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932007

[redacted]

FTA

FRONTIER TECHNICAL ASSOCIATES INC.

8675 Sheridan Drive. Buffalo. New York 14221 (716) 634-2293

GROUNDWATER SAMPLING & ANALYSIS PLAN

LANDFILL AREA

CARBORUNDUM ABRASIVES COMPANY

NYSDEC Site 932007

FTA Report ET-703-GWP1

November 17, 1999

Prepared For:

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Prepared By:

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The sample and analysis plan provided herein was developed for Carborundum Abrasives Company management use only and, except for required regulatory compliance submission, is not intended for any other purpose.

FTA Frontier Technical Associates, Inc.

TABLE OF CONTENTS

INTRODUCTION

In response to the requirements of NYSDEC Region 9, Carborundum Abrasives Company has been requested to supply this revised groundwater sampling and analysis plan for the landfill area located on the southwest corner of the property in Wheatfield, New York. Figure 1 is a sketch of the landfill area showing the location of the monitoring wells which were installed in 1981 and the location of the "A" storm sewer line (West Branch). Frontier Technical Associates, Inc. has prepared this plan for CAC's submission to the NYSDEC. This revised plan is amended from the plan submitted and approved in 1991 and subsequently revised in 1994.

Previously, technical reports were prepared which described the results of the priority pollutant sampling and analysis in 1990 and 1991. This included sample splits and full QA/QC. As a result of the findings, the NYSDEC subsequently reduced monitoring parameters for 1992. For 1993, the NYDEC deleted the requirement for analysis of filtered and unfiltered groundwater samples for metals including zinc. In 1994, all metals requirements were deleted and turbidity was added for informational purposes. This report presents the current requirements for monitoring at the landfill and discusses maintenance activities which have been performed in connection with the wells since 1994. In addition, a new section on Operations and Maintenance of the monitoring wells has been added.

Chronology

Since 1982, the monitoring wells and adjacent catch basins were sampled for pH and total phenolics (4AAP). In the period 1982-1988 there were no detectable levels of phenolics (4AAP) in monitoring wells OW2-81 through OW5-81. However, in 1989, perhaps as the result of unusual Spring and Summer precipitation events, low levels of phenolics were detected in the monitoring wells and adjacent catch basins. Again in 1990, low levels of total phenolics were detected. This resulted in the NYSDEC's desire to obtain additional data for evaluation beginning in 1991 as discussed above. Based upon the 1991 results, CAC requested the decommissioning of one well (OW1-81) which had fallen into disrepair and was no longer functioning. The request was approved and subsequently implemented on September 27, 1991. The phenolics analytical methodology was also changed to the more accurate and specific EPA Method 625/8270 and approved by the NYSDEC.

On May 20, 1994, new locking caps were installed on Well OW2-81 and OW4-81 by Frontier Technical Associates, Inc. New concrete pads were also installed by FTA around Well OW2-81 and OW3-81 on June 26, 1997.

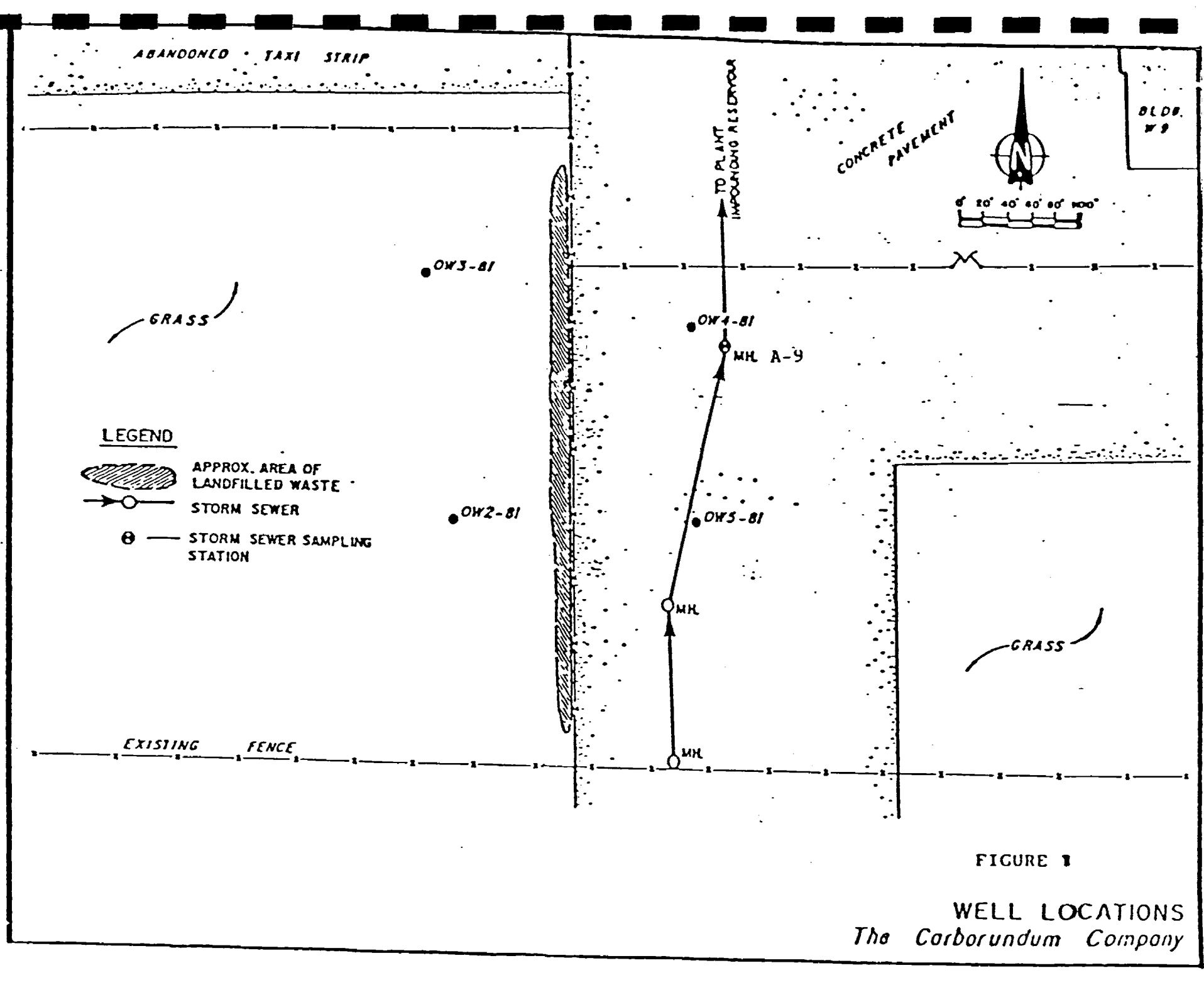

FIGURE 1

WELL LOCATIONS

The Carborundum Company

As the result of review of the well depths presented in the 1997 sampling report, Frontier Technical Associates, Inc. undertook the redevelopment of all four wells in the monitoring network. On October 16 and 22, 1998, each well was purged and flushed two times on each day. A well development report dated January 28, 1999 was prepared and forwarded to the NYSDEC (Mr. Michael Hinton) for review. As a result of the review, this revised and updated Sampling and Analysis Plan (SAP) has been prepared. This report outlines the approach used to fulfill the NYSDEC requirements for udating and revising the SAP to reflect current practice and requested and approved changes to the previous plans.

Geology and Hydrogeology

The area in the immediate vicinity of the CAC plant is underlain by approximately 10 to 15 feet of clayey to sandy silt, glacial-lacustrine deposits and till. These deposits thicken southward across the site toward the Niagara River. The hydraulic conductivity of these materials is relatively low perhaps reaching the range of 10-5 to 10-8 cm/sec.

The bedrock underlying the site consists of approximately 160 feet of dolomite of the Lockport Formation. The upper zone of the Lockport Formation is generally highly weathered, medium-gray dolomite with extensive vertical fractures. The dolomite has partings which are argillaceous or gypsum-coated. Water produced from this upper zone in the Bergholtz area of Wheatfield is generally of very poor quality, with a characteristic odor. The water generally is not suitable for drinking but is used for watering livestock or agricultural purposes. The Town of Wheatfield has extended its water lines throughout the area and recent information indicates that there are few wells in use throughout the area. On the adjacent property formerly operated by Textron Defense Systems, groundwater remediation is being conducted. The bottom of the CAC landfill is up dip in the Lockport Dolomite. This appears to have had little effect on the CAC landfill site as evidenced by historical groundwater elevation data.

The upper portion of the dolomite sequence consists of 10 to 20 feet of bedrock consisting of thinly bedded dolomite which may produce well yields of 10 to 20 gpm. Hydraulic conductivities of 0.1 to 0.01 cm/sec may be encountered in this unit. For purposes of this current plan, it is not thought that any of the wells penetrate significantly into the bedrock and were either drilled to refusal or into the uppermost few feet of the weathered bedrock. The bedrock surface is generally encountered at elevations between 560 feet to 570 feet MSL and gently dips to the south.

The wells monitored in this project were drilled to refusal as indicated in a report by Conestoga-Rovers Associates, who installed the wells in 1981 after placement of a clay cap by Secured Landfill Contractors, Inc.

SAMPLING AND ANALYSIS METHODS

Sampling Objectives

The results of samples collected and analyzed in accordance with the approval of the NYDEC are to be used to:

1. Assess the groundwater flow direction and chemistry.
2. Define the nature and extent of pollutant migration, if any.
3. Meet the NYDEC requirements for data submission.

Sampling Locations

Figure 1 illustrates the sample locations. Four wells are to be sampled together with one catch basin (A-9). Table 1 presents the sample locations and the analytical parameters for each location. All methods used conformed to the USEPA Methods of Analysis for Water and Wastewater (40 CFR 136) or SW-846. Table 2 is a summary of the parameters, methods used, preservation methods, and holding times required for this site.

Sample Designation

All samples obtained at the CAC site shall have sample numbers which are uniques to the well or sampling location. For example, the numbering scheme below will be used:

OW2XXX	OW5XXX
OW3XXX	MH9XXX
OW4XXX	

The last three numbers at each sample location will indicate the analysis to be performed with each sample and parameter group being unique as listed below:

001	pH, Temperature, Spec. Conductance
002	Turbidity
003	Phenol Compounds (625/8270)

All field duplicates shall be identified with the letters "A" or "B". Any trip blanks, field blanks, equipment blanks, matrix spikes, and matrix spike duplicates shall have identifying sample numbers which are unique.

Table 1. Sample Locations and Parameters Analyzed.

Well Designation	Well Depth (Ft.)*	Analytical Parameters**
OW2-81	18.20	pH, SC, Phenols (625) Temp., Turbidity
OW3-81	19.66	pH, SC, Phenols (625) Temp., Turbidity
OW4-81	19.38	pH, SC, Phenols (625) Temp., Turbidity
OW5-81	18.23	pH, SC, Phenols (625) Temp., Turbidity
MH A-9	-----	pH, SC, Phenols (625) Temp.,Turbidity

* Based upon measurement by FTA in 1998 after well development; measured from top of riser pipe.

** Field measurement of pH made within NYELAP guidelines (15 min). Turbidity measured using a nephelometer in the field.

pH = Hydrogen Ion Concentration
SC = Specific Conductance
Phenols = Phenol Compounds by EPA Method 625/8270
Temp. = Temperature

Table 2. Summary of Parameters, Methods, Preservation Methods and Holding Times.

Parameter	EPA Method	Preservation	Holding Times
pH*	150.1	4 C	15 minutes (Field)
Specific Conductance*	120.1	4 C	6 hours (Field)
Temperature*	170.1	--	15 minutes (Field)
Turbidity	180.1	4 C	48 hours
Phenol Compounds	625/8270	4 C	7 days to extract 40 days to analyze

* pH, Specific Conductance, and temperature measured in the field. Temperature measurements are used to correct specific conductance measurements.
Frontier Technical Associates is a NYELAP-Certified Laboratory (10475).

Any and all split samples made available for NYSDEC duplicate analysis will be marked and labeled as above.

Quality Assurance/Quality Control Protocol for CAC Samples

Table 3 represents the recommended QA/QC sampling protocol for the samples obtained in this program. Standard deliverables will be requested for these analyses.

Sampling Equipment and Procedures

The procedures outlined here were developed to minimize contamination of water sampling, minimize concentration change prior to testing, and standardize procedures to minimize analytical differences.

The procedures below outline the purging, sampling, and preservation methods used during this sampling program in accordance with the approved sampling plan submitted in 1991 and used to the present time:

1. Inspection of the well noting any unusual conditions.

2. The water level indicating device and the bottom foot or more of cable will be triple rinsed with distilled water.

3. The depth to the water surface from the top of the riser pipe will be measured and recorded on the Sample Collection Form. The total depth of each well is to be checked against previous measurements made by the sample team since the 1998 well redevelopment.

4. Calculate the volume of water in each well. Purge each well was purged by removing three times this volume, or if the well yield is low, remove water until the well is "dry." (within 1-2 inches of bottom).

5. A peristaltic pump or bailer will be used to purge these shallow wells. All tubing coming into contact with the well water shall consist of food-grade polyethylene tubing dedicated to the well or catch basin. It shall be rinsed prior to use with distilled water and sealed in a polyethylene bag for storage. The dedicated tubing is necessary to prevent cross-contamination between the wells. The tubing will be gradually lowered to the bottom of the well as pumping continuees to the bottom of the well. The volume required, the volume purged, water level before purging, and the start and stop times will also be recorded on the Sample Collection Forms.

Table 3. QA/QC Protocol for Groundwater Samples.

Item	Number Required	Parameters
Field Duplicate	5	pH, SC*
Field Duplicate	1	Phenols (625)
Field Blank	1	Phenols (625)
Equipment Blank	**	**
Method Blank	1	Phenols (625)
Matrix Spike	1	Phenols (625)
Surrogate Recovery	1	Phenols (625)

* Analysis of pH and specific conductance will be performed in quadruplicate and average values reported.

** Dedicated bailers, dedicated tubing and new, precleaned, certified sample containers are to be used.

a. It is recommended that all sampling be completed within one day along with all required QA/QC samples. Well yielding highest volumes should be selected for field duplicate or other requirements.

b. Sampling schedule will be provided to NYSDEC to enable split sampling if desired. In most instances, wells must be purged at least one day prior to sampling to enable recovery of sufficient sample volumes.

6. All purge water will be placed in a container specifically used for that purpose and for measuring purge volume. Based upon the results of the analyses previously conducted, the water contains no pollutants incompatible with the treatment process or CAC's sanitary sewage permit, and has been acceptable to the NCSD and meets their criteria. The water will be disposed of in the sanitary sewer.

7. Because most of the wells recover slowly, the wells will be sampled within 24 hours of purging. Sample size, containers, and amount of sample obtained are listed in Table 4. If any delays are encountered, proper documentation must be provided.

8. Groundwater samples will be obtained by dedicated tubing. No equipment will be used for more than one well.

9. Usually, the first sample is taken for analysis of pH and specific conductance. A subsample will be taken for analysis of turbidity. pH and specific conductance probes were triple rinsed with distilled water prior to and after use. The temperature measurement is used to correct specific conductance to 25 C together with a determination of the cell constant by calibration standards. A standard reporting form with all field data is provided for each well and sample location (see Appendix).

10. Temperature, specific conductance, turbidity and pH are reported on the form along with equipment used, weather conditions, field observations, and sampling times.

11. Sample container labels will be affixed to the sample container and the samples placed in an insulated container where they will be kept cool with ice.

12. In a similar fashion, samples will be obtained for phenolic compounds as required for each sample location. Each sample label will be completed including the date, time, location, analysis required, and sampler's initials.

13. All samples are to be packed in an insulated cooler with sufficient ice to ensure a temperature of 4 C during storage and transport to the laboratory.

14. If analyzed locally, all samples will be transported to the laboratory on the same day acquired. If a laboratory outside of the immediate area is chosen, the samples will be shipped by overnight service.

Table 4. Sample Containers and Required Sample Volume.

Parameter	Sample Volume	Number of Containers
pH, Spec. Conductance	1,000 ml	1
Phenols (625)	1,000 ml	1
Turbidity*	25 ml	1

* Subsample of pH and Specific Conductance sample

Note: Samples for turbidity will be analyzed on-site, however if any time delays are encountered, they will be maintained at 4 C until analysis.

15. Analyses will be completed within the specified holding times (see above). The laboratory will be notified by the sampling team prior to sampling and upon shipping to assist in scheduling analyses to meet all specified holding times.

Sample Custody

Two field sampling data collection forms will be used: (1) Well Groundwater Purging Data Form, and (2) a Sample Collection Form. The following data or information shall be included:

1. Site name (CAC), sample number, etc.;

2. Date, time, and elapsed time from sample start to sample finish (if applicable);

3. Information regarding purging the well prior to sampling including initial groundwater level, purge volume required, and actual purge volume;

4. Field test results including pH, temperature, turbidity and specific conductance;

5. Sampling method used; the construction material of equipment;

6. Type of sample and information which appeared significant;

7. Field observations/sampling conditions (e.g., weather);

8. Appearance of sample, such as color, sediment, oil on surface, obvious odor, etc.;

9. Sampler's identity and signature.

In order to maintain integrity of the groundwater samples, strict chain-of-custody procedures will be followed. From the time the sample is collected until the sample is in the custody of the analytical laboratory, the samples are required to be:

1. In the sampler's possession;

2. In the sampler's view, after being in his possession;

3. In the sampler's possession and then locked in a designated, secure area to prevent tampering; or

4. In a sample cooler sealed with a tamper-proof chain-of-custody seal.

A written Chain-of-Custody Record of the transfer of samples must be maintained with a copy in the Appendix of this report.

The Chain-of-Custody Record will be transported with the sample container at the time the sample is collected. When transferring the possession of samples, the person making the transfer signs and records the date and time on the record. The number of custodians in the chain of possession should be as few as possible.

OPERATIONS AND MAINTENANCE PLAN

A landfill area operations and maintenance plan has been developed to address the requirements to inspect and maintain the landfill area proper as well as the monitoring wells. In connection with this plan, an inspection schedule, grass cutting requirements, and required items to be performed have been outlined in detail. A copy of the site O & M Plan is included as an Appendix to this SAP.

SAFETY

Personnel performing the sampling must adhere to all safety requirements for contractors and/or visitors to the CAC facility. Personnel performing the sampling must wear suitable field boots and protective gloves and goggles or safety glasses. Since no detectable levels of priority or hazardous pollutants have been present in the past, additional safety clothing may be used but is not required.

ANALYTICAL LABORATORIES

The pH, temperature, turbidity and specific conductance are to be measured in the field by Frontier Technical Associates, NYELAP #10475, Dr. P. Michael Terlecky, Laboratory Director. All other anlyses must be performed by a NYELAP-certified laboratory. Each laboratory must be certified for the parameters for which data are provided. No other laboratory may perform any analyses related to the effort reported here without demonstrating that they have and maintain the required NYELAP certification for the required parameters. In addition, pH, temperature and specific conductance must be performed in the field by certified analytical laboratory personnel. These analyses must meet the holding times specified in this SAP.

FIELD SAMPLING PERSONNEL

All field sampling and field measurements must be performed by qualified personnel. In the case of groundwater measurements, these personnel must be a Certified Professional Hydrogeologist or a Professional Engineer or be under the responsible charge or supervision of them. Personnel performing the work must be identified in the sampling report, and if requested, must present their certifications, licenses and/or professional qualifications for inspection by the CAC Environmental Engineer.

Samples must be in the custody of the above personnel at all times or be sealed in a container with a tamper-proof seal attached. A summary of weather conditions during the sampling period must be recorded on field sampling forms.

REPORTING

Daily field sampling reporting forms including all sample collection forms, inspection reports, purging data, weather conditions and chain-of-custody forms shall be maintained. Within approximately 15 business days of receipt of laboratory data, three copies of the sampling and analytical report shall be delivered to the CAC Environmental Engineer. In turn, after review and approval, CAC will transmit one copy to the NYSDEC Project Monitor (for 1999, Mr. Michael Hinton). In the event of discovery of a significant concentration of phenol in the wells, a determination will be made as to the cause or source and a decision to resample only those wells, if necessary, will be made to reconfirm the analysis. This will be done in consultation with the NYSDEC, as appropriate.

As a minimum, the following data shall be provided in any sampling report provided in accordance with this SAP:

1. Groundwater Elevations; these data shall be certified by a Certified Professional Hydrogeologist or Professional Engineer.

2. Piezometric Surface Map of groundwater elevations and inferred groundwater flow direction.

3. A summary of pH, Turbidity, and Specific Conductance sampling and analytical results. Specific Conductance data shall be corrected for the cell constant of the instrument and temperature.

4. pH, Turbidity, Specific Conductance and Phenol concentration of water sampled from Catch Basin A-9 if there is any flow present (A-9 is frequently dry unless rainfall or snowmelt is occurring).

5. A summary of the phenol analytical results (EPA 625/8270) including all QA/QC data.

6. A discussion of the findings including any quality assurance/quality control data.

7. Results of the field duplicate, field blank, and surrogate recovery, method blank and matrix spike and matrix spike duplicate, if analyzed, must be presented.

8. Conclusions and Recommendations for future action including any O & M required.

10. Appendix to include field data and notes, groundwater elevations, observations, well inspection reports, laboratory report(s), and chain-of-custody forms.

APPENDIX

I. Sample Well Purging Report and Field Notes

II. Sample Well Inspection Report Form

III. Operations and Maintenance Plan

IV. 1998 Well Development Report

V. Elevations of Monitoring Wells

VI. Analytical Methods

VII. Equipment Cleaning Methods

FRONTIER TECHNICAL ASSOCIATES, INC.

WELL MONITORING FIELD FORM

Site Location:

Sample Point I.D.: _____ Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION Purge Method: Bailer, Perisaltic Pump

Depth to Bottom of Well: _____ft. Top of Casing Elevation: _____ ft.

Depth to Water Surface: _____ft. Groundwater Elevation: _____ ft.

Depth of Water Column: _____ft. 2" Well = 0.17 gals/ft; 4" well = 0.66 gals/ft.

Volume of Standing Water in Well: _____ gallons

Start of Purge: Date: _____ Time: _____

End of Purge: Date: _____ Time: _____

Total Volume Purge: _____ gallons Well Purged Dry?: Yes No # of Volumes Purged _____

Purging Personnel: _____

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump

Sample Date: _____ Sample Time: _____ Depth to Water Surface _____ ft.

Sample Appearance: _____

Samples Preserved: Yes No Dissolved Metals Field Filtered Yes No NA

Sampling Personnel: David Harty

FIELD MEASUREMENTS

Meters Calibrated Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Corning 103	STD. UNITS		
Spec. Conductance	YSI 33	µMHOS/CM		
Temperature	YSI 33	C or F		
Turbidity	Hach 16800	NTU		

Weather: _____

Notes/Well Condition: _____

_____

FRONTIER TECHNICAL ASSOCIATES INC.

MONITORING POINT ASSESSMENT FORM
CARBORUNDUM ABRASIVES CO.
QUARTERLY INSPECTION FORM

Monitoring Point: _____ Date: _____

Inspector's Name (Print): _____

Inspector's Company: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, N.Y. 14221

Well Locked:	Yes	No	NA
Lock Functioning:	Yes	No	NA
Bailer and Rope OK:	Yes	No	NA
Tubing OK:	Yes	No	NA
Protective Casing OK:	Yes	No	NA
Concrete Pad in Good Condition:	Yes	No	NA
Heaving of Well or Casing:	Yes	No	NA
Well Sand in Purge Water:	Yes	No	NA
Well Constricted:	Yes	No	NA
Debris in Well:	Yes	No	NA
Insects in Well:	Yes	No	NA

Other Observations or Details on Conditions Identified Above: _____

_____

_____

Inspector's Signature: _____

OPERATIONS AND MAINTENANCE PLAN

LANDFILL AREA

CARBORUNDUM ABRASIVES COMPANY

(Addendum to Sampling and Analytical Plan)

Report ET-99-703-01

September 27, 1999

Prepared for:

Ms. Suzette Kosikowski
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P.O. Box 350
Niagara Falls, NY 14304-0550

Prepared by:

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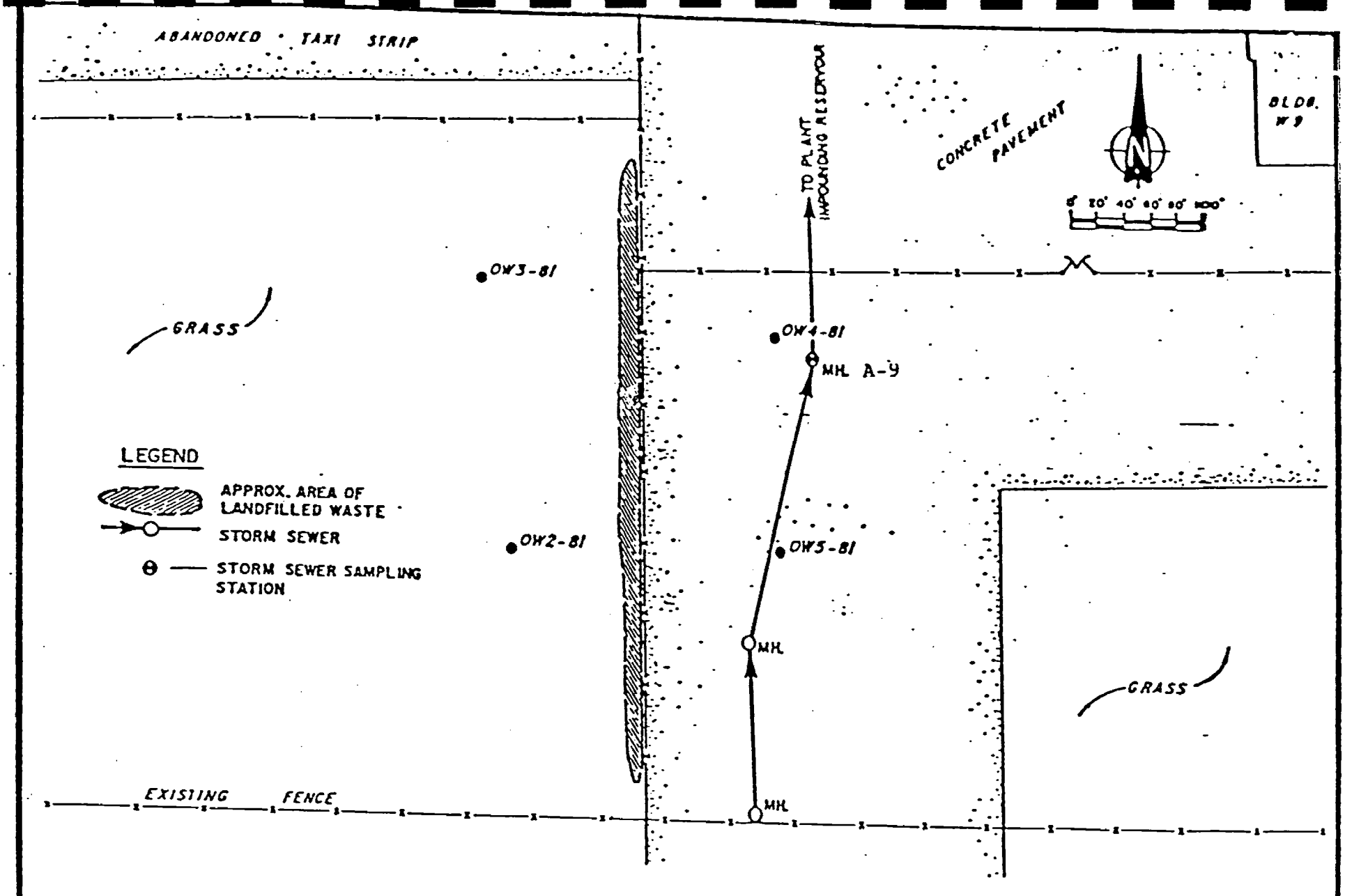

FIGURE 1

WELL LOCATIONS
The Corborundum Company

Elevations of Monitoring Wells at Carborundum Abrasives Company (Feet above Mean Sea Level).

Well No.	Top of Pipe Elevation	Measured Depth*	Bottom Elevation
OW-2	588.50	18.20	570.30
OW-3	587.59	19.66	567.93
OW-4	587.74	19.38	568.36
OW-5	587.52	18.23	569.29

* Measured depths obtained on October 16 and 22, 1998 by Dr. P. Michael Terlecky of FTA, Certified Professional Hydrogeologist (American Institute of Hydrology).

Introduction

In response to the requirements of NYSDEC Region 9, Carborundum Abrasives Company has been monitoring groundwater and performing sampling and analysis for the landfill area located on the southwest corner of the property in Wheatfield, New York since 1981. Figure 1 is a sketch of the landfill area showing the location of the monitoring wells which were installed in 1981 and the location of the "A" storm sewer line (West Branch). Frontier Technical Associates, Inc. has been performing monitoring and inspection on behalf of Carborundum Abrasives Company and has prepared this supplemental report for CAC's submission to the NYSDEC. Previously, technical reports were prepared which described the results of the sampling and analysis for each year and a formal monitoring or sampling and analytical plan has been on file since 1991. The NYSDEC subsequently reduced monitoring parameters for 1992. For 1993, the NYSDEC deleted the requirement for analysis of unfiltered groundwater samples for metals, and for 1994, all metals requirements were deleted and turbidity was added for informational purposes. In 1998, the NYSDEC approved a modification of the monitoring frequency to once every two years.

Originally, five wells were installed in the landfill area--one in the landfill itself and four on the perimeter of the landfill. In 1991, one well (OW1-81), was decommissioned because it had fallen into disrepair because of ground movement in the landfill cap and was no longer functioning. The request was approved and subsequently implemented on September 27, 1991. The phenolics analytical methodology was also changed to the more accurate and specific EPA Method 625/8270.

This report outlines the approach used to fulfill the NYSDEC requirements for operations and maintenance as requested by way of Mr. Hinton's letter in 1998 and inspection conducted in September 1999. The purpose of this report is to present the CAC Operations and Maintenance Plan for the monitoring wells and inspection of the landfill area. We are prepared to implement this plan immediately.

Site Inspection

The physical attributes of the site will be inspected quarterly. This inspection may be conducted by Carborundum Abrasives Company or Frontier Technical Associates, Inc. personnel. The inspections will be conducted in January, April, July and October.

For each monitoring point, the following items will be included: well locks, well casings, covers, concrete pads, bailers and ropes, general conditions and tubing. If any of these items has deteriorated or is in disrepair, they will be replaced or repaired as appropriate. This action will be undertaken immediately or prior to the next quarterly inspection. A written report will be prepared and maintained on file at Carborundum Abrasives Company.

A monitoring point assessment form to be used for the quarterly inspections is presented as Figure 2. A copy of this form will be retained for review during NYSDEC inspections.

Physical Conditions and Grass Cutting

During the quarterly inspection, observations of the landfill cap will be made to assess whether any soil slumping is present, rodent burrows present, growth of any large rooted vegetation, etc. Brush and bushes will be trimmed and the area will be kept clear of debris or trash which might blow onto the site, etc.

Grass cutting will be performed as needed, however, it is expected that it will be cut at least three times during the growing season (expected in May, July and September) or more frequently if inspection indicates it is necessary.

Annual Inspection

One each year, the wells will be purged and depths checked. If depth data indicates infilling of sand or sediment to a depth of 25% of the screen length, the wells will be developed in order to remove the sediment. The wells were last developed in October 1998. Sampling and purging will be conducted in accordance with the following schedule:

Year	Activity
1999	Purging, Sampling
2000	Purging
2001	Purging, Sampling
2002	Purging
2003	Purging, Sampling
2004	Purging
2005	Purging, Sampling
2006	Purging
2007	Purging, Sampling
2008	Purging
2009	Purging, Sampling
2010	Purging

FRONTIER TECHNICAL ASSOCIATES INC.

MONITORING POINT ASSESSMENT FORM
CARBORUNDUM ABRASIVES CO.
QUARTERLY INSPECTION FORM

Monitoring Point: _____ Date: _____

Inspector's Name (Print): _____

Inspector's Company: Frontier Technical Associates, Inc.

Address: 8675 Sheridan Drive, Buffalo, N.Y. 14221

Well Locked:	Yes	No	NA
Lock Functioning:	Yes	No	NA
Bailer and Rope OK:	Yes	No	NA
Tubing OK:	Yes	No	NA
Protective Casing OK:	Yes	No	NA
Concrete Pad in Good Condition:	Yes	No	NA
Heaving of Well or Casing:	Yes	No	NA
Well Sand in Purge Water:	Yes	No	NA
Well Constricted:	Yes	No	NA
Debris in Well:	Yes	No	NA
Insects in Well:	Yes	No	NA

Other Observations or Details on Conditions Identified Above: _____

_____

_____

Inspector's Signature: _____

The annual inspection will include the following in addition to purging:

1. Inspection of the well noting any unusual conditions.

2. The depth to the water surface from the top of the riser pipe. The total depth of each well will be checked against previous measurements. If infilling is noted, well development will be scheduled.

3. Each well will be purged to remove suspended sediment and biological growth if present.

4. A peristaltic pump or bailer may be used to purge these shallow wells. All tubing or bailers are dedicated to ensure that no cross-contamination occurs.

5. In years ending with odd numbers, sampling will be conducted in accordance with the sampling and analytical plan and schedule above.

Safety

Personnel performing the sampling will adhere to all safety requirements for contractors and/or visitors of the CAC facility. Personnel performing the sampling or purging will wear suitable field boots and protective gloves and safety glasses or goggles.

Well Development Report

CAC Landfill (Site 932007)
(October 1998)

FTA Report ET-703-01

January 28, 1999

Prepared For:

Ms. Suzette Kosikowski
Carborundum Abrasives Company
P.O. Box 350
6600 Walmore Road
Niagara Falls, NY 14304

Prepared By:

Frontier Technical Associates, Inc.
8675 Sheridan Drive
Buffalo, NY 14221

FTA Frontier Technical Associates, Inc.

INTRODUCTION

At the request of the NYSDEC, the monitoring wells at the former Carborundum Abrasives Company landfill (Site 932007) were redeveloped in October 1998. This included flushing and pumping each well four times on two separate occasions in October 1998. The purpose of this report is to document the redevelopment activities and well as the measurements and analyses which were made at that time.

METHODS

Initially before redevelopment, a measurement was made of the depth to water and the depth to the bottom of each well. In addition, a sample of the well water was recovered for measurement of pH, temperature and specific conductance. Purging and development of each well was performed on two separate dates, October 16 and 22, 1998. Each well, except for Well 4, was purged to dryness. The recovery rates for Well 2, 3 and 5 were so slow that a sufficient volume of water was not available for flushing and purging. A supplemental supply of potable water (approx. two gallons at each well) was used to flush each of these wells, and subsequently each well was purged a total of four times. At the conclusion of development of these wells, each well was purged to dryness. For Well 4, a sufficient volume of well water was always available to allow continued purging. Measurement of depth to the bottom of each well was also performed at the conclusion of each episode of well redevelopment. It was visually noted that some well casings have shown some vertical alignment changes over the past 18 years, although the elevations to the top of the casings have not been surveyed.

RESULTS

Table 1 is a summary of the well measurements made in association with each purge and development cycle. A comparison of final depths to the bottom of each well to original elevations and depths is provided below:

Well #	Orig. Well Depth	Current Well Depth
2	19.50	18.20
3	19.89	19.66
4	19.84	19.38
5	18.02	18.93

If the data for original well depths were reliable, there are two wells which present some problems of interpretation, Well 2 and Well 5. For Well 2, the data indicate that approximately 1.3 feet of depth have been lost, suggesting some infilling. However, purging and pumping as well as plunging the well did not yield significant amounts of sediment. For Well 5, the current measured depth is greater than the original depth. However, it should be pointed out that recent measurements are consistent with this observation. For Well 3 and 4, each bottom depth is consistent with a small amount of infilling. In these cases, no significant suspension of sediment was observed during redevelopment activities.

Although the data would appear to be somewhat inconsistent, a plot of groundwater elevations measured relative to the original surveyed elevations indicates that the piezometric surface is similar to that observed every Spring since groundwater elevation maps have been prepared. The only noticeable difference is the relative elevations at Well 4 and Well 5. Usually Well 4 has the lowest groundwater elevation, whereas during this episode, it was the second lowest. Well 5 had the lowest elevation of all wells observed in October 1998. It should be pointed out that no measurements are available for the Fall in past years and that the Summer and Fall of 1998 were somewhat dry compared to past years observed. This may explain the reversal of the elevations at these two wells. In addition, at the adjacent property to the south, an extensive network of wells and a pump and treat groundwater remediation system has been installed and is being operated. Since Well 5 is located closest to the property line, it is more likely that this well may have been influenced by pumping activities to the south and east.

With regard to pH and specific conductance values of the well water from each well, the data for both dates indicated that the values were consistent with data recovered for these wells in the past and were within the expected range for groundwater from the Lockport Dolomite in this area.

CONCLUSIONS

Development of each well did not change the depth to the bottom or produce any significant change in the characteristics of the produced water. The wells appear to be performing for the purpose intended. Based upon data recovered in the past, no leaching of contained landfill materials has been detected. The next scheduled monitoring period is April 1999.

RECOMMENDATIONS

We recommend that the elevations at the top of each well casing be determined in 1999 prior to the next scheduled sampling episode. This will enable determination if any elevation changes have occurred over the past 18 years.

Equipment Cleaning Procedures

All bailers including new bailers shall be cleaned prior to use during this program.

1. Prepare a non-phosphate laboratory grade detergent solution in a bucket.
2. Rinse all bailers in tap water.
3. Disassemble bailer and scrub each part with the detergent and water using a brush.
4. Rinse with tap water.
5. Rinse with distilled or deionized water twice and reassemble bailer.
6. Rinse with hexane (removes pesticides and PCBs).
7. Allow to air dry.
8. Rinse with distilled or deionized water.
9. Rinse bailer with methanol (must be certified acetone-free). The methanol used is extremely critical. Many grades have acetone and 2-Butanone (MEK) as trace constituents.
10. Allow to air dry.
11. Rinse with distilled water.
12. Rinse with organic-free distilled or deionized water.
13. Allow to air dry.
14. Seal in a polyethylene bag to minimize potential for contamination and store in area free from contamination or use of solvents.

MAXIMUM HOLDING TIMES AND SAMPLE COLLECTION/PRESERVATION INFORMATION

VOLATILE ORGANICS

Matrix	Container	Minimum Sample Size	Preservative	Holding Time (From Date Sampled)
Water Samples				
No Residual Chlorine Present	3 40 mL vials with Teflon lined septum caps	40 mL	4 drops 1:1 HCl or HNO_3	14 days
Residual Chlorine Present	3 40 mL vials with Teflon lined septum caps	40 mL	4 drops of 10% sodium thiosulfate, 4 drops conc. HCl, 4°C	14 days
Acrolein and Acrylonitrile	3 40 mL vials with Teflon lined septum caps	40 mL	Adjust to pH 4-5, 4°C	14 days
Soil/Sediments and Sludges	Glass jar with Teflon liner or core tube	10 g	4°C	14 days
Concentrated Waste Samples	Glass jar with Teflon liner or core tube	10 g	None	14 days

The above information applies to the following parameters and methods:

Parameter	Method
Volatile Halocarbons	601/8010 (GC)
Volatile Aromatics	602/8020 (GC)
Volatile Organics	624/8240/8260 (GC/MS)
Acrolein/Acrylonitrile	603/8030 (GC)

SEMIVOLATILE ORGANICS

Matrix	Container	Minimum Sample Size	Preservative	Holding Time (From Date Sampled)
Water Samples				
No Residual Chlorine Present	1 liter glass with Teflon liner	1 liter	4°C	Samples must be extracted within 7 days and analyzed within 40 days of extraction.
Residual Chlorine Present	1 liter glass with Teflon liner	1 liter	Add 3 mL 10% sodium thiosulfate per gallon, 4°C	Samples must be extracted within 7 days and analyzed within 40 days of extraction.
Soil/Sediments and Sludges	Glass jar with Teflon liner or core tube	50 g	4°C	Samples must be extracted within 14 days and analyzed within 40 days of extraction.
Concentrated Waste Samples	Glass jar with Teflon liner or core tube	50 g	None	Samples must be extracted within 14 days and analyzed within 40 days of extraction.

The above information applies to the following parameters and methods:

Parameter	Method
Phenols	604/8040 (GC)
Phthalate Esters	606/8060 (GC)
Organochlorine Pesticides/PCBs	608/8080 (GC)
Polyaromaltic Hydrocarbons	610/8310 (HPLC)
Organophosphate Pesticides	614/8140 (GC)
Phenoxy acid Herbicides	615/8150 (GC)
Semivolatile Organics	625/8270 (GC/MS)
Carbamate & Urea Pesticides	632 (HPLC)

METALS

Parameter	Method No.	Matrix	Holding Time (from Date Sampled)	Container	Preservative[a]	Min. Sample Size
Metals (ICP)	200.7/6010	Water	6 months	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	6 months	core tube/glass jar	4°C	10 g
Arsenic (GF-AA)	206.2/7060	Water	6 months	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	6 months	core tube/glass jar	4°C	10 g
Mercury (CV-AA)	245.1/7470	Water	28 days	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	28 days	core tube/glass jar	4°C	10 g
Selenium (GF-AA)	270.2/7740	Water	6 months	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	6 months	core tube/glass jar	4°C	10 g
Thallium (GF-AA)	279.2/7841	Water	6 months	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	6 months	core tube/glass jar	4°C	10 g
Lead (GF-AA)	239.2/7421	Water	6 months	Poly	HNO_3 to pH < 2.0	100 ml
		Soil/Waste	6 months	core tube/glass jar	4°C	10 g
Chromium (III/VI)	220.7/218.4/ 312B/7197	Water	24 hours	Poly	4°C	100 ml
		Soil/Waste	24 hours extn. [b]	core tube/glass jar	4°C	10 g
Silica	200.7/6010	Water	28 days	Poly	4°C	100 ml
		Soil/Waste	28 days	core tube/glass jar	4°C	10 g

(a) Listed preservative is for total metals. Dissolved or suspended metals require filtration prior to pH adjustment.
(b) extn: extraction

CONVENTIONALS

Parameter	Method No.	Matrix	Holding Time[a] (from Date Sampled)	Container	Preservative	Min. Sample Size
Color	110.2	Water	48 hours	Poly	4°C	100 ml
Oil and Grease	413.1/ 413.2 1664	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	1000 ml
Specific Conductance	120.1	Water	28 days	Poly	4°C	50 ml
Acidity	305.1	Water	14 days	Poly	4°C	50 ml
pH	150.1	Water	ASAP	Poly	4°C	50 ml
Alkalinity	310.1	Water	14 days	Poly	4°C	50 ml
Hardness	200.7/ 314A/314B	Water	6 months	Poly	HNO_3 to pH < 2	50 ml
Biochemical Oxygen Demand	405.1	Water	48 hours	Poly	4°C	200 ml
Chemical Oxygen Demand	410.4	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	100 ml
Organic Carbon (TOC)	415.1	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	100 ml

CONVENTIONALS (Cont.)

Parameter	Method No.	Matrix	Holding Time(a) (from Date Sampled)	Container	Preservative	Min. Sample Size
Orthophosphate	365.3	Water	48 hours	Poly	4°C	100 ml
Total Phosphorus	365.3	Water	28 days	Glass	H_2SO_4 to pH < 2	100 ml
Total Kjeldahl Nitrogen	351.2	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	100 ml
Ammonia	350.1	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	50 ml
Nitrite	354.1	Water	48 hours	Poly	4°C	50 ml
Nitrate	353.2/300.0	Water	48 hours	Poly	4°C	50 ml
Nitrite plus Nitrate	353.2	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	50 ml
Total Solids	160.3	Water	7 days	Poly	4°C	100 ml
Total Suspended Solids	160.2	Water	7 days	Poly	4°C	100 ml
Total Dissolved Solids	160.1	Water	7 days	Poly	4°C	100 ml

CONVENTIONALS (Cont.)

Parameter	Method No.	Matrix	Holding Time[a] (from Date Sampled)	Container	Preservative	Min. Sample Size
Total Volatile Solids	160.4	Water	7 days	Poly	4°C	100 ml
Turbidity	180.1	Water	48 hours	Poly	4°C	50 ml
Sulfate	300.0	Water	28 days	Poly	4°C	50 ml
Sulfite	377.1	Water	ASAP	Poly	4°C	100 ml
Sulfide	376.2	Water	7 days	Poly	4°C, NaOH to pH > 9 $Zn(C_2H_3O_3)2$	100 ml
Cyanide	335.1/ 335.2/335.3	Water	14 days	Poly	4°C, NaOH to pH > 12	250 ml
Coliform, Total & Fecal	909A/ 909C	Water	6 hours	Sterile poly	4°C, $Na_2S_2O_3$	100 ml
Bromide	Dionex	Water	28 days	Poly	4°C	50 ml
Chloride	300.0	Water	28 days	Poly	4°C	50 ml
Chlorine, residual	330.1	Water	ASAP	Poly	4°C	100 ml

CONVENTIONALS (Cont.)

Parameter	Method No.	Matrix	Holding Time[a] (from Date Sampled)	Container	Preservative	Min. Sample Size
Fluoride	340.2	Water	28 days	Poly	4°C	50 ml
Iodide	Dionex	Water	28 days	Poly	4°C	50 ml
Organic Halogen (TOX)	9020	Water	28 days	Glass	4°C, H_2SO_4 to pH < 2	200 ml
Phenolics	420.1/ 420.2	Water	28 days	Glass	4°C, H_2SO_4 to ph < 2	100 ml
Surfactants (MBAS)	425.1	Water	48 hours	Poly	4°C	100 ml
Gross Alpha, Beta and Radium	9310/ 9315	Water	6 months	Poly	HNO_3 to ph < 2	2000 ml
Odor	140.1	Water	ASAP	Glass	4°C	1000 mL

a) Parameters with holding times of 24 hours or less are analyzed on the day of receipt in the laboratory. Parameters with holding times between 24 and 48 hours are analyzed within one day of receipt in the laboratory.

CLP HOLDING TIMES

Parameter	Matrix	Holding Time[a] (from Date Received)	Container	Preservative	Min. Sample Size
Volatile Organics	Water	10 days	2 40 mL vials with Teflon lined caps	4°C	40 mL
	Soil	10 days	Glass jar with Teflon liner or core tube	4°C	10 g
Extractable Organics	Water	5 days extn. 40 days anal.	1 liter glass with Teflon liner	4°C	1000 mL
	Soil	10 days extn. 40 days anal.	Glass jar with Teflon liner or core tube	4°C	50 g
Metals (other than Mercury)	Water	180 days	P,G [b]	HNO_3 to pH < 2	100 mL
	Soil	180 days	P,G	4°C	10 g
Mercury	Water	26 days	P,G	HNO_3 to pH < 2	100 mL
	Soil	26 days	P,G	4°C	10 g
Cyanide	Water	14 days	P,G	0.6 g ascorbic acid,[c] NaOH to pH >12, 4°C	100 mL
	Soil	14 days	P,G	4°C	10 g

(a) Holding times calculated from date of receipt in laboratory
(b) Polyethylene (P) or glass (G)
(c) Only used in the presence of residual chlorine