STATE SUPERFUND WORK ASSIGNMENT

CONTRACT NO. D004594

FINAL REMEDIATION REPORT

FOR

FORMER DINABURG DISTRIBUTING INC. SITE

SITE No. 8-28-103

ROCHESTER, NEW YORK

SUBMITTED BY:

URS CORPORATION

77 GOODELL STREET

BUFFALO, NEW YORK 14203

APRIL 2007

CERTIFICATION

OF

CONSTRUCTION QUALITY ASSURANCE

AT

FORMER DINABURG DISTRIBUTING INC. SITE

REMEDIAL ACTION CONSTRUCTION

ROCHESTER, NEW YORK

URS Corporation's (URS's) personnel have provided oversight of the remedial action construction at the Former Dinaburg Site according to generally accepted practices. Based on field observations and inspections made by on-site personnel, field and laboratory test data, and data provided by the Contractor and its subcontractors, my professional opinion is that the remedial action construction at the site has been performed in substantial conformance with the New York State Department of Environmental Conservation (NYSDEC)-approved Contract Documents as stated in this report.

Signature

APRIL 2007

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ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
AST	aboveground storage tank
bgs	below ground surface
C&D	construction & demolition
EEO	equal opportunity employment
gpm	gallon per minute
GWE	groundwater extraction well
HDPE	high density polyethylene
IRM	interim remedial measure
LS	lump sum
MCPW	Monroe County Pure Waters
MPE	multi-phase extraction
M/WBE	minority/woman-owned business enterprise
NTP	notice to proceed
NYSDEC	New York State Department of Environmental Conservation
O&M	operation & maintenance
PCE	perchloroethylene (tetrachloroethylene)
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
scfm	standard cubic feet per minute
SVE	soil vapor extraction

TCE	trichloroethylene
UC	unit cost
UCQ	Uniform Contracting Questionnaire
URS	URS Corporation
UST	underground storage tank
VOC	volatile organic compound

FINAL REMEDIATION REPORT
FORMER DINABURG DISTRIBUTING SITE
NYSDEC SITE NO. 8-28-103

1.0 INTRODUCTION

This report documents the remedial activities completed for Contract No. D004954 at the Former Dinaburg Distributing Inc, site. URS Corporation (URS) provided engineering services during construction, including oversight services, to the New York State Department of Environmental Conservation (NYSDEC) under Work Assignment No. D003825-66.

This report was prepared in accordance with the *Project Management Work Plan and Budget for Construction Management and O&M,* prepared by URS in 2004. As required under Task 8 of that plan, this report summarizes construction activities at the site and identifies all variations from the Contract Documents. Also included is a summary and analysis of the remedial system operation performed by the Contractor, as well as any recommendations to the Department for additional work that may be required. Survey information, as-built drawings, and other project documentation are included as appendices to this report.

1.1 Site Description and Background

1.1.1 Site Location and Description

The Dinaburg site is a Class 2 site, listed on the NYSDEC Registry of Inactive Hazardous Waste Sites (NYSDEC Site No. 8-28-103). The site is located at 1012 South Clinton Avenue, City of Rochester, Monroe County, New York. The property is in a mixed commercial/residential area just inside the Rochester City limits. The site is located on the east side of South Clinton Street. The site occupies about 0.25 acres on two parcels orientated perpendicular to one another. The site is surfaced by a combination of pavement, a concrete former building slab, and soil.

The site geology consists of approximately 20 feet of overburden overlying Silurian age dolomite (calcium-magnesium carbonate) bedrock. The overburden consists of a thin layer of fill (1.0-5.0 feet) overlying naturally occurring unconsolidated deposits of sand, silt and glacial till. Groundwater is typically found between 7.5 and 13.0 feet below ground surface (bgs) with elevations between 500 and 505 feet above mean sea level (AMSL) and flows radially outward from the site to the south and west.

1.1.2 Site History

The property and buildings were reportedly used as an automobile repair shop from circa 1950 to circa 1969. From circa 1971 to circa 1993, the site was occupied by Dinaburg Distributing, Inc., which operated a dry cleaning supply business. Aboveground Storage Tanks (ASTs) were located inside in the northeast area of the site building and were used for the storage of dry cleaning fluids.

The property has been vacant since 1995 and currently consists of a parking lot. The building and an adjacent house at 350 Benton Street were demolished in 2004. A layout of the site can be found in the Record Drawings, Appendix C.

The results of previous environmental investigations revealed that soil and groundwater beneath the site are contaminated with trichloroethene (TCE) and tetrachloroethene (PCE). These chemicals were stored at the site and sold to various dry cleaners. In April 1999, the owner sampled the basement air in two homes adjacent to the site. PCE and TCE were detected in the air in both basements. PCE was detected above the guideline value of 100 micrograms per cubic meter ($\mu g/m^3$) as identified in the New York State Department of Health (NYSDOH) *Tetrachloroethene Ambient Air Criteria Document* (1997).

Based on the results of this indoor air testing, later in 1999 the NYSDEC installed two soil vapor extraction (SVE) systems to control vapor migration into these two homes. Since operation of the SVE systems has been initiated, the concentrations of PCE have decreased to below the action level. The systems were operated and maintained by the Department until this contract was initiated

and the systems were replaced. NYSDOH and Monroe County Health Departments continue to monitor indoor air in area homes. The neighborhood homes and businesses are served by public water and drinking water has not been impacted.

In June 2001, the State completed a site investigation to determine the extent of the source-area contamination. The investigation included installation of several groundwater monitoring wells, sub-surface soil sampling, sewer sampling and a soil vapor survey. The investigation identified one well-defined source of TCE and PCE contamination. Levels of PCE in soils were as high as 10,000 ppm (1%) and levels in groundwater were as high as 180 ppm. The bulk of the contamination appears to be limited to the source area and two adjacent residential properties. Site-related contaminants have also been detected in the sewers on South Clinton Avenue and Benton Street. Data collected to date indicates that portions of the groundwater plume are being intercepted by these sewers.

1.2 Description of the Remedial Action

To address the source area of contamination and to provide a more permanent solution to control off-site vapor migration into nearby homes, URS designed a multi-phase extraction (MPE) system as an interim remedial measure (IRM). This cleanup system uses vacuum pumps to extract contaminated groundwater and vapors from wells in the ground. The construction contract for the remedial action at the site consisted of the following major components:

- Excavation of contaminated soils from the source removal area
- Backfilling of the source removal area
- Installation of a liner system over the unpaved areas of MPE treatment
- Installation of eighteen multi-phase extraction wells
- Installation of three groundwater extraction wells

- Construction of a multi-phase extraction and treatment system, containing provisions for both a groundwater collection and treatment system, as well as a soil vapor extraction and treatment system.

- Connection and integration of the existing soil vapor extraction trenches with the newly installed system. Removal and disposal of the existing treatment systems.

- Construction of a discharge line from the groundwater treatment system to the Monroe County Pure Waters (MCPW) combined sewer system on Benton Street.

- Construction of secure system housing and all required aboveground and below ground utilities and appurtenances.

- System startup and performance testing, followed by six months of operation and maintenance of the systems.

1.3 Project Bidding and Award

Contract Documents, prepared by URS, were issued by the NYSDEC for bidding by prospective contractors. The Contract Documents consisted of specifications, drawings, and a Limited Site Data document. A mandatory pre-bid meeting was conducted at the Dinaburg site on April 28, 2005. Two addenda to the Contract Documents were prepared and issued prior to the bid opening. These addenda included revisions to Contract Documents, pre-bid meeting minutes, and responses to questions raised by the bidders. After the bid opening on May 17, 2005, the contract was awarded to the approved low bidder of Abscope Environmental, Inc. (Abscope), from Canastota, New York, for an amount of $747,075.00.

1.4 Pre-Construction Meeting

On August 31, 2005, a pre-construction meeting was held with representatives of NYSDEC, URS, Abscope, and GES (Abscope's technical consultant). Items of discussion included the following topics: the responsibilities of project participants and lines of communication; Minority/Women-Owned Business Enterprise (M/WBE) and Equal Employment Opportunity (EEO)

goals; contract time; progress schedules; working hours; approval of subcontractors; maintenance of as-built drawings; submittal requirements; changes in the work; payments; completion of the work and final acceptance; dispute resolution; project plans; certified payrolls; and health and safety. At the meeting, a Notice-to-proceed date of September 7, 2005 was established.

1.5 Subcontractors

Abscope utilized several specialty subcontractors over the course of this contract. Uniform Contracting Questionnaires (UCQs) were submitted for NYSDEC approval of all subcontracts with a contract value greater than $10,000. Subcontractors and the services they provided on this contract included:

- Atlantic Testing Laboratories – Nuclear Density Testing
- Bedrock Construction – Sawcutting and Paving
- Frank's Vacuum – Wastewater Disposal
- GES, Inc. – Treatment system and environmental consulting
- GeoLogic NY, Inc. – MPE and GWE Well Installation
- Howe and Bassett – Plumbing
- Larsen Engineers – Surveying
- Maple Leaf Environmental Equipment Ltd. – Supplier of treatment system
- Narham Construction, Inc. – Masonry repairs to adjacent building
- North Star Drilling – Well Decommissioning
- O'Rourke, Inc. – Air Monitoring and Meteorological Station
- Stablex Canada, Inc. – Soil Disposal

- Western Logistics – Delivered treatment system to the site
- Yaeger Electric – Electrical

1.6 Project Schedule

The Notice-to-Proceed date for this contract was determined to be September 7, 2005 (see Appendix J). As defined in the Contract Documents, Section VI, the schedule for this project had two separable parts of completion. Part A substantial completion included the construction, startup, and testing of the MPE system; decommissioning of the existing SVE system; soil excavation and installation of the liner system; site restoration; and all other construction work. The deadline for Part A substantial completion was 100 days from the Notice to Proceed, or December 16, 2005.

The second part of substantial completion primarily included operation of the MPE system for a period of six months. Operation of the system included providing all labor, equipment, and material in order to keep the system fully operational and meeting all design requirements. The deadline for substantial completion of this part of the work was 280 days from the Notice-to-Proceed, or June 14, 2006. The deadline for final completion of all work, including punch list items identified as part of substantial completion, was 340 days from Notice-to-Proceed, or August 13, 2006.

Over the course of the contract, the contract time was extended by a total of 105 days, as executed by Change Order No. 1. The increase in the contract time included a 70 day increase due to delays in obtaining approvals to ship the contaminated soil for disposal, as well as increases due to modifications to the well head designs, removal of additional trench soils, replacement of basement floor slabs, and other miscellaneous work that delayed work at the site. An additional extension to the contract time was granted due to delays by the local utility in providing electric service to the site. With the 105-day extension to the contract, the new deadlines for completion became March 31, 2006 for Part A substantial completion, September 27, 2006 for substantial of the second part, and November 26, 2006 for the final completion of all work. Change Order No. 1 is discussed further in this report and additionally is included in Appendix G.

2.0 SUMMARY OF REMEDIAL WORK

URS maintained a resident engineer/inspector on site during all significant construction activities. Signed daily inspection reports, including sign-in sheets, photographs of the site, waste manifests, and air monitoring reports were prepared to document the Contractor's daily efforts and the progress of construction during the construction period. Daily reports are included as Appendix A to this report.

This section summarizes the remedial construction activities at the site, generally defined as all work through Part A Substantial Completion. Descriptions of the work have been separated into sections consistent with the contract pay items as identified in Section V of the contract documents. These sections include site facilities and services, site work, MPE system, and MPE system installation and startup. Operation of the system is described in Section 3.0 of this report.

Changes in the work that occurred during the project also are described in the following sections.

2.1 Site Facilities and Services

2.1.1 Site Preparation

Site preparation activities were conducted prior to excavation and other major work at the site. Larsen Engineers did an initial site survey to locate and identify control points and to determine the actual property boundaries. The pre-survey information also was used in conjunction with later surveys to determine the quantity of material removed from the excavation. Additional surveying was conducted at the end of the excavation, and at the end of the backfill work.

The City of Rochester Water and Lighting Bureau staked out the locations of the underground water lines and electric lines.

Abscope mobilized a construction trailer to the site and made connections for telephones, power, and cable. This trailer served as the offices for both the Contractor and the resident engineer. A project sign was installed on the south face of the construction trailer, facing South Clinton Avenue. Abscope also documented the existing condition of the building exterior at 1010 South Clinton Avenue, adjacent to the work site. This building was damaged later in the project by excavation equipment. Narham Construction, Inc., a masonry contractor, was subcontracted by Abscope to make the repairs to the building.

URS inspected the basements and exterior of immediately adjacent structures at 338 Benton Street and 1018 South Clinton Avenue to document their pre-construction condition (See Appendix C for layout drawing showing buildings). Later in the project, Abscope was directed to use a concrete mix to repair and seal the basement floor of 1018 South Clinton Avenue. The basement of the residence at 338 Benton Street also was to be sealed, but there were delays in getting access to the building due to the landlord being out of town. This work was completed toward the end of the project.

The existing SVE systems at 338 and 350 Benton Street were disconnected, and the power supply from 338 Benton Street was reconnected to be the power supply for the construction trailer. The existing SVE systems were then dismantled. The extraction trenches for these systems were connected to the vapor extraction portion of the MPE system once it was operational.

2.1.2 Health and Safety

O'Rourke, Inc., was subcontracted by Abscope to perform air monitoring work. O'Rourke set up a meteorological station and air monitoring stations along the edge of the project boundaries. Monitoring was conducted on days when excavation and intrusive work activities occurred. This work generally was conducted for the months of October and November 2005. Air monitoring reports have been included in Appendix A.

In addition to air monitoring, other health and safety related work included the decontamination of the drilling equipment between boreholes. The decontamination procedure

included spraying the equipment with high-pressure hot water. The equipment was staged on pallets within a decontamination tub for the cleaning. Abscope made arrangement to obtain potable water for the decontamination activities from a neighboring barbershop at 1002 South Clinton Avenue. Dirty decontamination wash water was collected and stored in either a 1,000 or 1,500- gallon tank until disposal. A total of approximately 2,500 gallons of contaminated water, including decontamination water, well development water, well purge water, and excavation water, were collected and disposed. Water was transferred to a Chemical Waste Management facility on November 30, 2005.

2.1.3 Fencing

Abscope installed an orange construction-type fence along Benton Street to supplement an existing wood picket fence and to help separate the project area from public areas. Following the completion of construction in Spring 2006, a permanent vinyl-coated chain-link fence, approximately 5 feet high, was installed along Benton Street to replace the wood picket fence.

2.1.4 Well Decommissioning

Northstar drillers decommissioned an existing monitoring well and other well structures located within the footprint for excavation of the source area. Monitoring well MW-2, and piezometers PZ-1 and PZ-2 were each decommissioned by removing the well box, overdrilling the borehole, and then tremie grouting the borehole with a cement/grout mix. Well RW-1 was decommissioned via grouting only, without overdrilling the well.

2.2 Site Work

2.2.1 Excavation and Backfill

Abscope saw cut and removed the portion of the concrete slab (the floor from the original building) overlying the area to be excavated for source removal. Using headspace analysis of the concrete, URS determined that the concrete should be considered hazardous and be treated as such.

Following concrete removal, an excavator was used to load the excavated source material directly onto 35-ton dump trailers. During the source area excavation, a total of 14 trailers of material (concrete and soil), weighing a total of 518.96 tons, were removed. The excavation effort was completed within 3-4 days. The final excavation area had dimensions of approximately 32 feet square by 8 feet deep. All soil and concrete were disposed at a Stablex facility in Canada. No groundwater was encountered during the excavation effort. However, during the backfill some precipitation was collected, and subsequently was removed from the hole. This water was stored and later disposed at a Chemical Waste Management facility with the other contaminated water generated during the work.

During the source area excavation, Abscope encountered a wooden trench, 1-foot by 1-foot square, running parallel to South Clinton Avenue. The trench was located at the bottom of excavation, approximately 7 feet bgs, on the top of apparent bedrock. A 750-gallon underground storage tank (UST) also was encountered. The UST was located 1-foot bgs, adjacent to the building at 1010 South Clinton. The bottom of the UST was found to be corroded away. The UST was removed and disposed along with the excavated source material.

Prior to the backfill of the excavation, the contractor installed one layer of non-woven polypropylene geotextile fabric at the bottom of the excavation. Geotextile also was installed along the walls of the excavation in addition to the floor. No PID readings above background were detected in the excavation prior to the backfill. The excavation was backfilled with clean soil, with the first lift approximately 1 foot thick, and then 6-8 inch lifts thereafter. Compaction of the backfill

was tested via nuclear density testing by Atlantic Testing Laboratories. Once the backfilling activities were completed, the excess geotextile was trimmed to grade.

2.2.2 Liner System

To prevent short-circuiting of the MPE wells, a 20-mil HPDE liner was installed over the unpaved areas of the site within the zone of MPE treatment. In preparation for the liner installation, the top one-foot of topsoil was excavated from the liner footprint and stockpiled within the liner footprint pending offsite removal. Field headspace screening of three grab samples from the topsoil with a PID revealed no VOC detections above background concentrations. Upon receipt of the sample results, the topsoil was transported to the Riccelli Trucking facility where it was stored, pending reapplication during the final grading of the site. To facilitate the construction, Abscope also temporarily relocated community flower boxes along Benton Street.

Following removal of the topsoil, Larsen Engineers surveyed the excavated section of the liner footprint to determine the final grades with respect to the slope between Benton Street and the abutting property at 497 Caroline Street. It was determined that the liner should be graded toward Benton Street to prevent ponding and to prevent runoff towards the abutting properties.

After the topsoil was removed, but prior to placement of the liner, Abscope installed the trenches and lines to connect the MPE wells to the treatment system trailer. After all excavation was complete, a roller-compacter was used to compact the entire site. The liner, consisting of 20 mil HDPE geomembrane sandwiched between two layers of geotextile fabric, was then placed over the site. The previously removed soil/topsoil was re-staged on existing concrete slabs outside the liner footprint. The staged soil was screened and the placed over the liner material. Large fragments in the soil (> 2-inches) were placed in the northern corner of the site. A total of nine inches of soil was placed over the liner. The final 3-inch layer of clean fill/topsoil was installed over the liner in Spring 2006.

2.3 MPE System

2.3.1 Multi-phase Extraction Wells

A total of 18 MPE wells were installed at the site by Geologic, NY, Inc. The wells were installed to the top of the till layer, generally in the range of 10 to 13 feet bgs. Well borings are located in Appendix D. Installation of the MPE wells was completed in approximately two weeks. MPE wells located outside the liner footprint were installed flush to grade. MPE wells located within the footprint of the liner were installed at 18-inches above grade. These wells were finished to grade following placement of the liner. There was one significant change to the construction of the MPE wells. The contract drawings had indicated that the wells would be finished to grade with 2-foot by 2-foot concrete wellboxes and hinged, aluminum doors. Since the contractor elected to place all well controls and sampling taps inside of the treatment system trailer instead of each wellhead, smaller hand-hole type wellboxes with bolted covers were installed instead. Dedicated piping from the treatment trailer to each of the extraction wells was installed instead of using a well manifold.

Following installation, the MPE wells were developed by pumping first to remove excess silt, followed by surging with a 4-inch diameter surge block. The surge block and other equipment was decontaminated between each well location. Due to low productivity, some wells required that potable water be added to help clear the well of silt. All well purge water was stored for offsite disposal along with the other contaminated water generated from the site.

Twenty-eight, 55-gallon drums of soil cuttings were generated from the well installation efforts (MPE and GWE wells). The drums of soil eventually were emptied, crushed, and placed into rolloffs for disposal at the Stablex facility in Canada. One drum of PPE also was generated and disposed of.

During construction, it was necessary to relocate several of the wells from the locations indicated in the contract drawings. These relocated wells were:

- MPE-1 moved 1 foot northwest

- MPE-5 moved 1 foot southeast
- MPE-9 moved 13 feet north-northeast due to overhead power lines as well as subsurface SVE laterals in the area.
- MPE-13 moved 10 feet west-southwest due to overhead power lines
- MPE-14 was moved 2 feet northwest due to community flower boxes
- MPE-17 was moved 1.5 feet north-northwest of the original location to avoid a neighboring building at 338 Benton Street.
- MPE-16 was moved 2.5 feet east to avoid the existing concrete footprint

Following construction of the wells, Larsen Engineers surveyed all new well locations and elevations.

In January 2006, approximately two weeks before the expected delivery of the treatment system, Abscope attempted to install the air operated pumps in the extraction wells. However, the pitless adapter at the top of each well prevented the 4-inch pumps from fitting into the 4-inch wells. The accepted solution proposed by the Contractor was to use 3-inch pumps of the same type and manufacturer, and meeting the same design requirements. In order to meet the adjustability requirement of the contract documents, the contractor included a section of pipe that could be added or removed to adjust the height of the pumps. The only exceptions were wells MPE-11 and 12, which are not adjustable due to the short length of the intake screens on these two particular wells. All pumps were installed so that the intakes are 6 inches above the bottom of the wells.

2.3.2 Groundwater Extraction Wells

Geologic NY installed a total of three groundwater extraction wells at the site. The groundwater extraction wells are installed to the top of bedrock and are approximately twice as deep as the MPE wells. Well boring logs are included in Appendix D.

On the first attempt at installation, all three of the GWE wells had refusal of the drilling equipment prior to reaching the required depth. The first attempts were all grouted to surface with a cement/bentonite grout and topped with an asphalt cold patch to match the surrounding area. All of the wells were successfully installed to depth on the second attempts.

Following installation, the GWE wells were developed by pumping first to remove excess silt, followed by surging with a 4-inch diameter surge block. The surge block and other equipment was decontaminated between each well location. Due to low productivity, some wells required that potable water be added to help clear the well of silt. Well GWE-2 in particular was difficult to develop since the well went dry after the removal of one volume of water. Following construction of the wells, Larsen Engineers surveyed all new well locations and elevations.

2.3.3 System Piping

Following installation of the extraction wells, Abscope began to lay out the trenches and sawcut the pavement lines for all of the piping from the wells to the treatment system. Abscope excavated soil from the trench excavations and if it was determined to be contaminated, loaded it directly into rolloff boxes. If the soil was determined to be uncontaminated, it was staged for later re-use on site. The determination of whether or not the soil was contaminated was based on PID readings, visual indications, and odor. After excavation of the trenches, the piping was installed. Piping to the MPE and GWE wells consists of a 3/8-inch diameter polyethylene tubing air supply line (to operate the extraction pump) and a ¾-inch PVC line to transfer water back to the treatment system. A 2-inch diameter PVC line for vapor extraction was additionally installed to each of the MPE wells. Due to its small diameter and the fact that hose tubing was used instead of piping, the air tubing was installed inside of 2-inch diameter PVC conduit. Most of the pipe trenches are located approximately 4 feet bgs. Both the air supply and the groundwater return lines above the frost depth were heat traced and insulated to prevent freezing.

Pea stone gravel was installed in the trenches 6 inches above and below the pipes. Backfill then proceeded in 12-inch lifts with Troxler density testing of each lift. After a short period, Abscope switched to 6-inch lifts because sufficient compaction was not being achieved with the 12-inch lifts.

For trenching conducted in areas open to the public, the trenches could not remain open overnight. These trenches were backfilled the same day, even if temporarily with uncompacted backfill material. Trenching, line installation and backfilling were all complete within approximately three weeks.

Approximately 17 rolloffs (431 tons) of contaminated soil and C&D debris were generated and removed from the site during the trenching work. All contaminated soil and debris was taken for offsite for disposal in Canada by Stablex Canada, Inc.

After construction of the piping system, the lines were pressure tested. Due to the cold winter temperatures, Abscope built a temporary shed at the location where the lines emerged aboveground to connect to the treatment system. The shed was to keep the aboveground lines from freezing during the pressure testing. The shed was constructed of plywood and polyethylene sheeting and measured approximately 12 feet by 20 feet. All of the lines were pressure tested on December 12. The only problems noted were wells MPE-2, 10, and 13 where the o-rings on the pitless adapters failed. The failure was attributed to extremely cold temperatures affecting the flexibility of the rubber o-rings.

Following installation of the system lines, Abscope excavated an area 10' x 4' x 7' deep for the sewer tie-in. Howe and Bassett, licensed plumbers, then connected the site discharge line to the municipal sewer tie-in. A Monroe County Sewer Inspector oversaw and approved the connection. The sewer connection was made via one of two pre-existing laterals on the site as opposed to installing a new lateral connection to the street. Later in Spring 2006, at the request of MCPW, the remaining lateral from the site was abandoned in place by filling the lateral with concrete.

2.3.4 MPE Treatment System

Concurrent with backfilling over the liner, Abscope had a concrete slab poured as a foundation for the MPE trailer. All of the system well piping and discharge connections were stubbed up adjacent to the concrete pad.

The treatment system itself was constructed by Maple Leaf Environmental Equipment at their facility in Ontario, Canada. Prior to delivery of the system, URS and Abscope toured the Maple Leaf facility to observe and inspect the trailer, indicate corrections required, and make suggestions to improve the layout and operation of the system. Originally, the contractor had intended to construct a large pipe manifold outside of the trailer, to be housed in a separate enclosure constructed adjacent to the trailer. Based on the inspection, it was determined that the pipe manifold should be located inside the trailer to reduce the chance of vandalism. This change ultimately delayed the delivery of the trailer.

On February 3, 2006, the treatment trailer was delivered to the site. A large crane was used to lift the system from the trailer to the concrete pad. Following placement of the trailer, Abscope made the connections from the existing stub-ups to the trailer wall via flexible hoses. Inside the trailer, the hoses were connected to the relocated pipe manifold. The aboveground flexible hoses were heat traced, insulated, and secured for protection. Abscope also installed the vapor phase carbon discharge stack and other appurtenances on the outside of the trailer that had been removed for shipping.

2.3.5 Electrical

Approximately one month before the expected delivery of the treatment system, Yaeger, the electrical contractor, installed a separate electric panel box for the system trailer. The electric service installed was a 200 amp, 3 phase service. A new telephone pole was installed just east of the trailer footprint. Two weeks later, RG&E, the local electric supplier, prepared to connect their lines to the panel box for the MPE system. RG&E tested the connection and discovered a short in their utility lines and that they could not meet the power demands of the MPE system without an upgrade to the area. The upgrade of the electrical supply required that an entire section of the power line be replaced, including turning off power to the neighboring residents for approximately 8 hours. The work also required excavation of the street and a second field crew. Due to the complications and notification requirements associated with this type of work, RG&E delayed work by approximately 4 weeks until the upgrade work was completed. Before making the connection to the electric service, RG&E noted that the electric box was not inspected by the City of Rochester. Abscope subsequently arranged to have the electric panel box inspected by the city.

After the upgrades, RG&E connected the public utility line to the system panel box and installed the power meter. Yaeger Electric, the electrical subcontractor, then connected the power panel to the treatment system trailer. Other work by Yaeger included installation of the exterior lights, and the heat trace systems.

Yaeger discovered that there was a problem with the voltage being supplied to the system. RG&E investigated and found that one of RG&E's fuses was malfunctioning. Upon replacement of the fuse, the electric supply met the system requirements. Two weeks later, due to continuing power problems, RG&E again came to the site. This time, the problem was determined to be RG&E's transformer, which was old and apparently unable to keep up with the demands of the MPE system. These issues have since been resolved.

2.4 MPE System Installation and Startup

2.4.1 System Operation

Even while the site electrical issues were being resolved, Abscope was able to begin limited operation of the system. On February 16, the system manufacturer, Maple Leaf Environmental, was on site to inspect the installed system, to perform preliminary start-up, and to review operation and maintenance procedures with Abscope. While the system was operating, Abscope took samples of the treated effluent water as required by the MCPW permit.

The MPE treatment system officially began operation on February 22, 2006, even though there were a few problems including water in some of the well air lines, control system problems (alarms not functioning correctly), and the metering pump was not operational. Abscope resolved all of the outstanding issues over the next several weeks. April 1, 2006 was considered to be the official start of the six month operation period.

2.4.2 Sampling and Analytical

In early March, the Engineer determined that the manifold that Maple Leaf had installed for the treatment system influent was not adequate for collecting discrete samples from each of the MPE wells. The configuration allowed water from multiple wells to flow out of each sample tap. Maple Leaf supplied a reconstructed manifold with valves correctly installed to allow for the collection of discrete samples, with no possibility of groundwater from other wells being intermixed.

2.4.3 Groundwater Monitoring Well Samples

On February 16, 2006, prior to startup of the treatment system, Abscope collected their first round of groundwater samples and water levels to set a baseline of the contaminant concentrations prior to operation of the treatment system. Three well volumes were purged from each well with a bailer. Purge water was staged on site in 55 gallon drums for future treatment in the treatment system.

Since the end of March, no samples have been collected from monitoring well MW-11K, as this well has been damaged. This well has not been repaired.

2.5 Submittals

The approved shop drawings document many of the minor details of the construction. Those details are not discussed in this report. The required shop drawings and other submittals were received from Abscope, and reviewed by URS, in a timely manner. All required shop drawings ultimately were approved by URS.

Other submittals by Abscope included six months of system operating data and analytical results of air and water samples from the system influent and effluent. The operating data is further discussed in Section 3.0.

2.6 Contract Modifications

The following section discusses significant variations (field clarifications, proposed change orders, approved substitutions, etc.) from the Contract Documents. Only changes that affected the construction or operation of the facilities are described in this section. All changes were included in the executed Change Order No. 1, included as Appendix G.

2.6.1 Modifications to the Site Work

The following modifications to the general site work were included as part of approved Change Order No. 1for this contract:

- The total quantity of soil and other material for disposal was more than twice the quantity that was included in the original contract documents. Much of the additional quantity was due to the fact that the concrete slab at the site was found to be contaminated and required disposal as such. Additionally, the soil generated by excavation of the trenches for the MPE piping originally was intended to be backfilled in place. However, during the excavation, it was found that the soil was highly heterogeneous and could potentially damage the piping and/or not compact properly. Therefore, the trench soil was determined to be unsuitable as backfill and was instead disposed off site.

- The existing wood stockade and other fence at the site was determined to be insufficient to properly secure the site following construction of the MPE system. Therefore, new vinyl coated chain-link fence was installed around much of the site. The total linear feet of fencing installed at the site was increased by 128 linear feet.

- Concerns were raised about the potential for either short-circuiting of the MPE system, or contaminant vapor migration via cracks and holes in the basement floors of adjacent structures. Therefore, the concrete basement floor slabs of the buildings at 1018 South Clinton Street and 338 Benton Street were inspected, and any cracks or holes were repaired with a non-shrink concrete material.

2.6.2 Modifications to the MPE System

Although presented as three separate change order items, there was essentially only one major modification to the MPE System. The original Contract Documents called for the 18 MPE wells and 3 GWE wells to be installed as part of a manifold system. A network of pipe would extend and branch out to each of the wells, starting from one large diameter pipe at the treatment system, and then decreasing down to smaller diameter pipes at each of the extraction wells. Controls for each of the well pumps and for the vapor extraction system would be accomplished via valves and instrumentation located in large concrete boxes installed at each wellhead.

The alternate system proposed by the Contractor and installed at the site consisted of centralized controls and instrumentation for the wells inside the treatment trailer, with completely separate pipes and lines from the treatment system to each well. The only piping manifolds are located inside the trailer. While this change required that more piping be installed, it also provided some benefits in that only small well boxes were required and that all well controls and instrumentation could be located inside of the treatment trailer. This eliminated the need for the system operator to individually open each well location in order to take readings or samples or to make adjustments to the flow rates. All routine well activities are completed from one location.

Specific pay items affected by this system modification were credits for the elimination of items associated with the pipe manifolds (UC-6, UC-7, and UC-8), credits associated with installing smaller well boxes (from Item LS-2), and in increase for the additional trenching and pipe installation (new pay item).

2.7 Final Contract Prices and Change Orders

There was only one change order executed over the course of this project. The final contract price for the general contract is $868,078.95, an increase of $121,003.95 over the original contract price of $747,075.00. The change order also included a 105-day extension to the contract time. The extension of the contract time was granted due to problems with the local electrical supply outside of Abscope's control, and due to the extra time required for redesign of the system based on the revised

well and piping layout. A copy of the executed change order is included in Appendix G to this report.

In addition to the change order items, final quantities for many of the bid items differed from those estimated in the original contract bid form. Table 2-1 summarizes both the original and actual bid quantities and costs. It should be noted that the actual quantities and final contract amounts must be considered an estimate since the Abscope has not submitted a final CAP for the project.

Table 2-1

Comparison of Bid Quantities and Costs to Actual Quantities and Costs

Item No.	Description	Units	Estimated Bid Quantity	Unit Price	Original Contract Amount	Change Order Quantity	Change Order Amount	Estimated + Change Order Quantity	Actual Quantity	Final Contract Amount [1]
UC-1	Excavation and Offsite Disposal of Contaminated Soils	Ton	465	$ 215.00	$ 99,975.00	485.23	$ 104,324.45	950.23	950.23	$ 204,299.45
UC-2	Backfill	CY	300	$ 30.00	$ 9,000.00		$ -	300	273	$ 8,190.00
UC-3	Liner System	SF	5,000	$ 2.00	$ 10,000.00		$ -	5,000	4,858	$ 9,716.00
UC-4	Multi-Phase Extraction Well	LF	250	$ 65.00	$ 16,250.00		$ -	250	209	$ 13,585.00
UC-5	Groundwater Extraction Well	LF	60	$ 65.00	$ 3,900.00		$ -	60	66	$ 4,257.50
UC-6	MPE Pipe for Laterals	LF	325	$ 50.00	$ 16,250.00	(325)	$ (16,250.00)	0	0	$ -
UC-7	MPE Pipe Manifold	LF	210	$ 60.00	$ 12,600.00	(210)	$ (12,600.00)	0	0	$ -
UC-8	GEW Pipe	LF	325	$ 30.00	$ 9,750.00	(325)	$ (9,750.00)	0	0	$ -
UC-9	Fencing	LF	160	$ 75.00	$ 12,000.00	128	$ 9,600.00	288	288	$ 21,600.00
UC-10	MPE System Operation After Startup	Month	6	$ 2,500.00	$ 15,000.00		$ -	6	6	$ 15,000.00
UC-11	Health and Safety	Day	85	$ 1.00	$ 85.00		$ -	85	56	$ 56.00
UC-12	Vapor Phase Carbon	LB	37,500	$ 2.00	$ 75,000.00		$ -	37,500	4,000	$ 8,000.00
UC-13	MPE System - Water Samples (TCL VOCs)	Each	167	$ 145.00	$ 24,215.00		$ -	167	214	$ 31,030.00
UC-14	MPE System - Water Samples (TDS, TSS, pH, Hardness)	Each	22	$ 110.00	$ 2,420.00		$ -	22	20	$ 2,200.00
UC-15	MPE System - Water Samples (Cd, Cr, Cu, Pb, Ni, As, Zn, Ba)	Each	12	$ 155.00	$ 1,860.00		$ -	12	13	$ 2,015.00
UC-16	MPE System - Air (TCL VOCs)	Each	146	$ 320.00	$ 46,720.00		$ -	146	148	$ 47,360.00
UC-17	Groundwater Monitoring Wells - Water Sample	Each	36	$ 150.00	$ 5,400.00		$ -	36	38	$ 5,700.00
UC-18	Site Facilities and Services	Day	80	$ 75.00	$ 6,000.00		$ -	80	80	$ 6,000.00
LS-1	General and Site Preparation	Lump Sum	1	$ 36,850.00	$ 36,850.00		$ -	1	1	$ 36,850.00
LS-2	Multi-Phase Extraction System	Lump Sum	1	$ 342,000.00	$ 342,000.00	(0.11)	$ (37,500.00)	0.89	0.89	$ 304,500.00
LS-3	Treated Water Discharge Allowance	Lump Sum	1	$ 1,800.00	$ 1,800.00		$ -	1	0	$ -
New CO Item	Additional Trench and Pipe			$ 78,189.00	$ -	1	$ 78,189.00	1	1	$ 78,189.00
New CO Item	Floor Slab Repairs			$ 4,990.50	$ -	1	$ 4,990.50	1	1	$ 4,990.50
Totals					**$ 747,075.00**		**$ 121,003.95**			**$ 803,538.45**

1. Costs must be considered estimates since final CAP has not yet been submitted by the Contractor.

N:\11173839.00000\EXCEL\[Cert Report table 2-1.xls]sum of costs

3.0 MPE SYSTEM OPERATION

3.1 Introduction

The MPE system was designed to address contamination in both the vadose and the saturated zones at this site. Rather than separate extraction and treatment of the contaminated groundwater and soil vapors, the MPE system uses one set of extraction wells to concurrently extract soil vapor and groundwater. The two remedial systems benefit from the combined operation in that the vacuum in the vadose zone increases the efficiency of groundwater collection, while depression of the groundwater table from pumping exposes additional soil for cleanup via vapor extraction.

3.2 System Description

3.2.1 MPE and GWE Wells

A total of 18 MPE wells and 3 GWE wells were installed at the site. Most of the MPE wells are installed underneath the footprint of the buildings that formerly were located at this site. A few of the MPE and the GWE wells are immediately adjacent to the former buildings, or slightly further east along Benton Street. All well locations are shown on the Record Drawings, Appendix C. Each of the 18 MPE wells are of similar construction, being 4 inch diameter PVC wells, completed to the top of the till layer, approximately 10-13 feet bgs. The GWE wells are the same construction, although installed deeper, to the top of bedrock, approximately 22 feet bgs. Boring logs and installation information for all wells are located in Appendix D.

Both the MPE and the GWE wells are equipped with three-inch diameter automatic air powered well pumps. These pumps, designed specifically for remediation applications, are powered by compressed air, and operate without any additional outside power or controllers. The pumps operate whenever the water level in the well has recovered sufficiently for the pump to operate, and then shut off when the water level in the well drops. Simply raising or lowering the pump in the well changes the operating range for the pump. The pumping flow rate can be individually controlled by

adjusting the air pressure supplied to each pump via the compressed air manifold located inside the treatment system trailer. Flow rates for each of the pumps are determined by stroke counters, also located inside the trailer, that totalize the number of times that the pumps have operated. Groundwater samples and all other measurements can be collected for each well via dedicated lines inside the treatment trailer.

The MPE wells are additionally equipped with 2-inch diameter lines that extract soil vapor from these wells concurrent with the groundwater extraction. Valves to control the vapor flow from each of the wells also are located inside the treatment system building, in addition to sample ports for measuring flow rate and collecting vapor samples. All lines then connect into one common manifold. In addition to the MPE wells, the SVE system is connected to two pre-existing trenches, one located at a property on Benton Street, and one located at a property on the corner of Benton Street and South Clinton Avenue. These trenches, previously connected to SVE systems, are to mitigate the intrusion of subsurface vapors into the adjacent buildings.

3.2.2 Treatment System

The MPE treatment system consists of an SVE and a groundwater treatment system. The SVE side of the system consists of the influent manifold from the extraction wells, a moisture separator, two extraction blowers installed in parallel, and treatment of the vapor via two vapor phase carbon units, installed in series. Treated vapor is finally discharged to the atmosphere. Any condensate collected by the moisture separator is pumped directly to the groundwater portion of the treatment system. The SVE system is designed to operate at a nominal air flow rate of 500 scfm.

The groundwater treatment system consists of the influent manifolds for both the MPE and the GWE extraction wells. Discharge from all of the pumps is directed to an equalization tank. The water from the equalization tank is pumped to a low-profile type air stripper for the removal of the volatile organic contaminants from the water. A chemical agent is added to the water prior to the air stripper to mitigate mineral deposits from forming on the air stripper and downstream system components. Treated water from the air stripper flows by gravity through a flow meter directly to the local sanitary sewer. The air stripper operates in an induced draft mode. A blower pulls air through

the trays of the air stripper and then discharges the air through the same vapor phase carbon adsorption units that are utilized for the SVE system. The components of the groundwater system are each designed for a minimum flow rate of 5 gpm, although the actual flow rate is expected to be somewhat lower.

The entire MPE system was constructed by Maple Leaf Environmental Equipment at the Canadian facility, and then transported to the site. URS conducted an inspection and testing of the MPE system trailer in January 2006 at the fabrication shop, prior to its shipment to the site. Minor system problems were identified and corrected.

3.3 System Operation

After the MPE system was constructed and operational, the system underwent a one-month startup and shakedown phase. During this phase, the system was monitored frequently, and with short turn around times for sample results. During this month, the system was verified to meet all of the performance objectives identified for the system and also verified to be capable of continuous, unattended operation. After a month of startup and shakedown of the MPE system, the contractor began a six-month period of routine system operation and maintenance. The official six-month period was from April through September 2006. During this period, the Contractor was responsible for all system operation and monitoring, as well as sampling and system maintenance. At the completion of the six-month operating period, the system was turned over to the NYSDEC. Appendix L contains monthly operating reports that summarize the sampling and estimate the mass of contamination removed by the MPE system.

Figures 3-1 and 3-2 summarize the monthly contaminant removal by the MPE system. To date, the system is estimated to have removed approximately 212 pounds of contamination. Only a small fraction of the contamination has been removed via the groundwater extraction portion of the system; the majority has been removed via vapor from the MPE wells. The system is operating as designed, and has presented relatively few operational problems. It is recommended that operation of the system continue in its present configuration for at least an additional six-month period.

Figure 3-1

Monthly VOC Removal via MPE Wells
February - September 2006

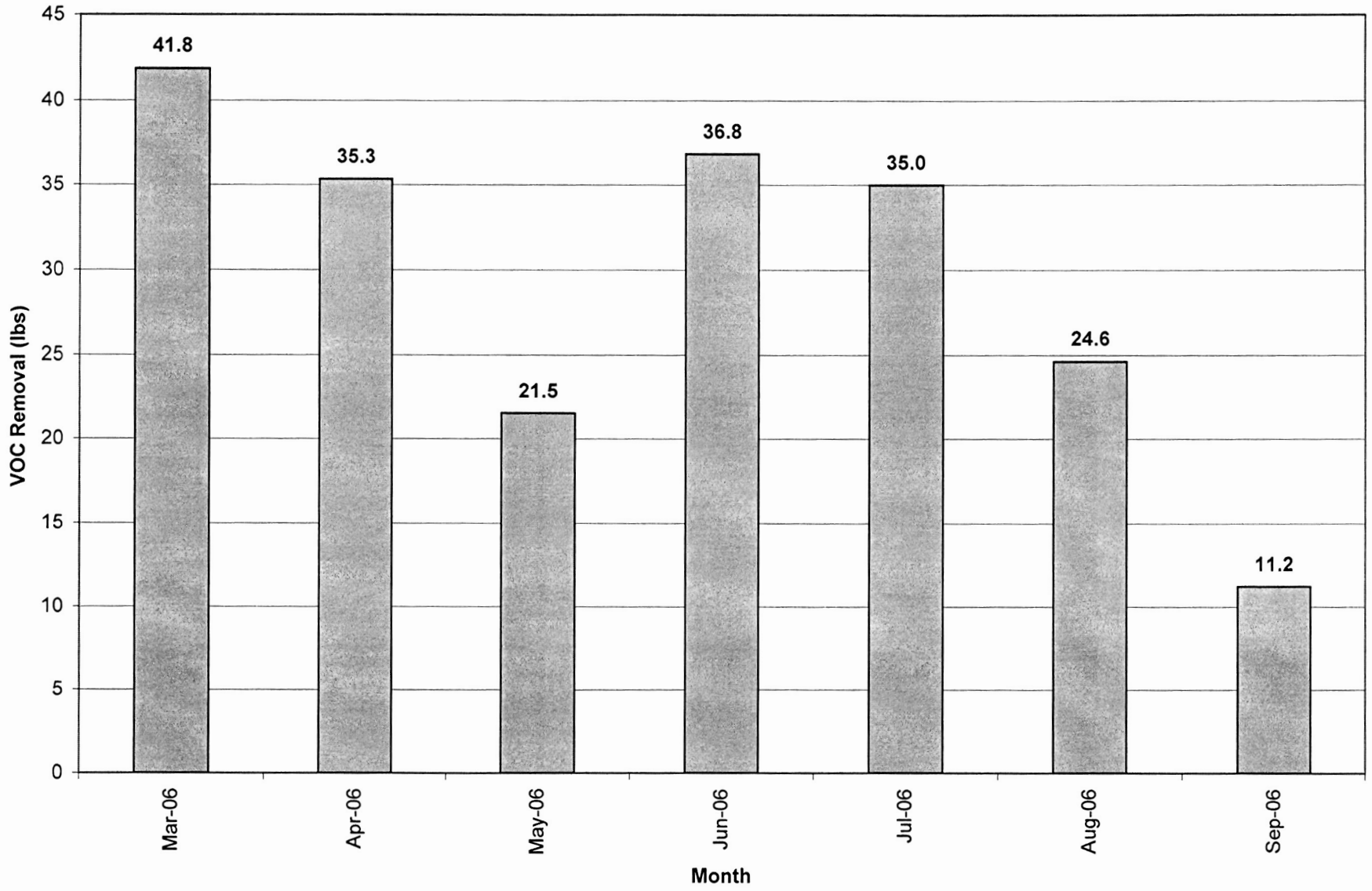

Figure 3-2

Total VOC Removal via GWE Wells
February - September 2006