



June 11, 2007

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Clayton Project No. 12005-005110.05

Subject: New York State Department of Environmental Conservation, West Side
Corporation OU #1, Site Number 2-41-026, Contract No. D004478

Technical Submittal No. 22

Dear Mr. Sundquist:

As requested by Don McCall please find please attached find the following:

Electronic copy of Revisions to the Updated Operation & Maintenance Plan and a pdf copy of
the sewer discharge approval.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

Allen A. Attenborough, P.G.
Senior Geologist

Attachment

AA

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Operational & Maintenance Plan

West Side Corp OU #1

Site No. 2-41-026

Contract No. D004478

107-10 180th Street

Jamaica, Queens, New York

May 11, 2007

Bureau Veritas Project No. 12005-005110.05

New York State Department of Environmental Conservation

Prepared by:

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FIGURE

1. Soil Vapor Extraction Trailer Gauge and Filter Location

APPENDIX

- A. SVE SYSTEM O&M MANUAL
- B. CATOX SYTEM O&M MANUAL
- C. NYC DEP SEWER DISCHARGE PERMIT





1.0 INTRODUCTION

Bureau Veritas North America, Inc. (Bureau Veritas) was retained by the New York Department of Environmental Conservation (NYSDEC) and URS Corp (the project engineer) to build and operate a Soil Vapor Extraction System at the Westside Corp OOU #1 site located at 107-10 180th Street, Jamaica, Queens, New York. This Operation & Maintenance Plan is provided as part of the requirements under Contract No. D004478.

1.1 DIRECTORY

<u>Name</u>	<u>Company</u>	<u>Address</u>	<u>Phone</u>
Jon Sundquist Donald McCall	URS Corporation (design, engineering)	77 Goodell Street Buffalo, NY 14203	(716)856-5636 ph (716)856-2545 fax
Anders Brunelle	URS Corporation (construction oversight)	950 Fountain Avenue Brooklyn, NY 11208	(718)277-4600 (718)277-2113 fax
David Chiusano	New York State Department of Environmental Conservation (owner/oversight agency)	Remedial Bureau E 12 th Floor 625 Broadway Albany, NY 12233-7017	(518)402-9814 ph (518)402-9819 fax
Allen Attenborough	Bureau Veritas (general contractor)	160 Fieldcrest Avenue Edison, New Jersey 08837	(732)225-6040 ph (732)225-4577 fax
Gary Sheridan	J. E. Gasho Inc. (SVE equipment trailer manufacturer)	460 West Gay Street West Chester, PA 19380	(610)692-5650 ph (610)692-5837 fax
Stephen Parker	HiTemp Technology Corp. (CATOX unit manufacture/maintenance)	PO Box 903 Flemington, NJ 08822	(908)788-6999 ph (908)500-7500 cell
Anthony LaMarca	Atlantic Express Corp. (the bus company - tenants on the property)	107-10 180th Street Jamaica, NY 11433	(718)298-6000
Sheldon Schiff	c/o New York Life (property owner)	120 Broadway 37th floor New York, NY 10271	



<u>Name</u>	<u>Company</u>	<u>Address</u>	<u>Phone</u>
John Dydland	New York City Department of Environmental Protection (environmental issues, sewer permits)	96-05 Horace Harding Expy 2nd floor Corona, NY 11368	(718)262-8383 (morning) (718)595-5333 (afternoon)
Stephanie Selmer	New York State Department of Health(air issues)	Flannigan Square 547 River Street Troy, NY 12180-2216	(518)402-7850
Joseph Ciciliato	Con Edison Energy Services	30 Flatbush Avenue Brooklyn, NY 11217	(718)802-5324 ph (347)865-4188 cell

1.2 PURPOSE

The purpose of the treatment system is to provide treatment of residual tetrachloroethene and its daughter products during the second phase of the Westside Corp OU #1 remediation.

1.3 OPERATION & MANAGERIAL REPSONSIBILITY

Bureau Veritas was responsible for operation and management of this system from September 5, 2006 to April 17, 2007. Malcolm Pirnie assumed these responsibilities on April 17, 2007.

1.4 DISCHARGE PERMITS AND OPERATING STANDARDS

The system is currently permitted to discharge condensate water to the New York City Sewer System under permit number SCQ-374/05. The permit did not include a sample collection schedule other than the collection of one pretreated sample prior to startup. Permit discharge parameters are as follows:

Parameter	Daily Limit	Units	Sample Type	Monthly Limit
Total Petroleum Hydrocarbons	40	mg/L	Instantaneous	
pH (range)	5 – 11	SU's	Instantaneous	
Benzene	134	ppb	Instantaneous	57
Ethylbenzene	380	ppb	Instantaneous	142
Toluene	74	ppb	Instantaneous	28
Xylenes (Total)	74	ppb	Instantaneous	28



Parameter	Daily Limit	Units	Sample Type	Monthly Limit
Temperature	<150	degrees F	Instantaneous	
Cadmium	2 0.69	mg/L mg/L	Instantaneous Composite	
Chromium (VI)	5	mg/L	Instantaneous	
Copper	5	mg/L	Instantaneous	
Lead	2	mg/L	Instantaneous	
Mercury	0.05	mg/L	Instantaneous	
Nickel	3	mg/L	Instantaneous	
Zinc	5	mg/L	Instantaneous	
Flash Point	>140	degrees F	Instantaneous	
Total Suspended Solids	No Limit		Instantaneous	
PCBs (Total)	1	ppb	Composite	
Perc (Tetrachloroethylene)	20	ppb	Instantaneous	
MTBE (Methyl-tertiary-butyl-ether)	10	ppb	Instantaneous	10
Naphthalene	47	ppb	Composite	19
Other				

The site received an exemption for an air permit; however, a Determination of Compliance with Substantive Air Requirements was submitted to the New York State Department of Environmental Conservation. Emissions information under the submittal is as follows:

Contaminant	CAS Number	Hourly Emissions (lbs/yr)	Annual Emissions (tons/year)
Tetrachloroethylene	127-18-4	0.0275	0.120
Methyl Acetate	79-20-9	1.14x 10 ⁻⁷	4.99 x 10 ⁻⁷
Cis-1,2-dichloroethene	156-59-2	0.0035	0.0153
Trichloroethene	79-01-6	0.0011	0.0048
Vinyl chloride	75-01-4	0.0012	0.0053
Hydrochloric Acid	7647-01-0	0.59	2.58



1.5 OVERALL SYSTEM DESCRIPTION

The system consists of three Rotron regenerative direct drive blowers connected in parallel housed in an 18 foot long trailer. Each blower is capable of moving a minimum of 250 cubic feet of air per minute and producing a vacuum of 50 inches of water. The blowers are piped to 16 vapor extraction wells (EW1 through EW16). Soil vapor pulled from the wells is collected through a series of 4 inch diameter underground pipes which feed two 6 inch diameter above ground pipes which feed a single 8 inch diameter pipe. The 8 inch diameter pipe runs along the top of the loading dock at the south end of the building and then runs underground for approximately 20 feet where it resurfaces and enters the trailer. The soil vapor enters the side of the trailer into a moisture separation unit. The dried soil vapor is then pushed to a catalytic oxidizer (CATOX) for treatment.

Flow can be controlled by opening or closing a butterfly valve in the collection piping at each well head. Valves are also located in front of each blower. The system has two dilution valves. The first is located inside the SVE trailer immediately after the moisture separation unit and the second is a louver located before the CATOX blower.

1.6 TREATMENT PROCESS

The single treatment process used by the system is catalytic oxidation. Soil vapor collected by the Soil Vapor Extraction System is pushed to the catalytic oxidizer for treatment. The catalytic oxidizer treats the soil vapor by heating it to a temperature of at least 875°F and forcing the area over a catalyst. The catalyst promotes oxidation of the target compounds effectively increasing the efficiency of contaminant destruction. The effluent vapors are discharged through the catalytic oxidation unit's stack.

1.7 SAFETY INSPECTIONS AND PERSONAL PROTECTIVE EQUIPMENT

Inspect the system for safety issues. Relevant safety factors include but are not limited to electrical wiring, high temperature surfaces, pinch hazards, and gas leaks. The system should be inspected as follows:

1. Electrical wiring – wiring should be completely insulated and connections firm. If copper wire is exposed the wire should be properly repaired.
2. High temperature surfaces – the burner for the catalytic oxidation unit can reach temperatures as high as 950°F this area is made secure by a locked fence. The fence should be closed and locked when no one is inside the catalytic oxidation unit area. This area should only be entered by authorized personnel.



3. Pinch hazards –all machine guards should be in place while the system is running.
4. Gas Leaks – the gas line and gas service entrance should be inspected for indications of leakage. In the event of a gas leak call 911 and report the incident immediately.

Personal protective equipment required for the site is currently modified Level D. This includes the following items:

- Steel toed safety shoes or boots.
- Safety glasses.
- Hard hat.
- Gloves.
- Traffic Vest.

1.8 ONSITE SAFETY FACILITIES

Onsite safety facilities include a first aid kit stored inside the SVE trailer and an eyewash station inside the garage area adjacent to the Atlantic Express Foreman Mechanic’s office.

1.9 CONFINED SPACE SAFETY

Site activities do not currently involve confined space entry.

2.0 OPERATION AND MAINTENANCE INSTRUCTIONS

This section provides instructions for operation and maintenance of the SVE system and catalytic oxidizer located at the Westside Corp OU #1 site. A directory of suppliers and subcontractors is provided in Section 1.1 of this plan.

2.1 SIGNIFICANT DESIGN CRITERIA

Significant design criteria for the SVE system include the following:

- Minimum vapor treatment capacity of 750 SCFM.
- Minimum volatile organic compound destruction efficiency of 99%.
- Weather proof system housing
- Noise level from each blower shall not exceed 70 dBA at a distance of 3’0” from the blower housing
- Construction materials are chemically inert to the suspected contaminants



- System will shut down automatically if any of the following occur: 1) electrical power loss to the control panel; 2) loss of proper inflow; 3) high/low temperature; 4) high... low gas pressure; 5) flame out of the burner; 6) system operation above 25% LEL; 7) high level in moisture separator.
- Moisture separator operates on an automated high level switch which activates the pump to empty the separator unit.
- All electrical equipment is rated for hazardous locations (Class 1 or Class 1 Division 2) in accordance with the New York City Electrical Code
- Stack discharge height to comply with NYSDEC Air discharge requirements.
- Stack is to be anchored to withstand wind loading for the area.

2.2 SVE MANUFACTURER OPERATION AND MAINTENANCE MANUAL

The SVE Manufacturer's Operation and Maintenance Manual is provided as Appendix A. This manual includes the following items in accordance with Section 01600 1.2 F:

1. List of equipment
2. Parts list for each component
3. Standard Operating Procedures
4. Troubleshooting
5. Scheduled Preventative Maintenance
6. Spare Parts Records
7. Recommended Lubricants and Spare Parts
8. Required Tools
9. Maintenance instructions for finishes, cleaning methods, materials and special precautions identifying detrimental agents

2.3 CATALYTIC OXIDIZER OPERATIONS AND MAINTENANCE MANUAL

The Catalytic Oxidizer Operations and Maintenance Manual are attached as Appendix B. The attached manual includes the following items in accordance with Section 01600 1.2 F:

1. List of equipment
2. Parts list for each component
3. Standard Operating Procedures
4. Troubleshooting
5. Scheduled Preventative Maintenance
6. Spare Parts Records
7. Recommended Lubricants and Spare Parts



8. Required Tools
9. Maintenance instructions for finishes, cleaning methods, materials and special precautions identifying detrimental agents

2.4 STANDARD OPERATIONAL PROCEDURES

The following Standard Operational Procedures are supplemental to those provided in the Manufacturers' Operation and Maintenance Manuals. These procedures include routine data collection, sample collection, and balancing the airflow at the inlet to the catalytic oxidizer.

2.4.1 Blower Vacuum, Pressure, and Flow Readings

Vacuum readings are observed at five locations inside the SVE trailer. These include at the filter influent, the filter effluent, and at the influent of each blower. Pressure readings are measured at the effluent of each blower. The procedure for observing readings is as follows:

Required Equipment:

1. Notebook and writing implement
2. Keys to trailer

Procedure:

- Unlock and open the SVE Trailer.
- Turn on the light.
- Enter the trailer and walk to the rear of the trailer
- Read vacuum gauge at the filter influent and record reading in a bound notebook
- Read vacuum gauge at the filter effluent and record the reading in a bound notebook
- Read the vacuum gauge at the influent and the pressure gauge for each SVE blower. The blowers are labeled SVE1, SVE2 and SVE3. Approximate gauge locations are shown on Figure 1. Vacuum readings range from 42 – 60 inches water and pressure readings range from 10 -15 inches of water.

No flow readings are collected inside the SVE trailer. A total flow reading and a temperature reading are taken using a hot wire anemometer at the rear of the trailer. The procedure is as follows:

- Unscrew the cap on the pipe nipple in the CATOX effluent pipe at the outside rear of the trailer.



- Insert the hotwire anemometer probe into the pipe so that the 6 inch marking is at the edge of the pipe and the holes in the probe are open directly into the air stream.
- Wait for the probe reading to stabilize.
- Record readings in a bound notebook.

2.4.2 Extraction Well Vacuum, Temperature and Flow Readings

Specifications require periodic collection of monitoring data from the 16 extraction wells (EW1 – EW16 at the site. Extraction wells which are closed during system operation are typically not monitored. Currently three wells (EW7, EW8, and EW10) are completely closed. The SOP for collection of extraction well data is as follows:

Required Equipment:

1. Hotwire anemometer
2. Special tool for opening vault doors
3. Traffic vest
4. Safety glasses
5. Gloves
6. Boots
7. Notebook and writing implement
8. Pencil
9. Adjustable wrench or 9/16” box wrench

Procedure:

- Verify that bus traffic is clear
- Use special tool to remove the protective screw from the vault door.
- Insert the special tool and turn counterclockwise. The latch will click and the door may spring up slightly. Simultaneously lift up on the handle to lift door. Always lift the door from the handle. Be careful to keep fingers out of the way while lifting the door.
- Note vacuum reading on vacuum gauge installed on the side of the well. Record reading in the notebook.
- Use wrench to remove sampling port at top of well head.
- Turn on hotwire anemometer, select desired units (Metric or English) and insert the probe into the well through the sampling port hole.
- Observe readings for flow and record in the notebook. If flow is out of range the anemometer’s range can be increased by pressing the button labeled “Range.”
- Replace sampling port.



- Close well lid and replace protective screw.

2.4.3 Extraction Well Sampling Procedure

Soil vapor samples are collected from each extraction well in accordance with the project schedule. Samples are collected in 6 liter SUMMA canisters and submitted to a New York Certified Laboratory of analysis. The procedure for soil vapor sample collection is as follows:

Required Equipment:

1. Special tool for opening vault doors
2. Traffic vest
3. Safety glasses
4. Gloves
5. Boots
6. Notebook and writing implement
7. Pliers
8. Dedicated Teflon sampling tube
9. 14 x 6 liter SUMMA canisters (This accounts for 13 samples and 1 duplicate)
10. Labels
11. Chain of Custody Form

Procedure:

- Verify bus traffic is clear
- Use special tool to remove protective screw on vault door
- Insert special tool and turn counterclockwise. Simultaneously lift up on handle to lift door. Always use the handle to lift the door. Be careful to keep fingers out of the way while lifting the door.
- Remove cap from sampling port.
- Check to make sure SUMMA canister valve is closed.
- Remove cap from SUMMA canister.
- Attach dedicated tube to the SUMMA canister by screwing the swag lock adapter onto SUMMA canister.
- Attach the other end of dedicated sampling tube to hose barb sampling port on the well.
- Open valve on SUMMA canister and allow to fill. You will note a hissing sound as the can fills. After approximately 5 seconds the hissing sound will stop, this indicates the can is full. Close the valve.
- Remove the sampling tube and replace the protective cap on the canister.



- Label canister in accordance with laboratory requirements.
- Record sampling time and canister information in notebook
- Complete chain of custody.
- Arrange delivery of canisters to laboratory.

2.4.4 CATOX Influent and Effluent Sampling Procedures

The influent and effluent vapors of the CATOX unit are sample for VOCs by USEPA Method TO15. The effluent CATOX vapors are also sampled for hydrochloric acid via Draeger tube analysis. The procedures are as follows:

Required Equipment:

1. Keys to CATOX.
2. Notebook and writing implement.
3. Photoionization detector (PID).
4. 2 x 6 liter SUMMA Canisters.
5. 1 Draeger Hydrochloric Acid tube 0-10 ppm.
6. Draeger sampling pump.
7. Dedicated sampling tube.

Procedure:

- Calibrate PID. Record Calibration in notebook.
- Unlock gate.
- Enter CATOX area. Do not touch the stack, it is very hot and could cause significant burns.
- Open effluent valve (AP205) and collect PID reading. Record results in notebook
- Open influent valve (AP204) and collect PID reading. Record results in notebook.
- Open Draeger Tube by inserting each end in hole on the bottom side of the Draeger Sampling pump and gently pushing against the porcelain wedge. Do not push too hard or the entire tube could shatter.
- Place the appropriate end in the sampling pump and the other end in the CATOX effluent port. Push the bellows closed and for the white dot to reappear in the window. Repeat this 9 more times (10 total repetitions).
- As you pump you will notice that the tube changes color from purple to yellow. After 10 repetitions note how far the yellow color change has occurred on the tube in comparison to the graduated markings on the tube. Record this number in the notebook as ppm of HCl. Note that you should only read the marking on the side that reads “n=10.”
- Check that the SUMMA canisters are closed then remove the cap



- Attach the dedicated sampling tube and open the valve on the CATOX sampling port.
- Open the SUMMA canister valve. You will hear a hissing sound. Close the valve when the hissing stops (this should be around 5 – 10 seconds) the canister is full.
- Record sampling time and canister information in the notebook.
- Complete the sample labels and chain of custody in accordance with the laboratory requirements.

2.4.5 Cleaning the CATOX Flame Arrestor

The CATOX Unit is equipped with a flame arrestor which is located on the influent side of the blower. If there is a significant pressure buildup on as shown by readings on the SVE pressure gauges it may be necessary to inspect and clean the flame arrestor.

Required Equipment:

1. Adjustable Wrench and 1 x 5/8” socket wrench
2. Hammer
3. Compressed air line
4. Safety glasses
5. Steel toed boots
6. Gloves

Procedure

- Turn off SVE System and CATOX unit.
- Note relative position of the flame arrestor.
- Remove the bolts on both flanges of the flame arrestor.
- Grasp flame arrestor handle and pull the flame arrestor from between the two pipes.
- Inspect the interior of the flame arrestor for debris.
- Place the flame arrestor influent side down and gently tap with a hammer.
- Use the compressed air line to blow air through the flame arrestor.
- Replace the flame arrestor in the same position as noted in the first step.
- Replace bolts and tighten hand tight.
- Tighten each bolt ¼ turn past hand tight.



3.0 SYSTEM TROUBLESHOOTING

To achieve the vacuum stated in the project specifications, Bureau Veritas made adjustments to the system as follows:

- Line leaks were identified and filled with silicone sealant.
- Vacuum leaks in well vaults were identified by smoke testing.
- Exposed well screens were identified and sealed by filling the well vault with concrete until the screen was covered.
- The annulus between well casings and well vaults were filled with hydraulic cement
- Broken or misaligned aboveground pipe joints were removed and replaced with double arc expansion joints.
- Wells EW-2 and EW-3 where the vault weep hole was found to cause short circuiting were filled with concrete above the level of the weep hole.
- Wells EW7, EW8, and EW10 which were found to short circuit with the surface were fully closed.
- Wells which had an abnormally high vacuum at the nearest vacuum monitoring point were throttled back as follows: EW-14 was shut but still shows a vacuum of 5 inches of water and EW-15 was shut 1/3rd of the way.

Troubleshooting methodology was as follows:

- The vacuum reading at a well known to achieve a high vacuum was observed.
- The valve of a well identified as affecting the system was closed.
- The effect of the valve change was noted on the observation well.
- The valve of the target well was opened partially.
- The effect was noted at the observation well.

This process was repeated until the target well was opened as much as possible with the least effect on the target well. After adjusting the vacuum at monitoring wells it may be necessary to address the flow at the CATOX blower. This is accomplished as follows:

- Place a small plastic lid over the flame arrestor.
- If the lid is blown off loosen the wing nut on the louver and open the louver by pulling it towards you.
- If the lid is held on by heavy suction push the close the louver away from you.
- Adjust the louver until the lid lightly rests on the flame arrestor and can be easily moved.
- Tighten the wing nut on the louver.



4.0 SCHEDULED MAINTENANCE

The SVE system was constructed using direct drive blowers with sealed bearings. As such there is no regularly scheduled maintenance of the blowers or blower motors. The manufacturer's Operation and Maintenance Manual suggests periodically checking the system filters and replacing them if necessary. The system filters were inspected on September 21, 2006 and replaced on October 6, 2006.

5.0 UNSCHEDULED MAINTENANCE AND REPAIRS

On January 30, 2007 two motor starters were replaced on the SVE System control panel.