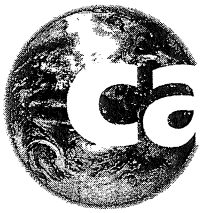

RICH
ENVIRONMENTAL SPECIALISTS

Remedial Investigation Work Plan
Former Belle Cleaners Site
40 Purchase Street
Rye, New York
Site Number 3-60-086

June 2007

Prepared for Submittal to
The New York State Department of Environmental Conservation

on Behalf of:
West Turnpike, Inc.

Prepared by:

CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803

CA RICH
ENVIRONMENTAL SPECIALISTS

June 22, 2007

NYSDEC Region 3
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, NY 12561-1696

Attention: Michelle Tipple.

Re: Remedial Investigation Work Plan
Former Belle Cleaners
40 Purchase Street, Rye, New York
Site Number 3-60-086
Index Number W3-1081-05-10

Dear Ms. Tipple:

Attached are three copies (one unbound) of our Remedial Investigation Work Plan (RIWP) for the above referenced site. The RIWP has been developed by CA Rich Consultants, Inc. (CA RICH) on behalf of West Turnpike, Inc. (the Respondent) in response to the informational requirements of the executed Order On Consent dated March 1, 2006. This Work Plan has been revised to incorporate your comments forwarded under cover dated April 9, 2007 and supersedes our earlier one dated February 2007.

In accordance with the Consent Order, copies have been forwarded to Rosalie K. Rusinko, Esq. of NYSDEC (Tarrytown) and Mr. Mike Rivera of NYSDOH. In addition, an electronic version in PDF format is attached.

If there are any questions regarding this Work Plan, please do not hesitate to call our office.

Sincerely,

CA RICH CONSULTANTS, INC.

Richard J. Izzo, CPG
Associate

cc: James Kim, Esq.
Helen Collier Mauch, Esq.
Rosalie Rusinko, Esq.
Mike Rivera

Attachments

NT Server\Files\Projects/ Flamingo/ RIWP/ revised RIWP

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3. PROPOSED WELL CONSTRUCTION DETAILS

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B. QUALITY ASSURANCE PROJECT PLAN

Remedial Investigation Work Plan
Former Belle Cleaners
40 Purchase Street, Rye, New York
Site Number 3-60-086

1.0 INTRODUCTION & PURPOSE

This Remedial Investigation Work Plan (RIWP) has been developed by CA Rich Consultants, Inc. (CA RICH) on behalf of West Turnpike, Inc. (the Respondent) in response to the informational requirements of the Order on Consent (Index No. W3-1081-05-10) executed March 1, 2006 as administered by the New York State Department of Environmental Conservation (NYSDEC). This SCWP is based upon the guidelines set forth in Exhibit "G" of the Order on Consent as well as discussions between CA RICH and NYSDEC representatives. For the purposes of this SCWP, the contaminants of concern are perchloroethene (a.k.a. PCE or tetrachloroethene) and its degradation products.

Environmental conditions at and emanating from the subject property have been documented in the following reports that were submitted to NYSDEC in the form of a Records Search Report dated October 9, 2006 :

- *Phase I Environmental Site Assessment, Survey for Asbestos Containing Materials, and Phase II Site Investigation; proposed Commerce Bank Site, Smith Street and Purchase Street, Rye, Westchester County, New York;* prepared by Whitestone Associates, Inc.; dated October 8, 2004

- *Summary Report, Environmental Testing in response to Reported Release (Spill No. 0406235), Belle Cleaners and Laundry, 40 Purchase Street, Rye, NY 10580*; prepared by CA Rich Consultants, Inc.; dated February 24, 2005

The purpose of this RIWP is to outline the scope and protocol to be followed in the further investigation of soil, groundwater and air quality impacts identified in the previous investigations and thereby provide NYSDEC sufficient information to determine whether a consequential amount of hazardous waste has been disposed at the site and, if so, whether contamination presents a significant threat to public health and/or the environment.

2.0 SITE HISTORY & DESCRIPTION

2.1 Site History/Description

The subject Property located at 40 Purchase Street, Rye, NY was utilized as a dry cleaning facility from the late 1940s until approximately 1 year ago when the existing 1-story building was completely renovated and converted for use as a bank. The property is currently the location of an active Commerce Bank branch that occupies the entire ground floor and utilizes the basement for maintenance supplies and an electrical/utility room. The on-site dry cleaning business was operated from 1984 through 2005 by Mr. Taesak Kim. 38-40 Purchase Street Corp. (owned by Taesak Kim's son, Mr. James Kim) purchased the property in 2001. In addition, the southern portion of the building was divided from the main portion and utilized as a separate retail store that most recently (up until the recent building renovation) was occupied by a nail salon.

The footprint of the building along with a small rear driveway comprises the entire property that is approximately 5,000 square feet in area. The building is located at 40 Purchase Street on the southeast corner of Purchase Street and Smith Street in Rye, Westchester County, NY. A Site Location Map (USGS Topoghraphic Quadrangle) is included as Figure 1.

According to information gathered in the Phase I ESA, the former onsite building was constructed in between 1887 and 1892 with occupancy by the C.H. Walker Carriage Facility. The earliest on-site listing for a dry cleaners is 1947 and a dry cleaning facility has been reported on-site from that time until the recent renovation and occupation by Commerce Bank.

The Property has always been serviced by public water and public sewers. The former dry cleaning facility and the separate retail store were heated with oil stored in three 275-gallon aboveground storage tanks. These tanks were removed by Commerce bank during site renovation activities.

2.2 Surrounding Land Use

The former Belle Cleaners site is located along Purchase Street, the main commercial shopping area within the City of Rye. Adjoining properties include retail and commercial buildings to the north, south and west, and a parking lot to the east.

2.3 Physical/ Hydrogeologic Setting

According to the USGS Mamaroneck Topographic Quadrangle Map, the Property is located at an elevation of 30 feet above mean sea level. Local topography slopes gradually toward Blind Brook located approximately 500 feet to the southeast of the Property.

The Property is underlain by glacial till characterized as a poorly sorted mixture of clay, silt sand, gravel, cobbles and boulders of Pleistocene age. This thin veneer of till is expected to be less than 20 feet in thickness and rests unconformably on Ordovician age crystalline bedrock of the Hartland Formation which includes Basal Amphibolite and pelitic schist.

Site specific work conducted to date suggests that the uppermost groundwater surface under unconfined conditions (i.e. the water table) is encountered at a depth of approximately ten feet below land surface within the unconsolidated glacial sediments. Although no site-specific groundwater flow information has been developed to date, it is anticipated that shallow groundwater flow underlying the Property will generally mirror local topographic relief. As such, groundwater is expected to flow to the southwest with eventual discharge into Blind Brook which discharges approximately 2 miles southeast of the site into the tidal areas of Milton Harbor and the Long Island Sound. Based upon the Property's proximity to Blind Brook and Long Island Sound, it is anticipated that the Property is located in an area of groundwater discharge as opposed to a deep recharge area. Underlying groundwater is not used for potable supply purposes in Rye, as such, no potable resources appear to be threatened by local groundwater contamination.

2.4 Evaluation of Previous Soil & Groundwater Sample Analyses

As outlined in Section 1.0, a series of previous investigations were performed at this site. Copies of these reports were previously submitted in the form of a Records Search Report (Appendix A). The scope and findings the previous investigations are outlined below:

1. Phase II ESA (Whitestone Associates, October 04)

   Scope:

   Installation of 5 shallow soil borings within the rear driveway area with collection and chemical analysis of four soil samples and one groundwater sample for volatile organic compounds VOCs and semi-volatile organic compounds (SVOCs).

   Findings:

   Soils from sample 7166-B4 collected at the water table (9 feet below grade) contained two semi-volatile compounds in excess of NYSDEC soil cleanup objectives. Additional SVOCs and the chlorinated VOC tetrachloroethylene (PCE)were also detected, but at concentrations below cleanup guidelines.

Groundwater from 7166-B1 detected the presence of PCE at a concentration of 134 micrograms per liter (ug/l). This is in excess of the NYSDEC groundwater quality standard of 5 ug/L. Additional VOCs including trichloroethylene (TCE) vinyl chloride, and benzene were also detected in excess of groundwater quality standards.

2. Environmental Testing in response to Reported Release (CA RICH February 05)

Scope:

Installation of four Geoprobe soil borings and four microwells with collection of soil and groundwater samples from beneath the on-site building. Also included collection of two indoor air samples within the two separate on-site basements along with the installation of two temporary soil vapor well points and collection of two sub-slab vapor samples.

Findings:

Results of this most recent Phase II investigation indicate the presence of low levels of volatile organic compounds (VOCs) in sub-slab soil gas and groundwater underlying the building at concentrations and an areal extent indicative of residual impacts from low-level historical releases or waste handling practices. No indoor air quality impacts were observed.

3.0 SITE CHARACTERIZATION

3.1 Purpose and Objectives

The Purpose of the Site Characterization is to identify and investigate potentially contaminated areas of the Site.

The objectives of the Investigation phase of this project are to:

1) Determine the nature of contamination at the Site; and,
2) Obtain the necessary data needed to allow NYSDEC to determine whether a consequential amount of hazardous waste has been disposed at the site and, if so, whether the contamination presents a significant threat to public health and/or the environment.

We propose to use the data developed during the previous Phase II work as a point of departure and to expand upon this available information. It is noted that some of the sampling points installed during the previous on-site investigation were inadvertently destroyed during on-site construction activities related to the recent building renovation. In addition, the layout of the interior portion of the building has changed. The building now comprises only one distinct ground floor and basement space. The scope of the investigation will include limited soil sampling and analysis along with the installation of permanent monitoring wells and a vapor intrusion testing program. A utility mark-out will be requested prior to performing the subsurface investigation.

3.2 Field Sampling/Lab Analysis Plan

3.2.1 Soil Borings

A total of seven (7) soil borings (designated SCB-1 through SCB-7) are proposed for this investigation. Four of the six borings (SCB-1 through SCB-4) will be installed in the driveway area to the east of the building in the vicinity of the former back door of the former dry cleaner to investigate a potential source of groundwater contamination in this area. One of the four borings will be installed in the area of monitoring well MW-1 which was destroyed during construction activities. This location is also the location of Boring “B-1” installed by Whitestone Associates that detected the presence of PCE in the groundwater. Two additional borings (SCB-5 & SCB-6) will be installed in the front (west) of the building at the north and south corners

The exterior soil borings will be installed using a Geoprobe, direct push drilling system. Macro core samples will be collected continuously from land surface to the depth at which bedrock is encountered (anticipated to be 12-15 feet below land surface). One additional soil boring (SCB-7) will be installed beneath the basement floor downgradient of the MW-1/B-1 location. This boring will be installed using an electric Bosch hammer with soil sample collection via hand auger.

The geologic composition of these soil samples will be identified and logged as the borings are advanced. Boring logs will be prepared including the depth to bedrock and the depth of sample collection. All soils will be screened with the PID and samples exhibiting the highest PID readings or other signs of contamination will be selected for laboratory analysis. If no elevated PID readings are observed, the deepest dry sample above the water table will be analyzed for halogenated VOC analysis. The locations of the proposed exterior borings are illustrated on Figure 2.

Soil samples will be collected and screened using a PID. The samples will be delivered to an ELAP-approved laboratory and analyzed for halogenated VOCs using U.S.EPA method 8021 and NYSDEC ASP category B deliverables.

During this sampling, the following samples will be collected for QA/QC purposes in accordance with the attached Quality Assurance Project Plan (QAPP Appendix B): 1 trip blank, 1 field blank, 1 duplicate sample, 1 matrix spike and 1 matrix spike duplicate.

3.2.2 Installation of Permanent Monitoring Wells and Groundwater Sampling/Analysis

Three of the soil borings (SCB-1, SCB-5 and SCB-6) will be converted to one-inch microwells for groundwater sampling and analysis purposes. These wells will be installed to the depth at which bedrock is encountered (anticipate approximately 12-15 feet below land surface to provide permanent sampling points for repeatable monitoring of the vertical extent of CVOC groundwater impacts directly surrounding the building.

These one-inch diameter PVC wells will be designated MW-1a, 3a & 4a to replace wells MW-1, 3 & 4 which were destroyed during construction activities. The wells will be installed using 0.020-inch slotted (20 slot) pipe and No. 1 sand as provided by the Jesse Morie Company. These wells will have 10 foot screens set at the bedrock interface. Each well will be constructed to industry standards and will be fitted with a bolt-down curb box. The locations of the proposed microwells are included on Figure 2. Proposed well construction details are included on Figure 3.

Each of the wells will be developed using a perastaltic pump. After the installation of the wells is completed, the elevations of the top of the well casings will be surveyed by a NYS-Licensed Surveyor to the nearest 0.01 of a foot. The depth to water will be measured and a water table elevation contour map will be prepared.

Approximately one to two weeks after the installation of the wells is completed, we will return to sample the newly installed wells along with pre-existing basement microwell MW-2 which survived the building renovation activities. A volume of at least three times the volume of the well will be removed from each well using a low flow rate perastaltic pump. A sample of the groundwater will then be collected directly from the pump discharge using laboratory-issued 40 mil vials. Water samples from each well will be analyzed for halogenated VOCs using U.S.EPA method 8021 and NYSDEC ASP category B deliverables. During this sampling the following samples will be collected for QA/AC purposes in accordance with the attached Quality Assurance Project Plan (QAPP): 1 trip blank, 1 field blank, 1 duplicate sample, 1 matrix spike and 1 matrix spike duplicate.

3.2.3 Vapor Intrusion Sampling

Vapor intrusion sampling will be conducted in and below the building in accordance with The New York State Department of Health "Guidance for Evaluating Soil Vapor Intrusion in the State of New York". Sub-slab samples SCSS-1 and SCSS-2 will be collected beneath the basement along with indoor air samples SCAS-1 and SCAS-2 (in the basement) In addition, one concurrent background exterior air sample (SCAS-3) will also be collected. Proposed sampling locations are illustrated on Figure 2. Prior to sampling, a product inventory will be completed for the basement.

The Sub-slab sample will be collected in the following manner: The boring for installation of the permanent sub-slab vapor well will be installed using an electric bosch hammer to penetrate the concrete floor. A stainless steel screened well point or stainless steel tubing will be advanced to a depth of two inches below the slab and capped with a sampling fitting to allow for collection of soil gas. The annular space around the screen will be packed with coarse sand to a depth of 1 inch above the bottom of the slab. The remainder of the space around the well point will be sealed with bentonite to ensure the integrity of the soil gas sample. The installation will then be fitted with a bolt-down curb box. Proposed soil vapor well construction details are included on Figure 3.

Prior to sampling, one to three volumes of soil gas will be purged from the column using Teflon tubing and a calibrated air sampling pump. During purging and sampling, flow rates will not exceed 0.2 liters per minute to achieve a 2-hour sample at each location. Soil gas will be field screened with a PID and collected in a SUMMA canister.

The canisters will be submitted to a NYSDOH certified laboratory for analysis of VOCs (Halogenated) via TO14 (of TO15) methodology. One interior air sample and one exterior background sample will also be collected using laboratory-issued SUMMA canisters. The locations of proposed sub-slab and air quality samples are illustrated on Figure 2.

3.2.6 Sampling QA/QC Protocol

All on-site sampling equipment will be decontaminated between each use in the following manner: laboratory grade detergent and fresh water wash using scrub brush, followed by two fresh water rinses and final air dry. Decontaminated sampling equipment will then be wrapped in clean (unused) aluminum foil pending use for sample collection. The peristaltic pump used for groundwater sample collection will be decontaminated between sample collection by passing the detergent and water mixture through the pump, followed by two fresh water rinses. Gloves worn for sample handling will be discarded between sample collections.

Dedicated, new polyethylene tubing will be used at each well location for purging and sampling. New, clean acetate macro core tube samplers will be used for collection of each Geoprobe soil sample. A new disposable sterile wooden tongue depressor will be used for each soil sample collection and discarded after each use.

Samples will be packaged in laboratory-issued sample containers by CA RICH personnel and stored on ice pending same day or overnight shipment to CA RICH's subcontracted State-Certified laboratory. Soil samples for volatile organic analyses will be packaged in 100 milliliter volatile organics jars. Special care is taken to completely fill the jars so that no head space remains after they are sealed, thus minimizing the loss of volatile organic compounds present in the sample. Groundwater samples will be collected directly from the decontaminated sampling pump into laboratory-issued 40-milliliter VOC vials. The vials will be filled completely and checked to ensure no air bubbles are present.

Additional field and laboratory QA/QC protocol is included in the attached QAPP (Appendix A).

3.3 Health & Safety

A site-specific Health and Safety Plan (HASP) will be prepared for the field portion of the Investigation prior to field mobilization and submitted to NYSDEC and NYSDOH for their review. The HASP will cover all activities in the 'investigation area', as well as emergency procedures and available emergency services in proximity to the Site. The HASP will also include a community air monitoring plan in accordance with NYSDOH guidelines.

3.4 Remedial Investigation Report

Once the laboratory results are obtained, a Remedial Investigation Report will be prepared. The RI Report will include the following items:

- A description of the work performed;
- Boring logs for the Geoprobe soil borings;
- Well construction details;
- Laboratory summary tables and maps;
- A Data Usability Summary Report (DUSR)
- A water table map; and,
- Recommendations for further action.

4.0 SCHEDULE

The following schedule has been developed for this project.

Plans

Submission of Revised Work Plan	June, 2007
NYSDEC approval of Work Plan	anticipate 45 days

Field Activities

Installation of monitoring wells, soil vapor Well and collection of soil, air and sub-slab vapor samples	30 days after DEC approval
Collection and analysis of groundwater samples	45 days after DEC approval

Report Preparation

Preparation of Remedial Investigation Report	60-90 days after DEC approval

5.0 REFERENCES

1. E.S. Asselstine & I.G. Grossman, (1955), The Groundwater Resources of Westchester County, USGS Bulletin GW-35.

2. CA Rich Consultants, Inc.; (February 24, 2005); Summary Report, Environmental Testing in response to Reported Release (Spill No. 0406235), Belle Cleaners and Laundry, 40 Purchase Street, Rye, NY 10580;

3. Whitestone Associates, Inc.; (October 8, 2004); Phase I Environmental Site Assessment, Survey for Asbestos Containing Materials, and Phase II Site Investigation; proposed Commerce Bank Site, Smith Street and Purchase Street, Rye, Westchester County, New York;

4. NYSDEC, (January 24, 1994), Department's Technical And Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels.

5. NYSDEC, (October 22, 1993), Technical and Operational Guidance Series (1.1.1)

6. NYSDEC Division of Environmental Remediation, (December 2002), Draft DER-10, Technical Guidance for Site Investigation and Remediation.

7. New York State Department of Health (February 2005) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Public Comment Draft).

8. United States Geological Survey (1967) Mamaroneck, NY, Topographic Quadrangle Map.

FIGURES

APPROX. SCALE (ft.)

0 1,200 2,400

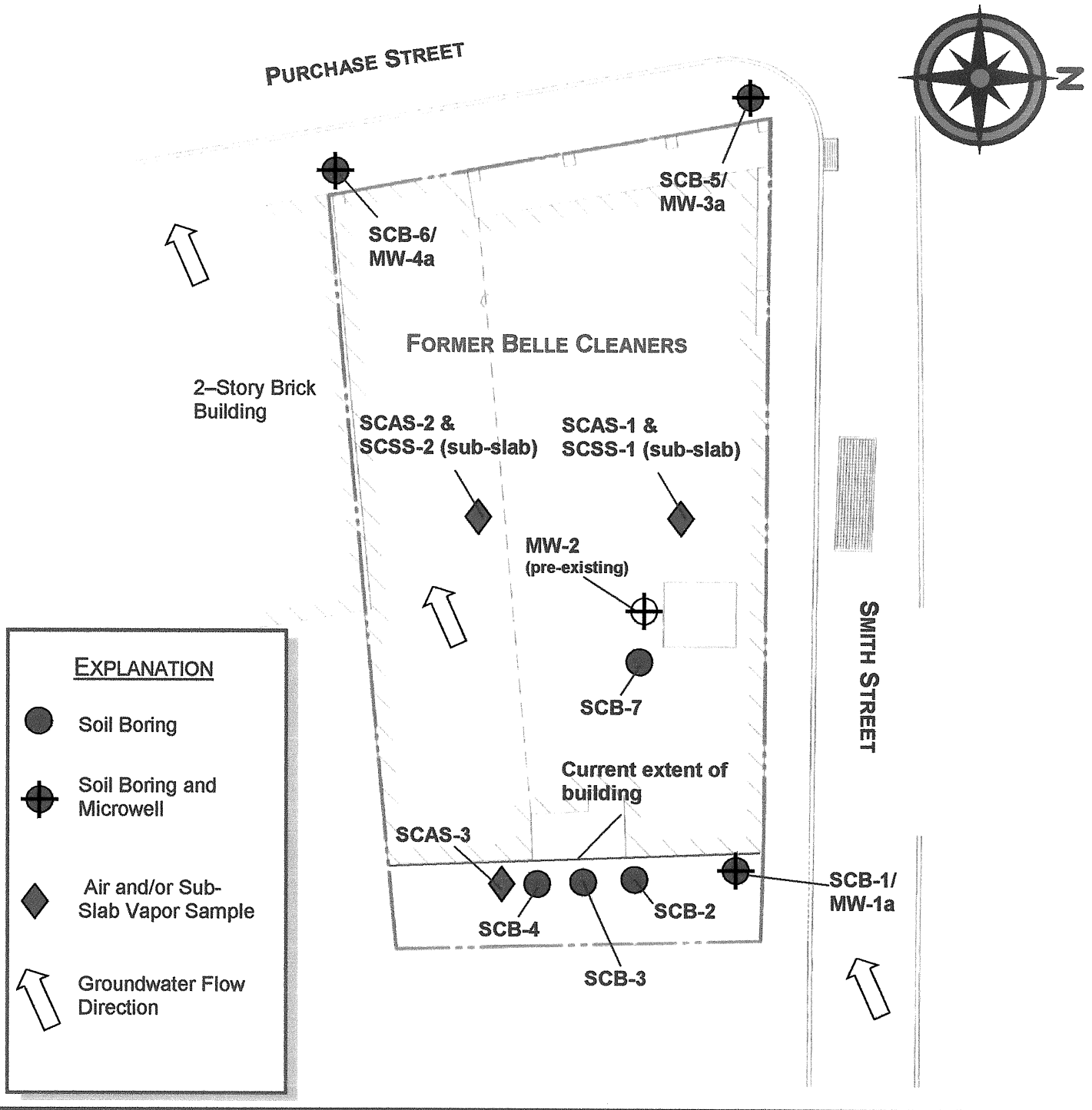
N

Adapted from USGS Mamaroneck Quadrangle Map (1975 photorevision)

CA RICH CONSULTANTS, INC.
17 Dupont Street,
Plainview, NY 11803

ENVIRONMENTAL SPECIALISTS

TITLE: **SITE LOCATION MAP**		DATE: **2/16/07**
		SCALE: **AS SHOWN**
FIGURE: **1**	**Former Belle Cleaners 40 Purchase St. Rye, NY**	DRAWN BY: **STM**
DRAWING:		APPR. BY: **RJI**



APPROX. SCALE (ft.)

0 16 32

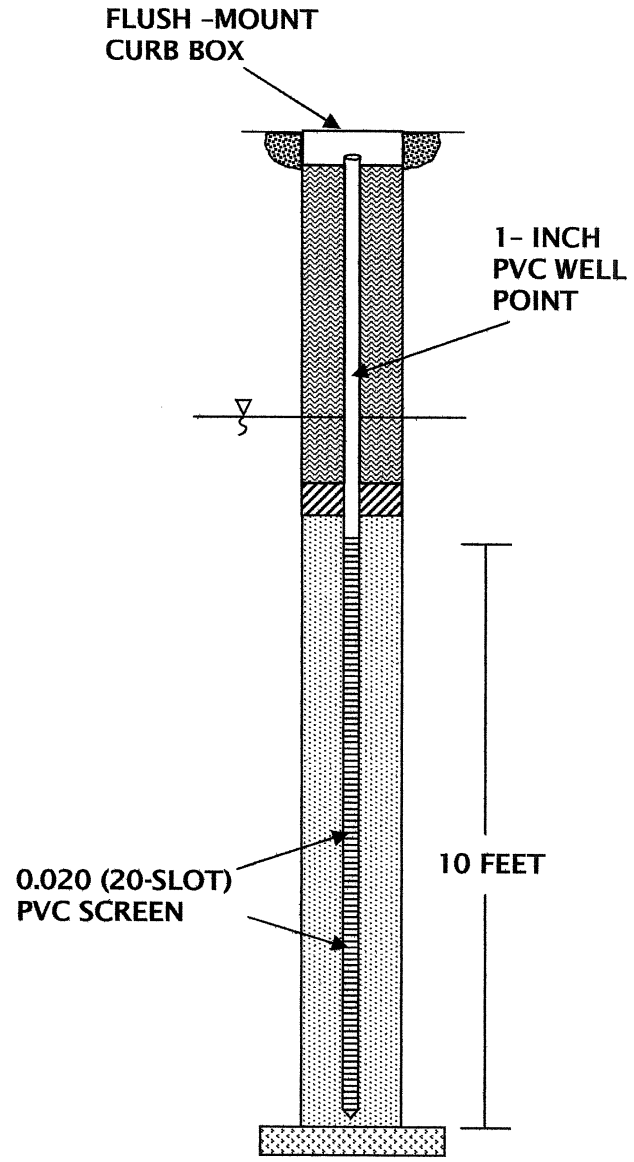
Adapted from Whitestone Associates, Inc. 9/28/04

Modified 6/22/07

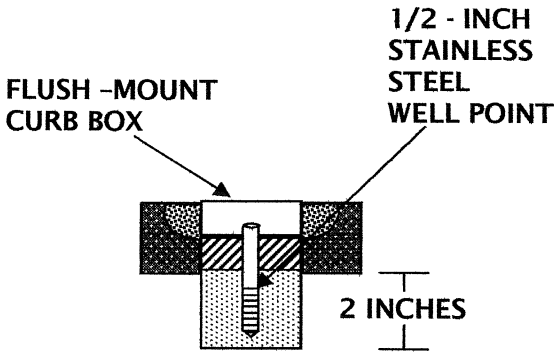
CA RICH CONSULTANTS, INC.
17 Dupont Street,
Plainview, NY 11803

TITLE: **Sampling Locations**		DATE: **2/12/07**
		SCALE: **AS SHOWN**
FIGURE: **2**	**Former Belle Cleaners**	DRAWN BY: **STM**
DRAWING:	**40 Purchase Street**	APPR. BY: **RJI**
	Rye, NY	

TYPICAL GEOPROBE-DRIVEN BEDROCK-SURFACE WELL POINT



TYPICAL SUB-SLAB VAPOR WELL



LEGEND

- CEMENT
- BEDROCK
- BENTONITE
- FLOOR / SLAB
- NO. 2 MORIE SAND
- CEMENT/BENTONITE GROUT

CA RICH CONSULTANTS, INC.
17 Dupont Street,
Plainview, NY 11803

TITLE: WELL CONSTRUCTION DETAILS		DATE: 2/13/07
		SCALE: AS SHOWN
FIGURE: 3	Former Belle Cleaners 40 Purchase Street Rye, NY	DRAWN BY: STM
DRAWING:		APPR. BY: RJI

APPENDIX A
COPY OF RECORD SEARCH REPORT

CA RICH
ENVIRONMENTAL SPECIALISTS

October 9, 2006

Ram Pergadia, P.E.
New York State Department of
Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, NY 12561

RE: RECORD SEARCH REPORT
Belle Cleaners and Laundry
40 Purchase Street, Rye, NY 10580
Site # 3-60-086
Index # W3-1081-05-10

Dear Mr. Pergadia

On behalf of West Turnpike, Inc., CA RICH is pleased to provide you with the following Records Search Report for the above-captioned Site. This report is being submitted in accordance with the requirements of the Order On Consent dated March 1, 2006 (Consent Order). The scope of this Report is based upon the requirements set forth in Exhibit "F" of the Consent Order.

1.0 Background

The subject Property located at 40 Purchase Street, Rye, NY was utilized as a dry cleaning facility from the late 1940s until approximately 1 year ago when the existing 1-story building was completely renovated and converted for use as a bank. The property is currently the location of an active Commerce Bank branch. The on-site dry cleaning business was operated from 1984 through 2005 by Mr. Taesak Kim. 38-40 Purchase Street Corp. (owned by Taesak Kim's son, Mr. James Kim) purchased the property in 2001.

2.0 Environmental Data and Information

Environmental conditions at and emanating from the subject property have been documented in the following three reports (copies attached):

- *Subsurface Investigation Summary Letter, 40 Purchase Street, Rye, NY 10580;* prepared by Merrit Engineering Consultants, P.C., dated July 13, 2001
- *Phase I Environmental Site Assessment, Survey for Asbestos Containing Materials, and Phase II Site Investigation; proposed Commerce Bank Site, Smith Street and Purchase Street, Rye, Westchester County, New York;* prepared by Whitestone Associates, Inc.; dated October 8, 2004
- *Summary Report, Environmental Testing in response to Reported Release (Spill No. 0406235), Belle Cleaners and Laundry, 40 Purchase Street, Rye, NY 10580*; prepared by CA Rich Consultants, Inc.; dated February 24, 2005

The initial study by Merrit Engineering Consultants, P.C. (Merrit) in 2001 was conducted on behalf of Mr. Kim as part of his due diligence for property purchase. Testing, at that time, was limited to the installation of soil borings and collection of soil samples. The results of this sampling did not indicate the presence of subsurface contamination in excess of NYSDEC cleanup guidelines.

The Phase I and Phase II conducted by Whitestone Associates, Inc. (Whitestone) in 2004 was performed prior to the execution of a lease agreement for the Property between Mr. Kim and Commerce Bank, N.A who subsequently entered into the lease agreement and now occupies the Property.

The Whitestone Phase II included the installation of five Geoprobe borings to the east (behind) the on-site building and collection of groundwater from a temporary wellpoint. This study identified the presence of low levels of Perchloroethylene (PCE) and its related degradation "daughter" byproducts in the subsurface soil and groundwater immediately adjacent (east) of the building. In addition, low levels of petroleum-related and fill-related constituents were also detected. As recommended by Whitestone Associates, Inc., the NYSDEC Region 3 Spill Hotline was contacted (by Mr. Kim) on October 26, 2004, and Spill Number 0408235 was issued by the Department.

The most recent subsurface investigation was performed by CA RICH in early 2005 and included the installation of four Geoprobe soil borings and four microwells with collection of soil and groundwater samples from beneath the on-site building. In addition, two indoor air samples were collected within the two separate on-site basements along with the installation of two temporary soil vapor well points and collection of two sub-slab vapor samples.

Results of this most recent Phase II investigation (CA RICH 2004) indicate the presence of low levels of volatile organic compounds (VOCs) in sub-slab soil gas and groundwater underlying the building at concentrations and an areal extent indicative of residual impacts from low-level historical releases or waste handling practices. No indoor air quality impacts were observed. Recommendations for further action were limited to one year of quarterly air, soil vapor and groundwater monitoring.

3.0 On-Site Waste Disposal

Mr. Taesak Kim and Mr. James Kim report that they have no records or knowledge of the accidental, incidental or deliberate on-site discharge or disposal of any chemicals during the ownership or occupation of the Property by Belle Cleaners. As required, Mr. Taesak Kim maintains records of the usage and proper off-site disposal of dry-cleaning chemicals in accordance with State and Federal regulations.

Respectfully submitted,

CA RICH CONSULTANTS, INC.

Richard J. Izzo, CPG 9644
Associate

RJI/tk
Attachments

cc:.
James Kim, Esq.
Helen Mauch, Esq.

Hdrive/projects/bellecleaners/records search rept.

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan

1.1 Introduction - The following Quality Assurance Project Plan (QAPP) has been prepared specifically for the Site Characterization Work Plan at the former Belle Cleaners located in Rye, New York. This Plan was prepared and approved as stated below:

Prepared by: _____ Date: 6/22/07
Richard J. Izzo, Project Manager

Approved by: _____ Date: 6/22/07
Stephen T. Malinowski, Q.A. Officer

1.2 QAPP - Table of Contents

The following elements are included in this QAPP:

Title Page and Introduction

Table of Contents

Project Description

Project Organization

Quality Assurance Objectives for Data Measurements

Sampling Procedure

Sample and Document Custody Procedures

Calibration Procedures and Frequency

Analytical Procedures

Data Reduction, Validation and Reporting

Internal Quality Control Checks

Performance and System Audits

Preventive Maintenance

Data Measurement Assessment Procedures

Corrective Action

Quality Assurance Reports and Management

1.3 Project Description - The Investigation Work Plan subject to this QAPP has been prepared to address the following issues:

- Identify areas of potential sources of the perchloroethene (PCE);
- Determine the nature and extent of any sources of these contaminants at the subject property; and,

The investigative methods that will be used include Geoprobe drilling, soil sampling, monitoring well installation and sampling, and sub-slab soil vapor and indoor air sampling. These are described in detail in Investigation Work Plan.

1.4 Project Organization - Mr. Richard Izzo will serve as the Project Manager (PM) and will be responsible for the overall scheduling and performance of all the Investigation activities.

Mr. Stephen Malinowski will serve as the Quality Assurance Officer (QAO) for this project. His duties will include:

- Review of laboratory data packages
- Interface with data validator and laboratory
- Performance of Field Audits
- Preparation of a Data Usability Report

Experienced CA RICH staff will complete the field activities described in the Work Plan.

1.5 Quality Assurance Objectives and Data Measurement - Two types of data will be collected during this R.I.

Field Screening - Organic vapor readings will be recorded from the head space of soil samples. This data is intended to be used only as a screening tool. To meet these goals clean sampling tools will be used for each head space measurement and the PID will be calibrated at the beginning of each day.

Laboratory Analysis - Soil samples will delivered to a New York State-certified laboratory for analysis of volatile organics. This data is intended to be used to determine the nature and extent of soil contamination and for use in the development of remedial measures such as those discussed in the Investigation Work Plan. To meet these goals the laboratory will follow the NYSDEC - Analytical Services Protocol dated 1995. All samples will be analyzed for volatile organic compounds using USEPA method 8021 (Halogenated VOCs only) by a NYSDOH-ELAP certified laboratory. NYSDOH ELAP-certified American Analytical Laboratories of Farmingdale, NY will perform the analysis of all soil and groundwater samples and NYSDOH ELAP-certified Ecotest Laboratories of West Babylon, NY will perform analysis of all vapor samples. A summary of analytical methods /quality assurance samples is presented on Table 1.

Quality assurance objectives are generally defined in terms of five parameters:

- **Representativeness -** Representativeness is the degree to which sampling data accurately and precisely represent site conditions, and is dependent on sampling and analytical variability. The Work Plan has been designed to assess the presence of the constituents at the time of sampling. The Plan presents the rationale for sample quantities and location. The Work Plan presents field sampling methodologies and laboratory analytical methodologies, respectively.

The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data. Further discussion of QC checks is presented in Section 1.11.

- **Comparability** - Comparability is the degree of confidence with which one data set can be compared to another. Comparability between this investigations, and to the extent possible, with existing data will be maintained through consistent sampling and analytical methodology set forth in the QAPP, the Investigation Work Plan, the NYSDEC ASP analytical methods (1995) with NYSDEC ASP QA/QC requirements (1995) and Superfund Category reporting deliverables; and through use of QA/QC procedures and appropriately trained personnel.

- **Completeness -** Completeness is defined as a measure of the amount of valid data obtained from an event and/or investigation compared to the amount that was expected to be obtained under normal conditions. This will be determined upon assessment of the analytical results, as discussed in Section 1.12.

- **Precision -** Precision is the measure of reproducibility of sample results. The goal is to maintain a level of analytical precision consistent with the objectives of the Remedial Action. To maximize precision, sampling and analytical procedures will be followed. All work for the investigation phase of this project will adhere to established protocols presented in the QAPP and Investigation Work Plan. Checks for analytical precision will include the analysis of matrix spike duplicates, laboratory duplicates, and field duplicates. Checks for field measurement precision will include obtaining duplicate field measurements. Further discussion of precision QC checks is provided in Section 1.11.

- **Accuracy** - Accuracy is the deviation of a measurement from the true value of a known standard. Both field and analytical accuracy will be monitored through initial and continuing calibration of instruments. In addition, internal standards, matrix spikes, blank spikes, and surrogates (system monitoring compounds) will be used to assess the accuracy of the laboratory analytical data. Further discussion of these QC samples is provided in Section 1.11.

1.6 Sampling Procedures - The sampling procedures that will be employed are discussed in detail in the Investigation Work Plan.

1.7 Sample and Document Custody Procedures

- **General** - The Chain-of-Custody program allows for the tracing of possession and handling of the sample from the time of collection through laboratory analysis. The chain-of-custody program at this site will include:

  - Sample labels
  - Chain-of-Custody records
  - Field records

- **Sample Labels** - To prevent misidentification of samples, a label will be affixed to the sample container and will contain the following information:

  -Site Name
  -Sample identification number
  -Date and time of collection
  -Name of Sampler
  -Preservation (if any)
  -Type of analysis to be conducted.

- **Chain-of-Custody Records** - To establish the documentation that is necessary to trace sample possession from the time of collection, a chain-of-custody record (sample attached) will be filled out and will accompany samples at all times. The record will contain the following information:

  -Project name:
  -Printed name and signature of samplers
  -Sample number
  -Date and time of collection
  -Sampling location
  -Number of containers for each sample
  -Signature of individuals involved in sample transfer
  (when relinquishing and accepting samples)
  -Inclusive dates and times of possession.

- **Field Records** - Field records will be maintained during each sampling effort in a logbook. All aspects of sample collection, handling and visual observations will be recorded. All sample collection equipment, field analytical equipment and equipment utilized to make physical measurements will be identified in the field logbook.

  All calculations, results and calibration data for field sampling, field analytical and field physical measurement equipment will also be recorded in the field logbook. Entries will be dated and initialed. Entries will be made in ink, and will be legible. The bottom of each page will be signed.

1.8 Calibration Procedures and Frequency - The contracted laboratory will follow the NYSDEC ASP protocols (1995) for equipment calibration procedures and frequency.

The QA Officer will be responsible for ensuring that the PID is calibrated at the beginning of each day of field sampling using calibration gas supplied by the manufacturer. A log of the meter calibration will be kept in the filed log book.

1.9 Analytical Procedures - All laboratory analysis will be performed USEPA method 8021 (Halogenated VOCs only) and will follow NYSDEC ASP (1995) protocols with category B deliverables. The parameters list will include the TCL Volatile Organics format with a quantitation limit of 10 ug/kg.

1.10 Data Reduction, Validation and Reporting

- **Field Data** - All field data recorded in logbooks or on log sheets will be evaluated in the office and transferred to word processor text by field personnel or clerical staff. PID readings will be included on the logs. The QAO and/or PM will review this data for accuracy and completeness. Typed boring logs will be prepared for the deep on-site boring.

- **Laboratory Data** - The laboratory will transfer the instrument readings to laboratory report forms. Ms. Renee Cohen will perform independent data validation of all analytical data using NYSDEC DUSR protocols. Ms. Cohen's resume is attached.

  The data validator will provide CA Rich with a Data Validation Summary Report. The QAO will review the summary report as well as other field data and prepare a Data Usability Report. Both the Data Validation Summary Report and the Data Usability Report will be provided to NYSDEC.

CA Rich will prepare summary tables of the validated analytical data using computer spread sheet software. The data entries will be reviewed using the red check-green check method. All entries will be reviewed and entry errors will be marked in red ink. Once these entries are corrected, the printouts will be marked with green ink and placed in the project file.

1.11 Internal Quality Control Checks

Both field and laboratory quality control checks are proposed for this project. In the event that there are any deviations from these checks, the Project Manager and Quality Assurance Officer will be notified. The proposed field and laboratory control checks are discussed below.

Field Quality Control Checks

- **Field Measurements** - To verify the quality of data collected using field instrumentation, at least one duplicate measurement will be obtained per day and reported for all field analytical measurements.

- **Sample Containers** - Certified-clean sample containers in accordance with NYSDEC ASP (1995) will be supplied by the contracted laboratory.

- **Field Duplicates** - Field duplicates will be collected to check reproducibility of the sampling methods. Field duplicates will be prepared as discussed in the Investigation Work Plan. In general, field duplicates will be analyzed at a five percent frequency (every 20 samples).

- **Field Rinse Blanks** - Field rinse blanks are used to monitor the cleanliness of the sampling equipment and the effectiveness of the cleaning procedures. Field rinse blanks will be prepared and submitted for analysis at a frequency of once for this initial investigation. Field rinse blanks will be prepared by filling sample containers with analyte-free water (supplied by the laboratory) which has been routed through a cleaned sampling device.

- **Trip Blanks** - Trip blanks will be used to assess whether site samples have been exposed to non-site-related volatile constituents during storage and transport. Trip blanks will be analyzed at a frequency of once per day, and will be analyzed for volatile organic constituents. A trip blank will consist of a container filled with analyte-free water (supplied by the laboratory) which remains unopened with field samples throughout the sampling event. Trip blanks will only be analyzed for volatile organic constituents.

1.12 Performance and Systems Audits

Performance and systems audits will be completed in the field and the laboratory during the investigation phase of this project as described below.

- **Field Audits** - The Project Manager and Quality Assurance Officer will monitor field performance. Field performance audit summaries will contain an evaluation of field measurements and field meter calibrations to verify that measurements are taken according to established protocols. The Project Manager will review all field logs. In addition, the Project Manager and the Quality Assurance Officer will review the field rinse and trip blank data to identify potential deficiencies in field sampling and cleaning procedures.

- **Laboratory Audits** – The contracted laboratory will perform internal audits consistent with NYSDEC ASP (1995).

1.13 Preventive Maintenance

Preventive maintenance schedules have been developed for both field and laboratory instruments. A summary of the maintenance activities to be performed is presented below.

- **Field Instruments and Equipment** - Prior to any field sampling, each piece of field equipment will be inspected to assure it is operational. If the equipment is not operational, it must be serviced prior to use. All meters which require charging or batteries will be fully charged or have fresh batteries. If instrument servicing is required, it is the responsibility of the field personnel to follow the maintenance schedule and arrange for prompt service.

- **Laboratory Instruments and Equipment** - Laboratory instrument and equipment procedures will be documented by the laboratory. Documentation includes details of any observed problems, corrective measure(s), routine maintenance, and instrument repair (which will include information regarding the repair and the individual who performed the repair).

  Preventive maintenance of laboratory equipment generally will follow the guidelines recommended by the manufacturer. A malfunctioning instrument will be repaired immediately by in-house staff or through a service call from the manufacturer.

1.14 Data Assessment Procedures

The analytical data generated during the RI will be evaluated with respect to precision, accuracy, and completeness and compared to the Project DQOs. The procedures utilized when assessing data precision, accuracy, and completeness are presented below.

- **Data Precision Assessment Procedures** - Field precision is difficult to measure because of temporal variations in field parameters. However, precision will be controlled through the use of experienced field personnel, properly calibrated meters, and duplicate field measurements. Field duplicates will be used to assess precision for the entire measurement system including sampling, handling, shipping, storage, preparation and analysis.

  Laboratory data precision for organic analyses will be monitored through the use of matrix spike duplicate sample analyses. For other parameters, laboratory data precision will be monitored through the use of field duplicates and/or laboratory duplicates.

  The precision of data will be measured by calculation of the standard deviation (SD) and the coefficient of variation (CV) of duplicate sample sets. The SD and CV are calculated for duplicate sample sets by:

  $$SD = (A-B)/1.414$$
  $$CV = SD/((A+B)/2) = 1.414(A-B)/(A+B)$$

  Where:

  A = Analytical result from one of two duplicate measurements
  B = Analytical result from the second measurement.

  Where appropriate, A and B may be either the raw measurement or an appropriate mathematical transformation of the raw measurement (e.g., the logarithm of the concentration of a substance).

Alternately, the relative percent difference (RPD) can be calculated by the following equation:

$$RPD = \frac{(A-B)}{(A+B)/2} \times 100$$

$$RPD = 1.414\ (CV)(100)$$

- **Data Accuracy Assessment Procedures -** The accuracy of field measurements will be controlled by experienced field personnel, properly calibrated field meters, and adherence to established protocols. The accuracy of field meters will be assessed by review of calibration and maintenance logs.

  Laboratory accuracy will be assessed via the use of matrix spikes, surrogate spikes, and internal standards. Where available and appropriate, QA performance standards will be analyzed periodically to assess laboratory accuracy. Accuracy will be calculated as a percent recovery as follows:

$$Accuracy = \frac{A-X}{B} \times 100$$

  Where:

  A = Value measured in spiked sample or standard
  X = Value measured in original sample
  B = True value of amount added to sample or true value of standard

  This formula is derived under the assumption of constant accuracy over the original and spiked measurements. If any accuracy calculated by this formula is outside of the acceptable levels, data will be evaluated to determine whether the deviation represents unacceptable accuracy, or variable, but acceptable accuracy. Accuracy objectives for matrix spike recoveries and surrogate recovery objectives are identified in the NYSDEC, ASP (1995).

- **Data Completeness Assessment Procedures -** Completeness of a field or laboratory data set will be calculated by comparing the number of samples collected or analyzed to the proposed number.

$$Completeness = \frac{\text{No. Valid Samples Collected or Analyzed}}{\text{No. Proposed Samples Collected or Analyzed}} \times 100$$

  As general guidelines, overall project completeness is expected to be at least 90 percent. The assessment of completeness will require professional judgment to determine data useability for intended purposes.

1.15 Corrective Action

Corrective actions are required when field or analytical data are not within the objectives specified in this QAPP, or the Investigation Work Plan. Corrective actions include procedures to promptly investigate, document, evaluate, and correct data collection and/or analytical procedures. Field and laboratory corrective action procedures for this project are described below.

- **Field Procedures** - When conducting the investigative field work, if a condition is noted that would have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause and corrective action implemented will be documented as a memo to the project file and reported to the Project Manager.

  Examples of situations which would require corrective actions are provided below:

  - Protocols as defined by the QAPP and the Work Plan have not been followed;
  - Equipment is not in proper working order or properly calibrated;
  - QC requirements have not been met; and
  - Issues resulting from performance or systems audits.

  Project field personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

- **Laboratory Procedures** - In the laboratory, when a condition is noted to have an adverse effect on data quality, corrective action will be taken as not to repeat this condition. Condition identification, cause and corrective action to be taken will be documented, and reported to the Quality Assurance Officer.

  Corrective action may be initiated, at a minimum, under the following conditions:

  - Specific laboratory analytical protocols have not been followed;
  - Predetermined data acceptance standards are not obtained;
  - Equipment is not in proper working order or calibrated;
  - Sample and test results are not completely traceable;
  - QC requirements have not been met; and
  - Issues resulting from performance or systems audits.

  Laboratory personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

1.16 Quality Assurance Reports to Management

- **Internal Reporting** -The analytical laboratory will submit analytical reports using NYSDEC ASP (1995), Category B requirements. The analytical reports will be submitted to the data validator for review. Supporting data (i.e., historic data, related field or laboratory data) will also be reviewed to evaluate data quality, as appropriate. The Quality Assurance Officer will incorporate results of data validation reports (if any) and assessments of data usability into a summary report. This report will be filed in the project file and will include the following:

  - Assessment of data accuracy, precision, and completeness for field & laboratory data;
  - Results of the performance and systems audits;
  - Significant QA/AC problems, solutions, corrections, and potential consequences;
  - Analytical data validation report; and
  - Data usability report.

- **Reporting** - The Investigation Report will contain a separate QA/QC section summarizing the quality of data collected and/or used as appropriate to the project DQOs. The Quality Assurance Officer will prepare the QA/QC summaries using reports and memoranda documenting the data assessment and validation.