FRONTIER TECHNICAL ASSOCIATES, INC.
8675 Main Street, Williamsville, New York 14221 (716) 634-2293
Environmental Monitoring and Consulting

PERIODIC REVIEW REPORT (PRR)

INACTIVE LANDFILL AREA

SAINT GOBAIN ABRASIVES, INC.

St. Gobain Abrasives Division
Site No. 932007
6600 Walmore Road
Wheatfield NY 14304

FTA Report ET-18-703PRR

April 18, 2018

Prepared For:

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Prepared By:

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This report was prepared at the request of and for the use of Saint Gobain Abrasives, Inc. management use only, and except for required regulatory compliance reporting, is not intended for any other purpose. This report updates previously submitted information and reflects no change in the data.

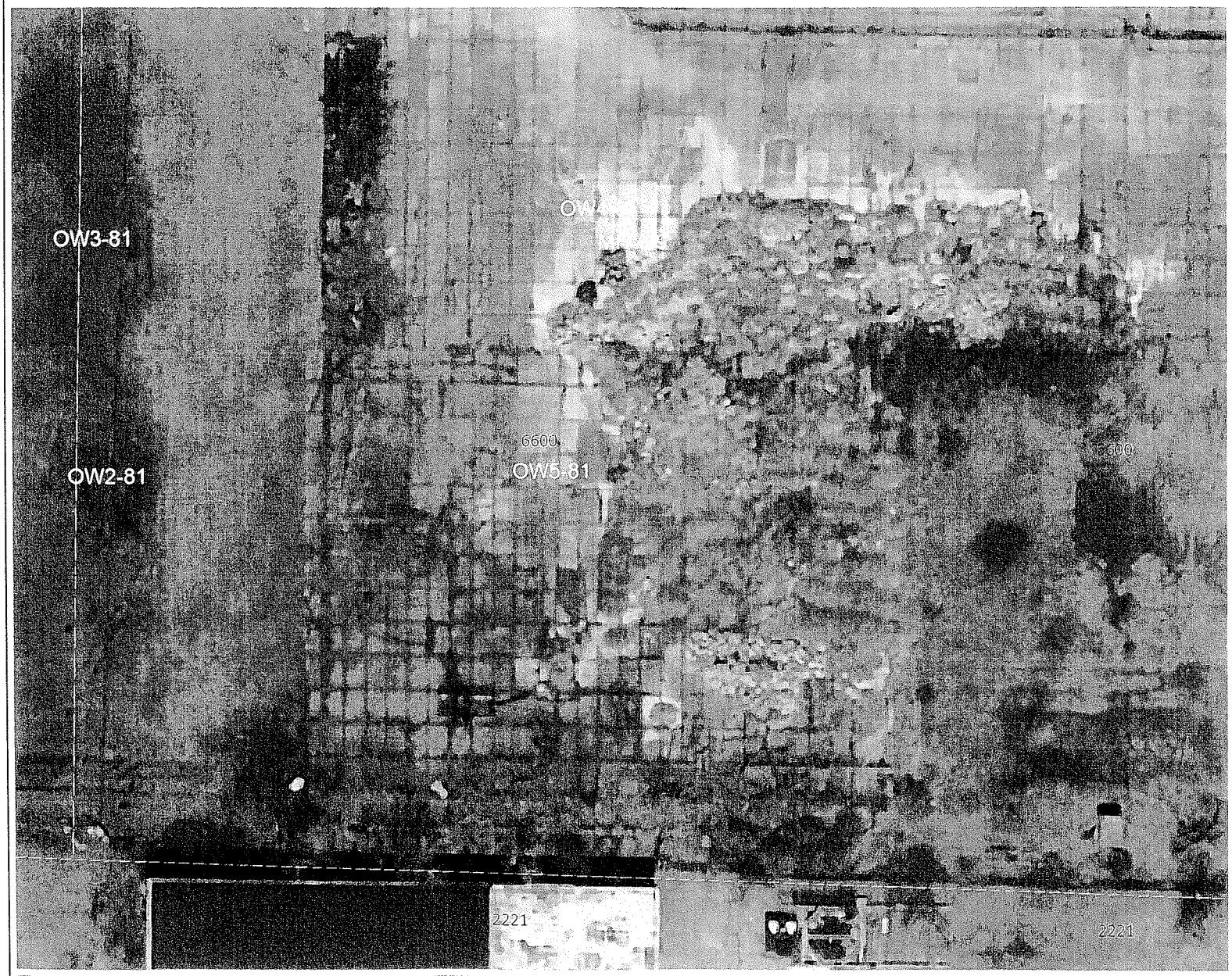
INTRODUCTION

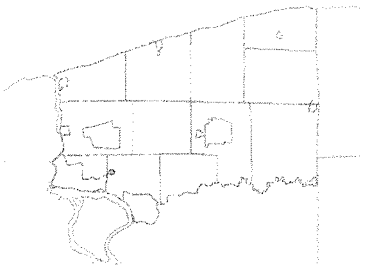
In response to the requirements of NYSDEC (6 NYCRR 375-1.2), Saint Gobain Abrasives, Inc. has requested that Frontier Technical Associates, Inc. complete documentation of site activities and site characteristics of the former Carborundum Abrasives Inactive Landfill Site (932007). This site was capped in 1981 and since that time inspections and groundwater sampling and analysis for the landfill area located on the southwest corner of the property in Wheatfield, NY have been completed. 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) (see NFTA security fence installed in 2004). Figure 1 A is an *aerial photo* of the area with the fence installed. Frontier Technical Associates, Inc. has completed much of the monitoring and site activities since that time, and has periodically submitted inspection and monitoring reports to the NYSDEC documenting these activities. FTA had prepared technical reports describing sampling and analytical results for 1991. The NYSDEC subsequently reduced monitoring parameters for 1992. For 1993, the NYSDEC deleted the requirement for analysis of unfiltered groundwater for metals, and for 1994, all metals requirements were deleted and turbidity was added for informational purposes. After the 1997 monitoring episode, SGC requested and received approval to monitor these wells every two years. The requirement for quarterly inspections of the wells was eliminated by the NYSDEC in 2012. A regularly scheduled bi-annual sampling event took place in 2017.

Since 1982, the monitoring wells and adjacent catch basin were sampled for pH and total phenolics (4AAP). In the period 1982-1988, there were no detectable levels of phenolics 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 (4AAP) were detected in the monitoring wells and adjacent catch basins. Again in 1990, low levels of total phenolics were detected using the same method. This resulted in the NYSDEC's desire to obtain additional data for evaluation beginning in 1991. Based upon the 1991 results, Well OW1-81 was decommissioned because it had fallen into disrepair and was no longer functioning to monitor the *interior* of the landfill. The request was approved by the NYSDEC and implemented on September 27, 1991. The phenolic compound analytical methodology was also changed to the more accurate and specific EPA Method 8270. The former method (4AAP) is subject to interferences (colorimetric method) typically yielding false positive results. It was deemed inappropriate for monitoring at this site.

This report outlines the approach used to fulfill the NYSDEC requirements for 2016 in connection with the Site Management Periodic Review request. This report covers the period from January 1, 2017 to December 31, 2017.

Figure 1 SCG Landfill Locations





Legend

Parcels

0 94.04 188.1 Feet

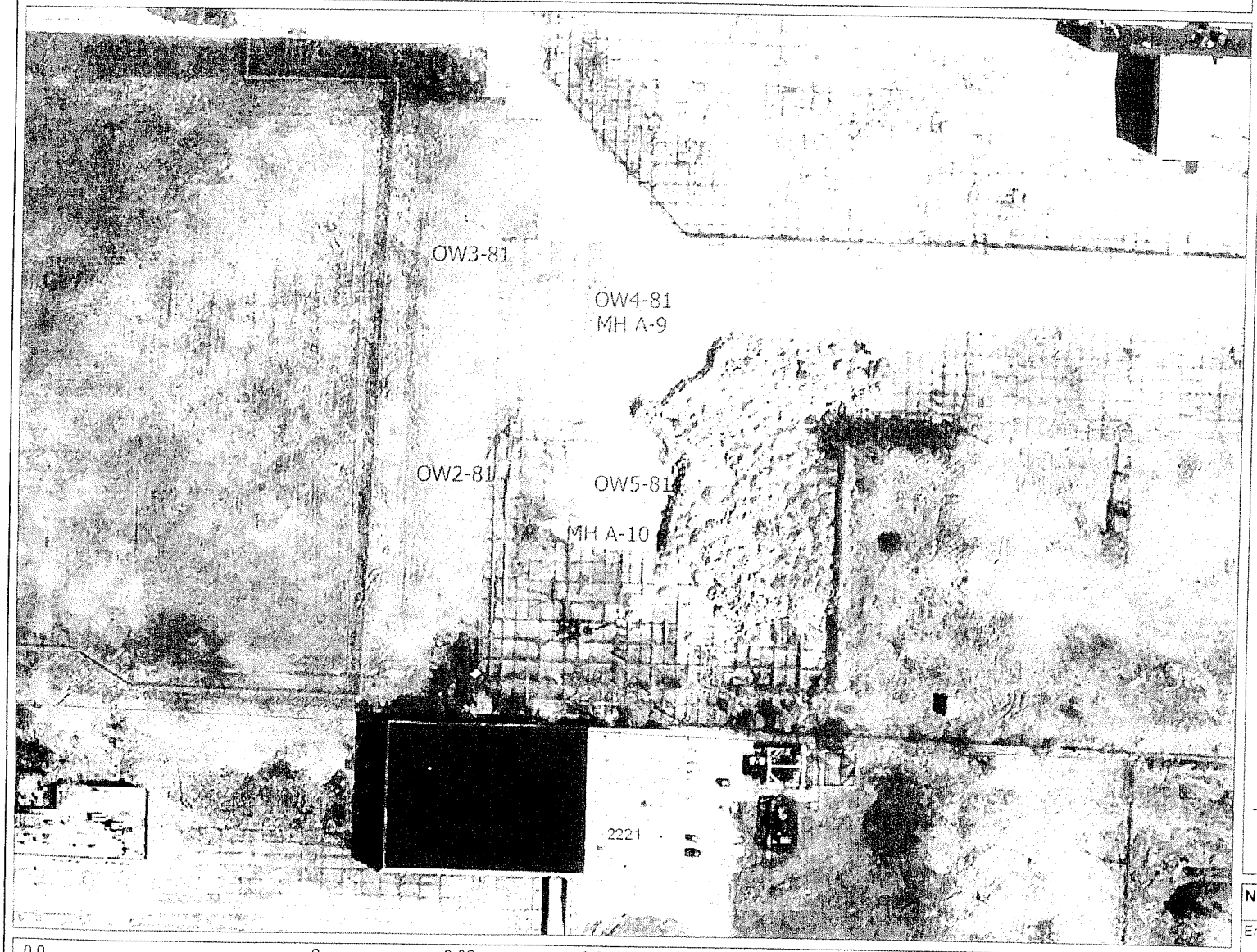
WGS_1984_Web_Mercator_Auxiliary_Sphere
THIS MAP IS NOT TO BE USED FOR NAVIGATION

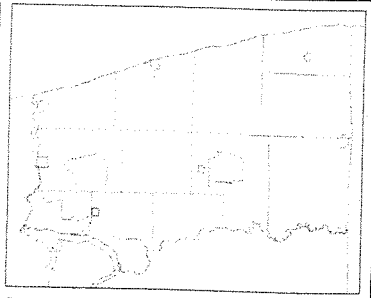
NIAGARA COUNTY
DEPARTMENT OF REAL PROPERTY SERVICES

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 1,128

Figure 1A. SCG Landfill Locations





Legend

Streets and Highways
- Interstate
- Primary State Road
- Secondary State Road
- County Road
- Local Road

Parcels

1Ft Color Aerials
- Red: Band_1
- Green: Band_2
- Blue: Band_3

2Ft Color Aerials
- Red: Band_1
- Green: Band_2
- Blue: Band_3

1: 1,414

Notes

Enter Map Description

0.0 0 0.02 0.0 Miles

NIAGARA COUNTY, NEW YORK
DEPARTMENT OF REAL PROPERTY SERVICES

The most recent biennial sampling and monitoring effort took place in 2017 and included sampling of all four groundwater monitoring wells and one catch basin which drains the surface runoff and subsurface drainage from the landfill area . In accordance with the Site Sampling Plan, the samples collected were all analyzed for pH, specific conductance, temperature, turbidity and phenolic compounds by EPA Method 8270.

GEOLOGY AND HYDROGEOLOGY

The area in the immediate vicinity of the SGA, Inc. (formerly Carborundum Abrasives) plant is underlain by approximately 10-15 feet of clayey to sandy silt, glacial-lacustrine deposits and glacial 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. It is generally striated on the surface, has extensive 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 occasionally 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. Those that were used occasionally along Walmore Rd to the south were closed as part of a groundwater remediation effort conducted by the former Bell Aerospace-Textron in the late 1980's and early 1990's. This groundwater withdrawal and treatment on-site continues to the present.

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 10-20 gpm. Hydraulic conductivities of 0.1 to 0.01 cm/sec may be encountered in this unit. For purposes of this current study, 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 is gently dipping 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. (SLC Contractors). Figure 2 illustrates a typical surficial geologic cross section in the landfill area.

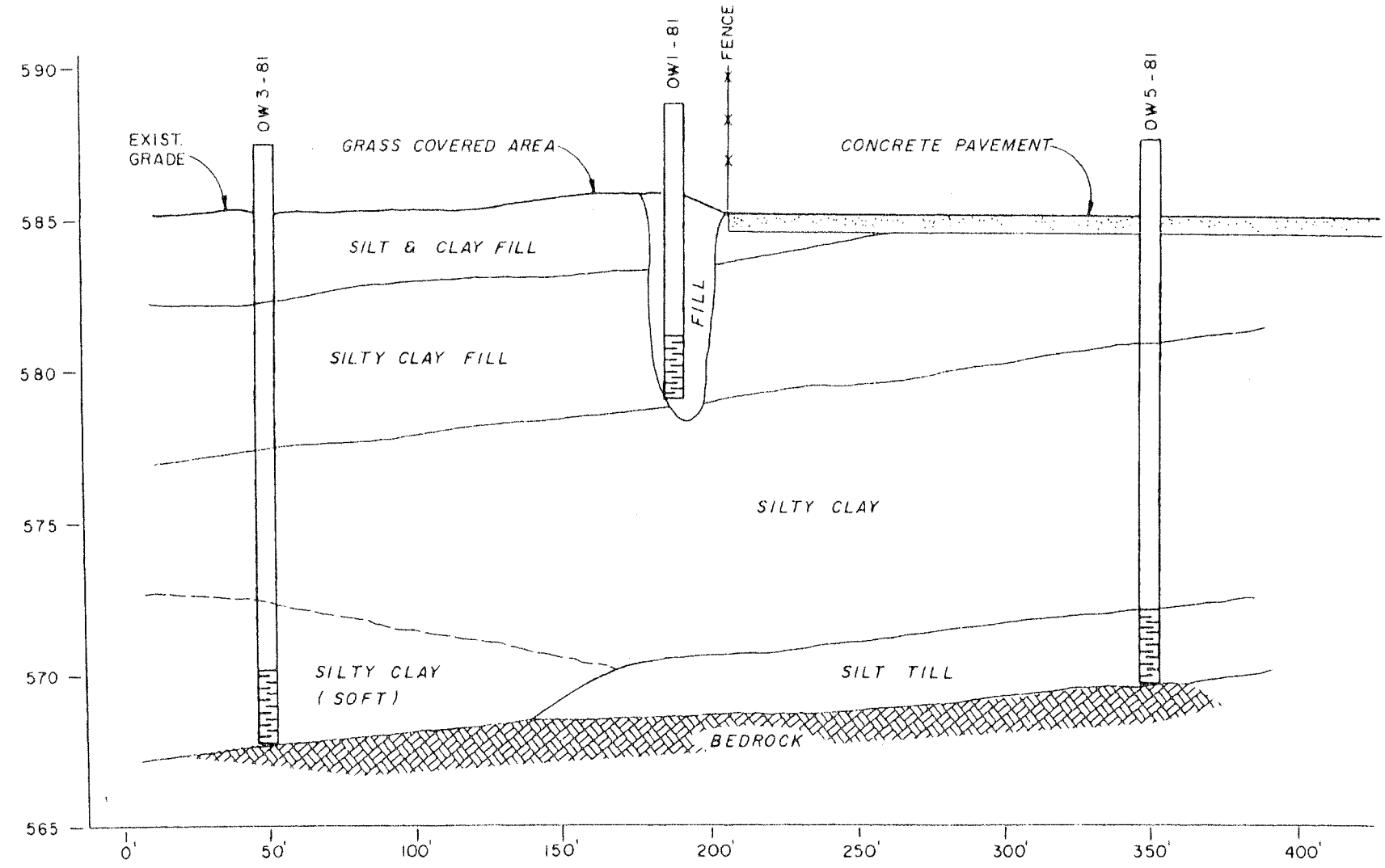


Figure 2

GEOLOGIC CROSS SECTION A - A'

The Carborundum Company

FORMER USE OF THE LANDFILL

The former Carborundum Abrasives Company landfill site in Wheatfield was identified in a report by the Inter-Agency Task Force on Hazardous Wastes in the report entitled "Draft Report on Hazardous Waste Disposal in Erie and Niagara County, New York, March 1979." The site was used during the period 1968 to 1976 to dispose of plant-generated wastes described in the Draft Report as follows:

> **"...partially solidified and solidified resins, floor sweepings, wastes (sic) fillers including calcium carbonate, clays and animal glue (est. 400 tons total) with free phenols (resins) (est. 800 to 1600 lbs total)."**

The method used to dispose of the waste materials involved the excavation of a long, narrow trench. The dimensions of the trench were estimated to be 20 feet in width, 450 feet in length, and 12 feet in depth. As waste materials were deposited into the trench, a soil cover utilizing the excavated soil (glacial-lacustrine clays) was placed over the waste.

MONITORING WELLS

From January 20-22, 1981, Empire Soils Investigations, Inc. installed a total of five groundwater monitoring wells in the landfill area. Four were located at the perimeter of the site and the fifth well was installed through the center of the landfilled waste in order to identify landfill characteristics. This included waste types, depth of disposal, soil cover, and moisture conditions.

All four of the perimeter wells extended to the bedrock-overburden interface or penetrated them slightly. The monitoring well installed in the landfilled waste extended only to the bottom of the landfilled materials. This well was damaged over time and ceased to function properly and was subsequently removed in 1991 (see locations in Figure 1). The wells were constructed of two inch diameter black steel pipe attached to a two foot, Johnson SS well point. All joints were welded during installation. Each well has a protective outer casing with a lockable cap. A typical installation is shown in Figure 3.

STRATIGRAPHY

The landfill area had a typical overburden which included an upper mixed layer of silt and clay fill which supported a grass cover. Two of the wells were installed through the concrete pavement which was approximately six to eight inches in thickness. Beneath these materials was a medium to stiff silty clay material. Traces of vegetative matter could be observed and these materials appeared to be graded and compacted prior to installation of

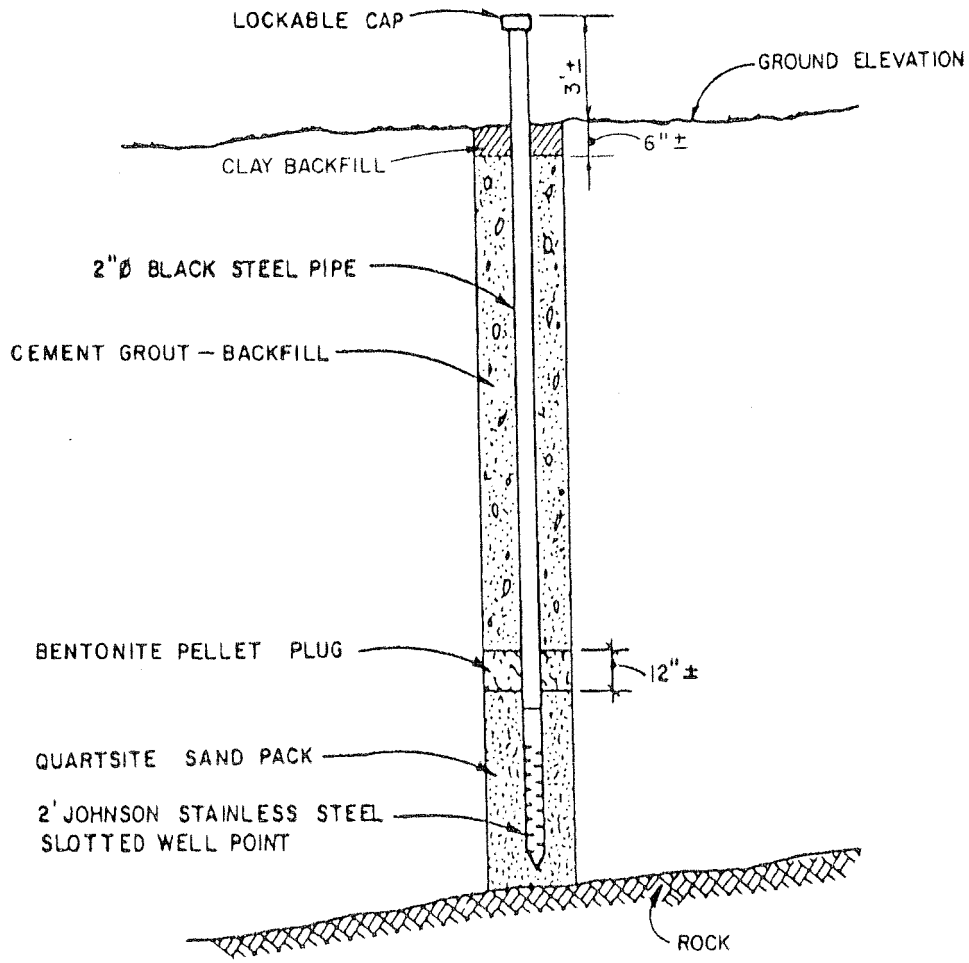


Figure 3

TYPICAL MONITORING
WELL INSTALLATIONS
The Carborundum Company

the concrete pad which, from old photographs of the site, appeared to be either a taxiway or parking area for aircraft manufactured at Bell Aircraft Co. during WW II. Beneath the silty clay fill is a silty clay layer which in the area is reddish brown in color. Some mottling can be observed with gray clay. Beneath these layers is a reddish-brown silt to clayey silt till. The thickness of the materials overlying the bedrock at this site may reach 15 feet based upon other excavations. Most of the perimeter boreholes reached a maximum depth of approximately 17 feet. Bedrock slopes in the area are approximately 0.25 to 0.5 degrees to the south.

Materials encountered in the central borehole included wood, silt, sand, screen materials, paper and the backing cloth used for sandpaper manufacturing. Most of the materials contained in the landfill were general plant trash and off spec materials and damaged goods from the manufacturing process.

GROUNDWATER

The primary presence of groundwater at the landfill site and surrounding area is in a silty till material immediately overlying the bedrock. This layer ranges in thickness from absent at some site locations to approximately 8-12 inches in thickness at others. At the time of the initial investigation in 1981, perched groundwater was observed in the landfill monitoring well. Installation of a landfill cap with appropriate slopes coupled with the low permeability surrounding soils subsequent to the initial investigation in 1981, indicated that the landfill water itself was contained in the landfill. The source was precipitation infiltration. The terrain is relatively flat except for the capped landfill itself. To the west of the landfill, soils remain moist throughout most of the summer due to runoff from the airport runways and taxiways in the area and low permeability of the soils.

The initial piezometric surface observed differs little from 1981 to the present time. The direction of groundwater flow is from the southwest to northeast and has remained constant through the series of investigations carried on over the last 20 years of monitoring by Frontier Technical Associates, Inc. In addition, based upon the analysis of the groundwater, the landfill cap has remained intact, and the quality of the groundwater has not been impaired. The landfill is functioning to contain the waste materials present. In addition, it would appear that the waste resins either were polymerized or became polymerized and thus very resistant to breakdown. No phenolic compounds are present in the catch basin draining the immediate area during recent sampling episodes in the last ten years.

SITE MONITORING AND ANALYICAL PLAN

Sampling Objectives

The results of analysis of samples collected and analyzed in accordance with the approval of the NYSDEC are being used to:

1. Assess the groundwater flow direction and chemistry.

2. Define the nature and extent of pollutant migration, if any.

3. Meet the NYSDEC requirements for data submission.

Sampling Personnel

Sampling personnel must be trained and experienced in the procedures used for data collection, sampling procedures and analytical methodology in the field. They must demonstrate their competence in accordance with NYDOH-ELAP certification program. Personnel must be specifically trained in the analytical procedure and pass demonstrations of capability in accordance with the NYSDOH-ELAP requirements and FTA SOPs implementing the Laboratory Procedures Manual.

The project manager is currently David M. Harty, P.E., BCEE. Mr. Harty has been involved with this site since 1981.

Sampling Locations

As indicated previously, Figure 1 and 1A illustrate the sample locations. Four wells are sampled together with one catch basin (MH-9 located on the "A" Storm Line). Table 1 presents the sample locations and USEPA or Standard Methods analytical methods used for samples from each location. All methods used conformed to the USEPA Methods of

Table 1. Sample Locations and Parameters Analyzed

Well Designation	Well Depth (ft)*	Analytical Parameters**
OW2-81	18.20	pH, Specific conductivity, Temperature, Turbidity, Phenols (8270)
OW3-81	19.66	pH, Specific conductivity, Temperature, Turbidity, Phenols (8270)
OW4-81	19.38	pH, Specific conductivity, Temperature, Turbidity, Phenols (8270)
OW5-81	18.23	pH, Specific conductivity, Temperature, Turbidity, Phenols (8270)
MH A-9	-----	pH, Specific conductivity, Temperature, Turbidity, Phenols (8270)

* Based upon measurement by FTA in 1998; rechecked in 2000 and 2003; measured from top of riser pipe.

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

Phenols = Phenol Compounds as measured by EPA Method 8270.

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

Parameter	EPA Method	Preservation	Holding Time
pH	SM18-21: 4500 H B	None	Analyze Immediately- 15 Minutes (Field)
Specific Conductance	120.1 (rev 1982)	4° C	6 Hours (or Field)
Temperature	SM 18:21 2550B	---	Immediately (Field)
Turbidity	180.1 (Rev 2.0)	4° C	Immediately (Field)
Phenol Compounds	8270	4° C	5 days to extract 28 days to analyze

pH, Specific Conductance, turbidity, and temperature were measured immediately in the field. Frontier Technical Associates, Inc. is a NYELAP-Certified Laboratory (10475).

Analysis for Water and Wastewater (40 CFR Part 136) or SW-846 (as revised). Table 2 is a summary of the parameters, methods used, preservation methods, and holding times required.

Sampling Equipment and Procedures

The procedures outlined here were developed to minimize contamination of water sampling equipment and analyses, minimize concentration changes 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 and approved in 1991 and revised in 1999. This plan was revised again in November 2012 per the NYS DEC.

1. Annual inspection of the well noting any unusual conditions .

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

3. The depth to the water surface from the top of the riser pipe was measured and recorded on the Sample Collection Form. Depth to the bottom of each well was also measured.

4. The volume of water in each well is calculated. Each well is purged by removing three times this volume, or if the well yield is low, water is removed until the well is considered "dry" (within 1-2 inches of the bottom).

5. A peristaltic pump is used to purge these shallow wells. All tubing coming into contact with the well water consists of food-grade polyethylene tubing dedicated to the well. This dedicated tubing is intended to eliminate cross-contamination between the wells. No equipment is to be used for more than one well location. The tubing was gradually lowered into the well as pumping continued. The volume required, volume obtained, water level before purging, and the start and stop times are to be recorded.

6. All purge water is to be placed in a container specifically used for that well and for measuring purge volume. If the well contained very little volume, this water was reserved for pH, specific conductance and turbidity determination. After a time has elapsed for sufficient recovery, sampling was completed. In one instance several days are occasionally necessary to obtain a sufficient volume for phenol compound analysis. Based upon results of the analyses performed over the past decade, the water, contains no parameters which might be incompatible with the treatment process or SGA's sanitary sewage permit, and is acceptable to the NCSD #1 and meets their criteria. The water is then disposed of in the sanitary sewer.

7. For the wells which generally recover slowly, the wells are sampled within 24 to 48 hours of purging. Sample size, containers and amount of sample obtained are contained in Table 3. In 2007 for example, it took nine days to recharge to an adequate volume for sampling from one well after checking it daily.

8. Usually, the first sample is taken for analysis of pH, temperature, specific conductance and turbidity. Probes are triple rinsed with distilled water after use. A standard reporting form with all field data is provided for each well and sample location (See Appendix).

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

10. Samples were obtained for phenolic compounds as required for each sample location (EPA 8270). Each sample label was completed including the date, time, location, analysis required, and sampler's initials.

11. All samples are packed in an insulated cooler with sufficient ice to maintain a temperature of 4^{o} to 6^{o} C during storage and transport to the laboratory.

12. Analyses are to be completed within the specified holding times. The laboratory is notified by the sampling team prior to sampling and upon shipping to assist in scheduling analyses to meet all specified holding times.

SAMPLE CUSTODY

Field sampling data and purging was documented on a Well Monitoring Field Form. The following information was included:

1. Site name (Saint Gobain Abrasives, Inc.), sample number, etc;
2. Date, time, and elapsed time from purge start to finish;
3. Information regarding the well groundwater level, purge volume required, and actual purge volume;
4. Field test results including pH, temperature, turbidity and specific conductance;
5. Sampling method used;
6. Type of sample and information which appears 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 are to be followed. From the time the sample was collected until the sample was in the custody of the analytical laboratory, the samples were:

1. In the sampler's possession;

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

3. In the sampler's possession and then locked in a designated, secure area to prevent tampering; or in a sample cooler sealed with a tamper proof chain-of-custody seal.

A written Chain-of-Custody Record of the transfer of samples is maintained with a copy in the Appendix of the Sampling and analytical report.

The Chain-of-Custody Record is transported with the sample container at the time the sample is collected. When transferring the possession of the samples, the person making the transfer signs and records the date and time on the record.

SAFETY

Personnel performing the sampling adhered to all safety requirements for contractors and/or visitors of the facility. Personnel performing the sampling wear suitable personal protective equipment.

ANALYTICAL LABORATORIES

The pH, temperature, turbidity and specific conductance are measured in the field by Frontier Technical Associates, Inc., NYELAP # 10475, Katherine A. Wager, Laboratory Director. FTA is a certified NYSDOH-ELAP laboratory. All field analyses for appropriate parameters under the NYELAP program are performed within prescribed holding times. The phenol compound analyses (EPA 8270) is performed by ALS Environmental, NYELAP # 10145. Each laboratory is certified (where applicable) for the parameters for which data are provided.

FIELD SAMPLING PERSONNEL

All field sampling and field measurements were performed by personnel who are specifically trained in the analytical procedure and who pass demonstrations of capability in accordance with the NYSDOH-ELAP requirements and FTA SOPs implementing the Laboratory Procedures Manual.

RESULTS OF RECENT SAMPLING AND INSPECTIONS

Phenol Compounds

Table 3 is a summary of the analysis for phenol compounds for 2015 (Complete data are contained in Appendix II). EPA Method 8270 was used for analysis of these compounds. There were no detectable concentrations of phenol above minimum detection or quantitation limits in all samples analyzed including the duplicate sample obtained at Well OW4-81. Surrogate recovery data indicated acceptable recoveries of spiked compounds. The data are consistent with the data collected over the last 20 years, and there is no reason to believe with the low detection limits reported here, that phenol compounds are migrating from the landfill. Tables 4 and 5 summarize the 2017 field data collected and analyzed.

Table 3
Results for Phenol Compounds (EPA Method 8270) Analysis
at Saint Gobain Abrasives Inc.
(July 31, 2017)

Location	Concentration (mg/l) All Phenol Compounds
OW2-81	ND
OW3-81	ND
OW4-81	ND
OW4-1(Dup)	ND
OW5-81	ND
MH A-9	ND
Method Blank	ND

ND = None of the 14 phenolic compounds detected by this method were present above laboratory quantitation levels for each sample (See Analytical Report).

MS/MSD Recovery: Insufficient sample volume

Table 4
Groundwater Elevations at
Saint Gobain Abrasives, Inc.

Date	Well No.	Top of Pipe Elevation	Depth to Water Surface	Groundwater Elevation
July 31, 2017	OW2-81	588.50	8.07	580.43
July 31, 2017	OW3-81	587.59	6.12	581.47
July 31, 2017	OW4-81	587.74	10.36	577.38
July 31, 2017	OW5-81	587.52	12.02	575.50

* Groundwater level measurements obtained on July 31, 2017 by Ronald B. Blinston of Frontier Technical Associates, Inc. under the supervision of David M. Harty, PE, BCEE.

The groundwater elevation data presented above were obtained under my supervision and represent, to the best of my knowledge, accurate measurements for the date listed.

David M. Harty
PE, BCEE

Table 5
Field Monitoring Data
at Saint Gobain Abrasives Inc.
(July 31, 2017)

Well No.	pH (SU)	Specific Conductance (umhos/cm)	Turbidity (NTU)
OW2-81	7.89	3,520	21.8
OW3-81	6.81	1,212	139
OW4-81	9.97	2,280	109
OW5-81	6.97	8,410	664
MH-9	6.63	614	1.59

Notes:

pH, specific conductance and turbidity analyses performed by Ron Blinston immediately upon sampling.

The recoveries of spiked surrogate compounds in the set of samples analyzed from the site were very similar. Duplicate analysis performed on OW4 indicated consistent results with the separate sample. Laboratory Control Sample (LCS) recoveries were also within QC limits and indicated agreement with surrogate recoveries. The monitoring wells appear to have a dark, biological particulate material. These waters when stored in the laboratory support rapid biological growth. The method blank also had no detectable phenol at MDLs or MRLs.

It should be noted that historically only "phenol" resins were used in the resins and materials disposed in the landfill. The other compounds, particularly chlorinated phenols, were not used and have never been detected.

Quality Assurance/Quality Control

As part of the QA/QC activities associated with the 2017 sampling episode, a field duplicate was obtained at Well OW4-81, surrogate recoveries were reported, and a method blank was analyzed for this batch. A matrix spike and matrix spike duplicate was also not performed due to insufficient sample volume. Analysis for all these samples was by EPA Method 8270.

Physical Appearance

New concrete pads installed in 1999 at Wells OW2-81 and OW3-81 by Frontier Technical Associates, Inc. has remained intact. The riser for Well OW4-81 was replaced and repaired in 2004 due to a vehicle collision. Some cracking may be present in the well pads but this does not impede their function. Quarterly inspections of the landfill area continue under the supervision of Saint Gobain Abrasives Co. Annual well inspections are conducted by Frontier Technical Associates, Inc. Copies of the annual inspection report has been provided to Mr. Michael Hinton, P.E. and Mr. Brian Sadowski of the NYSDEC Region 9.

COMMENTS ON HISTORICAL DATA

Groundwater associated with the Lockport Dolomite is highly mineralized as evidenced by the specific conductance values measured at the wells which indicates the concentration of dissolved solids present. This has been consistent with previous data from this site and data available for wells in the immediate vicinity.

As a result of evaluation of the data, the following is concluded:

1. Sampling of the four existing monitoring wells and catch basin in 2017 and quantification of the phenolic compounds again showed no detectable levels of any of the phenol compounds above detectable or quantitation limits.

2. Groundwater data indicate no migration of materials from the former landfill. This confirms after 29 years of monitoring that the containment and cap is effective.

3. Any future monitoring for phenols should continue to use EPA Method 8270.

4. pH measurements during this episode indicate elevated pH values at Well OW4-81. Repair and replacement of the riser for this well was completed during the Fall of 2004. It is believed that the bentonite-cement grout and water migrating along the casing contributed to the rise in pH at this location.

5. The wells produce very little groundwater for analysis. We are recommending the all four wells be replaced prior to the next sampling event (2019). We are also recommending that the existing wells be properly abandoned. The two western -most wells on the NFTA Airport should be moved inside the fence line and closer to the disposal area.

OPERATIONS AND MAINTENANCE PLAN

This operation and maintenance plan was modified from the original plan developed in 1999 and taken from the following document with appropriate timely minor modifications:

> **"Operations and Maintenance Plan, Landfill Area St. Gobain Abrasives Company, Frontier Technical Associates, Inc. Report ET-99-703-02."**

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 was removed because it was no longer functioning properly and soil shifts between the cap materials and landfill materials themselves had occurred, most likely due to settling. The request was approved and implemented on September 27, 1991. The phenolics analytical methodology was changed from the 4AAP method to EPA Method 8270 to develop more specific and accurate data.

Site Inspection

The physical attributes of the site will be inspected annually This inspection may be conducted by Saint Gobain Abrasives personnel or Frontier Technical Associates, Inc. personnel. The inspections will be generally conducted in July.

For each monitoring point, the following items will be included: well locks, well casings, covers, concrete pads, bailers and ropes (if any), general conditions and tubing. If any of these items are missing, deteriorated or in disrepair, they will be replaced as or repaired as appropriate. This action will be undertaken immediately or prior to the next quarterly inspection as appropriate. A written inspection report (usually a form) will be prepared and completed and maintained on file at Saint Gobain Abrasives, Inc.

A monitoring point assessment form to be used for the annual inspection is attached in the Appendix. A copy of the completed forms will be forwarded to the NYSDEC Project Manager.

Physical Conditions and Grass Cutting

During the annual 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 free of debris or trash which might blow onto the site.

Grass cutting will be performed as needed, however it is expected that it will be cut at least once annually after August 15th as a habitat objective.

Annual Inspection

Once 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. Sampling and purging will be conducted in accordance with the following schedule:

2009	Purging, Sampling	2018	Purging
2010	Purging	2019	Purging, Sampling
2011	Purging, Sampling	2020	Purging
2012	Purging	2021	Purging, Sampling
2013	Purging, Sampling	2022	Purging
2014	Purging	2023	Purging, Sampling
2015	Purging, Sampling	2024	Purging
2016	Purging	2025	Purging, Sampling
2017	Purging, Sampling	2026	Purging

During even years, field measurements are taken after completion of purging during the annual inspection. However, biannual sampling for phenols occurs only in odd years.

The annual inspection (even years) will include the following in addition to purging:

1. Analysis of well samples for field parameters; pH, turbidity, specific conductance and temperature.

2. The depth/elevation to the water surface. 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 visitors to the SGC facility. In addition, since two of the wells are within the security fence erected by the NFTA and the USAF, appropriate arrangements with the NFTA Police and an escort is required to inspect and conduct operations at those well locations. Personnel performing the sampling or purging will wear suitable field boots, and protective gloves and safety glasses or goggles.

EVALUATION OF REMEDY PERFORMANCE, EFFECTIVENESS, AND PROTECTIVENESS

As can be seen from the information presented above and elsewhere in this document, the landfill cap is functioning as intended, the lacustrine clay surrounding the fill has prevented any escape of phenols and phenol-containing resins, and the polymerization of these materials, appears to have taken place. There has been no detection of phenol containing materials or alteration of the groundwater quality though out the last eighteen year monitoring period (1999-2017).

IC/EC PLAN COMPLIANCE REPORT

The clay cap, periodic inspections and biannual sampling of the monitoring wells and catch basin have been proven effective in prevention of seepage of leachate from the landfill. In addition the site appears to be relatively dry from a groundwater standpoint. Recharge of three of the wells is generally slow. The site monitoring plan is appropriate for the type of site and little maintenance appears to be warranted provided inspections are conducted on a regularly scheduled basis.

The plans were updated in November 2012 per the NYS DEC.

OVERALL PRR CONCLUSIONS AND RECOMMENDATIONS

1. Site analytical plan is adequate for the site and the monitoring frequency is appropriate. No detection of phenol-containing groundwater has occurred in the last eighteen years.

2. Biennial sampling, annual well development and field sample analysis, including annual inspection provides an adequate level of protection for the facility and remedy.

3. The O & M plan, in conjunction with the annual inspection, has been adequate to detect any changes in the landfill cap or site conditions. Inspections have been reduced to annually beginning in 2013.

4. The changes in this facility have been minimal during the past thirty years, there is no reason to believe that this may change. At some point in the future, monitoring wells may have to be replaced, but at this point they are functioning properly and in good repair. Annual inspections will be sufficient to detect any needed repair needed.

5. Well pad repair for wells OW-2 and OW-3 is being pursued by the client.

6. Well replacement is recommended by Frontier Technical Associates, Inc.

APPENDIX

Sampling and Analytical Plan

Operations and Maintenance Plan

2017 Analytical Data Laboratory Report

FRONTIER TECHNICAL ASSOCIATES INC.

GROUNDWATER SAMPLING & ANALYSIS PLAN

LANDFILL AREA

St. Gobain Abrasives, Inc.

NYSDEC Site 932007

FTA Report ET-703-GWP2

November 19, 2012

Prepared For:

Mr. Douglas Wright
St. Gobain Abrasives, Inc.
6600 Walmore Road
P.O. Box 301
Niagara Falls, NY 14304

Prepared By:

Frontier Technical Associates, Inc.
8675 Main Street
Williamsville, NY 14221

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

Table of Contents

Introduction

In response to the requirements of NYSDEC Region 9, St. Gobain Abrasives Inc. 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 St. Gobain's submission to the NYSDEC. This revised plan is amended from the plan submitted and approved in 1999.

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.

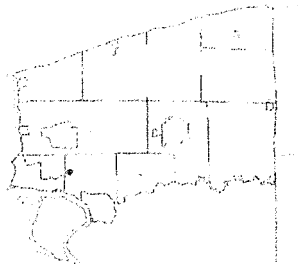
Chronology

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, Carborundum Abrasives 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 SW846 Method 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.

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 f or updating and revising the SAP to reflect current practice and requested and approved changes to the previous plans.

Figure 1 SCG Landfill Locations



Legend

Parcels

0 94.04 188.1 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
THIS MAP IS NOT TO BE USED FOR NAVIGATION

NIAGARA COUNTY
DEPARTMENT OF REAL PROPERTY SERVICES

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 1,128

Geology and Hydrogeology

The area in the immediate vicinity of the St. Gobain 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 $1x10^{-5}$ to $1x10^{-8}$ 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 St. Gobain landfill is up dip in the Lockport Dolomite. This appears to have had little effect on the St. Gobain 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 Analytical 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 Standard Methods for Examination of Water/Wastewater, EPA 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 St. Gobain site shall have sample numbers which are unique to the well or sampling location. For example, the numbering scheme below will be used:

OW-2
OW-3
OW-4
OW-5
MH A-9

Any trip blanks, field blanks, equipment blanks, matrix spikes, and matrix spike duplicates shall have identifying sample numbers which are unique. Any and all split samples made available for NYSDEC duplicate analysis will be marked and labeled as above.

Table 1 Sample Locations and Well Depths

Well Designation	Well Depth (feet)*
OW2-81	18.20
OW3-81	19.66
OW4-81	19.38
OW5-81	18.23
MH A-9	---

* 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.

All samples are analyzed biannually for pH, specific conductivity, temperature, turbidity and phenol by Method 8270

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

Analysis	Method	Preservation Method/ Sample Container	Holding Time*
pH	SM4500 HB	None/plastic or glass	Analyze immediately in the field
Specific Conductivity	EPA 120.1	None/plastic or glass	Analyze immediately in the field
Temperature	SM2550B	None/plastic or glass	Analyze immediately in the field
Turbidity	EPA 180.1	None/plastic or glass	Analyze immediately in the field
Phenol	SW846 8270	4°C; glass	7 days to extraction; 40 days for analysis

* pH, specific conductivity, temperature, turbidity measured in the field. Frontier Technical Associates is a NYELAP-Certified Laboratory (10475).

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 following procedures 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 electronic water level meter probe 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 Well Monitoring Field 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 by removing three times the volume, or if the well yield is low, remove water until the well is "dry." (within 1-2 inches of bottom).

5. A low-flow peristaltic pump 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. This dedicated tubing is stored in its respective well. The dedicated tubing is necessary to prevent cross-contamination between the wells. The tubing will be gradually lowered 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 Well Monitoring Field Form.

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 St. Gobain'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 3. 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, specific conductance, temperature and turbidity. All field analysis equipment is triple rinsed with distilled water prior to and after use.

10. Temperature, specific conductance, turbidity and pH are reported on the Well Monitoring Field 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.

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.

Table 3 Sample Containers and Required Sample Volume

Analysis	Container	Sample Volume
pH, Specific Conductance, Temperature	Plastic or glass	500 ml
Turbidity*	Glass vial	25 ml
Phenol	Glass	1000 ml

Well Monitoring Field Form will be used to record the following data/information:

1. Site name (St. Gobain), 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.

Sample Custody

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. An example can be found in the Appendix of this report.

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.

Landfill Operations and Maintenance

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 St. Gobain 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. All other analyses 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.

Field Sampling Personnel

All field sampling and field measurements must be performed by qualified personnel. 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 St. Gobain 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 St. Gobain Environmental Engineer. In turn, after review and approval, St. Gobain will transmit one copy to the NYSDEC Project Monitor (Mr.

Brian Sadowski and 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 St. Gobain and 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 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.
4. pH, Turbidity, Specific Conductance and Phenol concentration of water sampled from MH 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 (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 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.
9. Appendix to include field data and notes, groundwater elevations, observations, well inspection reports, laboratory report(s), and chain-of-custody forms.

APPENDIX

I. Well Monitoring Field Form

II. Sample Well Inspection Report Form

III. Operations and Maintenance Plan

IV. Chain-of-Custody Form

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703

Sample Point ID: _____ Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION Purge Method: Bailer, Peristaltic Pump

Depth to Bottom of Well: _____ft. 2" Well = 0.17 gals/ft.

Depth to Water Surface: _____ft.

Depth of Water Column: _____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

Sampling Personnel: _____

FIELD MEASUREMENTS

Meters Calibrated Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Hanna HI9023	STD. UNITS		
Spec. Conductance	Oakton Con6	µMHOS/CM		
Temperature	Oakton Con6	C		
Turbidity	Hach 2100P	NTU		

Weather: _____

Notes: _____

FRONTIER TECHNICAL ASSOCIATES INC.
3675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form at Saint-Gobain Abrasives Landfill

Monitoring Point:_____ Date:_____

Inspector's Name (Print):_____

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 Above: _____

_____

_____

Inspector's Signature:_____

FRONTIER TECHNICAL ASSOCIATES INC.

OPERATIONS AND MAINTENANCE PLAN

LANDFILL AREA

ST. GOBAIN ABRASIVES INC.

(Addendum to Sampling and Analytical Plan)

Report ET-703-02

November 19, 2012

Prepared for:

Mr. Douglas Wright
St. Gobain Abrasives Inc.
6600 Walmore Road
P.O. Box 301
Niagara Falls, NY 14304

Prepared by:

Frontier Technical Associates, Inc.
8675 Main Street
Williamsville, NY 14221

INTRODUCTION

In response to the requirements of NYSDEC Region 9, St. Gobain Abrasives Inc. 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 map 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 St. Gobain Abrasives Inc. and has prepared this supplemental report for St. Gobain'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 SW 846 Method 8270.

This report outlines the approach used to fulfill the NYSDEC requirements for operations and maintenance as requested by way of Mr. Sadowski's letter dated October 30, 2012. The purpose of this report is to present the St. Gobain's Operations and Maintenance Plan for the monitoring wells and inspection of the landfill area. We are prepared to implement this plan immediately.

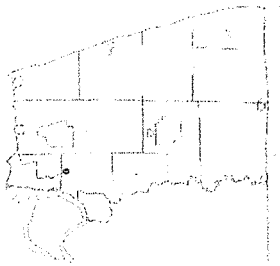
SITE INSPECTION

The physical attributes of the site will be inspected annually. This inspection may be conducted by St. Gobain Abrasives Inc. or Frontier Technical Associates, Inc. personnel. The inspection will be conducted in July.

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 as soon as practicable and prior to the next annual inspection. A written report will be prepared and maintained on file at St. Gobain Abrasives Inc.

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

Figure 1 SCG Landfill Locations



Legend

Parcels

0 94.04 188.1 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
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NIAGARA COUNTY
DEPARTMENT OF REAL PROPERTY SERVICES

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1: 1,128

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form
at Saint-Gobain Abrasives Landfill

Monitoring Point:_____ Date:_____

Inspector's Name (Print):_____

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 Above: _____

_____

_____

Inspector's Signature:_____

Figure 2

PHYSICAL CONDITION AND GRASS CUTTING

During the annual 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.

The Department has and continues to encourage all Responsible Parties to cut the grass on their landfills once per year after August 15th. The reason for this is for habitat objectives.

ANNUAL INSPECTION

Once 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
2011	Purging, Sampling
2012	Purging
2013	Purging, Sampling
2014	Purging
2015	Purging, Sampling
2016	Purging
2017	Purging, Sampling
2018	Purging
2019	Purging, Sampling
2020	Purging
2021	Purging, Sampling
2022	Purging

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.

REPORTING

All observations and results made during the annual inspections(s) of the landfill and physical integrity/physical parameters of the monitoring points along with the bi-annual chemistry sampling shall be reported to the Department in one annual report (Periodic Review Report) as it pertains for that year.

SAFETY

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

ALS Environmental

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 3385

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE _____ OF _____

Project Name	Project Number
Project Manager	Report CC
Company/Address	
Phone #	Email
Sampler's Signature	Sampler's Printed Name

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

NUMBER OF CONTAINERS

- GC/MS VOAs ◦ 8260 ◦ 624 ◦ CLP
- GC/MS SVOAs ◦ 8270 ◦ 625
- GC VOAs ◦ 8021 ◦ 601/602
- PESTICIDES ◦ 8081 ◦ 608
- PCBs ◦ 8082 ◦ 608
- METALS, TOTAL (List in comments below)
- METALS, DISSOLVED (List in comments below)

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

REMARKS/ ALTERNATE DESCRIPTION

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ 1 day _____ 2 day _____ 3 day
_____ 4 day _____ 5 day

REQUESTED REPORT DATE
_____

REPORT REQUIREMENTS
_____ I. Results Only
_____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
_____ IV. Data Validation Report with Raw Data

Edata _____ Yes _____ No

INVOICE INFORMATION
PO #
BILL TO:

STATE WHERE SAMPLES WERE COLLECTED

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm	Firm	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

FRONTIER TECHNICAL ASSOCIATES INC.

GROUNDWATER SAMPLING AND ANALYSIS

LANDFILL AREA

SAINT GOBAIN ABRASIVES, INC.

FTA Report ET-703-17

December 11, 2017

Prepared For:

Mr. Doug Wright
Saint Gobain Abrasives, Inc.
P.O. Box 301
(6600 Walmore Road)
Niagara Falls, NY 14304

Prepared By:

Frontier Technical Associates, Inc.
8675 Main Street
Williamsville, NY 14221

The test results reported herein were obtained in accordance with the professional standards of the NYELAP certification program. The report was prepared for the use of Saint Gobain Abrasives, Inc. management use only, and except for required regulatory compliance reporting, are not intended for any other purpose.

INTRODUCTION

In response to the requirements of NYSDEC Region 9, Saint Gobain Abrasives, Inc. has completed groundwater sampling and analysis for the landfill area located on the southwest corner of the property in Wheatfield, NY. 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) (see fence installed in 2004). Figure 1 B is an aerial photo of the area with the fence installed. Frontier Technical Associates, Inc. completed the monitoring and field analysis and prepared this report for SGA's submission to the NYSDEC. Previously, FTA had prepared technical reports which described the results of the sampling and analysis for 1991. The NYSDEC subsequently reduced monitoring parameters for 1992. For 1993, the NYSDEC deleted the requirement for analysis of unfiltered groundwater for metals, and for 1994, all metals requirements were deleted and turbidity was added for informational purposes. After the 1997 monitoring episode, SGC requested and received approval to monitor these wells every two years (1999-2009 were subsequently submitted). This report presents the results for the monitoring episode conducted for 2017.

Since 1982, the monitoring wells and adjacent catch basin were sampled for pH and total phenolics (4AAP). In the period 1982-1988 there were no detectable levels of phenolics 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. Based upon the 1991 results, Well OW1-81 was decommissioned because it had fallen into disrepair and was no longer functioning to monitor the interior of the landfill. The request was approved by the NYSDEC and implemented on September 27, 1991. The phenolic compound analytical methodology was also changed to the more accurate and specific EPA Method 8270.

This report outlines the approach used to fulfill the NYSDEC requirements for 2017. The effort included sampling of four groundwater monitoring wells and one catch basin. The samples collected were all analyzed for pH, specific conductance, temperature, turbidity and phenolic compounds by EPA Method 8270.

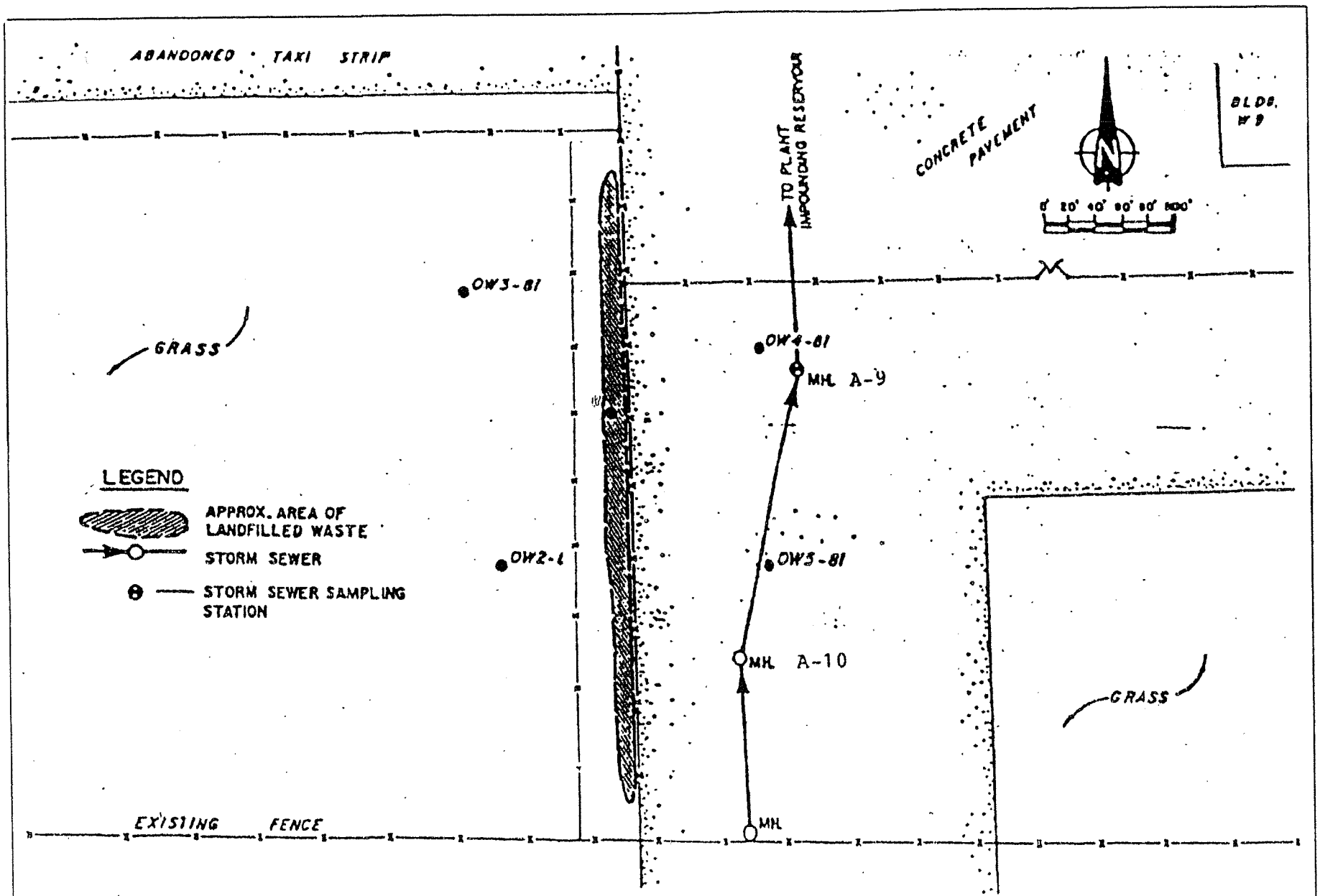
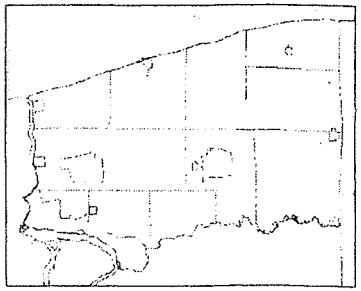


FIGURE 1

WELL LOCATIONS

The Carborundum Company

Figure 1B. SCG Landfill Locations



Legend

Streets and Highways
- Interstate
- Primary State Road
- Secondary State Road
- County Road
- Local Road

Parcels

1Ft Color Aerials
- Red: Band_1
- Green: Band_2
- Blue: Band_3

2Ft Color Aerials
- Red: Band_1
- Green: Band_2
- Blue: Band_3

1: 1,414

Notes

Enter Map Description

0.0 0 0.02 0.0 Miles

NIAGARA COUNTY, NEW YORK
DEPARTMENT OF REAL PROPERTY SERVICES

Field analysis was completed within 15 minutes of sampling. Field data includes pH, temperature, specific conductance and turbidity. These data, as well as well purging reports and groundwater elevation data, are also included this report.

GEOLOGY AND HYDROGEOLOGY

The area in the immediate vicinity of the SGA, Inc. plant is underlain by approximately 10-15 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. It is generally striated on the surface, has extensive 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 occasionally 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.

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 10-20 gpm. Hydraulic conductivities of 0.1 to 0.01 cm/sec may be encountered in this unit. For purposes of this current study, 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 is gently dipping 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. (SLC Contractors). Figure 2 illustrates a typical surficial geologic cross section in the landfill area.

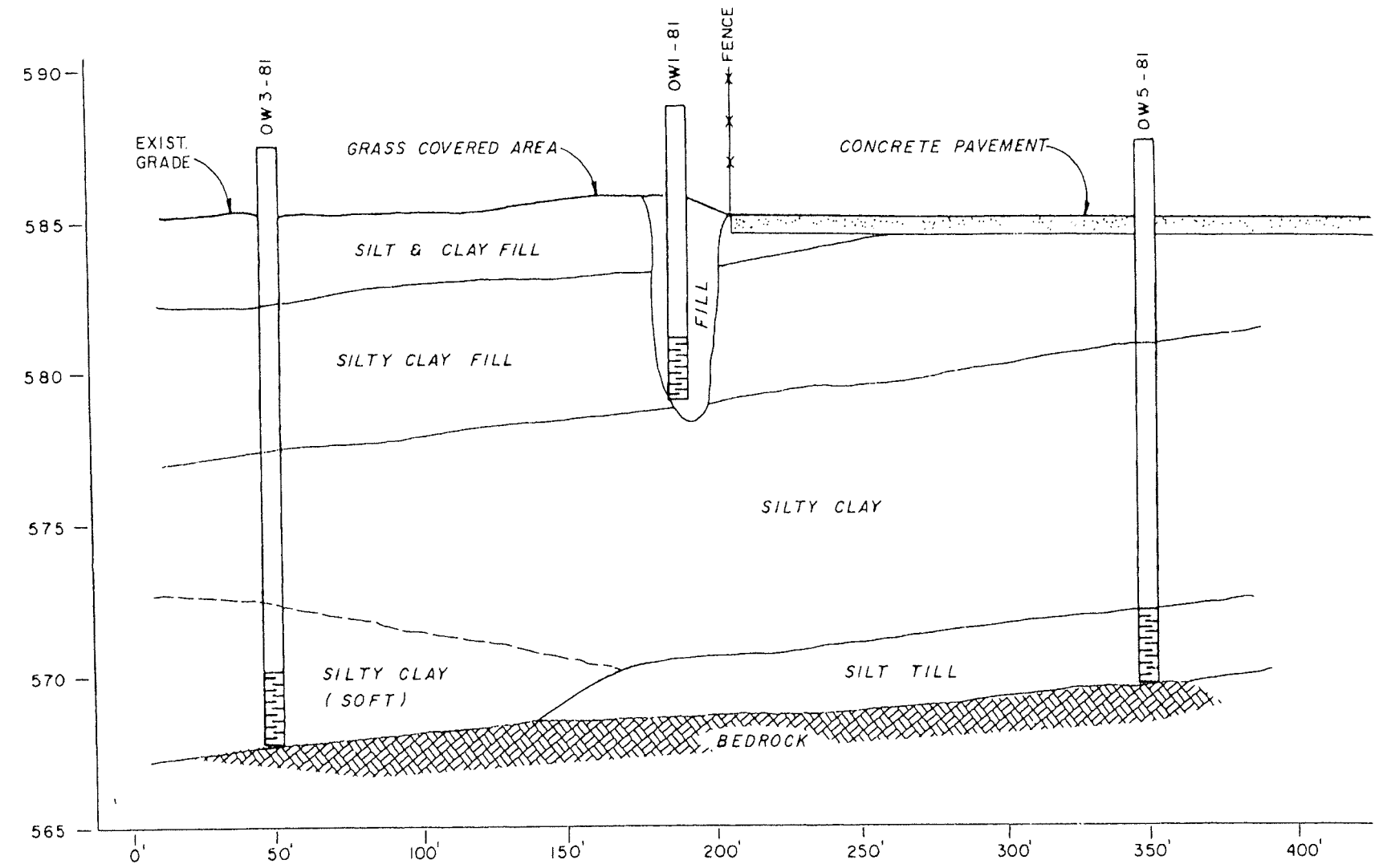


Figure 2

GEOLOGIC CROSS SECTION A - A'

The Carborundum Company

SAMPLING OBJECTIVES

The results of analysis of samples collected and analyzed in accordance with the approval of the NYSDEC 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 NYSDEC requirements for data submission.

SAMPLING LOCATIONS

As indicated previously, Figure 1 and 1B illustrate the sample locations. Four wells were sampled together with one catch basin (MH-9 located on the "A" Storm Line). Table 1 presents the sample locations and USEPA analytical methods used for samples from each location. All methods used conformed to the USEPA Methods of Analysis for Water and Wastewater (40 CFR Part 136) or SW-846 (as revised). Table 2 is a summary of the parameters, methods used, preservation methods, and holding times required.

SAMPLING EQUIPMENT AND PROCEDURES

The procedures outlined here were developed to minimize contamination of water sampling equipment and analyses, minimize concentration changes 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 and approved in 1991 and revised in 1999:

1. Inspection of the well noting any unusual conditions.

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

3. The depth to the water surface from the top of the riser pipe was measured and recorded on the Sample Collection Form. Depth to the bottom of each well was also measured.

4. The volume of water in each well was calculated. Each well was purged by

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; rechecked in 2000 and 2003; measured from top of riser pipe.

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

SC = Specific Conductance
Phenols = Phenol Compounds as measured by EPA Method 8270/625.
Temp. = Temperature

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

Parameter	EPA Method	Preservation	Holding Time
pH*	SM 4500 H B	4°C	15 Minutes (Field)
Specific Conductance	120.1	4°C	6 Hours (Field)
Temperature*	SM2550B	---	Immediately (Field)
Turbidity	180.1	4°C	48 Hours
Phenol Compounds	8270	4°C	7 days to extract 40 days to analyze

* pH, Specific Conductance, and temperature were measured immediately in the field. Frontier Technical Associates, Inc. is a NYELAP-Certified Laboratory (10475).

removing three times this volume, or if the well yield was low, water was removed until the well was "dry" (within 1-2 inches of the bottom).

5. A peristaltic pump was used to purge these shallow wells. All tubing coming into contact with the well water consisted of food-grade polyethylene tubing dedicated to the well. This dedicated tubing is intended to eliminate cross-contamination between the wells. The tubing was gradually lowered into the well as pumping continued. The volume required, volume obtained, water level before purging, and the start and stop times were also recorded.

6. All purge water was placed in a container specifically used for that well and for measuring purge volume. If the well contained very little volume, this water was reserved for pH, specific conductance and turbidity determination. After a time had elapsed for sufficient recovery, sampling was completed. Based upon results of the analyses performed over the past decade, the water contains no parameters which might be incompatible with the treatment process or SGA's sanitary sewage permit, and is acceptable to the NCSD #1 and meets their criteria. The water was then disposed of in the sanitary sewer.

7. Groundwater samples were obtained by dedicated tubing. No equipment was used for more than one well location.

8. Usually, the first sample was taken for analysis of pH, temperature, specific conductance and turbidity. Probes were triple rinsed with distilled water after use. A standard reporting form with all field data is provided for each well and sample location (See Appendix).

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

11. Sample container labels were affixed to the sample container and the samples placed in an insulated container where they were kept cool with ice if temperatures were above 4°C.

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

Table 3. Sample Containers and Required Sample Volume.

Parameter	Sample Volume	No. of Containers
pH, Specific Conductance	100 ml	1
Phenols	1,000 ml	1
Turbidity*	25 ml	1

* Subsample of pH and Specific Conductance sample.

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

15. Analyses were completed within the specified holding times. The laboratory was notified by the sampling team prior to sampling and upon shipping to assist in scheduling analyses to meet all specified holding times.

SAMPLE CUSTODY

Field sampling data and purging was documented on a Well Monitoring Field Form. The following information was included:

1. Site name (Saint Gobain Abrasives, Inc.), sample number, etc;

2. Date, time, and elapsed time from purge start to finish;

3. Information regarding the well 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 materials of construction of special equipment (in margin);

6. Type of sample and information which appears 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 were followed. From the time the sample was collected until the sample was in the custody of the analytical laboratory, the samples were:

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

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

The Chain-of-Custody Record was transported with the sample container at the time the sample was collected. When transferring the possession of the samples, the person making the transfer signed and recorded the date and time on the record. The number of custodians in the chain of possession were as few as possible.

SAFETY

Personnel performing the sampling adhered to all safety requirements for contractors and/or visitors of the facility. Personnel performing the sampling wore suitable personal protective equipment.

ANALYTICAL LABORATORIES

The pH, temperature, turbidity and specific conductance were measured in the field by Ronald B. Blinston and Kathy Wager of Frontier Technical Associates, Inc., NYELAP # 10475. The phenol compound analyses (EPA 8270) were performed by Adirondack Environmental Services Inc., NYELAP # 10709. Each laboratory was certified for the parameters for which data were provided.

FIELD SAMPLING PERSONNEL

All field sampling and field measurements were performed by the following:

Ronald B. Blinston and Kathy Wager

RESULTS OF GROUNDWATER ANALYSIS

Groundwater Elevations

Groundwater elevations were measured at the arrival at each well and recorded. These data were initially used to determine the required purge volume since the well depths are known. The data are summarized in Table 4. The data obtained here support the previous observations that, historically, the movement of groundwater is generally from the southwest to the northeast in the landfill vicinity. Typically, well OW2-81 exhibits the highest groundwater elevations from year-to-year compared to the other wells while OW4-81 generally exhibits the lowest elevation. Thus, groundwater generally is moving from southwest to northeast. For this monitoring period, the movement is generally northwest to southeast (Figure 3).

pH, Turbidity and Specific Conductance

Analysis for pH and specific conductance were completed within 15 minutes of sampling in the field. Turbidity analyses were completed within EPA-prescribed holding times. The field data sheets documenting the analyses are included in the Appendix. Table 5 summarizes all pH, turbidity, and specific conductance data obtained on the sample date. Field sheets with the measurements are presented in Appendix I. Turbidity values were measured directly. The pH measurements were within the typical range expected and previously encountered for waters in this area. The specific conductance values for the wells were similar to past data and to other wells drilled to refusal or to the upper few feet of bedrock in this area. These waters are often highly mineralized. The catch basin also yielded values which were characteristic of rain water accumulation.

Phenol Compounds

Table 6 is a summary of the analysis for phenol compounds (Complete data are contained in Appendix). EPA Method 8270 was used for analysis of these compounds. There were no detectable concentrations of phenol, the primary parameter analyzed, above minimum detection or quantitation limits in all samples analyzed including the duplicate sample obtained at Well OW4-81. Surrogate recovery data indicated acceptable recoveries of spiked compounds.

The data are consistent with the data collected over the last 24+ years, and there is no reason to believe with the low detection limits reported here, that phenol compounds are migrating from the landfill.

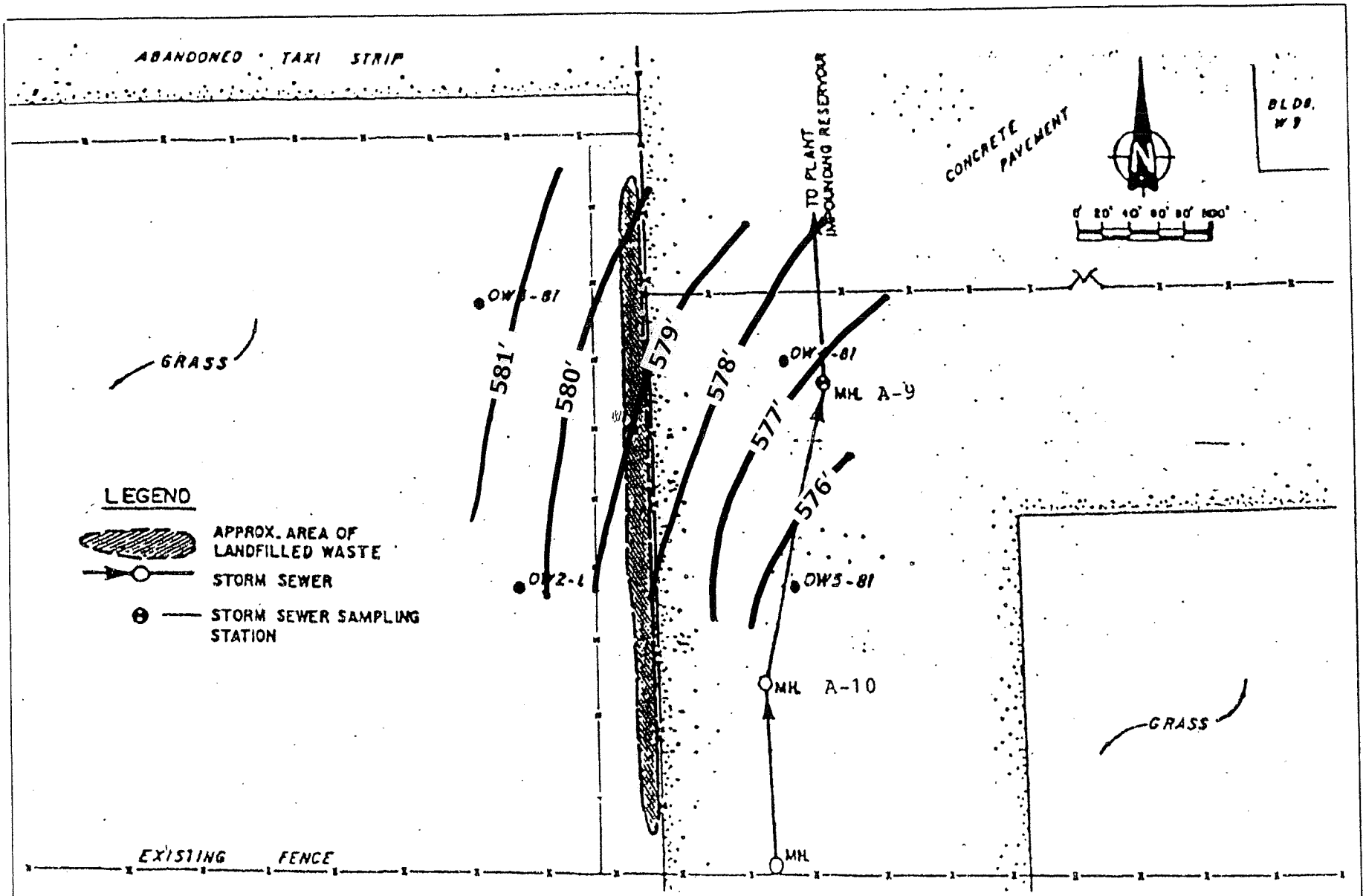


FIGURE 3.
PIEZOMETRIC SURFACE – GROUNDWATER ELEVATION CONTOURS
(July 31, 2017)

WELL LOCATIONS
The Carborundum Company

Table 4. Groundwater Elevations at Saint Gobain Abrasives, Inc.

Date	Well No.	Top of Pipe Elevation	Depth to Water Surface	Groundwater Elevation
07/31/17	OW2-81	588.50	8.07	580.43
07/31/17	OW3-81	587.59	6.12	581.47
07/31/17	OW4-81	587.74	10.36	577.38
07/31/17	OW5-81	587.52	12.02	575.50

The groundwater elevation data presented above were obtained under my supervision and represent, to the best of my knowledge, accurate measurements for the date listed.

David M. Harty PE, BCEE

Table 5. Field Monitoring Data at Saint Gobain Abrasives Inc. (August 7, 2017).

Well No.	pH (SU)	Spec. Conductance (umho/cm)	Turbidity (NTU)
OW2-81	7.89	3,520	21.8
OW3-81	6.81	1,212	139
OW4-81	9.97	2,280	109
OW5-81	6.97	8,410	664
MH A-9	6.63	614	1.59

Notes:

1. pH, specific conductance and turbidity analyses performed by Ronald B. Blinston/Kathy Wager immediately upon sampling.

Kathy Wager
Laboratory Director
NYELAP # 10475

Table 6. Results for Phenol Compound Analysis at SGA, Inc.
EPA Method 8270
(August 7, 2017)

Location	Concentration All Phenol Compounds*
OW2-81	ND
OW3-81	ND
OW4-81	ND
OW4-81(Duplicate)	ND
OW5-81	ND
MH A-9	ND
Method Blank	ND

ND = None of the 14 phenolic compounds detected by this method were present above laboratory quantitation levels for each sample (See Analytical Report).

Method Blank: ND for all compounds.

The recoveries of spiked surrogate compounds in the set of samples analyzed from the site were very similar. Duplicate analysis performed on OW4-81 indicated consistent results with the separate sample. Blank spike recoveries were also within QC limits and indicated agreement with surrogate recoveries. The monitoring wells appear to have a dark, biological particulate material. The method blank also had no detectable phenol.

Based upon analysis of phenol compounds and use of the previous method (4AAP), it is believed that EPA Method 8270, which is not subject to the same interferences of the former method, accurately reflects the concentrations of the phenolic compounds of concern. It should be noted that historically only "phenol" resins were used in the resins and materials disposed in the landfill. The other compounds, particularly chlorinated phenols, were not used and have never been detected. Other substances present in groundwater including biological materials may produce false positive detections by the 4AAP test as seen in previous analysis by both methods at this site. Colorimetric methods such as the 4AAP method are subject to many interferences, and thus are not recommended nor used for monitoring at this site.

Quality Assurance/Quality Control

As part of the QA/QC activities associated with the 2017 sampling episode, a field duplicate was obtained at Well OW4-81, surrogate recoveries were reported, and a method blank was analyzed for this batch. A matrix spike and matrix spike duplicate was performed on laboratory control sample water. Analysis for all these samples was by EPA Method 8270. pH, Temperature, specific conductance and turbidity were reported. However, there was little to no little variation noted in the data.

The analytical data presents the results of the analyses performed by the laboratory including the field duplicate, surrogate recoveries, method blank, etc. Duplicate samples were taken at Well OW4-81 with identical results.

SUMMARY

The well and catch basin samples obtained during this sampling program did not exhibit levels above the quantitation limits of any of the phenol compounds as measured by EPA Method 8270 (see Appendix—Lab Report).

The three wells surrounding the former landfill did not contain detectable levels of phenol or any of the phenol compounds analyzed. Well OW-5 was still dry one week after purging so an analytical sample was not collected. Method blank, matrix spike and matrix spike duplicate results were within EPA acceptance criteria. The results are identical to monitoring data for 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013 and 2015. MH 9 also did not exhibit detectable levels of phenol compounds. Based upon these data, together with the last six monitoring episodes covering eleven years, we conclude that the containment of the landfilled phenolic materials in the low permeability, silty-clay subsoil must be effective. The cap appears to be functioning as designed and shows no evidence of settling or dessication cracking. There is no significant vegetation present with long tap roots. Continued grass cutting has kept vegetation under control.

New concrete pads installed in 1999 at Wells OW2-81 and OW3-81 by Frontier Technical Associates, Inc. has remained intact. The riser for Well OW4-81 was replaced and repaired in 2004 due to a vehicle collision. Some cracking may be present in the well pads. Annual inspections of the landfill area continue under the supervision of Saint Gobain Abrasives Co. and are conducted by Frontier Technical Associates, Inc.

Groundwater associated with the Lockport Dolomite is highly mineralized as evidenced by the specific conductance values measured which indicates the concentration of dissolved solids present. This is consistent with previous data from this site and data available for wells in the immediate vicinity.

As a result of evaluation of the data recovered, the following is concluded:

1. Sampling of the three existing monitoring wells in 2017 and quantification of the phenolic compounds again showed no detectable levels of any of the compounds above detectable or quantitation limits.

2. Groundwater data indicate no migration of materials from the former landfill. This confirms after 30 years of monitoring that the containment and cap is effective

3. Any future monitoring for phenols should continue to use EPA Method 625/8270.

4. There is no data developed within the past several years that would indicate a need to alter the current monitoring frequency (every two years).

5. pH measurements during this episode indicate elevated pH values at Well OW4-81 (pH 9.97 SU). Repair and replacement of the riser for this well was completed during the Fall of 2004. It is believed that the bentonite-cement grout and water migrating along the casing contributed to the rise in pH at this location.

6. The wells produce very little groundwater for analysis. We are recommending that all four wells be replaced prior to the next sampling event (2019). We are also recommending that the existing wells be properly abandoned. The two western-most wells on the NFTA Airport should be moved inside the fence line and closer to the disposal area.

APPENDIX

Well Purging Reports, Field Forms and Notes

Laboratory Report and Chain of Custody Forms

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street, Williamsville, NY 14221

Saint-Gobain Abrasives Landfill

Calibration Record

Date: 8/7/17 Time: 9:28

				Standard Expires
pH Calibration: Temp: 21.7 °c	Buffers:	7.0	7.01	10/2018
Instrument ID: #2		10.0	10.05	10/2018
		Check 4.0	4.05	10/2018

Turbidity: Cal. Check Std: 20 NTU Reading: 20.3 1/2018

Instrument ID: C must be +/- 10% of true value

Specific Conductivity Cal. Check Std: 1413 umhos/cm

Instrument ID: CON 6 Reading: 1413 6/2018

Field Analyst: [signature]

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703
Sample Point ID: OW-2 Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION Purge Method: Bailer, ~~Peristaltic Pump~~
Depth to Bottom of Well: 18.20 ft. 2" Well = 0.17 gals/ft.
Depth to Water Surface: 8.07 ft.
Depth of Water Column: 10.13 ft.
Volume of Standing Water in Well: 1.72 gallons
Start of Purge: Date: 7/31/17 Time: 9:52
End of Purge: Date: 7/31/17 Time: 10:00
Total Volume Purge: 2 gallons Well Purged Dry?: Yes No
# of Volumes Purged 1 Purging Personnel: Ron Blinston
Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump
Sample Date: 8/7/17 Sample Time: 1:17 Depth to Water Surface 9.64 ft.
Sample Appearance: SLIGHTLY TURBID
Samples Preserved: Yes No
Sampling Personnel: RON BLINSTON

FIELD MEASUREMENTS
Meters Calibrated Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Oakton 300	STD. UNITS	7.89	
Spec. Conductance	Oakton Cond 6	µMHOS/CM	3520	
Temperature	Oakton Cond 6	°C	14.3	
Turbidity	Hach 2100P	NTU	21.8	

Weather: _____
Notes: _____

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703
Sample Point ID: OW-3 Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION Purge Method: Bailer, Peristaltic Pump
Depth to Bottom of Well: 19.66 ft. 2" Well = 0.17 gals/ft.
Depth to Water Surface: ~~8.07~~ ft. 6.12
Depth of Water Column: ~~11.6~~ ft. 13.54
Volume of Standing Water in Well: ~~2~~ gallons 2.3
Start of Purge: Date: 7/31/17 Time: 10:07
End of Purge: Date: 7/31/17 Time: 10:18
Total Volume Purge: 2.3 gallons Well Purged Dry?: Yes No
# of Volumes Purged 1 Purging Personnel: Ron Blinston
Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump
Sample Date: 8/7/17 Sample Time: 1:35 Depth to Water Surface 19.09 ft.
Sample Appearance: TURBID
Samples Preserved: Yes No
Sampling Personnel: RON BLINSTON

FIELD MEASUREMENTS
Meters Calibrated: Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Oakton 300	STD. UNITS	6.81	
Spec. Conductance	Oakton Con5	µMHOS/CM	1282	
Temperature	Oakton Con5	°C	15	
Turbidity	Hach 2100P	NTU	139	

Weather:
Notes:

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703
Sample Point ID: OW-4 Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION Purge Method: Bailer, Peristaltic Pump
Depth to Bottom of Well: 19.38 ft. 2" Well = 0.17 gals/ft:
Depth to Water Surface: 10.36 ft.
Depth of Water Column: 9.02 ft.
Volume of Standing Water in Well: 1.5 gallons
Start of Purge: Date: 7/31/17 Time: 10:53
End of Purge: Date: 7/31/17 Time: 10:59
Total Volume Purge: 1.5 gallons Well Purged Dry?: Yes No
# of Volumes Purged 1 Purging Personnel: Ron Blinston

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump
Sample Date: 8/7/17 Sample Time: 9:59 Depth to Water Surface 14.03 ft.
Sample Appearance: TURBID
Samples Preserved: Yes No
Sampling Personnel: RON BLINSTON

FIELD MEASUREMENTS
Meters Calibrated: Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Oakton 300	STD. UNITS	9.79	
Spec. Conductance	Oakton Cond 6	µMHOS/CM	2280	
Temperature	Oakton Cond 6	°C	15.3	
Turbidity	Hach 2100P	NTU	109	

Weather:
Notes: DUP

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703
Sample Point ID: OW-5 Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION Purge Method: Bailer, Peristaltic Pump
Depth to Bottom of Well: 18.23 ft. 2" Well = 0.17 gals/ft.
Depth to Water Surface: 12.02 ft.
Depth of Water Column: 6.21 ft.
Volume of Standing Water in Well: 1.0 gallons
Start of Purge: Date: 7/31/17 Time: 11:08
End of Purge: Date: 7/31/17 Time: 11:12
Total Volume Purge: 1 gallons Well Purged Dry?: Yes No
# of Volumes Purged 1 Purging Personnel: Ron Blinston
Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump
Sample Date: 8/1/17 Sample Time: 10:15 Depth to Water Surface DRY ft.
Sample Appearance: TURBID
Samples Preserved: Yes No
Sampling Personnel: RON BLINSTON

FIELD MEASUREMENTS
Meters Calibrated Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Oakton 300	STD. UNITS	6.87	
Spec. Conductance	Oakton Con5	µMHOS/CM	8410	
Temperature	Oakton Con5	°C	18.8 oc	
Turbidity	Hach 2100P	NTU	664	

Weather:
Notes:

FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: Saint-Gobain Abrasives Landfill Job No: ET- 703
Sample Point ID: MH-9 Consultant: **Frontier Technical Associates, Inc.**
SAMPLING INFORMATION Sample Method: Bailer, Peristaltic Pump, Bladder Pump
Sample Date: 8/7/17 Sample Time: 9:47 Depth to Water Surface 34 3/4" ft.
Sample Appearance: CLEAR
Samples Preserved: Yes No
Sampling Personnel: RON BLINSTON

FIELD MEASUREMENTS
Meters Calibrated Yes No

PARAMETER	METER NUMBER	UNITS	MEASUREMENT	NOTES
pH	Oakton 300	STD. UNITS	6.63	(6.63)
Spec. Conductance	Oakton Con 6	µMHOS/CM	614	
Temperature	Oakton Con 6	°C	22.4	
Turbidity	Hach 2100P	NTU	1.59	

Weather:
Notes:

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form at Saint-Gobain Abrasives Landfill

Monitoring Point: OW-2 **Date:** 7/31/17

Inspector's Name (Print): Kathy Wager

Well Locked:	(Yes)	No	NA	
Lock Functioning:	(Yes)	No	NA	- to be replaced
Bailer and Rope OK:	Yes	No	(NA)	
Tubing OK:	Yes	(No)	NA	replace
Protective Casing OK:	(Yes)	No	NA	
Concrete Pad in Good Condition:	Yes	(No)	NA	rocks
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 Above: _____

Inspector's Signature: Kathy Wager

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form at Saint-Gobain Abrasives Landfill

Monitoring Point: OW-3 Date: 7/31/17

Inspector's Name (Print): Kathy Wagner

Well Locked:	(Yes)	No	NA	- replaced
Lock Functioning:	(Yes)	No	NA	
Bailer and Rope OK:	Yes	No	(NA)	
Tubing OK:	Yes	(No)	NA	replaced
Protective Casing OK:	Yes	(No)	NA	leaning
Concrete Pad in Good Condition:	Yes	(No)	NA	corner cracked off
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 Above: _____

Inspector's Signature: Kathy Wagner

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form
at Saint-Gobain Abrasives Landfill

Monitoring Point: OW-4 **Date:** 7/31/17

Inspector's Name (Print): Kathy Wagh

Well Locked:	(Yes)	No	NA
Lock Functioning:	(Yes)	No	NA - to be replaced
Bailer and Rope OK:	Yes	No	(NA)
Tubing OK:	Yes	(No)	NA - replaced
Protective Casing OK:	(Yes)	No	NA
Concrete Pad in Good Condition:	(Yes)	No	NA - slight cracks
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 Above: _____

Inspector's Signature: Kathy Wagh

FRONTIER TECHNICAL ASSOCIATES INC.
8675 Main Street Williamsville, NY 14221 (716)634-2293 NYSDOH ELAP No. 10475

Monitoring Point Assessment Form at Saint-Gobain Abrasives Landfill

Monitoring Point: OW-5 **Date:** 7/31/17

Inspector's Name (Print): Kathy Wagy

Well Locked:	(Yes)	No	NA
Lock Functioning:	(Yes)	No	NA to be replaced
Bailer and Rope OK:	Yes	No	(NA)
Tubing OK:	Yes	(No)	NA u/loaded
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 Above: _____

Inspector's Signature: Kathy Wagy

Adirondack Environmental Services Inc

Experience is the solution

314 North Pearl Street ♦ Albany, New York 12207
(800) 848-4983 ♦ (518) 434-4546 ♦ Fax (518) 434-0891

August 23, 2017

Kathy Wager
Frontier Technical Associates
8675 Main Street
Williamsville, NY 14221

TEL: (716) 634-2293
FAX: (716) 634-2344

Work Order No: 170808022

RE: Plant C
Land Fill

Dear Kathy Wager:

Adirondack Environmental Services, Inc received 5 samples on 8/8/2017 for the analyses presented in the following report.

Please see case narrative for specifics on analysis.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

ELAP#: 10709

Krzysztof Trafalski
Laboratory Manager

Adirondack Environmental Services, Inc — CASE NARRATIVE

CLIENT:	Frontier Technical Associates	**Date:**	*23-Aug-17*
Project:	Plant C		
Lab Order:	170808022		

Sample containers were supplied by Adirondack Environmental Services.

Qualifiers:

- ND - Not Detected at reporting limit
- J - Analyte detected below quantitation limit
- B - Analyte detected in Blank
- X - Exceeds maximum contamination limit
- H - Hold time exceeded
- N - Matrix Spike below acceptable limits
- N+ - Matrix Spike is above acceptable limits
- C - Details are above in Case Narrative
- S - LCS Spike recovery is below acceptable limits
- S+ - LCS Spike recovery is above acceptable limits
- Z - Duplication outside acceptable limits
- T - Tentatively Identified Compound-Estimated
- E -Above quantitation range-Estimated

Note : All Results are reported as wet weight unless noted

The results relate only to the items tested. Information supplied by the client is assumed to be correct.

Adirondack Environmental Services, Inc

Date: *23-Aug-17*

CLIENT:	Frontier Technical Associates	**Client Sample ID:**	OW-2080717
Work Order:	**170808022**	**Collection Date:**	8/7/2017
Reference:	Plant C / Land Fill	**Lab Sample ID:**	170808022-001
PO#:		**Matrix:**	GROUNDWATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SEMI-VOLATILE ORGANICS - EPA 8270D						Analyst: **MT**
(Prep: SW3535A - 8/11/2017)						
Phenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2-Chlorophenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2-Methylphenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
4-Methylphenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2-Nitrophenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2,4-Dimethylphenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2,4-Dichlorophenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
4-Chloro-3-methylphenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2,4,6-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2,4,5-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 6:39:00 PM
2,4-Dinitrophenol	**ND**	50		µg/L	1	8/18/2017 6:39:00 PM
4-Nitrophenol	**ND**	50		µg/L	1	8/18/2017 6:39:00 PM
4,6-Dinitro-2-methylphenol	**ND**	50		µg/L	1	8/18/2017 6:39:00 PM
Pentachlorophenol	**ND**	50		µg/L	1	8/18/2017 6:39:00 PM
Surr: 2,4,6-Tribromophenol	**115**	36.5-123		%REC	1	8/18/2017 6:39:00 PM
Surr: 2-Fluorophenol	**87.6**	23.2-98.1		%REC	1	8/18/2017 6:39:00 PM
Surr: Phenol-d5	**91.5**	17.8-103		%REC	1	8/18/2017 6:39:00 PM

Adirondack Environmental Services, Inc

Date: *23-Aug-17*

CLIENT:	Frontier Technical Associates	**Client Sample ID:**	OW-3080717
Work Order:	**170808022**	**Collection Date:**	8/7/2017
Reference:	Plant C / Land Fill	**Lab Sample ID:**	170808022-002
PO#:		**Matrix:**	GROUNDWATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SEMI-VOLATILE ORGANICS - EPA 8270D						Analyst: **MT**
(Prep: SW3535A - 8/11/2017)						
Phenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2-Chlorophenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2-Methylphenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
4-Methylphenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2-Nitrophenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2,4-Dimethylphenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2,4-Dichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
4-Chloro-3-methylphenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2,4,6-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2,4,5-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:07:00 PM
2,4-Dinitrophenol	**ND**	50		µg/L	1	8/18/2017 7:07:00 PM
4-Nitrophenol	**ND**	50		µg/L	1	8/18/2017 7:07:00 PM
4,6-Dinitro-2-methylphenol	**ND**	50		µg/L	1	8/18/2017 7:07:00 PM
Pentachlorophenol	**ND**	50		µg/L	1	8/18/2017 7:07:00 PM
Surr: 2,4,6-Tribromophenol	**106**	36.5-123		%REC	1	8/18/2017 7:07:00 PM
Surr: 2-Fluorophenol	**79.5**	23.2-98.1		%REC	1	8/18/2017 7:07:00 PM
Surr: Phenol-d5	**85.4**	17.8-103		%REC	1	8/18/2017 7:07:00 PM

Adirondack Environmental Services, Inc

Date: *23-Aug-17*

CLIENT:	Frontier Technical Associates	**Client Sample ID:**	OW-4080717
Work Order:	**170808022**	**Collection Date:**	8/7/2017
Reference:	Plant C / Land Fill	**Lab Sample ID:**	170808022-003
PO#:		**Matrix:**	GROUNDWATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SEMI-VOLATILE ORGANICS - EPA 8270D						Analyst: **MT**
(Prep: SW3535A - 8/11/2017)						
Phenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2-Chlorophenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2-Methylphenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
4-Methylphenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2-Nitrophenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2,4-Dimethylphenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2,4-Dichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
4-Chloro-3-methylphenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2,4,6-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2,4,5-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 7:34:00 PM
2,4-Dinitrophenol	**ND**	50		µg/L	1	8/18/2017 7:34:00 PM
4-Nitrophenol	**ND**	50		µg/L	1	8/18/2017 7:34:00 PM
4,6-Dinitro-2-methylphenol	**ND**	50		µg/L	1	8/18/2017 7:34:00 PM
Pentachlorophenol	**ND**	50		µg/L	1	8/18/2017 7:34:00 PM
Surr: 2,4,6-Tribromophenol	**71.3**	36.5-123		%REC	1	8/18/2017 7:34:00 PM
Surr: 2-Fluorophenol	**62.9**	23.2-98.1		%REC	1	8/18/2017 7:34:00 PM
Surr: Phenol-d5	**67.9**	17.8-103		%REC	1	8/18/2017 7:34:00 PM

Adirondack Environmental Services, Inc

Date: *23-Aug-17*

CLIENT:	Frontier Technical Associates	**Client Sample ID:**	MH9080717
Work Order:	**170808022**	**Collection Date:**	8/7/2017
Reference:	Plant C / Land Fill	**Lab Sample ID:**	170808022-004
PO#:		**Matrix:**	GROUNDWATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SEMI-VOLATILE ORGANICS - EPA 8270D						Analyst: **MT**
(Prep: SW3535A - 8/11/2017)						
Phenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2-Chlorophenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2-Methylphenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
4-Methylphenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2-Nitrophenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2,4-Dimethylphenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2,4-Dichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
4-Chloro-3-methylphenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2,4,6-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2,4,5-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:02:00 PM
2,4-Dinitrophenol	**ND**	50		µg/L	1	8/18/2017 8:02:00 PM
4-Nitrophenol	**ND**	50		µg/L	1	8/18/2017 8:02:00 PM
4,6-Dinitro-2-methylphenol	**ND**	50		µg/L	1	8/18/2017 8:02:00 PM
Pentachlorophenol	**ND**	50		µg/L	1	8/18/2017 8:02:00 PM
Surr: 2,4,6-Tribromophenol	**90.6**	36.5-123		%REC	1	8/18/2017 8:02:00 PM
Surr: 2-Fluorophenol	**70.8**	23.2-98.1		%REC	1	8/18/2017 8:02:00 PM
Surr: Phenol-d5	**74.5**	17.8-103		%REC	1	8/18/2017 8:02:00 PM

Adirondack Environmental Services, Inc

Date: *23-Aug-17*

CLIENT:	Frontier Technical Associates	**Client Sample ID:**	DUP080717
Work Order:	**170808022**	**Collection Date:**	8/7/2017
Reference:	Plant C / Land Fill	**Lab Sample ID:**	170808022-005
PO#:		**Matrix:**	GROUNDWATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SEMI-VOLATILE ORGANICS - EPA 8270D (**Prep: SW3535A - 8/11/2017**)						Analyst: **MT**
Phenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2-Chlorophenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2-Methylphenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
4-Methylphenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2-Nitrophenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2,4-Dimethylphenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2,4-Dichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
4-Chloro-3-methylphenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2,4,6-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2,4,5-Trichlorophenol	**ND**	10		µg/L	1	8/18/2017 8:29:00 PM
2,4-Dinitrophenol	**ND**	50		µg/L	1	8/18/2017 8:29:00 PM
4-Nitrophenol	**ND**	50		µg/L	1	8/18/2017 8:29:00 PM
4,6-Dinitro-2-methylphenol	**ND**	50		µg/L	1	8/18/2017 8:29:00 PM
Pentachlorophenol	**ND**	50		µg/L	1	8/18/2017 8:29:00 PM
Surr: 2,4,6-Tribromophenol	**111**	36.5-123		%REC	1	8/18/2017 8:29:00 PM
Surr: 2-Fluorophenol	**82.7**	23.2-98.1		%REC	1	8/18/2017 8:29:00 PM
Surr: Phenol-d5	**86.9**	17.8-103		%REC	1	8/18/2017 8:29:00 PM

Adirondack Environmental Services, Inc.
314 North Pearl Street
Albany, New York 12207
518-434-4546/434-0891 FAX

CHAIN OF CUSTODY RECORD

AES Work Order # 170808022

Experience is the solution

A full service analytical research laboratory offering solutions to environmental concerns

Client Name:	Address:	
Frontier Technical Associates, Inc.	8675 Main Street, Williamsville, NY 14221	
Send Report To: Kathy Wager	Project Name (Location): PLANT-C LAND FILL	Samplers: (Names): RON BLINSTON
Client Phone No: 716-634-2293	Client Email: kathy.wager@frontiertechnical.com	PO Number:
		Samplers: (Signature)

AES Sample Number	Client Sample Identification & Location	Date Sampled	Time A=a.m. P=p.m.	Sample Type: Matrix	Comp	Grab	Number of Cont's	Analysis Required
001	OW-2080717	8/7/17	1:17 A/P	GW		/	1	PHENOL COMPOUNDS 8270
002	OW-3080717		1:35 A/P			/	1	
003	OW-4080717		9:59 A/P			/	1	
004	MW9080717		9:47 A/P			/	1	
005	DUP080717		— A/P			/	1	
			A/P					
			A/P					
			A/P					
			A/P					
			A/P					
			A/P					
			A/P					
			A/P					
			A/P					

Shipment Arrived Via: (FedEx) UPS Client AES Other:

CC Report To / Special Instructions/Remarks: STD REPORT + EQUIS

Turnaround Time Request:
☐ 1 Day ☐ 3 Day ☒ Normal
☐ 2 Day ☐ 5 Day
Note: Samples received after 3:30 pm are considered next business day

QUOTE 6596

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
	FED EX	8/7/17 4:30pm
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received for Laboratory by:	Date/Time
		8/8/17 11:45am

Temperature	AES Bottles	Properly Preserved	Received Within Holding Times
Ambient or (Chilled) 2°C	Y ☒ N ☐	(Y) N	(Y) N
Notes:		Notes:	Notes:

WHITE - Lab Copy YELLOW - Sampler Copy PINK - Generator Copy

Adirondack Environmental Services, Inc

170808022