owners' prior approval. Both property owners were provided with cut trees and logs generated from Site clearing activities, thereby eliminating the need to transport and dispose the cleared trees off-Site. In addition, ESG and the owner on the east side executed a mutual, private agreement (with compensation) for brush from the Site to be disposed on the east property. With Engineer approval, ESG elected not to clear the trees and brush at the location indicated as the Contractor Staging and Storage Area (Contract Drawing C-102) adjacent to the private property at the southwest portion of the Site.

Excavator with "Thumb" Attachment, Stacking Cut Trees and Brush, Looking Southeast

Subsequent to completion of clearing activities (most of the clearing was completed on October 13, 2011) and prior to grubbing of tree roots and removing brush, erosion and sedimentation controls were installed at the locations specified on the plans as well as observed areas needing controls, in accordance with ESG's Stormwater Pollution Prevention Plan. Erosion and sedimentation controls consisted of silt fence, augmented silt fence (silt fence supplemented with hay bales), and stone check dams at the southern (toe of slope) portion of the Site, and hay bales in the eastern drainage swale. Initially, ESG constructed the stone check dams with New York State Department of Transportation (NYSDOT) SS Type 1 (3/4" stone)

and later supplemented the material with larger stone and rip-rap placed inside gabion baskets at the request of the Engineer.

Grubbing of the root systems was performed with the excavator (Komatsu PC-300). Subsequently, all grubbed material was placed inside the landfill. Grubbings greater than six inches in diameter were broken down into smaller pieces using dozer tracks and the teeth of the excavator bucket. The grubbings were placed in single lifts of four ft or less with care to prevent the creation of large void spaces. The resulting disposal area for the grubbings was surveyed and plotted on the redline drawing, Submittal 91, Appendix C. Disposal of grubbings in the landfill was completed by November 15, 2011.

Dozer Tracking Grubbings during Placement within the Landfill Limits, Looking South

3.3 SITE SURVEY

ESG subcontracted Fisher Associates (Rochester, NY) to perform the initial field verification survey. Fisher Associates completed the initial field verification survey and established construction survey control on September 20, 2011. ESG indicated that there were no significant differences between the initial field verification survey and the survey included in the Contract Drawings. The initial field verification survey was submitted by ESG (Submittal 31, Appendix C) and approved by MACTEC.

During the initial field verification survey, Fisher field-flagged the property line, the limit of work, and the limit of grading.

ESG self-performed survey for construction layout using Global Positioning System (GPS). GPS surveying was used to establish and document the following: the new solid waste boundary; sub-grade and final grade elevations; horizontal and vertical extents of waste excavation between the existing and new solid waste boundaries for the purpose of volume calculations; location and inverts of installed storm water drainage culverts and detention basin outlet structures; soil sampling locations; and constructed drainage features including slope benches, downdrains, perimeter drainage channel, eastern drainage swale, and detention basin.

Fisher Associates also performed the American Land Title Association (ALTA) survey. The ALTA survey was completed in November 2012, submitted for review by ESG (Submittal 84 and 84A, Appendix C), and approved by MACTEC. The ALTA survey was approved on March 20, 2013.

3.4 "BULKY WASTE METAL" AND TIRE REMOVAL AND OFF-SITE TRANSPORTATION AND DISPOSAL

"Bulky waste metal" refers to surficial and buried solid wastes that are large in size and difficult to breakup and incorporate into the landfill though grading and compacting, including but not limited to white goods (appliances); tires and rims; construction and demolition debris; large scrap metal including junk car carcasses; large waste items (i.e. mattresses); and other items identified by MACTEC. ESG segregated bulky waste metal and tires from the solid waste and waste soil observed at the landfill surface. In addition, bulky waste metal and tires buried inside the landfill were segregated from the solid waste and waste soil as it was uncovered during waste consolidation activities. ESG did not purposely excavate waste to mine metal and tires, but rather removed the materials as they were encountered during the course of contract work.

Metal and tires were loaded onto a small trailer by the Case CX 130 excavator and pulled to the top of the landfill with the D-51 dozer. ESG stockpiled metal and tires at the top of the landfill, immediately below the toe of slope of the parking area. As roll-offs were delivered to the Site, the Case CX 130 excavator loaded metal and tires into separate roll-offs. Contentos (Cortland, NY) provided the roll-offs and transported them for off-Site disposal. Contentos recycled the metal, and transported the tires to Seneca

Meadows Landfill (Waterloo, NY) for disposal. Tires with hubs greater than 20 inches were processed for disposal at Alpco Recycling (Macedon, NY), and then transported for disposal at Seneca Meadows Landfill.

Scrap Metal and Tires Stockpiled Below the Toe of Slope of the Parking Area, Looking Northwest

Contentos transported 82.2 tons of metal and 61.9 tons of tires off Site. Bulky waste metals exceeded the original contract quantity by 38.2 tons, and bulky waste tires exceeded the original contract quantity by 58.4 tons. ESG submitted PCO No. 3 and PCO No. 20 (Appendix F) for compensation for the quantity increase. Details of bulky waste metal and tires transportation and recycling/disposal are summarized in Submittal 40C (Appendix C).

3.5 DRUM REMOVAL AND OFF-SITE TRANSPORTATION AND DISPOSAL

Intact and damaged drums with solid material contents located on the surface of the landfill or uncovered during waste consolidation activities were segregated and transported to a staging area in the northern portion of the Site, adjacent to South Hill Road. The drums were typically encountered in groups (drum nests) and in only a few landfill locations. Drum nest were located/uncovered at the eastern border of the landfill and immediately east of the MW-2 groundwater monitoring well cluster. These locations are shown in Submittal 33 as DL-1, DL-2, and DL-3. Soil samples were collected at these three locations at

the landfill to evaluate soil below the drum nests. Results indicated that additional soil excavation near the drum nests was not required (see Subsection 4.6 for the GPS locations of these documentation samples and details of the analytical results). These locations also contained a significant number of damaged drums and drum carcasses. Many drum carcasses and drum fragments that did not contain solid material contents were disposed off-Site as bulky waste metal as discussed in Subsection 3.4 of this report.

A total of 56 intact and damaged drums were relocated and staged on plastic and covered with plastic. Each drum was assigned a unique number, photographed, and categorized into one of four waste streams. The waste streams consisted mostly of the following solids: epoxy solids, fiberglass, paint, and ash mixed with soil. Waste characterization samples were collected from various drums to represent the four waste streams. A drum log with photographs and descriptions is included in Submittal 28 (Appendix C).

Drums Staged on Plastic for Off Site Transportation and Disposal, Looking Northeast

Analytical results of the waste characterization samples indicated that all four of the waste streams were non-hazardous (see Subsection 4.5). The Contract Documents allowed for disposal of non-hazardous drum contents within the landfill; however, NYSDEC requested that the non-hazardous drum contents be transported and disposed off-Site, thus off-Site disposal of the drums was completed by American Recyclers Company (ARC), an affiliate of ESG. ESG submitted PCO No. 5 (Appendix F) which

eliminated the Contract bid item for Hazardous Waste Drum Removal and Offsite Transportation and Disposal and replaced it with Non-hazardous Waste Drum Removal and Offsite Transportation and Disposal. The drums were loaded onto pallets and prepared for transportation and disposal. The disposal location was ARC, 177 Wales Ave, Tonawanda, NY. The non-hazardous waste manifest for the drums is included in Submittal 36 (Appendix C). The analytical results for the waste characterization sampling are discussed in more detail in Subsection 4.5.

3.6 ON-SITE WASTE CONSOLIDATION AND SUBGRADE PREPARATION

ESG began on-Site waste consolidation activities on October 27, 2011, during construction of the sedimentation basin located at the southern end of the landfill. Solid waste observed between the existing solid waste boundary and the new solid waste boundary was excavated and consolidated inside the new solid waste boundary. The location of the new solid waste boundary was documented using GPS technology. Inside the new boundary, solid waste was graded to maintain maximum 3 horizontal to 1 vertical (3:1) slopes and 5% minimum slopes, and was consolidated at locations requiring fill to achieve the subgrade elevations prescribed in the Contract Documents.

Solid waste encountered during the work consisted primarily of soil (presumed from use as historic daily cover), construction and demolition material (e.g., wood and various metal and plastic products), household waste (e.g., plastic containers, plastic bags, and toys), typewriter parts and ribbon, auto parts, tires, appliances and appliance parts, textiles, fishing line, glass bottles, shoes, glass, ash, newspapers, and other paper products. Exposed waste gave off a typical aged municipal solid waste odor close to the surface which typically dissipated quickly and was not encountered off-Site during the course of the contract work.

Consolidation of Waste Soil, Looking East

Solid Waste Consolidation (1), Looking West

Solid Waste Consolidation (2), Looking East

Solid Waste Consolidation (3), Looking South

Inspections and observations made during ESG's waste consolidation activities confirmed the presence of municipal/household and industrial wastes, consistent with the Site's reported past usage. Visual

evidence of past burning activities (ash and charred solid waste) was also encountered, supporting reports of burning as a means of disposal during landfill operation. Though an oil pit was reported to have been present during the landfill's years of operation (or a portion thereof), no direct evidence of such a pit was encountered during waste consolidation.

ESG determined that odor control measures were not necessary during waste consolidation activities. There were no complaints received from the public regarding odor during the work. However, ESG implemented air monitoring for dust and contaminants per the CAMP and HASP. Air monitoring was suspended during wet weather periods when soil and waste was visibly damp.

Typically, ESG excavated solid waste with the PC-300 and the Komatsu D-61 dozer, pushed it onto the footprint of the landfill and spread it in multiple lifts with a thickness of less than six inches. A Dynapac sheepsfoot roller was used to compact the waste after the dozer had placed lifts totaling approximately one to two ft.

Waste consolidation started at the toe of the landfill slope at the sedimentation basin and proceeded counter-clockwise around the landfill perimeter. Solid waste was consolidated until it was determined visually that there was no additional waste beyond the new boundary. Visually clean soil was excavated from outside the new solid waste boundary for use:

- in meeting the subgrade elevations indicated on Contract Drawings C-104 and C-105
- as select borrow for cover material for the upcoming winter shutdown
- in constructing the new access road
- in filling other areas beyond the new solid waste areas that were over excavated.

Storm water runoff from the landfill was directed to the sedimentation basin (constructed per Detail E, Contract Drawing C-302), which was filled with two ft of crushed stone and four-inch diameter underdrain piping. The crushed stone and subsequent build-up of sediment provided filtering for storm water before it entered the outlet culvert and discharged off-Site. Clean storm water run-on from the hill north of the Site was captured in the on-Site eastern drainage swale. ESG installed and maintained stone check dams and hay bales in the eastern drainage swale to provide erosion and sedimentation control.

Installing Crushed Stone and Underdrain Piping at the Sedimentation Basin, Looking Northeast

Subgrade preparation occurred simultaneously with waste consolidation and was performed primarily with the D-61 dozer. During subgrade preparation, ESG installed slope benches and downdrains as shown on the Contract Drawings C-104 through C-107. ESG employed GPS technology in the placement of survey stakes on the landfill indicating cut or fill locations in relation to the final subgrade.

Landfill Subgrade Preparation, looking South

Subgrade elevation was achieved on the landfill at the east side of the landfill toe of slope and proceeded up-slope around the landfill in a counter-clockwise direction, with the following exception. Subgrade was achieved at the landfill's center (highest portion) prior to achievement of subgrade at the west and southwest portions of the landfill. However, most of the waste consolidation had been completed (by December 12, 2011), and there was insufficient solid waste remaining beyond the new solid waste boundary to achieve required subgrade elevation on the west and southwest sides. Thus, with the approval of the Engineer, ESG removed the top fifteen ft of existing landfill material (to elevation 1,643 ft above sea level) and re-graded the material at locations requiring fill for subgrade achievement on the western and southwestern sides of the landfill.

During waste excavation for the construction of the sedimentation basin, ESG uncovered soil exhibiting a strong petroleum odor and visual black staining. At the Engineer's direction, ESG excavated the visually-impacted soil and temporarily stockpiled it inside the new solid waste boundary on plastic sheeting and with a plastic sheeting cover. The excavation volume for this soil removal was 203 cubic yards (cy), covered under Bid Item UC-8, Excess On-Site Waste Consolidation. Bottom and sidewall soil confirmation samples were collected from the excavation by ESG, and the excavation was backfilled with select borrow (see Subsection 4.4.1 for the GPS locations of the confirmation soil samples and details of the analytical results). Waste characterization testing was performed on a composite sample of the excavated soil, and the results indicated that the soil was non-hazardous solid waste (see Subsection 4.4.1 for details of the waste characterization analytical results). Therefore, the soil was allowed to be graded into the landfill subgrade in accordance with the Contract Documents.

3.7 PARKING AREA WASTE CONSOLIDATION

During waste consolidation activities at the toe of the slope of the Contractor parking area located near South Hill Road, ESG uncovered solid waste beyond the contract defined landfill limit. The extent of the waste was subsequently determined by conducting five test pits (PCO No. 6, Appendix F) in early December 2011. ESG submitted PCO No. 7 (Appendix F) to excavate the solid waste from the parking area for placement within the new landfill limit.

ESG returned to the Site on January 3, 2012 after the holiday break, and began the work associated with PCO No. 7. ESG conducted the following work items:

- demobilized the on-Site scale - see FO #3, Appendix G
- moved the construction trailer to the former drum staging area
- removed overburden from the parking area and stockpiled it for re-use
- re-established the survey control point
- excavated the solid waste in the parking area and consolidated it at the top of the landfill
- collected confirmation soil samples from the bottom and sidewalls of the excavation
- surveyed the excavation for payment purposes
- re-constructed the Site entrance road.

Excavation at the Former Parking Area, Looking Northwest

ESG completed work associated with the removal of solid waste at the parking area on January 10, 2012. The as-built survey of excavation indicated that 3,432 cy of overburden and solid waste were excavated from the parking area. The solid waste was re-located to the landfill, and the re-constructed entrance road was backfilled with 684.3 cy of overburden. A 10 ft x 10 ft x 2 ft deep excavation (included in the 3,432 cy amount) was required at the bottom of the excavation as a result of the bottom confirmation sample exhibiting concentrations of PCBs above the restricted residential use cleanup objectives. Subsection

4.3.1 includes details of the analytical results and GPS locations of the confirmation soil samples from the former parking area.

3.8 WINTER SHUTDOWN

During January 2012, in preparation for the winter shutdown , ESG covered the solid waste on the landfill with up to six inches of select borrow and placed hay on exposed soil throughout the Site. In addition, ESG added rip-rap, stone, and hay bale checkdams at erosion-sensitive locations on the Site as indicated on their winter shutdown plan submittal (Submittals 32 and 32A, Appendix C).

Solid Waste Covered with Six Inches of Select Borrow and Hay for Winter Shutdown, Looking Southeast

ESG demobilized for the winter shutdown on January 27, 2012. The construction trailer remained on-Site, and rip-rap, crushed stone, and hay bales were stockpiled for erosion and sedimentation controls, if necessary.

ESG inspected the landfill once every two weeks during the winter shutdown period. Inspection reports (six total) are included in Submittals 42A, 46A, 47, 48, 49, and 50 (Appendix C). ESG and MACTEC conducted a joint inspection of the Site on April 8, 2012, and ESG re-mobilized after winter shutdown on

April 30, 2012. During the winter shutdown, on February 14, 2012, NYSDEC collected a sample of the groundwater seep on the southeastern side of the landfill. The analytical results of the groundwater seep sample indicated the presence of VOCs, semivolatile organic compounds (SVOCs), and metals in the seep water (see Subsection 4.8). Physical measures undertaken to control the seep are described in Subsection 3.9.

3.9 SUBGRADE PREPARATION AFTER WINTER SHUTDOWN

Subsequent to the winter shutdown, ESG focused its work on the landfill cover subgrade preparation at the southeastern corner of the Site. Because the soil underlying the subgrade in this area was found saturated from the winter thaw, construction equipment could not operate effectively to achieve the required subgrade elevation. Contributing to the soil saturation was the presence of the groundwater seep, noted on the eastern side of the landfill. NYSDEC's decision was to eliminate the expression of the groundwater seep at ground surface to the extent practical. As described in more detail below, MACTEC directed ESG to excavate saturated soil and solid waste in the affected area and replace those materials with a combination of on-Site select borrow and a supporting geosynthetic material (i.e., geogrid) to augment placement of the subgrade and prevent surface expression of the seep.

ESG submitted PCO 9 (Appendix F) to remove saturated soil and solid waste at the seep area to bedrock (fractured shale). The excavated soil and waste was placed at the top of the landfill and allowed to dry. The seep was backfilled with loose nine-inch lifts of select borrow. Each lift of select borrow was compacted with the vibratory roller and "keyed" into the competent subgrade material beyond the excavation. In addition, ESG installed a geogrid material (Submittal 53A, Appendix C) that extended beyond the limits of the seep repair area to provide additional support for the landfill cover system that would be installed over it. Relatively smaller additional groundwater seeps were subsequently observed at ground surface at a few locations downgradient from the original seep on the eastern side of the landfill. Saturated soil was excavated to fractured shale at these groundwater seep locations, and rip rap imported from off-Site was backfilled in the excavation to provide a structural surface on which to backfill select borrow. A total of 790 cy of saturated soil and solid waste was removed from the multiple groundwater seeps and placed on top of the landfill.

Excavation of Soil at Groundwater Seep, Looking North

Similarly, the silty subgrade soil along the southern end (approximately 250 ft long) of the eastern perimeter road was observed to be saturated. MACTEC determined that the soil was unsatisfactory for use as roadway subbase, as it was too wet to compact and did not meet Specification Section 02300, Sub-Part 1.06C of the Contract Documents. Thus, ESG submitted PCO 11 (Appendix F) to remove the saturated soil to the fractured shale. The excavated soil was placed at the top of the landfill and allowed to dry, and the excavation was backfilled with structural fill material imported from off-Site (Type 2 crushed limestone, see PCO 11 [Appendix F] for sieve analysis) and compacted. On-Site select borrow material was backfilled in lifts and compacted to achieve the required subgrade elevation. A total of 401 cy of the unsatisfactory soil was excavated from the southern end of the eastern perimeter road and placed on top of the landfill.

Southern End of the Eastern Perimeter Road Excavated to Weathered Shale, Looking North

Soil beyond (below and outside) the Contract Document excavation limits was excavated at three additional areas (i.e., at the western perimeter road, near the midway point of the eastern perimeter road, and at the adjacent private property on the east side) as a result of observed visual staining and olfactory evidence. These areas are shown in the redline drawing, Submittal 91, Appendix C. Bottom and sidewall soil confirmation samples were collected by ESG from the excavations, and the excavations were backfilled with on-Site select borrow. Backfill at the adjacent private property on the east side of the landfill was finished with topsoil imported from off-Site and seeded with the same seed type as that provided for the landfill, see subsection 3.10. Subsection 4.4 includes details of the analytical results and survey coordinates of the confirmation soil samples from these excavations.

Excavated soil from these areas was graded into the landfill. ESG submitted PCOs for the removal of petroleum impacted soil at the eastern perimeter road (PCO 12, Appendix F) and at the adjacent private property on the east side of the landfill (PCO 13, Appendix F). A total of 403 cy of petroleum impacted soil were excavated from the eastern perimeter road, and a total of 1,153 cy of petroleum impacted soil were excavated from the adjacent private property on the east side of the landfill.

Landfill subgrade (i.e., top of waste and waste soil elevation in accordance with the Contract Drawings) was achieved in stages beginning in late May 2012 and ending in mid July 2012. ESG surveyed the

finished subgrade elevation with GPS, and provided record drawings as documented in submittals 57, 57A, 57B, 57C, and 57D (Appendix C). The Remedial Action Record is included as Appendix H. The subgrade record drawings were also used to check the landfill slopes for the maximum slope (3 horizontal to 1 vertical) and the minimum slope (5%) allowed by the Contract Documents, and later to assist with verification of installed landfill cover thickness.

3.10 LANDFILL COVER SYSTEM INSTALLATION

Subsequent to MACTEC's approval of the achieved subgrade surface slopes, ESG commenced placement and grading of cover soil imported from off-Site on June 11, 2012. The cover soil was a fine-grained soil, with more than 35% (by weight) passing the No. 200 sieve. The maximum particle size was two inches. Geotechnical reports (particle size analysis and modified Proctor) are included in Submittals 52, 52A, and 52C (Appendix C). Analytical testing requirements and results for cover soil are discussed in Subsection 4.2. Cover soil was obtained from Homer Quarry in Homer, NY, operated by Action Topsoil/T.H. Kinsella, Inc. (TH Kinsella). TH Kinsella also provided transport of the cover soil in dump trucks to the Site via Interstate 81, State Route 11, and the southern end of South Hill Road.

Cover soil was placed in two nine-inch compacted lifts by the dozers. Cover soil was installed to mimic the subgrade surface, including the slope benches and downdrain. Compaction was achieved using the vibratory sheepsfoot roller. Compaction testing was performed by nuclear method by SJB Services, Inc. (SJB), Cortland, NY, on each lift at a rate of one test per 4,000 square feet (sf). Compaction testing results are included in Submittal 74 (Appendix C).

Placing and Grading Cover Soil on the Landfill, Looking Southeast

Cover soil was completed such that the full cover thickness (18 inches, as shown in Detail H, Contract Drawing C-303) was achieved across the entire landfill - including at the new solid waste boundary - as shown in Details J and M on Contract Drawings C-303 and C-304, respectively. ESG assisted MACTEC to obtain QA checks (by GPS) for the required cover soil thickness at 39 random locations on the landfill on August 7, 2012. These location IDs are labeled QACS1 through QACS39 in the Record Final Cover Plan, Submittal 57F (Appendix C). After review of the QA data (recorded in the MACTEC field book), additional soil cover was required at three of the QA locations to achieve the required soil thickness. ESG completed the installation of the cover soil on August 8, 2012 by adding cover soil at those locations that were deficient based on MACTEC's QA thickness check. Approximately 18,000 tons of cover soil were installed.

Following completion of cover soil placement, ESG installed seven gas vents in accordance with Detail Q, Contract Drawing C-305, at the locations indicated on Contract Drawings C-106 and C-107. Also, ESG installed non-woven geotextile and rip rap at the downdrain and slope benches in accordance with the Contract Documents. Rip rap at the landfill perimeter apron was installed later (after installation of topsoil).

The specified size of the rip rap for installation at the downdrain was "standard" sizes D_{50}=eight inches and D_{100}=twelve inches. The guidance for selection of this "standard" riprap was the New York State Standards and Specifications for Erosion and Sediment Control (NYSDEC, Division of Water, August 2005). Rip rap suppliers in the area, however, were prepared to provide rip rap based on NYSDOT specifications. With MACTEC approval, ESG installed a mixture of two rip rap sizes (NYSDOT Stone Filling Fine and NYSDOT Stone Filling Light) to provide a comparable size to the required D_{50}=eight inches. The installed D_{100} upper size limit was closer to D_{100}=18 inches (originally specified as D_{100}=12 inches) and was approved by MACTEC. The rip rap was obtained from TH Kinsella in Syracuse, NY. The rip rap sizes for the fine and light stone were approved as Submittal 67A (Appendix C).

Rip Rap Installed at the Downdrain and the Bottom Slope Bench on the Western Side, Looking Southeast

The specified size of the rip rap for installation at the slope benches and landfill perimeter apron was "standard" sizes D_{50}=3 inches and D_{100}=4.5 inches. This guidance for the selection of "standard" rip rap was also the New York State Standards and Specifications for Erosion and Sediment Control (NYSDEC, Division of Water, August 2005). Rip rap suppliers in the area, however, were prepared to provide rip rap based on NYSDOT specifications. With MACTEC approval, ESG installed a non-standard crushed stone available from TH Kinsella blended with a 3-inch crushed stone. Prior to formal Contractor submittal, ESG provided a representative physical sample of the mixed stone, sorted into appropriate sizes, to MACTEC for review. The mixed stone was approved as Submittal 67 (Appendix C).

ESG placed and graded the six-inch topsoil layer (topsoil was imported from off-Site) beginning on August 13, 2012. Topsoil testing results (particle size, organic content, pH, soluble salt content, and soil nutrient analysis) are included in Submittals 69 and 69A (Appendix C). Analytical testing results for topsoil are discussed in Subsection 4.2. Topsoil was obtained from Homer Quarry in Homer, NY, operated by TH Kinsella. TH Kinsella also provided transport of the topsoil in dump trucks to the Site via Interstate 81, State Route 11, and the southern end of South Hill Road. The topsoil layer – with the exclusion of the slope benches, perimeter apron, and downdrain - was installed to mimic the finished subgrade surface. Approximately 7,000 tons of topsoil was installed.

Placing and Grading Topsoil on the Landfill, Looking Southwest

ESG completed the installation of topsoil on September 10, 2012. ESG surveyed final grade (top of topsoil) with GPS and provided a record drawing as documented in submittal 57E (Appendix C). The record drawing of the final grade was also used to check the landfill slopes for the maximum slope (3 horizontal to 1 vertical) and the minimum slope (5%) allowed by the Contract Documents, and to verify installed landfill cover and topsoil layer thickness.

ESG commenced hydroseeding on August 29, 2012 with a 600-gallon capacity hydroseeder pulled by the dozer, at areas on the landfill that had been completed to date with topsoil. The hydraulic seeding method (Submittal 72A), grass seed vendor's certificate (Submittal 71), and the fertilizer manufacturer's product data (Submittal 72A) were provided as submittals (Appendix C). ESG installed erosion control blankets (Submittal 68B, Appendix C) by hand on landfill slopes at the hydroseeded areas.

Laborers Installing Erosion Control Blankets on the Landfill Slope, Looking Southeast

The site was vandalized during Labor Day Weekend, 2012. The office trailer and ESG's trailer for tools were forced open. A laptop, camcorder, and drill were stolen. A police report was filed with the Cortland County Sheriff's Department.

3.11 GROUNDWATER MONITORING WELLS

On November 18, 2011, ESG subcontractor SJB abandoned existing groundwater monitoring wells MW-3S and MW-3B because these wells would otherwise have been located within the footprint of the new perimeter roadway on the eastern side of the landfill. MW-3S was pulled and then overdrilled with 8-inch outside diameter augers to a depth of 10 ft (bottom of the well). The boring was then tremie grouted with Type 1 cement/bentonite mixture prior to removing the augers. MW-3B was an open rock well with no polyvinyl chloride pipe. The open rock hole was tremie grouted with Type 1 cement/bentonite mixture from a depth of 26.3 ft (bottom of the well) to the ground surface. Decommissioning was conducted in

accordance with the contract documents and with CP-43, NYSDEC Groundwater Monitoring Well Decommissioning Policy. The well abandonment completion form and narrative are included as Submittal 54A (Appendix C).

Two new groundwater monitoring wells were installed between October 11, 2012 and October 16, 2012, to replace wells MW-3S and MW-3B. SJB installed new well MW-3SR to replace MW-3S in accordance with Detail V, Contract Drawing C-306 and new well MW-3BR to replace MW-3B in accordance with Detail U, Contract Drawing C-306. The new bedrock well, MW-3BR, was installed to 41 ft below ground surface (bgs), 15 ft deeper than specified in Detail U because competent rock was actually reached at 27 ft bgs (not 13 ft bgs, as anticipated in Detail U). The bottom of the new overburden well, MW-3SR, was installed at 24 ft bgs (not 15 ft bgs, as anticipated in Detail V) because groundwater was not encountered until 22.6 ft bgs during drilling. Well installation drilling records, well details, and well development records are included as Submittal 87 and 87A (Appendix C).

Installing Replacement Groundwater Monitoring Wells, Looking Northwest

3.12 FINAL SITE WORK

ESG constructed the eastern drainage swale and the western drainage channel with the rip rap mix (NYSDOT Stone Filling, Fine and Light) as shown in Detail L, Contract Drawing C-303 and Detail M,

Contract Drawing C-304 and in accordance with the alignment as shown on Contract Drawings C-106 and C-107. Three corrugated polyethylene (PE) culverts were installed. One twelve-inch culvert was installed along the western drainage channel, another twelve-inch culvert was installed as the outlet from the detention basin, and a 24-inch culvert was installed at the bottom of the downdrain to the detention basin. The culverts were installed as shown in Section 1, Contract Drawing C-305. The crushed stone bedding gradation was provided as Submittal 15 (Appendix C), and the PE piping specifications were provided as Submittal 23 (Appendix C).

Culvert and Rock Outlet Protection at the Detention Basin, Looking Northwest

As part of the final Site work, ESG installed the rock outlet protection at the culverts with the rip rap mix (NYSDOT Stone Filling, Fine and Light) as shown in Section 1, Contract Drawing C-305. Also, the perimeter access road was constructed by placing, grading, and compacting two nine-inch lifts of aggregate base (Submittal 11A, Appendix C). The perimeter access road was compacted with a smooth drum roller, and compaction testing was performed by the nuclear method by SJB at one test per 2,000 sf. Compaction testing results for the perimeter access roads are included in Submittal 79, Appendix C. MACTEC relaxed the compaction testing requirement for the second lift because MACTEC was satisfied with the compaction effort observed during installation of the second lift. A total of 27 water bars were installed per Detail O, Contract Drawing C-304, in the perimeter access road, to promote drainage from the perimeter roads to the perimeter drainage swales/channels.

Eastern Perimeter Access Road, Looking Southeast Along Eastern Edge of Landfill

ESG converted the sedimentation basin to a storm water detention basin on August 14, 2012, per Contract Addendum No. 1, by removing accumulated sediment and twelve inches of crushed stone and installing twelve inches of topsoil. In addition, ESG installed three orifices in the basin riser pipe at elevation 1553.5 ft. A concentric trash rack and anti-vortex device was installed per Field Order 5, Appendix G. Also, crushed stone was piled up around the base of the riser pipe in accordance with direction provided in Addendum No. 1. The sedimentation basin to detention basin conversion was completed in accordance with the Contract Documents.

Detention Basin, Looking Southeast

ESG graded, hydroseeded, and installed erosion control matting at all disturbed areas within the limit of grading (which coincided with the limit of work). Warning signs that read "No Trespassing" were installed approximately every 100 linear ft along the Site property boundary.

Finally, approximately 730 linear ft. of chain link fence and gate was installed by Whitmore Fencing (Dryden, NY) along the South Hill Road frontage, as shown in Contract Drawing C-107. Due to shallow bedrock and with MACTEC approval, ESG built up the area at the toe of South Hill Road with a soil berm, and the fence was installed on top of the soil berm.

3.13 CONTRACT COMPLETION

MACTEC conducted a substantial completion inspection on September 20, 2012, on which date it was determined that ESG had satisfactorily achieved Substantial Completion. Final Completion was achieved on November 26, 2012. The Substantial Completion Certification and the Final Completion Letter are in Appendix I. Included in Appendix I are ESG's Contractor Applications for Payment and certified payrolls generated during the remedial action.

Also included in Appendix I are the Contractor Quarterly Reports prepared by ESG and submitted to NYSDEC's Office of Minority and Women's Business Program. The reported information indicates that the contract goal for Women-Owned Business Enterprise (WBE) was 6%, and the actual result achieved was 6%. The reported information also indicates that the contract goal for Minority-Owned Business Enterprise (MBE) was 6%, and the actual result achieved was 0%. ESG reported that it made good faith efforts to meet the MBE/WBE goals established for the contract.

A list of subcontractors who performed work on-Site during the remedial action is summarized below. Based on information provided by ESG, approximately 30% of the on-Site work by dollar value was subcontracted.

Subcontractor Name	**Services Provided**	**Approximate Dollar Value**	**MBE (yes/no)**	**WBE (yes/no)**
Paradigm Environmental Service	Analytical laboratory	360,000	no	no
Page Transportation, Inc.	Non-hazardous material hauler	5,500	no	yes
Contentos	Metal/tire hauling and disposal	1,000	no	no
Action Topsoil/TH Kinsella	Stone and soil material	250,000	no	yes
Whitmore Fencing	Fence installation	16,000	no	no
Martisco Corp.	Pipe installation	1,000	no	no
All Star Leasing	Trailer rental	5,050	no	no
Rosewood Sign	Signs	900	no	no
Fisher Associates	Survey	33,125	no	yes
SJB Services Inc.	Well abandonment and installation, materials testing	7,500	no	no
EQ North East	Hazardous drum disposal	5,900	no	no

3.14 DEMOBILIZATION

Following completion of remedial construction activities, ESG removal of tools, supplies, equipment, and office trailer from the Site was completed on September 21, 2012. ESG terminated full time involvement at the site on October 26, 2012.

4.0 SAMPLING AND ANALYSIS

4.1 AIR MONITORING

As described within Subsection 2.3.3 and except during wet weather periods when soil and waste was visibly damp, total particulates were continuously monitored downwind of the exclusion zone with real time monitoring and documentation air monitoring, and at three other perimeter locations (documentation air monitoring) during working hours. In addition, at least two selected ESG workers, determined to be at high risk for contamination exposure, wore personal air sampling pumps and collection media for documentation air monitoring during intrusive activities.

Particulates were monitored with a DustTRAK as well as visual inspection; VOCs were monitored utilizing a PID. Each piece of monitoring equipment was programmed to sound an alarm during action level exceedances to ensure a safe working environment. In addition, daily electronic logs were reviewed by the Site Health and Safety Officer and kept on-Site for the duration of the project. Real time readings, daily average, and daily maximum for particulates from the DustTRAK air monitors are included in Submittals 30 and 30B (Appendix C). Also, collection media from selected workers (personal air monitoring samples) were analyzed for metals and pesticides. These results are included in Submittal 30 (Appendix C).

4.1.1 Dust Monitoring (Particulates) Results

As described within ESG's CAMP, the following action level was employed for particulates during remedial construction activities: an action level of 150 micrograms per cubic meter or 0.150 milligrams per cubic meter was established to employ dust suppression techniques. This action level was not exceeded during remedial construction (waste consolidation and subgrade preparation) activities due at least in part to relatively wet conditions on Site during the fall of 2011 and January 2012. The action level was exceeded on at least six different days after winter shutdown during the placing and grading of cover soil and topsoil; however, dust suppression (application of water) was used regularly when dusty conditions were observed, typically during the summer months. Water was obtained from an unnamed tributary to the Tioughnioga River located approximately 1 ½ miles southwest of the landfill along South Hill Road between the Interstate 81 overpass and State Highway 11. Use of water from this tributary was

approved by the Town of Cortlandville Highway Department. ESG used a 2,000 gallon water truck to apply water for dust suppression.

Dust monitoring logs are provided in Submittal 30 and 30B, Appendix C.

4.1.2 VOC Monitoring Results

As described within the ESG's CAMP, an action level of five parts per million within the breathing zone was established as the 'stop work' action level. This action level was never exceeded within the breathing zone, and there were no observed VOC detections above background; thus, work was not stopped at any point during the work as a result of the observed VOC readings. ESG monitored VOCs continuously during excavation and consolidation of solid waste; VOC monitoring was discontinued when waste consolidation activities were completed.

4.2 RESULTS OF ANALYTICAL TESTING OF IMPORTED SOIL

Cover soil and topsoil were imported for use in the landfill cover system, and imported select borrow was used for filling outside the new solid waste boundary on its eastern side to establish final grade. Analytical testing was required for the imported soil at a rate of 1 sample per 1,000 cy; analytical results were compared to the Unrestricted Use Soil Cleanup Objectives (SCOs) for Protection of Public Health as defined within the New York Code, Rules and Regulations (NYCRR), Subpart 375-6.4 (NYSDEC, 2006), and included in 6 NYCRR Part 375 Table 375.6.8(a) in accordance with the ROD.

Analytical testing data for cover soil are included in Submittals 51, 51B, and 51C. Analytical testing data for topsoil are included in Submittal 64, and analytical testing data for imported select borrow are included in Submittal 58A. These submittals are included in Appendix C. No soil was rejected from the off-Site borrow source - Homer Quarry - based on the analytical results.

4.3 COMPACTION TESTING

SJB was subcontracted by ESG to perform compaction testing in accordance with Supplemental Specification Section 02300 *Earthwork* of the Contract Documents. Prior to testing, the maximum dry density and optimum moisture of each material proposed to be used for backfilling was obtained through

Proctor Testing via American Society for Testing and Materials (ASTM) 1557-09 D Method C: Modified. A maximum dry density of 135.3 pounds per cubic foot (pcf) with optimal moisture of 7.5% was obtained for cover soil; values of 144.7 pcf and 5.0% were obtained for aggregate base material. Proctor Test results were provided by ESG as Submittals 52 and 52A (cover soil) and 11A (aggregate base).

Nuclear density testing via ASTM D 6938 was utilized to obtain a percentage of the maximum dry density for each lift compacted. Testing locations were randomly selected by SJB in conformance with Section 02300, Paragraph 3.12, A.2: one test for every 4,000 sf for cover soil and one test for every 2,000 sf for aggregate base material.

Results were compared to the specifications outlined in Section 02300, Paragraph 3.11.D. Cover soil was compacted to 90% of the maximum dry density, and aggregate base material at the perimeter access road was compacted to 95% of the maximum dry density. Testing locations are included with Submittal 74 for cover soil and Submittal 79 for aggregate base material. Crushed stone used as bedding material for piping was not compaction tested, as approved by MACTEC, because the stone bedding was compacted to a firm and unyielding condition.

4.4 CONFIRMATION SOIL SAMPLING

ESG collected soil confirmation samples on excavation bottoms and excavation sidewalls subsequent to removal of solid waste from outside the new solid waste boundary, at the rates indicated in Section 02105, Paragraph 3.04B: one sample per 60 linear ft of excavation sidewall; and one sample from the bottom of the excavation per 3,600 sf of bottom area. Solid waste excavation was considered complete when there was no waste remaining at the bottom or sidewall of the excavation, as determined visually. At some sample locations, fractured bedrock was encountered at the bottom of the excavation. No bottom confirmation soil samples were collected in fractured bedrock. Soil confirmation sample locations are included on a site plan presented in Submittal 33C, Appendix C. In total, ESG collected 33 confirmation soil samples.

Sampling methods were conducted in accordance with the ESG-provided Sampling Plan (Submittal 2A, Appendix C). Each soil sample was collected as a discrete entity, placed into glass jars, and assigned a unique identification. Samples were submitted to Paradigm Environmental Services, Inc, Rochester, NY, for Target Analyte List (TAL) metals analysis via United States Environmental Protection Agency

(USEPA) method 6010B, mercury using USEPA Method 7471B, cyanide using USEPA Method 9010 or equivalent, Target Compound List VOCs using USEPA 8260, TAL SVOCs using USEPA Method 8270C, and TAL Pesticides/PCBs using Method 8081/8082.

Confirmation soil samples were compared to the Restricted Residential Use SCOs for Protection of Public Health as defined within the NYCRR, Subpart 375-6.4 (NYSDEC, 2006), and included in 6 NYCRR Part 375 Table 375.6.8(b) in accordance with the ROD. In accordance with the Contract Documents, additional excavation was required if analytical results exceeded the Restricted Residential use SCOs. Only one location (at the former parking area) required additional excavation due to analytical results of confirmation soil sampling. Analytical results for confirmation soil samples are included in Submittals 20, 21, 22, 38, and 41.

4.4.1 Former Parking Area

The confirmation sample (LCS-12, Submittal 38) collected at the bottom of the excavation from the former parking area contained PCBs with concentrations above the Restricted Residential Use SCO: Aroclor-1242 was detected at 3.29 milligrams per kilogram (mg/kg), and Aroclor-1254 was detected at 3.48 mg/kg; the Restricted Residential SCO is 1 mg/kg for PCBs. Accordingly, ESG excavated a 10 ft x 10 ft area at a depth of two ft, and relocated the excavated soil inside the new solid waste boundary. ESG collected a composite confirmation sample (LCS-13, Submittal 41) at the sidewalls and bottom at the excavation. Results indicated that PCBs were non-detect and additional excavation (beyond the 10 ft x 10 ft x 2 ft excavation) at the former parking area was not required.

4.5 CONFIRMATION AND WASTE CHARACTERISTIC SAMPLING OF AREAS CONTAINING PETROLEUM IMPACTED SOIL

Confirmation soil samples included the samples collected by ESG after excavating areas (three areas total) below the required subgrade. These areas included: petroleum impacted soil at the sedimentation basin; petroleum impacted soil at the perimeter access road at the western side of the Site; and petroleum impacted soil at the adjacent private property on the landfill's east side. In addition, waste characteristic soil samples were collected from the observed petroleum impacted soil (at two of the locations) to determine whether the soil could be disposed on-Site inside the new solid waste boundary. The petroleum impacted soil was stained black and exhibited a petroleum odor.

4.5.1 Sedimentation Basin

ESG collected a waste characteristic soil sample (SWC-1, Submittal 20) from the observed petroleum impacted soil at the location of the sedimentation basin. The results of the waste characterization sample indicated that the Restricted Residential SCOs were not exceeded, and the petroleum impacted soil was allowed to be relocated inside the new solid waste boundary in accordance with the Contract Documents.

After removing the extents of the petroleum impacted soil (at MACTEC's direction, based on visual and olfactory observation) at the location of the sedimentation basin, ESG collected confirmation soil samples (Samples SBW, NBW, WBW, and EBW, Submittal 21) at the four sidewalls on November 8, 2011. Fractured bedrock was encountered at the bottom of the excavation, and therefore no bottom confirmation soil sample was collected. The results of the confirmation sampling indicated that the Restricted Residential SCOs were not exceeded, and therefore no further excavation was conducted.

4.5.2 Perimeter Access Road

ESG collected soil confirmation samples from three sidewalls and bottom at the petroleum impacted removal at the perimeter access road at the western side of the Site. A sidewall confirmation sample was not collected on the sidewall of the landfill because that side was at the new solid waste boundary and was eventually filled with landfill cover material. Analytical results indicated that the Restricted Residential SCOs were not exceeded, and therefore no further soil excavation was conducted.

4.5.3 Abutting Private Property to the East

ESG collected a waste characterization sample (EWE-1, Submittal 56A) of petroleum impacted soil identified at the eastern perimeter road and extending onto the abutting private property on the landfill's east side. The analytical results indicated that contaminant concentrations in the impacted soil were below Restricted Residential SCOs. Thus, MACTEC directed ESG to excavate the petroleum impacted soil and to dispose the soil inside the new solid waste boundary.

ESG collected four sidewall soil confirmation samples (Shmitz#1 through Shmitz#4, Submittal 62B) on June 4, 2012, on the exposed sidewalls on the abutting property. The bottom of the excavation was fractured bedrock.

The analytical results from the sidewall confirmation soil samples at the exposed sidewall at the adjacent private property (east side) excavation were compared to Unrestricted Use SCOs as defined within the NYCRR, Subpart 375-6.3. One pesticide (4,4-dichlorodiphenyldichloroethane) was detected at 3.90 parts per billion (ppb) in one of the four sidewall samples (Shmitz#1). This detection exceeded its Unrestricted Use SCO of 3.3 ppb. However, it was noted that this detection is significantly lower than the Restricted Residential SCO (1,800 ppb). It was also noted that pesticides may likely have been historically applied on the abutting property during past farming activities independent of on-Site landfilling operations at the Site. Parts of the abutting property are used for farming, and the area near the Site contains numerous fruit trees. As a result, it was determined after discussions with NYSDEC that additional soil would not be excavated.

Results of soil confirmation sampling and waste characterization sampling conducted by ESG during the remedial action were uploaded to NYSDEC's EQuIS electronic data deliverable system. A summary of soil confirmation sample results uploaded to EQuIS during the remedial action including survey coordinate information is provided in Appendix J.

4.6 DRUM SAMPLING

As discussed in Subsection 3.5, 56 waste drums were relocated from several areas on the landfill, staged on plastic near the decontamination pad at the South Hill Road site entrance, and covered with plastic. Six composite waste characterization samples (Comp#1, Comp#2, Drum#4, Drum#53, Drum#39, and Drum#48) were collected from the drums to represent the four suspected waste streams. The waste characterization samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP metals, TCLP SVOCs, TCLP pesticides, TCLP herbicides, ignitability, pH, reactivity, paint filter test, PCBs, and percent solids to satisfy the sampling requirements of the Contract Documents and the permitted disposal facility. The results of the six waste characterization samples - included in Submittal 29 - indicated that the materials in the drums were considered Resource Conservation and Recovery Act non-hazardous.

4.7 DOCUMENTATION SAMPLING

Documentation soil samples DL-1, DL-2, and DL-3 were collected at locations (inside the new solid waste boundary) where waste drum nests were removed. Analytical results for these samples (Submittal 20) indicated that Restricted Residential SCOs were not exceeded. In accordance with the Contract Documents, the soil in the immediate vicinity of the drum nests was covered with additional waste and new landfill cover material.

4.8 GROUNDWATER SEEP SAMPLING

Results of the groundwater seep sample discussed in Subsection 3.8 are included in Appendix K. The analytical results of the seep sample indicated the presence of VOCs, SVOCs, and metals. Physical measures undertaken to control the seep are described in Subsection 3.9.

5.0 ISSUES AND CHANGES TO THE CONTRACT

5.1 PROJECT SCHEDULE

The initial project schedule (Submittal 05, Appendix C) was revised several times during the project to accommodate actual milestone dates and to reflect current progress at the Site. ESG provided an "as-built" progress schedule - Rev. 7 - reflecting completion dates for each major phase of work (Submittal 70A, Appendix C). The date of substantial completion was moved from the initial anticipated date of July 24, 2012 to September 20, 2012 due to unanticipated delays encountered during the remedial action. Similarly, the date of final completion was moved from the initial anticipated date of September 22, 2012 to November 26, 2012.

5.2 CONSTRUCTION ISSUES

This subsection describes project activities related to Requests for Information (RFIs), Field Orders (FOs), PCOs, and Change Orders.

5.2.1 Requests for Information

Three RFIs were submitted by ESG to MACTEC during remedial construction activities. RFIs were addressed by MACTEC and subsequent FOs or PCOs, if needed, were issued accordingly. RFIs and associated responses are provided as Appendix L.

RFI 01 clarified how transportation and disposal of grubbing debris - specifically stumps greater than six inches in diameter - were to be paid under the Contract. The Contract Documents stated that grubbed materials - including roots and stumps - greater than six inches in diameter were to be considered impacted wastes and disposed off-Site as solid waste. Thus, ESG interpreted payment for disposal of stumps and roots to be covered under UC-10, Solid Waste Off-Site Transportation and Disposal. However, MACTEC determined in RFI No. 1 that roots and stumps greater than six inches diameter shall be paid for under LS-4, Site Preparation. ESG disagreed with MACTEC's determination in RFI No. 1. Ultimately, MACTEC determined that there would be room for material disposal under the landfill cover and issued FO No. 2, which allowed roots and stumps greater than six inches to be broken up and placed

in the landfill at locations with the largest observed fill depths to achieve the subgrade elevation prescribed in the Contract Documents.

RFI 02 provided definitions for substantial completion of individual Contract bid items. MACTEC provided a table with definitions of percent complete for each bid item, and allowable remaining items at substantial completion.

RFI 03 requested approval to use a Komatsu D-61 low ground pressure bull dozer for compacting solid waste/waste soil within the new solid waste boundary. In response, MACTEC disapproved substituting the dozer tracking for sheepsfoot rolling (as specified in the Contract documents) to compact solid waste.

5.2.2 Field Orders

Five FOs were issued by MACTEC during remedial construction activities. FOs and associated approval forms are provided as Appendix G.

In FO 01, MACTEC approved installation of staked hay bales as part of the augmented silt fence as a comparable sediment barrier to the Contract-specified filter berm.

In FO 02, MACTEC approved disposal of larger-sized grubbings (including stumps) within the new solid waste boundary; the approval stipulated that the disposal would occur in such a manner to mitigate potential for future landfill settlement/subsidence. MACTEC included several additional conditions for the on-Site disposal.

In FO 03, MACTEC approved the removal of the on-Site weight scale, and terminated the requirement to confirm the weight of each truck containing imported select borrow. The imported select borrow was subsequently paid for on a weight basis as determined by using certified weight tickets from a certified scale at the borrow source.

FO 04 introduced Rev. 1 to Contract Drawing C-107 to indicate the locations of the 11 water bars referenced on Rev 0 of the drawing.

FO 05 introduced Detail W, Concentric Trash Rack and Anti-Vortex Device, provided as supplemental information to assist in constructing and installing the device as called out on Contract Drawing C-302, Detail E.

5.2.3 Proposed Change Orders

21 PCOs were submitted by ESG during remedial construction activities. All PCOs were reviewed and approved by MACTEC on behalf of the NYSDEC. The PCOs and the PCO summary table are included in Appendix F.

PCO 01 was submitted by ESG to add the abutting owner on the west property boundary as additional insured. There was no additional cost to the project.

PCO 02 was submitted by ESG to work into the winter shutdown period. Only two months of work prior to winter shutdown was allowed under the contract due to the timeframe of the start of the project and winter shutdown date. This was determined not to be enough time to achieve the progress required to complete the actual contract work on time. ESG worked on-Site past the contract winter shutdown date of November 15, 2011 until January 27, 2012, due to weather conditions allowing ESG to progress on the contract. The change in contract price was an increase of $54,150.00.

PCO 03 was submitted by ESG to be compensated for costs associated with additional transportation and disposal of bulky waste metal and bulky waste tires. Unforeseen quantities of bulky waste metal (38.2 addition tons of metal) and tires (54.7 additional tons of tires) were uncovered during waste consolidation. The change in contract price was an increase of $40,746.50.

PCO 04 was submitted by ESG to be compensated for costs associated with the waste characterization sampling and analysis of unforeseen petroleum contaminated soil uncovered during waste consolidation. This soil was not transported and disposed off-Site. Thus, these costs were not associated with an existing line item (i.e. UC-10, Solid Waste Off-Site Transportation and Disposal), and a PCO was necessary to compensate ESG. The change in contract price was an increase of $1,300.00.

PCO 05 was submitted by ESG as a refund for transporting and disposing drums as non-hazardous. The Contract required the drums to be transported and disposed as hazardous; however, waste characterization

analytical results indicated that the drum contents were non-hazardous. The change in contract price was a decrease of $8,684.50.

PCO 06 was submitted by ESG to be compensated for costs associated with conducting test pits in the Contractor parking area to determine the extents of solid waste. Unforeseen solid waste was uncovered outside the existing limit of waste in the parking area. The change in contract price was an increase of $1,791.12.

PCO 07 was submitted by ESG to be compensated for costs associated with removing unforeseen solid waste at the parking area and consolidating it inside the new solid waste boundary. Associated costs included reinstalling the construction entrance, moving the construction trailer, and reestablishing the survey control point. The change in contract price was an increase of $63,824.70, and the change in contract time was an increase of 20 calendar days.

PCO 08 was created to decrease the required number of soil confirmation samples because many confirmation sidewall and bottom samples were not needed. At some soil excavations, there were no sidewalls to sample because the depth of excavation was shallow; at other excavations, weathered bedrock was reached and bottom sampling was not necessary. This PCO was an administrative change, and there was no formal PCO paperwork associated with it. The change in contract price was a decrease of $122,250.00.

PCO 09 was submitted by ESG to be compensated for costs associated with removing saturated subgrade soil at multiple groundwater seeps in the southeast area of the new solid waste landfill, backfilling with compacted select borrow, and installing a geo-grid over the repaired area. The change in contract price was an increase of $44,768.85, and the change in contract time was an increase of 9 calendar days.

PCO 10 was submitted by ESG for a time extension for the winter shutdown. There was inclement weather at the end of the contract defined winter shutdown period. There was no formal PCO paperwork associated with this PCO. The change in contract time was an increase of 15 calendar days.

PCO 11 was submitted by ESG to be compensated for costs associated with removing saturated subgrade soil (i.e. determined to be unsatisfactory soil by MACTEC) at the southern end of the eastern perimeter

road. This included backfilling with structural fill material. The change in contract price was an increase of $37,754.27, and the change in contract time was an increase of 7 calendar days.

PCO 12 was submitted by ESG to be compensated for costs associated with removing impacted soil encountered below subgrade of the eastern perimeter road and backfilling with select borrow. The change in contract price was an increase of $8,989.00, and the change in contract time was an increase of 6 calendar days.

PCO 13 was submitted by ESG to be compensated for costs associated with removing impacted soil encountered at the eastern property boundary and extending onto the adjacent private property. This included test pitting, clearing, backfilling with select borrow, placing topsoil, and seeding. The change in contract price was an increase of $30,521.00, and the change in contract time was an increase of 6 calendar days.

PCO 14 was submitted by ESG to be compensated for installing non-woven geotextile fabric at the surface of the sedimentation basin to act as an additional filter for storm water entering the basin and to increase the detention time of captured storm water. The change in contract price was an increase of $1,250.

PCO 15 was submitted by ESG to be compensated for 11 water bars required to be installed along the western perimeter road. These water bars were required to be installed per the contract drawings; however, the graphic for the water bars did not print in the drawing set reproduced. There was no formal PCO paperwork associated with this PCO. The change in contract price was an increase of $5,000.

PCO 16 was submitted by ESG to be compensated for installing a soil berm with rip rap face at the outlet of the detention basin. The change in contract price was an increase of $4,950.00.

PCO 17 was submitted by ESG to be compensated for obtaining an Abstract of Title for the South Hill Dump Property. There was no formal PCO paperwork associated with this PCO. The change in contract price was an increase of $350.

PCO 18 was submitted by ESG to be compensated for obtaining a Title Insurance Policy for the South Hill Dump Property. There was no formal PCO paperwork associated with this PCO. The change in contract price was an increase of $350.

PCO 19 was submitted by ESG to be compensated for advancing the bedrock well and overburden well deeper than anticipated. There was no formal PCO paperwork associated with this PCO. The change in contract price was an increase of $2,482.50.

PCO 20 was submitted by ESG to be compensated for transporting and disposing 3.69 tons of post-winter shut down Bulky Waste Tires. There was no formal PCO paperwork associated with this PCO; however the unit rate for transporting and disposing Bulky Waste Tires is the same as indicated in PCO 03. The change in contract price was an increase of $2,490.75.

PCO 21 was created to decrease the required number of documentation samples because there were limited cases of visually impacted soil. This PCO was an administrative change, and there was no formal PCO paperwork associated with it. The change in contract price was a decrease of $81,500.00.

5.2.4 Change Orders

PCO Numbers 1 through 9 described in Subsection 5.2.3 were processed into Change Order No. 1 (see Appendix F) for a net increase in contract price of $26,177.82 and a 20-day increase in contract time. Change Order No. 1 was subsequently executed by the office of the New York State Comptroller on September 13, 2012.

PCOs Nos. 10 through 21 described in Subsection 5.2.3 were processed into Change Order No. 2 (see Appendix F) for a net increase in contract price of $57,406.37 and a 46-day increase in contract time. The change order was executed by the office of the New York State Comptroller on February 15, 2013.

As a result of Change Order Nos. 1 and 2, the revised contract amount was $2,263,129.69, and the contract time for Final Completion was 456 calendar days.

6.0 ENGINEER'S CONSTRUCTION CERTIFICATION

6.1 CONCLUSIONS AND CERTIFICATION

I, Mark Stelmack, certify that I am currently a New York State licensed professional engineer. I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Design Plans and Specifications were implemented and that all construction activities were completed in substantial conformance with the DER-approved Remedial Design Plans and Specifications.

All use restrictions, institutional controls, engineering controls and/or any operation and maintenance requirements applicable to the site are contained in an environmental easement created and recorded pursuant to ECL 71-3605 and that any affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

A Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of any engineering controls employed at the site including the proper maintenance of any remaining monitoring wells, and that such plan has been approved by the DER.

Signature: Mark Stelmack

Mark J. Stelmack, P.E.
Associate Engineer - Environmental

Date: FEB 18, 2014

7.0 REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2011a. Remedial Action Drawings, South Hill Dump, NYSDEC Site No. 712009. March 2011.

MACTEC, 2011b. Inspection Report (Test Pits), South Hill Dump, NYSDEC Site No. 712009. January 25, 2011.

MACTEC, 2010. Design Summary Memorandum: South Hill Dump, NYSDEC Site No. 712009. April 19, 2010.

MACTEC, 2006. Feasibility Study Report: South Hill Dump, NYSDEC Site No. 712009. December 2006.

New York State Department of Environmental Conservation (NYSDEC), 2008. Record of Decision – South Hill Dump Site, Town of Cortlandville, Cortland County, New York: Site Number 712009. January 2008.

NYSDEC, 2006. New York Codes, Rules and Regulations, Title 6, Part 375 – Environmental Remedial Programs. Amended December 2006.

NYSDEC, Division of Water, 2005. New York State Standards and Specifications for Erosion and Sediment Control. August 2005.

NYSDEC, 2003. Remedial Investigation Report for the South Hill Dump Inactive Hazardous Waste Disposal Site No. 712009. July 2003.

FIGURE

APPENDIX A

CONTRACT DOCUMENTS, ADDENDA, AND BID SUMMARY

APPENDIX B

PRE-CONSTRUCTION MEETING MINUTES, APPARENT LOW BID NOTICE, NOTICE OF INTENT TO AWARD, NOTICE TO PROCEED, AND DOL DISPENSATION

APPENDIX C

CONTRACTOR SUBMITTALS AND SUBMITTAL LOG

APPENDIX D

PROGRESS MEETING MINUTES

APPENDIX E

ENGINEER OBSERVATION REPORTS

APPENDIX F

PROPOSED CHANGE ORDERS, PCO LOG, AND CHANGE ORDERS

APPENDIX G

FIELD ORDERS AND FO LOG

APPENDIX H

REMEDIAL ACTION RECORD

APPENDIX I

SUBSTANTIAL COMPLETION CERTIFICATION, FINAL COMPLETION LETTER, CONTRACTOR APPLICATION FOR PAYMENT AND CERTIFIED PAYROLLS, PRIME CONTRACTOR CERTIFICATION, FINAL PAYMENT RELEASE, SUBCONTRACTOR CERTIFICATIONS, AND MWBE QUARTERLY REPORTS

APPENDIX J

EQUIS SUMMARY

APPENDIX K

GROUNDWATER SEEP ANALYTICAL RESULTS

APPENDIX L

REQUESTS FOR INFORMATION AND RFI LOG