GRAFTECH INTERNATIONAL HOLDINGS INC.

(formerly UCAR Carbon Company, Republic Site)

POST-CLOSURE LANDFILL OPERATION, MONITORING AND MAINTENANCE MANUAL FOR SWMF #32N03 (Registry No. 932035)

September 2009

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1.0 INTRODUCTION

This document is the Operation, Monitoring and Maintenance (OM&M) Manual for the GrafTech International Holdings Inc. (GTIH) (formerly UCAR Carbon Company Inc.) closed landfill facility, SWMF #32N03 ("Landfill"). The Landfill is located in the Town of Niagara, Niagara County, State of New York, on Parcel # 130.20-1.1. The Landfill is located off of Hyde Blvd. behind the former UCAR Republic Plant. The Landfill was closed and capped in 1987, and in September 1997, it was reclassified by the state from Class 2a to a Class 4 Inactive Hazardous Waste Site. This OM&M Manual is being submitted under the provisions of the Division of Environmental Remediation (DER) Inactive Hazardous Waste Site Program.

The size of the Landfill is 61.80 acres, of that 16.48 acres make up the cap. The Landfill is completely enclosed with a metal hurricane-style security fence, which is eight (8) feet high and has two (2) locked gates.

This post-closure OM&M Manual will cover the routine inspection and maintenance plans, and the program to monitor the groundwater quality at the Landfill. It also describes the soil management plan for the footprint of the Landfill.

The OM&M Manual will be reviewed every five years, starting in 2015. The review will ensure that the manual is current with regulations and best management practices. Any changes deemed appropriate by GTIH at that time, or in the interim, will be timely communicated to the New York State DEC.

GTIH will designate an employee to be the responsible manager for the Landfill. All official correspondence concerning the Landfill should be provided to this manager. As of September 2009, the GTIH Corporate Sr. Manager of Environmental Protection is responsible to manage the Landfill. This position is currently filled by Ms. Juanita M. Bursley. Her contact information is provided below.

Juanita M. Bursley
GrafTech International Holdings Inc.
12900 Snow Rd.
Parma, OH 44130
216-676-2175
216-676-2697 fax

GTIH will also have a contracted employee or other qualified person on contract that will be the local point-of-contact for the Landfill and will be responsible for carrying out the routine activities, including conducting the scheduled inspections, making or scheduling needed repairs, responding to neighborhood requests, etc. This contractor will also be responsible for communicating any significant issue that could prevent full conformance with this OM&M Plan, or other important matters concerning the Landfill outside the scope of this Plan, to the above designated manager so that the necessary resources can be promptly allocated to implement the appropriate corrective actions that adequately address the identified deficiency. As of September 2009, the following contract employee is responsible for the day-to-day operations at the Landfill.

Mr. Robert Bucci
344 Wildwood Dr.
Niagara Falls, NY 14304
(716) 628-8208

The New York State DEC, the Director Environmental Health, and the Town of Niagara will be notified should there be a change to the above contact information.

2.0 INSPECTION AND MAINTENANCE PLAN

1. Weekly Inspections

A report will be written to document the landfill inspection results and record the date, time and name of the inspector. See **Appendix A** for an example of a standard inspection form that will be used. The areas to be inspected once per week are as follows:

1) Fence (general condition)

2) Gate (general condition and lock)

3) Cap (general condition, including signs of erosion and adequate vegetation)

4) Surrounding area

5) Well inspection (check the lock, ID tag, and condition of the external casing)

The inspection record will identify any noted deficiency and document the corrective action. Any fence areas that are found damaged will also be duly noted on inspection map.

2. Required NYSDEC Annual Inspections

The inspector will record his/her name, the date and time of the inspection and the inspection results. (See **Appendix B**).

a. Inspect locks on the groundwater monitoring wells.

b. Inspect outer casing on the groundwater monitoring wells.

c. Inspect concrete seal on the groundwater monitoring wells.

d. Inspect the condition of the cap.

3. Routine Maintenance and Repairs

a. Repairs will be scheduled as needed with outside contractor(s) to ensure that any deficiencies discovered during the routine inspections are timely corrected.

b. Lawn mowing and other general care will be scheduled, as needed. The perimeter of the Landfill will be typically mowed a minimum of 3 times per year or more frequently, if needed,

depending on the amount of rainfall and other factors affecting the growing season. The Landfill cap will be cut a minimum of once per year after September 1.

c. General clean-ups of any debris along the fence line, etc. will be performed, as needed, to keep the Landfill area clear of any objectionable or unsightly materials.

4. Recordkeeping

All inspection records will be retained for a period of 3 years and copies made available to the state upon written request.

3.0 GROUNDWATER MONITORING PROGRAM

The GTIH Republic SWMF was capped and closed in 1987. The GTIH groundwater monitoring network at the Landfill site consists of eleven (11) wells. Between 1987 and 2000, groundwater monitoring was conducted quarterly.

In 2000, the post-closure groundwater monitoring program and the collected groundwater quality data from 1987 to 2000 were reviewed cooperatively by GTIH and the NYSDEC Divisions of Environmental Remediation (represented by Mr. Michael Hinton) and the Division of Solid and Hazardous Materials (represented by Ms. Mary McIntosh). Based on that review, a modified monitoring program was designed to meet the requirements of 6 NYCRR Section 360 for solid waste landfill closure and to continue to monitor the effectiveness of the landfill closure in protecting groundwater quality. The modified post-closure groundwater monitoring program commenced in April 2000. The modified monitoring program consisted of semi-annual sampling from April 2000 to November 2005 of the eleven (11) on-site monitoring wells listed in **Table 1** and shown in **Appendix C**, as described in the letter from Mary E. McIntosh (NYSDEC) to Robert Bucci (GTIH), dated January 18, 2000 (see **Appendix C**).

In 2005, the post-closure groundwater monitoring program was once again reviewed by GTIH and the NYSDEC Divisions of Environmental Remediation (represented by Mr. Michael Hinton) and the Division of Solid and Hazardous Materials (represented by Ms. Mary McIntosh). Based on that subsequent review, a new modified groundwater monitoring program was designed to meet the requirements of 6 NYCRR Section 360 for solid waste landfill closure and to continue to monitor the effectiveness of the landfill closure in protecting groundwater quality. The new annual sampling program adopted in November 2005 is based on responses by NYSDEC, comments from Ms. Mary McIntosh dated September 20, 2005 (see **Appendix D**), and the response from James K. Kay, P.E., of Conestoga-Rovers & Associates (CRA) (see **Appendix E)** regarding the post-closure monitoring requirements. As agreed, the new sampling program consists of monitoring a network of seven (7) selected on-site groundwater wells (BW-1, BW-2, BW-3, BW-4, MW-3, GW-8B and GW-9B) once a year. Scheduling of the annual sampling event is being rotated every year between spring and autumn, so that one year sampling is completed in the spring, and the following year it is completed in autumn. One sampling event must occur in every calendar year. This annual sampling plan began in the fall of 2006 and will take place in the fall of each even year. The annual spring sampling event will be scheduled every odd year. The groundwater samples will be tested for the following parameters and using the referenced EPA test methods.

PARAMETER	METHODOLOGY
Volatile Organic Compounds (VOCs)	SW-846 8260B (September 1986 with all subsequent revisions)
Total and Dissolved Iron, Potassium and Zinc	SW-846 8260B (September 1986 with all subsequent revisions)
Ammonia	USEPA 350.1 (March 1983 with all subsequent revisions)
Nitrite	USEPA 353.2 (March 1983 with all subsequent revisions)
Total Kjeldahl Nitrogen (TKN)	USEPA 351.2 (March 1983 with all subsequent revisions)
Turbidity	Field Measurement
Specific Conductance	Field Measurement
pH	Field Measurement
Temperature	Field Measurement

The groundwater elevation measurements will be recorded. The analytical test results will be compared to the New York State Class GA water criteria and the results of the historical monitoring data for the Landfill.

If a discernible negative trend in groundwater quality is observed, the monitoring program will be reviewed again to ensure that it is still adequate. In particular, the level of redundancy will be reassessed. Any proposed amendments to the sampling program will be discussed and approved by NYSDEC Divisions of Environmental Remediation and the Division of Solid and Hazardous Materials before implementation. If the trend continues, the potential source(s) of the contaminant(s) will be evaluated and a plan of corrective actions developed and implemented, if appropriate. See **Appendix F** for the Site Plan and Monitoring Well Locations Post-Closure Monitoring Program.

As of September 2009, GTIH currently contracts with CRA for groundwater sampling services at the Landfill. CRA condition the active monitoring wells and collect representative samples in accordance with recognized industry standards (**Appendix G**). The collected samples are then sent to Columbia Analytical (**Appendix H**) to be analyzed for the selected parameters using the specified analytical procedures. However, GTIH reserves the right to enter into contracts with other qualified environmental consulting companies and laboratories for the above services.

Also included in this OM&M Plan are the test results of the most recent semi-annual sampling event, dated March 26, 2009 (See **Appendix I**).

The Annual Report and Certification including a written summary of the sampling results, the laboratory data reports, chain-of-custody documentation and any other requisite documents, will be prepared and submitted by the December 31st deadline. This report will be submitted to the following agencies and offices either by hard copy or electronically, as acceptable (full report unless otherwise noted below):

A. New York State DEC – Region 9

a. Engineering Geologist II, Div. of Solid and Hazardous Materials, currently held by Ms. Mary F. McIntosh.

b. Regional Solid Materials Engineer, currently held by Mr. Mark Hans, P.E.

c. Environmental Engineer II, Div. of Environmental Remediation, currently held by Mr. Michael Hinton, P.E.

B. Niagara County

a. Director Environmental Health, currently held by Mr. Jim Devald

C. Town of Niagara

a. Town Clerk, currently held by Mrs. Sylvia Virtuoso

b. Chairman Environmental Committee, currently held by Mr. Fabian Rosati (cover letter of report only)

c. Supervisor, currently held by Steven Richards (cover letter of report only)

d. Current Town of Niagara Council members (cover letter of report only)

4.0 SOIL MANAGEMENT PLAN (SMP)

GTIH has no immediate plans or anticipates any future plans to excavate and/or remove soils from the property surrounding the footprint of the Landfill. Therefore, GTIH proposes that it prepare and submit to the New York DEC for approval a written Soil Management Plan 30 days prior to commencing such activities, should this situation change at any time in the future. This plan would address the particulars of the planned project. In the event of an unlikely and unforeseen emergency event requiring that GTIH disturb the soils on-site, GTIH would follow all applicable OSHA regulations to protect the workers, would stage the removed soils as close to the excavation site as safely possible, and would contact the New York DEC within 48 hours of this event.

5.0 SOIL VAPOR MANAGEMENT

On August 21, 2006, GTIH received a written request from the New York DEC to conduct a soil vapor intrusion evaluation at the Landfill site, based on the facts that some chlorinated aliphatic compounds had been detected during the 2005 groundwater sampling event in bedrock wells located along the northern property boundary, and that there are residential properties adjacent to the southern boundary of the site. Despite numerous low risk factors at the site, GTIH agreed to voluntarily perform the requested study along the southern property boundary along Rhode Island Avenue to assess the potential for soil gas presence and migration in the direction of the bordering residential properties. In October 2006, GTIH submitted a written Soil Gas Investigation Work Plan for agency approval. The Work Plan conformed to the applicable requirements of the "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" prepared by the New York State Department of Health (February 2005 Public Comment Draft). New York DEC reviewed that plan in December 2006 and recommended GTIH add a fourth soil gas probe at the west side near the access road to the Landfill site. In January 2007, GTIH resubmitted a revised written Soil Gas Investigation Work Plan based on agency comments, for their approval. On February 8, 2007, New York DEC approved the revised Work Plan inclusive of the following three (3) conditions: that the study be completed before March 31, 2007; that a Data Usability Summary Report following the agency guidelines be included; and that a community Fact Sheet was not required unless additional investigation, based on the results of the initial vapor intrusion study, required the performance of off-site work.

New York DEC was advised of the schedule in advance, and on March 8, 2007, four soil vapor implants were installed along the south fence line of the property in order to collect soil gas samples near the residences along Rhode Island Street. On March 26, 2007 these implants were purged for approximately 25 minutes. On March 27, 2007, the four soil vapor implants were sampled using one-liter vacuum canisters. The vacuum canisters were allowed to collect soil gas from each implant for a minimum of 2 hours, and a maximum of 3 hours none of the canisters drew in any (or enough) air for analysis. The purge pump was again connected to the implant tubing and the discharge from the pump checked for helium. Again the pump rates dropped to 0 cc/min, indicating no soil gas drawn from the implant, and no helium was noted in the discharge from the pump. After a minimum of two hours, the volume of soil vapor drawn into each cylinder at the 4 sampling locations was insufficient to analyze the contents in the laboratory. The inability to draw soil vapor from any of the implants suggests that the clay soils are too tight to allow migration of vapors. On May 5, 2007, GTIH submitted the results of the attempted soil vapor sampling event in March 2007 with the conclusion that no threat was posed to neighboring residential properties and recommended that no further action concerning vapor studies was warranted.

On December 28, 2008, the New York State Department of Environmental Conservation (NYS DEC) and the New York State Department of Health (NYS DOH) informed GTIH, in writing, that they had reviewed the submitted Soil Intrusion Evaluation report for the GTIH Republic Landfill Site report, dated May 2, 2007. Furthermore, the agencies determined that the potential for soil vapor intrusion into neighboring homes and businesses had been satisfactorily evaluated and concurred with GTIH's recommendation that no further action is needed at this site regarding soil vapor intrusion (see **Appendix J**). Therefore, no vapor intrusion monitoring program is included with this OM&M Plan.

APPENDIX A

INSPECTION OF LANDFILL FENCE, CAP & SURROUNDING AREA

Date	Time	Inspector

AREA	OK	DAMAGED	DATE REPAIRED	REMARKS
A				
B				
C				
D				
E				
F				
G				
H				
I				
J				

GATE	OK	DAMAGED	DATE REPAIRED	REMARKS
1				
2				
3				

COMMENTS:

CAP CONDITION COMMENTS: (Checking for erosion and vegetation)

SUROUNDING AREA:

APPENDIX A

WELL INSPECTION

ID	WELL ID YES	WELL ID NO	LOCKED YES	LOCKED NO	COMMENTS
MW1-78					
MW2-78					
MW3-79					
BW1-86					
BW2-86					
BW3-86					
BW4-86					
BW5-86					
BW6-86					
WW1-86					
OW1-88					
OW2-88					

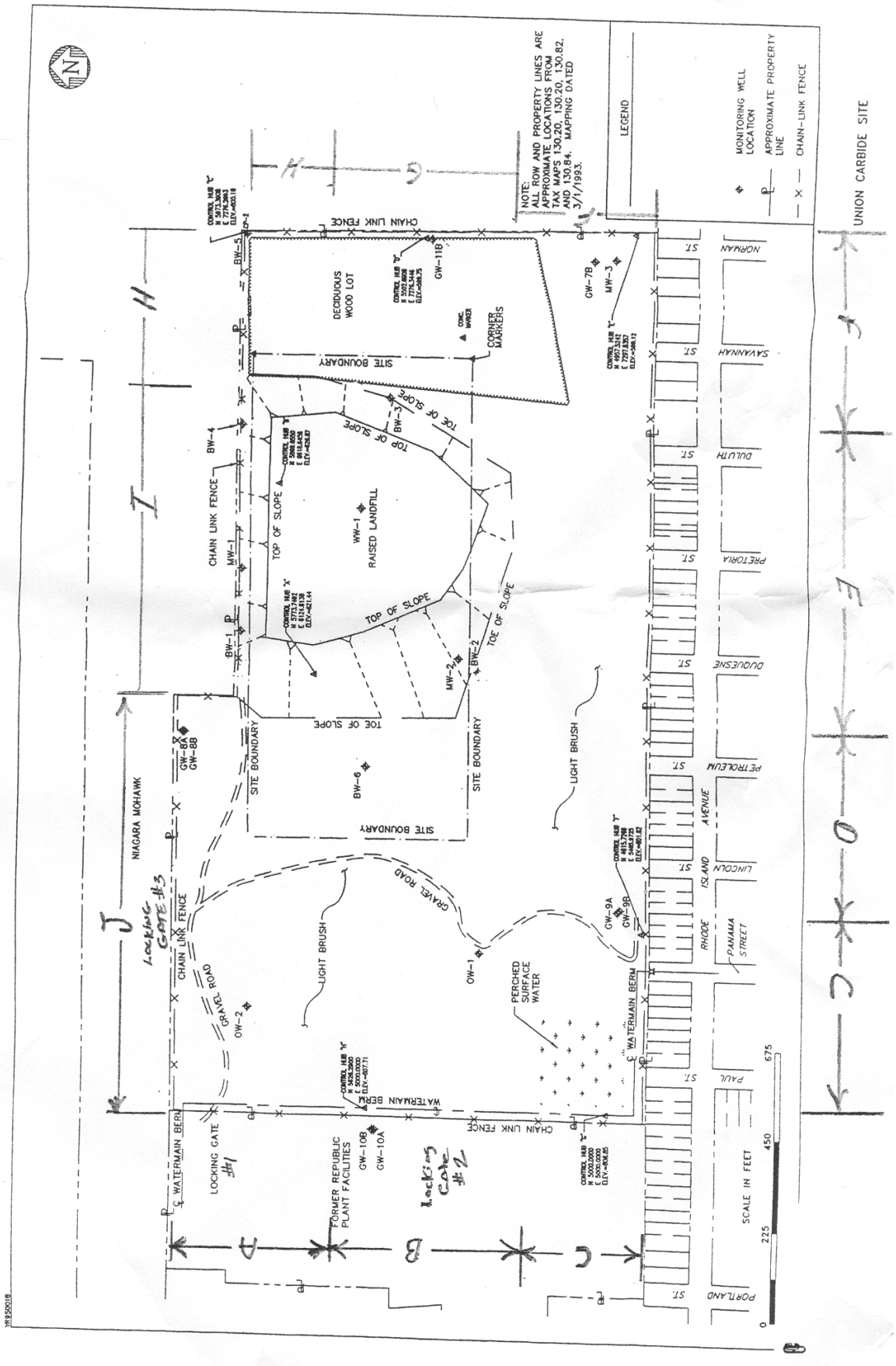
NYSDEC WELLS

INSTALLED SEPT/OCT 93

ID	WELL ID YES	WELL ID NO	LOCKED YES	LOCKED NO	COMMENTS
GW7B-93					
GW8A-93					
GW8B-93					
GW9A-93					
GW9B-93					
GW11B-93					

COMMENTS:

APPENDIX A


NOTE:
ALL ROW AND PROPERTY LINES ARE APPROXIMATE LOCATIONS FROM TAX MAPS 130.20, 130.20, 130.82, AND 130.84. MAPPING DATED 3/1/1993.
LEGEND
MONITORING WELL LOCATION
APPROXIMATE PROPERTY LINE
CHAIN-LINK FENCE
UNION CARBIDE SITE
DECIDUOUS WOOD LOT
CORNER MARKERS
SITE BOUNDARY
TOP OF SLOPE
TOE OF SLOPE
RAISED LANDFILL
CHAIN LINK FENCE
LIGHT BRUSH
GRAVEL ROAD
PERCHED SURFACE WATER
WATERMAIN BERM
LOCKING GATE #1
LOCKING GATE #2
LOCKING GATE #3
FORMER REPUBLIC PLANT FACILITIES
NIAGARA MOHAWK
NORMAN ST.
SAVANNAH ST.
DULUTH ST.
PRETORIA ST.
DUQUESNE ST.
PETROLEUM AVENUE
LINCOLN ISLAND
RHODE PANAMA STREET
PAUL ST.
PORTLAND ST.
SCALE IN FEET
0
225
450
675

APPENDIX B

ANNUAL MONITORING WELL INSPECTION

ID WELL NUMBER	WELL ID TAG INTACT YES/NO	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
MW1-78					
MW2-78					
MW3-79					
BW1-86					
BW2-86					
BW3-86					
BW4-86					
BW5-86					
BW6-86					
WW1-86					
OW1-88					
OW2-88					

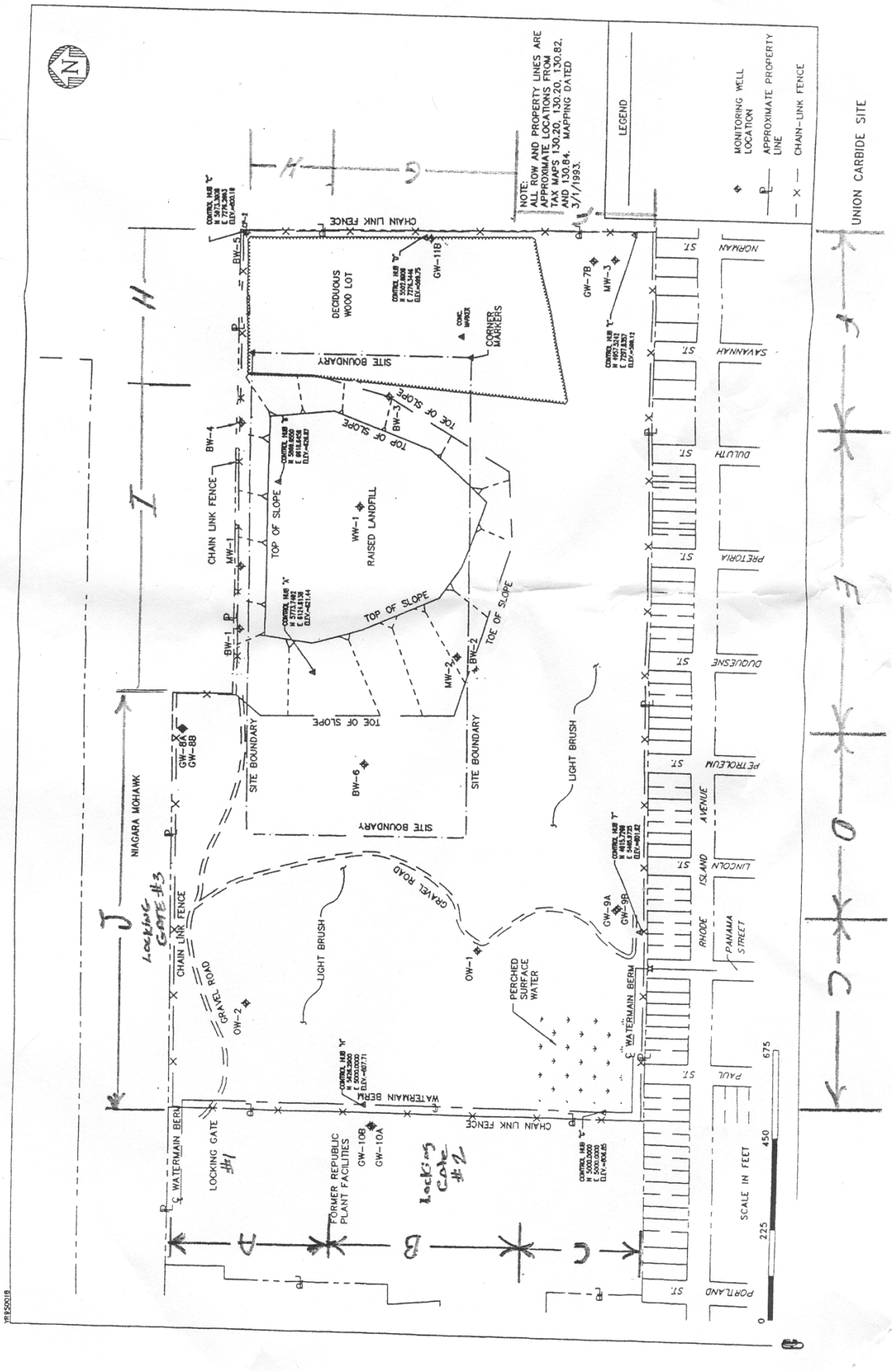
NYSDEC WELLS

(INSTALLED SEPT/OCT 93)

ID WELL NUMBER	WELL ID TAG INTACT YES/NO	LOCK CONDITION	OUTER CASING CONDITION	CONCRETE SEAL CONDITION	COMMENTS
GW7B-93					
GW8A-93					
GW8B-93					
GW9A-93					
GW9B-93					
GW11B-93					

ENTIRE CAP MOWED:_____

APPENDIX B


NOTE:
ALL ROW AND PROPERTY LINES ARE APPROXIMATE LOCATIONS FROM TAX MAPS 130.20, 130.20, 130.82, AND 130.84. MAPPING DATED 3/1/1993.
LEGEND
MONITORING WELL LOCATION
APPROXIMATE PROPERTY LINE
CHAIN-LINK FENCE
UNION CARBIDE SITE
DECIDUOUS WOOD LOT
CORNER MARKERS
SITE BOUNDARY
TOP OF SLOPE
TOE OF SLOPE
RAISED LANDFILL
CHAIN LINK FENCE
LIGHT BRUSH
GRAVEL ROAD
PERCHED SURFACE WATER
WATERMAIN BERM
LOCKING GATE #1
LOCKING GATE #2
LOCKING GATE #3
FORMER REPUBLIC PLANT FACILITIES
NIAGARA MOHAWK
NORMAN ST.
SAVANNAH ST.
DULUTH ST.
PRETORIA ST.
DUQUESNE ST.
PETROLEUM AVENUE
LINCOLN ISLAND
RHODE ISLAND
PANAMA STREET
PAUL ST.
PORTLAND ST.
SCALE IN FEET
0
225
450
675

APPENDIX C

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.state.ny.us

John P. Cahill
Commissioner

January 18, 2000

Mr. Robert Bucci
Site Manager
UCAR Carbon Company Inc.
P.O. Box 887
Niagara Falls, New York 14302-0887

Dear Mr. Bucci:

UCAR Republic Solid Waste
Management Facility #32N03

Thank you for your letter of October 25, 1999 regarding the monitoring program at the UCAR closed Republic Landfill. As you are aware, both the Division of Solid Materials and the Division of Environmental Remediation have wells on the site and an interest in the post-closure monitoring program. Mr. Michael Hinton of the Division of Environmental Remediation and I met to discuss how the concerns of both programs can be met in a monitoring program that will be both efficient and comprehensive. We are requesting that the following program be implemented:

1. Sample all of the on-site wells once initially (wells GW-7B, GW-8A, GW-8B, GW-9A, GW-9B, GW-10A, GW-10B, GW-11B under the Environmental Remediation program, and wells BW-1, BW-2, BW-3, BW-4, BW-5, BW-6, MW-1, MW-2, MW-3 under the Solid Materials Program for Part 360 baseline volatile organics using method 8260.

2. If volatile organics are not detected in the Environmental Remediation Program wells, eliminate all of them except well GW-9B from the monitoring program.

3. Perform semi-annual (twice yearly) sampling at wells BW-1, BW-2, BW-3, BW-4, BW-5, BW-6, MW-1, MW-2, MW-3 and GW-9B, as indicated on the attached table.

This program will satisfy the monitoring concerns of both programs and represents a reduction from the quarterly program now being conducted at the site. If you have any questions, or wish to meet to discuss this proposal further, please contact me at 851-7220. Thank you.

Yours truly,

Mary E. McIntosh
Engineering Geologist II

MEM:lj

Attachment

cc: Mr. Mark Hans, Regional Solid Materials Engineer
Mr. Michael Hinton, Environmental Engineer II

a:bucci.mem

APPENDIX C

Revised Post-Closure Monitoring Plan

Semi-Annual Sampling List

Parameters	1st Round	2nd Round
Ammonia	X	X
Iron (t)	X	X
Iron (s)	X	X
Potassium (t)	X	X
Potassium (s)	X	X
Zinc (t)	X	X
Zinc (s)	X	X
Nitrite	X	X
Total Kjeldahl Nitrogen	X	X
Turbidity	X	X
Groundwater Elevation	X	X
Volatile Organics (SW846, 8260)	X*1	X*2

*1 at wells BW-4, BW-6, BW-1, and BW-3

*2 at all wells (MW-1, MW-2, MW-3, BW-1, BW-2, BW-3, BW-4, BW-5, BW-6, GW-9B)

APPENDIX D

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.dec.state.ny.us

Denise M Sheehan
Commissioner

September 20, 2005

Mr. James K. Kay, P. Eng.
Conestoga-Rovers and Associates
23271 George Urban Blvd.
Depew, New York 14043

Dear Mr. Kay:

UCAR Carbon Landfill
#32NO3

This office has reviewed your submission of July 27, 2005 in support of a reduction in the monitoring program for the closed UCAR Carbon Landfill. You have requested, on behalf of the company, a reduction to annual sampling in four wells for volatile organics only. The following comments have been generated by myself as a representative of the Division of Solid and Hazardous Materials, and Mr. Michael Hinton of the Division of Environmental Remediation (please note that our respective divisions were reversed in the report):

1. The report does not contain the correct class GA standards for several parameters. In Table 3 the standard for iron is listed as 300 mg/l, but it is really 300 ug/l or .3 mg/l. The standard for zinc is listed as 300 mg/l but it is really 2000 ug/l or 2 mg/l. The standard for ammonia is listed as no standard, but the standard is 2000 ug/l or 2 mg/l. Because of the incorrect standards applied, several of the conclusions from the review of the monitoring data are erroneous. For example, the report states that in 6 of the 11 wells currently monitored, the concentrations of constituents of concern are currently lower than the water quality criteria cited. In reality, most of the wells exhibit elevated levels of one or more of the parameters. Many of the wells exhibit elevated levels of iron (MW-1, MW-3, GW-8B, GW-9B, BW-1, BW-2, BW-3, BW-4, BW-5, and BW-6). Ammonia is elevated in wells MW-1 and BW-4. Zinc is elevated in wells BW-1 and BW-4.

2. The Division of Environmental Remediation investigated the area north of UCAR for other sources of the contaminants detected in wells along the north property boundary, and no alternate source was found. The Division of Environmental Remediation sent a copy of this report to UCAR.

3. The report notes that vinyl chloride was detected in well BW-3 up to 26 ug/l, but this value is not shown in Table 3. What was the sampling date on which this level was recorded?

APPENDIX D

4. The report states that the concentration of cis-1,2-DCE has ranged between 20 and 27 ug/l. Table 3 shows that a concentration of 14 ug/l was recorded.

5. Due to the incorrect groundwater standards used in the evaluation of the data, we do not agree with Conestoga-Rovers conclusions that only 4 wells exhibit consistent presence of compounds of concern at concentrations exceeding water quality criteria, with these compounds limited to volatile organics. Therefore we cannot agree to Conestoga-Rovers proposed changes in the monitoring program. The Department will allow a reduction in the frequency of monitoring to annual for the following wells: BW-1, BW-2, BW-3, BW-4, MW-3, GW-8B, and GW-9B. These wells must be sampled for the same list of parameters currently sampled for at the site (Part 360 volatiles, ammonia, iron (total and soluble), potassium (total and soluble), zinc (total and soluble), nitrite, TKN, turbidity, groundwater elevation, pH, specific conductance, and temperature. The timing of the annual sampling shall be rotated yearly between spring and fall, so that one year sampling will be done in the spring, and the next year it will be done in the fall. A sampling event must occur in every calendar year.

If you have any questions on the program hereby approved by the Department, please contact me at (716) 851-7220.

Yours truly,

Mary E. McIntosh, C.P.G.
Engineering Geologist II

MEM:deg
mem\kay.ltr

cc: Mr. Mark Hans, Regional Solid Materials Engineer
Mr. Michael Hinton, Environmental Engineer II
Mr. Robert Bucci, UCAR
Ms. Carol Barron, Conestoga-Rovers

APPENDIX E

CONESTOGA-ROVERS
& ASSOCIATES

2371 George Urban Blvd., Depew, New York 14043
Telephone: 716-206-0202 Facsimile: 716-206-0201

November 4, 2005

Reference No. 5513

Ms. Mary E. McIntosh, C.P.G.
Engineering Geologist II
NYSDEC
270 Michigan Avenue
Buffalo, New York 14203-7226

Dear Ms. McIntosh:

Re: Responses to NYSDEC Comments Dated September 20, 2005
UCAR Republic SWMP No. 32N03

The enclosed responses to NYSDEC comments dated September 20, 2005, regarding the post-closure monitoring program review for the above-referenced site are being submitted by Conestoga Rovers & Associates on behalf of UCAR Carbon Corporation. Included with the responses is a groundwater analytical data table showing the corrected groundwater quality criteria as cited in the comment letter.

It is our understanding from the comment letter that the approved modified monitoring program consists of the following:

> Annual sampling of seven wells (BW-1, BW-2, BW-3, BW-4, MW-3, GW-8B, and GW-9B) with analysis of the samples for Part 360 volatiles, ammonia, iron (total and soluble), potassium (total and soluble), zinc (total and soluble), nitrite, TKN, turbidity, groundwater elevation, pH, specific conductance, and temperature. Monitoring will be rotated between the spring and fall seasons such that one year sampling will be conducted in the spring and the next year it will be conducted in the fall. Sampling will be conducted once in each calendar year and reporting will be submitted annually following receipt and review of the groundwater analytical data.

The next monitoring event will be conducted in the fall of 2006.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Carl Barron for

James K. Kay, P. Eng.

JKK/dl/13
Encl.

c.c.: M. Haas, NYSDEC
M. Hinton, NYSDEC
R. Bucci, UCAR
C. Barron, CRA

APPENDIX F

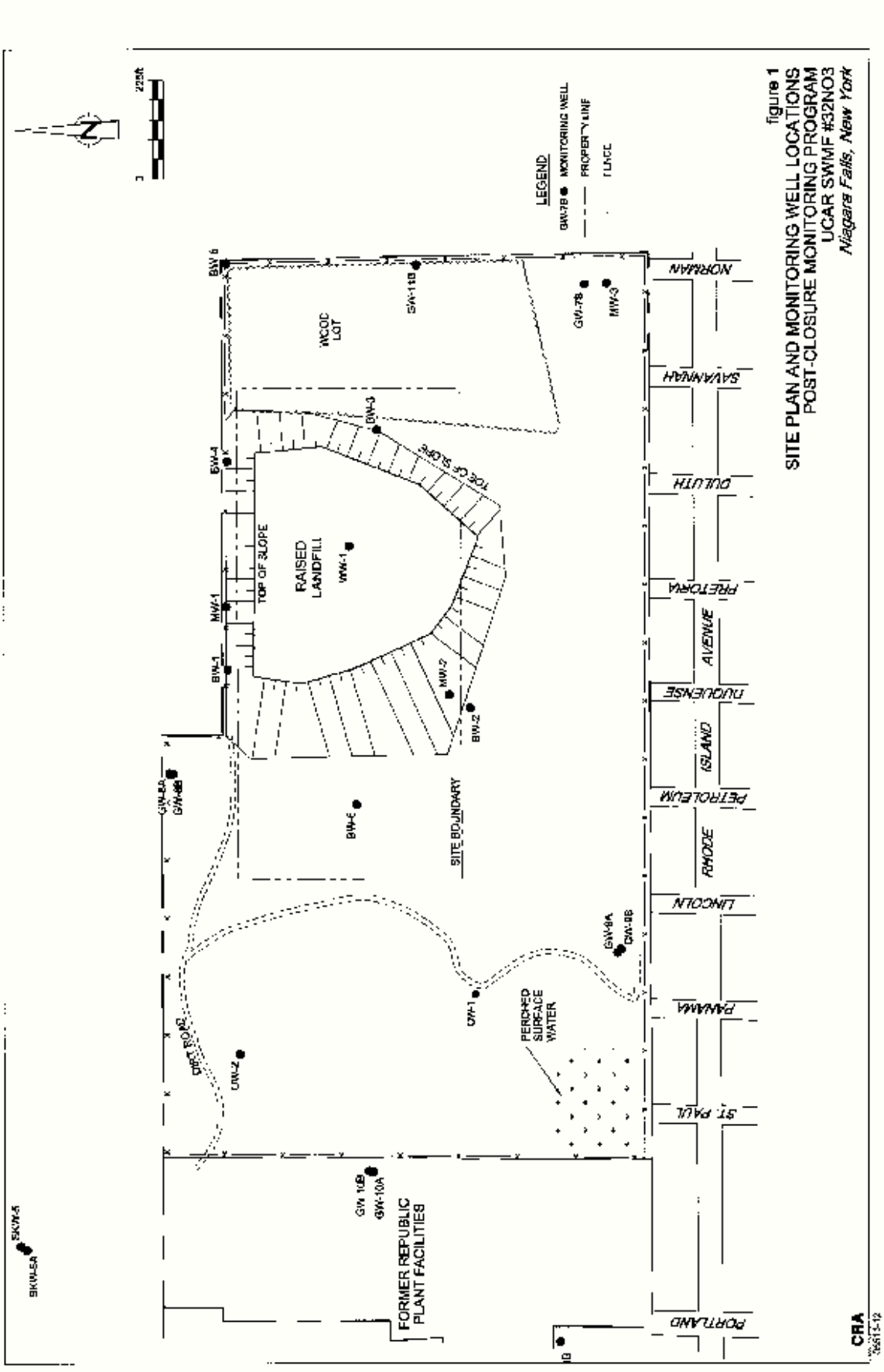


figure 1
SITE PLAN AND MONITORING WELL LOCATIONS
POST-CLOSURE MONITORING PROGRAM
UCAR SWMF #32NO3
Niagara Falls, New York
LEGEND
GW-7B MONITORING WELL
PROPERTY LINE
FENCE
N
225ft
WOOD LOT
RAISED LANDFILL
TOP OF SLOPE
TOE OF SLOPE
SITE BOUNDARY
DIRT ROAD
PERCHED SURFACE WATER
FORMER REPUBLIC PLANT FACILITIES
BW-1
BW-2
BW-3
BW-4
BW-5
BW-6
MW-1
MW-2
MW-3
GW-1
GW-2
GW-7B
GW-8A
GW-8B
GW-10A
GW-10B
SKWL-5A
SKWL-5
NORMAN
SAVANNAH
DULUTH
PRETORIA
AVENUE
TUSCALOOSA
ISLAND
PETROLEUM
RHODE
LINCOLN
PANAMA
ST. PAUL
PORTLAND
CRA

APPENDIX G

CONESTOGA-ROVERS & ASSOCIATES

2055 Niagara Falls Blvd., Suite #3
Niagara Falls, New York 14304
Telephone: (716) 297-6150 Fax: (716) 297-2265
www.CRAworld.com

MEMORANDUM

Sent via email

TO:	Jim Kay	REF. NO.:	005513
FROM:	Dave Tyran/adh/7 DJT	DATE:	March 27, 2009
RE:	**Annual Groundwater Sampling**		

INTRODUCTION

In accordance with Conestoga-Rovers & Associates (CRA) Field Sampling Plan (FSP) Post-Closure Monitoring Program for UCAR Carbon's Solid Waste Management Unit (SWMU) No. 32NO3, the Annual groundwater sampling event was performed on March 26, 2009. Activities associated with this sampling event are described in this memo.

HYDRAULIC MONITORING

Prior to sampling, a complete round of water level measurements and well soundings were taken. Table 1 presents the water level information in addition to comparing the sounded depths to the installed depths.

GROUNDWATER MONITORING

A total of seven monitoring wells were visited during this sampling round. Monitoring well MW-3 had minimal water and was purged dry; the remaining six wells had sufficient recharge to purge three to five well volumes. Monitoring well MW-3 recovered enough for a full sample to be collected.

Purging of wells was accomplished by the use of either a battery operated submersible pump or Teflon bailer. Samples were obtained with a dedicated bottom loading Teflon bailer. Table 2 provides the pertinent groundwater data.

WELL INSPECTIONS

Well inspections were performed at each of the monitoring wells. No problems were noted during this round.

FUTURE MONITORING

The next scheduled groundwater sampling round will be performed in September 2010.

APPENDIX H

CONESTOGA-ROVERS & ASSOCIATES

2055 Niagara Falls Blvd., Suite #3
Niagara Falls, New York 14304
Telephone: (716) 297-6150 Fax: (716) 297-2265
www.CRAworld.com

MEMORANDUM

TO: Jim Kay

REF. NO.: 005513

FROM: Deb Andrasko/bjw/1

DATE: May 15, 2009

E-Mail and Hard Copy If Requested

RE: **Analytical Results and QA/QC Review**
Annual Groundwater Monitoring Program
UCAR Carbon Company, Inc.
Niagara Falls, New York
March 2009

INTRODUCTION

Eight groundwater samples, including one field duplicate sample were collected during March 2009 in support of the annual monitoring program at the UCAR Carbon Site in Niagara Falls, New York (Site). The samples were submitted to Columbia Analytical Services (CAS), located in Rochester, New York, and analyzed for the following:

Parameter	*Methodology*
Volatile Organic Compounds (VOCs)	SW-846 8260B[1]
Total & Dissolved Iron, Potassium, and Zinc	SW-846 6010B[1]
Ammonia	USEPA 350.1[2]
Nitrite	USEPA 353.2[2]
Total Kjeldahl Nitrogen (TKN)	USEPA 351.2[2]

A sampling and analysis summary is presented in Table 1. The analytical results are summarized in Table 2. The quality assurance/quality control (QA/QC) criteria by which the data have been assessed are outlined in the respective methods and the following documents:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", October 1999, United States Environmental Protection Agency (USEPA) 540/R-99/008;

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", February 1994, USEPA 540/R-94/013.

1 "Test Methods for Solid Waste Physical/Chemical Methods", SW-846, 3rd Edition, September 1986 (with all subsequent revisions).

2 "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency (USEPA) 600/4-79-220, March 1983 (with all subsequent revisions).

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. The data quality assessment and validation presented in the following subsections were performed based on the sample results, supporting QA/QC and raw data provided.

Holding Time Period And Sample Analysis

The holding time periods are presented in the analytical methods. All samples were properly preserved and cooled to 4°C (±2°C) after collection. All samples were prepared and analyzed within the method-required holding times.

Gas Chromatography/Mass Spectrometer (GC/MS) Mass Calibration

Prior to analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the volatile organic compound (VOC) method requires the analysis of the specific tuning compound bromofluorobenzene (BFB). The resulting spectra must meet the criteria cited in the method before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Instrument tuning data were reviewed. The tuning compound was analyzed at the required frequency throughout the VOC analysis periods. All tuning criteria were met for the analyses, indicating proper optimization of the instrumentation.

Initial Calibration - GC/MS Analyses

To quantify compounds of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a minimum of a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range.

Calibration data were reviewed for all samples. Linearity of the calibration curve and instrument sensitivity were evaluated against the following criteria:

i) all relative response factors (RRFs) for the GC/MS must be greater than or equal to 0.05; and

ii) percent relative standard deviation (%RSD) values for the GC/MS must not exceed 30 percent, or if linear regression is used, the correlation coefficient (R^2) value must be at least 0.990.

Initial calibration standards were analyzed as required and the data showed acceptable sensitivity and linearity.

Initial Calibration - Metals Analyses

To calibrate the inductively coupled plasma (ICP), a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. After calibration, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves within a method-specific percent recovery of the accepted or true value. A Contract Required Detection Limit (CRDL) standard is analyzed before and after sample analyses to verify instrument sensitivity.

A review of the data showed that all metals calibration curves, ICVs and CRDL were analyzed at the proper frequencies and were within the acceptance criteria.

Initial Calibration – General Chemistry Analyses

The general chemistry analyses of ammonia, nitrite, and TKN were calibrated in accordance with the methods and all calibration criteria were met.

Continuing Calibration – GC/MS

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

i) all RRF values for the GC/MS must be greater than or equal to 0.05; and

ii) percent difference (%D) values must not exceed 25 percent.

Continuing calibration standards were analyzed at the required frequency and the results met the above criteria for instrument sensitivity and linearity of response.

Continuing Calibration – Inorganics

Continuing calibration criteria for inorganic analyses were the same criteria as used for assessing the initial calibration data. All continuing calibration verification data were within the acceptance criteria.

Surrogate Compound Recoveries

Surrogates were added to all samples, blanks, and QC samples prior to analysis of VOCs. All recoveries met the method criteria, with the exception of a low surrogate recovery for one sample. All associated results were qualified as estimated based on the indicated low bias (see Table 3).

Method Blank Samples

Method blanks were analyzed for all parameters. All results were non-detect, indicating that contamination during analysis was not a concern.

Laboratory Control Sample (LCS) Analysis

The LCS serves as a measure of overall analytical performance. LCSs are prepared with all analytes of interest and analyzed with each sample batch.

LCSs were prepared and analyzed for all parameters at the proper frequency. The LCS recoveries were within the control limits for all analytes of interest, indicating acceptable analytical accuracy.

APPENDIX H

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

The recoveries of MS analyses are used to assess the analytical accuracy achieved on individual sample matrices. MS/MSD analyses were performed on the sample submitted for analysis, as shown in Table 1. The MS/MSD recoveries were within laboratory control limits for all analytes of interest, indicating good analytical accuracy and precision.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

To verify that proper inter-element and background correction factors have been established by the laboratory, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period.

ICS analysis results were evaluated for all samples. All ICS recoveries were within the established control limits of 80 to 120 percent.

Serial Dilution - Metals Analyses

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of one per 20 investigative samples is analyzed at a five-fold dilution. For samples with sufficient analyte concentrations, the serial dilution results must agree within 10 percent of the original results.

Serial dilution analysis was performed on the sample chosen for MS/MSD analyses and all results were within the method criteria.

Internal Standard (IS) Summaries

To correct for changes in GC/MS response and sensitivity, IS compounds are added to investigative samples and QC samples prior to VOC analyses. All results are calculated as a ratio of the IS response. The criteria by which the IS results are assessed are as follows:

i) IS area counts must not vary by more than a factor of two (-50 percent to −100 percent) from the associated calibration standard; and

ii) the retention time of the IS must not vary more than ±30 seconds from the associated calibration standard.

All sample IS results met the above criteria and were correctly used to calculate sample results.

Trip Blanks - VOCs

Trip blanks are transported, stored, and analyzed with the investigative samples to identify potential cross-contamination of VOCs. A trip blank was collected as shown on Table 1. All results were non-detect for the analytes of interest, indicating that contamination during transport and storage was not an issue.

APPENDIX H

Field Duplicates

Samples were collected in duplicate as summarized in Table 1 and submitted "blind" to the laboratory for analysis. All sample results outside of estimated ranges of detection showed acceptable sampling and analytical precision with the exception of the zinc result for the dissolved metals analysis. The associated result was qualified as estimated based on the indicated variability (see Table 4).

CONCLUSION

Based on the preceding assessment, the data were acceptable for use with the qualifications noted.

(106)

Hydraulic Monitoring

Date 3.26.09 Crew DD, SG, D

Well #	Time	w/l	Sounded Depth
MW 3	1028	4.38	15.08
BW 1	0952	10.54	25.88
BW 2	0924	8.89	21.50
BW 3	1011	5.10	23.46
BW 4	1005	5.53	21.21
GW 8B	0828	8.79	29.60
GW 9B	0909	~~11.29~~ 10.74	31.83
MW 1	0959	7.97	21.00
MW 2	0920	18.83	24.55
BW 5	1022	1.70	28.80
BW 6	0904	13.70	26.00

Inst. Control #

w/l Meter NF05034

Daily Log

YSI 650 MDS NF04441 CALABRATION

	BEFORE	AFTER
DO	-	98.1
PH (7.00)	6.62	7.00
PH (4.00)	3.96	4.00
COND. (4.49)	4.49	4.49
TURB. (0)	0.2	0.0
TURB (100)	100.6	100.0

3-26-09 Partly Sunny 49°F

0755 on-site Meet Bob Bucci get site keys

DJT w/l Round DO/SG purge and Sample GW 8B, 9B, BW 2

1030 DJT Dry out MW 3

1100 DJT off-site

SG/DO Purge & Sample BW 1, 4, 3

Sample MW 3

1345 off-site

(108) MW-3

Date 3-26-09 Crew DJT,
Project # 5513-02
Condition Good
Depth 2" D-15.25
Initial w/L 4.38
Vol. Calc. 15.25 - 4.38 = 10.87 x .16 = 1.7
Method dedicated Teflon Bailer

Purge Record

Time	Vol	pH	Cond	Temp °C	Turb
1035	1.7	7.90	0.580	9.66	360.8

well Dry @ 2.2 gallons

Initial w/Q Clear, Colorless

Final w/Q Cloudy Red/Brown

Final w/L Dry

Sample Record

Date 3.26.09
Crew SG/DD
Method dedicated Teflon Bailer

Vol/Analysis See pg 28C

Sample Time 1300
Sample ID WG-5513-032609-005

w/Q CLEAR, LT BROWN

pH	Cond	Temp °C	Turb
7.90	0.554	7.32	100.2

CofC #
18094

Inst. Control #5
w/L Meter NF05034
YSI NF04441

Dave J Tyan

APPENDIX H

(110)

BCW-1

Date 3/26/09 Crew SG, DJT, DD
Project # 5513-RD
Condition Good
Depth 4" 0 - 20.9 3" 20.9 - 35.9
Initial w/L 10.54
Vol. Calc 20.9 - 10.54 = 10.36 x .165 = 6.7
Method WHALE PUMP
35.9 - 20.9 = 15 x .37 = 5.6 5.6 + 6.7 = 12.3 GAL

Purge Record

Time	Vol	pH	Cond	Temp°C	Turb
1133	12.3	7.89	1.84	9.83	58.5
1137	24.6	7.66	1.83	9.85	76.5
1142	36.9	7.59	1.83	9.85	9.1
1146	49.2	7.49	1.82	9.81	8.4
1151	61.5	7.59	1.82	9.83	7.4

Initial w/Q CLOUDY BLACK

Final w/Q CLEAR, COLORLESS

Final w/L 12.83

Sample Record

Date 3/26/09
Crew SG, DJT, DD
Method TEFLON BAILER

Vol/Analysis See pg 28C

Sample Time 1145
Sample ID WCW-5513-032609-0006

w/Q CLOUDY GRAY

pH	Cond	Temp°C	Turb
7.89	1.96	8.80	121.3

CofC # 18094

Inst. Control #'s
w/L Meter NF 05034
YSI NF 04441

Dave J Tyga

APPENDIX H

APPENDIX H

(112) BCW-2

Date 3/20/09 Crew DD/SG
Project # 5513-20
Condition Good
Depth 4" 0-21.1 3" 21.1-37.1
Initial W/L 8.83
Vol. Calc 21.1-8.83 = 12.27 x .65 = 7.97
37.1-21.1 = 17 x .37 = 6.29 7.97+6.29 = 14.3 gal
Method WHALE PUMP

Purge Record

Time	Vol	pH	cond	Temp °C	Turb
1043	14.3	7.02	2.62	10.22	11.8
1048	28.6	6.93	2.51	10.17	7.1
1053	42.9	7.00	2.57	10.21	2.3

Initial W/Q CLOUDY, BROWN

Final W/Q CLEAR, COLORLESS

Final W/L 9.02

Sample Record DUP

Date 3/20/09
Crew SG, DJT, DD
Method TEFLON BAILER

Vol/ Analysis See pg 28C

Sample Time 1100
Sample ID WG-5513-032009-003
BLIND DUP 10* WG-5513-032009-004 TIME 1110

W/Q CLOUDY BROWN

pH	cond	Temp °C	Turb
7.48	2.34	8.32	289.7

C of C #
130941

Inst. Control #'s
W/L Meter NF05034
YSI NF04441

[signature]

(114)

BCW-3

Date 3/26/09 Crew SG, DJT, DD

Project # 5513.20

Condition Good

Depth 4" 0-9.7 3" 9.7-23.45

Initial w/L 5.10

Vol. Cal 9.7-5.10 = 4.6 x .65 = 3.0

23.45-9.7 = 13.75 x .37 = 5.1 5.1+3.0 = 8.1

Method WHALE PUMP

Purge Record

Time	Vol	pH	cond	Temp °C	Turb
1255	8.1	7.54	0.950	8.37	4.8
1258	16.2	7.34	0.929	8.05	2.7
1300	24.3	7.24	0.929	8.00	3.5
1302	32.4	7.20	0.930	8.01	2.3

Initial w/Q CLEAR, COLORLESS

Final w/Q CLEAR, COLORLESS

Final w/L 5.15

Sample Record

Date 3/26/09

Crew SG, DJT, DD

Method TEFLON BAILER

Vol/Analysis See pg 28c

Sample Time 1315

Sample ID WG-5513-032609-008

w/Q CLEAR, COLORLESS

pH	Cond	Temp °C	Turb
7.33	0.845	7.55	15.6

CofC # 18094

Inst. Control #5

w/L Meter NF05034

VST NF04441

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BW-4

Date 3/26/09 Crew SG, DJT, DD

Project # 5513-20

Condition GOOD

Depth 4" 0-13.9 3" 13.9-27.5

Initial w/L 5.53

Vol. Calc 13.9-5.53 = 8.37 x .65 = 5.4

27.5-13.9 = 13.6 x .37 = 5.0 5.4 + 5.0 = 10.4 GAL

Method WHALE PUMP

Purge Record

Time	Vol	pH	cond	Temp °C	Turb
1219	10.4	7.68	1.43	9.23	134.[illegible]
1223	20.8	7.36	1.47	9.20	20.0
1227	31.2	7.38	1.46	9.22	14.5
1230	41.6	7.35	1.44	9.21	12.0

Initial w/Q CLEAR, LT BROWN

Final w/Q CLEAR, COLORLESS

Final w/L 6.96

Sample Record

Date 3/26/09

Crew SG, DJT, DD

Method TEFLON BAILER

Vol/Analysis See pg 28C

Sample Time 1245

Sample ID WG-5513-032609-007

W/Q CLEAR LT BROWN

pH	cond	Temp °C	Turb
7.55	1.30	7.93	39.9

C of C # 18094

Inst. Control #'s

w/L Meter NF05034

YSI NF04441

(118) GW-8B

Date 3/26/09 Crew SG, DJT, DD
Project # 5513-20
Condition Good
Depth 3" 0-29.5
Initial w/L 8.79
Vol. Calc. 29.5-8.79 = 20.21 x .37 = 7.7

Method WHALE PUMP

Purge Record

Time	Vol	pH	Cond	Temp°C	Turb
0833	7.7	8.47	1.75	8.80	86.2
0837	15.4	8.05	1.87	9.63	180.2
0841	23.1	7.50	1.88	9.66	65.7
0847	30.8	7.24	1.87	9.64	20.2
0852	38.5	7.19	1.87	9.64	11.1

Initial w/Q CLEAR, COLORLESS

Final w/Q CLEAR, COLORLESS

Final w/L 16.28

Sample Record MS/MSD

Date 3/26/09
Crew SG, DJT, DD
Method TEFLON BAILER

Vol/Analysis See pg 28C

Sample Time 0900
Sample ID WG 5513-032609-001

w/Q CLEAR, COLORLESS

pH	Cond	Temp°C	Turb
7.40	1.87	9.30	4.5

CofC # 18094

Inst. Control #'s
w/L Matic NFO5034
YSI NFO4441

Dave Q / Ryan

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(20) GW-9B

Date 3/26/09 Crew SG, DJT, DD

Project # 5513-20

Condition GOOD

Depth 3" 0-31.7

Initial W/L 10.74

Vol. Calc. 31.7-10.74 = 20.96 x .37 = 7.8 GAL

Method WHALE PUMP

Purge Record

Time	Vol	pH	Cond	Temp°C	Turb
0952	7.8	7.38	2.61	9.96	2.9
0955	15.6	7.15	2.67	10.10	3.7
1000	23.4	7.09	2.67	10.23	2.1
1004	31.2	7.08	2.68	10.22	2.5

Initial W/Q CLEAR, COLORLESS

Final W/Q CLEAR, COLORLESS

Final W/L 23.09

Sample Record

Date 3/26/09

Crew SG, DJT, DD

Project # 5513-20

METHOD: TEFLON BAILER

Vol/Analysis See pg 28C

Sample Time 1015

Sample ID WG-032609-002

W/Q CLEAR, COLORLESS

pH	Cond	Temp °C	Turb
7.47	2.61	9.87	8.6

CofC #

18094

Inst. Control #5

W/L Meter NF05034

YSI NF0444L

APPENDIX I

Robert Bucci, Consultant
3344 Wildwood Dr.
Niagara Falls, New York 14304
Phone 716 297-6772 Cell & 716 628-8208
Email: nia3344@verizon.net

June 2, 2009 Reference No. 005513

Ms. Mary F. McIntosh
Engineering Geologist II
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Ms. McIntosh:

Re: Annual Monitoring Event 2009
UCAR Republic SWMF #32N03

The annual monitoring event for the above-referenced Site was conducted on March 26, 2009. The Site groundwater monitoring program was modified in November 2005 and currently consists of the following (excerpt from letter from C. Barron (CRA) to M. McIntosh (NYSDEC) dated November 4, 2005.):

> Annual sampling of seven wells (BW-1, BW-2, BW-3, BW-4, MW-3, GW-8B, and GW-9B) with analysis of the samples for Part 360 volatiles, ammonia, iron (total and soluble), potassium (total and soluble), zinc (total and soluble), nitrite, total kjeldahl nitrogen (TKN), turbidity, groundwater elevation, pH, specific conductance, and temperature. Monitoring is rotated between the spring and fall seasons such that one year sampling is conducted in the spring and the next year it will be conducted in the fall. Sampling is conducted once in each calendar year and reporting is submitted annually following receipt and review of the groundwater analytical data.

The sample collection and analyses were performed in accordance with the program outlined in the letters from M. McIntosh (NYSDEC) to R. Bucci (UCAR), dated January 18, 2000 and February 23, 2000. A sample collection and analysis summary is presented in Table 1 and water level elevations measured prior to well purging are presented in Table 2. The analytical laboratory report for this sampling event is enclosed and the data are summarized in Table 3.

APPENDIX I

June 2, 2009 Reference No. 005513

The analytical data from this monitoring event are consistent with the historical data.

The next groundwater monitoring event at the Site will be conducted in the Fall of 2010. Should you have any questions or require additional information, please do not hesitate to contact the undersigned at 716-628-8208.

Yours truly,

Robert Bucci
Site Consultant

Encl.

c.c.: M. Hans
M. Hinton
J. M. Bursley

APPENDIX I

TABLE 1

HYDRAULIC MONITORING
POST-CLOSURE MONITORING PROGRAM
UCAR REPUBLIC SWMU #32NO3
NIAGARA FALLS, NEW YORK
MARCH 2009

Well I.D.	*TOC Elevation (Ft. AMSL)*	*Depth to Water (Ft. BTOC)*	*Water Level Elevation (Ft. AMSL)*	*Sounded Depth (Ft. BTOC)*	*Installed Depth (Ft. BTOC)*
MW-3	601.89	4.38	597.51	15.08	14.4
BW-1	610.72	10.54	600.18	25.88	35.9
BW-2	608.43	8.89	599.54	24.50	37.1
BW-3	604.72	5.10	599.62	23.46	22.7
BW-4	607.08	5.53	601.55	21.21	27.5
GW-8B	603.90	8.79	595.11	29.60	29.5
GW-9B	603.40	10.74	592.66	31.83	31.7

Notes:

AMSL	Above Mean Sea Level.
BTOC	Below Top of Casing.
Ft.	Feet.
NM	Not Measured.

TABLE 2

ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING
UCAR CARBON COMPANY, INC.
NIAGARA FALLS, NEW YORK
MARCH 2009

Parameters	Units	Sample ID: WG-5513-032609-003 Location ID: BW-2 Collection Date: 03/26/09	Sample ID: WG-5513-032609-004 Location ID: BW-2 Collection Date: 03/26/09 Duplicate	Sample ID: WG-5513-032609-001 Location ID: GW-8B Collection Date: 03/26/09	Sample ID: WG-5513-032609-006 Location ID: BW-1 Collection Date: 03/26/09
TCL Volatiles					
1,1,1-Trichloroethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,1,2-Trichloroethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethene (total)	µg/L	10 U	10 U	20	10 U
1,2-Dichloropropane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
2-Butanone	µg/L	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	10 U	10 U
Acetone	µg/L	3.1 J	3.5 J	20 U	3.4 J
Benzene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Bromodichloromethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Bromoform	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Bromomethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	µg/L	0.84 J	0.86 J	10 U	0.63 J
Carbon tetrachloride	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	µg/L	5.0 U	5.0 U	5.0 U	3.0 J
Chloroform	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Chloromethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Ethyl benzene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Toluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	µg/L	5.0 U	5.0 U	7.4	5.0 U
Vinyl chloride	µg/L	5.0 U	5.0 U	3.5 J	5.0 U
Xylenes (total)	µg/L	5.0 U	5.0 U	5.0 U	5.0 U

TABLE 2

ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING
UCAR CARBON COMPANY, INC.
NIAGARA FALLS, NEW YORK
MARCH 2009

Parameters	Units	Sample ID: WG-5513-032609-003 Location ID: BW-2 Collection Date: 03/26/09	WG-5513-032609-004 BW-2 03/26/09 Duplicate	WG-5513-032609-001 GW-8B 03/26/09	WG-5513-032609-006 BW-1 03/26/09
TCL Volatiles					
cis-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
trans-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U
Metals					
Iron (total)	mg/L	49.1	54.4	0.319	5.49
Potassium (total)	mg/L	7.38	7.38	5.86	5.01
Zinc (total)	mg/L	8.82	9.64	0.725	11.4
Iron (dissolved)	mg/L	0.668	0.621	0.234	0.622
Potassium (dissolved)	mg/L	6.96	7.37	5.63	5.13
Zinc (dissolved)	mg/L	0.262 J	0.583 J	0.419	0.0200 U
General Chemistry					
Ammonia	mg/L	0.275	0.282	0.050 U	0.758
Nitrite	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Kjeldahl Nitrogen	mg/L	0.75	0.91	0.26	1.62

APPENDIX I

TABLE 2

ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING
UCAR CARBON COMPANY, INC.
NIAGARA FALLS, NEW YORK
MARCH 2009

	Sample ID:	WG-5513-032609-008	WG-5513-032609-002	WG-5513-032609-007	WG-5513-032609-005
	Location ID:	BW-3	GW-9B	BW-4	MW-3
	Collection Date:	*03/26/09*	*03/26/09*	*03/26/09*	*03/26/09*
Parameters	***Units***				
TCL Volatiles					
1,1,1-Trichloroethane	µg/L	0.71 J	5.0 U	13 UJ	5.0 U
1,1,2,2-Tetrachloroethane	µg/L	5.0 U	5.0 U	2.5 J	5.0 U
1,1,2-Trichloroethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
1,1-Dichloroethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
1,1-Dichloroethene	µg/L	5.0 U	5.0 U	3.6 J	5.0 U
1,2-Dichloroethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
1,2-Dichloroethene (total)	µg/L	10 U	10 U	720	10 U
1,2-Dichloropropane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
2-Butanone	µg/L	10 U	10 U	25 UJ	10 U
2-Hexanone	µg/L	10 U	10 U	25 UJ	10 U
4-Methyl-2-pentanone	µg/L	10 U	10 U	25 UJ	10 U
Acetone	µg/L	1.2 J	1.6 J	4.2 J	1.9 J
Benzene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Bromodichloromethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Bromoform	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Bromomethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Carbon disulfide	µg/L	10 U	10 U	25 UJ	10 U
Carbon tetrachloride	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Chlorobenzene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Chloroethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Chloroform	µg/L	5.0 U	5.0 U	4.6 J	5.0 U
Chloromethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Dibromochloromethane	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Methylene chloride	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Ethyl benzene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Styrene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Tetrachloroethene	µg/L	5.0 U	5.0 U	140 J	5.0 U
Toluene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Trichloroethene	µg/L	5.0 U	5.0 U	220 J	5.0 U
Vinyl chloride	µg/L	5.0 U	5.0 U	160 J	5.0 U
Xylenes (total)	µg/L	5.0 U	5.0 U	13 UJ	5.0 U

TABLE 2

ANALYTICAL RESULTS SUMMARY
ANNUAL GROUNDWATER MONITORING
UCAR CARBON COMPANY, INC.
NIAGARA FALLS, NEW YORK
MARCH 2009

	Sample ID:	WG-5513-032609-008	WG-5513-032609-002	WG-5513-032609-007	WG-5513-032609-005
	Location ID:	BW-3	GW-9B	BW-4	MW-3
	Collection Date:	*03/26/09*	*03/26/09*	*03/26/09*	*03/26/09*
Parameters	***Units***				
TCL Volatiles					
cis-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
trans-1,3-Dichloropropene	µg/L	5.0 U	5.0 U	13 UJ	5.0 U
Metals					
Iron (total)	mg/L	2.33	0.699	26.0	7.67
Potassium (total)	mg/L	2.0 U	7.41	13.1	3.07
Zinc (total)	mg/L	2.32	0.0200 U	7.67	0.0268
Iron (dissolved)	mg/L	0.10 U	0.100 U	3.51	0.384
Potassium (dissolved)	mg/L	2.00 U	6.73	13.2	2.00 U
Zinc (dissolved)	mg/L	1.2100	0.0200 U	0.694	0.0200 U
General Chemistry					
Ammonia	mg/L	0.050 U	0.103	2.85	0.050 U
Nitrite	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Kjeldahl Nitrogen	mg/L	0.46	0.68	3.54	0.59

TABLE 3

SAMPLE COLLECTION AND ANALYSIS SUMMARY
ANNUAL GROUNDWATER MONITORING
UCAR CARBON COMPANY, INC.
NIAGARA FALLS, NEW YORK
MARCH 2009

				Analysis/Parameters					
Sample I.D.	*Location I.D.*	*Collection Date (mm/dd/yy)*	*Collection Time (hr:min)*	*VOCs*	*Selected Metals-total and dissolved*	*TKN*	*Nitrate*	*Ammonia*	*Comments*
WG-5513-032609-001	GW-8B	03/26/09	9:00	X	X	X	X	X	MS/MSD
WG-5513-032609-002	GW-9B	03/26/09	10:15	X	X	X	X	X	
WG-5513-032609-003	BW-2	03/26/09	11:00	X	X	X	X	X	
WG-5513-032609-004	BW-2	03/26/09	11:10	X	X	X	X	X	Field duplicate of WG-5513-032609-003
WG-5513-032609-005	MW-3	03/26/09	13:00	X	X	X	X	X	
WG-5513-032609-006	BW-1	03/26/09	11:45	X	X	X	X	X	
WG-5513-032609-007	BW-4	03/26/09	12:45	X	X	X	X	X	
WG-5513-032609-008	BW-3	03/26/09	13:15	X	X	X	X	X	
TB-5513-032609	-	03/26/09	-	X					Trip blank

Notes:

- = Not applicable.
MS - Matrix Spike.
MSD - Matrix Spike Duplicate.
TKN - Total Kjeldahl Nitrogen.
VOCs - Volatile Organic Compounds.

APPENDIX J

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.dec.state.ny.us

December 29, 2008

Mr. Robert Bucci
GrafTech
3344 Wildwood Drive
Niagara Falls, New York 14304

Dear Mr. Bucci:

Soil Vapor Intrusion Evaluation Report
UCAR Republic Site, Registry No. 932035
Town of Niagara, Niagara County

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYS DOH) have reviewed the Soil Intrusion Evaluation at the UCAR Republic Site report dated May 2, 2007. We have determined that the potential for soil vapor intrusion into neighboring homes and business' has been satisfactorily evaluated and we concur with your recommendation that no further action is needed at this site regarding soil vapor intrusion.

We appreciate your patience while we were evaluating your report. If you have any questions please call me at 716-851-7220.

Sincerely yours,

Michael J. Hinton P.E.
Environmental Engineer II
Region 9, Buffalo Office

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hinton\bucci-dec1.ltr

cc: Mr. Gregory Sutton, NYSDEC, Region 9
Ms. Mary McIntosh, NYSDEC, Region 9
Mr. Thomas Festa, NYSDEC, Albany (Code 7013)
Mr. Matthew Forcucci, NYS DOH, Buffalo
Ms. Juanita Bursley, Senior Manager Corporate Environmental Protection, UCAR