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BROWNFIELD CLEANUP PROGRAM (BCP) REMEDIAL INVESTIGATION WORKPLAN REGION 8

ECL Article 27/Title 14

37 Bittner Street Rochester, New York 14604

NYSDEC Site #C828127

Prepared for:

234 – 250 ANDREWS STREET, LLC

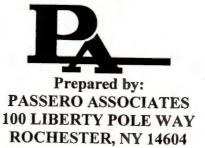


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Passero Associates

BROWNFIELD CLEANUP PROGRAM

37 Bittner Street Rochester, New York 14604

NYSDEC Site No. C828127

October 2006

1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) describes specific activities to be undertaken during the investigation of 37 Bittner Street in the City of Rochester, New York pursuant to the Brownfield Cleanup Program Agreement between the New York State Department of Environmental Conservation (DEC) and 234-250 Andrews St. LLC. The scope of this RIWP reflects discussions held at a May 16, 2005 meeting and subsequent follow-up discussions with NYSDEC and NYSDOH, and revisions made to address comments in the November 22, 2005 NYSDEC critique of our draft September 8, 2005 RIWP.

1.1 **Project Scope and Goals**

The purpose of this Remedial Investigation (RI) is to further define the nature and extent of potential on-site impacts resulting from historic operations at the site. The extent of off-site impact, if any, will be evaluated at the property boundary. The results of this investigation will be used to evaluate remedial actions that might be required to render the site suitable for a mixed residential/commercial development. The basement and first floor are proposed for parking and commercial space; the upper floors will be residential apartments. Specifically, the investigation is intended to:

- further define the nature and extent of petroleum contamination in the soil, surface water, groundwater, and any other impacted media, including a boundary investigation;
- 2) evaluate on-site soil and groundwater quality; and
- conduct an on- and off-site qualitative exposure assessment, including a human health exposure assessment and a fish & wildlife exposure assessment.

2.0 SITE HISTORY AND DESCRIPTION

The 37 Bittner Street parcel is located on the west side of Bittner Street, adjacent at the north side of the Kirstein Building parcel at 242 Andrews Street (Figure 1).

Prior to the City reconfiguring streets in the subject area in circa 1980, Bittner Street was the northern extension of Franklin Street. The subject site is currently used as a public parking lot. The historic Sanborn Fire Insurance maps and Polk City directories indicate that this parcel was historically comprised of two parcels listed as 191 and 201 Franklin Street. The northern parcel (201 Franklin Street) was utilized as a public gas station from 1925 through 1965; it was listed as Franklin Street parking lot and gas station, Monroe Union Oil Co., Inc. gas station, and John J. DeCamilla gas station. There was no listing of the 201 Franklin Street address prior to 1925. From 1966 through the early 1980s it was listed as a parking lot. Franklin Street was reconfigured by 1985, and there was no longer a 201 Franklin Street address.

The 191 Franklin Street address was only listed from 1967 to the early 1980s. It was occupied by Hahn Automotive Warehouse in the late 1960s, and by the

New York State Division of Unemployment Insurance in the 1970s; it was listed as "vacant" by 1981.

2.1 Previous Investigations

In November and December, 2004, Day Environmental, Inc. (Day) identified soil and groundwater contamination on the north side of the subject site related to the presence of the historic gas station from 1925 to 1965.

The most highly contaminated soil sample collected by Day was from the depth of 8 feet to 12 feet in their Borehole 12 (Appendix 1). The analytical results are presented in the following table with comparisons to the NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives:

Volatile Organic Compounds	Concentration (ppb)	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ppb) ⁽¹⁾
STARS VOCs		
Benzene	ND	60
n-Butylbenzene	ND	10,000
sec-Butylbenzene	ND	10,000
tert-Butylbenzene	ND	10,000
Ethylbenzene	3,480	5,500
n-Propylbenzene	6,180	3,700
Isopropylbenzene	2,700	2,300
p-Isopropyltoluene	1,460	10,000
Toluene	194	1,500
1,2,4 - Trimethylbenzene	23,500 E	10,000
1,3,5 - Trimethylbenzene	12,800	3,300
Xylenes (total)	16,500	1,200
Total STARS VOCs	66,814	N/A
Total VOC TICs	146,310	N/A
Total TCL/STARS VOCs & TICs	213,124	10,000

Day installed three groundwater monitoring wells (Figure 3); two of Day's groundwater samples exhibited petroleum contamination at orders of magnitude greater than NYSDEC TOGS 1.1.1 Groundwater Standards as tabulated below:

	Sample Location		NYSDEC TOGS	
Compound Detected	MW-2 μg/L	MW-3 µg/L	1.1.1 Groundwater Standard or Guidance Value µg/L (ppb)	
Volatile Organic				
Compounds				
Benzene	ND	51.3	1	
Ethylbenzene	934	1,400	5	
n-Propylbenzene	214	210	5	
Isopropylbenzene	115	115	5	
Toluene	ND	34	5	
1,2,4 - Trimethylbenzene	1,900	970	5	
1,3,5 - Trimethylbenzene	657	592	5	
Xylenes	1,080	421	5	

Day stated that the area of gasoline-impacted soils is approximately 65 feet long parallel to Bittner Street, and approximately 50 feet wide.

Day also identified the buried remains of a hydraulic lift system.

Suspect USTs

There is <u>no</u> documentation that underground storage tanks (USTs) were ever removed from the public gas station that occupied the north portion of the subject site for 40 years. The City of Rochester did not produce any records relative to this historic gas station in response to our F.O.I.L. request.

3.0 WORKPLAN OBJECTIVES

The purpose of this RI is to further define the nature and extent of potential onsite impacts resulting from historic operations at the site. The extent of off-site impact, if any, will be evaluated at the property boundary. The results of this investigation will be used to evaluate remedial actions that might be required to render the site suitable for a mixed residential/commercial development. The basement and first floor are proposed for parking and commercial space; the upper floors will be residential apartments. Specifically, the investigation is intended to:

- further define the nature and extent of petroleum contamination in the soil, surface water, groundwater, and any other impacted media, including a boundary investigation;
- 2) evaluate on-site soil and groundwater quality; and
- conduct an on- and off-site qualitative exposure assessment, including a human health exposure assessment and a fish & wildlife exposure assessment.

4.0 FIELD ACTIVITIES PLAN

This section outlines the activities that will be performed during the RI. The work will be conducted in accordance with Draft DER 10, *Technical Guidance for Site Investigations and Remediation* the Draft Brownfield Cleanup Program Guide and Brownfield Cleanup Program codified in Title 14 of Article 27 I in the Environment Conservation Law (BCP).

4.1 Preliminary Mapping and Utility Mark Out

Prior to conducting any invasive sampling, the locations of all subsurface utilities (power, phones, gas, and sewer) will be marked by Underground Facilities Protective Organization (UFPO).

4.2 Electromagnetic Survey

To investigate for USTs we will conduct an electromagnetic survey (EM) by EM-61 across the subject site. Our contractor Geomatrix Consultants (Geomatrix) is experienced in conducting geophysical investigations on NYSDEC sites. Geomatrix will establish a grid to facilitate data location and conduct the EM-61 survey across the extent of the site.

4.3 Test Pits

A test pit excavation to identify the presence of USTs will be conducted in the anomalous electromagnetic areas identified by EM-61. If any USTs are located, they will be registered and permanently closed by removal in compliance with 6 NYCRR Part 613.9 Petroleum Bulk Storage regulations as an interim remedial measure (IRM).

4.4 Soil Sampling

4.4.1 Subsurface Soil Sampling

Four subsurface soil samples will be collected by Geoprobe on the north, south, east, and west sides of the site to satisfy BCP boundary investigation requirements. Four foot plastic sample sleeves will be collected and logged in the field by Passero Associates' Certified

Professional Geologist (C.P.G.). Soils will be placed in a re-sealable plastic bag; a soil sample jar will be filled concurrently with the filling of the bag.

An organic vapor meter (OVM) is a portable, battery operated, gas chromatograph using digital LED displays and high level audio alarms. The OVM that we utilize in the BCP will be a Mini Rae 2000 photoionization detector (PID). The specifications for the Mini Rae 2000 are included in Appendix 6. Headspaces of the bagged soils will be screened with the PID. The PID readings will be recorded in a field log book and a summary table of the PID readings will be provided in the Remedial Investigation Report (RIR).

If elevated levels of organic vapors are detected, the soils exhibiting the highest PID readings will be submitted for laboratory analysis. In the absence of visible staining or PID readings, one soil sample will be submitted for laboratory analysis from each boring from the interval directly above the water table. These four soil samples will be submitted for Target Compound List volatile organic compounds (TCL VOCs) and tentatively identified compounds (TICs); TLC semi-volatile organic compounds (SVOC) & TICs; polychlorinated biphenyls (PCBs); pesticides; and target analyte list (TAL) metals by ASP methodology with Category B deliverable package.

The Geoprobe will be used to bore down through overburden soils until refusal on top of bedrock or dense glacial till is encountered. Based on Day's Phase II data we anticipate bedrock or till to be present at an approximate dept of fourteen to fifteen feet beneath ground surface (BGS). Passero Associates will confer with the NYSDEC field representative for the final determination of the boring depths.

In addition to collecting soil samples by Geoprobe to satisfy BCP boundary investigation requirements, we propose to more precisely delineate the petroleum contamination identified by Day in order to determine the scope of an IRM consisting of contaminated soil removal (Section 2.1). We propose to implement this additional delineation work with headspace PID screening of the soils only. A 15 foot by 15 foot grid will be sampled to more precisely delineate the contaminated area identified by Day. In the highly contaminated area, the borings will terminate when contamination is identified; to define the extent of contamination at the periphery, soils will be collected and screened to the final depth of Geoprobe refusal.

One contaminated soil sample will be collected and submitted for full Toxicity Characteristic Leaching Procedure (TCLP) analysis and for RCRA characterization. These results will be used to submit the contaminated soils for landfill approval. We will explore the option of conducting an IRM of excavating the petroleum-contaminated soils for off-site disposal.

4.5 Groundwater Well Installation

To satisfy the boundary investigation requirements in the BCP program, we will install and develop four groundwater monitoring wells to supplement three wells installed by Day in 2004. Two wells will be located along the north property line, one well will be on the west property line, and one will be on the south property line. Day's MW-2 will be used as the eastern boundary well (Figure 2).

The installation of bedrock monitoring wells at the Site will be conducted in a phased approach. During the initial remedial investigation phase, one bedrock monitoring well will be installed in cluster with the existing Day groundwater monitoring well MW-2 (Figure 3)..

Based on the analytical data obtained from the soil sampling and the groundwater sampling, additional bedrock monitoring wells may be installed to evaluate the bedrock contamination at the Site.

The bedrock monitoring well will be installed using aqueous rotary drilling methods; attention will be paid to the volume of water used for the rotary drilling of the well. The volume of water lost/not recovered during the drilling process will be removed from the well. This volume of water will be taken into account during the development of the monitoring well. A minimum of three (3) times the volumetric loss will be removed in addition to the typical monitoring well development volume of water removed.

An undisturbed bedrock core will be retrieved for the characterization of the bedrock lithology and other bedrock features including the orientation of fractures and bedding planes. The minimum core size will be an "N" series, 50 mm (2 plus inches) and bedrock core will be an unoriented core.

The new and existing groundwater monitoring wells (including the bedrock well) will have two (2) rounds of groundwater sampling completed. The groundwater analytical will include Target Compound List (TCL) volatile organic compounds (VOCs) plus Tentatively Identified Compound (TICs), TCL semi-volatile organic compounds (SVOCs) plus TICs, PCBs, Target Analyte List (TAL) Metals, and Pesticides.

The new and existing monitoring wells will be located and Geodetic elevations above sea level will be determined for the inner casing of each well by Passero Associates' survey crew.

The headspace screening samples and soil samples to be analyzed by the laboratory will be collected concurrently. The soil sample that correlates to the headspace screening sample with the highest PID reading will be selected for analysis. If no elevated PID readings are registered, and no visible staining is noted, then the soil sample from the top of bedrock will be analyzed. The soil sample will be analyzed for TCL VOCs plus TICs, TCL SVOCs plus TICs, PCBs, TAL Metals, and Pesticides

Monitoring well borings will be drilled with hollow stem augers and the wells will be constructed of 2-inch diameter, machine slot PVC well screen and PVC riser, installed through the auger stem. The well screens will be 10 feet long and set to straddle the water table. A sand pack will be placed from approximately one foot below the screen to one foot above the screen. A bentonite seal will be placed on top of the sand pack. Wells will be completed with flushed-mounted curb boxes cemented in place with cement/bentonite grout and a concrete collar, and completed with a flush mount well cover. Bentonite-containing grout will not be used above the frost line.

Concurrently with monitoring well installation, the truck-mounted drill rig will be utilized to investigate the bedrock interface. A boring will be drilled with the hollow stem augers until another permeable water-bearing layer is encountered, or until refusal on bedrock. If a deeper water-bearing zone is encountered above bedrock, a well will be installed in a similar fashion as described above. If bedrock is encountered before the second water-bearing zone is encountered, a soil sample will be collected from the top of bedrock for VOC analysis.

4.5.1 Development

The purpose of well development is to remove fine-grained material near the well screen and improve the hydraulic connection between the well and the adjacent water bearing strata. The objective of well development is enhancing the filtration ability of the filter pack that surrounds the well screen reducing the turbidity of the groundwater entering the well. This will be accomplished by repeatedly drawing water with suspended sediment through the filter pack and well screen by hand-bailing with disposable polyethylene bailers. Bailing will continue until turbidity appears to stabilize visually, or until a maximum of ten well volumes is purged. The development, purge, and decontamination water will be drummed and characterized for disposal purposes.

The monitoring wells will be given a minimum of 48 hours after installation to equilibrate prior to development. The new and existing groundwater wells will be developed.

4.5.2 Groundwater Sampling

Groundwater samples will be collected from the eight monitoring wells a minimum period of two weeks following development. There will be a minimum of two rounds of groundwater sampling performed during this RI. A minimum of two (2) rounds of groundwater elevations will be measured concurrently with the sampling events.

The groundwater sampling will include trip blanks, blind field duplicate, and matrix spike/matrix spike duplicate (MS/MSD) per each

round of sampling. The first round of groundwater analyses will include at a minimum TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, PCBs and Pesticides by ASP methodology with Category B deliverables. Pending the results of the first round of groundwater analyses, the laboratory analyses performed on the second round of groundwater sampling may be scaled back.

In order to obtain seasonal variation data for the groundwater contamination, one groundwater sampling event will be done during seasonal low conditions and one groundwater sampling event will be done during seasonal high conditions, approximately six months apart.

Wells will be checked for light non-aqueous phase liquid (LNAPL) prior to purging and dense non-aqueous phase liquid (DNAPL) after sample collection; if present, samples of NAPL will be collected for laboratory analysis. The known petroleum contamination on Site is LNAPL. Prior to low-flow sampling, a bailer will be used to sample the groundwater surface; the bailer will be checked visually for LNAPL. If the results from the first round of groundwater samples indicate the presence of DNAPL, we will investigate the possibility of installing a monitoring well with a short screen on top of the underlying aquitard, in conformance with DER-10.

The groundwater samples will be collected from the eight monitoring wells using low-flow minimal drawdown methodology; a low-flow QED bladder pump will be utilized to minimize agitation of the water column while drawing the samples. The monitoring wells will be sampled using low-flow techniques with dedicated polyethylene tubing. The QED bladder pump will be used for purging and for sample collection. The following parameters and guidelines will be

met/followed during low-flow purging of the monitoring wells (i.e., new and existing) at the Site:

- Drawdown not to exceed 3.9 inches;
- Turbidity: three (3) successive readings ± 10% and a final value between 5 and 10 NTUs;
- Specific conductance: three (3) successive readings ± 3%;
- pH: three (3) successive readings ± 0.1 pH units;
- Temperature: three (3) successive readings \pm 3%;
- Dissolved oxygen: three (3) successive readings ± 10%; and
- Oxidation reduction potential: three (3) successive readings ±
 10 mv.

The following parameters and guidelines will be met/followed when purging monitoring wells (i.e. new and existing) with disposable polyethylene bailers:

- Three (3) well volumes will be removed from the monitoring wells; and
- Turbidity readings will be less than 50 NTUs.

The unfiltered groundwater samples will be analyzed for TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, PCBs and Pesticides by ASP methodology with Category B deliverables. The analytical laboratory contracted to perform the samples analyses will be Severn Trent Laboratories, Inc. (STL), a NYSDOH ELAP-certified laboratory.

STL will perform the analyses in conformance with ASP including a Category B deliverable package.

All soil and ground water data generated will be ASP data that includes a Data Usability Summary Report (DUSR) validation in accordance with NYSDEC Guidance for the Development of Data Usability Summary Reports.

4.5.3 Instrument Survey

After monitoring well installation, our survey crew will locate the new and existing monitoring wells and Geoprobe locations. The survey will provide x, y, and z coordinate data for each well relative to the site datum. Elevations will be expressed using the NGVD '88 coordinate system and the horizontal measurements using the NAD '83 UTM Zone 18 coordinate system.

4.6 <u>Interim Remedial Measures (IRM)</u>

4.6.1 <u>USTs</u>

If the test pit investigation (Section 4.3) identifies USTs, the tanks will be removed as an IRM in compliance with Part 613.9 of the NYSDEC Petroleum Bulk Storage regulations, and also in conformance with Section 3.14 of the Brownfield Cleanup Program Guidance (May 2004) as well as Section 1.11 of DER-10. The IRM of UST removal, if tanks are located, will be conducted prior to the IRM of contaminated soil removal discussed in Sections 4.4.1 and 4.6.2. The process for UST removal, if applicable, will be as follows:

- Liquid and sludge will be removed from the tanks and connecting lines and disposed of in compliance with all applicable state and federal requirements.
- The tanks will be rendered free of petroleum vapors with dry ice.
- All connecting lines will be disconnected and removed.
- Any underground piping will also be removed.

During UST removal, Passero Associates will screen excavated soils with a PID. As discussed in Section 4.4.1 of this Work Plan, the contaminated soils will be characterized for disposal purposes. Any soils exhibiting petroleum contamination (e.g., staining, odor, or elevated PID readings) will be directly loaded into dump trucks or containerized for disposal. Any soils exhibiting organic vapor readings above background will be placed directly into the truck.

If underground storage tanks (USTs) are located during test pitting, the UST closure will be performed in conformance with DER-10 Section 5.5 including documented field observations and photographic documentation of any tanks, the excavation, and any associated piping.

4.6.2 Petroleum Contaminated Soil Removal

After the IRM of tank removals has been completed, if applicable, all of the contaminated soils will be excavated. As previously stated, Day identified an area of gasoline-impacted soil parallel to Bittner Street, approximately 65 feet long by 50 feet wide at an approximate depth of 8 feet BGS to 14 feet BGS. We propose to remove this contaminated soil for off-site disposal to obtain spill closure in

conformance with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 Recommended Soil Cleanup Objectives.

If the results indicate that the soils are a petroleum-contaminated solid waste, they will be submitted to Waste Management for approval to dispose of the soils for use as cover material at either their High Acres or Mill Seat Landfill. If the soils are classified hazardous because of a chlorinated component, disposal of the soils as a hazardous waste at Model City Landfill or Seneca Meadows may be required.

Biocell Option

We will also evaluate the option of treating the contaminated soils in an on-site biocell constructed in conformance with NYSDEC STARS Memo #2. If an on-site biocell is selected, it will follow the guidelines established in Spill Technology and Remediation Series *STARS) #2 - Biocell and Biopile Designs for Small Scale Petroleum Contaminated Soil Projects. An on-site biocell will be designed with a structure that will prevent access to the biocell by the general public. It will be designed to protect the cell from the infiltration of precipitation and from wind erosion. The process specifications for a biocell will include the following:

- pH: lime may need to be added for correct pH.
- Temperature: biocell must operate at above 40° F.
- Moisture: dryness must be checked weekly. Only dechlorinated water can be used when adding water to the biocell.

- Nutrients: fertilizer may need to be added depending on the TPH of the soil.
- Aeration: the biocell will be tilled frequently. Ease of tilling
 is dependent upon the type of soil (saturated, clayey) and
 depth of biocell (soil deeper than 10 inches).

A biocell monitoring plan and the biocell design will be developed and submitted to the NYSDEC for review and approval. The Site will be secured to restrict the general public's access to the Site if a biocell is constructed.

Confirmatory Samples

Upon completion of UST and contaminated soil removal, confirmatory pit samples will be collected in accordance with DER-10.

Based on Day's estimate that the contaminated soils are within a 65-foot by 50-foot area, the number of anticipated confirmatory samples is based upon DER-10 guidance. A minimum of 10 samples will be collected from the pit walls, and two pit bottom samples will be collected.

Approximate Pit Length	Minimum Number of
(Feet)	Sampling Locations
to 15'	5
to 30'	10
to 45'	15
to 60'	20

Confirmatory analyses will be performed for TCL VOCs and TCL SVOCs by NYSDEC Analytical Services Protocol (ASP) Method

OLM 4.2 with Category B deliverable package, and will include total lead and MTBE.

4.7 Soil Vapor

The potential issue of soil vapor will be addressed after the site has been characterized and after the IRMs have been completed. Soil vapors will be investigated in conformance with the New York State Department of Health (NYSDOH) Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York (February 2005). The soil vapor investigation will be designed to address the following issues:

- 1. Are subsurface vapors contaminated (i.e., soil vapor as defined in Section 1.1, including vapors located immediately beneath the foundation or slab of a building)? If so, what is the nature and extent of contamination? What is/are the source(s) of the contamination?
- What are the current and potential exposures to contaminated subsurface vapors?
- 3. What actions, if any, are needed to prevent or mitigate exposures and to remediate subsurface vapor contamination?

4.8 Exposure Assessments

4.8.1 Qualified Human Health Exposure

A Qualified Human Health Exposure Assessment will be conducted in accordance with DER-10 Appendix 3B. The potential exposure pathway will be analyzed relative to: (1) a contaminant source; (2)

contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population.

4.8.2 Fish and Wildlife Resources Impact (FWRI)

The FWRI will be conducted in conformance with DER-10, Appendix 3C.

5.0 QUALITY ASSURANCE/QUALITY CONTROL PROTOCOLS

5.1 Project Manager

Peter S. Morton, C.P.G. is Passero Associates' Certified Professional Geologist, licensed Asbestos Inspector, and licensed Lead Paint Inspector. His 40 hour OSHA safety training is up to date. He will serve as Project Manager for this BCP.

5.2 Quality Assurance Officer

Our Director of Environmental Services, Arpad Kolozsvary, REM, IH, will serve as the Quality Assurance Officer. In conformance with DER-10, App 2A, Mr. Kolozsvary has a Bachelor of Science degree in chemistry. He acted as the President of Northeast Environmental Services prior to joining Passero Associates in 1990. Arpad has developed the Quality Assurance Plan and Sampling Plan relative to this BCP, and will interact with Severn Trent Laboratory to ensure that all data is of usable quality.

5.3 <u>Decontamination</u>

The drilling augers and split-spoon samplers will be decontaminated by pressure washing in between each borehole if the equipment is to be re-used. The augers will be power-washed and the samplers will be washed with alconox and water. All decontamination water and soil cuttings generated at the Site will be containerized and characterized for disposal purposes.

5.4 Sampling Equipment

Ground water samples will be collected through a bladder pump with dedicated bladder and tubing; there will be no potential for cross-contamination. Soil samples will be collected directly by hand from the split-spoon samplers wearing surgical gloves. A new pair of surgical gloves will be used for each sample.

5.5 Protocols

Low-flow groundwater samples will be collected and analyzed by Severn-Trent Laboratories as discussed in Section 4.5.2; they are familiar with all required NYSDEC and NYSDOH protocols and methodologies. The laboratory analyses will all be performed by ASP methodology with a Category B deliverable package and third party DUSR validation.

5.6 Analytical Laboratory

The analytical laboratory that performs all of the soil and groundwater analyses will be Severn Trent Laboratories (STL). STL is a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. Their QA/QC protocols are in conformance with DER-10 Section 2 "Quality Assurance for

Sampling and Laboratory Analysis." STL's Laboratory Quality Manual is included in Appendix 5.

5.7 Sample Storage and Handling

Samples will be placed on ice and stored in a cooler and transported directly to Severn Trent Laboratory on the day they are collected, or packed on ice and expedited for overnight delivery to the laboratory.

ANALYTICAL METHODS/QUALITY ASSURANCE TABLE

MATRIX TYPE	SOIL	AQUEOUS	VAPOR
Number and Frequency of Samples Collected	4 boundary samples 1 waste characterization		4-8 to be determined
Number of Field and Trip Blanks			
Analytical Parameters	TCL VOCs & TICs TCL SVOCs & TICs PCB/pesticide TAL metals TCLP with RCRA characteristics	TCL VOCs & TICs TCL SVOCs & TICs PCB/pesticide TAL metals	VOCs 10-15
Analytical Methods Used	OLMO4.2; ILMO5.2	OLMO4.2; ILMO5.2	
Number and Type of matrix spike and matrix spike duplicates	Organic-1 MS/MSD per 20 samples Inorganic-1 MD/MS per 20	Organic-1 MS/MSD per 20 samples Inorganic-1 MD/MS per 20	
Number and Type of Duplicate Samples		1	
Number and Type of Split Samples			
Number and Type of performance evaluation			
Sample Preservation Method	cool 4°C	VOC-HCI SVOC- cool 4°C P/PCB-cool 4°C metals-HNO3	
Sample Container Volume and Type	1-4 oz glass jar for each analysis	VOC-3- 40 ml vials SVOC, P/PCB- 2- 1L glass amber metals-1- 16oz plastic	
Sample holding Time VOC-10 Days SVOC,P/PCB- 10 Days for Extraction, 40 for Analysis Metals-180 Days		VOC- 10Days SVOC,P/PCB-5 Days for Extraction, 40 Days for Analysis Metals - 180 Days	

6.0 HEALTH AND SAFETY PROTOCOLS

6.1 Introduction

6.1.1 General

This Health and Safety Plan (HASP) was prepared to address the specific health and safety practices and procedures associated with the 37 Bittner Street Brownfield Cleanup Program (BCP). The HASP presents information and procedures, including the assignment of responsibilities, personnel protection requirements, work practices and emergency response procedures for Passero Associates, P.C. who will be conducting field activities. This document is based on an assessment of potential health hazards at the site, using available historical information.

This HASP will be followed in conformance with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations found in 29 CFR 1926. Contractors will be responsible for wearing hard hats, protective foot wear, and hearing protection in conformance with these OSHA regulations.

All personnel and subcontractors who enter the site during field operations and are involved with remedial activities will be required to comply with this HASP.

PROJECT MANAGER:

Name: Gary W. Passero, P.E. Telephone: Office: (585) 325-1000

SITE HEALTH AND SAFETY COORDINATOR

Name: Arpad Kolozsvary, R.E.M. Telephone: Office: (585) 325-1000

FIELD MANAGER

Name: Peter S. Morton, C.P.G. Telephone: Office: (585) 325-1000

MONROE COUNTY DEPARTMENT OF HEALTH

Name: Joe Albert

Telephone: Office: (585) 753-5904

NEW YORK STATE DEPARTMENT OF HEALTH

Name: Debbie McNaughton Telephone: Office: (585) 423-8069

This HASP addresses the requirements set forth in the OSHA regulations contained in 29 CFR Parts 1910 and 1926. Emergency Contacts has been included in Section 7.0 of this HASP, and can be readily detached for use in the event of an emergency requiring site evacuation, medical treatment, etc.

6.1.2 Background

Historic documents indicate that the Site was occupied by a public gas station from at least 1930 to 1960. Day's Phase II work in November and December 2004 identified gasoline-impacted soil and groundwater beneath the north portion of the site.

The results of Phase II sampling and known contaminants are discussed in Section 2.1 of the work plan.

6.2 <u>Hazard Evaluation</u>

6.2.1 Chemical Hazards

OSHA states that the HASP should be based on a thorough site characterization and analysis to determine the nature and extent of the actual hazards on a site. The Phase II generated by Day is used as a basis for this HASP. The only contaminants detected by Day were gasoline-related compounds:

Volatile Organic Compounds	Concentration	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ppb) ⁽¹⁾
STARS VOCs		
Benzene	ND	60
n-Butylbenzene	ND	10,000
sec-Butylbenzene	ND	10,000
tert-Butylbenzene	ND	10,000
Ethylbenzene	3,480	5,500
n-Propylbenzene	6,180	3,700
Isopropylbenzene	2,700	2,300
p-Isopropyltoluene	1,460	10,000
Toluene	194	1,500
1,2,4 – Trimethylbenzene	23,500 E	10,000
1,3,5 – Trimethylbenzene	12,800	3,300
Xylenes (total)	16,500	1,200
Total STARS VOCs	66,814	N/A
Total VOC TICs	146,310	N/A
Total TCL/STARS VOCs & TICs	213,124	10,000

Two of Day's groundwater samples exhibited petroleum contamination at orders of magnitude greater than NYSDEC TOGS 1.1.1

Groundwater Standards as tabulated below:

	Sample Location		NYSDEC TOGS 1.1.1 Groundwater	
Compound Detected	MW-2 μg/L	MW-3 μg/L	Standard or Guidance Value µg/L (ppb)	
Volatile Organic Compounds				
Benzene	ND	51.3	1	
Ethylbenzene	934	1,400	5	
n-Propylbenzene	214	210	5	
Isopropylbenzene	115	115	5	
Toluene	ND	34	5	
1,2,4 – Trimethylbenzene	1,900	970	5	
1,3,5 - Trimethylbenzene	657	592	5	
Xylenes	1,080	421	5	

6.3 <u>Responsibilities of Safety Personnel</u>

The following roles have been identified for Passero project personnel:

Project Manager - The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. He is responsible for ensuring that Passero field personnel and subcontractors are properly trained.

Site Health and Safety Coordinator/Field Manager - The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of this HASP for personnel at the site. Ambient air levels will be monitored with an organic meter (OVM) during all drilling activities.

If unsafe work conditions are identified, the Site Health and Safety

Coordinator is authorized to order site personnel to stop work; resolution of all
on-site health and safety problems will be coordinated through the Project

Manager.

6.4 Safe Work Practices

6.4.1 General Safety Practices

Site work will be carried out in conformance with OSHA HAZWOPER regulations.

The recommended general safety practices for working around the drilling subcontractor's equipment (i.e., drill rigs) are as follows:

- The drilling contractors will wear hard hats, protective footwear, and earplugs in conformance with OSHA 1926.
- The drilling contractor's equipment will always be inspected prior to use to check for obvious structural damage, loose nuts and bolts, loose or missing guards, cable guides or protective covers, fluid leaks, damaged hoses, cables, pressure gauges or pressure relief valves, and damaged drilling tools and equipment.
- Heavy equipment will not be operated within 20 feet of overhead wires. The site will be clear to ensure the project staff can move around the equipment safely.
- Hard hats and safety boots will be worn in the vicinity of the heavy equipment.

The drilling contractor will keep the drilling location tidy.
 This will prevent personnel from tripping and will allow the safe and expeditious exit from the site.

6.4.2 Site Security

If any excavation relative to IRMs are to be left open overnight they will be securely fenced around the perimeter prior to our leaving the site.

6.4.3 Respiratory Protection

Based on Day's previous Phase II data, level D respiratory protection will be utilized, and will be upgraded as described below.

- During all drilling and sampling activities, ambient air will be screened with an Organic Vapor Meter (OVM). If reading greater than 25 ppm above background level is registered consistently for a five (5) minute period, Level C respiratory protection will be required.
- If readings greater than 50 ppm above background, work will be halted and Health and Safety issues will be re-evaluated.

6.4.4 <u>Air Monitoring</u>

Continuous air monitoring will be performed with the PID during all intrusive activities. Temporary upwind and downwind points will be monitored. Wind direction will be monitored throughout the work day; the locations of the monitoring points will be changed according to the wind direction.

6.5 Personal Protection Equipment

6.5.1 Protection Levels

Field work will be performed utilizing Level D protective gear (i.e. field clothes). Surgical gloves will be worn while collecting environmental samples. Drillers will wear hard hats and steel-toed boots, and ear plugs in conformance with OSHA 1926.

6.6 **Decontamination**

A bermed decontamination pad lined with polyethylene sheeting will be constructed at the northwest corner of the site prior to drilling activities. All equipment will be decontaminated prior to entering the Site. Personnel and equipment will be decontaminated with a mixture of alconox (or similar detergent) and water prior to leaving the site. All equipment will be pressure-washed between sample locations to prevent cross contamination. Rinse water will be collected and drummed to prevent runoff. The decontamination water generated within the decontamination pad will be containerized and characterized for disposal purposes.

6.7 Emergency Procedure And Contacts

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

A list of emergency contacts and phone #'s is provided on the following page:

- 911 emergency situations requiring immediate response from police, fire department, or ambulance.
- (800) 457-7362 NYSDEC Spill hotline
- (585) 226-5354 NYSDEC Project Manager Charlotte B. Theobald
- (518) 402-7860 NYSDOH
- (585) 274-6904 MCDOH
- (800) 424-9300 Chemtrec (chemical emergencies)
- (404) 633-5313 Centers for Disease Control (biological agents)
- (800) 424-8802 National Response Center
- (202) 426-0656 USDOT Office of Hazardous Operations
- (202) 426-8802 USDOT Regulatory Matters
- (800) 424-9346 USEPA RCRA-Superfund Hotline

6.7.1 Regulatory Contacts

NYSDEC Region 8 Project Manager Charlotte B. Theobold 585-226-5354

Monroe County Department of Health Joseph Albert 585-753-5904

NYS Department of Health Debbie McNaughton 585-423-8069

6.7.2 Personal Injury in the Work Zone

Upon notification of an injury in the Work Zone, the designated emergency signal of three blasts of a horn shall be sounded. The affected person should be decontaminated to the extent possible prior to movement. Contact will be made for an ambulance and with the designed medical facility. No persons shall re-enter the work area until the cause of the injury or symptoms is determined.

If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue. If the injury increases the risk to others, the designated emergency signal of three blasts of a horn shall be sounded and all site personnel shall move to the designated area determined prior to start of project. Activities on-site will stop until the added risk is removed or minimized.

6.7.3 Fire/Explosion

Upon notification of a fire or explosion on-site, the designated emergency signal, two long blasts of a horn, shall be sounded and all site personnel assembled. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

In all situations, when on-site emergency results in evaluation of the work area, personnel shall not re-enter until:

- 1. The conditions resulting in the emergency have been corrected.
- 2. The hazards have been re-assessed.

- 3. The Site Safety Plan has been reviewed.
- 4. Site personnel have been briefed on any changed in the Site Safety Plan.

6.7.4 Route to Hospital

In the event of a medical emergency, the nearest hospital is Highland Hospital (Highland). Directions to Highland:

South on Bittner Street
Go right on Andrews Street to
Left on St. Paul
Merge with South Avenue
Highland Hospital on left
(map attached)

7.0 REPORTING AND SCHEDULE

Passero Associates will prepare a Final RIR (in conformance with BCP Title 14 and Section 3.14 of DER-10) signed by a professional engineer registered in the State of New York. The report will describe the methodology and results of the above activities and will include the following:

- descriptions and results of IRMs;
- all data generated during the investigation;
- tabular summaries of the analytical results;
- maps of groundwater elevations and flow directions;
- maps of sampling locations;

- map of utilities which potentially act as preferential pathways;
- all assessments and evaluations identified in the Remedial Investigation Work Plan;
- identification of any additional data that should be collected;
- engineering and geological interpretations of the data;
- a comparison of the data to applicable Standards, Criteria and Guidance (SCGs)
- a characterization of the nature and extent of contamination at the site;
- certification by Passero Associates that all activities specified in the Work Plan are complete;
- interpretation of results;
- a qualitative exposure assessment (in conformance with Appendix 3B of DER 10) and a fish & wildlife exposure (in accordance with Section 3.10 and Appendix 3C of DER 10) will be performed with the analytical data generated during this SI, and included in the Final SI Report;
- the exposure assessment will include characterization of the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport; and
- a recommendation as to whether additional remediation is required.

The report's appendices will include boring logs, monitoring well construction diagrams, all analytical laboratory summary reports, and complete DUSR Reports.

SCHEDULE

The amount of time anticipated to complete this RI after NYSDEC Work Plan approval is:

٠	UFPO Stakeout	one week
•	EM Survey	one weeks
•	Test Pits	one week
•	Geoprobe Investigation	one week
	Monitoring Well Installation	one week
•	Monitoring Well Development.	one week
•	Monitoring Well Sampling	one week
•	Receipt of ASP Analytical Data	three weeks
	Receipt of DUSR	two weeks
•	IRM Tank & Soil Removal	two weeks
	Submission of draft RIR	two weeks

Based on these projections, the field work is anticipated to take approximately 16 weeks, or four months to complete the RI tasks.

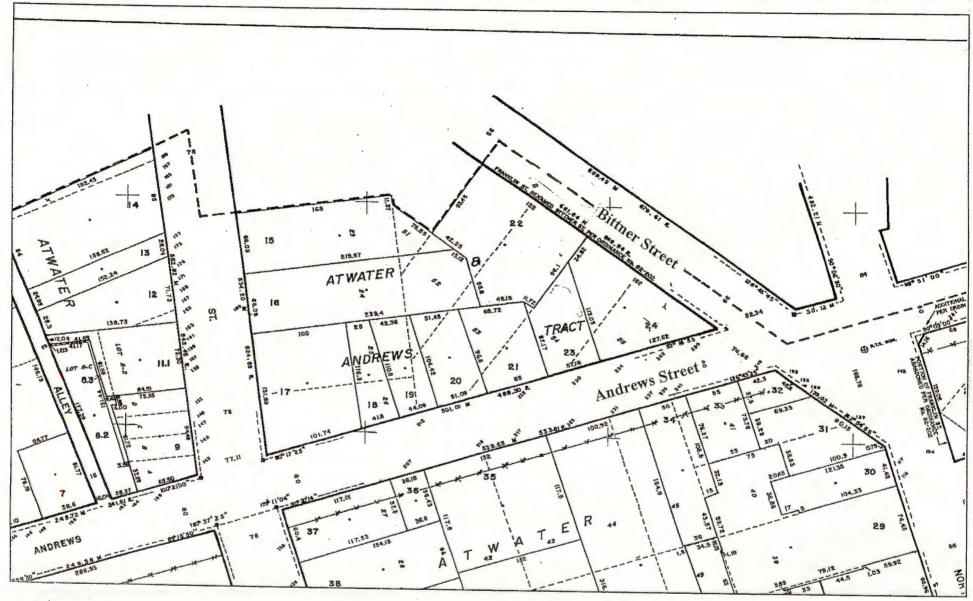
8.0 CITIZEN PARTICIPATION PLAN

The citizen participation activities, during the remedial investigation phase of the project, will conform to the BCP Citizen Participation Plan for 37 Bittner Street (Appendix 3). A copy of this plan is in the City of Rochester Rundel Library, 115 South Ave. Rochester, New York 14604. This Plan includes the following:

- Introduction and Overview of the Citizen Participation Plan.
- Background Information About the 37 Bittner Street
- Upcoming Site Investigation Activities.
- Citizen Participation Activities.
- Site Issues and Communication Needs.
- Document Repositories and List of Available Documents.
- List of Project Contacts.
- Facts about the BCP Program.
- List of People Potentially Interested in the 37 Bittner Street Site (Mailing List).
- · Site Map.
- Project Contacts and Document Repositories.
- Brownfield Site Contact List.
- Identification of Citizen Participation Activities.
- Brownfield Cleanup Program Process.

The following table describes these and other citizen participation activities that will take place during the investigation and determination of a cleanup plan for the 37 Bittner St. site. The table also lists the stage in the process at which each activity will take place as well as tentative completion dates. Some citizen participation activities may be performed by the State, and some may be performed by 234-250 Andrews St. LLC. The project managers will use this table to track required citizen participation activities for the site.

Citize	n Participation Activiti	es	
ACTIVITY:	Activity will occur at this point in the investigation/cleanup:	The activity is scheduled to be completed:	The activity was completed:
Set up Document Repositories, where citizens can review site-related documents, at the regional DEC office and a public location near the site.	Before start of the remedial investigation		•
Create a list of people (Mailing List) interested in the site, including residents, government representatives, media and any interested civic, environmental or business groups.	Before the remedial investigation starts.		
Create a Citizen Participation Plan and place it in Document Repositories.	Before the remedial investigation starts		
Submit a remedial investigation fact sheet to DEC for review	Concurrently with Work Plan approval		
Mail a fact sheet to the Mailing List describing the remedial investigation work plan (RIWP) and announcing a 30- day comment period and place copy of RIWP in document repositories	After DEC approval of fact sheet		
Submit a remedial investigation report (RI Report) fact sheet to DEC for review	After RI Report is completed		
Mail a Fact Sheet to the Mailing List describing results of the remedial investigation and announcing 45-day comment period and place RI Report in document repositories.	After DEC approval of fact sheet		
Submit a remedial work plan (RWP) Fact Sheet to DEC for review.	After RWP is prepared		
Mail a Fact Sheet to the mailing list describing RWP.	After DEC approval of fact sheet		
Submit pre-construction notice to DEC for approval.	20 days prior to start of construction		
Mail notice to mailing list of start of construction and place design document in document repositories.	At least 10 days prior to start of construction		
Submit Fact Sheet on Remedial Action Report (RAR) to DEC	When construction is complete		
Mail Fact Sheet to BCP contact list	When approved by DEC		
Submit Fact Sheet re institutional/engineering controls (if applicable)	Within 10 days of issuance of Certification of Completion		
Mail Fact Sheet re institutional and engineering controls			



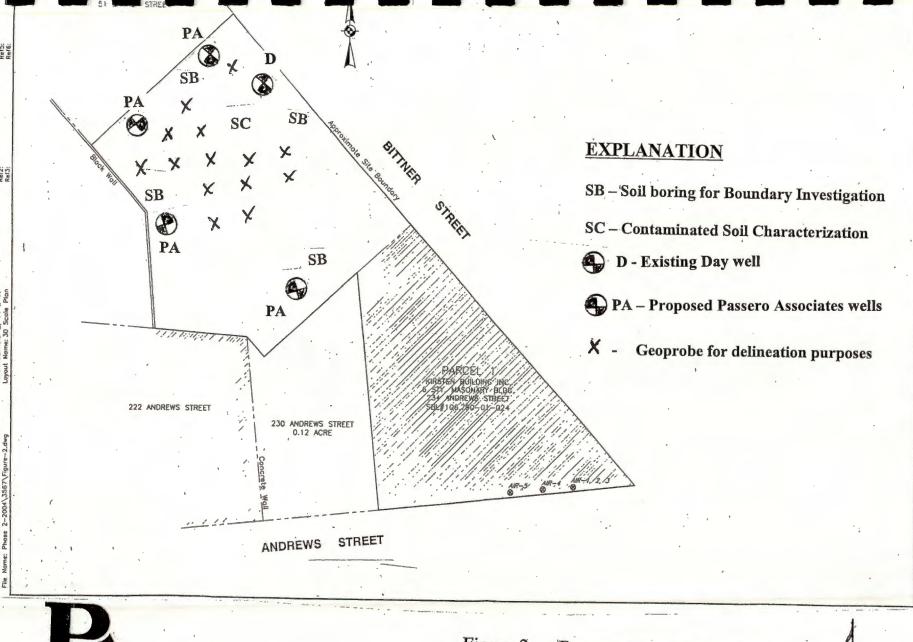


Prepared by:
PASSERO ASSOCIATES
100 LIBERTY POLE WAY
ROCHESTER, NY 14604

Figure 1 Site Location Map/Tax Map

37 Bittner Street Rochester, New York 14604

Site# C828127



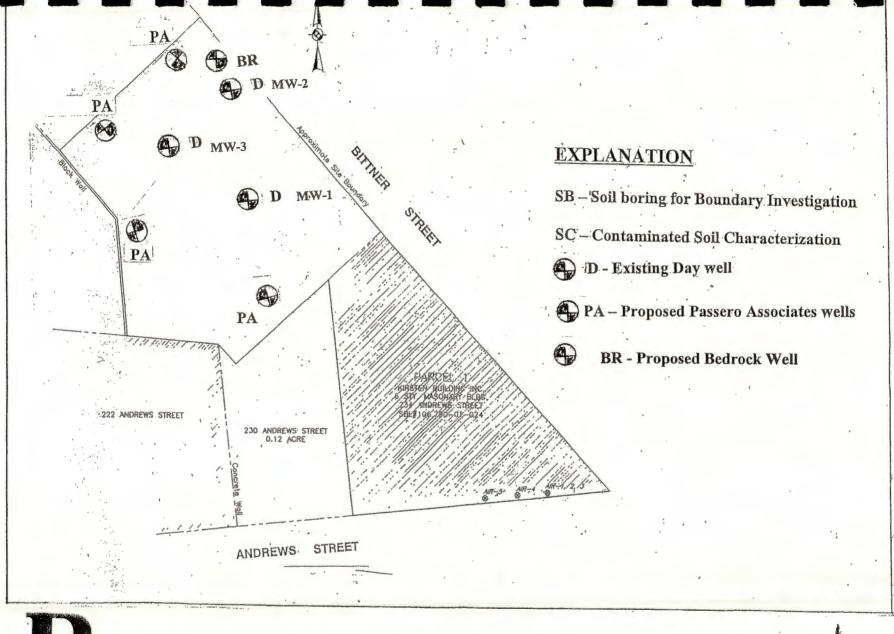


Prepared by: PASSERO ASSOCIATES 100 LIBERTY POLE WAY ROCHESTER, NY 14604

Figure 2 Proposed Sample Locations

37 Bittner Street Rochester, New York 14604

Site# C828127





Prepared by:
PASSERO ASSOCIATES
100 LIBERTY POLE WAY
ROCHESTER, NY 14604

Figure 3: Day Wells and Proposed Monitoring Wells

37 Bittner Street Rochester, New York 14604

Site# C828127



APPENDIX 1
Day December 2004
Phase II Supplement

day

DAY ENVIRONMENTAL, INC.

ENVIRONMENTAL CONSULTANTS AN AFFILIATE OF DAY ENGINEERING, P.C.

December 17, 2004

Kristina Rogers Winn Development 120 Corporate Woods, Suite 230 Rochester, New York 14623

Re: Status Report: Supplemental Phase II Environmental Assessment 242 Andrews Street/37 Bittner Street

Rochester, New York

Dear Ms. Rogers:

This letter summarizes preliminary findings of the supplemental Phase II Environmental Assessment (Phase II ESA) completed by Day Environmental, Inc. (DAY) at the above-referenced property (Site). This work was done in accordance with an addendum proposal dated November 22, 2004 (revised December 2, 2004) submitted by DAY to Winn Development (Winn).

The purpose of the supplemental Phase II ESA was to complete additional studies to augment the findings of previous studies completed by DAY as described in a report titled *Phase II Environmental Site Assessment, 242 Andrews Street, Rochester, New York* dated November 2004 (DAY File 3567S-04). Specifically, the intent of the studies recently completed by DAY was to: 1. evaluate the source and extent of gasoline impact identified on the 37 Bittner Street parcel, and 2. further evaluate various volatile organic compounds (VOCs) identified in a sample of sub-slab soil gas collected from beneath the basement of the Kirstein Building located at 242 Andrews Street.

Supplemental Phase II ESA Studies

The following work was done as part of the supplemental Phase II ESA:

- submittal of a freedom of information law (FOIL) request to the City of Rochester for the 37 Bittner Street parcel and a review of the response;
- excavation of six test pits (designated TP-1 through TP-6) on the 37 Bittner Street parcel in the area of the gasoline tanks identified on a 1951 Sanborn fire insurance map and in proximity to magnetic anomalies identified during previous studies;
- advancement of five test borings (designated TB-14 through TB-18) and the conversion of three of these test borings into groundwater monitoring wells (designated MW-1 through MW-3) on the 37 Bittner Street parcel to further delineate the extent of soil impacted by gasoline-related compounds and to evaluate groundwater quality;

Ms. Kristina Rogers December 17, 2004 Page 2

- collection of air samples (designated AIR-2 through AIR-5) from various locations within the Kirstein Building located on 242 Andrews Street; and
- testing of three soil samples from the test pits/test borings for NYSDEC STARS-list volatile organic compounds (i.e., gasoline-related compounds), three groundwater samples for STARS-list volatile organic compounds (VOCs), and two groundwater samples for lead (i.e., to evaluate the potential presence of leaded gasoline).

[Note: The groundwater sample collected from monitoring well MW-1 (i.e., located approximately 55 feet north of the 242 Andrews Street property) was also tested for Target Compound List (TCL) VOCs. As such, this sample was evaluated for an expanded list including VOCs that are not part of the STARS-list. This analysis was beyond the scope-of-work identified in the addendum proposal dated November 22, 2004.]

A Site Plan showing the location of test borings/monitoring wells, test pits and air sampling locations completed to date is attached to this letter.

Findings

The FOIL response for the 37 Bittner Street parcel included a listing for a building permit issued on 10/03/56. This permit was for the installation a one 2,000-gallon gasoline tank and one "pum" (i.e., presumably a pump associated with the gasoline tank). The FOIL response was incomplete as additional information from the City of Rochester fire department is pending. It is possible that this additional information could include documentation regarding the removal of tanks.

The test pits advanced during this study did not encounter an underground storage tank (UST); however piping that appeared to be associated with USTs was encountered in several of the test pits (e.g., TP-1 and TP-4). The apparent remains of a hydraulic lift system were also encountered in test pit TP-2. While some stained soil was observed adjacent to this equipment, no unusual odors or elevated photoionization detector (PID) readings were detected emanating from this soil.

Tables summarizing the analytical laboratory results for the various samples of soil, groundwater and air collected to date are attached to this letter. The additional testing of the soil samples from test boring TB-17 and test boring TB-18 assisted in defining the lateral extent of soil contamination in the eastern and western portion of the 37 Bittner Street parcel, respectively. The sample from TP-1 was collected adjacent to a pipe encountered in the test pit that exhibited a petroleum-type odor. As shown on Table 2, the soil sample from test pit TP-1 did not contain concentrations above recommended soil cleanup objectives (RSCOs) established by the New York State Department of Environmental Conservation (NYSDEC).

The groundwater samples from monitoring wells MW-2 and MW-3 contain concentrations of various VOCs that exceed groundwater standards or guidance values established by the NYSDEC (refer to Table 3). The concentrations measured in monitoring well MW-1 were generally reported as "not detected", with the exception of a 1,2,4-trimethylbenzene concentration that exceeded the NYSDEC guidance value. [Note: The TCL compounds tested for in the sample from monitoring well MW-1 were also reported as "not detected".]

Ms. Kristina Rogers December 17, 2004 Page 3

> During the recent study, groundwater was measured in monitoring well MW-2 at a depth of about 9.4 feet below the ground surface and at a depth of about 9.1 feet below the ground surface in monitoring well MW-3. However, groundwater was encountered in monitoring well MW-1 at a depth of about 12.1 feet below the ground surface. Although a survey has not yet been completed to determine the elevation of the monitoring wells so that groundwater elevations can be calculated, the depth to water measurements suggest a southerly groundwater flow direction. This direction varies from the regional pattern, which is to the north-northwest. The test results for the groundwater samples collected from monitoring wells MW-2 and MW-3 (i.e., positioned on the northern portion of the 37 Bittner Street property) appear to indicate that these wells are located hydraulically downgradient of the contaminant source area (i.e., the former filling station), which supports a north-northwest groundwater flow pattern. It is possible that monitoring well MW-1 may be installed in a different water-bearing zone than monitoring wells MW-2 and MW-3. [Note: During the drilling of monitoring well MW-1, the soil cuttings were typically damp to moist until the test boring was advanced to a depth of about 30 feet below the ground surface. In addition, standing water was not encountered in the augers until that depth was reached. When the monitoring well was installed and developed, the water level in MW-1 stabilized at a depth of about 12.1 feet below the ground surface.]

> As shown on Table 1, similar VOCs were detected at comparable concentrations in the air samples recently tested (i.e., AIR-2 through AIR-5). For example, tetrachloroethene (PCE) was measured in each sample tested at approximately the same concentration (i.e., including a sample collected from below the basement slab and air samples collected from the basement, the first floor and the sixth floor, near an open window). The concentration of PCE measured in each sample, and the concentration of benzene in air samples from the basement and first floor, exceeded target values for indoor air established by the United States Environmental Protection Agency (USEPA).

Conclusions and Recommendations

The following are preliminary conclusions and recommendations based upon the work completed to date.

- The test pits advanced during this study did not encounter USTs, but the remnants of an apparent hydraulic lift system and piping that may have been associated with the former filling station (i.e. potentially associated with USTs) were encountered. It is recommended that the hydraulic lift system be removed, cleaned and disposed of in accordance with applicable regulations. At the time of removal, the surrounding soil should be tested to evaluate possible leakage from this system. If necessary, impacted soil should also be removed and disposed of in accordance with applicable regulations. During this study, evidence that the piping encountered in the test pits has impacted the subsurface was not identified. As such, it does not appear that the piping has to be removed, but an environmental management plan (EMP) should be developed to address possible environmental concerns that may be encountered during future construction activities. These concerns could include piping that may act as a contaminant source area, USTs that were not encountered in the test pits advanced to date, fill materials or other currently unanticipated potential environmental impacts.
- It does not appear that a residual petroleum source is present within the soil at the Site. This is based upon the test borings and test pits advanced to date, and the absence of petroleum impact (i.e., staining, petroleum odors, PID readings, etc.) until depths of about 8.5 feet to 9.5 feet below the ground surface (i.e., comparable to the top of the groundwater table).

- The groundwater on the 37 Bittner Street parcel is impacted with gasoline-related compounds and the concentrations measured suggest that additional study and/or remediation may be required. It is recommended that the owner of the Site consult a qualified attorney to determine if there is an obligation to report the groundwater impact to the NYSDEC. Assuming that the spill is reported to the NYSDEC, it is recommended that a data package be prepared summarizing the work completed to date. In addition, a meeting should be scheduled with the NYSDEC to review the data, present plans for additional studies deemed necessary to characterize conditions at the Site, and to discuss possible remedial options. Based upon the available data, it appears that groundwater remediation may be warranted to reduce dissolved VOC concentrations. However, based upon the apparent absence of an ongoing source of contamination (including the absence of free product), and pending NYSDEC approval, it may be possible to pursue closure via a risk-based approach.
- The results of the air testing suggest a ubiquitous distribution of PCE within the Kirstein Building located at 242 Andrews Street, and some apparent impact from benzene. Although the specific source of these compounds is not known, the PCE could be attributable to discharges from the drycleaners located adjacent to the Site. Also, the benzene concentrations detected could be related to vehicle exhaust. Based on historic operations at the Site, it is also possible that the PCE and benzene (and the other VOCs detected in the subslab and indoor air samples) could be attributable to past sources of contaminants that were generated at the Site. To address the sub-slab and indoor air quality, additional testing could be warranted. In addition, the air discharge reports for the adjacent drycleaners should also be reviewed. It is possible that a sub-slab ventilation system may be needed for the building, and that any air handling equipment at the Site will need to be of sufficient capacity to ensure that indoor air contaminants are below regulatory criteria.

Please contact DAY if there are any questions regarding this letter.

Very truly yours,

Day Environmental, Inc.

Raymond L. Kampff

Associate

Attachments

-Site Plan

-Table 1: Air Sample Results
-Table 2: Soil Sample Results

-Table 3: Groundwater Sample Results

242 ANDREWS STREET ROCHESTER, NEW YORK

AIR SAMPLE RESULTS SUMMARY OF DETECTED VOCS IN MICROGRAMS PER CUBIC METER (µg/m³)

Detected Volatile Organic Compounds	AIR-1 (μg/m³)	AIR-2 (μg/m³)	AIR-3 (μg/m³)	AIR-4 (μg/m³)	AIR-5 (µg/m³)	USEPA TARGET INDOOR AIR CONCENTRATION (µg/m³) ⁽¹⁾	USEPA TARGET SHALLOW GAS CONCENTRATION (μg/m³)(2)
Acetone	16	8.9	17	24	9.9	350	3,500
Trichlorofluoromethane	1.7	ND	1.3	1.3	1.4	700	7,000
2-Butanone (MEK)	13	ND	1.4	1.4	1.7	1,000	10,000
Benzene	ND	ND	1.4	1.6	ND	0.31	3.1
Trichloroethene	1.7	ND	ND	ND	ND	0.022	0.22
Toluene	9.3	3.6	4.2	4.5	2.8	400	4,000
Tetrachloroethene	4.2	1.6	1.8	1.3	1.8	0.81	8.1
m,p-Xylenes	2.3	1.7	2.3	2.7	1.6	7,000*	70,000*

Samples analyzed by United States Environmental Protection Agency (USEPA) Method TO-15

- (1) = Target Indoor Air Concentration from Table 2C (Risk = 1 X 10⁻⁶) as referenced in the USEPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance) dated November 20, 2002.
- (2) ** Target Shallow Gas Concentration from Table 2C (Risk = 1 X 10⁻⁶) as referenced in the USEPA Draft Guidance for Evaluating the Vepor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vepor Intrusion Guidance) dated November 20, 2002.
- ≈ The USEPA Target Concentrations for m-Xylene and p-Xylene are listed separately and each are 7,000 μg/m³ (Indoor Air) and 70,000 μg/m³ (Shallow Gas).
- 1.7 = Bold denotes a concentration that exceeds the Target Shallow Soil Gas Concentration
 - = Shading denotes a concentration that exceeds the Target Indoor Air Concentration

AIR-1: Sub-slab air sample collected November 10, 2004

AIR-2: Sub-slab air sample collected December 7, 2004

AIR-3: air sample collected from basement on December 7, 2004

AIR-4: air sample collected from first floor on December 7, 2004

AIR-5; air sample collected from sixth floor on December 7, 2004

242 ANDREWS STREET ROCHESTER, NEW YORK

SOIL SAMPLE RESULTS STARS-List VOCs and Naphtalene IN MICROGRAMS PER KILOGRAM (µg/Kg), PARTS PER BILLION (ppb)

	Sample and Location							NYSDEC TAGM 4046
Volatile Organic Compounds	01 TB-1 (8'-12')	02 TB-4 (10'-12')	03 TB-11 (10'-11')	04 TB-12 (8'-12')	05 TP-1 (3')	06 TB-18 (10'-12')	07 TB-17 (8'-10')	RECOMMENDED SOIL CLEANUP OBJECTIVE (PPB) ⁽¹⁾
STARS VOCs								
Benzene	ND	ND	ND	ND	ND	ND	ND	60
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	10,000
sec-Butylbenzene	179	87.4	75.2	ND	ND	ND	22	10,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	10,000
Ethylbenzene	327	ND	ND	3,480	ND	ND	ND	5,500
n-Propylbenzene	898	374	149	6,180	ND	ND	ND	3,700
Isopropylbenzene	368	80.3	20.8	2,700	ND	ND	ND	2,300
p-Isopropyltoluene	312	132	39.7	1,460	ND	ND	42	10,000
Toluene	ND	ND	ND	194	ND	ND	ND	1,500
1,2,4-Trimethylbenzene	3,330	324.0	ND	23,500 E	ND	ND	ND	10,000
1,3,5-Trimethylbenzene	2,650	147	ND	12,800	ND	ND	ND	3,300
Xylenes (total)	322	ND	ND	16,500	ND	ND	ND	1,200
otal STARS VOCs	8,386	1,144.7	285	66,814	ND	ND	64	NA
otal VOC TICs	23,957	8,393	11,980	146,310	200.1	ND	5,435	N/A
OTAL TCL/STARS VOCs & TICs	32,343	9537.7	12,265	213,124	200.1	ND	5,499	10,000
Naphthalene	437	ND	ND	7,980	ND	ND	ND	13,000

VOC = Volatile Organic Compound

TICs = Tentatively Identified Compounds

STARS = Spill Technology and Remedation Series

ND = Not detected at concentration above the reported analytical laboratory detection limit

N/A = Not applicable

(1) = Recommended soil cleanup objectives (RSCOs) as referenced in January 24, 1994, NYSDEC Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM 4048) and addendum tables dated August 2001.

2,700 = Concentration detected exceeds RSCO

E = Estimated Concentration

242 ANDREWS STREET ROCHESTER, NEW YORK

GROUNDWATER SAMPLES (Collected December 10, 2004) SUMMARY OF STARS-List VOCS, NAPHTHALENE AND LEAD IN MICROGRAMS PER LITER (µg/L), PARTS PER BILLION (ppb)

	Sa	mple Locati	NYSDEC TOGS 1.1.1 GROUNDWATER STANDARD OR GUIDANCE VALUE (PPB) ⁽¹⁾	
Detected Constitutent	MW-1*	MW-1* MW-2 MW-3		
Volatile Organic Compounds				
Benzene	ND	ND	51.3	1
Ethylbenzene	ND	934	1,400	5
n-Propylbenzene	ND	214	210	5
Isopropylbenzene	ND	115	115	5
Toluene	ND	ND	34	5
1,2,4-Trimethylbenzene	5.03	1,900	970	5
1,3,5-Trimethylbenzene	ND	657	592	5
Xylenes	ND	1,080	421	5
Naphthalene	ND	599	684	10
Metals				
Lead	NT	49	24	25

VOC = Volatile Organic Compound

STARS = Spill Technology and Remediation Series

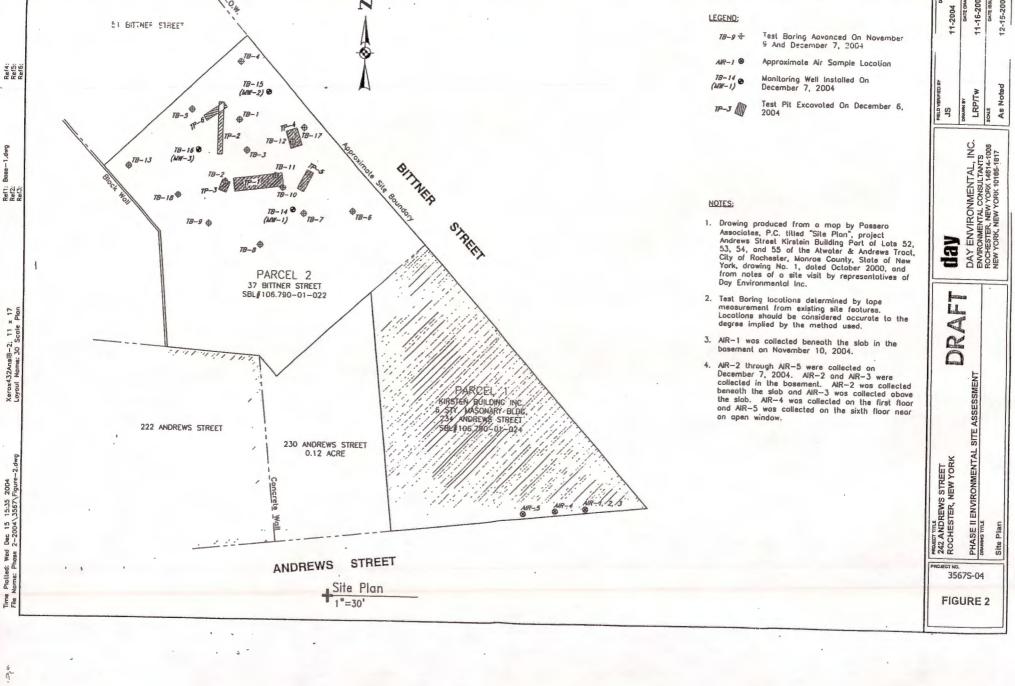
ND = Not detected at concentration above the reported analytical laboratory detection limit

N/A = Not applicable
NT = Not Tested

* = MW-1 was analyzed for USEPA Target Compound List (TCL) and STARS-List VOCs. MW-2 and MW-3 were analyzed for STARS-List VOCs.

(1) = New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series 1.1.1 Ambient Water QualityStandards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1) dated June 1998

1,800 = Concentration detected exceeds groundwater standard or guidance value



Day November 2004 Phase II Report

PHASE II ENVIRONMENTAL SITE ASSESSMENT 242 ANDREWS STREET ROCHESTER, NEW YORK

Prepared by:

Day Environmental, Inc. 40 Commercial Street

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Prepared for:

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Project Number:

3567S-04

Date:

November 2004

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1.0 INTRODUCTION

DAY Environmental, Inc. (DAY) was retained by Winn Development (Winn) to conduct a Phase II Environmental Site Assessment (Phase II ESA) at 242 Andrews Street, Rochester, New York (Site). A Project Locus is included as Figure 1 and a Site Plan is included as Figure 2.

1.1 Background

The approximate 0.65-acre Site is currently improved with an approximate 56,000 square foot, six-story building with a basement and sub-basement. The balance of the Site is paved and used for parking. The building has been vacant since at least 1997; however, the parking lots are being used. As shown on Figure 2, the Site consists of two parcels comprised of the footprint of the building addressed 234 Andrews Street (SBL# 106.790-01-024, referred to as "Parcel 1") and 37 Bittner Street (SBL# 106.790-01-022, referred to as "Parcel 2"). The Site is currently bound to the north by Kovalsky-Carr Electric Supply; to the south by Andrews Street, with Silver Cleaners and Epstein Dry Cleaning and Shirt Service beyond; to the east by Bittner Street with the YWCA beyond and to the west by a parking lot for Kovalsky-Carr with the Andrews Building (office building) beyond.

DAY completed an Environmental Transaction Screen Assessment (DAY File #3394E-04) for the Site. The Environmental Transaction Screen Assessment report dated February 12, 2004 identified a filling station formerly located on a portion of the Site as a recognized environmental condition (REC). Specifically, review of a 1951 Sanborn fire insurance map indicated that a filling station with two gasoline tanks in proximity was formerly located in the northern portion of Parcel 2 (i.e., an area that is currently covered with an asphalt paved parking lot). The status of the tanks and subsurface conditions in this portion of the Site could not be determined based upon work completed in conjunction with the Environmental Transaction Screen Assessment.

In addition to the REC, a dry cleaning facility identified as a RCRA Generator is located south of the Site. The impact of this dry cleaning facility on the Site (if any) was not evaluated as part of the Environmental Transaction Screen Assessment.

1.2 Purpose and Scope of Work

The purpose of DAY's work was to conduct limited studies to evaluate the REC associated with the former filling station reportedly located on the Site and to evaluate the potential impact of the adjacent dry cleaning facility on the building at the Site.

To achieve the stated purpose, the following scope of work was implemented:

- A review of various public records pertaining to 234 250 Andrews Street obtained through the Freedom of Information Law (FOIL).
- The collection and chemical analysis of a sub-slab air sample from the basement of the building at the Site.

- The completion of a site visit and magnetic locator survey.
- The retention of a subcontractor to advance test borings to evaluate subsurface conditions in the reported area of the filling station formerly located on the Site.
- The submittal of selected soil samples from the test borings for analytical laboratory testing.
- The review and evaluation of the data collected during the above activities to prepare this report of findings.

2.0 PHASE II ENVIRONMENTAL STUDIES

This section describes the regulatory record research, fieldwork and analytical laboratory testing completed as part of this study.

2.1 FOIL Request

On October 15, 2004, a FOIL request was sent to the City of Rochester building and fire departments, Monroe County Department of Health (MCDOH) and the New York State Department of Environmental Conservation (NYSDEC) requesting information pertaining to the Site. Copies of the FOIL responses obtained to date and other relevant documentation are included in Appendix A.

2.2 Sub-Slab Air Sample

On November 9, 2004, DAY drilled a ½-inch hole through the concrete slab (approximately 9 inches thick) and into granular material beneath the slab in the basement of the building at the Site. This hole was positioned approximately 30 feet from the southeast corner of the building and directly across the street from the dry cleaning facility located south of the Site (refer to Figure 2). Following drilling, flexible tubing was inserted through the hole extending into the sub-grade. The remaining annulus was grouted using anchoring cement. The tubing was then connected to a regulator attached to a Summa canister. The cement was allowed to cure overnight.

On November 10, 2004, DAY opened the valve on the Summa canister to collect a sample. [Note: Prior to delivery to the Site, the analytical laboratory lab calibrated the regulator on the canister such that it would continually draw air at a consistent rate into the canister over a 6-hour period.] Approximately six hours after the canister was opened, DAY closed the valve, removed the tubing from the slab and filled the hole in the floor with anchoring cement. The Summa canister was then delivered to the analytical laboratory for testing (refer to Section 2.5).

2.3 Field Observations

On November 9, 2004, DAY used a Shoenstadt Model GA-52A magnetic locating device in an attempt to identify magnetic anomalies in the northern portion of the Site (i.e., within a current parking lot that was reported to be the location of a former filling station and generally within the northern limits of Parcel 2). Several areas of magnetic anomaly were identified using the magnetic locating device, however the specific source of these anomalies (e.g., buried underground storage tanks (USTs), metal fragments within the fill, etc.) could not be determined. During the magnetic locator survey, two depressions measuring approximately 3 feet by 5 feet were observed in the asphalt pavement of the parking lot (i.e., in proximity of test boring location TB-2 and TB-8; refer to Figure 2). The cause of these approximate 4-inch deep depressions is not known (e.g., associated with current or former USTs or some other source).

2.4 Test Borings

DAY retained SLC Environmental Services, Inc. (SLC) to advance test borings at the Site using direct-push drilling techniques. On November 9, 2004, SLC advanced thirteen (13) test borings using a truck-mounted Simco Earthprobe 2000 direct-push drill rig. The approximate locations of these test borings are presented on Figure 2 and these locations are further described below:

- Test Borings TB-1, TB-3, TB-10, TB-11 were advanced in the reported location of the former filling station and in areas where magnetic anomalies were identified.
- Test Borings TB-2 and TB-8 were advanced where depressions in the asphalt were observed.
- Test borings TB-4, TB-5, TB-6, TB-7, TB-9, TB-10, TB-11, TB-12 and TB-13 were advanced to evaluate subsurface conditions throughout the Site and to assist in delineating the extent of apparent petroleum-impact identified in test borings advanced in the reported location of the former filling station.

In each of the test borings advanced during this study, soil samples were collected in consecutive intervals extending from the ground surface to depths ranging from 6.0 feet below land surface (BLS) to 14.0 feet BLS where equipment refusal was encountered. These direct-push samples were collected using a 4-foot long sampling device equipped with disposable inner plastic sleeves.

A DAY representative observed the soil and fill samples collected in order to develop a stratigraphic description of the subsurface conditions and to evaluate the recovered samples for evidence of contamination (i.e., odors, staining, etc.). The ambient air space above portions of the soil/fill samples was screened using a MiniRae 2000 photoionization detector (PID). Prior to use, the PID was calibrated using an isobutylene gas standard. The DAY representative recorded pertinent information for each test boring including PID measurements and subsequently prepared test boring logs describing subsurface conditions and observations. Copies of the test boring logs prepared are included in Appendix B.

Upon completion, the test borings were filled with drill cuttings and capped with an asphalt patch. However, test borings TB-4, TB-5, TB-6 and TB-13 were left open until the end of the day prior to backfilling. A bailer was lowered down the borehole in an attempt to measure the static groundwater level. Three of the four borings collapsed and a groundwater measurement could not be obtained, but groundwater was observed at a depth of about 10.5 feet BLS in test boring TB-5.

2.5 Analytical Laboratory Testing

The sub-slab air and soil/fill samples collected during this study were submitted to Paradigm Environmental Services, Inc. (Paradigm) under chain-of-custody control for analytical laboratory testing. The following analytical laboratory testing program was implemented as part of this study:

- One sub-slab air sample (designated AIR-1) was submitted for volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method TO-15 [Note: The TO-15 analysis was completed by Colombia Analytical Services, Simi Valley, California (i.e., a subcontractor to Paradigm)];
- Four soil/fill samples were submitted for NYSDEC Spill Technology and Remediation Series (STARS)-list VOCs including the top twenty tentatively identified compounds (TICs) using USEPA Method 8260;
- One soil/fill sample was submitted for STARS-list semi-volatile organic compounds (SVOCs) using USEPA Method 8270; and
- One soil/fill sample was submitted for total lead using USEPA Method 6010.

Copies of the analytical laboratory reports submitted by Paradigm and executed chain-of-custody documentation are included in Appendix C.

3.0 FINDINGS

This section presents the findings of this Phase II ESA.

3.1 FOIL Response

The City of Rochester FOIL response did not indicate the existence or closure of tanks at the Site. As shown in Appendix C, the information obtained from the City of Rochester is primarily related to code violations. The MCDOH did not have documents pertaining to the Site and as of the date of this report the NYSDEC has not responded to the FOIL request. [Note: NYSDEC spills and petroleum bulk storage (PBS) record checks were included in the Environmental Transaction Screen Assessment report. Although information was not available for the Site, these records described conditions on nearby properties.] It is not anticipated that the NYSDEC has additional records pertaining to the Site.

3.2 Subsurface Conditions

Fill material was encountered in each test boring advanced during this study. This fill extended from the ground surface and it generally consisted of asphalt, sand and gravel. In test borings TB-1, TB-2, TB-7, TB-8, TB-10, TB-11, TB-12 and TB-13 brick fragments were intermixed in the fill material. A piece of a tar-like substance was observed within the fill in test boring TB-3; ash and cinders were observed in the fill within test borings TB-5 and TB-7 and glass and roots were observed in the fill collected from test boring TB-13. The fill ranged in thickness from about one foot in test borings TB-12 and TB-13 to about eight feet in test boring TB-1. Based on the observation of the samples collected from the test borings advanced during this study, the average thickness of fill material at the Site is approximately four feet.

Evidence of UST systems (e.g., metal fragments, piping, etc.) was not identified in the samples collected from the test borings advanced during this study (i.e., including test borings TB-2 and TB-8 advanced adjacent to the depressions observed in the asphalt pavement).

Indigenous soil beneath the fill material generally consisted of sand with lesser components of silt and gravel. The indigenous soil extended beneath the fill (i.e., ranging in thickness from about one to eight feet with an average thickness of about four feet) to depths of about six to fourteen feet BLS, where equipment refusal was encountered. The source of this refusal is not known, but it could be representative of bedrock or a dense soil deposit (e.g., glacial till) that could not be penetrated by the direct-push sampling equipment. Groundwater was measured in the open borehole of test boring TB-5 at a depth of about 10.5 feet BLS. However, based upon observations of the soil samples it is suspected that stabilized groundwater may occur at depths of about 9 to 10 feet BLS.

PID readings above background (i.e., 0.0 ppm) were measured in seven of thirteen test borings advanced during this study. The peak PID readings measured during this study ranged from 20.5 ppm in test boring TB-11 at a depth of about 9.5 feet BLS and 1.313 ppm in test boring TB-1 at a

depth of about 9.0 feet BLS. Petroleum-type odors and staining were observed in 7 of 13 test borings (i.e., the same test borings containing samples with PID readings above background). Specifically, evidence of apparent petroleum-impact was detected in test borings TB-1, TB-2, TB-3, TB-4, TB-5, TB-11 and TB-12 (refer to Figure 2).

3.3 Analytical Laboratory Test Results

The results of the analytical laboratory testing conducted as part of this Phase II ESA are presented in this section.

Sub-Slab Air Sample Results

VOCs were detected above the detection limits utilized by the analytical laboratory in the one sub-slab air sample tested during this study. As shown on Table 1, the VOCs acetone; trichlorofluoromethane; 2-butanone (MEK); trichloroethene; toluene; tetrachloroethene; and m, p-xylenes were detected in the sample. A concentration of 1.7 μ g/m³ of trichloroethene was measured and this value exceeds both the target shallow soil gas concentration and the target indoor air concentration of 0.22 μ g/m³ and 0.022 μ g/m³, respectively. A concentration of 4.2 μ g/m³ of tetrachloroethene exceeds the target indoor air concentration of 0.81 μ g/m³ as referenced in the USEPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance) dated November 20, 2002.

Soil/Fill Sample Results

SVOCs were not detected above the detection limits utilized by the analytical laboratory in the one sample tested during this study. The sample tested for total lead had a concentration of 3.79 ppm. This concentration is below the to Recommended Soil Cleanup Objective (RSCO) of 500 ppm referenced in the NYSDEC document titled: "Division of Technical and Administrative guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM 4046).

STARS list VOCs and VOC TICs were detected in each of the four samples tested during this study. Naphthalene was detected in 2 of 4 soil samples analyzed. As shown on Table 2, the VOCs sec-Butylbenzene; Ethylbenzene; n-Propylbenzene; Isopropylbenzene; p-Isopropyltoluene; Toluene; 1,2,4-Trimethylbenzene; 1,3,5-Trimethylbenzene; and Xylene were detected at concentrations exceeding RSCOs established in TAGM 4046. The total concentration of specific STARS-list VOCs ranged between 285 parts per billion (ppb) (sample 03/TB-11) and 66,184 ppb (sample 04/TB-12). The total VOCs (including TICs) ranged between 9,537.7 ppb (sample 02/TB-4) and 213,124 ppb (sample 04/TB-12). With the exception of sample 02/TB-4 the total VOC concentration (including TICs) exceeds the RSCO of 10,000 ppb established in TAGM 4046.

3.4 Extent of Petroleum-Impacted Soil/Fill

In the test borings exhibiting petroleum-impact, the initial evidence of impact appears to occur at depths of about 8.5 feet to 9.5 feet BLS. Available information suggests that groundwater may occur at depths of about 9 to 10 feet BLS, but groundwater monitoring wells are required to confirm this assumption. The petroleum-impacted soil appears to extend to the bottom of the test borings (i.e., where equipment refusal was encountered). However, in some of the test borings the PID readings appeared to decrease with depth. The source of the petroleum-impacted soil was not specifically defined during this study (i.e., leaking USTs were not identified during the work completed), but the former filling station is a likely source. [Note: Based upon the analytical laboratory test results, the VOCs detected appear to be typical of "older" gasoline (e.g., MTBE, a relatively recent gasoline additive, was not detected).]

Based upon the test borings advanced during this study, the analytical laboratory test results and observations/PID readings, it appears that an area on the Site measuring about 65 feet in a direction generally parallel to Bittner Street and about 50 feet in a general east to west direction contains soil/fill material with VOC concentrations exceeding RSCOs. However, no test borings were advanced on the adjacent property to the north or within the Bittner Street right-of-way to the east to evaluate petroleum-impact in these areas.

The area containing soil/fill material with VOC concentrations exceeding RSCOs appears to be predominately located within the northern portion of Parcel 2 of the Site. The soil samples collected during this study from test borings TB-6, TB-7 and TB-8 did not exhibit evidence of petroleum-impact. These test borings are positioned between the Kirsten Building and the area of petroleum-impacted soil defined above.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the work completed during this Phase II ESA, the following items can be concluded.

- The sub-slab air sample collected from the basement of the building at the Site exhibited evidence of trichloroethene and tetrachloroethene above the draft guidance values in the subsurface soils that appears to be attributable to the dry cleaning facility to the south of the Site. Since the concentration of trichloroethene is above the target shallow soil gas concentration, the potential exists that trichloroethene may be present in the ambient air in the building.
- The City of Rochester FOIL response received to date did not indicate the existence or closure of tanks at the Site. It does not appear that the MCDOH or the NYSDEC have additional documents pertaining to environmental conditions at the Site.
- Thirteen test borings were advanced to depths up to 14 feet BLS to evaluate subsurface conditions at the Site.
- Fill material extending from the ground surface to depths of about one foot to about eight feet was encountered in each test boring advanced during this study. The average thickness of fill material encountered in the test borings advanced during this study is approximately four feet. The fill generally consists of sand and gravel with intermixed asphalt and lesser amounts of brick fragments, ash, cinders and glass in some locations.
- Indigenous soil beneath the fill material generally consists of sand with lesser components of silt and gravel. The indigenous soil extended beneath the fill to depths of about six to fourteen feet BLS, where equipment refusal was encountered. The source of equipment refusal could not be determined as part of this study, but it may be attributable to bedrock or a dense indigenous soil deposit (e.g., glacial till).
- Groundwater monitoring wells were not installed during this study, but a water level measurement of 10.5 feet BLS was measured within a borehole left open following drilling. Also, based upon observations of the soil samples, it is suspected that stabilized groundwater may occur at depths of about 9 to 10 feet BLS.
- Evidence of petroleum-impact (i.e., odors, staining, elevated PID readings, etc.) was detected in seven of the thirteen test borings advanced during this study. STARS list VOCs and VOC TICs were detected in each of the four soil samples tested during this study. The concentrations measured in three of these samples exceed the RSCOs established by the NYSDEC.
- In the test borings exhibiting petroleum-impact, the initial evidence of impact appears to occur at depths of about 8.5 feet to 9.5 feet BLS. The petroleum-impacted soil appears to extend to the bottom of the test borings (i.e., where equipment refusal was encountered).

However, in some of the test borings the PID readings appeared to decrease with depth.

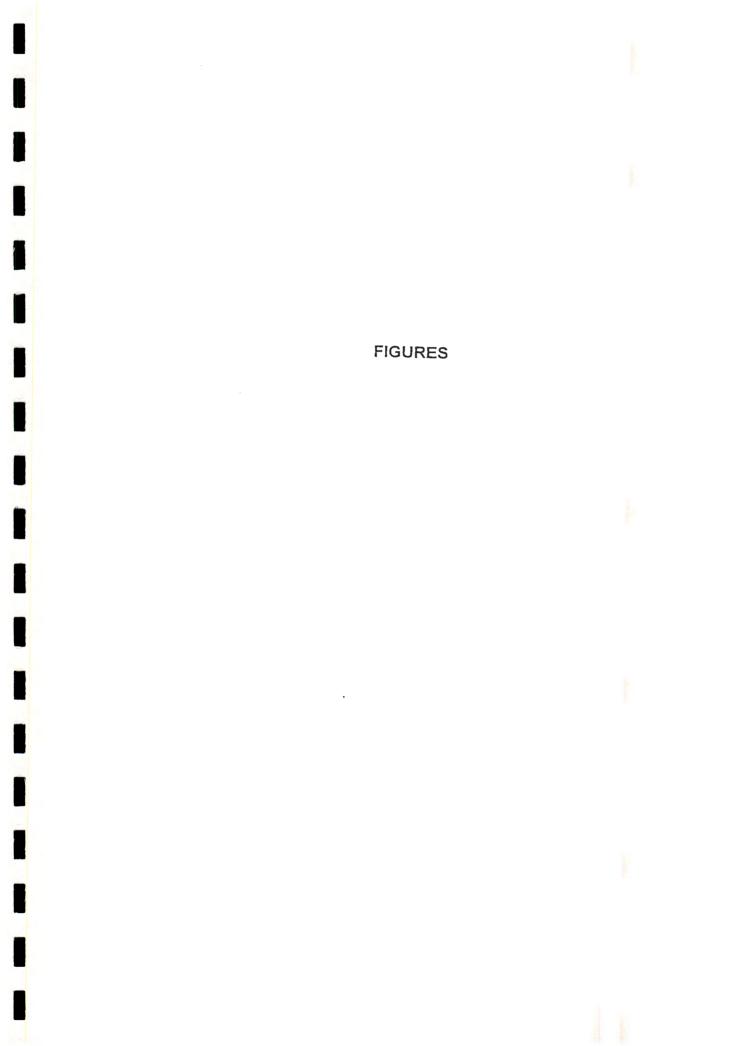
- The source of the petroleum-impacted soil was not specifically determined during this study (i.e., leaking USTs were not encountered during the work completed), but the filling station that was formerly located at the Site is a likely source.
- It appears that at a minimum an area on the Site measuring about 65 feet in a direction generally parallel to Bittner Street (i.e., generally north to south) and about 50 feet in a general east to west direction contains soil/fill material with VOC concentrations exceeding RSCOs established by the NYSDEC. This area appears to be predominately located within the northern portion of Parcel 2 of the Site.
- Soil samples collected from test borings positioned between the Kirstein Building and the area of petroleum-impacted soil predominately located in the northern portion of Parcel 2 did not exhibit evidence of petroleum-impact.

Based upon the findings of this Phase II ESA, it is recommended that additional studies be performed to assess the need for and type of remediation (if any) required to address the apparent petroleum-impact identified at the Site as well as the presence of chlorinated solvents in the indoor air quality in the building. This work should include additional studies to confirm that no USTs, or other potential on-going sources of petroleum-impact, remain at the Site.

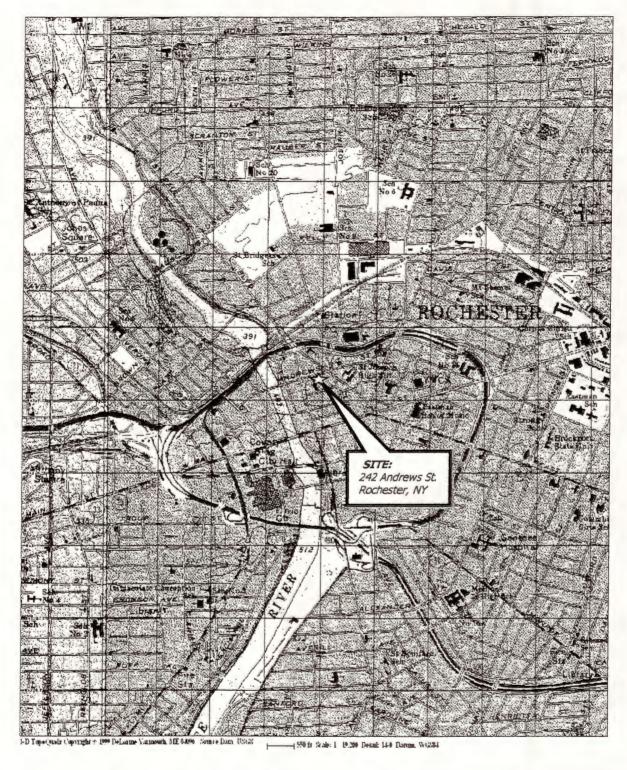
Additional studies should also include monitoring additional sub-slab locations at the Site to define the extent of trichloroethene and tetrachloroethene. Air samples should be collected in the ambient air in the basement to correlate the data collected below the slab to ambient air in the building. Finally, a background sample should be collected at the Site away from basement.

Additional studies consisting of test borings and groundwater monitoring wells and appropriate analytical laboratory testing should be done to better characterize subsurface conditions and delineate the extent of petroleum-impact. Depending on the results of these studies, remediation may be required to address petroleum-impact (i.e., source removal).

Based upon the intended use of the portion of the Site where petroleum-impact has been detected as a paved parking lot and the depth/extent of petroleum-impact, it is also possible that only limited remediation (or monitoring) will be required for the Site. This would require acceptance by the NYSDEC and completion of a risk-based assessment to document that the petroleum-impacted material at the Site does not pose an unacceptable risk.







Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad maps Rochester East (NY) 1995. Site Lat/Long: N43°9.58' - W77°36.5'

DATE 11-11-2004

DRAWN SY LRP

SCALE 1" = 2000"

DAY ENVIRONMENTAL, P.C. **ENVIRONMENTAL ENGINEERING CONSULTANTS** ROCHESTER, NEW YORK 14614-1008 **NEW YORK, NEW YORK 10165-1617**

242 ANDREWS STREET ROCHESTER. NY

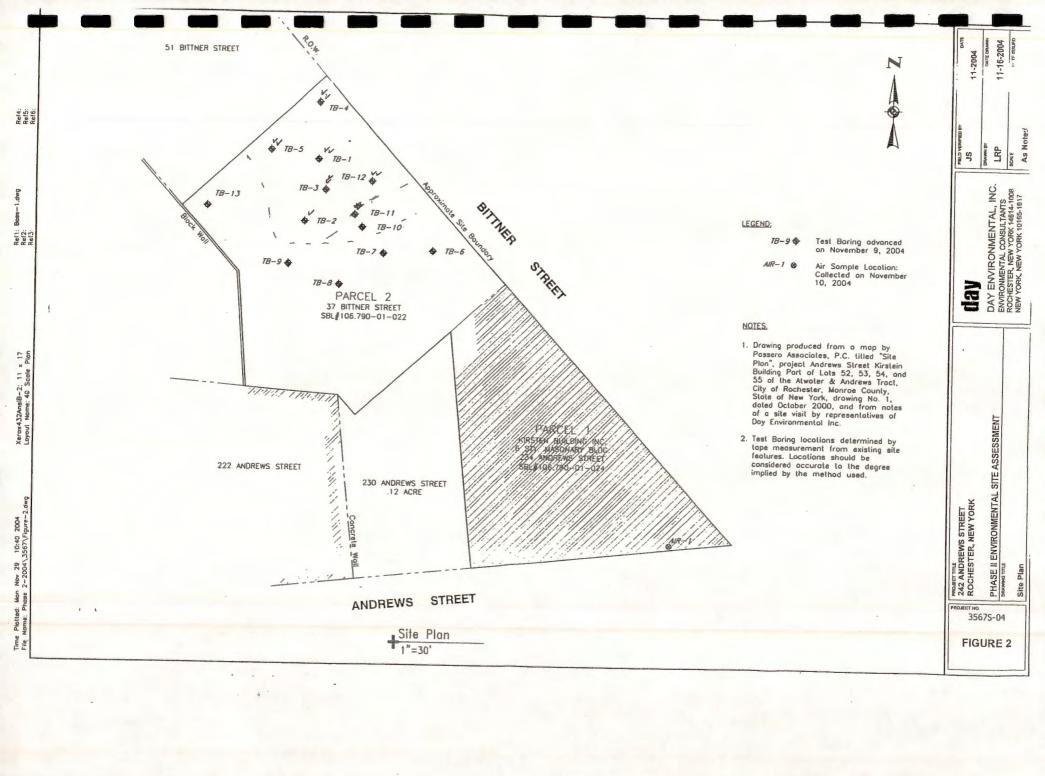
PHASE II ENVIRONMENTAL SITE **ASSESSMENT**

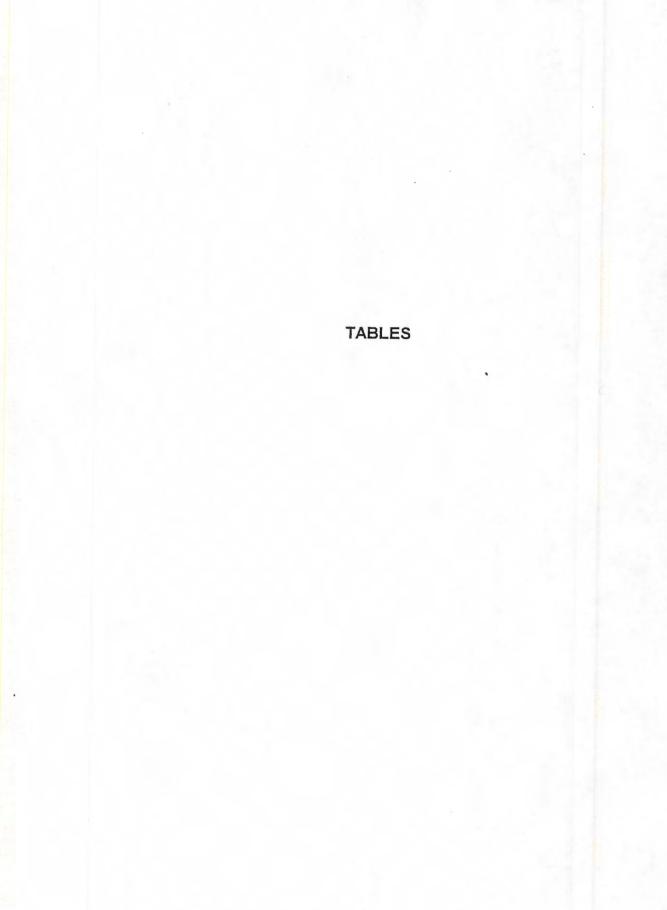
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PROJECT LOCUS MAP

PROJECT NO. 3567S-04

FIGURE 1





242 ANDREWS STREET ROCHESTER, NEW YORK

SUMMARY OF VOCS IN MICROGRAMS PER CUBIC METER (µg/m³)

SUB-SLAB AIR SAMPLE (Collected November 10, 2004)

Detected Volatile Organic Compounds	AIR-I (μg/m³)	USEPA TARGET INDOOR AIR CONCENTRATION (µg/m³)(1)	USEPA TARGET SHALLOW GAS CONCENTRATION (µg/m³)(2)
Acetone	16	350	3,500
Trichlorofluoromethane	1.7	700	7,000
2-Butanone (MEK)	13	1,000	10,000
Trichloroethene	1.7	0.022	0.22
Toluene	9.3	400	4,000
Tetrachloroethene	4.2	0.81	8.1
m,p-Xylenes	2.3	7,000*	70,000*

Samples analyzed by United States Environmental Protection Agency (USEPA) Method TO-15

- (1) = Target Indoor Air Concentration from Table 2C (Risk = 1 X 10⁻⁶) as referenced in the USEPA *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance)* dated November20, 2002.
- (2) = Target Shallow Gas Concentration from Table 2C (Risk = 1 X 10⁻⁸) as referenced in the USEPA *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance)* dated November 20, 2002.
- = The USEPA Target Concentrations for m-Xylene and p-Xylene are listed separately and each are 7,000 μg/m³ (Indoor Air) and 70,000 μg/m³ (Shallow Gas).
- 1.7 = Bold denotes a concentration that exceeds the Target Shallow Soil Gas Concentration
 - = Shading denotes a concentration that exceeds the Target Indoor Air Concentration

242 ANDREWS STREET ROCHESTER, NEW YORK

SUMMARY OF STARS VOCS AND NAPHTHALENE IN MICROGRAMS PER KILOGRAM (µg/Kg), PARTS PER BILLION (ppb)

SOIL SAMPLES (Collected November 9, 2004)

		Sample an	NYSDEC TAGM 4046		
Volatile Organic Compounds	01 TB-1 (8'-12')	02 TB-4 (10'-12')	03 TB-11 (10'-11')	04 TB-12 (8'-12')	RECOMMENDED SOIL CLEANUP OBJECTIVE (PPB) ⁽¹⁾
STARS VOCs				Tour Section 1	
Benzene	ND	ND	ND	ND	60
n-Butylbenzene	ND	ND	ND	ND	10,000
sec-Butylbenzene	179	87.4	75.2	ND	10,000
tert-Butylbenzene	ND	ND	ND	ND	10,000
Ethylbenzene	327	ND	ND	3,480	5,500
n-Propylbenzene	898	374	149	6,180	3,700
Isopropylbenzene	368	80.3	20.8	2,700	2,300
p-lsopropyltoluene	312	132	39.7	1,460	10,000
Toluene	ND	ND	ND	194	1,500
1,2,4-Trimethylbenzene	3,330	324.0	ND	23,500 E	10,000
1,3,5-Trimethylbenzene	2,650	147	ND	12,800	3,300
Xylenes (total)	322	ND	ND	16,500	1,200
Total STARS VOCs	8,386	1,144.7	285	66,814	NA
Total VOC TICs	23,957	8,393	11,980	146,310	N/A
TOTAL TCL/STARS VOCs & TICs	32,343	9537.7	12,265	213,124	10,000
Naphthalene	437	ND	ND	7,980	13,000

VOC = Volatile Organic Compound

TICs = Tentatively Identified Compounds

STARS = Spill Technology and Remedation Series

ND = Not detected at concentration above the reported analytical laboratory detection limit

N/A = Not applicable

(1) = Recommended soil cleanup objectives (RSCOs) as referenced in January 24, 1994, NYSDEC Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM 4046) and addendum tables dated August 2001.

2,700 = Concentration detected exceeds RSCO

E = Estimated Concentration

APPENDIX A FOIL RESPONSE

DAY ENVIRONMENTAL, INC.

ENVIRONMENTAL CONSULTANTS AN AFFILIATE OF DAY ENGINEERING, P.C.

October 15, 2004

Ms. Kim Shutts NYS DEC 6274 East Avon-Lima Road Avon, New York 14414

RE:

FOIL REQUEST

JOB NUMBER 2890AUD

Dear Ms. Shutts:

This letter is a Freedom of Information Law request for the following location:

OWNER

PROPERTY

I.F.F. Lisbon Asset Advisory Services, LLC

Kirsten Building 242-250 Andrews Street Rochester, NY

Kirsten Optical Manufacturing

adiM. Meller

We would appreciate being informed of any environmental records on the above site.

If you have any questions concerning this matter, please do not hesitate to call. Thank you for your cooperation.

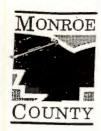
Very truly yours,

Sandi M. Miller

SMM/s

*Map Attached

FR4945



Application for Access to Records Maintained at the Monroe County Department of Health

Fax: (585) 274 - 6098

Return To: FOI Officer, Room 976

Monroe County Department of Health

111 Westfall Road P.O. Box 92832

Rochester, New York 14692-8932

I hearby apply to: [X] inspect	[/] obtain a copy of the following record(s) *:
242-250 Anarelis &. Calenter, Ny	MCDOH Records
Sandi M. Miller Please print name	Jardi IN Yeller
Day Environmental, Inc. Representing (If applicable)	10-15-04 Date
Mailing address	(585) 454-0210 X122
City, State, Zip code	454 - 0825 Fax number
FOR AGENCY USE ONLY:	
Approved Denied For the reason(s) checked below: Confidential Disclosure Part of investigatory files Unwarranted invasion of personal privacy Record is not maintained by this agency Records for which this agency is legal custodian cannot be found Exempted by statute other than Freedom of Information Act Other:	FOI Number: Date Received: Assigned To: Program Area: Date Applicant Contacted: Date File Review: # of Copies: Fee Waived: Yes No Amount Billed: Invoice #: Date Info Sent Out: Date of Closing Letter:
	page is payable to Monroe County Department of Health.
OTICE: You have the right to appeal denial of this ap	plication.
Rev. 6/12/02	Signature



Department of Public Health

Monroe County, New York

Maggie Brooks
County Executive

Andrew S. Doniger, M.D., M.P.H. Director

35675-04

November 3, 2004

Day Environmental, Inc. 40 Commercial Street Rochester, New York 14614

Attn: Sandi M. Miller

E: Freedom of Information Request HD04-270

242-250 Andrews Street, Rochester (C)

Dear Ms. Miller:

This is in follow-up to your Freedom of Information Request for documents maintained in Monroe County Department of Health files, received at the Department of Health on October 15, 2004.

Staff at the Monroe County Department of Health searched the files and were unable to locate information regarding the above-referenced request. We contacted you on October 25, 2004 to discuss your request. An additional response was made on November 3, 2004 in response to your telephone request.

We now consider this request closed.

If you have future needs, please feel free to contact my office at 585-274-6067.

Sincerely

Richard S. Elliott, P.E.

FOI Officer

RSE: ey

APPENDIX B
TEST BORING LOGS

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200
Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-1

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Elevation: NA Datum: NA Completion Date: 11/09/04

Borehole Diameter: 2.0"

Borehole Depth: 14.0'

Water Level: -

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NA	S-1	0-4	75	NA	0.0		Asphalt, Brick, Sand, some Gravel (FILL) Brown medium to coarse Sand, some Gravel (FILL) some Silt
5 1 1 1 1 1 1 1 1 1	NA	S-2	4-8	100	NA	0.0		trace Brick
9 11 11 12	NA	S-3	8-12	100	NA	67.1 1318 1182 164		Gray fine to medium SAND, some Silt, little Gravel, petroleum-type odor, moist
13-	NA	S-4	12-14	100	NA	72.2		Tan fine SAND, some Silt, petroleum-type odor
15 - 16 - 17 - 18 - 19 - 19 - 120 - 1								Refusal at 14.0'

File: 3567b1.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-2

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 13.0'

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
2-1	NA	S-1	0-4	60	NA	0.0		Asphalt, black medium to coarse Sand, Brick (FILL)
5 6 7 7	NA	S-2	4-8	100	NA	0.0	2	Tan, fine SAND, some Silt, damp petroleum-type odor, black staining
9 10 11	NA	S-3	8-11	100	NA	52.6 74.6 383		Gray fine SAND
12-	NA	S-4	11-13	100	NA	232		some Gravel
13								Refusal at 13.0'

File: 3567b2.log

APPENDIX A FOIL RESPONSE

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-3

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 14.0'

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1						0.0		Asphalt, Gravel, black Sand, damp (FILL)
2 3	NA	S-1	0-4	90	NA	0.0		piece of tar-like substance
4=								Brown medium to coarse SAND, some Silt, trace Gravel, damp
5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	NA	S-2	4-8	100	NA	0.0		
8						40.9		petroleum-type odor, staining, moist
9 110 111 111 111	NA	S-3	8-12	100	NA	399 816		
12						165		transition to tan
13	NA	S-4	12-14	100	NA	41.9		
15 16 17 17 18 19 19								Refusal at 14.0'

File: 3567b3.log

BORING NUMBER: TB-4

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 13.0'

Completion Method: Backfilled with cuttings, asphalt patch Water Level: ---

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample De <mark>scription</mark>
2 3	NA	S-1	0-4	60	NA	0.6		Asphalt, black medium to coarse Sand, trace Gravel (FILL) Dark brown SILT, some Clay, damp
5	NA	S-2	4-8	90	NA	0.0		Brown fine to medium SAND, trace Silt, trace Gravel, damp
9 10 11 11 11 11 11 11 11 11 11 11 11 11	NA	S-3	8-12	100	NA	166 72.7 169 383		transition to tan, petroleum-type odor, moist staining with petroleum odor
12	NA	S-4	12-13	100	NA	165 284		wet, sheen on water in sample liner
13								Refusal at 13.0'

File: 3567b4.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings

BORING NUMBER: TB-5

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Datum: NA

Completion Date: 11/09/04

Borehole Diameter: 2.0" Borehole Depth: 14.0'

Water Level: 10.5' (within borehole 11/09)

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
3	NA	S-1	0-4	55	NA	3.4 0.1 0.0		Asphalt, black coarse Sand, Cinders, Ash (FILL) Tan fine to medium to fine SAND, little Silt, damp
5	NA	S-2	4-8	50	NA	0.0		some Clay, moist
9 11 11 11 11 11 11 11 11 11 11 11 11 11	NA .	S-3	8-12	90	NA	286 586 796		petroleum-type odor
13	NA	S-4	12-14	100	NA	33.1 299		wet
15 16 17 18 19 19 10 20 2								Refusal at 14.0'

File: 3567b5.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-6

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 11.5'

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1-1						0.0		Asphalt, black coarse Sand and Gravel (FILL)
2	NA	S-1	0-4	80	NA	0.0		Brown medium Sand, moist (FILL)
3						0.0		
4						0.0		Brown fine to medium SAND, some Silt, trace Gravel, moist
5-11110	NA	S-2	4-8	95	NA NA	0.0		
7-						0.0		
8 =]			0.0		
9-						0.0		wet
10	NA	S-3	8-11.5	100	NA	0.0		
11-						0.0		,
12-								Refusal a <mark>t</mark> 11.5'
13-								
15	1							
16								
17	o de la constanta de la consta					The state of the s		
18								
19								
20- File: 350	67b6.log							

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-7

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: -

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 11.0'

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NA	S-1	0-4	55	NA	0.0		Asphalt, Brick coarse Sand, some Gravel, Cinders (FILL) Brown fine to medium Sand, trace Gravel, trace Brick (FILL)
5	NA	S-2	4-8	80	NA	0.0		Brown fine to medium SAND, trace Gravel, moist
9 10 11 11	NA	S-3	8-11	100	NA	0.0		
12 13 14 15 17 18 19 19 19 19 19 19 19								Refusal at 11.0'

File: 3567b7.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-8

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 12.0'

Depth (feet)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1 2 3	NA	S-1	0-4	90	NA	0.0		Asphalt, black coarse Sand, Brick, Gravel (FILL) Brown silty SAND, trace Clay, trace Gravel, damp
5 7 7 7 8	NA	S-2	4-8	100	NA	0.0		Brown fine to medium SAND, trace Gravel, damp moist
9 1 10 1 11 11 12	NA	S-3	8-12	100	NA	0.0	•	Refusal at 12.0¹
13 14 15 16 17 15 19 1 19 1 10 10 10 10								redusal at 12.0

File: 3567b8.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-9

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Otall Date: 11/00/04

Borehole Diameter: 2.0"
Water Level: ----

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 12.0'

Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
NA	S-1	0-4	90	NA	0.0		Asphalt, Black Sand, and Gravel (Fit.L.) Dark brown silty SAND, trace Gravel, damp Brown fine to medium SAND, some Slit, trace Gravel, damp
NA	S-2	4-8	60	NA	0.0		moist
NA	S-3	8-12	100	NA .	0.0		some Gravel
							Refusal at 12.0'

File: 3567b9.log

Boring Location: See Site Plan

Project No: 3567S-04

Ground Surface Elevation: NA

Start Date: 11/09/04 Completion Date: 11/09/04

Datum: NA

BORING NUMBER: TB-10

Borehole Diameter: 2.0" Borehole Depth: 6.0'

Sampling Method: Direct Push

Project: 242 Andrews Street, Rochester, NY

Drilling Contractor: SLC Environmental Services

DAY Representative: J. Scherer

Drilling Rig: Simco Earthprobe 200

Completion Method: Backfilled with cuttings, asphalt patch Water Level: ----Well Installation Log Peak PID Reading (ppm) Depth (feet) Recovery Depth (feet) N-Value or RQD % Blows per 0.5 Sample Description Number Asphalt, black Sand, Gravel, Brick (FILL) 0.0 NA S-1 0-4 80 NA 0.0 Black Silty SAND, wet

2 3 0.0 NA S-2 4-6 5 NA 0.0 Refusal at 6.0' 10-12-13 15-16-18 19-20-

File: 3567b10.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-11

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 11.0'

Water Level: ---

Asphalt, black medium to coarse Sand, Gravel (FILL) NA S-1 0-4 90 NA 0.0 Brown Sand, some Silt, some Gravel, Brick (FILL) Brown Silty SAND, trace Gravel, moist 0.0 Brown Silty SAND, trace Gravel, moist 0.0 NA S-2 4-8 75 NA 0.0 0.0 NA S-3 8-11 80 NA 20.5 23.2 petroleum-type odor Refusal at 11.0'	Capill (leat)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
Brown Silty SAND, trace Gravel, moist 0.0 0.0 0.0 NA S-3 8-11 80 NA 20.5 23.2 petroleum-type odor Refusal at 11.0'	2-	NA	S-1	0-4	90	NA	0.0		
NA S-3 8-11 80 NA 20.5 23.2 petroleum-type odor Refusal at 11.0'		NA	S-2	4-8	75	NA	0.0		Brown Silty SAND, trace Gravel, moist
	ori liri		S-3	8-11	80	NA	20.5		
	3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1								
	Treature.								,

File: 3567b11.log

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Símco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-12

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 13.0'

(Jaar) (Jaar)	Blows per 0.5'	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	NA	S-1	0-4	80	NA	0.0		Asphalt, black Sand, Gravel, Brick (FILL) Brown Silty SAND, trace Gravel, moist
6	NA	S-2	4-8	100	NA	0.0		
9 110 111 111	NA	S-3	8-12	100	NA	30.6 612 659		SAND and SILT petroleum-type odor .
13	NA	S-4	12-13	70	NA	282 81.3		wet Refusal at 13.0'
15 16 17 17 17 17 17 17 17	57b12.log							

Project: 242 Andrews Street, Rochester, NY

DAY Representative: J. Scherer

Drilling Contractor: SLC Environmental Services

Drilling Rig: Simco Earthprobe 200 Sampling Method: Direct Push

Completion Method: Backfilled with cuttings, asphalt patch

BORING NUMBER: TB-13

Project No: 3567S-04

Boring Location: See Site Plan

Ground Surface Elevation: NA

Start Date: 11/09/04

Borehole Diameter: 2.0"

Water Level: ---

Datum: NA

Completion Date: 11/09/04

Borehole Depth: 11.0'

Blows per	Number	Depth (feet)	% Recovery	N-Value or RQD %	Peak PID Reading (ppm)	Well Installation Log	Sample Description
NA NA	S-1	0-4	60	NA	0.0		Asphalt, Black Sand, Brick, Roots, Glass (FILL) Brown Sand, Brick (FILL)
NA NA	\$-2	4-8	100	NA	0.0		Brown fine to medium to fine SAND, moist
NA NA	S-3	8-11	100	NA	0.0		Rock fragments
							Refusal at 11.0'

File: 3567b13.log

APPENDIX C

ANALYTICAL LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION



Client:

Day Environmental, Inc.

Lab Project No .:

04-3361

Client Job Site:

242 Andrews

Sample Type:

Soil

Client Job No.:

35675-04

Method:

SW846 6010

Date(s) Sampled: Date Received:

11/09/2004

Date Analyzed:

11/10/2004

Laboratory Report for Solid Analysis

Lab Sample No.	Field ID No.	Field Location	Lead Result (mg/kg)
11289	N/A	01/TB-1 (8-12)	3,79

ELAP ID No.: 10958

mments:

roved By;

Bruce Moogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.



Semi-Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews St

Lab Project Number: 04-3361

Lab Sample Number: 11289

Client Job Number: Field Location:

35675-04 01 / TB-1 (8-12)

pate Sampled:

11/09/2004

Fleld ID Number:

N/A

Date Received:

11/10/2004

Sample Type:

Soil

Date Analyzed:

11/12/2004

	Base / Neutrals	Results in ug / Kg
	Acenaphthene Acenaphthyleпе Aпthracene	ND< 309 ND< 309
	Benzo (a) anthracene Benzo (b) fluoranthene Benzo (g,h,i) perylene Benzo (k) fluoranthene Chrysene Dibenz (a,h) anthracene Fluoranthene Fluorene indeno (1,2,3-cd) pyrene Naphthalene Phenanthrene	ND< 309
FLAR	Pyrane	ND< 309

ELAP Number 10958

Method: EPA 82700

Data File: 22357.D

Comments: ND denotes Non Detect

ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger Technical Director

This report is sent of a multipage document and should only be evaluated in its antirety. Chain of Custody provides additional information, including compliance with sample condition 043361\$1.XLs



Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361 Lab Sample Number: 11289

Client Job Number:

3567S-04

Field Location:

01/TB-1 (8-12)

Date Sampled: 11/09/2004 Date Received: 11/10/2004

Fleid ID Number: N/A Sample Type: Soil

Pate Analyzed:

11/11/2004

Aromatics	Results in ug / Kg
Benzene	ND< 43,2
n-Butylbenzene	ND< 43.2
sec-Butylbenzene	179
tert-Butylbenzene	ND< 43.2
Ethylbenzene	327
n-Propylbenzene	898
Isopropylbenzene	368
p-isopropyltaluene	312
Naphthalene	437
Toluene	ND< 43.2
1,2,4-Trimethylbenzene	3,330
1,3,5-Trimethylbenzene	2,650
m,p-Xylene	322
o-Xylene	ND< 43.2
Miscellaneous	
Methyl tert-butyl Ether	ND< 43.2

LAP Number 10958

Method: EPA 32608

Data File: 25838.D

Comments: ND denotes Non Detect ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteder, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Gustody provides additional information, including compliance with sample condition 2JX.1V18EE10



Volatile Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Client Job Number:

35675-04

Lab Sample Number: 11289

Field Location:

01/TB-1 (8-12)

Pate Sampled:

11/09/2004 11/10/2004

Field ID Number:

N/A

Date Received:

Sample Type:

Soll

Date Analyzed:

11/11/2004

Tentatively Identified Compounds	CAS Number	Retention Time	Results in ug / Kg	Davis
Octane	000111-65-9	7.12	1,390	Percent Fi
Ethyl cyclohexane	001678-91-7	7.87	907	83
Jnk. Alkane	N/A	7.93		90
Ink. Alkane	N/A	8.30	1,270	N/A
nk. Alkane	N/A	9.06	1,350	N/A
nk. Alkane	N/A	9.28	1,200	NA
nknown	N/A	4	1,170	NIA
nk. ALkyl Benzene	N/A	9.58	1,120	N/A
nk. ALkyl Benzene	N/A	10.10	827	N/A
nk. ALkyl Benzene	N/A	10.40	1,610	N/A
nk. ALkyl Benzene	N/A	11.30	1,030	N/A
nk. Alkane		11.39	2,430	NA
nk. Alkyl Benzene	N/A	11.53	1,050	N/A
nk. Alkyl Benzene	N/A	11.61	821	N/A
ik. Alkyl Benzene	N/A	11.74	1,060	N/A
ik. Alkyl Benzene	N/A	1.82	1,200	N/A
ramethyl benzene	NA	11.95	1,330	N/A
k. Alkyl Benzene	N/A	12.32	900	N/A
k. Alkyl Benzene	N/A	12.43	855	N/A
L Alkyl Dannan	N/A	2.60	927	N/A
nk, Alkyl Benzene AP Number 10958	N/A	2.77	1,480	N/A

Method: EPA 82608

Data File: 25836,D

Comments: ND denotes Non Detect

ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition 043361T1,XLS



179 Lake Avenue Rochester, New York 14608

585) 647 - 2530 FAX (585) 647 - 3311

Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361 Lab Sample Number: 11290

Client Job Number:

35675-04

11/09/2004

Field Location: Field ID Number: 02/TB-4 (10-12)

Date Sampled: Date Received:

11/10/2004

Sample Type:

N/A Soll

Date Analyzed:

11/11/2004

Aromatics	Results in ug / Kg
Benzene	ND< 12.9
n-Butylbenzene	ND< 12.9
sec-Butylbenzene	87.4
tert-Butylbenzene	ND< 12.9
Ethylbenzene	ND< 12.9
n-Propylbanzene	374
isopropylbenzene	80.3
p-Isopropyltoluene	132
Naphthalene	ND< 32.3
Toluene	ND< 12.9
1,2,4-Trimethylbenzene	324
1,3,5-Trimethylbenzene	147
m,p-Xylene	ND< 12.9
o-Xylene	ND< 12.9
Miscellaneous	
Methyl tert-butyl Ether	ND< 12.9

ELAP Number 10958

Method: EPA 82608

Data File: 25837.D

Comments: ND denotes Non Detect ug / Kg = microgram per Kilogram

Signature:

Bruca Hoogusteger: Technical Director

This report is part of a multi-page document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition

043381V2.XLS



179 Lake Avenue Rochester, New York 14608

(585) 647 - 2530 FAX (585) 647 - 3311

Volatile Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Client Job Number:

35675-04

Lab Sample Number: 11290

Field Location:

02/TB-4 (10-12)

Date Sampled:

11/09/2004 11/10/2004

Date Received: Date Analyzed:

11/11/2004

Field ID	Number:	N/A
Sample	Type:	Soil

Tentatively Identified Compounds	CAS Number	Retention Time	Results in ug / Kg	Percent Fit
Octane	000111-65-9	7.12	498	83
Ethyl cyclohexane	001678-91-7	7.87	361	90
Unk. Alkane	N/A	7.93	556	N/A
Unk. Alkane	N/A	8.30	427	N/A
Unk. Alkane	N/A	9.08	485	NIA
Unk. Alkane	N/A	9.26	479	N/A
Unknown	N/A	9.32	343	N/A
Unk. ALkyl Benzene	N/A	9.39	815	N/A
Unk. ALkyl Benzene	N/A	9.58	427	N/A
Unk. ALkyl Benzene	N/A	10.11	362	N/A
Unkпown Alkane	N/A	10.86	369	N/A
Unknown Alkyl Banzene	N/A	111.39	543	N/A
Unk. Alkyl Benzene	N/A	11.82	388	N/A
Jnk. Alkyl Benzene	N/A	11.97	420	N/A
Jnk. Alkyl Benzene	N/A	12.40	440	N/A
Jnknown	NA	12.58	401	N/A
Jnknown alkyl benzene	N/A	12.71	323	N/A
Jnk. Alkyl Benzene	N/A	12.78	433	N/A
Jnk. Alkyl Benzone	N/A	12.87	349	N/A
Jnknown	N/A	13.15	401	N/A

ELAP Number 10958

Method: EPA 8260B

Data File: 25837.D

Comments: ND denotes Non Detect

ug / Kg = microgram per Kilogram

Signature:

Bruca Hoogastagar: Technical Director

This report is part of a multipage documentand should only be evaluated in its antirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt,



179 Lake Avenue Rochester, New York 14608

(585) 647 - 2530 FAX (585) 647 - 3311

Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Client Job Number:

3567S-04

Lab Sample Number: 11291

Field Location: Field ID Number:

03/TB-11 (10-11)

Date Sampled: Date Received: 11/09/2004 11/10/2004

Sample Type:

N/A

Date Analyzed:

11/11/2004

Sail

Aromatics	Results in ug / Kg
Benzene	ND< 11.9
n-Butylbenzene	ND< 11.9
sec-Butylbenzene	75.2
tert-Butylbenzene	ND< 11.9
Ethylbenzene	ND< 11.9
n-Propylbenzene	149
Isopropylbenzene	20.8
p-isopropyltoluene	39.7
Naphthalene	ND< 29.6
Toluene	ND< 11.9
1,2,4-Trimethylbenzene	ND< 11.9
1,3,5-Trimethylbenzene	ND< 11.9
m,p-Xylene	ND< 11.9
a-Xylene	ND< 11.9
Miscellaneous	
Mathyl tert-butyl Ether	ND< 11,9

ELAP Number 10958

Method: EPA 8280\$

Data File: 25838.D

Comments: ND denotes Non Detect ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

This report is part of a multipage document and anould only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. C43361V3,XL9



Volatile Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Client Job Number:

35675-04

Lab Sample Number: 11291

Field Location:

03/TB-11 (10-11)

Date Sampled: Date Received:

11/09/2004 11/10/2004

Field ID Number: Sample Type:

N/A Soil

Date Analyzed:

11/11/2004

Tentatively Identified Compounds	CAS Number	Retention Time	Results in ug / Kg	Percent Fit
Unk. Alkane	N/A	5.02	367	. N/A
Unk, Alkane	N/A	5.26	1,920	N/A
Unk. Alkane	N/A	6.02	415	
Unk, Alkane	N/A	6.37	1,640	N/A N/A
Unk. Alkane	N/A	6.49	2,390	
Jnk. Alkane	N/A	6.59	267	N/A
Jnk. Alkane	N/A	6.86	687	N/A
Jnk. Alkane	N/A	7.73	213	N/A
Jnk ALkane	N/A	7,93	192	N/A
Jnk. Alkane	N/A	8.30	207	N/A
Jnknown Alkane	N/A	10.86	225	N/A
Jnk. Alkane	N/A	11.11	166	N/A
Jnk. Alkyl Benzene	N/A	11.29	314	N/A
Ink, Alkyl Benzene	N/A	11.38	486	N/A
Jnk. Alkyl Benzene	N/A	11.61	287	N/A
Ink. Alkyl Benzene	N/A	11.70	308	N/A
Inknown alkyl benzene	N/A	11.82		N/A
ink. Alkyl Benzene	N/A	11.96	818	N/A
lnk. Alkyl Benzene	N/A	12.26	189	N/A
Ink. Alkyl benzene	N/A		504	N/A
LAP Number 10958	Method: E	12.77	385	N/A

Method: EPA 8260B

Data File: 25838.D

Comments: ND denotes Non Detect

ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogestager: Technical Director

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Volatile STARS Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Lab Sample Number: 11292

Client Job Number:

35675-04

Date Sampled:

11/09/2004

Field Location: Field ID Number:

04/TB-12 (8-12) N/A

Date Received:

11/10/2004

Sample Type:

Soil

Date Analyzed:

11/11/2004

Aromatics	Results in ug / Kg
Benzene	ND< 91.4
n-Butylbenzene	ND< 91.4
sec-Butylbenzene	ND< 91,4
tert-Butylbenzene	ND< 91,4
Ethylbenzene	3,480
n-Propylbenzene	6,180
Isopropylbenzene	2,700
p-Isopropyitoluene	1,460
Naphthalene	7,980
Toluene	194
1,2,4-Trimethylbenzene	E 23,500
1,3,5-Trimethylbenzene	12,800
m.p-Xylene	16,500
o-Xylene	ND< 91.4
Miscellaneous	
Methyl tert-butyl Ether	ND< 91.4

ELAP Number 10958

Method: EPA 8260B

Data File: 25866.D

Comments: ND denotes Non Detect

ug / Kg = mlcrogram per Kilogram

E= Estimated concentration. Exceeds calibration range.

Signatura:

Bruce Hoogesteger; Tennical Director

This report is part of a multipage document and mould only be evaluated in its entirely. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. 043351V4.XLS



Volatile Analysis Report for Soils/Solids/Sludges

Client: Day Environmental

Client Job Site:

242 Andrews

Lab Project Number: 04-3361

Client Job Number:

3567S-04

Lab Sample Number: 11292

Fleld Location:

04/TB-12 (8-12)

Date Sampled:

11/09/2004

Field ID Number:

N/A

Date Received:

11/10/2004

Sample Type:

Soil

Date Analyzed:

11/11/2004

Tentatively Identified Compounds	CAS Number	Retention Time	Results in ug / Kg	Percent Fit
Octane	000111-65-9	7.13	24,200	90
Unk. Alkane	N/A	7.28	5,300	N/A
Unk. Alkane	N/A	7.73	5,250	N/A
Unk. Alkane	N/A	7.80	4,480	NA
Jnk. Alkane	N/A	7.88	7,450	NA
Jnk. Alkane	N/A	7.93	9,090	N/A
Jnk. Alkane	N/A	8.09	5,300	N/A
Jnk. Alkane	N/A	8.18	15,700	N/A
Jnk ALkane	N/A	8,30	9,910	N/A
Jnk. Alkane	N/A	8.77	3,930	N/A
Jπknown Alkane	N/A	9.06	6,620	N/A
Jnk. Alkane	N/A	9.26	5,940	N/A
Jnk. Alkane	N/A	9.32	4,190	N/A
Ink. Alkane	N/A	9.40	10,100	N/A
Ink. Alkane	N/A	9.59	5,620	N/A
Ink. Alkyl Benzene	N/A	10.10	10,800	N/A
Inknown alkyl benzene	N/A	10.11	4,520	N/A
ink. Alkyl Benzene	N/A	10.40	5,620	N/A
Ink. Alkyl Benzene	N/A	11.07	5,030	N/A
Ink. Alkyl benzene	N/A	11,40	7.260	N/A

Method: EPA 8260B

Data File: 25866.D

Comments: ND denotes Non Detect ug / Kg = microgram per Kllogram

Signature:

Bruce Hoogesteger: Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compilence with sample condition requirements upon receipt. 043291T4XLS

SERVICES, INC. 179 Lake Avenue Rochester NV 14608 (585) 647-2530 • (800) 724-1997 FAX: (585) 647-3311 PROJECT NAME/SITE NAME: 242 Andrews St			ADDRESS: 40 Commercial St CITY: Rochester NY NG14 PHONE: 4540210 4540825					ADDRE	PHONE: FAX:							TURK	PADJECT # -33(VAROUND TO NACOUN 1 X 2	CLIENT PROJECT #. 35675-04 RKING DAYS) STD OTHE 3 5					
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2 W 9/54	1100		X	02/TB-	4 (10-12)		Soil		X										1	1	2	9	(
3 1/9/04	1345		X	03/TB-	-11 (16-11)		Soil	1	X										1		2	a	1
4 11/4/01	1406		X	64/1B-	12 (8-12)		Soil	1	X										1	1	2	al	1
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COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS Page 1 of 2

Paradigm Environmental Services, Inc.

Client Sample ID:

04-3368-11302

CAS Project ID: P2402452 CAS Sample ID: P2402452-001

st Code:

EPA TO-15

trument ID:

Tckmar AUTOCAN/HP5972/HP5890 II+/MS2

Analyst: empling Media: Aristotle Bragasin Summa Canister

st Notes:

Container ID: AC00425

Date Collected: 11/10/04 Date Received: 11/12/04 Date(s) Analyzed: 11/15/04

Volume(s) Analyzed:

1.00 Liter(s)

Pi 1 = -1.7Pf1 = 3.5

D.F. = 1.40

CAS#	Сотроилд	Result µg/m³	MRL μg/m²	Result ppbV	MRL ppbV	Data Qualifie
74-87-3	Chloromethane	ND	1.4	. ND	0.68	
75-01-4	Vinyl Chloride	ND	1.4	ND	0.55	
74-83-9	Bromomethane	ND	1.4	ND	0.36	
75-00-3	Chloroethane	ND	1.4	ND	0.53	
67-64-1	Acetone	16	7.0	6.8	2.9	
75-69-4	Trichlorofluoromethane	1.7	1.4	0.31	0.25	
75-35-4	1,1-Dichloroethene	ND	1.4	ND	0.35	
75-09-2	Methylene chloride	ND	1.4	ND	0.40	
76-13-1	Trichlorotrifluoroethane	ND	1.4	ND	0.18	
75-15-0	Carbon Disulfide	ND	1.4	ND	0.45	
156-60-5	trans-1,2-Dichloroethene	ND	1.4	ND	0.35	
75-34-3	1,1-Dichloroethane	ND	1.4	ND	0.35	
1634-04-4	Methyl tort-Butyl Ether	ND	1.4	ND	0.39	
108-05-4	Vinyl Acetate	ND	1.4	ND	0.40	
78-93-3	2-Butanone (MEK)	13	1.4	4.4	0.47	
156-59-2	cis-1,2-Dichloroethenc	ND	1.4	ND	0.35	
67-66-3	Chloroform	ND	1.4	ND	0.29	
107-06-2	1,2-Dichlorocthane	ND	1.4	ND	0.35	
71-55-6	1,1,1-Trichloroethane	ND	1.4	ND	0.26	
71-43-2	Benzanc	ND	1.4	ND	0.44	
56-23-5	Carbon Tetrachloride	ND	1.4	ND	0.22	
3-87-5	1,2-Dichloropropane	ND	1.4	ND	0.30	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By:	Date:		
			Prop Man

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS Page 2 of 2

Paradigm Environmental Services, Inc.

lient Sample ID: 04-3368-11302

CAS Project ID: P2402452

CAS Sample ID: P2402452-001

t Code:

EPA TO-15

Instrument ID:

Tekmar AUTOCAN/HP5972/HP5890 II+/MS2

alyst:

Aristotle Bragasin

npling Media:

Summa Canister

Test Notes: ntainer ID:

AC00426

Date Collected: 11/10/04 Date Received: 11/12/04

Datc(s) Analyzed: 11/15/04 Volume(s) Analyzed:

1.00 Liter(s)

Pi 1 =

-1.7

Pf 1 = 3.5

D.F. = 1.40

CAS#	Compound	Result µg/m³	MRL μg/m³	Result ppbV	MRL ppbV	Data Qualifie
75-27-4	Bromodichloromethane	ND	1.4	ND	0.21	2-4,1110
79-01-6	Trichloroethene	1.7	1.4	0.31	0.26	
10061-01-5	cis-1,3-Dichloropropene	ND	1.4	ND	0.31	
1:08-10-1	4-Methyl-2-pentanone	ND	1.4	,ND	0.34	
10061-02-6	trans-1,3-Dichloropropene	ND	1.4	ND	0,31	
79-00-5	1,1,2-Trichloroethane	ND	1.4	ND	0.26	
108-88-3	Tolucne	9.3	1.4	2.5	0.37	
591-78-6	2-Hexanone	ND	1.4	ND	0.34	
124-48-1	Dibromochloromethane	ND	1.4	ND	0.16	
106-93-4	1,2-Dibromoethane	ND	1.4	ND	0.18	
127-18-4	Tetrachloroethene	4.2	1.4	0.62	0.21	
108-90-7	Chlorobenzene	ND	1.4	ND	0.30	
100-41-4	Ethylbenzene	ND	1.4	ND	0.32	
36777-61-2	m.p-Xylenes	2.3	1.4	0.53	0.32	
75-25-2	Bromoform	ND	1.4	ND	0.14	
100-42-5	Styrene	ND	1.4	ND	0.33	
5-47-6	o-Xylene	ND	1.4	ND	0.32	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.4	ND	0.20	
541-73-1	1,3-Dichlorobenzene	ND	1.4	. ND	0.23	
06-46-7	1,4-Dichlarobenzene	ND	1.4	ND	0,23	
95-50-1	1,2-Dichlorobenzene	ND	1.4	ND	0.23	

D = Compound was analyzed for, but not detected above the laboratory reporting limit.

(PL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By:	Date:
	9

APPENDIX 2
Health & Safety Plan

BROWNFIELD CLEANUP PROGRAM (BCP) HEALTH & SAFETY PLAN

37 Bittner Street Rochester, New York 14604

NYSDEC Site# C828127

Prepared for:

234 – 250 ANDREWS STREET, LLC



November 23, 2005 P.N. 25030.03

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1.0 INTRODUCTION

1.1 General

This Health and Safety Plan (HASP) was prepared to address the specific health and safety practices and procedures associated with the 37 Bittner Street Brownfield Cleanup Program (BCP). The HASP presents information and procedures, including the assignment of responsibilities, personnel protection requirements, work practices and emergency response procedures for Passero Associates, P.C. who will be conducting field activities. This document is based on an assessment of potential health hazards at the site, using available historical information.

This HASP will be followed in conformance with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations found in 29 CFR 1910.120 and 29 CFR 1926. Contractors will be responsible for wearing hard hats, protective foot wear, and hearing protection in conformance with these OSHA regulations.

All personnel and subcontractors who enter the site during field operations and are involved with remedial activities will be required to comply with this HASP.

PROJECT MANAGER:

Name: Telephone: Gary W. Passero, P.E. Office: (585) 325-1000

SITE HEALTH AND SAFETY COORDINATOR:

Name:

Telephone:

Arpad Kolozsvary, R.E.M. Office: (585) 325-1000

FIELD MANAGER

Name:

Telephone:

Peter S. Morton, C.P.G. Office: (585) 325-1000

This HASP addresses the requirements set forth in the OSHA regulations contained in 29 CFR Parts 1910 and 1926. Emergency Contacts has been included in Section 7.0 of this HASP, and can be readily detached for use in the event of an emergency requiring site evacuation, medical treatment, etc.

1.2 Background

Historic documents indicate that the Site was occupied by a public gas station from at least 1930 to 1960. Day's Phase II work in November and December 2004 identified gasoline-impacted soil and groundwater beneath the north portion of the site.

The results of Phase II sampling and known contaminants are discussed in Section 2.1 of the work plan.

2.0 HAZARD EVALUATION

2.1 Chemical Hazards

OSHA states that the HASP should be based on a thorough site characterization and analysis to determine the nature and extent of the actual hazards on a site. The Phase II generated by Day is used as a basis for this HASP. The only contaminants detected by Day were gasoline-related compounds:

Volatile Organic Compounds	Concentration	NYSDEC TAGM 4046 Recommended Soil Cleanup Objective (ppb) ⁽¹⁾
STARS VOCs		
Benzene	ND	60
n-Butylbenzene	ND	10,000
sec-Butylbenzene	ND	10,000
tert-Butylbenzene	ND	10,000
Ethylbenzene	3,480	5,500
n-Propylbenzene	6,180	3,700
Isopropylbenzene	2,700	2,300
p-Isopropyltoluene	1,460	10,000
Toluene	194	1,500
1,2,4 - Trimethylbenzene	23,500 E	10,000
1,3,5 - Trimethylbenzene	12,800	3,300
Xylenes (total)	16,500	1,200
Total STARS VOCs	66,814	N/A
Total VOC TICs	146,310	N/A
Total TCL/STARS VOCs & TICs	213,124	10,000

Two of Day's groundwater samples exhibited petroleum contamination at orders of magnitude greater than NYSDEC TOGS 1.1.1 Groundwater Standards as tabulated on the following page:

	Sample	Location	NYSDEC TOGS		
Compound Detected	MW-2 μg/L	MW-3 μg/L	1.1.1 Groundwater Standard or Guidance Value µg/L (ppb)		
Volatile Organic Compounds					
Benzene	ND	51.3	1		
Ethylbenzene	934	1,400	5		
n-Propylbenzene	214	210	5		
Isopropylbenzene	115	115	5		
Toluene	ND	34	5		
1,2,4 - Trimethylbenzene	1,900	970	5		
1,3,5 - Trimethylbenzene	657	592	5		
Xylenes	1,080	421	5		

3.0 RESPONSIBILITIES OF SAFETY PERSONNEL

The following roles have been identified for Passero project personnel:

Project Manager – The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. He is responsible for ensuring that Passero field personnel and subcontractors are properly trained.

Site Health and Safety Coordinator/Field Manager – The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of this HASP for personnel at the site. Ambient air levels will be monitored with an organic meter (OVM) during all drilling activities.

If unsafe work conditions are identified, the Site Health and Safety Coordinator is authorized to order site personnel to stop work; resolution of all on-site health and safety problems will be coordinated through the Project Manager.

4.0 SAFE WORK PRACTICES

4.1 General Safety Practices

Site work will be carried out in conformance with OSHA HAZWOPER regulations.

The recommended general safety practices for working around the drilling subcontractor's equipment (i.e., drill rigs) are as follows:

 The drilling contractors will wear hard hats, protective footwear, and earplugs in conformance with OSHA 1926.

- The drilling contractor's equipment will always be inspected prior to use to check for obvious structural damage, loose nuts and bolts, loose or missing guards, cable guides or protective covers, fluid leaks, damaged hoses, cables, pressure gauges or pressure relief valves, and damaged drilling tools and equipment.
- Heavy equipment will not be operated within 20 feet of overhead wires. The site
 will be clear to ensure the project staff can move around the equipment safely.
- Hard hats and safety boots will be worn in the vicinity of the heavy equipment.
- The drilling contractor will keep the drilling location tidy. This will prevent personnel from tripping and will allow the safe and expeditious exit from the site.

4.2 Respiratory Protection

Based on Day's previous Phase II data, level D respiratory protection will be utilized, and will be upgraded as described below.

- During all drilling and sampling activities, ambient air will be screened with an Organic Vapor Meter (OVM). If reading greater than 25 ppm above background level is registered consistently for a five (5) minute period, Level C respiratory protection will be required.
- If readings greater than 50 ppm above background, work will be halted and Health and Safety issues will be re-evaluated.

5.0 PERSONAL PROTECTION EQUIPMENT

5.1 Protection Levels

Field work will be performed utilizing Level D protective gear (i.e. field clothes). Surgical gloves will be worn while collecting environmental samples. Drillers will wear hard hats and steel-toed boots, and ear plugs in conformance with OSHA 19.26.

6.0 DECONTAMINATION

Personnel and equipment will be decontaminated with a mixture of alconox (or similar detergent) and water prior to leaving the site. All equipment will be pressure-washed between sample locations to prevent cross-contamination.

7.0 EMERGENCY PROCEDURE AND CONTACTS

7.1 Emergency Procedures

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

- 7.1.1 Emergency Procedures and Contacts A list of emergency contacts and phone #'s is provided below:
 - 911 Nationwide hotline numbers provided by the USEPA
 - (800) 457-7362 NYSDEC Spill hotline
 - (585) 226-5356 NYSDEC Project Manager Greg MacLean
 - (518) 402-7860 NYSDOH
 - (585) 274-6904 MCDOH
 - (800) 424-9300 Chemtrec (chemical emergencies)
 - (404) 633-5313 Centers for Disease Control (biological agents)
 - (800) 424-8802 National Response Center
 - (202) 426-0656 USDOT Office of Hazardous Operations
 - (202) 426-8802 USDOT Regulatory Matters
 - (800) 424-9346 USEPA RCRA-Superfund Hotline
- 7.1.2 Personal Injury in the Work Zone Upon notification of an injury in the Work Zone, the designated emergency signal of three blasts of a horn shall be sounded. The affected person should be decontaminated to the extent possible prior to movement. Contact will be made for an ambulance and with the designed medical facility. No persons shall re-enter the work area until the cause of the injury or symptoms is determined.

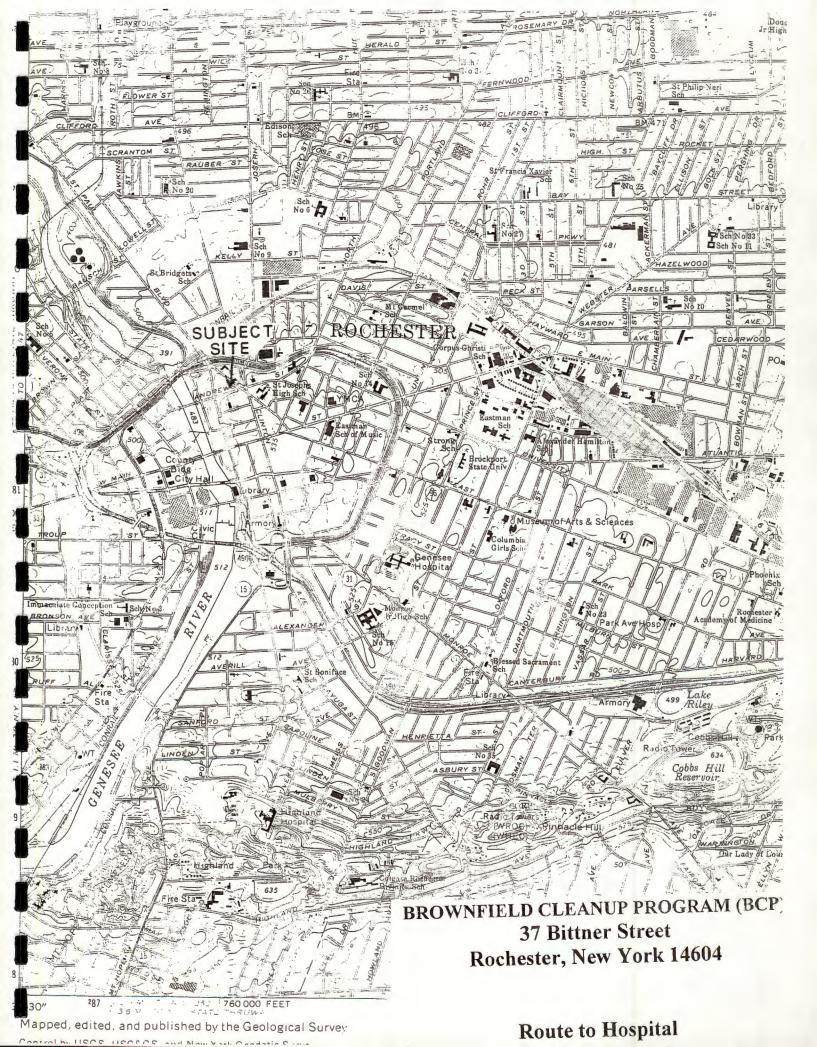
If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue. If the injury increases the risk to others, the designated emergency signal of three blasts of a horn shall be sounded and all site personnel shall move to the designated area determined prior to start of project. Activities on-site will stop until the added risk is removed or minimized.

7.1.3 Fire/Explosion – Upon notification of a fire or explosion on-site, the designated emergency signal, two long blasts of a horn, shall be sounded and all site personnel assembled. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

In all situations, when on-site emergency results in evaluation of the work area, personnel shall not re-enter until:

- 1. The conditions resulting in the emergency have been corrected.
- 2. The hazards have been re-assessed.

- 3. The Site Safety Plan has been reviewed.
- 4. Site personnel have been briefed on any changed in the Site Safety Plan.
- 7.1.4 Route to Hospital In the event of a medical emergency, the nearest hospital is Highland Hospital (Highland).
 Directions to Highland:
 South on Bittner Street
 Go right on Andrews Street to
 Left on St. Paul
 Merge with South Avenue
 Highland Hospital on left
 (map attached)



APPENDIX 3
Citizen
Participation Plan



New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan for 37 Bittner Street

37 Bittner Street City of Rochester Monroe County, New York

February 2006

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Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the brownfield site's remedial process.

Applicant: 234-250 Andrews Street, LLC ("Applicant")

Site Name: 37 Bittner Street ("site")

Site Address: 37 Bittner Street, Rochester, New York 14604

Site County: Monroe County

Site Number: C828127

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) is designed to encourage the private sector to investigate, remediate (clean up) and redevelop brownfields. A brownfield is any real property where redevelopment or reuse may be complicated by the presence or potential presence of a contaminant. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal and financial burdens on a community. If the brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site remedial activities. An Applicant is a person whose request to participate in the BCP has been accepted by NYSDEC. The BCP contains investigation and remediation (cleanup) requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: www.dec.state.ny.us/website/der/bcp

2. Citizen Participation Plan Overview

This Citizen Participation (CP) Plan provides members of the affected and interested public with information about how NYSDEC will inform and involve them during the investigation and remediation of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Appendix A contains a map identifying the location of the site.

Project Contacts

Appendix B identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's remedial program. The public's suggestions about this CP

¹ "Remedial activities", "remedial action" and "remediation" are defined as all activities or actions undertaken to eliminate, remove, treat, abate, control, manage, or monitor contaminants at or coming from a brownfield site.

Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Document Repositories

The locations of the site's document repositories also are identified in Appendix B. The document repositories provide convenient access to important project documents for public review and comment.

Site Contact List

Appendix C contains the brownfield site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and remediation process. The brownfield site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project, including notifications of upcoming remedial activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The brownfield site contact list includes, at a minimum:

- Chief executive officer and zoning chairperson of each county, city, town and village in which the site is located;
- Residents, owners, and occupants of the site and properties adjacent to the site;
- The public water supplier which services the area in which the site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- Document repositories.

Where the site or adjacent real property contains multiple dwelling units, the Applicant will work with the Department to develop an alternative method for providing such notice in lieu of mailing to each individual. For example, the owner of such a property that contains multiple dwellings may be requested to prominently display fact sheets and notices required to be developed during the site's remedial process. This procedure would substitute for the mailing of such notices and fact sheets, especially at locations where renters, tenants and other residents may number in the hundreds or thousands, making the mailing of such notices impractical.

The brownfield site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix B. Other

additions to the brownfield site contact list may be made on a site-specific basis at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Citizen Participation Activities

Appendix D identifies the CP activities, at a minimum, that have been and will be conducted during the site's remedial program. The flowchart in Appendix E shows how these CP activities integrate with the site remedial process. The public is informed about these CP activities through fact sheets and notices developed at significant points in the site's remedial process.

- Notices and fact sheets help the interested and affected public to understand contamination issues related to a brownfield site, and the nature and progress of efforts to investigate and remediate a brownfield site.
- Public forums, comment periods and contact with project managers provide
 opportunities for the public to contribute information, opinions and perspectives that
 have potential to influence decisions about a brownfield site's investigation and
 remediation.

The public is encouraged to contact project staff anytime during the site's remedial process with questions, comments, or requests for information about the remedial program.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 6. or in the nature and scope of remedial activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

3. Site Information

Site Description

The 37 Bittner Street parcel is located on the west side of Bittner Street, City of Rochester, Monroe County, adjacent to the north side of the Kirstein Building parcel at 242 Andrews Street. The site is located in an urban setting and is 0.315 acres in size. A site location map and an aerial photograph is presented in Appendix A.

Site History

Prior to the City reconfiguring streets in the subject area in circa 1980, Bittner Street was the northern extension of Franklin Street. The subject site is currently used as a public parking lot. The historic Sanborn Fire Insurance maps and Polk City directories indicate that this parcel was historically comprised of two parcels listed as 191 and 201 Franklin Street. The northern parcel (201 Franklin Street) was utilized as a public gas station from at least 1930 through 1960; it was listed as the Franklin Street parking lot and gas station, Monroe Union Oil Co., Inc. gas station, and John J. DeCamilla gas station.

Environmental History

In November and December 2004, an environmental investigation was performed by Day Environmental, Inc. (Day) on the Site, which identified petroleum-related soil and groundwater contamination on the north side of the subject Site relative to the historic gas station operations present from the 1930's through the 1960's. The petroleum contamination occurs at depths of 8.5 feet below ground surface to approximately 14 feet below ground surface. Day stated that the area of gasoline-impacted soils is approximately 65 feet long parallel to Bittner Street and approximately 50 feet wide. During test pitting at the Site, the apparent remains of a hydraulic lift system were identified. No underground storage tanks (USTs) were encountered during the test pitting investigation.

There is no documentation that USTs were ever removed from the public gas station that occupied the north portion of the subject site for at least 30 years. The City of Rochester did not produce any records relative to this historic gas station in response to our Freedom of Information Law (F.O.I.L). request.

4. Remedial Process

Note: See Appendix E for a flowchart of the brownfield site remedial process.

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination on-site, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for commercial and residential purposes.

To achieve this goal, the Applicant will conduct remedial activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting a remedial program at the site.

Investigation

If the Applicant conducts a remedial investigation (RI) of the site, it will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment as noted in Appendix D. The goals of the investigation are as follows:

- 1. Define the nature and extent of contamination in soil, surface water, groundwater and any other impacted media;
- Identify the source(s) of the contamination;
- 3. Assess the impact of the contamination on public health and/or the environment; and
- 4. Provide information to support the development of a Remedial Work Plan to address the contamination, or to support a conclusion that the contamination does not need to be addressed.

The Applicant will prepare an RI Report after it completes the RI. This report will summarize the results of the RI and will include the Applicant's recommendation of whether remediation is needed to address site-related contamination. The RI Report is subject to review and approval by NYSDEC. Before the RI Report is approved, a fact sheet that describes the RI Report will be sent to the site's contact list.

NYSDEC will determine if the site poses a significant threat to public health and/or the environment. If NYSDEC determines that the site is a "significant threat," a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying community group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interest of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment are potentially threatened by the site.

For more information about the TAG Program and the availability of TAGs, go online at: www.dec.state.ny.us/website/der

Remedy Selection

After NYSDEC approves the RI Report, the Applicant will be able to develop a Remedial Work Plan if remediation is required. The Remedial Work Plan describes how the Applicant would address the contamination related to the site.

The public will have the opportunity to review and comment on the draft Remedial Work Plan. The site contact list will be sent a fact sheet that describes the draft Remedial Work Plan and announces a 45-day public comment period. NYSDEC will factor this input into its decision to approve, reject or modify the draft Remedial Work Plan.

A public meeting may be held by NYSDEC about the proposed Remedial Work Plan if requested by the affected community and if significant substantive issues are raised about the draft Remedial Work Plan. Please note that, in order to request a public meeting, the health, economic well-being or enjoyment of the environment of those requesting the public meeting must be threatened or potentially threatened by the site. In addition, the request for the public meeting should be made within the first 30 days of the 45-day public comment period for the draft Remedial Work Plan. A public meeting also may be held at the discretion of the NYSDEC project manager in consultation with other NYSDEC staff as appropriate.

Construction

Approval of the Remedial Work Plan by NYSDEC will allow the Applicant to design and construct the alternative selected to remediate the site. The site contact list will receive notification before the start of site remediation. When the Applicant completes remedial activities, it will prepare a final engineering report that certifies that remediation requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the remediation is protective of public health and the environment for the intended use of the site. The site contact list will receive a fact sheet that announces the completion of remedial activities and the review of the final engineering report.

Certificate of Completion and Site Management

Once NYSDEC approves the final engineering report, NYSDEC will issue the Applicant a Certificate of Completion. This Certificate states that remediation goals have been achieved, and relieves the Applicant from future remedial liability, subject to statutory conditions. The Certificate also includes a description of any institutional and engineering controls or monitoring required by the approved remedial work plan. If the Applicant uses institutional controls or engineering controls to achieve remedial objectives, the site contact list will receive a fact sheet that discusses such controls.

An institutional control is a non-physical restriction on use of the brownfield site, such as a deed restriction that would prevent or restrict certain uses of the remediated property. An institutional control may be used when the remedial action leaves some contamination that makes the site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination, such as a cap or vapor barrier.

Site management will be conducted by the Applicant as required. NYSDEC will provide appropriate oversight. Site management involves the institutional and engineering controls

required for the brownfield site. Examples include: operation of a water treatment plant, maintenance of a cap or cover, and monitoring of groundwater quality.

5. Citizen Participation Activities

CP activities that have already occurred and are planned during the investigation and remediation of the site under the BCP are identified in Appendix D: Identification of Citizen Participation Activities. These activities also are identified in the flowchart of the BCP process in Appendix E. NYSDEC will ensure that these CP activities are conducted, with appropriate assistance from the Applicant.

All CP activities are conducted to provide the public with significant information about site findings and planned remedial activities, and some activities announce comment periods and request public input about important draft documents such as the Proposed Remedial Work Plan.

All written materials developed for the public will be reviewed and approved by NYSDEC for clarity and accuracy before they are distributed. Notices and fact sheets can be combined at the discretion, and with the approval of, NYSDEC.

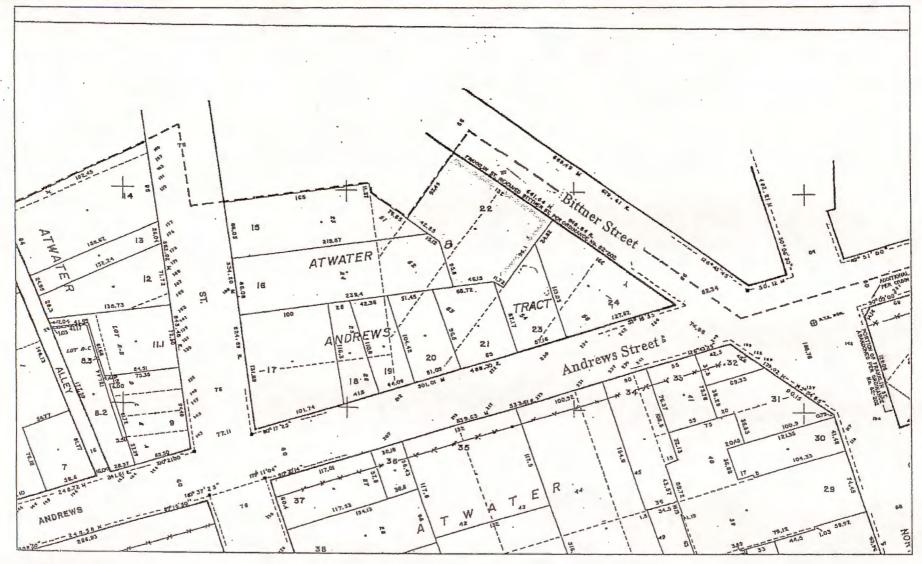
6. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern, if any, that relate to the site. Additional major issues of public concern may be identified during the site's remedial process.

No major issues of public concern are identified for the 37 Bittner Street site.

Appendix A – Site Location Map

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Prepared by:
PASSERO ASSOCIATES
100 LIBERTY POLE WAY
ROCHESTER, NY 14604

Figure 1 Site Location Map/Tax Map

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THE STATE STATE STATE STATE

37 Bittner Street Rochester, New York 14604

Site# C828127



FIGURE 1A

Appendix B - Project Contacts and Document Repositories

Project Contacts

For information about the site's remedial program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Charlotte B. Theobald Project Manager NYSDEC Region 8 Division of Environmental Remediation 6274 East Avon-Lima Road Avon, New York 14414 585-226-5354 Lisa LoMaestro Silvestri Citizen Participation Specialist NYSDEC Region 8 6274 East Avon-Lima Road Avon, New York 14414 585-226-5326

New York State Department of Health (NYSDOH):

Debby McNaughton Public Health Specialist New York State Department of Health 335 East Main Street Rochester, New York 14604 Telephone: 585-423-8069

Document Repositories

The document repositories identified below have been established to provide the public with convenient access to important project documents:

City of Rochester Rundel Library 115 South Avenue Rochester, NY 14604 Phone: 585-428-7300

Hours:

Mon., Thur.: 9 AM - 9 PM Tues., Wed., Fri.: 9 AM - 6 PM

Sat.: 9 AM - 5 PM

NYSDEC Region 8 6274 East Avon-Lima Road Avon, New York 14414 Attn: Charlotte B. Theobald Phone: 585-226-5354 Hours: 8:30 AM - 4:45 PM (call for appointment)

Appendix C - Brownfield Site Contact List

Media

News Director WROC-TV 201 Humboldt Street Rochester, New York 14610

Assignment Desk R News Channel 9 71 Mt. Hope Avenue Rochester, New York 14620

Assignment Editor WHEC-TV 10 191 East Avenue Rochester, New York 14604

Assignment Editor 13WHAM TV 4225 West Henrietta Road Rochester, New York 14623

News Director WXXI-TV 21 280 State Street P.O. Box 30021 Rochester, New York 14603-3021

News Director WUHF Fox 31 360 East Avenue Rochester, New York 14604

News Director WHAM-AM 207 Midtown Plaza Rochester, New York 14604 News Director WXXI-AM 280 State Street P.O. Box 30021 Rochester, New York 14603-3021

Metro Desk Democrat & Chronicle 55 Exchange Boulevard Rochester, New York 14614

Misty Edgecomb Democrat & Chronicle 55 Exchange Boulevard Rochester, New York 14614-2001

News Editor City Newspaper 250 North Goodman Street Suite 1 Rochester, New York 14607

Elected Officials

The Honorable Louise M. Slaughter US House of Representatives 3110 Federal Building 100 State Street Rochester, New York 14614

The Honorable Hillary Rodham Clinton United States Senate Kenneth B. Keating Federal Office Building 100 State Street Room 3280 Rochester, New York 14614

The Honorable Charles Schumer United States Senate Kenneth B. Keating Federal Office Building 100 State Street Room 3040 Rochester, New York 14614 David Gantt New York State Assembly 74 University Avenue Rochester, New York 14605

The Honorable Joseph E. Robach New York State Senate 2300 West Ridge Road Rochester, New York 14626

Robert J. Stevenson, Northwest District City Council Office City Hall, Room 301-A 30 Church Street Rochester, New York 14614

Lois J. Giess, East District Council President City Council Office City Hall, Room 301-A 30 Church Street Rochester, New York 14614

Benjamin L. Douglas, Northeast District City Council Office City Hall, Room 301-A 30 Church Street Rochester, New York 14614

Adam McFadden, South District City Council Office City Hall, Room 301-A 30 Church Street Rochester, New York 14614

Mark Gregor Division of Environmental Quality City of Rochester City Hall, Room 300-B Rochester, New York 14614 Monroe County Sheriff
Public Safety Building
Civic Center Plaza
130 Plymouth Avenue
Rochester, New York 14614

Rochester Fire Chief Rochester Fire & Rescue Department 185 Exchange Boulevard Suite 665 Rochester, New York 14614

Office of the Chief City Public Safety Building 185 Exchange Boulevard Rochester, New York 14614

Cheryl Dinolfo Monroe County Clerk Office of the Monroe County Clerk 39 West Main Street Room 101 Rochester, New York 14614

Wayne Zyra
President of the Legislature
Monroe County
407 County Office Building
39 West Main Street
Rochester, New York 14614-1476

Mayor Robert Duffy City Hall 30 Church Street Rochester, New York 14614

Maggie Brooks Monroe County Executive County Office Building, Room 110 39 West Main Street Rochester, New York 14614

Agency Officials

Margaret O'Neill, Executive Director Cornell Cooperative Extension Monroe County 249 Highland Avenue Rochester, New York 14620

Muffy Meisenzahl, Administrator Monroe County Office of Emergency Preparedness 1190 Scottsville Road Rochester, New York 14624

Louise Hartshorn Monroe County Environmental Management Council 111 Westfall Road P.O. Box 92832 Rochester, New York 146928932

Joe Albert
Monroe County Health Department
P.O. Box 92832
111 Westfall Road
Rochester, New York 14692

Richard Elliott Monroe County Health Department P.O. Box 92832 111 Westfall Road Rochester, New York 14692

Theresa Mazzullo, Chairman County of Monroe Industrial Development Agency City Place Suite 8100 50 West Main Street Rochester, New York 14614

Terrance G. Slaybaugh, Director Monroe County Department of Planning & Development 50 West Main Street Suite 8100 Rochester, New York 14614 Caroline Myers Soil & Water Conservation District Monroe County 1200A Scottsville Road, Suite 160 Rochester, New York 14624

Current Director Center for Environment Information., Inc. 55 St. Paul Street Rochester, New York 14604

Charlie Knauf Monroe County Water Quality Coordinating Committee 111 Westfall Road - Room 976 Rochester, New York 14620

Thomas T. Mooney President Greater Rochester Metro Chamber of Commerce 55 St. Paul Street Rochester, New York 14604-1391

Interested Parties

Michael Schade Citizens' Environmental Coalition Western New York Office 543 Franklin Street, Suite 2 Buffalo, New York 14202

League of Women Voters 45 Exchange Boulevard Suite 508 Rochester, New York 14614

Rochester Comm/Scientific Info., Inc. CPU 276 766 River Campus Station Rochester, New York 14627

William Larsen, P.E.
Rochester Institute of Technology
James Booth Building
78 Lomb Memorial Drive
Rochester, New York 14623

Molly Clifford Net Office City Hall 30 Church Street Rochester, New York 14614

Lisa LoMaestro Silvestri NYSDEC 6274 East Avon-Lima Road Avon, New York 14414

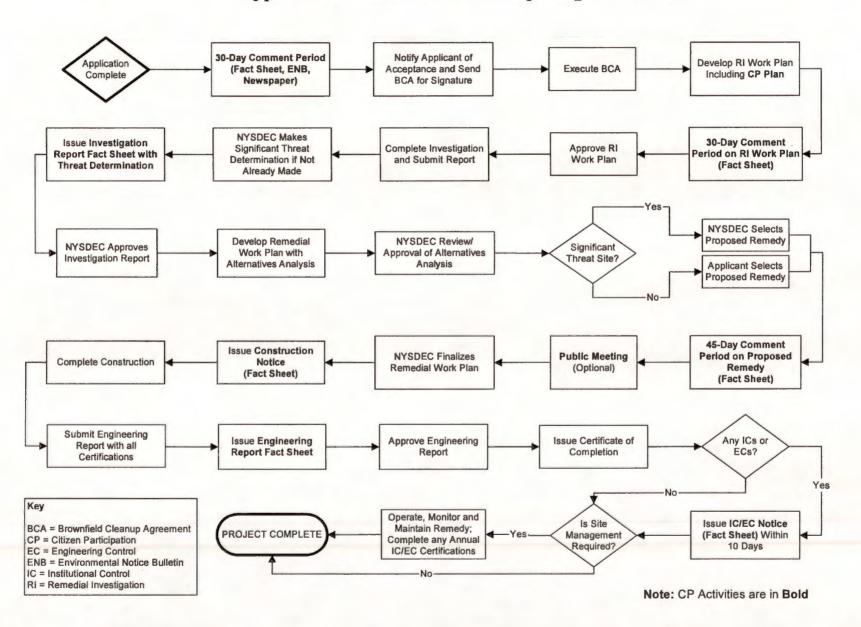
Linda Vera NYSDEC 6274 East Avon-lima Road Avon, New York 14414

Bart Putzig NYSDEC 6274 East Avon-Lima Road Avon, New York 14414

Appendix D – Identification of Citizen Participation Activities

Required Citizen Participation (CP) Activities	CP activity(ies) occur at this point	
Application Process:		
Prepare brownfield site contact list (BSCL).	At time of preparation of application to participate in BCP.	
Establish document repositories.		
 Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day comment period. Publish above ENB content in local newspaper. 	When NYSDEC determines that BCP application is complete. The 30-day comment period begins on date of publication of notice in ENB. End date of comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice and notice	
Mail above ENB content to BSCL.	to the BSCL should be provided to the public at the same time.	
After Execution of Brownfield Site Cleanup Agreem	ent:	
Prepare citizen participation (CP) plan.	Draft CP Plan must be submitted within 20 days of entering Brownfield Site Cleanup Agreement. CP Plan must be approved by NYSDEC before distribution	
After Remedial Investigation (RI) Work Plan Receiv	ed:	
 Mail fact sheet to BSCL about proposed RI activities and announcing 30-day public comment period on draft RI Work Plan. 	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, comment periods will be combined and public notice will include fact sheet. 30-day comment period begins/ends as per dates identified in fact sheet.	
After RI Completion:		
 Mail fact sheet to BSCL describing results of RI. 	Before NYSDEC approves RI Report.	
After Remedial Work Plan (RWP) Received:		
 Mail fact sheet to BSCL about proposed RWP and announcing 45-day comment period. 	Before NYSDEC approves RWP. 45-day comment period begins/ends as per dates identified in fact shee Public meeting would be held within the 45-day comment period.	
 Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager in consultation with other NYSDEC staff as appropriate). 		
After Approval of RWP:		
 Mail fact sheet to BSCL summarizing upcoming remedial construction. 	Before the start of remedial construction.	
After Remedial Action Completed:		
 Mail fact sheet to BSCL announcing that remedial construction has been completed. 	At the time NYSDEC approves Final Engineering Report. These two fact sheets should be combined	
 Mail fact sheet to BSCL announcing issuance of Certificate of Completion (COC). 	when possible if there is not a delay in issuance of COC.	

Appendix E - Brownfield Cleanup Program Process



APPENDIX 4
Community Air
Monitoring Plan

New York State Department of Health Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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APPENDIX 5
Severn Trent QA/QC
Package



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LABORATORY QUALITY MANUAL

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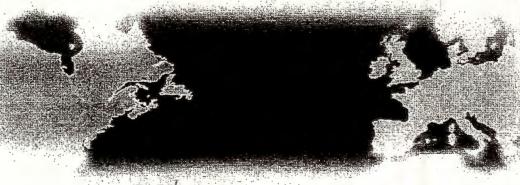
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STL will be the recognized industry leader for environmental analysis.



Mission

Through the innovation and dedication of our people, together with the quality of our systems, we will deliver levels of performance that delight our clients, retain the confidence of our stakeholders and enable the profitable growth of our business.

Severn Trent Laboratories

1.0 Introduction, Purpose, and Scope

1.1 STL Overview

STL Buffalo (STL) is a part of Severn Trent Laboratories, a major group of U.S. based companies. STL is a full-service environmental laboratory that provides quality comprehensive and integrated professional analytical services effectively and efficiently. A broad range of environmental testing services are offered that span a variety of matrices including aqueous, saline, solid, tissue and drinking water.

Associated with this activity are services to assure client requirements are known, communicated and satisfactorily addressed, and a deliverables package presenting the analytical results. The laboratory provides expert personnel for supervision, technical consultation, and project review for effective planning and implementation of analytical assignments.

STL operates under the regulations and guidelines of the following federal programs:

- Clean Water Act (CWA)
- National Pollution, Discharge, and Elimination System (NPDES)
- Occupational Safety and Health Administration (OSHA)
- Resource Conservation and Recovery Act (RCRA)
- Safe Drinking Water Act (SDWA)
- ♦ Toxic Substances Control Act (TSCA)

STL also provides services under various state and local municipal guidelines. A current table of analytical services and general service listing is presented on STL's website under the MySTL webpage or available from the laboratory. A current listing of STL Buffalo certifications (STLBuffCertList) is maintained by the laboratory on the company network directory. Copies of the actual certificates are available on the STL Buffalo intra-net site (BufNet).

1.2 Quality Assurance Policy

It is STL's policy to:

- Provide high quality, consistent, and objective environmental testing services that meet all federal, state, and municipal regulatory requirements.
- ◆ Generate data that are scientifically sound, legally defensible, meet project objectives, and are appropriate for their intended use.
- Promote employee adherence to quality documentation and implementation of Corporate Policies and Procedures
- Provide STL clients with the highest level of professionalism and the best service practices in the industry.
- Build continuous improvement mechanisms into all laboratory, administrative, and managerial activities.
- Maintain a working environment that fosters open communication with both clients and staff and ensures data integrity.

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1.3 Management Commitment to Quality Assurance

STL management is committed to providing the highest quality data and the best service in the environmental testing industry. To ensure that the data produced and reported by STL meet the requirements of its clients and comply with the letter and spirit of municipal, state and federal regulations, STL maintains a quality system that is clear, effective, well communicated, and supported at all levels in the company.

Line organizations verify that specifications are achieved; QA organizations assist and provide oversight and verification of processes through planning, reviews, audits, and surveillances. The quality objectives are derived from this Laboratory Quality Manual (LQM), Standard Operating Procedures (SOPs) and Work Instructions.

1.4 Purpose

The purpose of the LQM is to describe STL's Quality System and to outline how that system enables all employees to meet the Quality Assurance (QA) policy. This LQM also describes specific QA activities and requirements and prescribes their frequencies. Roles and responsibilities of management and laboratory staff in support of the Quality System are also defined in this LQM.

1.5 Scope

This LQM is specific to STL Buffalo's quality systems and laboratory operations. All other STL locations have LQMs under the Corporate Quality Management Plan (QMP) or the Corporate QMP itself.

The laboratory is committed to ensuring that resources are available and deployed to meet client expectations. This includes gathering project information prior to sample receipt to ensure client expectations will be met with respect to:

- Sampling containers;
- Analytical methods employed;
- Accuracy and precision;
- Reporting limits;
- Personnel qualifications, training, and experience;
- Calibration and quality control measures employed;
- Regulatory requirements;
- Report contents;
- Supporting documentation, records and evidence; and
- Review of data

1.6 Servicing

Project Managers are the direct client contact and they ensure resources are available to meet project requirements. Although Project Managers do not have direct reports or staff in production, they coordinate opportunities and work with laboratory management and supervisory staff to ensure available resources are sufficient to perform work for the client's project. Project Managers provide a link between the client and laboratory resources.

The laboratory has established procedures for performing and verifying that client servicing meets requirements. Typical services provided are:

- Sample Containers/Supplies Container Management: Process Operation/Bottle Order Set-Up (APM-BottleOrder-03)
- Project QAP preparation Project Planning Process: Project Information Requirements (APM-ProjInfo-20)
- ◆ Regulatory advisory functions Project Planning Process: Project Information Requirements (APM-ProjInfo-20)
- ◆ Consulting Project Planning Process: Project Information Requirements (APM-ProjInfo-20)

Regulatory and advisory functions are addressed under the same procedures used for project planning.

2.0 References

The following references were used in preparation of this document and as the basis of the STL Quality System:

EPA Guidance for Preparing Standard Operating Procedures (SOPs), EPA QA/G-6, US EPA, Office of Environmental Information, EPA/240/B-01/004, March 2001.

EPA Requirements for Quality Management Plans, EPA QA/R-2, US EPA, Office of Environmental Information, EPA/240,B-01/002 March 2001.

EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, US EPA, Office of Environmental Information, EPA/240/B-01/003, March 2001.

EPA Quality Manual for Environmental Programs, 5360 A1, US EPA Office of Environmental Information – Quality Staff, May 2000.

General Requirements for the Competence of Testing and Calibration Laboratories, ISO/IEC 17025, December 1999.

Good Automated Laboratory Practices, Principles and Guidance to Regulations for Ensuring Data Integrity in Automated Laboratory Operations with Implementation Guidance, EPA 2185, US EPA Office of Information Resources Management, August 1995.

National Environmental Laboratory Accreditation Conference, Constitution, Bylaws, and Standards, EPA 600/R-04/003, US EPA Office of Research and Development, June 2003.

Quality Systems Manual for Environmental Laboratories, Department of Defense, Version 3.0, March 2005

Shell for Analytical Chemistry Requirements, US Army Corps of Engineers, December 1998.

Quality Systems for Analytical Services, U.S. Department of Energy, Rev. 1, April 2004.

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This LQM was written to comply with the National Environmental Laboratory Accreditation Conference (NELAC) standards. Refer to Table 1 for a cross-section comparison of this LQM to the NELAC standards.

Table 1.

Correlation of QAPP Sections with NELAC 5.4.2.3 Quality Manual Requirements

NELAC Chapter 5.4.2.3 Quality Manual	Laboratory Quality Manual Section
a. Quality policy statement, including objectives and commitments	1.2 Quality Assurance Policy 4.2.1 Objectives of the Quality System
b. Organization and management structure	4.1 Organization and Management
c. Relationship between management, technical	4.1.2 Roles and Requirements
operations, support services and the quality systems	4.2 Quality System
d. Records retention procedures; document control	4.3 Document Control
procedures	4.12.2 Record Retention
e. Job descriptions of key staff and references to job descriptions of other staff	4.1.2 Roles and Requirements
f. Identification of laboratory approved signatories	4.1 Organization and Management
g. Procedures for achieving traceability of measurements	5.5 Measurement Traceability
h. List of all test methods under which the laboratory performs its accredited testing	5.3.1 Method Selection
 Mechanisms for assuring the laboratory reviews all new work to ensure that it has the appropriate facilities and resources before commencing such work 	4.4.2 Project-Specific Quality Planning
j. Reference to the calibration and/or verification test procedures used	5.4.3 Equipment Verification and Calibration 5.3.6.2 Data Review
k. Procedures for handling submitted samples	4.7.1 Sample Acceptance Policy 5.7 Sample Handling, Transport and Storage
I. Reference to the major equipment and reference	1.6 Servicing
measurement standards used as well as the	4.1.1 Laboratory Facilities
facilities and services used in conducting tests	5.4.2 Equipment Maintenance
	5.4.3 Equipment Verification and Calibration
m. Reference to procedures for calibration,	5.4.2 Equipment Maintenance
verification and maintenance of equipment n. Reference to verification practices including	5.4.3 Equipment Verification and Calibration
inter-laboratory comparisons, proficiency testing	5.8.1 Proficiency Testing
programs, use of reference materials and internal QC schemes	5.8.2 Control Samples
o. Procedures for feedback and corrective action	4.9 Control of Non-Conformances
whenever testing discrepancies are detected, or	4.10 Corrective Action
departures from documented policies and	4.11 Preventive Action
procedures occur	5.8.6 Permitting Departures from Documented Procedures
p. Laboratory management arrangements for	4.4.2 Project-Specific Quality Planning
exceptionally permitting departures from	5.8.6 Permitting Departures from Documented
documented policies and procedures or from standard specifications	Procedures
q. Procedures for dealing with complaints	4.8 Complaints

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Table 1.

Correlation of QAPP Sections with NELAC 5.4.2.3 Quality Manual Requirements

NELAC Chapter 5.4.2.3 Quality Manual	Laboratory Quality Manual Section
r. Procedures for protecting confidentiality and proprietary rights (including national security concerns)	4.7.2 Client Confidentiality and Proprietary Rights
s. Procedures for audits and data review	4.13 Internal Audits 4.14 External Audits 5.3.6 Data Reduction and Review
t. Process/procedures for establishing that personnel are adequately experienced in duties they are expected to carry out and are receiving any needed training	5.1.2 Training
u. Ethics policy statement developed by the laboratory and training personnel in their ethical & legal responsibilities	5.1.3 Ethics Policy
v. Reference to procedures for reporting analytical results	5.3.6 Data Reduction and Review 5.9 Project Reports
w. Table of contents, listing reference, glossaries and appendices	TOC Table of Contents Appendix List of Cited SOPs and Work Instructions

3.0 Terms and Definitions

Accuracy: The degree of agreement between a measurement and true or expected value, or between the average of a number of measurements and the true or expected value.

<u>Audit:</u> A systematic evaluation to determine the conformance to specifications of an operational function or activity.

<u>Batch</u>: Environmental samples, which are prepared and/or analyzed together with the same process, using the same lot(s) of reagents. A preparation batch is composed of 1 to 20 environmental samples of a similar matrix, meeting the above mentioned criteria. Where no preparation method exists (e.g., volatile organics, water), the batch is defined as environmental samples that are analyzed together with the same process and personnel, using the same lots of reagents, not to exceed 20 environmental samples. An analytical batch is composed of prepared environmental samples, extracts, digestates or concentrates that are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples.

<u>Chain of Custody (COC):</u> A system of documentation demonstrating the physical possession and traceability of samples.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA/Superfund): Legislation (42 U.S.C. 9601-9675 et seq., as amended by the Superfund Amendments and reauthorization Act of 1986 (SARA), 42 U.S.C. 9601et seq.

<u>Compromised Sample:</u> A sample received in a condition that jeopardizes the integrity of the results. See Section 4.7.1 of this LQM for a description of these conditions.

<u>Confidential Business Information (CBI):</u> Information that an organization designates as having the potential of providing a competitor with inappropriate insight into its management, operation or products.

<u>Confirmation:</u> Verification of the presence of a component using an additional analytical technique. These may include second column confirmation, alternate wavelength, derivatization, mass spectral interpretation, alternative detectors, or additional cleanup procedures.

<u>Corrective Action:</u> Action taken to eliminate the causes of an existing non-conformance, defect or other undesirable situation in order to prevent recurrence.

<u>Data Audit:</u> A qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality.

<u>Demonstration of Capability (DOC):</u> Procedure to establish the ability to generate acceptable accuracy and precision.

<u>Document Control:</u> The act of ensuring that documents (electronic or hardcopy and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed

ERA Sample: A control sample obtained from an independent source, used to monitor a specific element in the sampling and/or testing process.

Equipment Blank (EB): A portion of the final rinse water used after decontamination of field equipment; also referred to as Rinsate Blank and Equipment Rinsate.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA): Legislation under 7 U.S.C. 135 et seq., as amended.

Federal Water Pollution Control Act (Clean Water Act, CWA): Legislation under 33 U.S.C. 1251 et seq., Public Law 92-50086 Stat. 816.

Field Blank (FB): A blank matrix brought to the field and exposed to field environmental conditions.

Field Duplicate (FD): Duplicate field-collected sample most commonly used to assess the accuracy of the field collection process.

<u>Field of Testing (FOT):</u> A field of proficiency testing is based on NELAC's categorization of accreditation based on program, matrix and analyte.

Good Laboratory Practices (GLP): Formal regulations for performing basic laboratory operations outlined in 40 CFR Part 160 and 40 CFR Part 729 and required for activities performed under FIFRA and TSCA.

Holding Time: The maximum time that a sample may be held before preparation and/or analysis as promulgated by regulation or as specified in a test method.

<u>Instrument Blank:</u> A blank matrix that is the same as the processed sample matrix (e.g. extract, digestate, condensate) and introduced onto the instrument for analysis.

Internal Chain of Custody (COC): An unbroken trail of accountability that ensures the physical security of samples, data and records. Internal COC refers to additional documentation procedures implemented within the laboratory that includes special sample storage requirements, and documentation of all signatures and/or initials, dates, and times of personnel handling specific samples or sample aliquots.

Instrument Detection Limit (IDL): The minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific instrument. The IDL is associated with the instrumental portion of a specific method only, and sample preparation steps are not considered in its derivation. The IDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is ±100%. The IDL represents a <u>range</u> where <u>qualitative</u> detection occurs on a specific instrument. Quantitative results are not produced in this range.

<u>Laboratory Control Sample (LCS):</u> A blank matrix spiked with a known amount of analyte(s), processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure; also referred to as Matrix Spike Blank (MSB); Environmental Resource Associate Sample (ERA).

<u>Laboratory Quality Manual (LQM):</u> A document stating the quality policy, quality system and quality practices of the laboratory. The LQM may include by reference other documentation relating to the laboratory's quality system.

<u>Limit of Detection (LOD):</u> The minimum amount of a substance that an analytical process can reliably detect. Also referred to as the Method Detection Limit (MDL)

Matrix: The substrate of a test sample. Common matrix descriptions are defined in Table 2.

Table 2. Matrix Descriptions

Matrix	Description
Aqueous	Aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine source. Includes surface water, groundwater, effluents, leachates and wastewaters.
Drinking Water	Aqueous sample that has been designated a potable water source.
Saline	Aqueous sample from an ocean or estuary, or other salt-water source such as the Great Salt Lake.
Liquid	Liquid with <15% settleable solids.
Solid	Soil, sediment, sludge, ash, paint chips, filters, wipes or other matrices with >15% settleable solids.
Waste	A product or by-product of an industrial process that results in a matrix not previously defined (i.e., drum liquid or oils).
Tissue	Sample of a biological origin such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origin.

Matrix Duplicate (MD): Duplicate aliquot of a sample processed and analyzed independently; under the same laboratory conditions; also referred to as Sample Duplicate; Laboratory Duplicate.

Matrix Spike (MS): Field sample to which a known amount of target analyte(s) is added.

Matrix Spike Blank (MSB): A blank matrix spiked with a known amount of analyte(s), processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure; also referred to as Laboratory Control Sample (LCS).

Matrix Spike Duplicate (MSD): A replicate matrix spike.

Method Blank (MB): A blank matrix processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

Method Detection Limit (MDL): The minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific measurement system. The MDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is ±100%. The MDL represents a range where qualitative detection occurs using a specific method. Quantitative results are not produced in this range.

Non-conformance: An indication, judgment, or state of not having met the requirements of the relevant specifications, contract, or regulation.

<u>Precision:</u> An estimate of variability. It is an estimate of agreement among individual measurements of the same physical or chemical property, under prescribed similar conditions.

<u>Preservation:</u> Refrigeration and/or reagents added at the time of sample collection to maintain the chemical, physical and/or biological integrity of the sample.

<u>Proficiency Testing:</u> Determination of the laboratory calibration or testing performance by means of inter-laboratory comparisons.

<u>Proficiency Test (PT) Sample:</u> A sample, the composition of which is unknown to the analyst, that is provided to test whether the analyst/laboratory can produce analytical results within specified performance limits. Also referred to as Performance Evaluation (PE) Sample.

Proprietary: Belonging to a private person or company.

Quality Assurance (QA): An integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

Quality Assurance (Project) Plan (QAPP): A formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.

Quality Control (QC): The overall system of technical activities, the purpose of which is to measure and control the quality of a product or service.

Quality Control (QC) Sample: A control sample, generated at the laboratory or in the field, or obtained from an independent source, used to monitor a specific element in the sampling and/or testing process.

Quality Management Plan (QMP): A formal document describing the management policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an agency, organization or laboratory to ensure the quality of its product and the utility of the product to its users.

Quality System: A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA/QC.

Quantitation Limit (QL): The minimum amount of a substance that can be quantitatively measured with a specified degree of confidence and within the accuracy and precision guidelines of a specific measurement system. The QL can be based on the MDL, and is generally calculated as 3-5 times the MDL, however, there are analytical techniques and methods where this relationship is not applicable. Also referred to as Practical Quantitation Level (PQL), Estimated Quantitation Level (EQL), Limit of Quantitation (LOQ).

Raw Data: Any original information from a measurement activity or study recorded in laboratory notebooks, worksheets, records, memoranda, notes, or exact copies thereof and that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic/optical media, including dictated observations, and recorded data from automated instruments. Reports specifying inclusion of "raw data" do not need all of the above included, but sufficient information to create the reported data.

Record Retention: The systematic collection, indexing and storing of documented information under secure conditions.

Reference Standard: A standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.

Reporting Limit (RL): The level to which data is reported for a specific test method and/or sample. The RL is generally related to the QL. The RL must be minimally at or above the MDL.

Resource Conservation and Recovery Act (RCRA): Legislation under 42 U.S.C. 321 et seq. (1976).

Safe Drinking Water Act (SDWA): Legislation under 42 U.S.C. 300f et seq. (1974), Public Law 93-523.

Sampling and Analysis Plan (SAP): A formal document describing the detailed sampling and analysis procedures for a specific project.

<u>Selectivity:</u> The capability of a measurement system to respond to a target substance or constituent.

<u>Sensitivity:</u> The difference in the amount or concentration of a substance that corresponds to the smallest difference in a response in a measurement system using a certain probability level.

Spike: A known amount of an analyte added to a blank, sample or sub-sample.

<u>Standard Operating Procedure (SOP):</u> A written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.

Storage Blank: A blank matrix stored for 1 to 2 weeks with field samples of a similar matrix (volatiles only) that measures storage contribution to any source of contamination.

Systems Audit: A thorough, systematic, on-site, qualitative review of the facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system.

Test Method: Defined technical procedure for performing a test.

Toxic Substances Control Act (TSCA): Legislation under 15 U.S.C. 2601 et seq., (1976).

<u>Traceability:</u> The property of a result of a measurement that can be related to appropriate international or national standards through an unbroken chain of comparisons.

<u>Trip Blank (TB):</u> A blank matrix placed in a sealed container at the laboratory that is shipped, held unopened in the field, and returned to the laboratory in the shipping container with the field samples.

<u>Verification:</u> Confirmation by examination and provision of evidence against specified requirements.

4.0 Management Requirements

The organizational chart of STL is presented in Figure 1. Corporate employees are located at various STL facilities as outlined in the organizational structure. The organizational chart of STL Buffalo is presented in Figure 2.

4.1 Organization and Management

The Laboratory Director and Quality Assurance Manager are responsible and have the signature authority for approving and implementing this plan. The Laboratory Director and/or his designee also have signatory authority for approval of work and release of reports. The following listing defines those employees that may act as report signatory designees for the Laboratory Director.

Technical Director
Operations Manager
Quality Manager
Customer Service Manager
Project Manager
Project Manager Assistant

SOP No.: BUFF-LQM

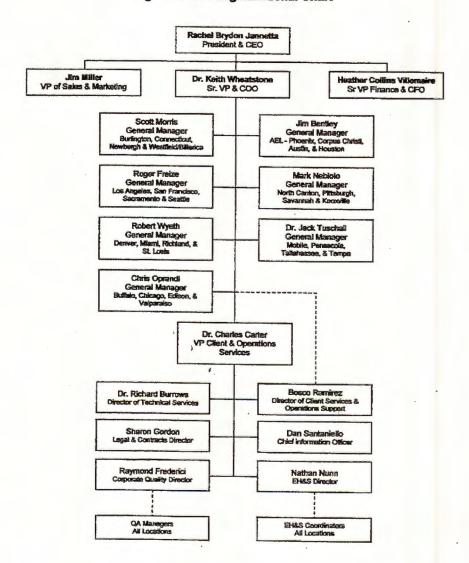
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Figure 1. STL Organization Chart

Figure 1. STL Organizational Chart

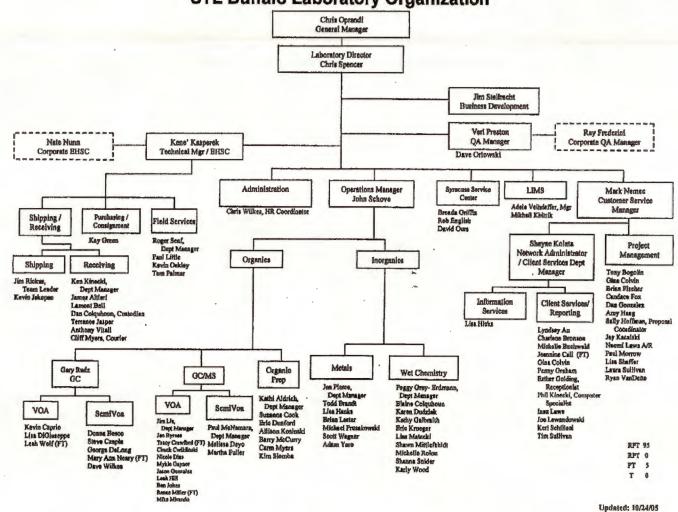


STL Buffalo Organizational Chart, November 2005

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Figure 2

STL Buffalo Laboratory Organization



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4.1.1 Laboratory Facilities

The laboratory is located in Amherst, New York, which is approximately 10 miles from Buffalo, New York, and is staffed by 100 professionals. The laboratory is comprised of 28,000 square feet of state-of-the-art commercial laboratory and office space and houses both inorganic and organic operations. The facility is divided into separate work areas to facilitate sample throughput. These areas include the following:

- Sample receipt and refrigerated storage
- Bottle kit preparation
- Organic and TCLP sample preparation
- Metals digestion
- Wet chemistry laboratory
- Organic instrumentation laboratories
- Metals instrumentation laboratory

The main instrumentation laboratories are equipped with state-of-the-art instrumentation and sufficient duplicate equipment to provide back-up service for most major systems. A listing of laboratory equipment and instrumentation is referenced as STL Buffalo Capital Equipment List, (STLBuffEquipList). Table 3 is a summary of the major laboratory instruments.

Table 3. Major Equipment List

GC	GC/MS	ICP	ICP/MS	CVAA	HPLC	Auto Analyzer	IC	TOC	тох
20	12	2	1	2	1	4	3	2	1

Each of the laboratory areas has separate heating, ventilation, and air conditioning systems. Non-destructive gas chromatographic detectors, and GC/MS rotary pumps are vented out of the instrumentation through charcoal filters.

4.1.2 Roles and Responsibilities

The specific duties and responsibilities of the Laboratory Director, Technical Director/Environmental Health & Safety Officer, Quality Assurance Manager, Operations Manager, Customer Service Manager/Project Managers, Laboratory Supervisors, Sample Management Coordination, Information Technology Manager, and Chemists/Technicians and Data Packaging Specialists are as follows.

In the absence of any one individual, the staff or assistant within each department is professionally skilled in the ability to administer the function of the administrator or support personnel. This will allow for the continuance of the day-to-day operations of the laboratory.

4.1.2.1 Laboratory Director

The ultimate responsibility for the generation of reliable laboratory data rests with the Laboratory Director, who is accountable to his General Manager and oversees the daily operations of the laboratory. The Laboratory Director's responsibilities include allocation of personnel and resources, setting goals and objectives for both the business and employees, achieving the financial, business and quality objectives of STL. Furthermore, to see that all tasks performed in the laboratory are

conducted according to the requirements of this LQM, the Project Specifications and/or the appropriate QAPP; and to assure that the quality of service provided complies with the project's requirements.

The Laboratory Director has the authority to affect those policies and procedures to ensure that only data of the highest level of excellence are produced. As such, the Laboratory Director is responsible for maintaining a working environment which encourages open, constructive problem solving and continuous improvement.

4.1.2.2 Quality Assurance Manager

The Quality Assurance Manager (QAM) has the full-time responsibility to evaluate the adherence to policies and to assure that systems are in place to produce the level of quality defined in this LQM. The QAM is responsible for:

- ♦ Ensures that the laboratory's quality system and LQM meet the requirements of the Corporate QMP.
- ♦ Ensures IDL/MDL studies are completed and documented
- Ensures method validation studies are completed and documented
- Periodically performs data package inspections
- Performs data authenticity audits on 100% of analysts and instruments
- ♦ Assist in the preparation, compilation, and submittal of quality assurance project plans
- Reviews program plans for consistency with organizational and contractual requirements and advises appropriate personnel of deficiencies
- Maintains QA records
- Maintains certifications and accreditations
- Initiates and oversees both internal and external audits; documents root cause investigations for all noted deficiencies; and ensures timely audit closure
- Maintains a corrective action process for internally identified issues and ensures timely closure
- Manages the laboratory's PT Program and performs/documents root cause investigations for all failures
- Monitors to ensure the documentation of training and method demonstration is current
- Facilitates SOP development and document control
- Submits monthly QA reports to management

The QAM shall have the final authority to accept or reject data, and to stop work in progress in the event that procedures or practices compromise the validity and integrity of analytical data. The QAM is available to any employee at the facility to resolve data quality or ethical issues. The QAM shall be independent of laboratory operations and has an indirect reporting relationship to the STL Corporate QA Director.

4.1.2.3 Technical Director

The Technical Director is responsible for assessing the construction and management of the facility design, maintaining environmental conditions, technical and financial evaluation of capital equipment and capital budgeting and asset valuation.

In addition, the Technical Director solves day to day technical issues, provides technical training and guidance to staff, project managers and clients, investigates technical issues identified by operations personnel or QA, and directs evaluation of new methods.

4.1.2.4 Operations Manager

The Operations Manager reports to the Laboratory Director and oversees the daily operations of the analytical laboratory, maintaining a working environment that encourages open, constructive problem solving and continuous improvement.

The Operations Manager is responsible for supervision of laboratory staff, setting goals and objectives for the laboratory, ensuring compliance with project/client requirements and ensuring on-time performance, supervises maintenance of equipment and scheduling of repairs. Responsibilities also include implementation of the quality system in the laboratory and ensuring timely compliance with audit and QA corrective actions.

In addition, the Operations Manager works with the Technical Director in evaluating technical equipment and assessing capital budget needs.

4.1.2.5 Customer Service Manager/Project Managers

The laboratory recognizes the importance of efficient project management. The laboratory Project Managers (PM) are responsible for preparing the LIMs project technical specifications which summarize QA/QC requirements for the project, maintaining the laboratory schedule, communicating technical requirements to the laboratory, and advising the Operations Manager, QA and Laboratory Supervisors of all variances. The laboratory Project Manager will provide technical guidance and the necessary laboratory-related information to the preparer of project-specific QAPPs and provide peer review of the final document to ensure accuracy of the laboratory information.

4.1.2.6 Laboratory Supervisors

The Laboratory Supervisors are as follows:

- Sample Management Supervisor
- Organic Preparation Supervisor
- GC Analysis Supervisor
- GCMS Volatiles Supervisor
- GCMS Semivolatiles Supervisor
- Metals Supervisor
- Wet Chemistry Supervisor

The Laboratory Supervisors serve as the technical experts on assigned projects, provide technical liaison, assist in resolving any technical issues within the area of their expertise; and implement established policies and procedures to assist the Operations Manager in achieving section goals. The Laboratory Supervisors are responsible for ensuring that their personnel are adequately trained to perform analyses; that equipment and instrumentation under their control is calibrated and functioning properly; that system and performance audits are performed on an as-needed basis; provide input and review in the development and implementation of project-specific QA/QC requirements; and for providing the critical review of proposal and project work for programs as

directed by the Operations Manager and Laboratory Director. The Laboratory Supervisors coordinate these activities with the project management and quality assurance sections.

4.1.2.7 Sample Management Coordination

The Sample Custodian is designated as the Sample Management Coordinator for any work performed internally and responsible for the receipt and login of client samples. The sample custodian confirms the samples received against the Chain of Custody, transports the samples to the proper storage unit within the facility and tracks the disposal of client samples after the required holding time has expired.

4.1.2.8 Subcontract Sample Management Coordination

The Project Manager is designated as the Sample Management Coordinator for any work subcontracted under their management. The Project Manager verifies each subcontracting request to ensure that special client restrictions are not jeopardized (e.g., samples must be analyzed by the receiving affiliated or network laboratory and must maintain specific certification(s)). The Project Manager is also responsible for verifying the credentials; establishing the service agreement; ensuring data review; and invoicing of all laboratory subcontractors. The Project Manager discusses any deficiencies or anomalies with the subcontractor prior to reporting any data to the client.

4.1.2.9 Environmental Health and Safety Coordinator / Waste Management

The Health and Safety Coordinator is responsible for the safety and well-being of all employees while at the laboratory. This includes, but is not limited to, administering the Corporate Safety Manual that complies with federal regulations, MSDS training and review, conducting laboratory safety orientation and tours for all new employees, providing instructions on safety equipment, cleaning up laboratory spills, and instructing personnel of laboratory procedures for emergency situations. The Health and Safety Coordinator is on-call 24-hours a day, 7-days a week for all laboratory situations.

The Health and Safety Coordinator responsibilities additionally include waste management of laboratory generated hazardous waste in accordance with appropriate regulations. This includes maintenance of required documentation, such as waste manifests, segregation of waste in accordance with requirements, and training of personnel in proper segregation of waste and preparation of Safety related SOPs. The EHSC maintains overall EH&S program oversight, but may delegate specific day-to-day activities as necessary.

4.1.2.10 Information Technology Manager

The overall role of the Information Technology (IT) Manager is to enhance laboratory productivity through improved information access, flow, and security. For information to be of greatest value, it must be readily accessible and reliable. It is the responsibility of the IT Manager to provide software tools that allow quick and user friendly access to that information, while at the same time controlling access to that information to those that have the need and proper authority.

Information flow can be enhanced through automation. Automation is the minimization of human intervention in a process. Reduction in human intervention can result in significant error reductions and time savings. The IT Manager assists the laboratory in automation by providing hardware and software solutions to help minimize human intervention in data collection, processing, and storage.

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The IT Manager is responsible for providing data security by controlling access, as mentioned above, and for providing for disaster recovery. Data stored on the central Laboratory Information Management System (LIMS) is the direct responsibility of the IT Manager. No fewer than two copies of all data should exist at any time so that lost or destroyed data can always be retrieved from an alternate source. These copies may consist of data within the system and on electronic storage media. Data stored electronically in other departments is the direct responsibility of those departments. However, the IT Manager is responsible for providing procedures and training to all laboratory operations, as appropriate, to assist in making backup copies of local data.

STL has established procedures for IT management:

- ♦ Computer Systems Account and Naming Policy P-I-003
- Computer Systems Password Policy P-I-004
- ♦ Software Licensing Policy P-I-005
- ♦ Virus Protection Policy P-I-006

4.1.2.11 Chemists / Technicians

Any effective laboratory quality assurance/quality control program depends on the entire organization, including management and every individual on the laboratory staff. Analysts and technicians must read and be familiar with the LQM, method SOPs and other essential standard operating procedures. They must know where SOPs are located and agree to adhere to them explicitly unless an error in the SOP is evident and they brought this to the attention of their supervisor or QA manager. They must receive ethics and data integrity training and sign an ethics agreement annually.

Analysts and technicians must ensure that their training records are up to date prior to performing a method without direct supervision. This includes maintaining their training file, filing demonstration of capability evidence and receiving supervisor approval.

The initial review for acceptability of analytical results rests with the analysts conducting the various tests. Observations made during the performance of an analytical method may indicate that the analytical system is not in control. Analysts must use quality control indicators to assure that the method is within acceptance limits, corrective action is taken or a non-conformance (job exception) report is documented/approved before reporting results.

4.1.2.12 Data Packaging Specialist

The Data Packaging Specialist is responsible for coordinating receipt of all data from the various service groups within the laboratory, reviewing data for compliance to laboratory QC criteria and/or criteria in the LIMs Project Profile Specification, and ensuring that data are reported in a timely manner and in the proper format.

4.2 Quality System

The quality system and quality objectives are driven by this LQM, SOPs and Work Instructions. Within these documents, the Laboratory Director and Quality Manager ensure that the quality policy is understood, implemented, and maintained at all levels of the organization. The development and implementation of appropriate accountabilities, duties, and authority by organizational positions are clearly delineated. Line organizations achieve and verify that specifications are achieved; the QAM provides oversight and verification of processes through planning, reviews, audits, and surveillances.

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The Laboratory Director's leadership, support and direction ensure that the policies and procedures are implemented throughout the organization.

4.2.1 Objectives of the Quality System

The goal of the quality system is to ensure that business operations are conducted with the highest standards of professionalism and data integrity in the industry.

To achieve this goal, it is necessary to provide our clients with scientifically sound, well documented, regulatory compliant data, and to ensure that we provide the highest quality service available in the industry with uncompromising data integrity. A well-structured, organized and communicated quality system is essential in meeting this goal. The laboratory's quality system is designed to minimize systematic error, encourage constructive, documented problem solving, and provide a framework for continuous improvement.

This LQM, Work Instructions and the SOPs are the basis and outline for our quality and data integrity system and contain requirements and general guidelines under which the laboratory conducts operations. In addition, other documents may be used by the laboratory to clarify compliance with quality system or other client requirements. Within the LQM, SOP or Work Instruction numbers are noted in parenthetic text. These numbers refer to the laboratory procedure(s) associated with the subject item. A table listing these quality system policies and procedures is appended to this document.

The QA Manager is responsible for implementing and monitoring the Quality System. The QA Manager reports to the Laboratory Director on the performance of the quality system for review and continuous improvement. The QA Manager has sufficient authority, access to work areas, and organizational freedom (including sufficient independence from cost and schedule considerations) to:

- Initiate action to prevent the occurrence of any nonconformities related to product, process and quality system,
- · Identify and record any problems affecting the product, process and quality system,
- Initiate, recommend, or provide solutions to problems through designated channels,
- Verify implementation of solutions, and
- Assure that further work is stopped or controlled until proper resolution of a non-conformance, deficiency, or unsatisfactory condition has occurred and the deficiency or unsatisfactory condition has been corrected.

The QA Manager identifies opportunities for continual improvement. When a situation arises where acceptable resolution of identified issues cannot be agreed upon at the laboratory, direct access to STL's Corporate QA Director is available. This provides laboratory QA personnel independence, where needed, to ensure that QA policies and procedures are enforced.

The QA Manager conducts annual training for all laboratory and administrative personnel to ensure their familiarity with the quality documentation and the implementation of the policies and procedures in their work.

4.3 Document Control

The laboratory maintains procedures to control documents and analytical data. Since an extensive quantity of data is generated and this is our primary product, document control is inherently segregated from data control, as described further in Sections 4.3.1 and 4.3.2.

4.3.1 Document Control Procedure

Organization, security and control of documents are necessary to ensure that confidential information is not distributed and that all current copies of a given document are from the latest applicable revision. Unambiguous identification of a controlled document is maintained by information in the document header: Document Number, Revision Number, Effective Date, and Number of Pages. Document control may be achieved by either electronic or hardcopy distribution. Documents may be controlled for a specific time period after issuance. In this case the document will be marked with the date issue and expiration date.

Controlled documents are authorized and records of their distribution and archiving are maintained by the QA Department. Controlled status is defined as the continuous distribution of document updates where document marked as either "Controlled" or "Uncontrolled". Uncontrolled status is defined as the single distribution of the current SOP. Document updates are not distributed to people holding documents marked "uncontrolled". For tracking purposes, a control copy number is assigned to documents distributed with a controlled status. All copy numbers are written or typed in red to easily identify the SOP as a controlled copy.

4.3.1.1 Document Revision

Changes to documents occur when a procedural change warrants a revision of the document. After document revisions are authorized, all outdated versions are removed from use and disposed or segregated from the active/current document versions. A single copy of the archived document is retained for historical purposes. This archived version is clearly identified as an "Archived Copy".

SOPs are reviewed and/or updated on a 12 month basis, which is tracked by an established review schedule (SOP Master Index). These reviews are conducted by the analyst, QA Manager, Department Supervisor, Laboratory Director or the Health and Safety Coordinator, all of whom may provide the approval signature for each SOP.

4.3.2 Data Control

All raw data, such as bound logbooks, instrument printouts, magnetic tapes, electronic data, as well as final reports, are retained for a minimum period of 5 years, unless otherwise specified by client or regulatory requirements. Such data may be maintained longer, as defined by client and project requirements. Specifics on the procedure of archiving records and client or project specific requirements are contained in the SOP, Record Storage and Retention, (AGP-RecordStorage-56).

Raw data and reports are documented and stored in a manner which are easily retrievable. The procedure for maintaining raw data records is briefly described below:

- Instrument print-outs for conventional inorganic parameters are filed by parameter and month.
 Inorganic Metals are filed by Instrument and Filename. Generally, current year documents are kept on file in the laboratory sections.
- All raw data, for example, instrument print-outs and logbooks, are maintained in a secured storage area or records are scanned and retained on electronic media.

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The computer information is backed up on tape daily, and stored in a secured and temperature/humidity controlled environment to maintain the integrity of the electronic information in the event of system failure. Copies of all back-up tapes are maintained in secured off-site locations.

 All copies of client final reports are maintained in hard copy format or electronically (e.g., Adobe Acrobat).

4.4 Request, Tender, and Contract Review

4.4.1 Contract Review

For many environmental sampling and analysis programs, testing design is site or program specific and does not necessarily "fit" into a standard laboratory service or product. It is STL's intent to provide both standard and customized environmental laboratory services to our clients. To ensure project success, technical staff members perform a thorough review of technical and QC requirements contained in contracts. Contracts are reviewed for adequately defined requirements and STL's capability to meet those requirements.

All contracts entered into by the laboratory are reviewed for the client's requirements in terms of compound lists, test methodology requested, sensitivity, accuracy, and precision requirements. The reviewer ensures that the laboratory's test methods are suitable to achieve these regulatory and client requirements and that the laboratory holds the appropriate certifications and approvals to perform the work. The review also includes the laboratory's capabilities in terms of turnaround time, capacity, and resources to provide the services requested, as well as the ability to provide the documentation, whether hardcopy or electronic. If the laboratory cannot provide all services but intends to subcontract such services, whether to another STL facility or to an outside firm, this will be documented and discussed with the client prior to contract approval.

Any contract requirement or amendment to a contract communicated to STL verbally is documented and confirmed with the client in writing (e.g., letter, contract, e-mail, etc.). Any discrepancy between the client's requirements and STL's capability to meet those requirements is resolved in writing before acceptance of the contract. Contract amendments, initiated by the client and/or STL, are documented in writing for the benefit of both the client and STL. All contracts, QAPPs, Sampling and Analysis Plans (SAPs), contract amendments, and documented communications become part of the permanent project record.

4.4.2 Project-Specific Quality Planning

Communication of contract specific technical and QC criteria is an essential activity in ensuring the success of site specific testing programs. To achieve this goal, STL assigns a Project Manager (PM) to each client. The PM is the first point of contact for the client. It is the PM's responsibility to ensure that project specific technical and QC requirements are effectively evaluated and communicated to the laboratory personnel before and during the project (Project Information Requirements, APM-ProjInfo-20). QA department involvement may be needed to assist in the evaluation of custom QC requirements.

PM's are the direct client contact and they ensure resources are available to meet project requirements. Although PM's do not have direct reports or staff in production, they coordinate opportunities and work with laboratory management and supervisory staff to ensure available

resources are sufficient to perform work for the client's project. Project management is positioned between the client and laboratory resources.

Prior to work on a new project, the dissemination of project information and/or project opening meetings may occur to discuss schedules and unique aspects of the project. Items to be discussed may include the project technical profile, turnaround times, holding times, methods, analyte lists, reporting limits, deliverables, sample hazards, or other special requirements. The PM introduces new projects to the laboratory staff through project kick-off meetings (APM-ProjInfo-20) or to the supervisory staff during production meetings. These meetings provide direction to the laboratory staff in order to maximize production and client satisfaction, while maintaining quality. In addition, project notes may be associated with each sample batch (e.g., Job) as a reminder upon sample receipt and analytical processing.

Any changes that may occur within an active project is agreed upon between the client/regulatory agency and the Project Manager/laboratory. These changes (e.g., use of a non-standard method or modification of a method) must be documented prior to implementation. Documentation pertains to any document, e.g., letter, variance, contract addendum, which has been agreed to by both parties.

Such changes are also communicated to the laboratory through the management Production Meetings which are conducted two times per week. Such changes are updated to the project notes and are introduced to the managers at these meetings. The laboratory staff is then introduced to the modified requirements via the Project Manager or the individual laboratory section manager.

STL strongly encourages client visits to the laboratory and for formal/informal information sharing sessions with employees in order to effectively communicate ongoing client needs as well as project specific details for customized testing programs.

4.4.3 Data Quality Objectives

Data quality objectives (DQO) are qualitative and quantitative statements used to ensure the generation of the type, quantity, and quality of environmental data that will be appropriate for the intended application. Typically, DQOs are identified before project initiation and during the development of QAPPs and SAPs. The analytical DQOs addressed in this section are precision, accuracy, representativeness, completeness, and comparability.

The components of analytical variability (uncertainty) can be estimated when QC samples of the right types and at the appropriate frequency are incorporated into the measurement process of the laboratory. STL incorporates numerous QC samples to obtain data for comparison with the analytical DQOs and to ensure that the measurement system is functioning properly. The control samples and their applications, described in Section 5.8.2, are selected based on analytical method or client-specific requirements. Analytical QC samples for inorganic and organic analyses may include calibration blanks, instrument blanks, method blanks, laboratory control standards, calibration standards, matrix spikes, matrix duplicates and surrogate spikes.

The DQOs discussed below ensure that data are gathered and presented in accordance with procedures appropriate for its intended use, that the data is of known and documented quality, and are able to withstand scientific and legal scrutiny.

4.4.3.1 Precision

Precision is an estimate of variability. It is an estimate of agreement among individual measurements of the same physical or chemical property, under prescribed similar conditions. Precision is expressed either as Relative Standard Deviation (RSD) for greater than two measurements or as Relative Percent Difference (RPD) for two measurements. Precision is determined, in part, by analyzing data from LCSs, MS, MSD, and MD.

Precision also refers to the measurement of the variability associated with the entire process, from sampling to analysis. Total precision of the process can be determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations.

4.4.3.2 Accuracy

Accuracy is the degree of agreement between a measurement and the true or expected value, or between the average of a number of measurements and the true or expected value. It reflects the total error associated with a measurement.

Both random and systematic errors can affect accuracy. For chemical properties, accuracy is expressed either as a percent recovery (R) or as a percent bias (R - 100). Accuracy is determined, in part, by analyzing data from LCSs, MS and MSD.

Accuracy and Precision objectives employed by the laboratory are as defined in the CERCLA's Inorganic and Organic Statements of Work (SOW); statistically-derived control limits; or default limits as listed in each respective method SOP.

4.4.3.3 Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, a variation in a physical or chemical property at a sampling point, or an environmental condition. Data representativeness is primarily a function of sampling strategy; therefore, the sampling scheme must be designed to maximize representativeness. Representativeness also relates to ensuring that, through sample homogeneity, the sample analysis result is representative of the constituent concentration in the sample matrix. STL makes every effort to analyze an aliquot that is representative of the original sample, and to ensure the homogeneity of the sample before sub-sampling.

4.4.3.4 Completeness

Completeness is defined as the percentage of measurements that are judged valid or useable. Factors negatively affecting completeness include the following: sample leakage or breakage in transit or during handling, loss of sample during laboratory analysis through accident or improper handling, improper documentation such that traceability is compromised, or sample result is rejected due to failure to conform to QC specifications. A completeness objective of greater than 90% of the data specified by the statement of work is the goal established for most projects.

4.4.3.5 Comparability

Comparability is a measure of the confidence with which one data set can be compared to another. To ensure comparability, all laboratory analysts are required to use uniform procedures (e.g., SOPs) and a uniform set of units and calculations for analyzing and reporting environmental data.

A measure of inter-laboratory comparability is obtained through the laboratory's participation in proficiency testing (PT) programs established with Water Supply (WS), Water Poliution (WP),

Solid Waste (SW), and Underground Storage Tank (UST) programs. In addition, the laboratory employs the use of NIST or EPA traceable standards, when available, to provide an additional measure of assurance of the comparability of data.

Project representativeness and comparability are dependent upon the sampling plan on a project specific basis, and are therefore not covered in this LQM. Assessment of site and collection representativeness and comparability is performed by client or field engineer.

4.4.3.6 Additional DQOs

Method Detection Limits

The method detection limit (MDL) is the lowest concentration that can be detected for a given analytical method and sample matrix with 99% confidence that the analyte is present. The MDL is determined according to Appendix B of 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants". MDLs reflect a calculated (statistical) value determined under ideal laboratory conditions in a clean matrix, and may not be achievable in all environmental matrices. The laboratory maintains MDL studies for analyses performed; these are verified at least annually.

For the performance of non-routine methods, e.g., client/contract requirement, MDLs or Method Validation Studies will be completed on an as needed basis. The turnaround time for such studies will be as determined by the client and Project Manager. Such studies will be reviewed and approved by the client and/or regulatory agency prior to project implementation.

Instrument Detection Limits

There are a number of ways to determine Instrument Detection Limit (IDL) sensitivity (e.g., signal-to-noise ratio, precision of the low-level standard, lowest calibration curve point or the IDL study defined within CLP). The method and means in which IDLs are determined are documented and maintained in the QA department for each individual instrument.

IDLs are periodically generated for each element by the metals laboratory based on project or program requirements (i.e., CLP is quarterly for each instrument). These limits are used to gauge instrument sensitivity without the introduction of preparation method variance.

Reporting Limits

Reporting Limits are defined as the lowest concentration of an analyte determined by a given method in a given matrix that the laboratory can report with acceptable quantitative error or client requirements, values specified by the EPA methods or other project and client requirements. The laboratory reporting limits are further related and verified by the lowest point on a calibration curve. Because of the high level of quantitative error associated with determinations at the level of the MDL, the laboratory endeavors to keep reporting limits higher than the MDL. Wherever possible, reporting is limited to values approximately 2-5x the respective MDL to ensure confidence in the value reported.

Client specific requests for reporting below the routine laboratory reporting limit or approaching the IDL or MDL are special circumstances not to be confused with the previous statement. Data evaluated down to the MDL/IDL is qualified as estimated with a 'J' for organic analyses, a 'B' for inorganic analyses or with a comment in the report case narrative.

MDL studies are performed annually, and reporting limits are assessed. If the MDL does not meet the routine laboratory reporting limit or the method specified limit, it is repeated or the laboratory reporting

limit is reassessed. If the laboratory continually demonstrates that the method reporting limits are not achieved, equipment, technique, and the method are reviewed to assure optimal performance or appropriate action is taken.

4.5 Subcontracting

Subcontracting is arranged with the consent of the client. Consent shall be requested in a timely manner and the client response shall be suitably prompt to ensure that it shall not be unreasonably refused. All QC guidelines specific to the client's analytical program are transmitted to the subcontractor and agreed upon before sending the samples to the subcontract facility. Proof of required certifications from the subcontract facility is maintained in the project records. Where applicable, specific QC guidelines, QAPPs, and/or SAPs are transmitted to the subcontract laboratory. Samples are subcontracted under formal Chain of Custody (COC).

Subcontract laboratories may receive an on-site audit by a representative of STL's QA staff if it is deemed appropriate by the QA Manager. The audit involves a measure of compliance with the required test method, QC requirements, as well as any special client requirements (e.g., Technical Profile and LIMS Project Notes). STL may also perform a paper audit of the subcontractor, which would entail reviewing the LQM, the last two PT studies, and a copy of any recent regulatory audits with the laboratory's responses.

Intra-company subcontracting may also occur between STL facilities. Intra-company subcontracting within STL is arranged with the documented consent of the client or a QAPP specification. The originating laboratory is responsible for communicating all technical, quality, and deliverable requirements as well as other contract needs.

Project reports from both STL and external subcontractors are not altered and are included in their original form in the final project report provided by STL. This clearly identifies the data as being produced by a subcontractor facility. If subcontract data are incorporated into the laboratory's report (i.e., imported), the report must explicitly indicate which lab produced the data for which methods and samples, as required in Section 5.9.4.

4.6 Purchasing Services and Supplies

Evaluation and selection of suppliers and vendors is performed, in part, on the basis of the quality of their products, their ability to meet the demand for their products on a continuous and short term basis, the overall quality of their services, their past history, and competitive pricing. This is achieved through evaluation of objective evidence of quality furnished by the supplier, which can include certificates of analysis, recommendations, and proof of historical compliance with similar programs for other clients. To ensure that quality critical consumables and equipment conform to specified requirements, all purchases from specific vendors are approved by a member of the supervisory or management staff.

Chemical reagents, solvents, glassware, and general supplies are ordered as needed to maintain sufficient quantities on hand. Purchasing guidelines for equipment and reagents meet with the requirements of the specific method and testing procedures for which they are being purchased. The measurements for evaluation and selection of suppliers; the acceptance of supplies and services; and certificates of conformance are described in the procurement SOP (*Procurement of Laboratory Supplies and Services, APH-Supply-08*).

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4.6.1 Solvent and Acid Lot Verification

Pre-purchase approval is performed for solvents and acids purchased in large quantities unless a certificate of conformance has been furnished. These may include acetone, ethyl ether, hexane, methylene chloride, nitric acid, hydrochloric acid, sulfuric acid, and hydrogen peroxide. Each lot of incoming supplies requiring pre-approval is checked against the previously approved lot number. If the lot number is not approved, the lot is refused. If the lot number is an approved lot number, it is accepted and documented. Solvents and acids are pre-tested in accordance with STLs Corporate *Testing Solvents and Acids* procedure (S-T-001) for all of the STL laboratories.

4.7 Service to the Client

4.7.1 Sample Acceptance Policy

Samples are considered "compromised" if the following conditions are observed upon sample receipt:

- ♦ Cooler and/or samples are received outside of temperature specification.
- Samples are received broken or leaking.
- Samples are received beyond holding time.
- Samples are received without appropriate preservation.
- Samples are received in inappropriate containers.
- COC does not match samples received.
- COC is not properly completed or not received.
- Breakage of any Custody Seal.
- Apparent tampering with cooler and/or samples.
- Headspace in volatiles samples >6mm.
- Seepage of extraneous water or materials into samples.
- Inadequate sample volume.
- Illegible, impermanent, or non-unique sample labeling.

When "compromised" samples are received, it is documented on the hardcopy COC, the LIMS Sample Receipt Checklist or on an Analytical Receipt Resolution Form (ARRF); and the client is contacted for instructions. If the client decides to proceed with the analysis, the project report will clearly indicate any of the above conditions and the resolution.

4.7.2 Client Confidentiality and Proprietary Rights

Data and sample materials provided by the client or at the client's request, and the results obtained by STL, shall be held in confidence (unless such information is generally available to the public or is in the public domain or client has failed to pay STL for all services rendered or is otherwise in breach of the terms and conditions set forth in the STL and client contract) subject to any disclosure required by law or legal process. Technical, business and proprietary information provided by a client and data/information generated by the laboratory are restricted for the use within the laboratory for purposes of accomplishing the project. Client information is not to be used on other projects or revealed except in conjunction with project work to anyone outside the laboratory without permission of the client.

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STL's reports, and the data and information provided therein, are for the exclusive use and benefit of client, and are not released to a third party without written consent from the client (Client Confidentiality Section 6.9; APM-ProjInfo-20).

4.8 Complaints

STL believes that effective client complaint handling processes have important business and strategic value. Listening to and documenting client's concerns captures "client knowledge" that helps to continually improve processes and outpace the competition. Implementing a client complaint handling process also provides assurance to the data user that the laboratory will stand behind its data, service obligations and products.

Client inquiries, complaints or noted discrepancies are documented, communicated to management, and addressed promptly and thoroughly. The investigation of the cause, resolution and authorization of corrective action is documented [Data Quality Request (DQR); SOP AQA-DQR-65 or Corrective Action Notice (CAN); SOP AQA-CA-65)].

Client complaints are documented by the employee receiving the complaint. The documentation can take the form of a Data Quality Review request (DQR) or in a format specifically designed for that purpose (e.g., phone conversation record or e-mail). The Laboratory Director, CSM, Technical Director and/or QA Manager are informed of client complaints and assist in resolving the complaint.

The nature of the complaint is identified, documented and investigated, and an appropriate action is determined and taken. STL Buffalo uses an automated documentation and tracking mechanism for the DQR process which provides a system for trend analysis of repeat complaints. In cases where a client complaint indicates that an established policy or procedure was not followed, the QA department is required to conduct a special audit to assist in resolving the issue. A written confirmation, or letter to the client, outlining the issue and response taken is strongly recommended as part of the overall action taken.

The number and nature of client complaints is reported by the QA Manager to the Corporate QA Director in the QA Monthly report. Monitoring and addressing the overall level and nature of client complaints and the effectiveness of the solutions is part of the Quality Systems Management Review (QMP, Section 4.15.2 and SOP AQA-Management Review-45).

4.9 Control of Non-conformances

Non-conformances include any out of control occurrence. Non-conformances may relate to client specific requirements, procedural requirements, or equipment issues. All non-conformances in the laboratory are documented at the time of their occurrence on a Job Exception Report, also known as a non-conformance report (AQA-CA-65)

All non-conformances that affect a sample and/or sample data become part of the affected project's permanent record. When appropriate, reanalysis is performed where QC data falls outside of specifications, or where data appears anomalous. If the reanalysis comes back within established tolerances, the results are approved. If the reanalysis is still outside tolerances, further reanalysis or consultation with the Section Manager, Project Manager or QA Manager for direction may be required. All records of reanalysis are kept with the project files.

Where non-conformances specifically affect a client's sample and/or data, the client is informed and action must be taken. Action can take the form of reporting and flagging the data, and including a description of the non-conformance in the project narrative.

4.10 Corrective Action

To consistently achieve technical and regulatory requirements, the laboratory data must be supported by an effective corrective action system. The system must be capable of isolating and rectifying both random and systematic errors. Identification of systematic errors, or errors that are likely to occur repetitively due to a defect or weakness in a system, is particularly valuable in maintaining an environment of continuous improvement in laboratory operations.

Mechanisms used to ensure problem definition include SOPs; internal and external audits and surveillances; and regular laboratory management meetings. When evaluation of performance against established criteria for good laboratory practices shows a condition that could adversely affect the quality of services provided, corrective action is initiated.

Any employee in STL can initiate a corrective action. The initial source of corrective action can also be external to STL (i.e., corrective action due to client complaint, regulatory audit, or PT(s)). When a problem that requires corrective action is identified, the following items are identified by the initiator on the corrective action report: the nature of the problem, the name of the initiator, and the date. If the problem affects a specific client project, the PM is informed immediately.

All corrective actions, whether immediate or long-term, will comprise the following steps to ensure a closed-loop corrective action process:

- Define the problem.
- Assign responsibility for investigating the problem.
- Determine a corrective action to eliminate the problem.
- ♦ Assign, and obtain commitment to, responsibility for implementing the corrective action.
- Implement the correction.
- Assess the effectiveness of the corrective action and verify that the corrective action has eliminated the problem.

4.10.1 Immediate Corrective Action

Immediate corrective actions to correct or repair non-conforming equipment and systems are generally initiated in response to adverse conditions identified through QC procedures. The analyst has relatively quick feedback that a problem exists, e.g., calibration does not meet or QC check samples exceed allowable criteria, and can take immediate action to repair the system.

The initial responsibility to monitor the quality of a function or analytical system lies with the individual performing the task or procedure. DQOs are evaluated against laboratory-established or against method or client specified QA/QC requirements. If the assessment reveals that any of the QC acceptance criteria are not met, the analyst must immediately assess the analytical system to correct the problem. When the appropriate corrective action measures have been defined and the analytical system is determined to be "in-control" or the measures required to put the system "in-control" have been identified and scheduled, the problem and resolution or planned action is documented in the

appropriate logbook or Job Exception Report. Data generated by an analytical system that is determined to be out-of-control must never be released without approval of the Section Manager, QA Manager, Laboratory Director and client notification.

When an acceptable resolution cannot be met or data quality is negatively affected, the analyst will notify their Section Manager and initiate a Job Exception. If a Job Exception is required, it is routed for proper authorizations and direction. Proper authorization and direction is given by the Project Manager and/or QA Manager. Based upon the circumstances and judgment of the Project Manager, in conjunction with the QA Manager, the client will be notified of the situation.

Data generated concurrently with an out-of-control system will be evaluated for usability in light of the nature of the deficiency. If the deficiency does not impair the usability of the results, data will be reported and the deficiency will be noted in the case narrative. Where sample results may be impaired, the Project Manager is notified by a written Job Exception Report and appropriate corrective action (e.g., reanalysis) is taken and documented.

A Job Exception documents analytical problems at the bench level. This form allows for the documentation of the out-of-control situation, actions undertaken to correct the problem and a return-to-control status. All Job Exceptions are signed/dated by the respective laboratory section manager.

The QA Manager has the authority to stop the analysis, e.g., failure to meet method or project requirements, and to hold all analyses of samples affected by an out-of-control situation. The method cannot be restarted without appropriate documentation leading to the QA Manager's approval and sign-off.

4.10.2 Long-term Corrective Action

Long-term corrective action is generally initiated due to QA issues, which are most often identified during internal and external audits (Sections 4.13 & 4.14). Typically, a deeper investigation into the root cause of the nonconformance is warranted, and the problem may take much longer to identify and resolve. Staff training, method revision, replacement of equipment, and LIMS reprogramming are examples of long-term corrective action.

4.10.3 Responsibility and Closure

The Section Manager is responsible for correcting out-of-control situations, placing highest priority on this endeavor. Associated corrective actions, once verified for effectiveness, are incorporated into standard practices. Ineffective actions will be documented and re-evaluated until acceptable resolution is achieved. Section Managers are accountable to the Operations Manager to ensure final acceptable resolution is achieved and documented appropriately.

The QA Manager also may implement a special audit (Section 4.13). The purpose of inclusion of the corrective action process in both routine and special audits is to monitor the implementation of the corrective action and to determine whether the action taken has been effective in overcoming the issue identified.

Any out-of-control situations that are not addressed acceptably at the laboratory level may be reported to the Corporate Quality Director by the QA Manager, indicating the nature of the out-of-control situation and problems encountered in solving the situation. This provides laboratory QA personnel non-laboratory management support, if needed, to ensure QA policies and procedures are enforced.

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4.11 Preventative Action

The laboratory's preventive action programs improve, or eliminate potential causes of nonconforming product and/or nonconformance to the quality system. This preventive action process is a proactive continuous process improvement activity which can be initiated by clients, employees, business providers, and affiliates. The QA section has the overall responsibility to ensure that the preventive action process is in place, and that relevant information on actions is submitted for management review.

Preventive action opportunities may be identified from information obtained through activities related to but not limited to the corrective action process, performance evaluation program, internal audits, management review, and/or market trends, industry trends and competitive comparisons.

Established standard practices for preventive action are included in the Corrective and Preventive Action SOP (AQA-CA-35); the Data Quality Request SOP (AQA-DQR-65) and the Quality System Management Review SOP (AQA-Management Review-45). These procedures describe the information sources used to detect, analyze, and eliminate potential causes of nonconformities and to ensure effective implementation of solutions.

4.12 Records

4.12.1 Record Types

Record types are described in Table 4.

4.12.2 Record Retention

Data reports are filed electronically as .pdf files by job number. Hardcopy COC files are maintained and are filed with the original Job File in job number order.

Laboratory data, project management files, QA records (e.g., PT scores/corrective actions; MDLs/IDLs, statistical analysis, QAPPs, etc..), Human Resources information, etc.., are compiled by date order. The same procedure is followed both in current and archived hardcopy storage.

Upon archiving, a record is made in the Archive Logbook and a number is assigned for each storage box of records. This logbook documents the contents (description and dates) of each storage box. Records are maintained for the periods defined in Tables 5 and 6. On an annual basis, the storage boxes are reviewed and those records subject to disposal are purged.

Table 5 outlines the laboratory's standard record retention time. For raw data and project records, record retention is calculated from the date the project report is issued. For other records, such as Controlled Documents, QC, or Administrative Records, the retention time is calculated from the date the record is formally retired. Records related to the programs listed in Table 6 have lengthier retention requirements and are subject to the requirements in Section 4.12.3.

Table 4. STL Record Types

Controlled		Project	Administrative
Raw Data Documents	QC Records	Records	Records

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Raw Data	Controlled Documents	QC Records	Project Records	Administrative Records
See Section 3.	LQMs/ QAPPs	Audits/ Responses	COC Documentation	Accounting
Terms and Definitions	QMP (Corporate)	Certifications	Contracts and Amendments	Corporate Safety Manual, Permits, Disposal Records
	SOPs	Job Exceptions / DQRs	Correspondence	Employee Handbook
		Logbooks*	QAPP	Personnel files,
		Method & Software Validation, Verification	SAP	Employee Signature & Initials, Training Records
		Standards Certificates	Telephone Logbooks	Technical and Administrative Policies
	Work Instructions	MDL/IDL/IDC Studies	E-mails	
		PTs	Electronic Data	
		Statistical Evaluations	Report	

^{*}Examples of Logbook types: Maintenance, Instrument, Preparation (standard and samples), Standard and Reagent Receipt, Archiving, and Balance Calibration.

Table 5. STL Record Retention

Record Type		Archival Requirement *	
Raw Data	All* (Electronic Data Reports (.pdf & EDD)	5 Years from completion	
Controlled Documents	All*	5 Years from document retirement date	
QC	All*	5 Years from archival	
Project	Ali*	5 Years from project completion	
Administrative	Personnel/Training	Indefinitely	
	Accounting	10 years	

^{*} Exceptions listed in Table 6.

4.12.3 Programs with Longer Retention Requirements

Some regulatory programs and clients have longer record retention requirements than the laboratory's standard record retention time. These are detailed in Table 6 with their retention requirements and client-specific requirements are listed in the Record Retention and Storage SOP (AQA-RecordStorage-56). In these cases, the longer retention requirement is implemented and

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noted in the archive. If special instructions exist such that client data cannot be destroyed prior to notification of the client, the container or box containing that data is marked as to who to contact for authorization prior to destroying the data.

Table 6. Special Record Retention Requirements

Program	Retention Requirement
NY Potable Water NYCRR Part 55-2	10 years
Commonwealth of MA – All environmental data 310 CMR 42.14	10 years
FIFRA – 40 CFR Part 160	Retain for life of research or marketing permit for pesticides regulated by EPA
Michigan Department of Environmental Quality – all environmental data	10 years
Minnesota - Drinking Water	10 years
Navy Facilities Engineering Service Center (NFESC)	10 years
OSHA - 40 CFR Part 1910	30 years
Pennsylvania - Drinking Water	10 years
TSCA – 40 CFR Part 792	10 years after publication of final test rule or negotiated test agreement
Louisiana – All environmental data	10 years

4.12.4 Archives and Record Transfer

Archives are indexed such that records are accessible on either a project or temporal basis. Archives are protected against fire, theft, loss, deterioration, and vermin. Electronic records are protected from deterioration caused by magnetic fields and/or electronic deterioration. Access to archives is controlled and documented.

STL ensures that all records are maintained as required by the regulatory guidelines and per this LQM upon facility location change or ownership transfer. Upon facility location change, all archives are retained by STL in accordance with this LQM. Upon ownership transfer, all final test reports generated by the laboratory will be submitted to the clients if not previously provided. Any further record retention requirements will be addressed in the ownership transfer agreement and the responsibility for maintaining archives is clearly established.

In the event that the laboratory is closed, all final test reports generated by the laboratory will be submitted to the clients if not previously provided. All records will then be transferred to STL's corporate record storage location. All boxes and contents will be appropriately labeled with the dates of destruction (Refer to Tables 5 and 6) and managed in accordance their policies.

4.13 Internal Audits

Quality assurance audits and surveillances are conducted to assess the performance of laboratory systems in meeting technical, regulatory and client requirements; and to evaluate the operational details of the QA program (Systems Audits; S-Q-002). They provide a means for management to be apprised of, and to respond to, a potential problem before it actually impacts the laboratory operations. They also are a mechanism for ensuring closure of corrective actions resulting from external audits.

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4.13.1 Audit Types and Frequency

A number of types of audits are performed at STL. These audit types and frequency are categorized in Table 7.

Table 7. Audit Types and Frequency

Audit Type	Performed by	Frequency
Systems	QA Department or Designee	Annual
Data	QA Department or Designee	Data Report Review: As necessary to ensure an effective secondary review process Analyst Data Audits: 100% of all analysts annually Electronic Data Audits: 100% of all organic instruments
Special	QA Department or Designee	As Needed

4.13.2 Systems Audits

Systems audits are technical in nature and are conducted on an ongoing basis by the QA Manager. Systems audits cover all departments of the facility, both operational and support. The review consists of laboratory systems, procedures, documentation and issues noted in external audits.

The audit report is issued by the QA Manager within 21 calendar days of the audit. The audit report is addressed to the Operations Manager and Department Supervisors and copied to the Corporate Quality Director and the Laboratory Director.

Written audit responses are required within 30 calendar days of the audit report issue. A maximum of one calendar month is given to address any recommended corrective actions. The audit response is directed to all individuals copied on the audit report. Where a corrective action may require longer than a calendar month to complete, the target date for the corrective action implementation is stated and evidence of the corrective action is submitted to the QA Department in the agreed upon time frame.

4.13.3 Data Audits

Data audits are focused to assess the level of customer service, SOP compliance, regulatory compliance, accuracy and completeness of test results and reports, documentation, and adherence to established QC criteria, laboratory SOPs, technical policy, and project specific QC criteria.

The QA Department provides feedback and/or corrections and revisions to project reports where necessary. Records of the data audits are kept, and the frequency of data audits is included in the monthly QA report. In performing data audits, it is essential that data be assessed in terms of

differentiating between systematic and isolated errors. Upon noting anomalous data or occurrences in the data audits, the QA Department is responsible for seeking clarification from the appropriate personnel, ascertaining whether the error is systematic or an isolated error, and overseeing correction and/or revision of the project report if necessary. Errors found in client project reports are revised and the revision sent to the client (Section 4.8). The QA Department is also responsible for assisting in the corrective action process where a data audit leads to identification of the need for permanent corrective action.

The frequency of data auditing may also be dependent upon specific clients and regulatory programs. All active laboratory logbooks and QC files are subject to periodic audits/ surveillances by the QA personnel.

4.13.3.1 Data Authenticity Audits

Data authenticity audits shall be performed on 100% of all analysts by the QA department or a designee independent from the operations. Performing data authenticity checks will typically include verifying raw data, evaluating calculation tools and independently reproducing the final results and comparing it to the hardcopy on randomly selected batches of data. The QA Manager will report the percentage of analysts reviewed (for the year) in the monthly QA report and should average about 8% per month.

4.13.3.2 Electronic Data Audits

Electronic data audits are performed on 100% of all organic instruments by the QA department or a designee independent from the operations. This may include Mint Miner® scanning of randomly selected batches of electronic data followed by a chromatography system review. The QA manager will report the percentage of instruments reviewed (for the year) in the monthly QA report and should average about 8% of instruments per month. Electronic data audits include spotchecking of manual integrations by QA personnel in order to determine that the manual integration is appropriate and documented according to Section 5.3.6.1.

4.13.4 Special Audits

Special audits are conducted on an as needed basis, generally as a follow up to specific issues such as client complaints, corrective actions, proficiency testing results, data audits, systems audits, validation comments, or regulatory audits. Special audits are focused on a specific issue, and report format, distribution, and timeframes are designed to address the nature of the issue.

4.14 External Audits

STL is routinely audited by clients and external regulatory authorities – both government and non-government. Whether the audit is scheduled or unannounced, full cooperation with the audit team is provided by the laboratory and administrative staff. STL recommends that the audits be scheduled with the QA Department so that all necessary personnel are available on the day of the audit.

4.15 Management Reviews

4.15.1 QA Reports to Management

A monthly QA report is prepared by the QA Manager and forwarded to the Laboratory Director and Corporate Quality Director. The reports include statistical results that are used to assess the effectiveness of the quality system. The required information for the monthly report is shown in Figure 3.

4.15.2 Quality Systems Management Review

A quality systems management review is performed at least annually by the Laboratory Director and QA Manager (SOP AQA-Management Review-45). This review ensures that the laboratory's quality system is adequate to satisfy the laboratory's policies and practices, government requirements, certification, accreditation, approval requirements, and client expectations. Quality systems management reviews are accomplished through the evaluation and revision of this LQM, monthly quality assurance reporting and goal setting.

Management reviews of specific quality system elements may be performed through continuous improvement activities, monthly QA reports, process changes, SOP revisions, and/or audit reports/responses. Documentation of these reviews are not required unless it is inherent in the review mechanism (e.g., approval signatures on SOP revisions).

4.15.3 Monthly QA Report and Metrics

By the 3rd day of the month, the QA manager prepares a monthly QA report. The report is sent to the Laboratory Director, General Manager and Corporate Quality Director. The report contains a narrative summary and metrics spreadsheet. At a minimum, the report content contains the items listed below (Figure 3). During the course of the year, the Laboratory Director, General Manager or Corporate Quality Director may request that additional information be added to the report.

Figure 3. Monthly QA Report Format

1	Audits
	Internal System Audits
	External System Audits
2	Revised Reports / Client Feedback
	Revised Reports
	Client Complaints
	Client Compliments
3	Certification Changes
	Changes
	Losses / Revocations
4	Proficiency Testing
	Study participation and scores
	Combined PT scores
	Repeat failures
5	SOP Status
	Report the percentage of SOPs that have been
	revised or reviewed within the last 24 months.
6	Miscellaneous QA and Operational Issues
	Narrative outlining improvements, regulatory

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compliance issues and general concerns.	
Appended	Metrics Spreadsheet
	Summarize metrics in template provided by the Corporate Quality Director

5.0 Technical Requirements

5.1 Personnel

5.1.1 General

STL management believes that its highly qualified and professional staff is the single most important aspect in assuring the highest level of data quality and service in the industry. The staff consists of professionals and support personnel that include the following positions:

- General Manager
- Laboratory Director
- Technical Director
- QA Manager
- Human Resource Manager
- Customer Service Manager
- · Operations Manager
- QA Specialist
- Health & Safety Coordinator / Waste Management
- Project Manager
- Information Technology Manager
- Network Administrator
- Department Supervisor
- Analyst
- Sample Custodian
- Technician
- Data Reporting Specialist

In order to ensure that employees have sufficient education and experience to perform a particular task, job descriptions are developed for all personnel. Job Descriptions are located on the STL Intranet Site's Human Resources web-page:

http://stlnet.stl-inc.com/Corporate/HR/JobDescriptions/JobDescrip index.htm.

5.1.2 Training

STL is committed to furthering the professional and technical development of employees at all levels. Selection of qualified candidates for laboratory employment begins with documentation of minimum education, training, and experience prerequisites needed to perform the prescribed task. Minimum education and training requirements for STL employees are outlined in Job Descriptions.

Orientation to the laboratory's policies and procedures, in-house method training, and employee attendance at outside training courses and conferences all contribute toward employee proficiency.

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The QA section in conjunction with the Human Resources section are responsible for maintaining documentation of these activities.

Each laboratory section is required to maintain documentation associated with analytical training (e.g., training records, IDOCs, CDOCs, and controlled documents). The QA department maintains documentation of method proficiency (e.g., IDMPs, MDLs, MDLvs, PT Sample Tracking, QC Control Limits/Data). This information is available to managers and staff for planning and evaluation.

The following evidence items are maintained in the employees technical training file for each technical employee:

- An Ethics Agreement signed by each staff member (renewed each year).
- ◆ A Confidentiality Agreement signed by each staff member (renewed each year).
- Initial Demonstration of Capability (IDOC)
- The employee has read and understood the latest version of the laboratory's quality documentation.
- The employee has read and understood the latest, approved version of all test methods and/or SOPs for which the employee is responsible.
- Annual evidence of continued DOC that may include successful analysis of a blind sample on the specific test method; a similar test method; an annual DOC; or four successive and acceptable LCSs.
- Documentation of external training courses attended
- All training regarding QA policies and procedures

The Human Resource department maintains documentation and attestation forms on employment status & records; benefit programs; timekeeping/payroll; and employee conduct (e.g., ethics). This information is maintained in the employee's secured personnel file.

Table 8. STL Employee Minimum Training Requirements

Specialty	Experience
General Chemistry and Instrumentation	Six months
Gas Chromatography	One year
Atomic Absorption	One year
Mass Spectrometry	One year
Spectra Interpretation	Two years

Required Training	Time Frame ¹	Employee Type
Environmental Health & Safety	Month 1	All
Ethics	Month 1	All
Data Integrity	Month 1	Technical and PMs
Ethics Refresher	Annually	All
Quality Assurance	Quarter 1	All
Initial Demonstration of Capability	Prior to unsupervised method	Technical

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performance

The quality assurance training includes an overview of regulatory programs and program goals, discussions about data integrity and data misrepresentation and an overview of laboratory quality control procedures and purposes.

When an analyst has not met these training requirements, they can perform a task under the supervision of a qualified analyst, peer reviewer or department supervisor, and are considered an analyst in training. The person supervising an analyst in training is accountable for the quality of the analytical data and must review and approve data and associated corrective actions.

Technical training is accomplished by the Operations Manager, Department Supervisor or a senior analyst to ensure method comprehension. All new personnel are required to demonstrate competency in performing a particular method by successfully completing an Initial Demonstration of Capability. IDOCs are performed by the analysis of four replicate QC samples. Results of successive LCS analyses can be used to fulfill the IDOC requirement. The accuracy and precision, measured as average recovery and standard deviation (using n-1 as the population), of the 4 replicate results are calculated and compared to those in the test method (where available). If the test method does not include accuracy and precision requirements, the results are compared to target criteria set by the laboratory. The laboratory sets the target criteria such that they reflect the DQOs of the specific test method or project. A IDOC Certification Statement is recorded and maintained in the employee's training file. Tabulated results summary and raw data are completed and signed by the analyst and section manager with the proper entries made onto the analysts training record. The data are submitted to the QA department for approval and entry into the master IDOC spreadsheet and filing. Figure 4 shows an example of a IDOC Certification Statement.

On an annual basis, each analyst's method capabilities must be evaluated. The requirement that a CDOC (Continued Demonstration of Capability) be completed for each method currently being analyzed must be presented for approval to QA in the same format as the IDOC discussed above.

Further details of the laboratory's training program are described in the SOP related to Laboratory Personnel Training (AQA-TRAIN-10).

5.1.3 Ethics Policy

(IDOC)

Establishing and maintaining a high ethical standard is an important element of a Quality System. In order to ensure that all personnel understand the importance the company places on maintaining high ethical standards at all times; STL has established an Ethics Policy (P-L-006) and an Ethics Agreement (Figure 5). Each employee signs the Ethics Agreement, signifying agreed compliance with its stated purpose. The ethics agreement is required to be re-signed on an annual basis.

Violations of this Ethics Policy will not be tolerated. Employees who violate this policy will be subject to disciplinary actions up to and including termination. Criminal violations may also be referred to the Government for prosecution. In addition, such actions could jeopardize the Company's ability to do work on Government contracts, and for that reason, the Company has a Zero Tolerance approach to such violations.

¹ From the date of initial employment unless otherwise indicated.

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Ethics is also a major component of STL's quality and data integrity systems. Each employee is trained in ethics within two weeks of hire and quality training within three months of hire. Annually, ethics refresher training will be provided. Employees are trained as to the legal and environmental repercussions that result from data misrepresentation. A data integrity hotline is maintained by STL and administered by the Corporate Quality Director.

Figure 4. Demonstration of Capability Certification Statement

SEAR	
51. 61	

DOC Cert. Statement Revision 6 October 12, 2005

SEVERN TRENT LABORATORIES - BUFFALO

TRAINING & DEMONSTRATION OF CAPABILITY CERTIFICATION STATEMENT

Employee		1	Pago	of
Method Number:			Deduc:	
Parameters or Analytes:		•		
Initial Demonstration of Capability:		•		
SOP Number:	Revisi	ion#	Date Read	
Trained By:				
Date training began:	Dute t	raining completed:		
Continued Demonstration of Capability:				
SOP Number:	Revisi	ion#	Date Read	
	Employee Sign	naturo	Date	
We, the undersigned, CERTIFY that: 1. The analyst identified above, using the cited test the National Environmental Laboratory Accreditat 2. The test method(s) was performed by the analys 3. A copy of the test method(s) and the laboratory	t(s) identified on this specific Sops are as	met the Demonstration is certification. vailable for all person	n of Capability nel on-site.	<i>t</i> .
 The data associated with the demonstration caps 	ibility are true, accu	rate, complete and se	lf-explanatory.	
 All raw data (including a copy of this certification etained at this facility, and that the associated inference. 	on form) necessary i smotion is well org	io reconstruct and val unized and available i	lidate these and for review by a	dyses have been authorized assessor
John Schove				
Operations Manager	Signature		Date	•
Verl Preston				
Quality Assurance Manager	Signature		Date	

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Figure 5. STL Ethics Agreement

I understand that STL is committed to ensuring the highest standard of quality and integrity of the data and services provided to our clients. I have read the Ethics Policy of the Company.

With regard to the duties I perform and the data I report in connection with my employment at the Company, I agree that:

- I will not intentionally report data values that are not the actual values obtained;
- I will not intentionally report the dates, times, sample or QC identification, or method citations of data analyses that are not the actual dates, times, sample or QC identifications, or method citations;
- · I will not intentionally misrepresent another individual's work;
- I will not intentionally report data values that do not meet established quality control criteria as set forth in the Method and/or Standard Operating Procedures, or as defined by Company Policy;
- I agree to inform my Supervisor of any accidental reporting of non-authentic data by me in a timely manner; and I
 agree to inform my Supervisor of any accidental or intentional reporting of non-authentic data by other employees; and
- If a supervisor or a member of STL management requests me to engage in or perform an activity that I feel is compromising data validity or quality, I will not comply with the request and report this action immediately to a member of senior management, up to and including the President of STL.

As a STL employee, I understand that I have the responsibility to conduct myself with integrity in accordance with the ethical standards described in the Ethics Policy. I will also report any information relating to possible kickbacks or violations of the Procurement Integrity Act, or other questionable conduct in the course of sales or purchasing activities. I will not knowingly participate in any such activity and will report any actual or suspected violation of this policy to management.

The Ethics Policy has been explained to me by my supervisor or at a training session, and I have had the opportunity to ask questions if I did not understand any part of it. I understand that any violation of this policy subjects me to disciplinary action, which can include termination. In addition, I understand that any violation of this policy which relates to work under a government contact or subcontract could also subject me to the potential for prosecution under federal law.

EMPLOYEE SIGNATURE:	Date:
Supervisor/Trainer:	Date:

5.2 Facilities

The laboratory is a secure facility with controlled and documented access. Access is controlled by keyless entry access cards, locked doors, and a staffed reception area. All visitors sign in and are escorted by STL personnel while at the facility. The laboratory is locked at all times.

The facility is designed for efficient, automated high-quality operations. The laboratory is equipped with Heating, Ventilation, and Air Conditioning (HVAC) systems appropriate to the needs of environmental testing laboratories. Environmental conditions in the facility, such as hood flow, are routinely monitored and documented.

The facility is equipped with structural safety features. Each employee is familiar with the location, use, and capabilities of general and specialized safety features associated with their workplace. STL also provides and requires the use of protective equipment including safety glasses, protective clothing, gloves, etc..

5.3	Test	Metho	ods
			_

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Routine analytical services are performed using standard EPA-approved methodologies. In some cases, modification of standard approved methods may be necessary to provide accurate analyses of particularly complex matrices.

5.3.1 Method Selection

Since numerous methods and analytical techniques are available, continued communication between the client and laboratory is imperative to assure the correct methods are utilized. Once client methodology requirements are established, this and other pertinent information is summarized by the Project Manager in the LIMs technical profile. These mechanisms ensure that the proper analytical methods are applied when the samples arrive for log-in. For non-routine analytical services (e.g., special matrices, non-routine compound lists, etc.), the method of choice is selected based on client needs and available technology.

Most of the test methods performed at STL originate from test methods published by a regulatory agency such as the US EPA and other state and federal regulatory agencies. These include, but are not limited to, the following published compendiums of test methods. A listing of methods in which the laboratory is capable of performing is listed in the laboratory's Master Methods Index and Preservation Table (SOP ASR-Psrv-07).

Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, and Appendix A-C; 40 CFR Part 136, USEPA Office of Water.

Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM) Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-003, February 1999.

Methods for Chemical Analysis of Water and Wastes, EPA 600 (4-79-020), 1983.

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993.

Methods for the Determination of Metals in Environmental Samples, EPA/600/4-91/010, June 1991. Supplement I: EPA-600/R-94/111, May 1994.

NIOSH Manual of Analytical Methods, 4th ed., August 1994.

Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88-039, December 1988, Revised July 1991, Supplement I, EPA-600-4-90-020, July 1990, Supplement II, EPA-600/R-92-129, August 1992.

Statement of Work for Inorganics Analysis, ILM04.2, ILM05.2 and ILM05.3 USEPA Contract Laboratory Program Multi-media, Multi-concentration.

Statement of Work for Organics Analysis, OLM04.2 (with OLM04.3 update) and OLC02.1, USEPA Contract Laboratory Program, Multi-media, Multi-concentration.

New York State Department of Environmental Conservation, Analytical Services Protocol, NYSDEC ASP.

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Standard Methods for the Examination of Water and Wastewater, 18th/19th /20th edition; Eaton, A.D. Clesceri, L.S. Greenberg, A.E. Eds; American Water Works Association, Water Pollution Control Federation, American Public Health Association: Washington, D.C.

Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), Third Edition, September 1986, Final Update I, July 1992, Final Update IIA, August 1993, Final Update II, September 1994; Final Update IIB, January 1995; Final Update III, December 1996.

Annual Book of ASTM Standards, American Society for Testing & Materials (ASTM), Philadelphia, PA.

The laboratory reviews updated versions to all the aforementioned references for adaptation based upon capabilities, instrumentation, etc., and establishes an implementation schedule. As such, the laboratory strives to perform only the latest versions of each approved method.

5.3.2 SOPs

STL maintains a Master Index of SOPs (SOP Master Index) for both Method and Process SOPs. Method SOPs are maintained to describe a specific test method. Process SOPs are maintained to describe function and processes not related to a analytical testing (e.g., administrative procedures).

Method SOPs contain the following information, but not necessarily in the order listed:

Title Page with Document Name, Document Number, Revision Number, Effective Date, Page Numbers and Total # of Pages, Authorized Signatures, Dates and Proprietary Information Statement (Figure 6).

- 1. Identification of Test Method
- 2. Applicable Matrix
- Scope and Application, including test analytes
- 4. Summary of the Test Method
- 5. Reporting Limits
- 6. Definitions
- 7. Interferences
- 8. Safety
- 9. Equipment and Supplies
- 10. Reagents and Standards
- 11. Sample Collection, Preservation and Storage
- 12. Quality Control

- 13. Calibration and Standardization
- 14. Procedure
- 15. Calculations
- 16. Method Performance
- Data Assessment and Acceptance Criteria for Quality Control Measures
- 18. Corrective Actions for Out-of-Control Data
- Contingencies for Handling Out-of-Control or Unacceptable Data
- 20. Waste Management/Pollution Prevention
- 21. References
- 22. Tables, Diagrams, Flowcharts and Validation Data
- 23. Changes From Previous Revision

Process SOPs contain the following information, but not necessarily in the order listed.

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Title Page with Document Name, Document Number, Revision Number, Effective Date, Page Numbers and Total # of Pages, Authorized Signatures, Dates and Proprietary Information Statement (Figure 6).

- 1. Scope
- 2. Summary
- 3. Definitions
- 4. Responsibilities
- 5. Procedure
- 6. References
- 7. Tables, Diagrams, and Flowcharts
- 8. Changes from Previous Revision

The QA Department is responsible for maintenance of SOPs, archival of SOP historical revisions, maintenance of an SOP Master Index, and records of controlled distribution. SOPs, at a minimum, undergo annual review (12 months). Where an SOP is based on a published method, the laboratory maintains a copy of the reference method.

Figure 6. Proprietary Information Statement

This documentation has been prepared by Severn Trent Laboratories, Inc. (STL) solely for STL's own use and the use of STL's customers in evaluating its qualifications and capabilities in connection with a particular project. The user of this document agrees by its acceptance to return it to STL upon request and not to reproduce, copy, lend, or otherwise disclose its contents, directly or indirectly, and not to use if for any other purpose other than that for which it was specifically provided. The user also agrees that where consultants or other outside parties are involved in the evaluation process, access to these documents shall not be given to said parties unless those parties also specifically agree to these conditions.

THIS DOCUMENT CONTAINS VALUABLE CONFIDENTIAL AND PROPRIETARY INFORMATION. DISCLOSURE, USE OR REPRODUCTION OF THESE MATERIALS WITHOUT THE WRITTEN AUTHORIZATION OF STL IS STRICTLY PROHIBITED. THIS UNPUBLISHED WORK BY STL IS PROTECTED BY STATE AND FEDERAL LAW OF THE UNITED STATES. IF PUBLICATION OF THIS WORK SHOULD OCCUR THE FOLLOWING NOTICE SHALL APPLY:

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SOP Interim Change Form

The SOP Interim Change Form is used for implementation, documentation, and authorization of changes to SOPs (*Procedure for Writing, Reviewing and Revising SOPs, AQA-SOP-55*). Immediate changes in SOPs may be necessary to accommodate improvements; to implement acceptable changes in practices; or to correct potential errors in the existing version. The reason for the change will be identified and a detailed description of the procedure change will be presented. Since this form will become part of the referenced SOP, until such time that the SOP is updated, it must be legible and comprehensible. The Interim Change Form must provide an exact description and identify the affected sections.

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Once this form is completed and changes are authorized, it becomes an official part of the SOP for which it revises, and is subject to all document control and records management policies.

5.3.3 Method Validation

Laboratory developed methods are validated and documented according to the procedure described in Section 5.3.5.

5.3.4 Method Verification

Method verification is required when a validated standard test method or a method modification is implemented. The level of activity required for method verification is dependent on the type of method being implemented, or on the level of method modification and its affect on a method's robustness. Method modification often takes advantage of a method's robustness, or the ability to make minor changes in a method without affecting the method's outcome.

It is the responsibility of the Operations Manager to present to the QA Manager all applicable method validation studies for review and approval. The documented approval by the Operations Manager, Department Supervisor and QA Manager must be applied to all applicable validation records before the method is released for use. Method verification may require some, but not all, of the activities described in Section 5.3.5.

5.3.5 Method Validation and Verification Activities

Before analyzing samples by a particular method, method validation and/or method verification must occur. A complete validation of the method is required for laboratory developed methods. While method validation can take various courses, the following activities can be required as part of method validation. Method validation records are designated QC records and are archived accordingly.

Determination of Method Selectivity

Method selectivity is demonstrated for the analyte(s) in the specific matrix or matrices. In some cases, to achieve the required selectivity for an analyte, a confirmation analysis is required as part of the method.

Determination of Method Sensitivity

Sensitivity can be both estimated and demonstrated. Whether a study is required to estimate sensitivity depends on the level of method development required when applying a particular measurement system to a specific set of samples. Where estimations and/or demonstrations of sensitivity are required by regulation or client agreement, such as the procedure in 40 CFR Part 136 Appendix B, under the Clean Water Act, these shall be followed. The laboratory determines MDLs are described in Section 4.4.3.6 and the corporate procedure for MDL Policy, (S-Q-003).

Relationship of Limit of Detection (LOD) to the Quantitation Limit (QL)

An important characteristic of expression of sensitivity is the difference in the LOD and the QL. The LOD is the minimum level at which the presence of an analyte can be reliably concluded. The QL is the minimum level at which both the presence of an analyte and its concentration can be reliably determined. For most instrumental measurement systems, there is a region where semi-quantitative data is generated around the LOD (both above and below the estimated MDL or LOD) and below the QL. In this region, detection of an analyte may be confirmed but quantification of the analyte is unreliable within the accuracy and precision guidelines of the measurement system.

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When an analyte is detected below the QL, and the presence of the analyte is confirmed by meeting the qualitative identification criteria for the analyte, the analyte can be reliably reported, but the amount of the analyte can only be estimated. If data are to be reported in this region, they must be done so with a qualification that denotes the semi-quantitative nature of the result.

Determination of Interferences

A determination that the method is free from interferences in a blank matrix is performed.

Determination of Range

Where appropriate, a determination of the applicable range of the method may be performed. In most cases, range is determined and demonstrated by comparison of the response of an analyte in a curve to established or targeted criteria. The curve is used to establish the range of quantitation and the lower and upper values of the curve represent upper and lower quantitation limits. Curves are not limited to linear relationships.

Demonstration of Capability

DOCs are performed prior to method performance.

Determination of Accuracy and Precision

Accuracy and precision studies are generally performed using replicate analyses, with a resulting percent recovery and measure of reproducibility (standard deviation, relative standard deviation) calculated and measured against a set of target criteria.

Documentation of Method

The method is formally documented in an SOP. If the method is a minor modification of a standard laboratory method that is already documented in an SOP, an SOP Appendix describing the specific differences in the new method is acceptable in place of a separate SOP.

Continued Demonstration of Method Performance

Continued demonstration of Method Performance is addressed in the SOP. Continued demonstration of method performance is generally accomplished by batch specific QC samples such as LCS and Method Blanks.

5.3.6 Data Reduction and Review

Analytical data are entered/downloaded directly into LIMS or recorded on pre-formatted bench sheets that are paginated and bound into laboratory logbooks. These logbooks are issued and controlled by the laboratory's QA Section. A unique document control code is assigned to each book to assure that chronological record keeping is maintained. Analytical data may also be electronically stored as a secure .pdf file.

Analytical data are referenced to a unique sample identification number for internal tracking and reporting. Both LIMS entries and logbook pages contain the following information, as applicable: analytical method, analyst, date, associated sample numbers, standard concentrations, instrument settings, and raw data. Entries are in chronological order and maintained so as to enable reconstruction of the analytical sequence.

The analyst is responsible for entering / recording all appropriate information, and for signing and dating all logbook entries daily. All entries and logbook pages are reviewed for completeness by a supervisor, peer reviewer or the analyst themselves. Data review checklists document the analytical review of the LIMS entries, logbook and associated QC indicators. Copies of instrument outputs

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(chromatograms, mass spectra, etc.) are maintained on file or electronically with the analyst's signature/initials and date.

5.3.6.1 Data Reduction

The complexity of the data reduction depends on the analytical method and the number of discrete operations involved (e.g., extractions, dilutions, instrument readings and concentrations). The analyst calculates the final results from the raw data or uses appropriate computer programs to assist in the calculation of final reportable values.

For manual data entry, e.g., Wet Chemistry, the data are reduced by the analyst and updated to the LIMs. Both the data entry and raw data are then verified by the department supervisor or alternate analyst. The spreadsheets, or any other type of applicable documents, are signed by both the analyst and alternate reviewer to confirm the accuracy of the data and manual entry(s).

Manual integration of peaks will be documented and reviewed and the raw data will be flagged in accordance with the STL Corporate SOP entitled Acceptable Manual Integration Practices (S-Q-004).

Copies of all raw data and the calculations used to generate the final results, such as bound logbooks, are retained on file for a minimum of 5 years or as otherwise requested by the client/project.

Calculations and data reduction steps for various methods are summarized in the respective analytical SOPs or program requirements.

5.3.6.2 Data Review

All data, regardless of regulatory program or level of reporting, are subject to a thorough review process. The individual analyst continually reviews the quality of the data through calibration checks, quality control sample results and performance evaluation samples. Data review is initiated by the analyst during, immediately, following, and after the completed analysis.

All levels of the review are documented on Data Review Checklists that are specific to each laboratory section (Technical Data Review; AGP-DataReview-21).

Primary Review

The primary review is often referred to as a "bench-level" review. In most cases, the analyst who generates the data (e.g., logs in, prepares and/or analyzes the samples) is the primary reviewer. In some cases, an analyst may be reducing data for samples run by an auto-sampler set up by a different analyst. In this case, the identity of both the analyst and the primary reviewer is identified in the raw data.

One of the most important aspects of primary review is to make sure that the test instructions are clear, and that all project specific requirements have been understood and followed.

Once an analysis is complete, the primary reviewer ensures, where applicable, that:

- Sample preparation information is complete, accurate, and documented.
- Calculations have been performed correctly.
- Quantitation has been performed accurately.
- Qualitative identifications are accurate.

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- Manual integrations are appropriate.
- Data flags to indicate manual integrations are recorded.
- Manual integrations are authorized by a date and signature or initials of primary analyst.
- Client specific requirements have been followed.
- Method and process SOPs have been followed.
- Method QC criteria have been met.
- QC samples are within established limits.
- Dilution factors are correctly recorded and applied.
- Non-conformances and/or anomalous data have been properly documented and appropriately communicated.
- COC procedures have been followed.
- Primary review is documented by date and initials/signature of primary analyst.
- ◆ All unused portions of hardbound logbooks are 'Z'ed out; corrections are made with a single line drawn through the error and are dated and initialed

Any anomalous results and/or non-conformances noted during the Primary Review are documented on the Data Review Checklist and on a Job Exception; and are communicated to the Supervisor and the Project Manager for resolution. Resolution can require sample reanalysis, or it may require that data be reported with a qualification. Non-conformances are documented per Section 4.9. Case narrative comments are generated by the primary reviewer for any unresolved anomalous results or non-conformances.

Secondary Review

The secondary review is also a complete technical review of a data and is performed by the Supervisor, peer analyst or data specialist. The secondary review is documented on the same Data Review Checklist as the primary review.

The following items are reviewed:

- Qualitative Identification
- Quantitative Accuracy
- Calibration
- QC Samples
- Method QC Criteria
- Adherence to method and process SOPs
- Accuracy of Final Client Reporting Forms
- Manual Integrations Minimal requirement is to spot-check raw data files for manual integration, as verified by date and initials or signature (hardcopy or electronic) of secondary data reviewer. Some regulatory programs require 100% secondary review of manual integrations.
- Completeness
- Special Requirements/Instructions
- Review and approve case narrative comments

If problems are found during the secondary review, which are documented on the data review checklist, the reviewer must work with the appropriate personnel to resolve them. If changes are made to the data, such as alternate qualitative identifications, identifications of additional target analytes, re-quantitation, or re-integration, the secondary reviewer must contact the laboratory analyst and/or primary reviewer of the data so that the primary analyst and/or reviewer is aware of the appropriate reporting procedures.

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Completeness Review

The completeness review includes the review of the case narrative which outlines anomalous data and non-compliances using project narrative notes, Job Exceptions and DQRs generated during the primary and secondary review. The completeness review addresses the following items:

- Is the project report complete?
- Does the data meet with the client's expectations?
- Were the data quality objectives of the project met?

Are QC outages and/or non-conformances approved and appropriately explained in the narrative notes?

The laboratory Department Supervisor, Data Reporting personnel and the Project Manager contribute to the completeness review.

5.3.7 Data Integrity and Security

This section details those procedures that are relevant to computer systems that collect, analyze, and process raw instrumental data, and those that manage and report data.

Security and Traceability

Access to the laboratory's LIMS system that collects, analyzes, and processes raw instrumental data, and those that manage and report data is both controlled and recorded. System users are granted access levels that are commensurate with their training and responsibilities.

Control of the system is accomplished through limitation of access to the system by users with the education, training and experience to perform the task knowledgeably and accurately. System users are granted privileges that are commensurate with their experience and responsibilities.

Computer access is tracked by using unique login names and passwords for all employees that have access to the computer system. Entries and changes are documented with the identity of the individual making the entry, and the time and date. Where a computer system is processing raw instrumental data, the instrument identification number as described in Section 5.4.1 is recorded. The system has the capability of maintaining audit trails to track entries and changes to the data. This function is activated on any computer system that has that capability (e.g., Enviroquant, Chemstation, TotalChrom).

Verification

All the LIMS software programs have been verified prior to use and prior to the implementation of any version upgrades. Verification involves assessing whether the computer system accurately performs its intended function. Verification generally is accomplished by comparing the output of the program with the output of the raw data manually processed, or processed by the software being replaced. The verification of LIMS software programs are conducted by the Information Technology Manager with the assistance of the QA Manager, Operations Manager and the Department Supervisors. The IT Manager documents the approval of the program verifications. All records of the verification are retained as QC records.

Validation

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Software validation involves documentation of the verification of final calculated results. Software validation is performed by the QA manager on all in house programs. Records of validation include original specifications, identity of code, printout of code, software name, software version, name of individual writing the code, comparison of program output with specifications, and verification records as specified above. Records of validation are retained as QC records.

The QA manager must retain documentation of the validation process as defined above. The designated LIMS methods administrator at the laboratory has the responsibility to validate any LIMS methods, calculations or criteria codes prior to use for sample analysis.

Auditing

STLs LIMS System Managers continually review the control, security, and tracking of IT systems and software.

Version Control

The laboratory maintains copies of outdated versions of software and associated manuals for all software in use at the laboratory for a period of 5 years from its retirement date. The associated hardware, required to operate the software, is also retained for the same time period.

5.4 Equipment

5.4.1 Equipment Operation

STL is committed to routinely updating and automating instrumentation. The laboratory maintains state of the art instrumentation to perform the analyses within the QC specifications of the test methods. The laboratory maintains an Equipment List (STLBuffEquipList) that documents the following information:

- Identity
- Date In Service
- Manufacturer's Name, Model Number, Serial Number
- Current Location

All equipment is subject to rigorous checks upon its receipt, upgrade, or modification to establish that the equipment meets with the selectivity, accuracy, and precision required by the test method for which it is to be used. All manufacturer's operations and maintenance manuals are kept up to date and accessible for the use of the equipment operator. Documentation of equipment usage is maintained using analytical run and maintenance logbooks.

5.4.2 Equipment Maintenance

STL employs a system of preventative maintenance in order to ensure system up time, minimize corrective maintenance costs and ensure data validity. All routine maintenance is performed as recommended by the manufacturer and may be performed by an analyst, instrument specialist or outside technician. Maintenance logbooks are kept on all major pieces of equipment in which both routine and non-routine maintenance is recorded.

Any item of equipment or instrumentation that has been subjected to overloading or mishandling, provides suspected results, has been shown by verification or otherwise to be defective, is new or

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not been used for an extended period of time, is taken out of service and tagged as "OUT-OF-SERVICE", (AGP-OutofService-65)

Any instrumentation that is brought back on-line must have MDLs and DOCs performed and have acceptance within prescribed criteria; or calibrated by a certified agency (e.g., balances or Class S weights) and tagged as being within calibration specifications; and proven to provide consistent measurements (e.g., refrigerators, eppendorf pipettes, ovens).

The return to analytical control following instrument repair is documented in the maintenance logbook. Notation of the date and maintenance activity is recorded each time service procedures are performed. Maintenance logbooks are retained as QA records.

Maintenance contracts are held on specific pieces of equipment where outside service is efficient, cost-effective, and necessary for effective operation of the laboratory. Table 9 lists STL's major equipment and the suggested maintenance procedures.

Table 9. Major Equipment Maintenance

Instrument	Procedure	Frequency
Leeman Mercury Analyzer	Check tubing for wear Fill rinse tank with 10% HCl Change dryer tube Fill reductant bottle with 10% Stannous Chloride	Daily Daily As Needed Daily
ICP & ICP/MS	Check pump tubing Check liquid argon supply Check fluid level in waste container Check re-circulator levels Clean or replace filters Check torch Check sample spray chamber for debris Clean and align nebulizer Change pump oil Change Cones Change printer cartridge Replace pump tubing	Daily Daily Daily Monthly As required Daily Monthly Monthly Monthly As required As required As required As required
UV-Vis Spectrophotometer	Clean ambient flow cell Precision check/alignment of flow cell Wavelength verification check	As required As required Annually
Auto Analyzers	Clean sampler Check all tubing Clean inside of colorimeter Clean pump well and pump rollers Clean wash fluid receptacle Oil rollers/chains/side rails Clean optics and cells	Daily Daily Daily Quarterly Weekly Weekly Quarterly

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Table 9. Major Equipment Maintenance

Instrument	Procedure	Frequency
Agilent GC/MS	Pump oil-level check Pump oil changing Analyzer bake-out Analyzer cleaning Resolution adjustment	Monthly Annually As required As required As required
	COMPUTER SYSTEM AND PRINTER: Air filter cleaning Change data system air filter Printer head carriage lubrication Paper sprocket cleaning Drive belt lubrication	As required As required As required As required As required As required
Gas Chromatograph	Compare standard response to previous day or since last initial calibration Check carrier gas flow rate in column Check temp. of detector, inlet, column oven Septum replacement Glass wool replacement Check system for gas leaks with SNOOP Check for loose/frayed power wires and insulation Bake injector/column Change/remove sections of guard column Replace connectors/liners Change/replace column(s)	Daily Daily via use of known compound retention Daily As required As required W/cylinder change as required
Electron Capture Detector (ECD)	Detector wipe test (Ni-63) Detector cleaning	Semi-annually As required
Flame Ionization Detector (FID)	Detector cleaning	As required
Photoionization Detector (PID)	Change O-rings Clean lamp window	As required As required
HPLC	Change guard columns Change lamps Change pump seals Replace tubing Change fuses in power supply Filter all samples and solvents Change autosampler rotor/stator	As required As required Semi-annually or as required As required As required Daily As required
Balances	Class "S" traceable weight check Clean pan and check if level Field service	Daily, when used Daily At least Annually

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Table 9. Major Equipment Maintenance

Instrument	Procedure	Frequency
Conductivity Meter	0.01 M KCl calibration Conductivity cell cleaning	Weekly As required
Turbidimeter	Check light bulb	Daily, when used
Deionized/Distilled Water	Check conductivity Check deionizer light Monitor for VOA's System cleaning Replace cartridge & large mixed bed resins	Daily Daily Daily As required As required
Drying Ovens	Temperature monitoring Temperature adjustments	Daily As required
Refrigerators/ Freezers	Temperature monitoring Temperature adjustment Defrosting/cleaning	Daily As required As required
Vacuum Pumps/ Air Compressor	Drained Belts checked Lubricated	Weekly Monthly Semi-annually
pH/Specific Ion Meter	Calibration/check slope Clean electrode	Weekly As required
BOD Incubator	Temperature monitoring Coil and incubator cleaning	Daily Monthly
Centrifuge	Check brushes and bearings	Every 6 months or as needed
Water baths	Temperature monitoring Water replaced	Daily Monthly or as needed

5.4.3 Equipment Verification and Calibration

All equipment is calibrated prior to use (Initial Calibration) to establish its ability to meet the QC guidelines contained in the test method for which the instrumentation is to be used. All sample measurements are made within the calibrated range of the instrument and in compliance with method requirements. The calibration data, which includes instrument conditions and standard concentrations, is documented in pre-formatted instrument injection logs or within LIMS itself. The preparation of all reference materials used for calibration is documented in standards preparation logbooks in accordance with SOP AGP-STD-14 (Standards Traceability and Preparation Logbooks).

Once an instrument is calibrated, ongoing instrument calibration is demonstrated (Continuing Calibration) at the appropriate frequency as defined in the test method. Refer to the STL Corporate Policy Selection of Calibration Points (P-T-001), for guidance on using calibration data. Any instrument that is deemed to be malfunctioning is clearly marked and taken out of service. When the instrument is brought back into control, acceptable performance is documented.

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5.4.3.1 Instrument Calibration

Specific instrument calibration procedures for various instruments are summarized further in this section, and detailed in the respective analytical methods. Typically, more than one analytical method is available for an analysis. These various methods and other program requirements (e.g., U.S. EPA CLP, AFCEE, USACE, QAPPs, contracts, etc.) may specify different calibration requirements. Therefore, calibration details as specified in the respective laboratory SOPs, Technical Profiles, QAPP, program requirements, and contracts supersede the general instrument calibration procedures are described further in Table 10. Complete details are provided in each method SOP.

Table 10. Minimum Instrument Calibration Procedures

Technique	Activity	Minimum Requirements
Metals (ICAP)	Initial Calibration	Following a period of time sufficient to warm up the instrument, the ICP is calibrated prior to each analytical run or minimally every 24 hours. Calibration standards are prepared from reliable reference materials and contain all metals for which analyses are being conducted. Working calibration standards are prepared fresh daily.
		Prior to an analytical run, the instrument is calibrated using appropriate standards. An Initial Calibration Verification (ICV) standard is analyzed immediately after standardization, followed by an Initial Calibration Blank (ICB). The ICV is from a source other than that used for initial calibration and the ICB must be free of target analytes at and above the value to be reported or appropriate corrective action must be taken. ICP Interference Check Samples (ICSAB) are analyzed at the frequency described in each method SOP.
	Continuing Calibration	The initial calibration is verified during the analysis sequence by analysis of a Continuing Calibration Verification (CCV) standard and a Continuing Calibration Blank (CCB). The response of the CCV must be within the SOP-specified criteria (e.g., ± 10% recovery of the true value). The CCB must be free of target analytes at or above the value to be reported or appropriate corrective action must be taken. If any ICVs/CCVs or blanks exceed their acceptance criteria, appropriate corrective action must be taken.

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Table 10. Minimum Instrument Calibration Procedures

Technique	Activity	Minimum Requirements
Inorganic Colorimetric Methods	Initial Calibration	A full initial standard calibration curve will be prepared for all colorimetric analyses. Working standards to define this curve will include a minimum of five (5) concentrations which cover the anticipated range of measurement, plus a calibration blank. At least one of the calibration standards will be at a concentration which will enable verification of instrument response near the reporting limit as defined in Section 8.6 or a level suitable for meeting specific program requirements. The requirement for an acceptable initial calibration is described in the analytical SOP. If the criteria are not met, appropriate corrective action must be taken. Calibration data, e.g., correlation coefficient, is entered into the laboratory notebook, or associated instrument printouts, and retained with the sample data. If the initial curve is not analyzed that day, a daily calibration verification must be analyzed. This daily calibration will at a minimum consist of a blank and a mid-range standard. Results must be within SOP-specified criteria. If not, reanalysis of the standards may be done once to verify the readings; otherwise, a new curve will be developed.
Inorganic Colorimetric Methods (cont'd.)		For procedures that require pretreatment steps, a minimum of one standard shall be prepared with the pretreatment. If the pre-treated standard is within SOP-specified criteria, the curve will be used. If the pre-treated sample is not within the criteria, the reason will be determined. If it is determined that the difference between the curves is inherent in the procedure, the curve will be based on the standards prepared and carried through the pretreatment. An ICV will be analyzed immediately after the standardization, followed by an ICB. The ICV must be from a source other than that used for initial calibration. The ICV must be within SOP-specified criteria and the ICB must be free of target analytes or appropriate corrective action must be
	Continuing Calibration	taken. The initial calibration is verified during the analysis sequence by analysis of a CCB and a CCV. If any ICVs/CCVs or blanks exceed their acceptance criteria, analysis is terminated, and the instrument is recalibrated. All samples since the last valid calibration verification are evaluated for acceptability or reanalyzed. (If the CCV is elevated and the samples are ND, the data are deemed acceptable.)
lon Chromatography	Initial Calibration	The ion chromatograph will be calibrated every three months or sooner if calibration verification can not be achieved. Calibration standards will be prepared from appropriate reference materials and will include a blank and a minimum of three concentrations to cover the anticipated range of measurements. At least one of the calibration standards will be at a concentration which will enable verification of instrument response near the reporting limit. If SOP-specified calibration criteria cannot be achieved, appropriate corrective action must be taken. Calibration data, e.g., correlation coefficient, will be archived with sample raw data.

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Table 10. Minimum Instrument Calibration Procedures

Technique	Activity	Minimum Requirements	
	Continuing Calibration Verification	A calibration verification standard and blank will be analyzed each day prior to sample analysis, throughout the sequence at a frequency of 10% and at the end of the analysis shift. The response calculated as a percent recovery of the standard must meet SOP or program-specific criteria. The response of the blank must be less than the concentration to be reported for samples analyzed.	
GC/MS	All GC/MS ins These specifica designated ana	trumentation is calibrated to set specifications prior to sample analysis. Itions vary depending on the requirements of the analytical program and the lytical method.	
	Tuning and Mass Calibration	Mass spectrometers are calibrated with perfluorotributylamine (FC-43) or perfluorophenanthrene (FC-5311) as required to ensure correct mass assignment. In addition, at the beginning of the daily work shift, the GC/MS system must be tuned with decafluorotriphenylphosphine (DFTPP) for semivolatiles analysis and 4-bromofluorobenzene (BFB) for volatiles analysis, and calibrated to target compounds.	
		Autotunes are run with PFTBA(perfluorotributylamine), which is encased in a vial inside the mass spec. DFTPP and BFB are run daily (12 hours where appropriate) for SVOA and VOA respectively.	
GC/MS (cont'd.)	Tuning and Mass Calibration	Laboratory work using SW-846 protocols, defines the work shift as a 12-hour period initiated by the injection of DFTPP or BFB. For drinking water programs (500 series methods), a 12-hour work shift is specified in the method for calibration frequency.	
		For wastewater programs (600 series methods), the tune expires when the day's analytical sequence is complete; however, no time limit is given for the length of the daily GC/MS work shift; therefore a maximum of 24 hours for, 624 and 625 is used. Ion abundances will be within the windows dictated by the specific program requirements.	

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Table 10. Minimum Instrument Calibration Procedures

Technique	Activity	Minimum Requirements		
	Initial Calibration	After an instrument has been tuned, initial calibration curves (generally 3-5 points) are generated for the compounds of interest. The low level standard must be at a concentration which will enable verification of instrument response near the reporting limit or at a concentration acceptable to meet program requirements. The other standards must extend through the linear working range of the detector. The parameters requiring quantitation must meet SOP or program-specified criteria prior to initiation of sample analysis. Any sample extracts containing parameters of interest which exceed the concentration of the high level standard, must be diluted to bring the parameters within the range of the standards. Instrument response to these target compounds are evaluated against SOP-specified criteria. Linearity is verified by evaluating the response factors (RF) for the initial calibration standards against SOP-specified criteria.		
		Once an acceptable calibration is obtained, samples may be analyzed up until the expiration of the tune. At that time, the instrument must be retuned prior to further analysis. After acceptable tuning, a continuing calibration standard may be analyzed in lieu of a full multi-point calibration if the SOP-specified criteria are met.		
		The majority of compounds analyzed for GC/MS comprise EPA's Target Compound List (TCL) or Priority Pollutant List (PPL). For add-on compounds not on the current TCL or PPL, initial calibration may be performed using a single point calibration of the additional compound(s), unless prior arrangements are made for a full three-to-five point calibration. Calibration data, to include linearity verification, will be maintained in the laboratory's records of instrument calibrations. 3 to 5 point curves for all GCMS analytes, special list. The only case where single point standards are used is for quantitation of PCBs other than Arochlor 1016 or 1260.		
	Continuing Calibration	During each operating shift, a single calibration standard may be analyzed to verify that the instrument responses are still within the initial calibration determinations, as defined in the specific SOPs. If criteria cannot be met, appropriate corrective action must be taken.		
GC and HPLC	to use as des mixtures will b	graphs and high performance liquid chromatographs will be calibrated prior scribed in analytical SOP or program requirements. Calibration standard be prepared from appropriate reference materials and will contain analytes the method of analysis or program requirements		
GC and HPLC (cont'd.) Initial Calibration Initial calibration will include thre the anticipated range of measure a concentration which will enable the reporting limit or at a concentration. The other star working range of the detector must meet SOP or program-spanalysis. Any sample extracts exceed the concentration of the		Initial calibration will include three or more calibration standards covering the anticipated range of measurement. The low level standard must be at a concentration which will enable verification of instrument response near the reporting limit or at a concentration acceptable to meet program requirements. The other standards must extend through the linear working range of the detector. The parameters requiring quantitation must meet SOP or program-specified criteria prior to initiation of sample analysis. Any sample extracts containing parameters of interest which exceed the concentration of the high level standard, must be diluted to bring the parameters within the range of the standards.		

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Table 10. Minimum Instrument Calibration Procedures

Technique	Activity	Minimum Requirements
	Continuing Calibration	The response of the instrument will be verified for each analysis sequence by evaluation of a daily calibration verification standard at a mid-range concentration. In order to demonstrate that the initial calibration curve is still valid, the calibration check standard must be within SOP or program-specified acceptance criteria for the compounds of interest or the instrument must be recalibrated. For multi-analyte methods, this check standard may contain a representative number of target analytes rather than the full list of target compounds. Optionally, initial calibration (e.g., the full range of concentration levels) can be performed at the beginning of the analysis sequence. Within the analysis sequence, instrument drift will be monitored by analysis of a mid-range calibration standard eventual sequence.
		analysis of a mid-range calibration standard every ten samples or 12 hour sequence (depending on the method protocol), including external QC. If the SOP or program-specified calibration criteria are not met for the compounds of interest, appropriate corrective action must be taken.

5.5 Measurement Traceability

5.5.1 General

Traceability of measurements is assured using a system of documentation, calibration, and analysis of reference standards. Laboratory equipment that are peripheral to analysis and whose calibration is not necessarily documented in a test method analysis or by analysis of a reference standard is subject to ongoing certifications of accuracy.

At a minimum, these include procedures for checking specifications for balances, thermometers, temperature, De-ionized (DI) and Reverse Osmosis (RO) water systems, automatic/eppendorf pipettes and other volumetric measuring devices. Wherever possible, subsidiary or peripheral equipment is checked against standard equipment or standards that are traceable to national or international standards [with the exception of class A glassware (including glass microliter syringes that have a certificate of accuracy)].

An external certified service engineer services laboratory balances on an annual basis. This service is documented on each balance with a signed and dated certification sticker. Balances are calibrated on each day of use. All thermometers and temperature monitoring devices are calibrated annually against a traceable reference thermometer. Temperature readings of ovens, refrigerators, and incubators are checked on each day of use

Laboratory DI and Elga water systems have documented preventative maintenance schedules and the conductivity of the water is recorded on each day of use

Procedures for maintenance and record keeping of support equipment are defined in SOP Support Equipment: Maintenance, Record Keeping and Corrective Actions of Analytical Balances, Temperature Control Devices and Reagent Water (AGP-SupportEquip-02)

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5.5.2 Reference Standards

The receipt of all reference standards is documented in the departmental Chemical History Logbook. Standards are obtained from commercial vendors and sources may vary depending upon the availability of mixes and solutions from vendors. Each production unit is responsible to ensure, when available, that all standards are traceable to EPA, NIST or A2LA and are accompanied by a Certificate of Analysis that documents the standard purity. If a standard cannot be purchased from a vendor that supplies a Certificate of Analysis, the purity of the standard is documented by analysis.

The receipt of each dry chemical, purchased stock solution or reference material to be used as a standard is assigned a unique ID number. The chemical name, manufacturer, lot number, date received, expiration date, date opened and initials of the analyst who opened the chemical are documented. The expiration dates for ampulated solutions shall not exceed the manufacturer's expiration date. Expiration dates for laboratory-prepared stock and diluted standards shall be no later than the expiration date of the stock solution or material or the date calculated from the holding time allowed by the applicable analytical method, whichever comes first. Expiration dates for pure chemicals shall be established by the laboratory and be based on chemical stability, possibility of contamination, and environmental and storage conditions. Expired standard materials shall be either revalidated prior to use or discarded. Revalidation may be performed through assignment of a true value and error window statistically derived from replicate analyses of the material as compared to an unexpired standard. The laboratory labels all standard and QC materials with expiration dates.

The preparation of all daughter solutions, whether a single or multiple-component stock, intermediate, or working standard solution, is documented in a standard solution preparation logbook. This documentation references the Standard ID of the respective parent solution(s) used in its preparation, providing a solid trail back to the solution or chemical received from the vendor. These records include the standard name, final volume, matrix, final concentration, analyst initials, prep date and expiration date. A daughter solution should not have an expiration date which post-dates any of the parent solutions used in its preparation.

References standards are labeled with a unique Standard Identification Number, date received, and the expiration date. All documentation received with the reference standard or documentation of standard purity is retained as a QC record and references the Standard Identification Number. All efforts are made to purchase standards that are \geq 97.0% purity. If this is not possible, the purity is used in performing standards calculations.

The accuracy of calibration standards is checked by comparison with a standard from a second source. In cases where a second standard manufacturer is not available, a different lot is acceptable for use as a second source. The appropriate QC criteria for specific standards are defined in laboratory SOPs. In most cases, the analysis of an ICV or LCS is used as the second source confirmation.

Storage conditions, such as shelf life, ambient or chilled, controlled or restricted access, wet or desiccated, etc., are in conformance with the specifications set in the associated method, the program requirements, or the manufacturer's recommendation, as appropriate.

5.5.3 Reagents

Reagents are, in general, required to be analytical reagent grade unless otherwise specified in method SOPs. Reagents must be, at a minimum, the purity required in the test method. The date

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of reagent receipt and the expiration date as well as the date of reagent preparation (where applicable) are documented in the standards preparation logbooks.

5.6 Sampling

Sample representativeness and integrity are the foundations upon which meaningful analytical results rely. Where documented and approved SAPs and/or QAPPs are in place, they must be made available to the laboratory before sample receipt, and approved by laboratory management before sample receipt.

5.7 Sample Handling, Transport, and Storage

5.7.1 General

COC can be established either when bottles are sent to the field, or at the time of sampling. STL can provide all of the necessary coolers, reagent water, sample containers, preservatives, sample labels, custody seals, COC forms, ice, and packing materials required to properly preserve, pack, and ship samples to the laboratory. Complete details for sample container preparation are contained within Sample Container Preparation and Shipment SOP (ASR-Bottle-03). A summary of sample receipt is as follows with complete details available within the Receipt of Analytical Samples SOP (ASR-Receipt-05).

Samples are received at the laboratory by the designated sample custodians and a unique LIMS job number is assigned. The following information is recorded for each sample shipment:

- Client/Project Name.
- Date and Time of Laboratory Receipt.
- Laboratory Job Number
- Signature or initials of the personnel receiving the cooler and making the entries.

Upon inspection of the cooler and custody seals, the sample custodian opens and inspects the contents of the cooler, and records the cooler temperature. If the cooler arrival temperature exceeds the required or method specified temperature range by $\pm 2^{\circ}$ C (for samples with a temperature requirement of 4° C, a cooler temperature of just above the water freezing temperature to 6° C is acceptable); sample receipt is considered "compromised" and the procedure described in Section 4.7.1 is followed. All documents are immediately inspected to assure agreement between the test samples received and the COC.

Any non-conformance, irregularity, or compromised sample receipt as described in Section 4.7.1 is documented in an Analytical Receipt Resolution Form (ARRF) and brought to the immediate attention of the Project Manager for resolution with the client. The COC, shipping documents, documentation of any non-conformance, irregularity, or compromised sample receipt, record of client contact, and resulting instructions become part of the permanent project record.

Samples that are being tested at another STL facility or by an external subcontractor are repackaged, iced, and sent out under COC.

Following sample labeling as described in Section 5.7.2, the sample is placed in storage. Refrigerated storage coolers are maintained at $4 \pm 2^{\circ}$ C and the temperatures are monitored daily.

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All samples are stored according to the requirements outlined in the test method, and in a manner such that they are not subject to cross contamination or contamination from their environment.

Access to the laboratory is restricted to laboratory personnel or escorted guests as described in Section 5.2. Therefore, once sample possession is relinquished to the laboratory, the sample is in a designated secure area (e.g., the laboratory facility) accessible only to authorized personnel. Locked storage coolers are available for protocol that require internal COC procedures.

5.7.2 Sample Identification and Traceability

The sample custodian organizes the sample containers, COCs, and all pertinent information associated with the samples. The sample identity is verified against all associated sample information. Any inconsistencies are documented via an ARRF and forwarded to the Project Manager for resolution with the client prior to identifying the sample(s) into LIMS.

Each sample container is assigned a unique Sample Identification Number that is cross-referenced to the client identification number such that traceability of test samples is unambiguous and documented. Each sample container is affixed with a durable sample identification label.

All unused portions of samples, including empty sample containers, are returned to the secure sample control area, unless it has been documented that the container was disposed.

5.7.3 Sub-Sampling

Taking a representative sub-sample from a container containing a soil or solid matrix is necessary to ensure that the analytical results are representative of the sample collected in the field. The size of the sample container, the quantity of sample fitted within the container, and the homogeneity of the sample need consideration when sub-sampling for sample preparation.

After thoroughly mixing the sample within the sample container or transfer to a suitable plastic bag, a sub-sample from various quadrants and depths of the sample are taken to acquire the required sample weight. Any non-homogenous looking material is avoided and noted as such within the sample preparation record.

5.7.4 Sample Preparation

Sample preparation procedures vary for each matrix and analytical method are as referenced in the laboratory SOPs.

5.7.5 Sample Disposal

Samples are retained in STL storage facilities for 30 days after the project report is sent unless prior written arrangements have been made with the client. Samples may be held longer or returned to the client per written request. Unused portions of samples are disposed of in accordance with federal, state and local regulations. The laboratory removes or defaces sample labels prior to disposal unless this is accomplished through the disposal method (e.g., samples are incinerated). Complete details on the disposal of samples, digestates, and extracts is available within the Sample Disposal SOP (ASR-DISP-33) and Hazardous Waste Management SOP (AWM-HazMg-01).

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5.8 Assuring the Quality of Test Results

5.8.1 Proficiency Testing

The laboratory analyzes Proficiency Test (PT) samples as required for accreditation and as outlined in NELAC. The laboratory participates in the PT program semi-annually for each PT field of testing for which it is accredited, according to the NELAC PT field of testing published guidelines. This includes drinking water, wastewater and solid/soil matrices.

The laboratory also participates in various client PT programs, when submitted.

PT samples are handled and tested in the same manner (procedural, equipment, staff) as environmental samples. Results of PT samples are distributed to the laboratory line management for review and action, if required. Any required response to deficiencies are submitted to the QA department for review and are filed with the PT study records. PT test sample data are archived using the requirements for project and raw data record retention.

5.8.1.1 Double Blind Performance Evaluation

The laboratory participates in an annual double blind performance evaluation study. An external vendor is contracted to submit double blind samples to the laboratory. Both the level of customer service and the accuracy of the test results are assessed objectively by the external contractor, who provides a detailed report to the Corporate Quality Director and to the laboratory. This is administered as a double blind program in order to assess all facets of the laboratory's operations.

5.8.2 Control Samples

Control samples (e.g., QC indicators) are analyzed with each batch of samples to monitor laboratory performance in terms of accuracy, precision, sensitivity, selectivity, and interferences. Control samples must be uniquely identified and correlated to unique batches. Control samples further evaluate data based upon (1) Method Performance, which entails both the preparation and measurement steps; and (2) Matrix Effects, which evaluates field sampling accuracy, precision, representativeness, interferences, and the effect of the matrix on the method performed. Each regulatory program and each method within those programs specify the control samples that are prepared and/or analyzed with a specific batch.

Control sample types and typical frequency of their application are outlined Sections 5.8.2.1 through 5.8.2.5 and Tables 11 through 15. Note that frequency of control samples vary with specific regulatory, methodology and project specific criteria. Complete details on method and regulatory program control samples are as listed in Sections 7 and 8 typically of each method SOP.

5.8.2.1 Method Performance Control Samples: Preparation Batch

Sample preparation or pre-treatment is commonly required before analysis. Typical preparation steps include homogenization, grinding, solvent extraction, sonication, acid digestion, distillation, reflux, evaporation, drying and ashing. During these pre-treatment steps, samples are arranged into discreet manageable groups referred to as preparation (prep) batches. Prep batches provide a means to control variability in sample treatment.

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Control samples are added to each prep batch to monitor method performance (Table 11) and are processed through the entire analytical procedure with investigative/field samples.

Table 11. Preparation Batch Control Samples

Control		Details
Sample Type		Alegi - Chamining
Method Blank (MB)		Monitors for potential contamination introduced during the sample preparation and analytical processes.
		1 per batch of ≤ 20 samples per matrix type per sample extraction or preparation method.
	Description	Organics: Laboratory pure water for water samples or a purified solid matrix for soil or solid samples (when available or when requested); solid matrices commonly include sodium sulfate, vendor or agency supplied soil or solid, or purchased sand; these solids may require purification at the laboratory prior to use. Inorganics: Laboratory pure water for both water and soil or sediment samples.
		Volume/weights are selected to approximately equal the typical sample volume/weight used in sample preparation; and final results in a soil/solid batch may be calculated as mg/kg or ug/kg, assuming 100% solids and a weight equivalent to the aliquot used for the corresponding field samples, to facilitate comparison to actual field samples.
Laboratory Control	Use	Measures the accuracy of the method in a blank matrix and assesses method performance independent of potential field sample matrix affects.
Sample (LCS)	Typical Frequency ¹	1 per batch of ≤ 20 samples per matrix type per sample extraction or preparation method. For multi-analyte methods, the LCS may consist of surrogates in the blank matrix, and or a representative selection of target analytes/internal standards.
	Description	Prepared from a reference source of known concentration and processed through the preparation and analysis steps concurrently with the field samples. Aqueous LCS's may be processed for solid matrices unless a solid LCS is requested; final results may be calculated as mg/kg or ug/kg, assuming 100% solids and a weight equivalent to the aliquot used for the corresponding field samples, to facilitate comparison with the actual field samples.
Known QC Sample	Use	Comply with regulatory requirements; check the accuracy of an analytical procedure; troubleshoot method performance problems; verify an analyst in training's ability to accurately perform a method; to verify the return-to-control after method performance problems; and may also be used as an LCS.
	Typical Frequency ¹	As defined by the client or QAPP.
Known QC Sample (cont'd.)	Description	Obtained from outside suppliers or agencies; generally require preparation from concentrated materials by dilution into a standard matrix; contain known analytes or compounds; acceptance limits are provided by the vendor.

¹ Denotes an STL required frequency.

Field blanks, equipment blank and trip blanks, when received, are analyzed in the same manner as other field samples. However, a field blank should not be selected for matrix QC, as it does not

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provide information on the behavior of the target compounds in the field samples. Usually, the client sample ID will provide information to identify the field blanks with labels such as "FB", "EB", or "TB".

5.8.2.2 Method Performance Control Samples: Matrix

Matrix control samples include sample duplicates (MD), sample matrix spikes (MS), and sample surrogate spikes. These control samples help monitor for potential physical and chemical effects which may interfere with the precision and/or accuracy of the selected analytical method. Since interferences can enhance or mask the presence of target analytes, matrix control samples measure the degree of interference and are used to assist in the interpretation of the analytical results. The laboratory avoids performing matrix QC on known field blank samples, such as trip blanks and rinsates, since these samples are not indicative of the sample matrix.

Table 12. Matrix Control Samples

Control Sample Type		Details
Matrix Duplicate (MD)	Use	Monitors the effect of site matrix on the precision of the method; and of the reproducibility of laboratory preparation and measurement techniques. Note: Precision may also be affected by the degree of homogeneity of the sample, particularly in the case of non-aqueous samples or aqueous samples with particulates. Sample homogeneity and matrix effect should be considered when field samples are used to assess reproducibility. Note: A field duplicate, when received, measures Representativeness of sampling and the effect of the site matrix upon precision.
Matrix Duplicate (MD) (cont'd.)	Typical Frequency ¹	1 per 20 samples per matrix or per SAP/QAPP 2.
	Description	Performed by analyzing two aliquots of the same field sample independently; analyzed for each associated sample matrix (e.g., when requested by the client or the analytical method).
Matrix Spike (MS)	Use	Measures the effect of site sample matrix on the accuracy of the method.
Matrix Spike (MS) (cont'd.)	Typical Frequency ¹	1 per 20 samples per matrix or per SAP/QAPP.
	Description	Aliquot of a field sample which is spiked with the analytes or compounds of interest; analyzed for each associated sample matrix (when requested by the client or analytical method). The determination of MS percent recovery (% R) requires an analysis of a fortified sample and a non-fortified sample under the same procedural conditions (e.g., sample volumes, dilutions, procedural conditions, etc.). The concentration determined in the non-fortified sample is subtracted from the fortified sample concentration before determining the %R. The degree of homogeneity of the sample, particularly in the case on non-aqueous samples or samples with particulates, may affect the ability to obtain representative recoveries.
Matrix	Use	Measures effect of site sample matrix on precision of method.

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Table 12. Matrix Control Samples

Control Sample Type	Details		
Spike Duplicate	Typical Frequency ¹	1 per 20 samples per matrix, when requested by the client or the analytical method, or per SAP/QAPP 2.	
(MSD)	Description	Alternative to sample duplicate. Generally, inorganic protocols specify an MD/MS and organic protocols specify an MS/MSD.	
Surrogate	Use	Measures method performance to sample matrix (organics only).	
Spike	Typical Frequency ¹	Every QC and analytical sample.	
	Description	Compounds similar to the target analytes in structure, composition and chromatography, but not typically found in the environment, are added to each QC and analytical sample, prior to preparation (e.g., extraction). If the surrogates in an analytical batch do not all conform to established control limits, the pattern of conformance in investigative and control samples is examined to determine the presence of matrix interference or the need for corrective action.	
Internal Standards	Use	Monitor the qualitative aspect of organic and inorganic analytical measurements.	
	Typical Frequency ¹	All organic and ICP methods as required by the analytical method.	
	Description	Used to correct for matrix effects and to help troubleshoot variability in analytical response and are assessed after data acquisition. Possible sources of poor internal standard response are sample matrix, poor analytical technique or instrument performance.	

¹ Denotes an STL required frequency.

5.8.2.3 Matrix QC Frequencies

The frequency of matrix QC indicators depends on regulatory program compliance, a project's data quality objectives, or a client's requirements. The following frequency will be applied to samples when the regulatory programs are known and it does not conflict with project or client requirements.

Table 13. EPA Program Requirements

Program	Description ¹
SDWA	MD performed at a 10% frequency or 1 per preparation batch of ≤10 samples, whichever is more frequent.
CWA	MS (GC methods) and MD is performed at a 10% frequency or 1 per preparation batch of ≤10 samples, whichever is more frequent. For GC/MS Methods, MS is performed at a 5% frequency or 1 per preparation batch of ≤20 samples, whichever is more frequent.
RCRA	MS/MSD or MS/MD is performed at a rate of 5% per client (independent of the preparation batch). For clients submitting less than 10 samples, the method matrix QC requirement may be satisfied by another client's sample within the same prep batch unless the paperwork indicates a client requirement for matrix QC.
U.S. EPA CLP	MS/MSD or MS/MD is performed at a rate of 5% or 1 set per Sample Delivery Group (SDG) per matrix, independent of the prep batch. Samples are processed in simultaneous or continuous batches.

² Either an MSD or an MD is required per 20 samples per matrix or per SAP/QAPP.

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5.8.2.4 Method Performance Control Samples: Instrument Measurement

Control samples are used to ensure that optimum instrument performance is achieved. These samples help ensure that the proper identification and quantitation of target compounds or analytes are achieved. The instrument control samples appropriate to each analytical technique are described in laboratory SOPs for each respective method. A brief description of these checks is included in Table 14.

Table 14. Instrument Performance Control Samples

Control Sample Type		Description		
		Inorganics		
ICV	Use	Calibration standard of known concentration prepared from a source other than that used for the calibration standards.		
	Sequence	Analyzed after the standard curve to confirm calibration.		
ICB	Use	Blank water or solvent; confirms the calibration and assures that any potential contamination is less than the reporting limit.		
	Sequence	Analyzed immediately after the ICV.		
ICP Interference	Use	Verifies the absence of spectral interferences.		
Check Samples (ICSA/ICSB)	Sequence	Analyzed consecutively at the beginning of each eight hour analytical sequence, after the ICV/ICB, and again at an eight hour frequency following a CCV/CCB. When CLP protocols are followed, the ICSA/B will be analyzed with the analytical sequence, before the final CCV/CCB.		
Reporting Limit Verification	porting Limit Use Verifies linearity near the reporting limit for CLP metals			
Standard (CRA and CRI)	Sequence	Performed only when analyzing CLP Samples or as specified the client or program. Analyzed after the ICB. The CRI is also analyzed at the end of the eight hour analytical sequence, pricanalysis of the final CCV/CCB.		
CCV	Use	Confirm that the instrument performance has not significantly changed during the analytical sequence; to verify stable calibration throughout the sequence; and/or to demonstrate that instrument response did not drift over a period of non-use. May be made from a source other than that used for the standard curve, however if the ICV is 2 nd source, the CCV may be same source.		
	Sequence	Analyzed at 10% or every two hours, whichever is more frequent; also analyzed at the end of the analytical sequence.		
CCB	Use	Water blank used to confirm that the baseline has not drifted and to monitor for contamination at the reporting limit.		
	Sequence	Analyzed at a rate of 10% for inorganics and at a rate of 1 per 10 readings/injections or every two hours, whichever is more frequent, for CLP metals; also analyzed at the end of the analytical sequence.		
ICP Metals Linear Range	Use	Verify linearity and document the upper limit of the calibration range for each element.		

¹ MS, MSD and MD may not be applicable to some analytical protocols because of the nature of the sample or protocol.

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Table 14. Instrument Performance Control Samples

Control Sample Type	1	Description	
Analysis Standard (LRS)			
ICP Inter- Element	Use	Correction factors for spectral interference (particularly due to Al, Ca, Fe, and Mg).	
Correction (IEC)	Sequence		
		Organics	
GC/MS Tuning & Performance	Use	Ensures correct mass assignment and is monitored through response to target compounds during initial and continuing calibration, with minimum response criteria for specified system performance check compounds (SPCCs), and linearity is verified by evaluating the response factors (RF) for calibration check compounds (CCCs).	
	Sequence	Tuned at the beginning of the daily work shift. Throughout the analysis, blanks, internal standard areas, surrogates, chromatographic baseline, resolution of peaks, and overall quality of the chromatography are used collectively to monitor instrument performance.	
GC & HPLC Instrument Performance	Use	Monitored through retention time shift evaluation, linearity checks, and degradation checks of selected target compounds (e.g., for Endrin or DDT as appropriate).	
GC & HPLC Instrument Performance	Sequence	Continuing calibration verification (e.g., blanks, shifts in chromatographic baseline or retention times, resolution of peaks, and overall quality of the chromatography) throughout the analytical sequence is accomplished through analysis of calibration check standards.	

5.8.2.5 Method Performance Control Samples: Analysis Batch

Matrix specific control samples are used to assess the precision and accuracy of the method as applied to the specific sample matrix. These indicators provide information on sample matrix effects that is independent of the efficiency of the preparatory technique. The method performance control samples appropriate to each analytical technique are identified in the respective method. A brief description of these checks is included in Table 15.

These control samples are performed to provide a tool for evaluating how well the method performed for the respective matrix. These values are used by the client to assess the validity of a reported result within the context of the project's data quality objectives. For matrix specific QC results falling outside laboratory control limits which are attributed to matrix affects, no systematic corrective action is taken.

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Table 15. Analysis Batch Performance Control Samples

Control Sample Type	1	Description
ICP Serial Dilution	Use	5X Dilution of a field sample (performed at the instrument) to check for possible physical and/or chemical interferences.
	Sequence	5% of field samples or 1 per ≤20 samples per batch.
Method of Standard	Use.	When specified by the analytical protocol or by client request.
Addition (MSA)	Sequence	When specified by the analytical protocol or by client request.

5.8.3 Statistical Control Limits and Charts

Statistical control limits and control charts are used to establish method performance of a given analysis and to monitor trends of QC results graphically over time. Once a data base of the laboratory results for a method/matrix/QC analyte combination is established, the acceptability of a given analysis of that QC parameter (and of the analytical batch to which it belongs) can be evaluated in light of the laboratory's normal performance. This is intended to help identify problems before they might affect data. Often, patterns of response that are not at all evident in sets of numbers are very distinct when the same values are viewed as a chronological graph.

Establishment of Limits

The purpose of using statistical control limits is to define, for each analyte in a given method/matrix/QC type combination, a range of expected values. This range encompasses the random variation that occurs normally in the laboratory and allows one to evaluate control samples in that context, rather than according to an arbitrary or external set of values. Limits for accuracy and precision are defined below:

Accuracy

As recoveries of a QC analyte in a given matrix are tabulated over time, a mean value for recovery is established, as is the standard deviation (s) of those recoveries. If the analysis is in statistical control (e.g., if the set of QC recoveries over time show random variation about the mean) approximately 99.7% of all recoveries for that QC will fall within three standard deviations (3s) of the mean. Thus, assuming that the mean itself is an acceptable level of recovery, the values corresponding to 3s above and 3s below the mean are defined as the Control Limits. Any single recovery outside these values is assumed to have resulted from some circumstance other than normal variation and shall be investigated.

Roughly 95% of points should fall within 2s of the mean. The values +2s and -2s are the Warning Limits. Any normal result has approximately a 1/20 chance of being between 2s and 3s from the mean, so a result in this region doesn't necessarily warrant corrective action, but attention should be paid to such points.

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Precision

Precision is used to indicate matrix variability so that appropriate decisions can be made by the client when repeated analyses vary significantly. The coefficient of variation, expressed as a percentage (e.g., the %RSD) for the data set used to calculate accuracy control limits defines the control limit for precision. Duplicate analyses of the QC samples, such as duplicates or MS/MSD, should have an RPD less than or equal to this established precision control limit to be considered free of matrix interferences.

The laboratory calculates statistical control limits on an annual basis, or more frequently if change have been made to the analytical process which affects the chemistry of the method. Such limits are available on a project or QAPP-specific basis.

5.8.4 Calibration

Calibration protocols are method-specific, are briefly described in Table 10 and are defined in the Sections 6 & 7 of the method SOPs.

5.8.5 Glassware Cleaning

All glassware is thoroughly cleaned prior to use to ensure that sample integrity is not affected from artifacts caused by contaminated glassware.

A summary of general cleaning procedures follows with details provided in the Laboratory Glassware Cleaning SOP (AGP-Glass-04):

General laboratory glassware is cleaned with a low- or non-phosphate detergent, followed by thorough rinsing with tap water and deionized water.

Volumetric flasks and pipettes used for inorganics (method dependent), test tubes and caps used for micro-COD procedures, phosphate glassware, and metals-related glassware include an acid-washing step.

BOD glassware, includes use of EPA approved disposable plastic bottles or cleaning with a nitric or sulfuric acid and/or a NOCHROMIX-washing step.

Organic glassware includes a solvent-wash,

5.8.6 Permitting Departures from Documented Procedure

Where a departure from a documented SOP, test method, or policy is determined to be necessary, or unavoidable, the departure is documented in a Job Exception and reported in the case narrative. In most cases, these departures can be made with the approval of the Department Supervisor, Project Manager and the client. Issues of serious concern, as determined by the Operations Manager, Department Supervisor or Project Manager, will be brought to the attention of the Laboratory Director and/or QA Manager. In some instances, it is appropriate to inform the client before permitting a departure. The Project Manager, in consultation with the QA Manager, will make the determination as to the degree of notification required by the client.

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On rare occasions, special analytical techniques will be requested for research, project specific requirements, or client needs. In these instances, SOPs may not be available, however, the analyst will thoroughly record the analytical steps and observations within a bound preformatted logbook.

5.8.7 Development of QC Criteria, Non-Specified in Method/Regulation

Where a method or regulation does not specify acceptance and/or rejection criteria, the laboratory must examine the data user's needs and the demonstrated sensitivity, accuracy and precision of the available test methods in determining appropriate QC criteria.

Data users often need the laboratory's best possible sensitivity, accuracy, and precision using a routinely offered test method, or are unsure of their objectives for the data. For routine test methods that are offered as part of STL's standard services, the laboratory bases the QC criteria on statistical information such as determination of sensitivity, historical accuracy and precision data, and method verification data. The method SOP includes QC criteria for ongoing demonstration that the established criteria are met (e.g., acceptable LCS accuracy ranges, precision requirements, method blank requirements, initial and continuing calibration criteria, etc.).

In some cases, a routine test method may be far more stringent than a specific data user's needs for a project. The laboratory may either use the routinely offered test method, or may opt to develop an alternate test method based on the data user's objectives for sensitivity, accuracy, and precision. In this case, it can be appropriate to base the QC criteria on the data user's objectives, and demonstrate through method verification and ongoing QC samples that these objectives are met.

For example, a client may require that the laboratory to test for a single analyte with specific DQOs for sensitivity, accuracy, and precision as follows: Reporting Limit of 10 ppm, Accuracy ±25%, and RSD of <30%. The laboratory may opt to develop a method that meets these criteria and document through the Method Blank results, MDL study, and LCS results that the method satisfies those objectives. In this case, both the method and the embedded QC criteria have been based on the client's DQOs.

In some cases, the data user needs more stringent sensitivity, accuracy, and/or precision than the laboratory can provide using a routine test method. In this case, it is appropriate that the laboratory provide documentation of the sensitivity, accuracy, and precision obtainable to the data user and let the data user determine whether to use the best available method offered by the laboratory, or determine whether method development or further research is required.

5.9 Project Reports

The SOP for data package assembly and reporting formats is ARP-Report-125 and a summary of this procedure follows.

Analytical reports comprise final results (uncorrected for blanks and recoveries unless specified), methods of analysis, levels of reporting, surrogate recovery data, and method blank data. In addition, special analytical problems will be noted in the case narratives. The number of significant figures reported are consistent with the limits of uncertainty inherent in the analytical method. Consequently, most analytical results will be reported to no more than two (2) or three (3) significant figures. Data are normally reported in units commonly used for the analyses performed.

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Concentrations in liquids are expressed in terms of weight per unit volume (e.g., milligrams per liter, mg/L). Concentrations in solid or semi-solid matrices are expressed in terms of weight per unit weight of sample (e.g., micrograms per kilograms, ug/kg). Reporting limits take into account all appropriate concentration, dilution, and/or extraction factors, unless otherwise specified by program requirements (e.g., IRPMS reports).

A client report is generated with various steps of approval prior to printing of the final version. If any analytical anomalies were encountered during the analyses, e.g., an out-of-control matrix duplicate, it is documented in a case narrative. The case narrative is prepared by the respective operating unit, project manager, or other designated personnel and inserted in the final report.

The final report forms are printed, data packages are organized, a glossary of flags and acronyms is added, and reports are paginated.

5.9.1 General

The criteria described in Section 5.9.2 apply to all Project Reports that are generated under NELAC requirements. The criteria described in Section 5.9.3 and 5.9.4 apply to all Project Reports.

5.9.2 Project Report Content

- ◆ Title
- Laboratory name, address, telephone number, contact person
- Unique Laboratory Project Number
- Name and Address of Client
- Client Project Name (if applicable)
- Laboratory Sample Identification
- Client Sample Identification
- Matrix and/or Description of Sample
- Dates: Sample Receipt, Collection, Preparation and/or Analysis Date
- Definition of Data Qualifiers
- Reporting Units
- Test Methods
- Report Paginated

The following are required where applicable to the specific test method or matrix:

- Solid Samples: Indicate Dry or Wet Weight
- ♦ Whole Effluent Toxicity: Statistical package used
- If holding time ≤ 48 hours, Sample Collection, Preparation and/or Analysis Time
- Indication by flagging or narrative comment where results are reported below the quantitation limit.

5.9.3 Project Narrative

A Project Narrative and/or Cover Letter is included with each project report and, at a minimum, includes an explanation of any and all of the following occurrences:

- Listing of any subcontracted analyses and subcontractor location
- Non-conformances

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- "Compromised" sample receipt (see Section 4.7.1)
- Method Deviations
- QC criteria failures
- Any authorized SOP deviations, non-conformances and QC failures must be covered in the case narrative, cover letter or within the report.

Project Release

The Project Manager or his designee authorizes the release of the project report with a signature.

Where amendments to project reports are required after issue, these are documented in the form of a DQR (refer to Section 4.8) and can be in the form of a separate document and/or electronic data deliverable resubmittal. The revised report is clearly identified as revised with the date of revision and the initials of the person making the revision. Specific pages of a project report may be revised using the above procedure with an accompanying cover letter indicating the page numbers of the project revised. The original version of the project report will be kept intact and the revisions and cover letter included in the project files.

5.9.4 Subcontractor Test Results

Subcontracted data are clearly identified as such, and the name, address, and telephone number for the laboratory performing the test is included in the project report. Subcontracted results from laboratories external to STL are not reported on STL report forms or STL letterhead. Test results from more than one STL facility are clearly identified with the name of the STL facility that performed the testing, address, and telephone number for that facility. Data from subcontractors' reports may be added to an STL electronic deliverable.

Data subcontracted within STL may be reported on the originating laboratory's report forms provided the following mandatory requirements are met:

- The name, address, and telephone number of the facility are provided.
- Analytical results produced by the STL intra-company subcontractor are clearly identified as being produced by the subcontractor facility.
- ♦ The intra-company subcontractor's original report, including the chain of custody is retained by the originating laboratory.
- Proof of certification is retained by the originating laboratory.
- All information as outlined in Section 5.9.2 is included in the final report where the report is required to be compliant with NELAC, for both the originating and subcontracting laboratory.

5.9.5 Electronic Data Deliverables

Electronic Data Deliverables (EDD) are routinely offered as part of STL's services. STL offers a variety of EDD formats. EDD specifications are submitted to the IT department by the PM for review and undergo the contract review process in Section 4.4.1. Once the laboratory has committed to providing diskettes in a specific format, the coding of the format may need to be performed. This coding is documented and validated. The validation of the code is retained as a QC record.

EDDs are subject to a review to ensure their accuracy and completeness. If EDD generation is automated, review may be reduced to periodic screening if the laboratory demonstrates that it can

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routinely generate that EDD without errors. Any revisions to the EDD format are reviewed until it is demonstrated that it can routinely be generated without errors. If the EDD can be reproduced accurately and if all subsequent EDDs can be produced error-free, each EDD does not necessarily require a review.

5.9.6 Project Report Format

Cited Status

STL offers a wide range of project reporting formats, including EDDs, short report formats, and complete data deliverable packages modeled on the Contract Laboratory Protocol (CLP) guidelines. Regardless of the level of reporting, all projects undergo the levels of review as described in Section 5.3.6.

Appendix. List of Cited SOPs and Work Instructions

Section No(s).	Status	Description	Document No.
1.1	Buff	Certification Listing	0718 %
1.6	Buff	Container Management: Process Operation/Bottle	STLBuffCertList
5.7.1		Order Set-Up	APM-Bottle Order-03
1.6 4.4.2	Buff	Project Management: Project Planning Process/Project Information Requirements	APM-ProjInfo-20
4.1.1 5.4.1	Buff	Capital Equipment Listing	STLBuffEquipList
4.1.2.9	Buff	Computer System Account and Naming Policy Computer System Password Policy	P-I-003
		Software Licensing Policy	P-I-004
		Virus Protection Policy	P-I-005 P-I-006
4.3.1.1	Buff	SOP Master Index	
5.3.2	Can	OCI Master Maex	STLBuff_SOPIndex
4.3.2	Buff	Data Management: Record Storage and Retention	AGP-RecordStorage
4.12.3			56
4.4.2	Buff	Project Kick-Off Meetings	APM-ProjInfo-20
4.6	Buff	Procurement of Laboratory Supplies and Services	APH-Supply-08
4.6.1	STL	Testing Solvents and Acids	S-T-001
4.7.2	Buff	Client Confidentiality	APM-ProjInfo-20
4.8	Buff	Data Quality Request	AQA-DQR-65
4.8	Buff	Preventative or Corrective Action	AQA-CA-35
4.8 4.11	Buff	Job Exception Report (Non-conformance Report)	AQA-CA-35
4.11	Buff	Quality Systems Management Review	AQA-Management Review-45
4.11	Buff	Preventive Action Measures	AQA-CA-35
4.13	STL	Systems Audits	S-Q-002
5.1.2	Buff	Laboratory Personnel Training	AQA-Train-10
5.1.3	STL	Ethics Policy	P-L-006
5.3.1	Buff	Methods Capabilities & Index	ASR-Prsv-07
5.3.2	Buff	SOP Interim Change	AQA-SOP-55
5.3.5	STL	MDL Policy	S-Q-003
5.3.6.1	STL	Acceptable Manual Integration Practices	S-Q-003

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List of Cited SOPs and Work Instructions Appendix.

Cited Section No(s).	Status	Description	Document No.
5.3.6.2	Buff	Data Review Checklists / Technical Data Review GC Extractables / HPLC GC Volatiles GC/MS: Volatiles and Semi-Volatiles Metals Wet Chemistry	AGP-DataReview-21
5.4.2	Buff	Instrument and Equipment Out-of-Service Tagging	AGP-OutofService-65
5.4.3	STL	Selection of Calibration Points	P-T-001
5.4.3	Buff	Standards Traceability and Preparation	AGP-STD-14
5.5.1	Buff	Balance Calibration, Care and Use	AGP-SuppEquip-02
5.5.1	Buff	Thermometer Calibrations	AGP-SuppEquip-02
5.5.1	Buff	Water Quality	AGP-SuppEquip-02
5.7.1	Buff	Sample Receipt: Handling and Processing	ASR-Receipt-05
5.7.1	Buff	Sample Container Preparation and Shipment	ASR-Bottle-03
5.7.5	Buff	Laboratory Waste Disposal Procedures	ASR-Disp-33 and AWM-Haz.Mg-01
5.8.5	Buff	Glassware Cleaning Procedures	AGP-Glass-04
5.9 5.9.6	Buff	Data Management: Reporting	ARP-Report-125

APPENDIX 6
PID Specifications

MiniRAE 2000

PORTABLE VOC MONITOR PGM-7600

OPERATION AND MAINTENANCE MANUAL

(Document No: 011-4001)

Rev. B



(

RAE SYSTEMS INC. 1339 Moffett Park Drive Sunnyvale, CA 94089

June 2001





GENERAL INFORMATION

in a rugged ABS + PC case with a backlit 1 line by 8 character dot matrix LCD and 3 keys to provide easy user interface.

General Specifications Table 1.1

Ester y

- ' '	Table 1.1
Portable VOC Monitor Specification	
Size:	8.2"L x 3.0"W x 2.0"H
Weight:	19.5 oz with battery pack
Detector:	Photo-ionization sensor with 9.8, 10.6 or 11.7 eV UV lamp
Battery:	A 4.8V /1250 mAH Rechargeable Nickel Metal Hydride battery pack (snap in, field replaceable)
Battery charging:	10 hours charge through built-in charger
Operating Hours:	Up to 10 hours continuous operation
Display:	1 line by 8 characters 5x7 dot matrix LCD (0.4" character height) with LED back light automatically in dim light
Range, Resolution	& Response time (t90):
Isobutylene	(calibration gas)
	0-99 ppm 0.1 ppm 2 sec
194	100-1,999 ppm 1.0 ppm 2 sec
in the second	2000-10,000 ppm 1.0 ppm 2 sec
Measurement accu	racy (Isobutylene):
the state of the s	$0 - 2000 \text{ ppm: } \pm 2 \text{ ppm or } 10\% \text{ of }$
	reading.
LIST CONTROL OF THE PARTY OF TH	$>$ 2000 ppm: \pm 20% of reading

GENERAL INFORMATION

PID Detector: Easy access to lamp and sensor for cleaning and replacement Correction Factors: Built-in 102 VOC gases Calibration: Two-point field calibration of zero and standard reference gas Calibration Memory: Store up to 8 separate calibration, alarm limits and span value Weller Shire Inlet probe: Flexible 5" tubing Keypad: 1 operation key and 2 programming keys Direct Readout: Instantaneous, average, STEL and peak value, battery voltage and elapsed time Intrinsic Safety: UL & cUL Class 1, Division I, Group A, B, C, D, TEMPERATURE CODE T3C (US & Canada); EEx ia IIC T4 (Europe) EM Interference: No effect when exposed to 0.43 W/cm² RF interference (5 watt transmitter at 12 inches) Alarm Setting: Separate alarm limit settings for Low, High, STEL and TWA alarm Operating Mode: Survey or Hygiene mode Alarm: 90 dB buzzer and flashing red LEDs to indicate exceeded preset limits, low

battery voltage, or sensor failure.

GENERAL INFORMATION

External Alarm: Optional plug-in pen-size vibration

alarm or remote alarm

Alarm Mode: Latching or automatic reset

Real-time Clock: Automatic date and time stamps on

data logged information

Data logging: 15,000 points with time stamp, serial

number, user ID, site ID, etc.

Communication: Upload data to PC and download

instrument setup from PC through RS-

232 port

Sampling Pump: Internally integrated. Flow rate: 450-

550 cc/min.

Temperature: 0° to 45°C (32° to 113°F)

Humidity: 0 % to 95 % relative humidity

(non-condensing)

Housing: ABS + PC, conductive coating, splash

and dust proof, will withstand 1 meter

drop test with rubber boot

Attachment: Wrist strap, rubber boot and belt clip