Polymer Applications Site

ERIE COUNTY, NEW YORK

FINAL ENGINEERING REPORT

NYSDEC Site Number: 915044

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
12th Floor, 625 Broadway
Albany, NY 12233-7017

Prepared by:

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MARCH 2012

CERTIFICATION

I, Jack E. Wilcox, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Design was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Design.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Design and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in for the remedy.

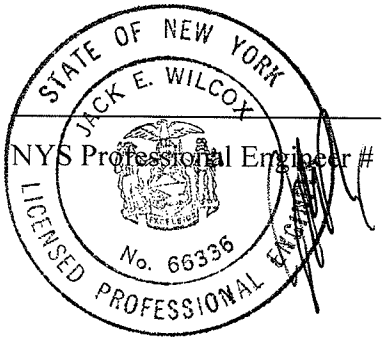
I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Jack E. Wilcox, of URS Corporation, 77 Goodell St., Buffalo, NY, am certifying as Owner's Designated Site Representative for the site.



NYS Professional Engineer #

4/17/12

Date

Signature

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ACM	Asbestos-Containing Material
CAMP	Community Air Monitoring Plan
DUSR	Data Usability Summary Report
EC	Environment Canada
FER	Final Engineering Report
FO	Field Order
FTP	File Transfer Protocol (internet-based system for sharing and storing project files in electronic format)
gal.	Gallon
GES	Groundwater and Environmental Services, Inc.
HASP	Health and Safety Plan
IR	Inspection Report
kg	kilograms
mg	milligrams
no.	number
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Dept. of Environmental Conservation
NYSDOH	New York State Dept. of Health
OSHA	Occupational Safety and Health Administration
PCO	Proposed Change Order
PID	Photo-Ionization Detector
PPM	parts per million
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RD	Remedial Design
RFI	Request For Information (by Contractor)
RFP	Request For Proposal
ROD	Record of Decision
SACM	Suspected Asbestos-Containing Material
SCE	SCE Environmental, Inc.
SCO	Soil Clean-Up Objective
SMP	Site Management Plan
SMR	Self-Monitoring Report
SVOC	Semi-Volatile Organic Compound
URS	URS Corporation, Inc.
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WBE	Women-owned Business Enterprise
WTS	Water Treatment System
WWTP	Waste Water Treatment Plant

1.0 SITE DESCRIPTION AND BACKGROUND

1.1 General

The Polymer Applications site is a 6.4-acre property listed under the inactive hazardous waste site registry (Site no. 915044) of the New York State Department of Environmental Conservation (NYSDEC). The property is located in the Town of Tonawanda, Erie County, New York. As result of the Remedial Action described in this Final Engineering Report (FER), the site has been remediated to commercial use standards.

Figures showing the site location of this 6.4-acre site located in the Town of Tonawanda, Erie County, New York are provided in Figures 1 and 2. The boundaries of the site are more fully described in the metes and bounds site description included as Appendix A to this FER.

An electronic copy of this FER with all supporting documentation is included as Appendix B.

1.2 Site History

Polymer Applications, Inc. operated at the site from 1968 through 1988. Its activities included the manufacture of phenolic resins, phenol-formaldehyde resins, plastics, and various rubber products for use in automotive, paint, and coatings industry.

Disposal practices at the site included the discharge of un-reacted phenols, phenolic resins, and light hydrocarbons into an onsite lagoon. Historical aerial photos also showed significant volumes of liquids within the former bermed storage tank areas. In addition, there have been several reports of spills from approximately 1977-1988. In July 1988, a major fire severely damaged the process and tank farm areas of the site. An estimated 70,000 gallons of a phenol/solvent mixture were released during the fire.

In 1983, the Department first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a was a temporary classification assigned to the site that had inadequate and/or insufficient data for inclusion in any of the other classifications. In 1991, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In 1995, a State funded Remedial Investigation and Feasibility Study (RI/FS) was completed. This investigation characterized the nature and extent of onsite and off-site contamination, and resulted in the March 1996 Record of Decision (ROD) for the site. An emergency removal action was also completed by the U.S. Environmental Protection Agency (EPA) in November 1996. This removal action included the following activities: the classification, stabilization, and disposal of a large number of drums of hazardous substances; the cleaning and decontamination of chemical storage tanks; and the removal and proper disposal of all remaining hazardous substances.

A soil treatability study was performed in 1997 which indicated that the bio-treatment remedy in the ROD could effectively treat the site contaminants. The Remedial Design was completed in February 1999. Remedy construction began in 2005 and was completed in 2006. The soil bio-treatment cell operated until January 2007. It was shut down after sampling of the treatment cell soils indicated that there were no appreciable reductions in the contaminants of concern.

Consequently, a ROD Amendment was issued by the Department in December 2009. The remedy in the ROD Amendment established Soil Cleanup Objectives (SCOs) for the compounds of concern, xylene and phenols. The SCOs were established to meet both the 6 NYCRR Part 375 Commercial-Use soil clean-up standards as well as the Land Disposal Restrictions for hazardous waste identified in 6 NYCRR Part 376 for those compounds. The remedy called for the excavation and proper off-site disposal of all contaminated soils remaining on site which were above the SCOs. The ROD

Amendment also included provisions for imposition of institutional control in the form of an environmental easement, development of a site management plan, and periodic certification of the institutional controls by a professional engineer. The design for the excavation and removal of contaminated soils was completed in January 2011. Implementation of the excavation and removal of contaminated soils began in February 2011 and was completed in December 2011.

2.0 SUMMARY OF SITE REMEDY

2.1 Remedial Action Objectives

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) were identified in both the ROD and Amended ROD:

1. Eliminate the potential for direct human or animal contact with the contaminated on-site and off-site soils;
2. Mitigate the impacts of contaminated groundwater to the environment (i.e. prevent off site migration of groundwater);
3. Prevent, to the extent practicable, impacts from site contaminants to the site groundwater;
4. Achieve, to the extent practicable, groundwater quality SCGs; and
5. Eliminate the threat to surrounding surface water quality by preventing discharges from contaminated site soils.

2.2 Description of the Selected Remedy

The site has been remediated in accordance with the remedy selected by the NYSDEC in the ROD dated March 3, 1996 and ROD amendment dated December 9, 2009 (contained in Appendix C). The factors considered during the selection of the remedy are those listed in 6NYCRR 375-1.8. The following are the components of the selected remedy as identified in the Amended ROD:

1. Implementation of remedial design program to verify the components of the conceptual design and provide the details necessary for the construction and monitoring of the remedial program;
2. Excavation of contaminated soils within the footprint of the bio-treatment cell;
3. Treatment/disposal of soils with contaminants above LDRs at an appropriate disposal facility;

4. Dismantling and reuse/salvage (as appropriate) of the air and water treatment system components of the bio-treatment cell;
5. Re-sampling of shallow groundwater in the northeastern portion of the site following contaminant source removal, with implementation of long term groundwater monitoring, if necessary;
6. Imposition of an institutional control in the form of an environmental easement that will require (a) limiting the use and development of the property to commercial use, which will also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls;
7. Development of a site management plan which will include the following institutional and engineering controls: (a) continued evaluation of the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (b) monitoring of groundwater, if necessary; (c) identification of any use restrictions on the site; and
8. Periodic provision by the property owner of a certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

3.0 INTERIM REMEDIAL MEASURES AND PREVIOUS REMEDIAL CONTRACTS

3.1 Interim Remedial Measures

No IRMs were performed for this site.

3.2 Previous Remedial Contracts

Construction of the initial remedial design was completed between 2005 and 2006. That construction followed the Final Remedial Design that was approved in 1999. That design included minor modifications (elimination of the asphalt cap and elimination of the repair of the underground containment wall) from the remedy identified in the 1996 ROD. The remedy as constructed in 2005-2006 consisted of the following major activities:

- Removal and off-site disposal (as hazardous waste) of 3,537 tons of contaminated concrete;
- Removal and off-site disposal (as hazardous waste) of approximately 4,250 tons of contaminated soils;
- Removal and off-site disposal (as non-hazardous waste) of approximately 4,270 tons of contaminated soils;
- Removal and off-site disposal of approximately 16 tons of non-friable asbestos;
- Removal and off-site disposal of approximately 2 tons of friable asbestos;
- Removal and off-site disposal of 4 drums of hazardous transformer oil;
- Removal and off-site disposal of 22 drums of non-hazardous transformer oil;
- Removal and off-site disposal of numerous drums of hazardous and non-hazardous chemicals remaining in site warehouse;
- Removal of 5,257 cubic yards of contaminated soils from off-site areas and consolidation into the on-site bio-treatment cell;

- Installation of two deep (approximately 65 feet below grade) overburden groundwater recovery wells to extract potentially impacted deep aquifer groundwater;
- Construction and operation of a bio-treatment cell and air and groundwater treatment system for the treatment of contaminated soils and groundwater.
- A Final Remediation Certification Report for the 2005-2006 Remedial Action was prepared by URS in January, 2007.

The soil bio-treatment cell operated until January 2007. It was shut down after sampling of the treatment cell soils indicated that there were no appreciable reductions in the contaminants of concern.

4.0 DESCRIPTION OF REMEDIAL ACTION

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved Remedial Design (RD) for the Polymer Applications site (January, 2011). Copies of the Contract Documents that were developed to implement the RD are included as Appendix D to this FER. All deviations from the RD are noted in Section 4.9, below.

4.1 Governing Documents

4.1.1 Contractor Plans

All relevant plans, including the following, were developed for the project by Groundwater and Environmental Services, Inc. (GES):

- Health and Safety Plan (discussed below)
- Filling and Grading Work Plan
- Excavation Work Plan
- Transportation and Disposal Plan
- Erosion and Sediment Control Plan
- Traffic Plan

URS reviewed all such plans and submittals and confirmed that they were in compliance with the requirements of the Contract Documents and the amended ROD (contained in Appendix C). Once approved, all of the plans were provided to NYSDEC in a timely manner and prior to the start of relevant portion of the work. Copies of all approved contractor submittals, and the submittal log maintained by URS Corporation, Inc. (URS) throughout the project, are contained in Appendix E.

4.1.2 Site Specific Health & Safety Plan (HASP)

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including site and worker safety requirements mandated by Federal OSHA.

The Health and Safety Plan (HASP) was complied with for all remedial and invasive work performed at the Site.

The HASP was developed and implemented by GES. A copy is included with other contractor submittals, in Appendix E.

4.1.3 Quality Assurance Project Plan (QAPP)

No formal QAPP was required, developed, or implemented for the project. (URS prepared a Data Usability Summary Report (DUSR) in accordance with NYSDEC protocols. The DUSR summarizes the limited data validation performed on the post-excavation documentation samples that GES collected from the bottom and sidewalls of the excavation. That DUSR is included in this FER as Appendix R.)

Soil and water samples for this project were analyzed by TestAmerica Laboratories in Tonawanda, NY, under contract to the NYSDEC (call-out contract no. C200305). A copy of the Standby Contractor Authorization Form is included with other Contract Documents in Appendix D. Analyses were specified in that contract to be performed in accordance with the June 2000 (or most current) edition of the NYSDEC Analytical Services Protocol for soil and groundwater.

4.1.4 Community Air Monitoring Plan (CAMP)

GES implemented the CAMP for this project. The components of their CAMP included the Air Monitoring Plan and Community Protection Plan defined in their approved Health and Safety Plan (submittal 01035-1 in Appendix E). The plans comprised monitoring of the site perimeter at one upwind and three downwind locations

for particulates and volatile organic compounds (VOCs). GES prepared a daily summary report of the previous day's CAMP results by 10 a.m. the next morning. Those reports are included in Appendix F.

4.2 Remedial Program Elements

4.2.1 Consultants

For this remediation contract, URS developed the Remedial Design (the Contract Documents contained in Appendix C), performed asbestos surveys of existing buildings 1 through 4 and 6 (the locations of all structures at the start of remediation are shown on Figure 3), and provided construction management and monitoring during the remedial action. URS developed the Site Management Plan (submitted separately) and this Final Engineering Report (FER).

4.2.2 Contractors

The majority of the work covered by this FER was performed by the prime contractor, GES, or by others, listed below, under subcontract to GES. For this contract, no limit was placed on the proportion of the work that could be subcontracted (in Addendum No. 1 to the Request for Proposals in Appendix D). A significant portion of this Remedial Action was performed by GES's subcontractors. Thus, in this FER, reference to "GES" should be taken to mean "GES and/or its subcontractors."

GES developed all submittals and work plans, administered the Health and Safety Plan, the Community Air Monitoring Plan, collected all soil and environmental samples, and developed, provided, and operated the water treatment system. The following firms were subcontracted by GES for the work stated:

- SCE Environmental Group. This contractor performed the majority of the construction activities on the project, including demolition of Building No. 6, grouting of monitoring wells, stripping, excavation, and stockpiling of all project soils, load-out of contaminated soil above SCOs, replacement

of all other soils as on-site backfill, construction of ancillary earthworks (earth dike, etc.), provision and placement of off-site backfill, final grading, and seeding.

- Russo Development, Inc.: Work included demolition of Buildings No. 1 through 4, asbestos abatement of Buildings No. 2 and 4, transportation of ACM from that demolition to Modern Landfill, Inc., and repair of the existing site perimeter fence.
- Geiter-Done, Inc.: Work included the controlled demolition, with asbestos in place, of Building No. 5, and hauling of the resultant suspected asbestos-containing material (SACM) waste to Chaffee Landfill, Inc. for disposal.
- Horizon Environment, Inc.: This firm was the approved, licensed disposal facility for all site soil above SCOs (except those disposed of with the drums).
- Laidlaw Bulk Carrier Group, Inc. (a New York State-listed woman-owned business enterprise, WBE): Responsible for hauling of contaminated soils above SCOs to Horizon, the approved disposal facility
- Fisher Associates (WBE): Surveyor.
- Carmen M. Pariso, Inc. of Tonawanda, NY: Trucking company for provision and delivery of off-site fill, stone for access roads, etc.
- Chaffee Landfill, Inc.: Used for disposal of potentially-asbestos-containing materials from the controlled demolition of Building No. 5.
- Modern Landfill, Inc.: Disposal facility for the ACM from the roofs of Buildings No. 2 and 4.
- Frank's Vacuum Truck Service: Used for transport of drums to Chemtron disposal facility.
- Chemtron Corporation: Licensed hazardous waste treatment and disposal facility in Avon, Ohio to which overpacked drums were transported for disposal.
- Other, minor disposal facilities for C&D debris, scrap metal, etc.

Other project work was performed by additional firms contracted directly by the NYSDEC:

- TestAmerica Laboratories, Inc.: Performed soil and water analytical services.
- SJB Services, Inc.: Performed air and performance monitoring for asbestos abatement activities at Buildings No. 2 and 4.
- EmpireGEO Service, Inc.: Implemented environmental monitoring for controlled demolition, with asbestos in place, of Building No. 5.

4.2.3 Site Preparation

Mobilization

The project experienced only one mobilization, but was started and stopped several times prior to the beginning of actual remedial excavation:

- Feb. 15, 2011: Russo demolished Building No. 1 and repaired the existing site perimeter chain-link fence. GES provided on-site supervision without mobilizing any site facilities.
- March 2 to March 9, 2011: Russo performed asbestos abatement of Buildings No. 2 and 4, and demolished Buildings No. 1 through 4. GES provided on-site supervision without mobilizing any site facilities. SJB Services provided asbestos abatement performance and perimeter monitoring.
- March 14, 2011: GES and SCE began mobilization, including site facilities, equipment, and the water treatment plant.
- March 17 to 24, 2011: Geiter-Done, Inc. performed controlled demolition, with asbestos in-place, of Building No. 5. EmpireGEO Services performed perimeter air monitoring.

- March 25, 2011: GES was forced to halt all project work and demobilize all personnel because it could not complete any further work until at least one of the following occurred: 1) removal by National Grid of the transformer from the pole adjacent to Building No. 6, to allow demolition of that building, or 2) granting by Environment Canada of an import permit to allow soil above SCOs to be hauled into, and disposed of in, Canada (the permit is actually granted to the disposal facility, in this case Horizon Environmental, to allow them to accept the waste).
- May 2 to 5, 2011: National Grid removed the transformer adjacent to Building No. 6. SCE and GES returned to site temporarily to demolish the building and also to conduct performance tests of the water treatment system.
- June 3, 2011: Environment Canada granted a permit to Horizon for the import of soils from the Polymer site.
- June 13, 2011: GES and SCE returned to site to begin remedial excavation and complete the project.

4.2.4 General Site Controls

GES controlled the site and site access. All people entering the site were given health and safety briefings, and were required to sign in on a log book that GES maintained in the site office trailer near the entrance. GES maintained a separate log on which all on-site personnel (workers and supervisory staff) signed in and out daily. All on-site personnel provided certificates of the required OSHA training and medical monitoring. Such certificates were maintained on site by GES.

One of the first work elements performed for the project was the repair of the existing perimeter chain-link fence that encloses the site. The fence restricted access to the site to the two front gates for the duration of the contract, with one exception. On July 7, 2011, vandals broke into the site office trailer, stealing equipment and personal belongings.

GES reported the break-in and theft to the Town of Tonawanda Police Department. A copy of the Police Report is contained in Apendix Y. The means by which the vandals gained access to the site was determined subsequently, on August 4, 2011, when a cut in the perimeter chain-link fence fabric was noted along the northern boundary. . GES repaired the fence that day.

Site security was breached two additional times:

- On August 3, 2011, an unauthorized vehicle whose driver claiming to be a National Grid, Inc. subcontractor entered the site, drove rapidly around the site, and left only when threatened by GES with police action. GES required that the driver sign in on the visitor log. He left site without further incident.
- On October 12, 2011, an unauthorized truck attempted to enter the northern gate of the site very rapidly, accidentally running over one of the gate leaves in the process. The trucker's insurance company contracted Russo to repair the damage.

Erosion and sediment controls were implemented in accordance with the Contractor's approved Erosion and Sediment Control Plan, and consisted primarily of silt fence at specific points around the perimeter of the site, and (as part of the decontamination process) washing sediments from truck tires before the truck left the site.

All equipment was decontaminated, at the decontamination station along the south side of the main building, when leaving the Contamination Reduction Zone.

4.2.5 Nuisance controls

Nuisance controls, specifically those for odors, dusts, traffic, and the like were implemented in accordance with the relevant plans described throughout this FER.

Dust was controlled throughout the project by frequent application of water to access roads and other travelled areas.

No complaints were received from the surrounding public regarding odors during the project. The site is located in an industrial area - there are no manned work areas for significant distances downwind of the property boundary.

Impacts to traffic on River Road, specifically queuing of trucks in front of the site, was prevented by use of the northern gate for access to the site during the majority of loading operations. This provided adequate storage at the front of the site for trucks waiting to proceed over the decon pad to the excavation/loading area at the back of the site.

On a few occasions, mud was tracked from the site (outside of the contamination reduction zone, after the decon pad) out onto River Road. In such cases, GES workers immediately removed the mud from the road with brooms and shovels.

4.2.6 CAMP results

GES developed and submitted its Community Air Monitoring program in two separate sections of its HASP (submittal 01035-1 in Appendix E): Attachment G, the Air Monitoring Program, and Attachment M, the Community Protection Program. GES implemented these programs during all intrusive activities, which occurred from June 20, 2011 until October 20, 2011.

VOC and particulate concentrations at the site perimeter exceeded the action levels (5 ppm time-weighted average) intermittently throughout the project, but only for durations less than 15 minutes. Mitigative measures were required of GES on September 1 and 2, 2011, when excavation in significantly contaminated soil near the eastern (downwind) fence line caused VOC levels at the downwind perimeter to exceed those criteria. GES halted its work activities, and misted the excavation and temporary stockpiles with water and BioSolve. GES halted its excavation briefly for the same reason, though no misting was performed, on September 15, 2011.

Copies of all reports generated by GES in accordance with their approved the

Community Protection Plan and Air Monitoring Program are provided in electronic format in Appendix F.

GES's daily air monitoring reports in Appendix F contain also the results of work zone monitoring, which GES used to determine the level of PPE required for its workers. Elevated VOC levels necessitated frequent upgrades to level C protection for personnel in the exclusion zone.

4.2.7 Reporting

URS's Resident Engineer produced an inspection report (IR) daily during all site activities. The IRs comprised a summary of the work performed for the day covered, relevant conversations and direction provided, photos of the work activities, etc. The IRs were posted on line (to a third-party FTP site) daily. Access to the FTP site was provided to the GES, URS, and NYSDEC personnel.

All daily reports are included in electronic format in Appendix G.

4.3 Contaminated Materials Removal

4.3.1 Soil Cleanup Objectives (SCOs)

The amended ROD required that soil exceeding the Commercial-use standards identified in 6 NYCRR Part 375 for the contaminants of concern be removed from the site. Additionally, the amended ROD indicated that the SCOs should meet the 6 NYCRR Part 376 Land Disposal Restrictions (LDRs) to "ensure that all soils are removed from site that would be regulated as hazardous waste. Since these soil cleanup criteria will also meet Commercial Use SCOs, the site will be suitable for future and industrial uses." The following table summarizes the development of the SCOs.

TABLE 1

Soil Clean-Up Objectives (SCOs) for the Polymer Applications Project

Compound	Units	Part 376 LDR[(1)]	Part 375 Commercial-Use Standard	SCO in Amended ROD
Xylene	mg/kg	300	500	300
Phenol	mg/kg	62	500	62

Notes: (1) These levels are 10 times the Universal Treatment Standards identified in Part 376.

4.3.2 Soil

The principal remedial activity of the contract comprised the excavation, stockpiling, and testing of soil from within the biocell area, followed by off-site disposal of the soil that was determined to exceed the site-specific SCOs identified above. Ninety-one (91) stockpiles, each approximately 300 cubic yards in volume, were excavated from the biocell area. Each was sampled by GES in accordance with the protocol proposed in its work plan and approved by URS. Grab samples were collected from each stockpile at 6 separate times during the creation of that stockpile. Each sample comprised one jar sample suitable for laboratory analysis for the SCOs as well as a bag sample of soil from the same location. The bag sample was allowed to equilibrate for 10 to 15 minutes before VOC levels were measured in the head space using the field VOC meter. Once the stockpile was completed and all 6 samples were collected and field-screened, the 3 jar samples represented by the bag samples with the highest VOC readings were selected as representative of the stockpile and were labeled, packaged, and shipped (under chain of custody) to the laboratory, TestAmerica. There the jar samples were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), to determine conformance with the site SCOs.

TestAmerica provided the analytical results directly to URS and the NYSDEC, generally within 24 hours of the official receipt of the samples (which had to occur prior to 4 p.m. on weekdays, though the results of samples received anytime on Fridays were

generally not provided until the following Monday morning). Upon receipt of the results, URS issued to GES a Field Order summarizing the results and stating the resultant disposition of the stockpile: either for use as on-site backfill (for samples at or below the SCOs), or to be shipped off-for site treatment and disposal as hazardous waste (for samples exceeding the SCOs). Copies of all Field Orders, some of which address other issues, are presented in Appendix H.

In two instances, URS directed GES to dispose as hazardous waste stockpiles that did not exceed SCOs. In those cases, stockpiles S-14 and S-30, two of the three VOC samples had been significantly above SCOs, but the third had been sufficiently low that the calculated (geometric) mean of the three samples did not exceed the SCOs. In those instances, URS determined, after consultation with the NYSDEC, that there was a significant likelihood that the majority of the stockpile exceeded the SCOs. URS directed GES to dispose of the entirety of those stockpile off-site.

As a result of that sampling and analysis, 36 of the piles were determined to require off-site disposal as hazardous waste. Those 36 piles comprised 15,992.80 tons of soil that was removed from the site as bid item UC-2. A tabulation of the analytical results of each of the 91 stockpiles, with the resultant disposition of each stockpile as either on-site backfill or off-site disposal, is presented in Table 2 (following the report text). The raw analytical data result forms are included in Appendix I.

Laidlaw Carrier Bulk Group, LLC (Laidlaw), transported all soils removed from the site to the disposal facility, Horizon Environmental Services (Horizon), in Grandes-Piles, Quebec. The permits granted by Environment Canada (EC) and USEPA allowing wastes from the site to be hauled to Horizon are contained in Appendix J. The EC permit references Laidlaw as an approved carrier. Appendix K contains a copy of the NYS Part 364 Waste Transporter Permit (no. CD-126) issued to Laidlaw by the NYSDEC. That permit lists Horizon as an approved destination facility for the type of wastes removed from the site. The permit lists also the license plate numbers of all vehicles it authorizes to transport waste.

URS, acting as agent for the NYSDEC, signed manifests authorizing the transportation of 563 truckloads of waste from the site. For each truck, two manifests were signed: a Uniform Hazardous Waste Manifest, covering hauling of the waste within New York State, and a Canadian Movement Document, covering hauling of the waste within Canada. Copies of both manifests signed at Horizon, along with the formal weigh slips over the scale at Horizon, are contained in Appendix L. Note that of those loads, 130 comprised "b-trains," i.e., tandem loads: two smaller trailers pulled by a single truck. Each trailer was separately manifested and hauled within the US to just over the Canadian border. Once in Canada, the trailers were joined and hauled in tandem to Horizon. Thus, only 433 separate trucks from the site were logged in at Horizon. A tabulation of the trucks and their manifests is contained in Appendix M.

Prior to signing the manifests, the trucks were checked for weight at GES's on-site (non-certified) scale. License numbers were checked against the authorized vehicle list in the Part 364 permit. The vehicles were inspected for placards and accurate display of NYS permit number and approved transporter name. The trucks were checked for adequate covering and any signs of leaking wastes.

4.3.3 On-Site Reuse

The 55 stockpiles of excavated soils that tested below SCOs and, so, were not removed from site, were re-placed into the excavation as on-site backfill, in accordance with the amended ROD. Those 55 piles comprised 21,129.45 tons of soil that was re-used on site as bid item UC-3.

In accordance with the Contract Documents, the upper 2 feet of the biotreatment cell were scraped up for subsequent replacement without testing as clean fill. Initially, all such soil was placed into a single, large stockpile located at the front of the site. Subsequently, as the site became congested with other stockpiles and equipment, such soils were scraped up, weighed for payment on GES's scale, then placed directly into the excavation without stockpiling. In total, this 2-foot layer comprised 12,227.37 tons of soil that was re-used on site as bid item UC-4. Documentation of the final approved pay

quantities of bid items UC-3 and UC-4 is presented in Appendix N.

Pay quantities for the majority of these two items were based on weights taken at the GES's on-site scale. Up to July 12, 2011, however, GES attempted to use a "bucket scale" system to weigh soils used as on-site backfill (i.e., UC-3 and UC-4). On May 4, 2011, a demonstration and test of this approach was conducted at a local facility (Twin River Recyclers) with a certified scale. The result was successful, and URS instructed GES to develop a submittal proposing the substitution of the bucket scale for the specified ground-based scale. However, before the submittal could be finalized, the bucket scale broke down, and GES decided to install the ground-based scale in its place. That scale, though not formally certified, was checked under URS supervision for accuracy daily with the same concrete block (weight of 1.10 tons) that had been used to check the accuracy of the bucket scale, and which had been weighed at the local certified scale.

4.3.4 Asbestos-Containing Material

On February 11, 2011, under separate contract to the NYSDEC, URS surveyed the buildings within and adjacent to the biocell area for asbestos-containing material (ACM), and identified ACM on the roofs of buildings 2 and 4. Between March 2 and 7, 2011, under contract to GES, Russo Development Corp. removed ACM from the roofs prior to demolition of the buildings. Performance and perimeter air monitoring of the abatement effort was performed by EmpireGEO Services under an existing standby remedial call–out contract with the NYSDEC. On March 11, 2011, Russo disposed of a single roll-off containing 6.18 tons of ACM at Modern Landfill, Inc. The final monitoring report prepared by EmpireGEO Services and the final close-out documentation provided by Russo Development are contained in Appendix O.

On March 15, 2011, Mr. Ed Krasinski, an inspector from the NYS Department of Labor visited and inspected the site in response to the Asbestos Containing Material (ACM) notification filed by GES for building demolition activities. GES's letter summary of the visit is contained in Appendix O. As a result of verbal comments that the

inspector made during his visit, GES contracted Russo to conduct a "sweep" of the biocell area for windblown shingles from the roof of the remaining on-site buildings, which the inspector felt were suspect ACM. Russo performed the "sweep" on March 23, 2011. EmpireGEO Services collected samples of the shingles for analysis, which determined that the shingles were ACM. As a result of that analysis, Russo removed 8 garabge bags (0.10 tons) of shingles from the site for disposal at Modern Landfill in Model City, NY. Disposal documentation for this material is contained in Appendix O. This additional effort was negotiated as proposed change order (PCO) no. 2.

4.3.5 Suspect ACM

The roofing material present within existing on-site building 5 was a suspect asbestos-containing material (SACM), but URS determined that the building was in too great a state of decay for asbestos inspectors to enter safely. Therefore, at the request of the NYSDEC, the Town of Tonawanda condemned the building and the SACM was abated by Geiter-Done, Inc. under the provisions of 12 NYCRR 56-11.5 for a controlled demolition with asbestos in place. The building was demolished on March 17, 2011; load-out of the debris continued until March 24, 2011, totaling approximately 170.28 tons of SACM. It was disposed of at the Chaffee (Waste Management of NY, LLC) Landfill. Final close-out documentation prepared by Geiter-Done is contained in Appendix O.

Perimeter monitoring of the abatement effort was performed by EmpireGEO Services, Inc. under stand-by contract to the NYSDEC. The final monitoring report prepared by EmpireGEO Services is contained in Appendix O.

4.3.6 Treated water

GES installed a water treatment system (WTS) in accordance with the Contract Documents and their approved submittal no. 02140-1a (contained in Appendix E).

The Town of Tonawanda wastewater treatment plant (WWTP) issued Wastewater Permit No. 639-S to the project, allowing discharge to the sanitary sewer of water

collected from the remedial activities on the site and treated in the WTS. The permit required that the water be pre-treated to Town standards prior to discharge to the sanitary sewer system. URS applied for the permit in February, 2011 but, at the request of the NYSDEC, the permit was issued to GES on May 2, 2011. A copy of the permit is contained in Appendix P.

The WTS was provisionally approved pending demonstration of successful performance. As a result of this condition, the WTS was installed initially with five 20,000-gallon storage ("frac") tanks: two tanks at the influent end of the system for primary settling and equalization, and three at the discharge end. Those three tanks provided the additional storage volume necessary to run the system in batch mode without discharge to the sanitary sewer while influent and effluent samples were collected and analyzed, and the results provided to the WWTP. Once the performance of the system had been demonstrated to the satisfaction of URS and the WWTP, the three effluent tanks were removed from the site and the system discharged directly to the sanitary sewer.

GES collected the first sample of water from the WTS on May 4, 2011. This water had been collected from the basement of Building 5 while waiting for the Import permit to be granted by Environment Canada. It was run through the treatment system during GES's brief re-activation of the site May 3 through 5, 2011, when Building 6 was demolished.

GES began discharge of water directly to the sanitary sewer on June 15, 2011, and submitted a self-monitoring report to the WWTP every month for the duration of the dewatering, though mid-October 2011. The permit required that the reports be provided on the 25th of each month, and that influent and effluent samples be collected and analyzed for each 100,000 gallons of water treated. A total of approximately 472,420 gallons of water was treated and discharged. The monthly self-monitoring reports issued by GES to the WWTP are summarized in Table 3, and contained in Appendix P.

TABLE 3

GES Self-Monitoring of Water Treatment System

Date		Total Volume Discharged as cited in the Report (gal.)	Comments
Self-Monitoring Report (SMR)	**I/E Samples Collected**		
	May 4, 2011		Initial sample at 23,000 gal ± treated; collected prior to discharge to demonstrate that system is effective.
June 25, 2011	(same as above)	23,020	Discharge started June 15, 2011 – minor additional quantity.
	June 28, 2011	23,020	This sample not referenced in any SMR.
July 25, 2011	July 18, 2011	125,369	100,000 gal. ± sample
August 25, 2011	Aug. 18, 2011	261,200	200,000 gal. ± sample
Sept. 26, 2011		294,200	SMR references samples not yet collected for 300,000 gal. discharge.
	Sept. 27, 2011		300,000 gal. ± sample
October 26, 2011	Oct. 13, 2011	472,420	400,000 gal. ± sample. SMR states that excavation activities have ceased .

The permit required also that GES analyze the collected samples for radiologic parameters (isotopic uranium, isotopic thorium, and radium 226). However, on September 9, 2011, the WWTP stated that, since the first two sets of analyses had shown no radiologic contamination, analysis for those parameters was no longer required for any further samples. A copy of that correspondence is included in Appendix P.

4.3.7 Drums

In the eastern portion of the biocell, 9 drums and drum fragments were unexpectedly encountered during remedial excavation. The drums were over packed, staged separately from the other activities, sampled, and then disposed of at the completion of the project. The contents of the drums were consistent with the contaminants previously identified in site soils, the excavation of which is the objective of the current remedial effort: phenols and xylenes, though mostly at greater concentrations. One of the drums, Drum no. 7, was determined to contain material that

could be disposed of with other site soils – it was loaded out with the last truckload of contaminated soils hauled from the site to Horizon, on October 21, 2011. The remaining 8 drums were removed from site on December 2, 2011 by Frank's Vacuum Truck Service of Niagara Falls, NY, a NYS-licensed waste transporter. The drums were disposed of at the Chemtron Corporation disposal facility in Avon, Ohio. Documentation of the disposal of the drums is included in Appendix Q.

Table 4 presents a summary of the drum excavation, handling, and sampling. Note that this table clarifies GES's drum mis-labeling. A photographic log of drum removal activities and analytical results of the drum samples are contained in Appendix Q.

TABLE 4

Drum Activity Summary

Drum Number	Date Encountered/ Excavated	Date Over-packed	Date Sampled	Lab Report Sample ID	Over-pack Label	Initial Field PID Screening (ppm)
1	9/7/2011	9/15/2011	9/9/2011	Drum 1 Sludge	1	100
				Soil 1 (1)		none recorded
2				Drum 2 Sludge	2	450
				Soil 2 (1)		none recorded
3			not sampled	not sampled	3	>15,000 (2)
4			not sampled	not sampled	4	>15,000 (2)
5	9/15/2011		9/15/2011	Drum 5	5	none recorded
6				Drum 6	6	none recorded
7	9/19/2011	9/30/2011	not sampled	not sampled	6 (on duct tape)	0.2
8	9/20/2011		9/30/2011	Drum 7	7 (on duct tape)	1200
9	9/22/2011			Drum 8	8 (on duct tape)	450

Notes:

(1) Soil adjacent to Drums 1 and 2 where they were buried was excavated with the drums but sampled separately. It was placed in the drum overpacks and ultimately disposed of with the drums.

(2) Drums 3 and 4 had little material on or in them, and so were not sampled or screened in the field when they were excavated. However, PID screening in the headspace of the overpack drums on October 19, 2011 showed VOC concentrations greater than 15,000 ppm.

4.4 Remedial Performance/Documentation Sampling

Prior to backfilling any portion of the remedial excavation, post-excavation documentation samples were collected on the bottom and sides of the excavation, in accordance with NYSDEC DER-10, on a 30-foot spacing on the bottom and at 30-foot intervals along the sides.

In the open discussion portion of Project Progress Meeting No. 5, on July 7, 2011, the NYSDEC clarified that all post-excavation samples were to be collected as "documentation", not "confirmation" samples. Thus, GES would be required to excavate only to the contract-specified horizontal and vertical limits, and if any post-excavation sample indicated that contamination above SCOs was remaining outside of those limits, GES would not be required to perform additonal excavation to remove it. This clarification allowed GES to proceed with project excavation and backfill without waiting for the results of the post-excavation sample analyses.

GES collected 158 documentation samples from 149 locations, which are summarized in Table 5, below. The sampling locations are shown on Figure 4. A total of 5 locations exceed SCOs after performance of the Remedial Action. Those locations are highlighted on Figure 4. Only 1 of those samples, as indicated below, exceeded the Part 375 Commercial Use criteria.

Data Usability Summary Reports (DUSRs) were prepared for all data generated in this remedial performance evaluation program, that is, for the post-excavation documentation samples. This DUSR is included in Appendix R (the associated raw data is included in Appendix I).

After GES excavated to the required depth over an area, GES subcontractor Fisher Associates staked out the post-excavation sampling grid over the excavation bottom and sidewalls in that area. GES then collected the post-excavation documentation samples at the staked points and submitted the samples to TestAmerica for analysis. The analytical results of all the samples were compiled with the surveyed (horizontal and

vertical) sample location data in accordance with the NYSDEC EQuIS protocol. URS then verified the data set using the EQuIS Data Processor, and uploaded the verified data set to the NYSDEC database on November 7, 2011.

TABLE 5

Documentation Sample Results Summary

Sample Type	Total Number (1)		Number of Sample Locations Exceeding SCOs			Number of Sample Locations Exceeding Part 375 Commercial-Use Standards		
	Samples	Locations	Xylene	Phenol	Total	Xylene	Phenol	Total
Bottom	112	107	0	4	4	0	0	0
Wall	46	42	1	0	1	1	0	1
Total	158	149	1	4	5	1	0	1

Note (1): A total of 7 field duplicate samples was collected: 5 on the excavation bottom, 2 on the excavation walls. Samples from 2 wall locations were resampled after additional excavation.

Data presented in Appendix S summarizes the results of all soil samples remaining at the site after completion of Remedial Action that exceed the SCOs.

4.5 Imported Backfill

GES attempted initially to get approval for the use of recycled concrete as imported backfill. URS denied this request, however, as not providing a level of performance equivalent to the specified natural material and not being in the best interest of the project. Subsequently, URS granted GES approval (Submittal 02221-3 in Appendix E) to use material from the Seven Springs Gravel Products mine in Batavia NY. GES submitted a sample of this backfill material to TestAmerica on September 23, 2011. TestAmerica, under an existing stand-by laboratory contract with the NYSDEC, analyzed the sample for the following parameters:

- TCL Volatile Organic Compounds by Method SW8260B
- TCL Semivolatile Organic Compounds by Method SW8270C
- TCL Pesticides by Method SW8081A
- TCL Polychlorinated Biphenyls (PCBs) by Method SW8082
- Herbicides (2,4,5-TP or Silvex only) by Method SW8151A
- TAL Metals by Method SW6010B/7471A
- Total Cyanide by Method SW9012A
- Hexavalent Chromium by Method SW7196A

GES submitted the analytical results, along with grain-size analyses, on October 3, 2011. URS compared the results to *6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives,* Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives, Effective December 14, 2006. The results included no exceedances of the unrestricted use criteria.

As a result of that approval, GES was allowed to bring 1,526.12 tons of the material on site (Oct. 19 through 21, 2011). However, when placed on top of the soft, wet, on-site backfill (i.e., soils below SCOs, bid item UC-3, as well as clean on-site soils, UC-4), the imported sandy material was not sufficient to support the weight of the placement equipment. Therefore, URS approved GES's request for an alternative imported backfill: a crushed stone that they had previously used to construct access roads over the un-excavated portions of the biocell. The material was furnished by the LaFarge Lockport Aggregate plant. GES proposed that this material could function as a bearing surface during its own placement provided that a woven high-strength geotextile was placed below it. An additional 1,290.83 tons of that material was brought onto site Nov. 2 through 5, 2011. Since the material was newly-crushed stone, URS required no chemical testing of the material as "clean fill".

A copy of GES's approved submittal, including the results of the chemical and grain-size analyses, for the material from the Seven Springs Gavel Products Mine, is included in Appendix T.

4.6 Contamination Remaining On-Site

Data on the contamination remaining on site is discussed in Section 4.4 and Table 5, above, and is further detailed on Figure 4 and in Appendices R and S.

Since contaminated soil remains beneath and adjacent to the site after completion of the Remedial Action, Institutional Controls (ICs) will be implemented to protect human health and the environment in accordance with the Amended ROD. Long-term management of these ICs and residual contamination will be performed under the Site Management Plan (SMP) subject to approval by the NYSDEC.

4.7 Final Conditions

The specified final condition of the remediated biocell included placement and establishment of vegetation on a 4-inch layer of topsoil.

However, URS and the NYSDEC agreed in Project Progress Meeting No. 11 (Oct. 19, 2011) and 12 (Nov. 1, 2011) to waive the requirement that GES place the topsoil layer. (See the minutes of those meetings in Appendix U for the discussion of this issue.) In Meeting No. 11, GES stated that the existing on site backfill was too soft to support the weight of placement equipment necessary to spread the 4-inch thick topsoil layer. URS agreed, noting that even GES's low ground pressure equipment was sinking into the backfill. GES proposed to replace the topsoil layer with a thickness of peat moss admixed into the existing backfill. GES stated that they had employed this approach successfully on other projects. URS and the NYSDEC agreed that GES should revise its Soil and Turf Work Plan submittal to reflect this proposed approach. Subsequently, in Project Meeting No. 12, GES stated that the existing soils were so soft that it did not believe that even their revised approach was feasible. In order to expedite completion of

the project, URS and the NYSDEC agreed to eliminate any requirement that topsoil be spread or created on site. Instead, GES was directed to sow the seed directly over the final grades of the on-site and off-site backfill. This effort was to be tracked and paid for on a Time and Materials basis.

At that project meeting (No. 12), the NYSDEC gave GES permission to apply the seed without concern for specific application rates. Due to the late time of year when the seed was sown (November), the NYSDEC decided to waive the vegetative establishment (performance) requirement for the seeding. This change was consistent with statements made by representatives of the Town of Tonawanda, which seeks to demolish the remaining on-site buildings in the winter/spring of 2012. The Town representatives stated that they did not believe that vegetation was necessary in the area of the remediated biocell. Therefore, the NYSDEC stated that it would not hold GES to any requirement to actually establish vegetation on the site. Thus, during the seeding, GES was required to sow seed only over the portion of the remediated biocell that could be reached by their hydroseeding equipment (supplemented briefly by a lawn spreader when the hydroseeder was inoperable). Based on this, they were able to apply seed to most of the perimeter of the site and the central discharge channel.

Note that a small quantity, 300 square yards, of bid item UC-6, "Topsoil/Vegetative Cover", was authorized and paid for under this contract. This amount was the area of the central discharge channel that was lined with permanent erosion control mat.

4.8 Engineering Controls

No Engineering Controls were identified in the amended ROD, and none were installed as part of this Remedial Action.

4.9 Institutional Controls

4.9.1 Enviromental Easement

The site remedy requires that an environmental easement be placed on the property to (1) implement, maintain and monitor the Engineering Controls; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to commercial or industrial uses only.

As stated above, no Engineering Controls were implemented as part of this Remedial Action. The Institutional Controls are further described in greater detail in the SMP.

4.10 Deviations from the Remedial Action Work Plan

GES performed the work in substantial compliance with the Contract Documents. No deficiencies were noted. The following modifications to the Contract Documents were approved and implemented during the Remedial Action:

- Modification of the vegetative cover requirements: As described in Section 4.9, above, GES was allowed to omit the 6-inch topsoil layer, and reduce the quantity of seed placed to stabilize the backfill, due to the extremely soft conditions of the backfill and the late season in which the seed was sown. URS and the NYSDEC approved this modification, without first negotiating a formal PCO, in Project Meeting No. 12. Since the ROD requires all soil remaining after remediation to meet 6 NYCRR 375 standards for Commercial Use, the topsoil layer was intended solely to support the vegetative cover and its omission does not compromise the intent of the Remedial Action. The seeding was tracked by URS and paid for on a time-and-materials basis. This change resulted in a savings to the NYSDEC of approximately $118,000 to the contract.

- Variation in final grades: GES's approved final grading plan could not be implemented due to buried concrete foundations that interfered with the design invert of the central drainage swale, and because the soft conditions of the on-site backfill during the final days of the contract prevented GES from being able to grade the site to provide positive drainage. As a result, two closed depressions (areas which hold surface water) remain on the final site grades. Record drawings showing the final conditions are contained in Appendix X.

- Modification of the northern boundary of excavation: As stated in PCO No. 010, GES determined that excavation to the northern boundary shown on the Contract Documents would contravene the Occupational Safety and Health Administration (OSHA) requirements for the minimum offsets for work near power lines of unknown voltage. When GES first identified the potential conflict, they determined that their equipment could not get any closer than 20 feet, measured horizontally, from the existing power lines along that boundary. URS, however, directed GES to determine the actual voltage of the lines by contacting National Grid, the owner of the lines, directly. National Grid took several weeks to respond to the request, so the excavation along the northern boundary was completed before National Grid visited the site. National Grid informed GES that the minimum offset from these lines was only 10 feet, and should be measured in a straight line from the power line to the equipment. As a result, GES was required to excavate at least an additional 10-foot width along the northern boundary. Due to obstructions and backfill conditions, however, this would have presented GES with significant technical difficulties.

  Instead, GES proposed that the post-excavation documentation samples from the new alignment of the northern wall, which had already been collected and analyzed, be reviewed to determine if contamination above SCOs remained there. That review, presented in PCO No. 010, showed that contaminant levels were above SCOs at only two locations along the new alignment, W-2 and W-4. After consultation with the NYSDEC, URS issued Field Order No. 049, which

approved GES's proposed modification of the required limit of excavation (PCO No. 010), except at those two locations. In those two locations, GES was required to excavate to the actual contract limit for 15 feet on either side of the sample locations and collect new post-excavation documentation samples. The results of the new post-excavation documentation samples at those locations indicated concentrations below SCOs.

The result of this approach is that, while the final area of excavation was reduced from that shown in the original contract documents, the documentation samples demonstrate that the change did not result in any additional soil with contaminant levels above SCOs being left on site.

- Excavation to clay within Area A: During a previous remedial effort, contaminated soils were excavated from a rectangular area in the northeast corner of the biotreatment cell area. This excavation went 4 to 8 feet into the existing clay layer that underlies the cell, and was then backfilled with clean soil. The Contract Documents of the current contract required that the backfill soil within that area be excavated and disposed of with the other site soils, except for that portion placed below the pre-existing top of clay. That backfill was to be left in place. However, once the excavation performed under the current project reached that backfill, URS directed GES to excavate all of the soil in Area A, including that below the pre-existing top of clay. This direction was based on visual observation of the backfill. URS directed GES to excavate all of the backfill, test it, and dispose of it according to same criteria applied to the other site soils.

  This change in the limits of remediation resulted in additional soil being excavated, and reduced the possibility that soil with contamination above SCOs would remain on site.

- Relocation of the earth dike: The upslope earth dike is shown on the Contract Documents at the eastern extent of the property, outside of the existing fence line.

To facilitate construction of the dike without reducing its effectiveness, URS allowed GES to relocate the dike inside of the fence line.

This change resulted in no decrease in the effectiveness of the Remedial Action.

5.0 CONSTRUCTION OF THE REMEDIAL ACTION

5.1 General

Section 5.8(b)7 of DER-10 requires that the FER provide a detailed report of the actual costs, including bid tabulations and change orders, if any State funding is provided. This section presents information to satisfy the requirements of DER-10, and additional information necessary to fully document the construction of the Remedial Action.

URS developed the Contract Documents as a Request for Proposal (RFP), including 2 addenda, between 2010 and January, 2011. The RFP was presented for bid by existing NYSDEC standby remedial "call-out" contractors in January 2011.

GES was the low bidder among the call-out contractors selected to bid on the job. GES was, however, already on-site, demolishing existing Buildings 1 through 4, under an existing work authorization with the NYSDEC for $60,000. As a result of the bid for the current project, that work authorization was amended to include the work required for the current contract (Contract Documents included in Appendix D) to include GES's bid of $3,641,827.00.

Therefore, on February 14, 2011, the NYSDEC issued a Notice To Proceed to GES for a combined total cost, for both scopes of work, of $3,701,827.00.

5.2 Project Meetings

A pre-construction meeting was held with NYSDEC and all principal contractors (GES, SCE, and URS) on March 1, 2011.

Twelve Project Progress Meetings were held approximately bi-weekly throughout the project, between March 16, 2011 and November 1, 2011. URS developed and distributed the agenda for the meetings, which generally covered the following topics:

- Approval of Minutes of Previous Meetings
- Progress Since Last Meeting

- Two-Week Look Ahead
- Project Schedule
- Sampling and Monitoring
- RFIs/Field Orders
- Submittals
- Disputes/Claims/Other Work
- Change Orders
- Payment Applications
- WBE/MBE Utilization
- Health & Safety
- Open Discussions/Questions
- Action Items
- Schedule Substantial Completion Inspection

URS issued draft minutes of all meetings prior to the subsequent meeting, and incorporated any changes agreed to by all parties into the final minutes, which were then posted to the project FTP site. Copies of the final minutes of all meetings are contained in Appendix U.

5.3 Submittals

GES developed and submitted the submittals identified in and required by the Contract Documents, including the Contractor Plans identified in Section 4.1, above. All submittals were reviewed and approved by URS. Copies of all contractor submittals (including the plans), and the submittal log maintained by URS throughout the project, are contained in Appendix E.

5.4 Requests for Information

GES submitted a total of 8 Requests for Information (RFIs). Some were submitted informally by e-mail at the beginning of the project, and were subsequently assigned

numbers by URS. A summary of the RFIs is presented in Table 6. Copies of the RFIs and responding documents are contained in Appendix V.

5.5 Field Orders

URS issued 60 Field Orders (FOs) during the construction (numbered up to FO 57, with three re-issued). The majority provided the results of the sampling and analysis of stockpiles, and provided the disposition for those stockpiles. That is, the FOs stated whether a stockpile had been found to be below SCOs and was to be used as on-site backfill, or whether it had been found to be above SCOs and was to be disposed of off-site as hazardous waste.

Other FOs addressed Requests for Information from GES, or provided direction to GES that did not involve changes in the contract price or time.

Table 7 summarizes all of the FOs issued. Copies of all FOs are contained in Appendix H.

5.6 Proposed Change Orders

GES developed and submitted 17 proposed changes orders (PCOs) during the construction, as summarized on Table 8. Fifteen of those were approved by URS and paid by the NYSDEC. One PCO was not approved, and one was developed but unused. Copies of all of the PCOs, and the responding documents (when not presented elsewhere), are contained in Appendix W.

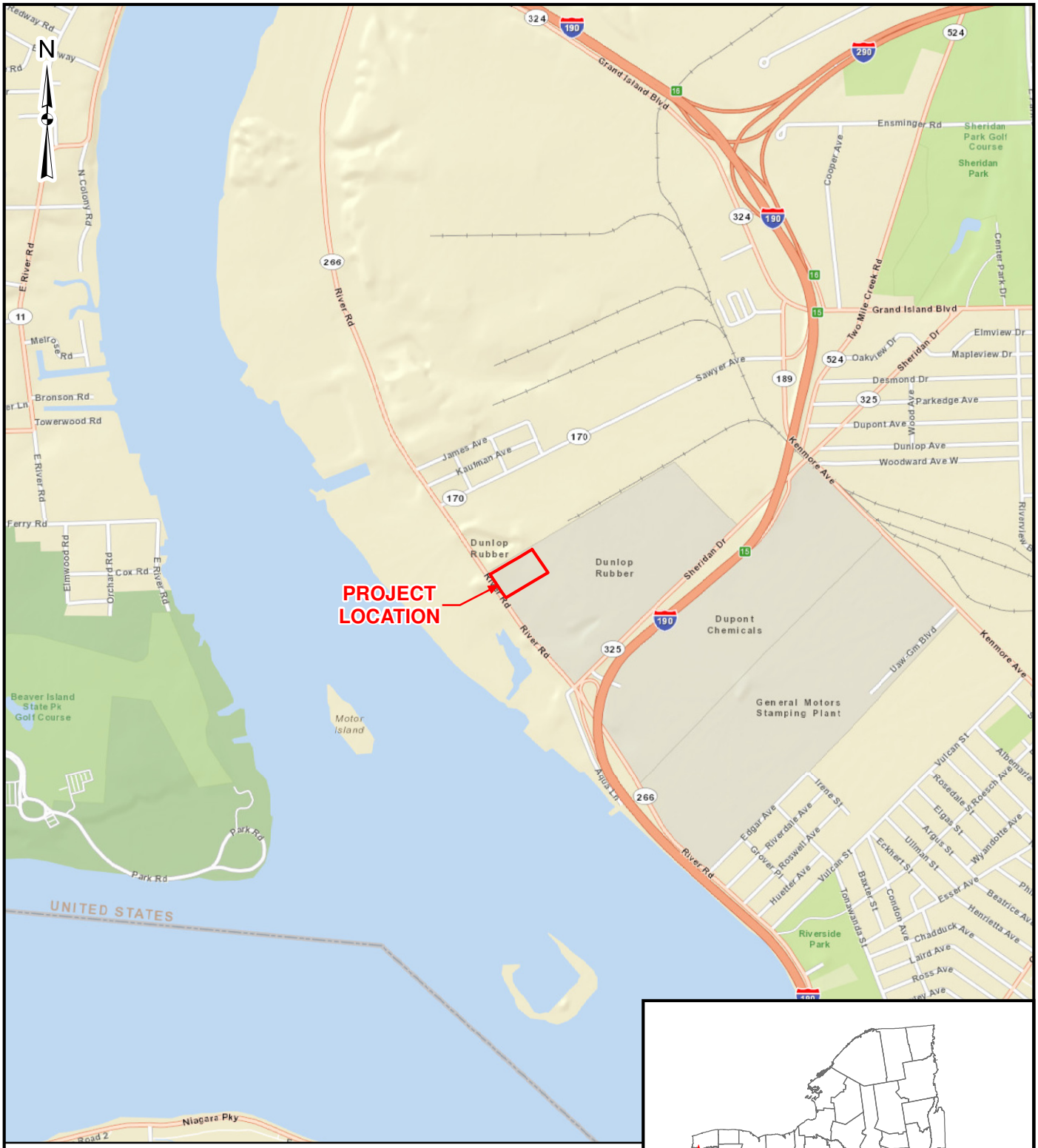
5.7 Final Project Cost

The final cost of the project, including change orders and final quantities, is $3,781,920.54. This represents an increase of $80,093.54, or 2.2 percent above the originally-approved contract cost of $3,701,827.00.

A summary of the final costs for the project is presented in Table 9.

5.8 Project Record Documents

Project Record Documents, including survey drawings of the final site condition and final mark-ups of the contract drawings to show substantive changes implemented during construction ("red-lines"), are contained in Appendix X.



Source: ESRI World Street Map

2,000 0 2,000 Feet

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URS

POLYMER APPLICATIONS SITE
SITE LOCATION MAP
3445 RIVER ROAD, TOWN OF TONAWANDA, NY

FIGURE 1

300 0 300 Feet

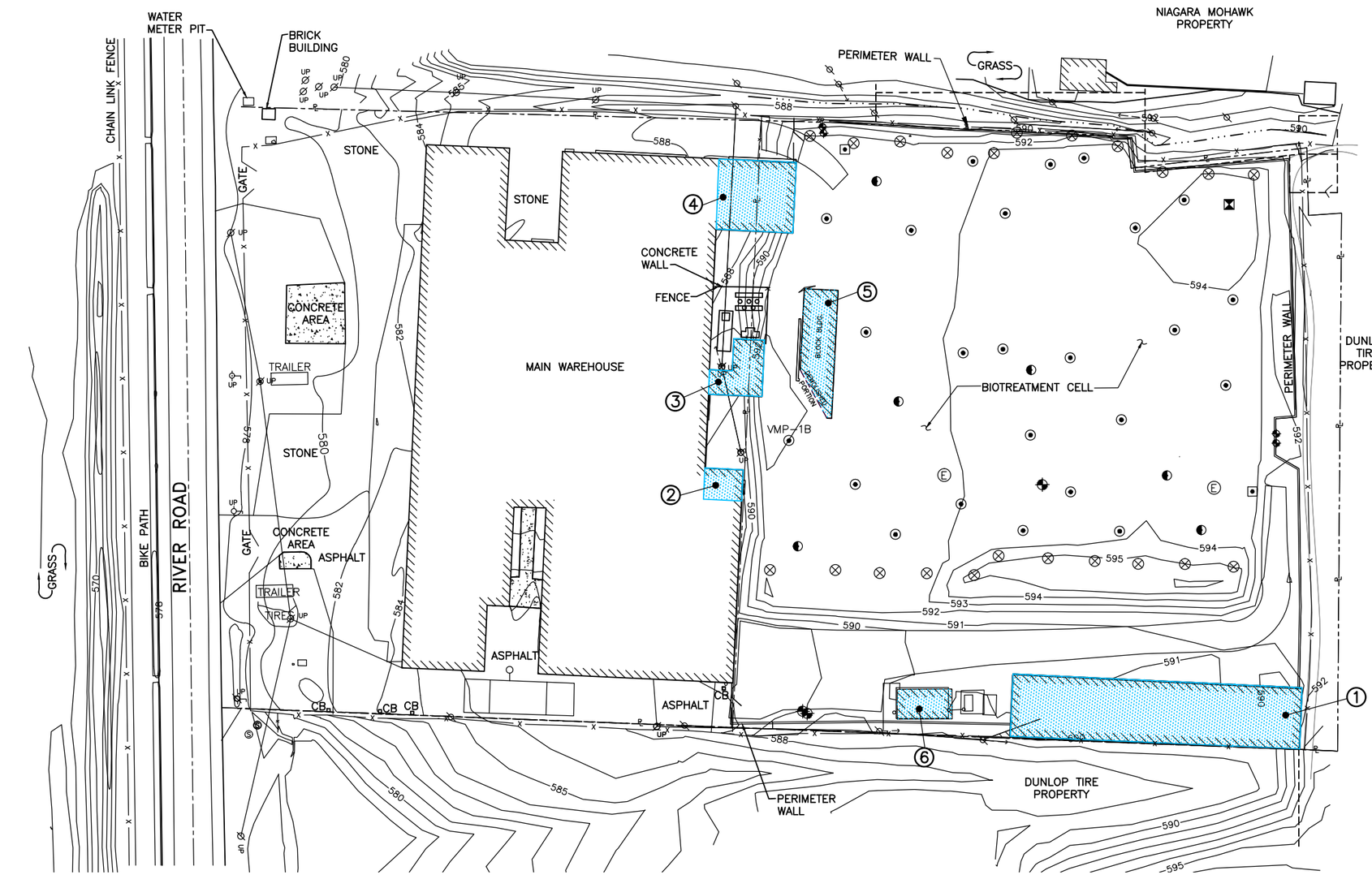
Source: Bing Maps Hybrid © 2010 Microsoft Corporation

URS

POLYMER APPLICATIONS SITE
SITE AERIAL VIEW

FIGURE 2

N:\11173425.00000\DB\Gis\REPORT (JAN 2012)\SITE AERIAL VIEW.mxd 2/29/2012



LEGEND:

- CONTOUR ELEVATION
- FENCE
- PERIMETER WALL (BELOW GRADE)
- LATERAL PIPE TRENCH (BELOW GRADE)
- PROPERTY LINE
- OVERHEAD ELECTRICAL LINE
- SANITARY SEWER LINE
- UTILITY/POWER POLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- CATCH BASIN
- VAPOR MONITORING POINT
- VAPOR/GROUNDWATER MONITORING POINT
- EXTRACTION WELL RISER MANHOLE
- RECOVERY WELL
- RECOVERY SUMP
- MONITORING WELL
- FLOW BALANCING MANWAY
- BUILDING NUMBER
- CONCRETE AREA
- BUILDING
- APPROXIMATE LIMITS OF BUILDINGS TO BE DEMOLISHED

80' 0 80'

SCALE IN FEET

NOTE:

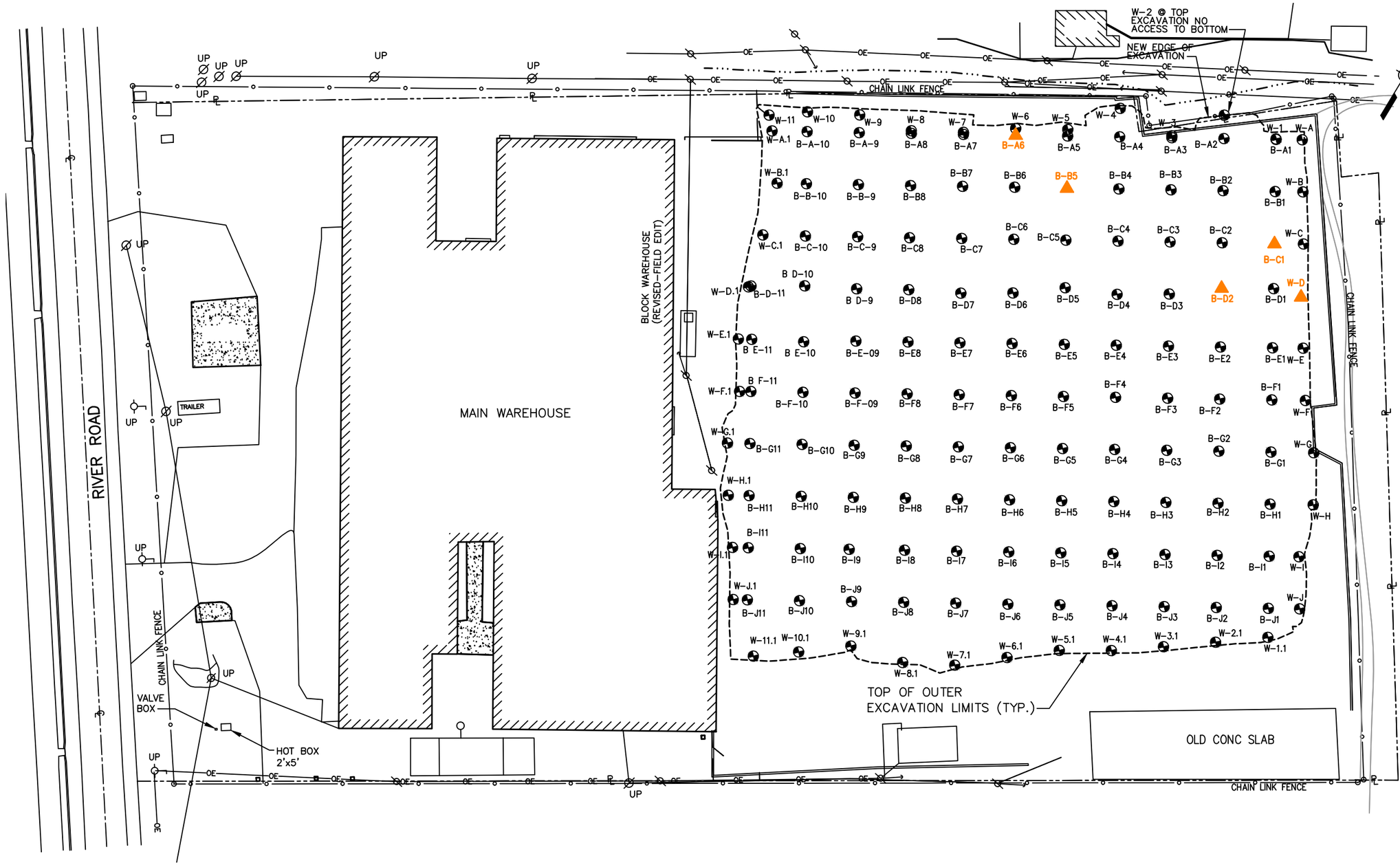
1. THIS PLAN SHOWS THE SITE CONDITIONS AT THE COMMENCEMENT OF ALL REMEDIAL WORK (INCLUDING DEMOLITION) IN JANUARY 2011.

EXISTING SITE CONDITIONS

URS

FIGURE 3

I:\11176416\CADD\FIGURE 3.dwg, 3/27/12 -1-RAL



SURVEY DATA			
LOCATION	NORTHING	EASTING	ELEVATION
B–A6	1,082,677	1,056,781	584.80
B–B5	1,082,666	1,056,822	584.81
B–C1	1,082,700	1,056,941	581.46
B–D2	1,082,662	1,056,928	585.21
W–D	1,082,681	1,056,970	585.14

SOIL ANALYTICAL RESULTS FOR EXCEEDANCES

COMPOUND / SCO: / LOCATION	XYLENE	PHENOL
	300	62
B–A6	0.43	130
B–B5	1.3	110
B–C1	1.9	100
B–D2	58	68
W–D	1,600	1.1

ALL CONCENTRATIONS IN mg/kg

CONCENTRATION EXCEEDS SCOs

NOTES:

1. SEE SECTION 4.3.2 OF THE FINAL ENGINEERING REPORT FOR FURTHER EXPLANATION OF REMAINING EXCEEDANCES.

LEGEND

- PROPERTY LINE/LEASE PARCEL LINE
- BUILDING LINE
- FENCE LINE
- EDGE OF WATER, STREAM OR DITCH
- OE, OT, OC — OVERHEAD ELECTRIC, TELEPHONE & CABLE LINE
- UTILITY POLE, GUY, LIGHT POLE
- E — ELECTRIC MANHOLE
- G-5 — BOTTOM/WALL SAMPLE POINT
- B-5 — BOTTOM/WALL SAMPLE POINT EXCEEDING SCO'S AFTER REMEDY

SURVEY NOTES:

1. COORDINATES AND NORTH ORIENTATION SHOWN HEREON ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE, TRANSVERSE MERCATOR PROJECTION, NAD 83/96 USING GPS PROCEDURES AND THE NEW YORK STATE DOT CORS NETWORK.
2. BASE MAP TAKEN FROM DRAWING NUMBER 2 TITLED "BOTTOM AND WALLS OF EXCAVATION", DATED FEBRUARY, 2012 AND PREPARED BY FISHER ASSOCIATES.

60' 0 60'

SCALE IN FEET

POLYMER APPLICATIONS SITE EXCEEDANCES OF SCOs AFTER REMEDY

URS

FIGURE 4

I:\11176416\CADD\FIGURE 4.dwg 1=1 3/26/2012-1 ELB

Table 2
Stockpiled Soil Analytical Results
Polymer Applications Site (Tonawanda, NY)
Site # 9-15-044

					Volatile Organic Compounds								Semivolatile Organic Compounds			Final Disposition of Stockpile
					Total Xylene						Total Xylene Geometic Mean*	SCO	Phenol		SCO	
	Date				mg/kg						mg/kg	mg/kg	mg/kg		mg/kg	
Stockpile ID	Samples Collected	Samples Sent to Lab	Results Sent to Site	Soil Type	A		B		C				D			
S-1	07/01/11	07/05/11	07/06/11	Grab	0.0027	J	0.0045	J	0.011	U	0.0051	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.22		62	
S-2	07/06/11	07/06/11	07/07/11	Grab	0.0058	J	0.012		0.0068	J	0.0078	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.52		62	
S-3	07/06/11	07/06/11	07/08/11	Grab	0.21		0.45		0.36		0.32	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.5		62	
S-4	07/07/11	07/08/11	07/11/11	Grab	600		640		490		573	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	11		62	
S-5	07/08/11	07/08/11	07/11/11	Grab	640		340		1700		718	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	15		62	
S-6	07/8-9/11	07/11/11	07/13/11	Grab	810		1400		340		728	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	7.8		62	
S-7	07/11/11	07/11/11	07/13/11	Grab	390		340		190		293	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.0		62	
S-8	07/11/11	07/12/11	07/14/11	Grab	250		310		540		347	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	8.5		62	
S-9	07/11-15/11	07/15/11	07/18/11	Grab	350		120		68		142	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	6.7		62	
S-10	07/14-22/11	07/22/11	07/25/11	Grab	0.18	J	0.069	J	0.95		0.23	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.18	U	62	
S-10-DUP				Grab	0.084	J	0.065	J	3.0		0.25	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.042	J	62	
S-11	07/16/11	07/18/11	07/20/11	Grab	66		190		2800		327	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	7.9		62	
S-12	07/18-21/11	07/21/11	07/22/11	Grab	130		1300		340		386	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	3.8		62	
S-13	07/21/11	07/21/11	07/22/11	Grab	400		620		130		318	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	7.8		62	
S-14	07/21-22/11	07/22/11	07/25/11	Grab	9.1		1200		1300		242	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	2.6		62	
S-15	07/22/11	07/25/11	07/26/11	Grab	30		150		300		111	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	18		62	
S-16	07/26/11	07/27/11	07/28/11	Grab	250		60		31		77	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	3.9		62	
S-17	07/28/11	07/28/11	08/01/11	Grab	14		12		1.9		7	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.81		62	
S-18	08/02/11	08/02/11	08/03/11	Grab	31		250		18		52	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.9		62	
S-19	08/02-03/11	08/03/11	08/05/11	Grab	0.39		2.6		0.061		0.40	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.51		62	
S-20	08/02/11	08/03/11	08/08/11	Grab	1900		340		500		686	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	7.9		62	
S-21	08/02/11	08/03/11	08/05/11	Grab	1000		1500		930		1117	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	23		62	
S-22	08/03/11	08/03/11	08/04/11	Grab	140		49		150		101	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.3		62	
S-23	08/03/11	08/03/11	08/04/11	Grab	320		1600		270		517	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	13		62	
S-24	08/03/11	08/03/11	08/04/11	Grab	400		870		410		523	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	8.7		62	
S-25	08/04/11	08/04/11	08/08/11	Grab	26		3.7		12		10	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.52	J	62	
S-26	08/04/11	08/05/11	08/08/11	Grab	2.5		3.3		1.9		2.5	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.17	J	62	
S-27	08/06/11	08/08/11	08/09/11	Grab	2.5		110		30		20	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	6.1		62	
S-28	08/08/11	08/08/11	08/09/11	Grab	180		190		410		241	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.9		62	
S-29	08/08/11	08/09/11	08/11/11	Grab	250		6500		590		986	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	11		62	
S-30	08/12/11	08/15/11	08/16/11	Grab	420		410		62		220	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	6.3		62	
S-30-DUP	08/12/11	08/15/11	08/16/11	Grab	370		690		90		284	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	8.8		62	

Table 2
Stockpiled Soil Analytical Results
Polymer Applications Site (Tonawanda, NY)
Site # 9-15-044

					Volatile Organic Compounds								Semivolatile Organic Compounds			
					Total Xylene						Total Xylene Geometic Mean*	SCO	Phenol		SCO	Final Disposition of Stockpile
	Date				mg/kg						mg/kg	mg/kg	mg/kg		mg/kg	
Stockpile ID	Samples Collected	Samples Sent to Lab	Results Sent to Site	Soil Type	A		B		C				D			
S-31	08/12/11	08/12/11	08/15/11	Grab	1.4		4.7		28		5.7	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	4.1		62	
S-32	08/12/11	08/12/11	08/15/11	Grab	2.5		12		26		9.2	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.54		62	
S-33	08/13/11	08/15/11	08/16/11	Grab	110		120		180		133	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	5.2		62	
S-34	08/13-15/11	08/16/11	08/17/11	Grab	100		530		850		356	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	1.2		62	
S-35	08/16/11	08/16/11	08/18/11	Grab	72		150		380		160	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	9.9		62	
S-36	08/16/11	08/17/11	08/18/11	Grab	280		630		740		507	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	6.0		62	
S-37	08/18/11	08/19/11	08/23/11	Grab	170		3.2		24		24	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	4.3		62	
S-38	08/19/11	08/19/11	08/23/11	Grab	480		480		540		499	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	5.3		62	
S-39	08/19/11	08/19/11	08/23/11	Grab	210		440		570		375	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	1.1		62	
S-40	08/19/11	08/22/11	08/23/11	Grab	290		300		290		293	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	3.8		62	
S-41	08/19/11	08/22/11	08/23/11	Grab	29		2.9		3.1		6.4	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.31		62	
S-42	08/20/11	08/22/11	08/23/11	Grab	86		8.3		260		57	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.53		62	
S-43	08/20/11	08/22/11	08/23/11	Grab	5.6		280		200		68	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	22		62	
S-44	08/22/11	08/23/11	08/25/11	Grab	11		10		12		11	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	15		62	
S-45	08/22/11	08/23/11	08/25/11	Grab	16		100		120		58	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.59		62	
S-46	08/23/11	08/24/11	08/26/11	Grab	400		63		17		75	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.6		62	
S-47	08/24/11	08/25/11	08/29/11	Grab	170		390		200		237	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	6.1		62	
S-48	08/24/11	08/25/11	08/29/11	Grab	65		150		220		129	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.6		62	
S-49	08/25/11	08/25/11	08/29/11	Grab	2600		150		120		360	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	7.1		62	
S-50	08/25/11	08/26/11	08/30/11	Grab	420		410		560		459	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	3.9		62	
S-50-DUP	08/25/11	08/26/11	08/30/11	Grab	630		260		560		451	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	3.3		62	
S-51	08/25/11	08/26/11	08/30/11	Grab	430		460		590		489	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	11		62	
S-52	08/26/11	08/26/11	08/30/11	Grab	340		330		340		337	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	8.6		62	
S-53	08/30/11	08/31/11	09/06/11	Grab	4700		2400		6000		4075	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	1.0	J	62	
S-54	08/31/11	08/31/11	09/06/11	Grab	43		8.0		69		29	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	31		62	
S-55	08/31/11	09/01/11	09/06/11	Grab	24		240		290		119	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	12		62	
S-56	08/31/11	09/01/11	09/06/11	Grab	960		48		200		210	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.2		62	
S-57	09/01/11	09/02/11	09/06/11	Grab	780		190		330		366	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	4.9		62	
S-58	09/01/11	09/02/11	09/06/11	Grab	2200		890		800		1161	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	2.3		62	
S-59	09/02/11	09/02/11	09/06/11	Grab	650		490		240		424	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	10		62	
S-60	09/02/11	09/06/11	09/07/11	Grab	240		640		150		285	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	7.2		62	
S-61	09/13/11	09/14/11	09/16/11	Grab	620		670		8100		1498	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	420		62	
S-62	09/15/11	09/15/11	09/19/11	Grab	290		160		120		177	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	45		62	
S-63	09/15/11	09/16/11	09/20/11	Grab	110		3300		99		330	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	29		62	
S-64	09/16/11	09/16/11	09/20/11	Grab	86		32		130		71	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	120		62	

Table 2
Stockpiled Soil Analytical Results
Polymer Applications Site (Tonawanda, NY)
Site # 9-15-044

					Volatile Organic Compounds								Semivolatile Organic Compounds			Final Disposition of Stockpile
					Total Xylene						Total Xylene Geometic Mean*	SCO	Phenol		SCO	
	Date				mg/kg						mg/kg	mg/kg	mg/kg		mg/kg	
Stockpile ID	Samples Collected	Samples Sent to Lab	Results Sent to Site	Soil Type	A		B		C				D			
S-65	09/17/11	09/19/11	09/21/11	Grab	110		13		2		14	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	300		62	
S-66	09/17/11	09/19/11	09/21/11	Grab	6.7		17		290		32	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	23		62	
S-67	09/19/11	09/20/11	09/22/11	Grab	910		2100		1600		1451	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	3.7		62	
S-68	09/19/11	09/20/11	09/22/11	Grab	760		900		760		804	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	6.1		62	
S-69	09/20/11	09/20/11	09/22/11	Grab	360		380		590		432	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	15		62	
S-70	09/20/11	09/21/11	09/23/11	Grab	460		230		370		340	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	15		62	
S-70-DUP	09/20/11	09/21/11	09/23/11	Grab	560		170		520		367	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	22		62	
S-71	09/22/11	09/22/11	09/26/11	Grab	6.4		130		190		54	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.5		62	
S-72	09/22/11	09/23/11	09/27/11	Grab	160		180		20		83	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	11		62	
S-73	09/22/11	09/23/11	09/27/11	Grab	220		150		13		75	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	5.1		62	
S-74	09/23/11	09/23/11	09/27/11	Grab	200		150		280		203	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	10		62	
S-75	10/05/11	10/05/11	10/10/11	Grab	20		59		2.5		14	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.73		62	
S-76	10/04/11	10/15/11	10/06/11	Grab	29		2.2		18		10	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.95		62	
S-77	10/04/11	10/15/11	10/06/11	Grab	0.51		0.62		6.8		1.3	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	3.0		62	
S-78	10/05/11	10/05/11	10/10/11	Grab	2.0		21		0.89		3.3	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.6		62	
S-79	10/05/11	10/05/11	10/10/11	Grab	8.7		1.2		6.3		4.0	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.61	J	62	
S-80	10/05/11	10/05/11	10/10/11	Grab	0.23	U	1.3		3.8		1.0	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.20	U	62	
S-80-DUP	10/05/11	10/05/11	10/10/11	Grab	0.24	U	1.9		5.2		1.3	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.20	U	62	
S-81	10/07/11	10/07/11	10/10/11	Grab	500		630		870		650	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	3.6		62	
S-82	10/08/11	10/10/11	10/12/11	Grab	610		150		73		188	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.32	J	62	
S-83	10/08/11	10/10/11	10/12/11	Grab	10		2.5		1.1		3.0	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.3		62	
S-84	10/08/11	10/10/11	10/12/11	Grab	1.1		0.24	J	0.54		0.52	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.52	J	62	
S-85	10/10/11	10/10/11	10/12/11	Grab	380		750		280		431	300	--		--	Dispose of Off-Site
				Composite	--		--		--		--	--	0.90	J	62	
S-86	10/10/11	10/10/11	10/12/11	Grab	0.85		1.0		2.1		1.2	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.48	J	62	
S-86-DUP	10/10/11	10/10/11	10/12/11	Grab	0.84		0.52		1.4		0.85	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.1	J	62	
S-87	10/10/11	10/11/11	10/13/11	Grab	14		3.8		3.0		5.4	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	1.9	U	62	
S-88	10/10/11	10/11/11	10/13/11	Grab	81		160		54		89	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	2.1	U	62	
S-89	10/11/11	10/11/11	10/13/11	Grab	370		130		210		216	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	0.32	J	62	
S-90	10/14/11	10/14/11	10/17/11	Grab	90		2.2		5.5		10	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	11	U	62	
S-91	10/14/11	10/14/11	10/17/11	Grab	120		230		3.1		44	300	--		--	On-Site Backfill
				Composite	--		--		--		--	--	11	U	62	

- Concentration exceeds Soil Cleanup Objective (SCO).
- Based on the judgement of NYSDEC and/or URS, the associated stockpile was declared to be above SCO.

Notes:
* - Geometric mean calculation includes reporting limits for non-detect values.
J - Estimated value above the method detection limit, but below the reporting limit.
mg/kg - milligrams per kilogram
U - Non-detect.

Table 6

Request for Information (RFI) Log

Number	Date Issued	Subject	Date of URS Response
1	February 18, 2011	Multiple Questions; E-Mail Subject line: "A few clarifications needed"	By e-mail and telecon., February 22, 2011
1A	February 24, 2011	Multiple Questions; E-Mail Subject line: "Erosion and Sediment Control Plan: Polymer Applications Site"	By e-mail and telecon., February 28, 2011
2	March 17, 2011	Regarding requirement for 10-hour OSHA construction worker training	Response posted to FTP site August 9, 2011
3	March 23, 2011	Proposed treatment system for potentially asbestos-contaminated water within the basement of Bldg no. 5.	E-mail dated March 24, 2011
4	May 6, 2011	Regarding required analytical testing for proposed off-site backfill material.	E-mail dated May 9, 2011
5	July 14, 2011	Requesting revision to FO#4 (July 11, 2011) to reflect field direction from NYSDEC on the disposal of concrete within excavations.	FO#4–Rev1 issued July 15, 2011
6	July 14, 2011, rev. July 22, 2011	Regarding offset of the northern boundary of excavation from power lines and the perimeter fence.	FO#27 issued Aug. 12, 2011. This issue subsequently addressed in GES PCO No. 10 dated Oct. 29, 2011
7	July 21, 2011	Regarding excavation of the soil mound along the southeast edge of the cell.	FO#13 issued July 26, 2011

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Table 7

Field Order Log

Number	Date Issued	Subject / In Response To
1	July 9, 2011	Stockpile S-1
2	July 9, 2011	Stockpiles S-2, S-3
3	July 11, 2011	Stockpiles S-4, S-5
4	July 12, 2011	Buried concrete
4-rev1	July 15, 2011	Revised direction on buried concrete, in response to RFI No. 5
5	July 13, 2011	Stockpile S-6
6	July 13, 2011	Stockpile S-7
7	July 14, 2011	Stockpile S-8
8	July 18, 2011	Stockpile S-9
9	July 20, 2011	Stockpile S-11
10	July 22, 2011	Stockpile S-12, S-13
11	July 25, 2011	Stockpile S-10, S-14
11-rev1	July 26, 2011	Revised to address only Stockpile S-10
12	July 26, 2011	Revised to provide new direction on Stockpile S-14
13	July 26, 2011	Excavation of soil mound, in response to RFI No. 7
14	July 26, 2011	Stockpile S-15
15	July 28, 2011	Stockpile S-16
16	Aug 1, 2011	Stockpile S-17
17	Aug 3, 2011	Stockpile S-18
18	Aug 4, 2011	Stockpile S-22
19	Aug 4, 2011	Stockpiles S-23, S-24
20	Aug 5, 2011	Stockpile S-19
21	Aug 5, 2011	Stockpile S-21
22	Aug 8, 2011	Stockpiles S-20, S-25
23	Aug 8, 2011	Stockpile S-26
24	Aug 9, 2011	Stockpiles S-27, S-28
25	Aug 9, 2011	OSHA Training Requirements
26	Aug 11, 2011	Stockpile S-29
27	Aug 12, 2011	Response to RFI 6 re power line offsets (file name corrected on FTP site 8/30)
27A	Aug 15, 2011	Stockpile S-31, S-32 (Originally issued as FO # 27 – reissued on 8/30)
28	Aug 16, 2011	Stockpiles S-31, S-32
29	Aug 17, 2011	Stockpiles S-30, S-34
30	Aug 18, 2011	Stockpile S-35
31	Aug 18, 2011	Stockpile S-36

Table 7
Field Order Log (cont.)

32	Aug 23, 2011	Stockpiles S-37, S-38, S-39
33	Aug 23, 2011	Stockpiles S-40, S-41, S-42, S-43
34	Aug 25, 2011	Stockpiles S-44, S-45
35	Aug 26, 2011	Stockpile S-46
36	Aug 29, 2011	Stockpiles S-47, S-48, S-49
37	Aug 30,2011	Stockpiles S-50, S-51, S-52
38	Sept. 6, 2011	Stockpiles S-53, S-54, S-55, S-56
39	Sept. 6, 2011	Stockpiles S-57, S-58, S-59
40	Sept. 7, 2011	Stockpile S-60
41	Sept. 16, 2011	Stockpile S-61
42	Sept. 17, 2011	Stockpile S-62
43	Sept. 20, 2011	Stockpiles S-63 and S-64
44	Sept. 21, 2011	Stockpiles S-65 and S-66
45	Sept. 22, 2011	Stockpiles S-67, S-68, and S-69
46	Sept. 23, 2011	Stockpile S-70
47	Sept. 26, 2011	Stockpile S-71
48	Sept. 27, 2011	Stockpiles S-72, S-73, and S-74
49	Oct 4, 2011	Approving no-cost PCO 11 for re-use of clean concrete demo debris as on-site backfill
50	Oct. 7, 2011	Stockpiles S-75, S-76, S-77, S-78, S-79, and S-80
51	Oct. 10, 2011	Directing GES to leave concrete slab along eastern edge
52	Oct. 10, 2011	Stockpile S-81
53	Oct. 12, 2011	Stockpiles S-82, S-83, S-84, S-85, and S-86
54	Oct. 13, 2011	Stockpiles S-87, S-88, and S-89
55	Oct. 17, 2011	Stockpiles S-90 and S-91
56	Nov. 4, 2011	Punch List
57	Nov. 11, 2011	Monitoring Well Survey Requirements

TABLE 8

Proposed Change Order Summary

PCO Number	Approved Cost	Description/Comments	Disposition
1	$12,853.03	Additional costs above the $60,000 initially authorized for the Demolition of Bldgs 1 - 4 (GES reduced the amount that claimed for this item in the final application for payment by $6,326.26)	Payment recommended by URS to the NYSDEC in correspondence dated Sept. 26, 2011
2	$1,778.76	Asbestos "sweep" and ACM disposal in response to comments by the Tonawanda Bldg. Insp.	
3	$74,235.21	Equipment standby costs waiting for the Canadian Import permit from Environment Canada	
4	(no cost)	Schedule extension waiting for the Canadian Import permit from Environment Canada	
5	$39,915.23	Level B work for drum handling and sampling, by Time and Materials	Payment recommended by URS to the NYSDEC in correspondence dated Jan. 18, 2012
6	$6,067.06	Costs for handling buried concrete, by Time and Materials	
7	$7,723.20	Additional costs for excavation in Area A (outside of Contract Limits), by Time and Materials	
8	$25,802.10	Increase of UC-1A and UC-1B over bid quantities, at the unit price bid	
9	$4,340.00	Cost for 7 additional days' H&S activities due to work in Level B (PCO 5)	
10	(no cost)	Alteration of excavation limits along the north boundary	Approved in URS correspondence dated Oct. 13, 2011
11	(no cost)	Disposal of excavated concrete as on-site backfill	Approved by URS in Field Order 49
12	-	Topsoil substitution with credit – Disapproved	Disapproved in URS correspondence dated Oct. 11, 2011
13	-	For payment for item UC-2 over the bid quantity	PCO not needed
14	$25,771.60	Additional imported backfill, by Time and Materials	Payment recommended by URS to the NYSDEC in correspondence dated Jan. 18, 2012
15	$17,240.33	Costs for hydroseeding, by Time and Materials	
16	$1,666.54	Costs for on-site soil below SCOs above the bid quantity, by Time and Materials	
17	$9,307.19	Off-Site transportation and disposal of Overpack Drums, by Time and Materials	

TABLE 9
Final Cost Summary Table

BID ITEM / PCO	DESCRIPTION	UNITS	BID			ACTUAL		CHANGE ORDER		
			UNIT PRICE	QUANT.	AMOUNT	QUANT.	AMOUNT	UNIT PRICE	QUANT.	AMOUNT
UC-1a	On-Site Soil Samples - VOC	each	$62.90	300	$18,870.00	300	$18,870.00			
PCO8	Additional Samples	each						$62.90	149	$9,372.10
UC-1b	On-Site Soil Samples - SVOC	each	$106.00	100	$10,600.00	100	$10,600.00			
PCO8	Additional Samples	each						$106.00	155	$16,430.00
UC-1c	Backfill Characterization Sample	each	$1,589.00	1	$1,589.00	1	$1,589.00			
UC-1d	Topsoil Characterization Sample	each	$1,589.00	1	$1,589.00	-	-			
UC-2	Soil Excavation, Transport and Disposal	tons	$126.60	16,000	$2,025,600.00	15,992.80	$2,024,688.48			
UC-3	Soil Excavation and Replacement On-Site	tons	$9.70	21,000	$203,700.00	21,411.54[3]	$207,691.94			
PCO16	Additional Excavation	T&M						-	-	$1,666.54
UC-4	Excavation of Clean Soil and Replacement On-Site	tons	$7.60	13,000	$98,800.00	12,226.07	$92,918.13			
UC-5	Imported Backfill	tons	$58.10	2,000	$116,200.00	2,000	$116,200.00			
PCO14	Additional Backfill	T&M						-	-	$25,771.60
UC-6	Topsoil/Vegetative Cover	SY	$10.70	13,000	$139,100.00	300	$3,210.00			
LS-1	Mobilization/Demobilization and Site Services	LS	$565,258.00	-	$565,258.00	-	$565,258.00			
LS-2	Demolition	LS	$213,054.00	-	$213,054.00	-	$213,040.38			
LS-3	Erosion and Sediment Control	LS	$46,217.00	-	$46,217.00	-	$46,217.00			
LS-4	Dewatering and Water Treatment and/or Disposal	LS	$261,250.00	-	$261,250.00	-	$261,250.00			
PCO1	Additional Costs for Demolition of Bldg.s 1 - 4	T&M								$6,540.39 [2]
PCO2	Asbestos “Sweep” and ACM Disposal	T&M								$1,778.76
PCO3	Equipment Standby Costs Waiting for Import Permit	T&M								$74,235.21
PCO5	Level B Drum Handling	T&M								$39,915..23
PCO6	Costs for Handling Buried Concrete	T&M								$6,067.06
PCO7	Additional Costs for Excavation in Area A	T&M								$7,723.20
PCO9	Costs for Additional H&S Days	day [1]						$620.00[2]	7	$4,340.00
PCO15	Hydroseeding	T&M								$17,240.33
PCO17	Off-Site Transportation of Overpacked Drums	T&M						-	-	$9,307.19
TOTALS:					$3,701,827.00		$3,561,532.93			$220,387.61
							TOTAL PROJECT COST:			**$3,781,920.54**

Notes: 1) Daily Health and Safety rate used in PCO 9 was first developed in GES’s approved bid breakdown, submittal MFP-1.
2) PCO 1 was approved for $12,853.03; however, GES has claimed only the amount shown in this table.
3) After completion of site work. the quantity of UC-3 was found to have exceeded the bid quantity. GES agreed to accept payment at the unit price bid for the additional quantity.