INTERNATIONAL PAPER

RECEIVED APR 26 2012 SOLID WASTE SECTION

RIEGELWOOD MILL
JOHN L. RIEGEL ROAD
RIEGELWOOD NC 28456
PHONE 910 655 2211

April 25, 2012
Mr. Mark Poindexter
North Carolina Division of Environmental Management
Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

Subject: Quarterly Groundwater Monitoring
International Paper – Riegelwood – Columbus County
Landfill Permit No. 24-02

Certified Mail: 7006 0100 0004 8355 1602

Dear Mr. Poindexter:

Enclosed please find the results of laboratory analyses performed on six groundwater monitoring wells, as specified in our new landfill permit No. 24-02, issued February 17, 2005. The required samples were collected by URS, Inc. on February 28 - 10, 2012, from monitoring wells MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, MW-8A, and from Landfill Cell 1 primary sump, secondary sump, and underdrain.

Enclosed are the required Environmental Monitoring Report Form, field sampling data, laboratory spreadsheets, raw laboratory data, and a drawing indicating the locations of the wells. An electronic copy of the report is also included, which contains detailed lab information.

If you have any questions or comments regarding this report, please contact me at (910)362-4590.

Sincerely,
Wallace Coverdale
Wallace Coverdale
Environmental Coordinator

Enclosure
cc: Ms. Ginny Henderson, Wilmington Regional Office

URS

April 12, 2012

RECEIVED
APR 26 2012
SOLID WASTE SECTION

Ms. Wallace Coverdale
International Paper
Riegelwood Mill
865 John L. Riegel Road
Riegelwood, North Carolina 28456

Re: Semi-Annual Groundwater
Compliance Monitoring Results (February 2012)
Permit No. 24-02
International Paper, Riegelwood, North Carolina
URS Project No. 31828323

Dear Ms. Coverdale:

URS Corporation (URS) has prepared the attached North Carolina Department of Environment and Natural Resources (NCDENR) Environmental Monitoring Reporting Form and tables presenting the results of the 2012 first semi-annual groundwater compliance monitoring event in the vicinity of the International Paper Riegelwood Mill solid waste landfill. The sampling activities were conducted in accordance with NCDENR Division of Waste Management Solid Waste Section requirements for groundwater monitoring.

The sampling event was conducted on February 28, 2012. The sampling event included the collection of three water samples, designated Primary, Secondary, and Under-Drain, obtained from the New Landfill Cell 1, and the collection of groundwater samples from monitoring wells MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, and MW-8A. All samples were submitted to Columbia Analytical Services (a North Carolina certified laboratory) for analysis.

The following are included as attachments to this document:

- NCDENR Environmental Monitoring Reporting Form
- NCDENR Electronic Data Deliverable (EDD)
- Table 1 – Semi-Annual Groundwater Analysis Results
- Table 2 – Historical Groundwater Analysis Results
- Table 3 – New Landfill Cell 1 Analysis Results
- Figure 1 – Location Map
- Figure 2 – Site Map
- Appendix A – Laboratory Report
- Appendix B – Field Activity Documentation

URS Corporation
1600 Perimeter Park, Suite 400
Morrisville, NC 27560
Tel: 919.461.1100
Fax: 919.461.1415
P:\Jobs4_Projects\International Paper\IP - Riegelwood Geosciences\31828323 Landfill GWM 2012\5 Deliverables\5.1 Working Documents\February 2012 GWMR\Draft Cover Letter.doc

URS

URS appreciates the opportunity to be of continued assistance to International Paper on this project. If you have any questions, please do not hesitate to contact Conan Fitzgerald at (919) 461-1260.

Sincerely,

URS CORPORATION

Conan Fitzgerald

Conan Fitzgerald, P.E.
Project Engineer

DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

International Paper

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Martha Meyers-Lee Phone: (919) 461-1100

E-mail: martha_meyers-lee@urscorp.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
International Paper	Riegelwood Mill 865 John L. Riegel Road Riegelwood, North Carolina 28456	24-02	.0500	February 28, 2012

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☐ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification:

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Conan Fitzgerald, PE — Facility Representative Name (Print)

Senior Project Manager — Title

(919) 461-1100 — (Area Code) Telephone Number

Signature

4/12/12 — Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 26500 ENGINEER CONAN D. FITZGERALD

URS Corporation, 1600 Perimeter Park Drive, Morrisville, North Carolina 27560

Facility Representative Address

C-2243

NC PE Firm License Number (if applicable effective May 1, 2009)

PRELIMINARY ANALYSIS of the CAUSE and SIGNIFICANCE of EACH VALUE EXCEEDING NC2L GROUNDWATER STANDARDS

Wells MW-1A and MW-1B are up-gradient background wells indicating natural conditions. Iron and vanadium were detected at concentrations above NC2L groundwater standards in both of these wells, indicating that these metals are naturally present in groundwater at elevated concentrations. The pH measured in MW-1A was measured to be 4.85 standard units, indicating that shallow groundwater is naturally acidic.

Well MW-4A was found to exceed the 2L standard for iron, while the pH was below the range of 6.5 – 8.5 standard units. The iron result is within the range of historic background data, which has been as high as 12,000 ug/L in the background wells. The acidic pH is also noted to be within historic background data which has been measured several times to be less than 4.0 standard units. Thus these results are attributed to naturally occurring conditions.

Well MW-5A was found to have exceedences of the 2L standard for iron, manganese, and vanadium, all of which were within the historic range of background data, which has been detected as high as 12,000 ug/L, 330 ug/L and 13.6 ug/L respectively. Levels of chloride slightly exceeded the 2L standard, but remain within the historic range of results for MW-5A. Total Dissolved Solids (TDS) was also found to exceed the 2L groundwater standard. As the data does not indicate any obvious contamination, the TDS result is believed to be due to swampy conditions and is therefore naturally occurring.

Well MW-7A: Arsenic was also detected in both background samples. Arsenic is demonstrated to be naturally occurring by historic results in the background wells where it has been detected as high as 31 ug/L in MW-1A and 300 ug/L in MW-1B.

Iron, manganese, vanadium, and TDS were also detected above the 2L groundwater standard. The iron, manganese, and TDS were detected at concentrations consistent with historic levels, but generally less than results over the past three years. Vanadium was detected within the historical range for this element, which is generally consistent with background levels. It is noted that MW-7A has the highest natural turbidity of the wells in this monitoring program, which likely contributes to detected concentrations of naturally occurring constituents such as arsenic, iron, manganese, vanadium, and TDS.

Well MW-8A: Arsenic was detected at 11 ug/L in this well, which is slightly above the new 2L groundwater standard, but is within the historic range of detections both in this well and in the background wells, where arsenic has been demonstrated to be naturally occurring. Iron, manganese, and TDS, established above as naturally occurring, were also detected above the NC 2L standard, but within historic ranges for this well. Sulfate, which historically tests high in this well, was also detected above the 2L groundwater standard for only the second time since 2009.

TABLES

TABLE 1
SEMI-ANNUAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA
FEBRUARY 2012 EVENT

		Montioring Well:	MW-1A		MW-1B		MW-4A		MW-5A		MW-7A		MW-8A		2L	
		Collection Date:	2/28/12		2/28/12		2/28/12		2/28/12		2/28/12		2/28/12			
Method	Parameter	Units	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Standard	SWSL
SW-846 6010C	Arsenic	ug/l	6.1	J	7.2	J	4.5	J	9.2	J	23		11		10	10
SW-846 6010C	Barium	ug/l	104		17		42		141		29		42		700	100
SW-846 6010C	Cadmium	ug/l	0.2	U	0.2	U	0.2	U	0.37	BJ	0.32	BJ	0.21	BJ	2	1
SW-846 6010C	Chromium	ug/l	0.71	J	0.7	J	0.5	U	4.7	J	9.7	J	0.5	U	10	10
SW-846 6010C	Copper	ug/l	2	U	2	U	2	U	4.6	J	2	J	2.2	J	1,000	10
SW-846 6010C	Iron	ug/l	909		851		4,050		308		16,200		7,150		300	300
SW-846 6010C	Lead	ug/l	4	U	4	U	4	U	4	U	4	U	4	U	15	10
SW-846 6010C	Manganese	ug/l	14		43		49		251		180		673		50	50
SW-846 6010C	Selenium	ug/l	7	U	7	U	7	U	7	U	7	U	7	U	20	10
SW-846 6010C	Silver	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	20	10
SW-846 6010C	Vanadium	ug/l	3.7	J	2.1	J	2	U	2	U	16	J	2	U	0.3 (I)	25
SW-846 6010C	Zinc	ug/l	5.4	BJ	2	U	7.2	BJ	4	BJ	4.5	BJ	3.6	BJ	1,000	10
SW-846 7470A	Mercury	ug/l	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	1	0.2
EPA 120.1	Specific Conductance	umhos/cm	159		363		210		2,190		1,070		1,070		NE	NE
EPA 300.0	Chloride	ug/l	11,400		9,320		22,200		278,000		114,000		3,360		250,000	NE
EPA 300.0	Fluoride	ug/l	180	J	190	J	160	J	180	J	210		230		2,000	2,000
EPA 300.0	Nitrate	ug/l	30	U	180	J	30	U	30	U	180	J	30	U	10,000	10,000
EPA 300.0	Sulfate	ug/l	43,200		20,200		53,100		12,800		58,300		422,000		250,000	250,000
EPA 410.4	Chemical oxygen demand	ug/l	16,000	U	16000	U	16000	U	131,000		48,000		16000	U	NE	NE
SM 2540C	Total Dissolved Solids	ug/l	90,000		238,000		134,000		1,320,000		680,000		872,000		500,000	NE
SM 4500H	pH	s.u.	4.34	J	7.63	J	4.74	J	6.94	J	7.25	J	6.84	J	6.5-8.5	NE
SM 5210B	Biochemical oxygen demand	ug/l	4000	U	4000	U	4000	U	3,800		2,900		4000	U	NE	NE
SM 5310B	Total Organic Carbon	ug/l	2,400		1,900		3,900		44,800		17,100		3,300		NE	NE
SW-846 9020B	Total Organic Halides	ug/l	100	U	100	U	100	U	700		400		100	U	NE	NE

Notes

Highlighted values indicate concentrations in excess of NC Groundwater quality standards for the protection of the groundwater.

2L Standard - 15A NCAC 2L Groundwater Standards

I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.3 ug/L

SWSL - Solid Waste Section Limits

NE = Not Established

s.u. = Standard unit

ug/L = Micrograms per Liter

umhos/cm = Micromhos per centimeter

Qualifiers (Q):

U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

TABLE 3
NEW LANDFILL CELL 1 ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

		Client Sample ID:	Primary Leachate Collection System		Secondary Leachate Collection System		Under-Drain Leachate Collection System		2L	
		Collect Date:	2/28/12		2/28/12		2/28/12			
Method	Parameter	Units	Value	Q	Value	Q	Value	Q	Standard	SWSL
SW-846 6010C	Arsenic	ug/l	162	J	37		11		10	10
SW-846 6010C	Barium	ug/l	148	J	74		128		700	100
SW-846 6010C	Cadmium	ug/l	0.94	BJ	1.1	BJ	0.28	BJ	2	1
SW-846 6010C	Chromium	ug/l	152	J	80		20		10	10
SW-846 6010C	Copper	ug/l	50	J	7.7	J	2.4	J	1,000	10
SW-846 6010C	Iron	ug/l	11,200	J	149,000		9,960		300	300
SW-846 6010C	Lead	ug/l	8.3	J	4	U	4	U	15	10
SW-846 6010C	Manganese	ug/l	264	J	1,210		781		50	50
SW-846 6010C	Selenium	ug/l	7	UJ	7	U	7	U	20	10
SW-846 6010C	Silver	ug/l	2.6	J	2	U	2	U	20	10
SW-846 6010C	Vanadium	ug/l	2,070	J	18	J	40		0.3 (I)	25
SW-846 6010C	Zinc	ug/l	94.7	J	398		3.8	BJ	1,000	10
SW-846 7470A	Mercury	ug/l	0.8		0.02	U	0.04	J	1	0.2
EPA 120.1	Specific Conductance	umhos/cm	15,200		2,250		3,200		NE	NE
EPA 300.0	Chloride	ug/l	190,000		38,700		256,000		250,000	NE
EPA 300.0	Fluoride	ug/l	300	U	510		200		2,000	2000
EPA 300.0	Nitrate	ug/l	600	U	30	U	160	J	10,000	10000
EPA 300.0	Orthophosphate	ug/l	1100	J	20	U	40	J	NE	NE
EPA 300.0	Sulfate	ug/l	4,940,000		666,000		167,000		250,000	250000
EPA 410.4	Chemical oxygen demand	ug/l	2,660,000	J	164,000		203,000		NE	NE
SM 2540C	Total Dissolved Solids	ug/l	15,300,000		1,660,000		2,140,000		500,000	NE
SM 4500H	Laboratory pH	s.u.	7.72	J	6.42	J	6.97	J	6.5-8.5	NE
SM 5210B	Biochemical oxygen demand	ug/l	440,000		9,000		4,900		NE	NE
SM 5310B	Total Organic Carbon	ug/l	1,100,000	J	35,900		57,700		NE	NE
SW-846 9020B	Total Organic Halides	ug/l	500		100	U	600		NE	NE

Notes:

Bold values indicate concentrations in excess of NC Groundwater quality standards for the protection of the groundwater.

2L Standard - 15A NCAC 2L Groundwater Standards

I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.3 ug/L.

SWSL - Solid Waste Section Limits

NE = Not Established

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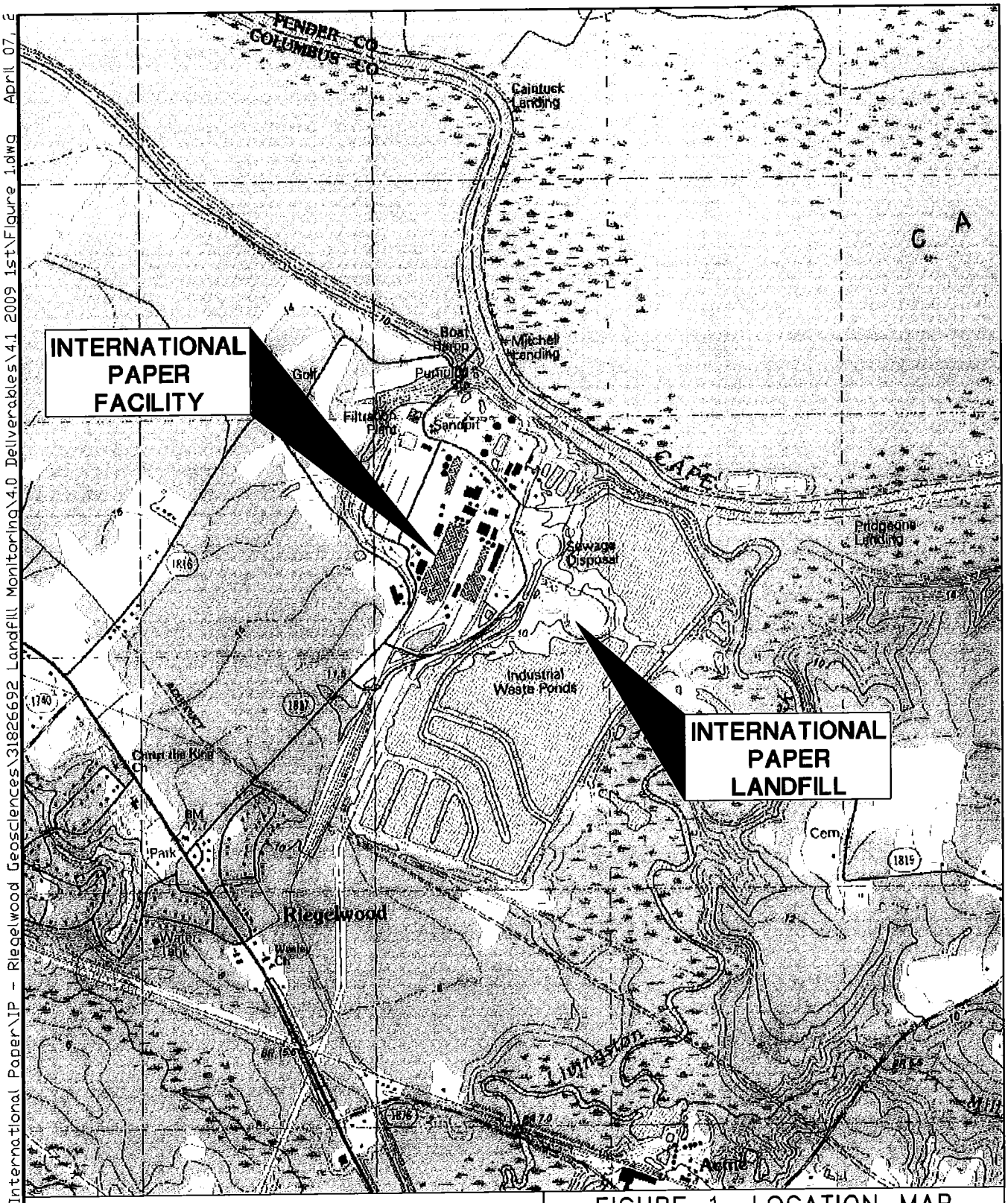
ug/L = Micrograms per Liter

umhos/cm = Micromhos per centimeter

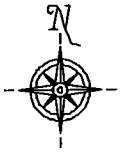
Qualifiers (Q):

U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
UJ	The analyte was not detected and the associated detection limit is estimated

FIGURES



QUADRANGLE LOCATION



SCALE IN FEET

0 2000

SOURCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE
ACME, NC – DATED 1984

FIGURE 1. LOCATION MAP

INTERNATIONAL PAPER
RIEGELWOOD MILL
RIEGELWOOD, NORTH CAROLINA

Prepared for:
INTERNATIONAL PAPER

URS
RDU, NORTH CAROLINA 27560

DRAWN BY:	TSH
DATE:	04/07/09
PROJECT NO.	

Fig. 1

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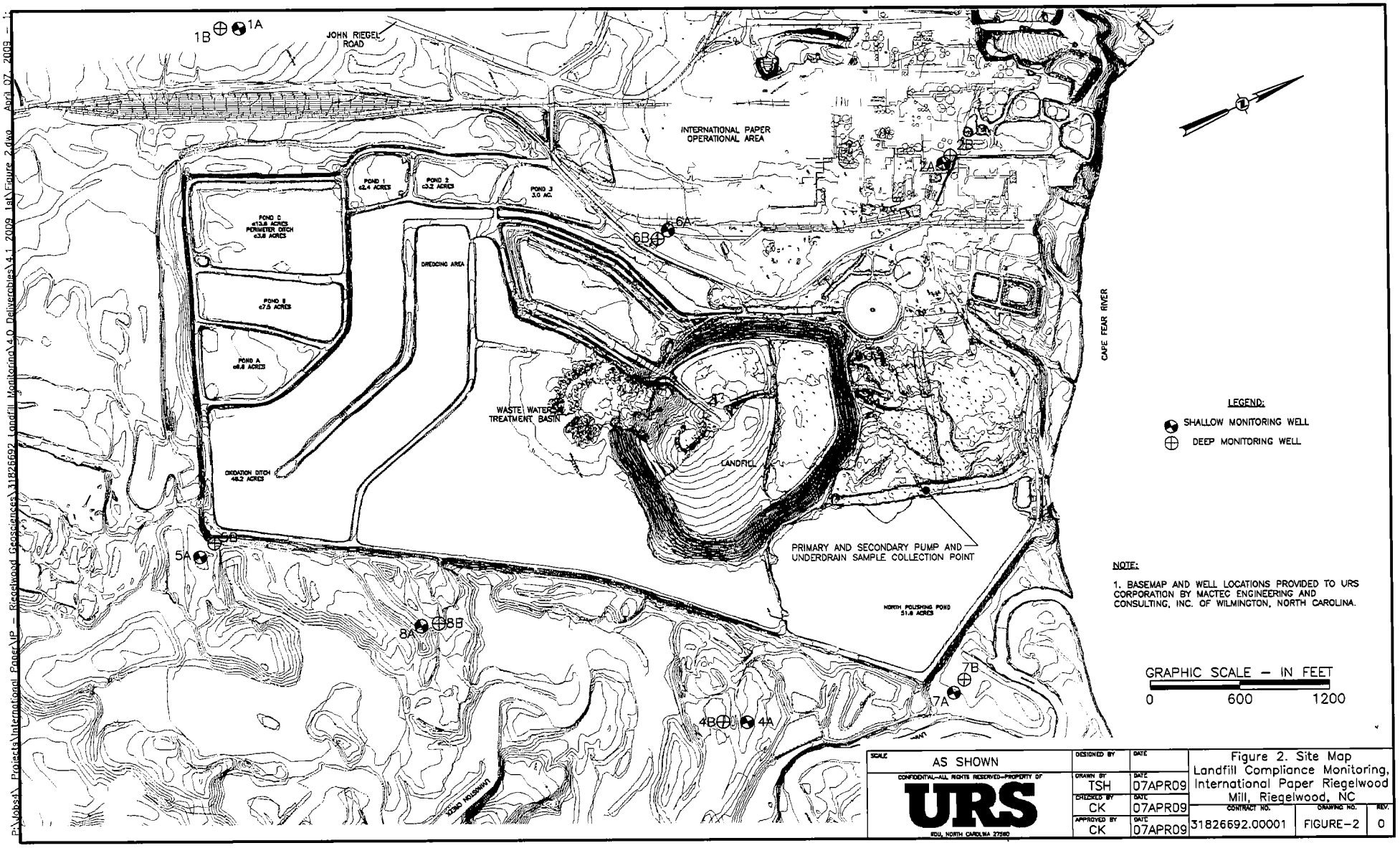

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APPENDIX A

Data Validation Checklist
Organic and Inorganic Analyses

Project: IP – Riegelwood, NC (Landfill Monitoring)
Work Order: J1200974

Project No: 31828323.00001
Methods: EPA 120.1 (Specific Conductance), 300 (Chloride, Fluoride, Nitrate, Orthophosphate, and Sulfate), 410.4 (COD), 6010C (ICP Metals[1]), 7470A (Mercury), and 9020B (TOX); Standard Methods 2540C (Total Dissolved Solids), 4500-H + B (pH), 5210B (BOD), and 5310B (TOC)

Laboratory: Columbia Analytical Services, Inc. (CAS)[2]
Jacksonville, FL
Sample Matrix: Water
Reviewer: Nicole Lancaster
Concurrence[3]: Sarah Choyke

Associated Sample IDs: MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, MW-8B, Primary, Secondary, & Under Drain
Date(s) Sampled: 2/28/12
Date: 3/30/12
Date: 4/3/12

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
1. Were holding times met?	✓			• EPA 6010: ≤180 days	
	✓			• EPA 7470: ≤ 28 days	
	✓			• EPA 120.1: ≤ 28 days	
	✓			• EPA 300: ○ ≤ 48 hours (Nitrate and Orthophosphate) ○ ≤ 28 days (Chloride, Fluoride, and Sulfate)	
	✓			• EPA 410.4: ≤ 28 days	
		✓		• SM 4500-H: ≤15 minutes. Samples were analyzed more than 15 minutes after sample collection. J-flag positive results.	J
	✓			• SM 2540C: ≤7 days	
	✓			• SM 5210B: ≤ 48 hours and after 5-day (±6 hours) incubation period.	
	✓			• SM 5310B: ≤ 28 days	
	✓			• EPA 9020B: ≤ 28 days	
2. Were sample storage and preservation requirements met?	✓			• Temperatures of sample containers upon receipt were 1.8 and 1.6°C (≤6°C).	

[1] As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, V, and Zn
[2] CAS subcontracted the TOX analysis to Summit Environmental Technologies, Inc. of Cuyahoga Falls, OH. The TOX analysis was conducted under Order number 1204782.
[3] Independent Technical Reviewer

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
				The laboratory verified that all samples, except Primary, Under Drain, Secondary, MW-5A, MW-7A, and MW-8A, were properly preserved in the field.	
		✓		• The pH of the COD, TOC, and metals bottles provided for the Primary sample was >2 upon receipt at the laboratory. The laboratory attempted to adjust the pH of the sample to ≤2 with the addition of nitric and sulfuric acid to each container to no avail. The COD sample result, which is preserved to pH ≤2 to prevent biological activity, may be biased low (J). The potential exists for the metals sample results to be biased low (J, UJ), as only 8 mL, instead of 40 mL, was used for preparation. The TOC sample result may be biased high (J), as all inorganic carbon may not have been converted to CO2.	J, UJ
				• The pH of the metals bottles provided for Secondary, Under Drain, MW-5A, MW-7A, and MW-8A was >2 upon receipt at the laboratory. The laboratory adjusted the pH of the sample bottles with the addition of nitric acid prior to analysis to correct the pH; therefore, qualification of data is not required.	
3. Was a method blank analyzed with each batch?	✓			• EPA 6010: MB-01244-02	
	✓			• EPA 7470: MB-01239-02	
	✓			• EPA 120.1: J1200974-MB1	
	✓			• EPA 300: J1200974-MB1 & J1200974-MB2	
	✓			• EPA 410.4: J1200974-MB1	
			✓	• SM 4500-H: Not applicable	
	✓			• SM 2540C: J1200974-MB1	
	✓			• SM 5210B: J1200974-MB1	
	✓			• SM 5310B: J1200974-MB1 & J1200974-MB2	
	✓			• EPA 9020B: Blank	

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
4. Were target analytes reported in the method/calibration blank above the Detection Limit (DL)?	✓			• EPA 6010: ○ MB-01244-02 3/5/12: Zinc @ 2.340 J µg/L (MRL 20.000, MDL 2.000) ○ ICB 3/5/12 @ 14:11: Cadmium @ 0.320 J µg/L (RL 5.000, MDL 0.200) ○ CCB 3/5/12 @ 17:06: Cadmium @ 0.335 J µg/L (RL 5.000, MDL 0.200) ○ CCB 3/5/12 @ 19:16: • Cadmium @ 0.400 J µg/L (RL 5.000, MDL 0.200) • Zinc @ 4.4 J µg/L (RL 20.0, MDL 2.0) ○ CCB 3/5/12 @ 20:48: • Cadmium @ 0.348 J µg/L (RL 5.000, MDL 0.200) • Zinc @ 2.0 J µg/L (RL 20.0, MDL 2.0)	
5. Were target analytes reported in field blank analyses (e.g., trip, ~~ambient, field, or equipment~~) above the DL?			✓		
6. Were contaminants detected in samples below the blank contamination action level?	✓			Blank contamination action levels: • Cadmium @ 2 µg/L (0.400 x 5) • Zinc @ 22 µg/L (4.4 x 5)	B
7. Was a field duplicate sample collected?		✓			
8. Was precision deemed acceptable as defined by the project plans and/or DV Guidelines?			✓		
9. Was a LCS prepared/analyzed with each batch?	✓			• EPA 6010: LCS-01244-01 (LCS Only)	
	✓			• EPA 7470: LCS-01239-01 (LCS Only)	
	✓			• EPA 120.1: J1200974-LCS2 (LCS Only)	
	✓			• EPA 300: J1200974-LCS2 (LCS Only) & J1200974-LCS3 (LCS Only)	
	✓			• EPA 410.4: J1200974-LCS2 (LCS Only)	
			✓	• SM 4500-H: Not applicable	
	✓			• SM 2540C: J1200974-LCS2 (LCS Only)	
	✓			• SM 5210B: J1200974-LCS2 (LCS Only)	
	✓			• SM 5310B: J1200974-LCS1/J1200974-DLCS1 (LCS/LCSD) & J1200974-LCS2 (LCS Only)	
	✓			• EPA 9020B: LCS (LCS Only)	

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
10. Were LCS recoveries within lab/project[4] specifications?	✓				
11. Were LCS/LCSD RPD within lab specifications?	✓				
12. Was a MS/MSD pair analyzed with each batch?	✓			• EPA 6010: J1200974-002 (Secondary), MS/MSD	
	✓			• EPA 7470: J1200974-001 (Primary), MS/MSD	
			✓	• EPA 120.1: Not applicable	
	✓			• EPA 300: J1200974-004 (MW-1A), MS only	
	✓			• EPA 410.4: J1200974-007 (MW-5A), MS only	
			✓	• SM 4500-H: Not applicable	
			✓	• SM 2540C: Not applicable	
			✓	• SM 5210B: Not applicable	
	✓			• SM 5310B: Batch sample[5]	
	✓			• EPA 9020B: 1204876-01 (Batch)	
13. Is the MS/MSD parent sample a project-specific sample?	✓	✓		See above.	
14. Were MS/MSD recoveries within lab specifications? *Only QC results for project samples are evaluated.*	✓				
15. Were laboratory criteria met for precision during the MS/MSD analysis? *Only QC results for project samples are evaluated.*	✓				
16. Was a serial dilution conducted on each inorganic batch?	✓			• EPA 6010: J1200974-002 (Secondary) • EPA 7470: J1200974-001 (Primary)	
17. Is the serial dilution parent sample a project-specific sample?	✓			See above.	
18. Is the percent difference between the serially diluted result and undiluted result less than 10% (for those analytes with native concentrations greater than 50x the DL)? *Only QC results for project samples are evaluated.*	✓			The percent difference between serially diluted and undiluted results was less than 10 when the native sample concentration was greater than fifty times the detection limit.	
19. Was a post-digestion spike analysis conducted whenever the MS or serial dilution results did not meet QC limits?	✓			• EPA 6010: J1200974-002 (Secondary) • EPA 7470: J1200974-001 (Primary)	
20. Were laboratory/project specifications met during the PDS analysis? *Only QC results for project samples are evaluated.*		✓		J1200974-002 (Secondary), 6010C: Iron @40%R (75-125). An evaluation of the matrix interference is not possible, as the native sample concentration is >4x the spiking level.	
21. Was a laboratory duplicate analyzed with each batch?		✓		See below.	
22. Is the laboratory duplicate sample a project-specific sample?			✓	• EPA 6010: Not applicable	

[4] LCS recovery is to be within 60-140% of the true value

[5] Per Craig Myers of CAS, batch sample analyses were conducted, but the results are not included in the laboratory data package.

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
			✓	• EPA 7470: Not applicable	
	✓			• EPA 120.1: J1200974-007 (MW-5A)	
	✓			• EPA 300: J1200974-004 (MW-1A)	
	✓			• EPA 410.4: J1200974-007 (MW-5A)	
	✓			• SM 4500-H: Batch sample[5]	
	✓			• SM 2540C: J1200974-001 (Primary)	
	✓			• SM 5210B: J1200974-002 (Secondary)	
	✓			• SM 5310B: Batch sample[5]	
	✓			• EPA 9020B: Cell Check	
23. Does laboratory duplicate results meet lab specifications? *Only QC results for project samples are evaluated.*	✓				
24. Were initial and continuing calibration standards analyzed at the lab/project-specified frequency for each instrument?	✓			EPA 6010 and 7470 calibration data only	
25. Were these results within lab/project specifications?	✓				
26. Were surrogate recoveries within lab/project specifications?			✓		
27. Were internal standard results within lab specifications?			✓		
28. Were TIC reported and were reported results qualified as estimated concentrations?			✓		
29. Were laboratory-generated Corrective Action Reports (i.e., QCER) issued? If yes, summarize contents or attach copy of the report.		✓			
30. Were lab comments included in report? If yes, summarize contents or attach a copy of the narrative.	✓			Refer to **Attachment A** (Case Narrative)	

Comments: The data review process was modeled after the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review* (EPA, June 2008) and *USEPA CLP NFG for Inorganic Superfund Data Review* (USEPA, January 2010). Sample results have been qualified based on the results of the data review process (refer to **Attachment B**). In performing the data evaluation, the URS' data reviewer assumed that the data reported by the laboratory are complete, compliant, and an accurate representation of the raw data. Criteria for acceptability of data were based upon available site information, analytical method requirements, guidance documents, and professional judgment.

DV Flag Definitions:

J Estimated value
UJ Not detected and the detection limit is estimated
U Not present above the associated level; blank contamination exists
R Unusable data

ATTACHMENT A

CASE NARRATIVE

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	URS Corporation	**Service Request No.:**	J1200974
Project:	IP Riegelwood Landfill Monitoring	**Date Received:**	02/29/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III data deliverables including validation summary forms. When appropriate to the procedure, method blank results have been reported with each analytical test. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Parameters that are included in the NELAC Fields of Testing but are not included in the lab's NELAC accreditation are identified in the discussion of each analytical procedure.

Sample Receipt

Nine water samples were received for analysis at Columbia Analytical Services on 02/29/12. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at ≤6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Metals Analyses:

Method 7470A: The reporting limit is elevated for Mercury in sample Primary. The sample reacted strongly when acid was added. As a result, a lesser amount of sample was utilized for digestion and the reporting limits are adjusted accordingly.

Method 6010C: The control criterion for matrix spike recovery of Iron for sample Secondary is not applicable. The concentration of the analyte in the parent sample is more than 4x the spike concentration. No further corrective action was required.

Method 6010C: The control criterion for the serial dilution analysis of Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Selenium, Silver, and Vanadium for sample Secondary is not applicable. The concentration of the analytes in the parent sample is less than 10x the reporting limit. No further corrective action was required

General Chemistry Analyses:

Method 300.0: Sample Primary required dilution due to high conductivity and color for the analysis of Fluoride, Nitrate, and Orthophosphate. The reporting limits are adjusted to reflect the dilution.

Subcontracted Analytical Parameters:

The samples were delivered to Summit Labs in Cuyahoga Falls, OH on 3/2/12 for EPA Method 9020 determination. The certified analytical report has been included in its entirety in Appendix A: Subcontracted Analytical Results.

Approved by_____ **Date** 3/16/12

ATTACHMENT B

QUALIFIED SAMPLE RESULTS

COLUMBIA ANALYTICAL SERVICES, INC

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-001 Client ID: Primary

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	162	ug/L	J		P	4.0	1.00	3/5/2012	14:59:32
Barium	7440-39-3	148	ug/L	J		P	0.30	1.00	3/5/2012	14:59:32
Cadmium	7440-43-9	0.94	ug/L	J B		P	0.20	1.00	3/5/2012	14:59:32
Chromium	7440-47-3	152	ug/L	J		P	0.50	1.00	3/5/2012	14:59:32
Copper	7440-50-8	50	ug/L	↓		P	2.0	1.00	3/5/2012	14:59:32
Iron	7439-89-6	11200	ug/L			P	3.0	1.00	3/5/2012	14:59:32
Lead	7439-92-1	8.3	ug/L	J		P	4.0	1.00	3/5/2012	14:59:32
Manganese	7439-96-5	264	ug/L	↓		P	3.0	1.00	3/5/2012	14:59:32
Mercury	7439-97-6	0.80	ug/L			CV	0.10	1.00	3/2/2012	17:47:49
Selenium	7782-49-2	7.0	ug/L	U J		P	7.0	1.00	3/5/2012	14:59:32
Silver	7440-22-4	2.6	ug/L	J		P	2.0	1.00	3/5/2012	14:59:32
Vanadium	7440-62-2	2070	ug/L	J		P	2.0	1.00	3/5/2012	14:59:32
Zinc	7440-66-6	94.7	ug/L	J		P	2.0	1.00	3/5/2012	14:59:32

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10)

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-002 Client ID: Secondary

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	37	ug/L			P	4.0	1.00	3/5/2012	15:08:20
Barium	7440-39-3	74	ug/L			P	0.30	1.00	3/5/2012	15:08:20
Cadmium	7440-43-9	1.1	ug/L	J B		P	0.20	1.00	3/5/2012	15:08:20
Chromium	7440-47-3	80	ug/L			P	0.50	1.00	3/5/2012	15:08:20
Copper	7440-50-8	7.7	ug/L	J		P	2.0	1.00	3/5/2012	15:08:20
Iron	7439-89-6	149000	ug/L			P	3.0	1.00	3/5/2012	15:08:20
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	15:08:20
Manganese	7439-96-5	1210	ug/L			P	3.0	1.00	3/5/2012	15:08:20
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:10:24
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	15:08:20
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	15:08:20
Vanadium	7440-62-2	18	ug/L	J		P	2.0	1.00	3/5/2012	15:08:20
Zinc	7440-66-6	398	ug/L			P	2.0	1.00	3/5/2012	15:08:20

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-003 Client ID: Under Drain

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	11	ug/L			P	4.0	1.00	3/5/2012	15:48:06
Barium	7440-39-3	128	ug/L			P	0.30	1.00	3/5/2012	15:48:06
Cadmium	7440-43-9	0.28	ug/L	J B		P	0.20	1.00	3/5/2012	15:48:06
Chromium	7440-47-3	20	ug/L			P	0.50	1.00	3/5/2012	15:48:06
Copper	7440-50-8	2.4	ug/L	J		P	2.0	1.00	3/5/2012	15:48:06
Iron	7439-89-6	9960	ug/L			P	3.0	1.00	3/5/2012	15:48:06
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	15:48:06
Manganese	7439-96-5	781	ug/L			P	3.0	1.00	3/5/2012	15:48:06
Mercury	7439-97-6	0.04	ug/L	J		CV	0.02	1.00	3/2/2012	16:12:08
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	15:48:06
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	15:48:06
Vanadium	7440-62-2	40	ug/L			P	2.0	1.00	3/5/2012	15:48:06
Zinc	7440-66-6	3.8	ug/L	J B		P	2.0	1.00	3/5/2012	15:48:06

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-004 Client ID: MW-1A

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	6.1	ug/L	J		P	4.0	1.00	3/5/2012	15:56:50
Barium	7440-39-3	104	ug/L			P	0.30	1.00	3/5/2012	15:56:50
Cadmium	7440-43-9	0.20	ug/L	U		P	0.20	1.00	3/5/2012	15:56:50
Chromium	7440-47-3	0.71	ug/L	J		P	0.50	1.00	3/5/2012	15:56:50
Copper	7440-50-8	2.0	ug/L	U		P	2.0	1.00	3/5/2012	15:56:50
Iron	7439-89-6	909	ug/L			P	3.0	1.00	3/5/2012	15:56:50
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	15:56:50
Manganese	7439-96-5	14	ug/L			P	3.0	1.00	3/5/2012	15:56:50
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:13:53
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	15:56:50
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	15:56:50
Vanadium	7440-62-2	3.7	ug/L	J		P	2.0	1.00	3/5/2012	15:56:50
Zinc	7440-66-6	5.4	ug/L	J B		P	2.0	1.00	3/5/2012	15:56:50

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-005 Client ID: MW-1B

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	7.2	ug/L	J		P	4.0	1.00	3/5/2012	16:09:41
Barium	7440-39-3	17	ug/L			P	0.30	1.00	3/5/2012	16:09:41
Cadmium	7440-43-9	0.20	ug/L	U		P	0.20	1.00	3/5/2012	16:09:41
Chromium	7440-47-3	0.70	ug/L	J		P	0.50	1.00	3/5/2012	16:09:41
Copper	7440-50-8	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:09:41
Iron	7439-89-6	851	ug/L			P	3.0	1.00	3/5/2012	16:09:41
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	16:09:41
Manganese	7439-96-5	43	ug/L			P	3.0	1.00	3/5/2012	16:09:41
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:15:38
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	16:09:41
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:09:41
Vanadium	7440-62-2	2.1	ug/L	J		P	2.0	1.00	3/5/2012	16:09:41
Zinc	7440-66-6	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:09:41

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-006 Client ID: MW-4A

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	4.5	ug/L	J		P	4.0	1.00	3/5/2012	16:13:45
Barium	7440-39-3	42	ug/L			P	0.30	1.00	3/5/2012	16:13:45
Cadmium	7440-43-9	0.20	ug/L	U		P	0.20	1.00	3/5/2012	16:13:45
Chromium	7440-47-3	0.50	ug/L	U		P	0.50	1.00	3/5/2012	16:13:45
Copper	7440-50-8	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:13:45
Iron	7439-89-6	4050	ug/L			P	3.0	1.00	3/5/2012	16:13:45
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	16:13:45
Manganese	7439-96-5	49	ug/L			P	3.0	1.00	3/5/2012	16:13:45
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:17:23
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	16:13:45
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:13:45
Vanadium	7440-62-2	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:13:45
Zinc	7440-66-6	7.2	ug/L	J B		P	2.0	1.00	3/5/2012	16:13:45

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-007 Client ID: MW-5A

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	9.2	ug/L	J		P	4.0	1.00	3/5/2012	16:18:10
Barium	7440-39-3	141	ug/L			P	0.30	1.00	3/5/2012	16:18:10
Cadmium	7440-43-9	0.37	ug/L	J B		P	0.20	1.00	3/5/2012	16:18:10
Chromium	7440-47-3	4.7	ug/L	J		P	0.50	1.00	3/5/2012	16:18:10
Copper	7440-50-8	4.6	ug/L	J		P	2.0	1.00	3/5/2012	16:18:10
Iron	7439-89-6	308	ug/L			P	3.0	1.00	3/5/2012	16:18:10
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	16:18:10
Manganese	7439-96-5	251	ug/L			P	3.0	1.00	3/5/2012	16:18:10
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:19:08
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	16:18:10
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:18:10
Vanadium	7440-62-2	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:18:10
Zinc	7440-66-6	4.0	ug/L	J B		P	2.0	1.00	3/5/2012	16:18:10

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-008 Client ID: MW-7A

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	23	ug/L			P	4.0	1.00	3/5/2012	16:27:15
Barium	7440-39-3	29	ug/L			P	0.30	1.00	3/5/2012	16:27:15
Cadmium	7440-43-9	0.32	ug/L	J B		P	0.20	1.00	3/5/2012	16:27:15
Chromium	7440-47-3	9.7	ug/L	J		P	0.50	1.00	3/5/2012	16:27:15
Copper	7440-50-8	2.0	ug/L	J		P	2.0	1.00	3/5/2012	16:27:15
Iron	7439-89-6	16200	ug/L			P	3.0	1.00	3/5/2012	16:27:15
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	16:27:15
Manganese	7439-96-5	180	ug/L			P	3.0	1.00	3/5/2012	16:27:15
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:20:54
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	16:27:15
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:27:15
Vanadium	7440-62-2	16	ug/L	J		P	2.0	1.00	3/5/2012	16:27:15
Zinc	7440-66-6	4.5	ug/L	J B		P	2.0	1.00	3/5/2012	16:27:15

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1200974 Method Type:

Sample ID: J1200974-009 Client ID: MW-8A

Matrix: WATER Date Received: 2/29/2012 Level: LOW

% Solids: Sample Wt/Vol: 50.0 Final Vol: 50.0

Prep Batch ID: 152825 Prep Date: 3/2/2012

Analyte	CAS No.	Concentration	Units	C	Qual	M	DL	Dil	Analytical Date	Analytical Time
Arsenic	7440-38-2	11	ug/L			P	4.0	1.00	3/5/2012	16:35:59
Barium	7440-39-3	42	ug/L			P	0.30	1.00	3/5/2012	16:35:59
Cadmium	7440-43-9	0.21	ug/L	J B		P	0.20	1.00	3/5/2012	16:35:59
Chromium	7440-47-3	0.50	ug/L	U		P	0.50	1.00	3/5/2012	16:35:59
Copper	7440-50-8	2.2	ug/L	J		P	2.0	1.00	3/5/2012	16:35:59
Iron	7439-89-6	7150	ug/L			P	3.0	1.00	3/5/2012	16:35:59
Lead	7439-92-1	4.0	ug/L	U		P	4.0	1.00	3/5/2012	16:35:59
Manganese	7439-96-5	673	ug/L			P	3.0	1.00	3/5/2012	16:35:59
Mercury	7439-97-6	0.02	ug/L	U		CV	0.02	1.00	3/2/2012	16:26:38
Selenium	7782-49-2	7.0	ug/L	U		P	7.0	1.00	3/5/2012	16:35:59
Silver	7440-22-4	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:35:59
Vanadium	7440-62-2	2.0	ug/L	U		P	2.0	1.00	3/5/2012	16:35:59
Zinc	7440-66-6	3.6	ug/L	J B		P	2.0	1.00	3/5/2012	16:35:59

Comments:

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 1230
Date Received: 2/29/12

Sample Name: Primary
Lab Code: J1200974-001

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	**440**		mg/L	2.0	2.0	1	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**1100**	J	mg/L	20	2	20	NA	3/5/12 12:17	
Chemical Oxygen Demand, Total	410.4	**2660**	J	mg/L	200	160	10	3/ 5/12	3/6/12 13:57	
Chloride	300.0	**190**		mg/L	10	3	20	NA	3/1/12 05:01	
Conductivity at 25 Degrees Celsius	120.1	**15200**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:18	
Fluoride	300.0	ND	U	mg/L	4.0	0.3	20	NA	3/1/12 05:01	
Nitrate as Nitrogen	300.0	ND	U	mg/L	4.0	0.6	20	NA	3/1/12 05:01	
Orthophosphate as Phosphorus	300.0	**1.1**	J	mg/L	4.0	0.4	20	NA	3/1/12 05:01	
pH	SM 4500-H+ B	7.72	~~X~~ J	pH Units			1	NA	2/29/12 17:14	H
Solids, Total Dissolved	SM 2540 C	**15300**		mg/L	200	200	20	NA	3/1/12 13:00	
Sulfate	300.0	**4940**		mg/L	25	9	50	NA	3/2/12 04:05	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 1245
Date Received: 2/29/12

Sample Name: Secondary
Lab Code: J1200974-002

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	**9.0**		mg/L	2.0	2.0	1	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**35.9**		mg/L	1.0	0.09	1	NA	3/3/12 16:34	
Chemical Oxygen Demand, Total	410.4	**164**		mg/L	20	16	1	3/ 5/12	3/6/12 13:58	
Chloride	300.0	**38.7**		mg/L	0.50	0.11	1	NA	3/1/12 05:16	
Conductivity at 25 Degrees Celsius	120.1	**2250**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:22	
Fluoride	300.0	**0.51**		mg/L	0.20	0.02	1	NA	3/1/12 05:16	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	3/1/12 05:16	
Orthophosphate as Phosphorus	300.0	ND	U	mg/L	0.20	0.02	1	NA	3/1/12 05:16	
pH	SM 4500-H+ B	6.42	~~X~~ J	pH Units			1	NA	2/29/12 17:16	H
Solids, Total Dissolved	SM 2540 C	**1660**		mg/L	40	40	4	NA	3/1/12 13:00	
Sulfate	300.0	**666**		mg/L	2.5	0.9	5	NA	3/2/12 04:20	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 1300
Date Received: 2/29/12

Sample Name: Under Drain
Lab Code: J1200974-003

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	**4.9**		mg/L	2.0	2.0	1	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**57.7**		mg/L	1.0	0.09	1	NA	3/3/12 16:48	
Chemical Oxygen Demand, Total	410.4	**203**		mg/L	20	16	1	3/ 5/12	3/6/12 13:58	
Chloride	300.0	**256**		mg/L	1.0	0.3	2	NA	3/2/12 04:35	
Conductivity at 25 Degrees Celsius	120.1	**3200**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:26	
Fluoride	300.0	**0.20**		mg/L	0.20	0.02	1	NA	3/1/12 05:31	
Nitrate as Nitrogen	300.0	**0.16**	J	mg/L	0.20	0.03	1	NA	3/1/12 05:31	
Orthophosphate as Phosphorus	300.0	**0.04**	J	mg/L	0.20	0.02	1	NA	3/1/12 05:31	
pH	SM 4500-H+ B	6.97	~~X~~ J	pH Units			1	NA	2/29/12 17:18	H
Solids, Total Dissolved	SM 2540 C	**2140**		mg/L	40	40	4	NA	3/1/12 13:00	
Sulfate	300.0	**167**		mg/L	0.50	0.18	1	NA	3/1/12 05:31	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.
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Analytical Report

Client:	URS Corporation	**Service Request:**	J1200974
Project:	IP Riegelwood Landfill Monitoring/31828323.00001	**Date Collected:**	2/28/12 0756
Sample Matrix:	Water	**Date Received:**	2/29/12
Sample Name:	MW-1A		
Lab Code:	J1200974-004	**Basis:**	NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	ND	U	mg/L	4.0	4.0	2	NA	3/1/12 08:30	*
Carbon, Total Organic (TOC)	SM 5310 B	**2.4**		mg/L	1.0	0.09	1	NA	3/3/12 17:01	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	3/ 5/12	3/6/12 13:59	
Chloride	300.0	**11.4**		mg/L	0.50	0.11	1	NA	3/1/12 05:46	
Conductivity at 25 Degrees Celsius	120.1	**159**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:30	
Fluoride	300.0	**0.18**	J	mg/L	0.20	0.02	1	NA	3/1/12 05:46	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	3/1/12 05:46	
pH	SM 4500-H+ B	4.34	~~X~~ J	pH Units			1	NA	2/29/12 17:20	H
Solids, Total Dissolved	SM 2540 C	**90**		mg/L	10	10	1	NA	3/1/12 13:00	
Sulfate	300.0	**43.2**		mg/L	0.50	0.18	1	NA	3/1/12 05:46	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10)

COLUMBIA ANALYTICAL SERVICES, INC.
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Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 0750
Date Received: 2/29/12

Sample Name: MW-1B
Lab Code: J1200974-005

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	ND	U	mg/L	4.0	4.0	2	NA	3/1/12 08:30	*
Carbon, Total Organic (TOC)	SM 5310 B	**1.9**		mg/L	1.0	0.09	1	NA	3/3/12 17:19	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	3/ 5/12	3/6/12 13:59	
Chloride	300.0	**9.32**		mg/L	0.50	0.11	1	NA	3/1/12 06:31	
Conductivity at 25 Degrees Celsius	120.1	**363**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:32	
Fluoride	300.0	**0.19**	J	mg/L	0.20	0.02	1	NA	3/1/12 06:31	
Nitrate as Nitrogen	300.0	**0.18**	J	mg/L	0.20	0.03	1	NA	3/1/12 06:31	
pH	SM 4500-H+ B	7.63	~~X~~ J	pH Units			1	NA	2/29/12 17:23	H
Solids, Total Dissolved	SM 2540 C	**238**		mg/L	10	10	1	NA	3/1/12 13:00	
Sulfate	300.0	**20.2**		mg/L	0.50	0.18	1	NA	3/1/12 06:31	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 0945
Date Received: 2/29/12

Sample Name: MW-4A
Lab Code: J1200974-006

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	ND	U	mg/L	4.0	4.0	2	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**3.9**		mg/L	1.0	0.09	1	NA	3/3/12 17:34	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	3/ 5/12	3/6/12 14:00	
Chloride	300.0	**22.2**		mg/L	0.50	0.11	1	NA	3/1/12 07:16	
Conductivity at 25 Degrees Celsius	120.1	**210**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:52	
Fluoride	300.0	**0.16**	J	mg/L	0.20	0.02	1	NA	3/1/12 07:16	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	3/1/12 07:16	
pH	SM 4500-H+ B	4.74	~~X~~ J	pH Units			1	NA	2/29/12 17:25	H
Solids, Total Dissolved	SM 2540 C	**134**		mg/L	10	10	1	NA	3/1/12 13:00	
Sulfate	300.0	**53.1**		mg/L	0.50	0.18	1	NA	3/1/12 07:16	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10)

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client:	URS Corporation	**Service Request:**	J1200974
Project:	IP Riegelwood Landfill Monitoring/31828323.00001	**Date Collected:**	2/28/12 1110
Sample Matrix:	Water	**Date Received:**	2/29/12
Sample Name:	MW-5A		
Lab Code:	J1200974-007	**Basis:**	NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	**3.8**		mg/L	2.0	2.0	1	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**44.8**		mg/L	1.0	0.09	1	NA	3/3/12 17:50	
Chemical Oxygen Demand, Total	410.4	**131**		mg/L	20	16	1	3/ 5/12	3/6/12 14:01	
Chloride	300.0	**278**		mg/L	2.5	0.6	5	NA	3/2/12 04:50	
Conductivity at 25 Degrees Celsius	120.1	**2190**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 22:54	
Fluoride	300.0	**0.18**	J	mg/L	0.20	0.02	1	NA	3/1/12 07:31	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	3/1/12 07:31	
pH	SM 4500-H+ B	6.94	~~X~~ J	pH Units			1	NA	2/29/12 17:28	H
Solids, Total Dissolved	SM 2540 C	**1320**		mg/L	40	40	4	NA	3/1/12 13:00	
Sulfate	300.0	**12.8**		mg/L	0.50	0.18	1	NA	3/1/12 07:31	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client:	URS Corporation	**Service Request:**	J1200974
Project:	IP Riegelwood Landfill Monitoring/31828323.00001	**Date Collected:**	2/28/12 0856
Sample Matrix:	Water	**Date Received:**	2/29/12
Sample Name:	MW-7A		
Lab Code:	J1200974-008	**Basis:**	NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	**2.9**		mg/L	2.0	2.0	1	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**17.1**		mg/L	1.0	0.09	1	NA	3/3/12 18:04	
Chemical Oxygen Demand, Total	410.4	**48**		mg/L	20	16	1	3/ 5/12	3/6/12 14:03	
Chloride	300.0	**114**		mg/L	0.50	0.11	1	NA	3/1/12 07:46	
Conductivity at 25 Degrees Celsius	120.1	**1070**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 23:00	
Fluoride	300.0	**0.21**		mg/L	0.20	0.02	1	NA	3/1/12 07:46	
Nitrate as Nitrogen	300.0	**0.18**	J	mg/L	0.20	0.03	1	NA	3/1/12 07:46	
pH	SM 4500-H+ B	7.25	~~X~~ J	pH Units			1	NA	2/29/12 17:30	H
Solids, Total Dissolved	SM 2540 C	**680**		mg/L	20	20	2	NA	3/1/12 13:00	
Sulfate	300.0	**58.3**		mg/L	0.50	0.18	1	NA	3/1/12 07:46	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10)

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001
Sample Matrix: Water

Service Request: J1200974
Date Collected: 2/28/12 1030
Date Received: 2/29/12

Sample Name: MW-8A
Lab Code: J1200974-009

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Biochemical Oxygen Demand (BOD)	SM 5210 B	ND	U	mg/L	4.0	4.0	2	NA	3/1/12 08:30	
Carbon, Total Organic (TOC)	SM 5310 B	**3.3**		mg/L	1.0	0.09	1	NA	3/3/12 18:17	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	3/ 5/12	3/6/12 14:03	
Chloride	300.0	**3.36**		mg/L	0.50	0.11	1	NA	3/1/12 08:01	
Conductivity at 25 Degrees Celsius	120.1	**1070**		µMHOS/cm	1.0	1.0	1	NA	3/5/12 23:03	
Fluoride	300.0	**0.23**		mg/L	0.20	0.02	1	NA	3/1/12 08:01	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	3/1/12 08:01	
pH	SM 4500-H+ B	6.84	~~X~~ J	pH Units			1	NA	2/29/12 17:32	H
Solids, Total Dissolved	SM 2540 C	**872**		mg/L	20	20	2	NA	3/1/12 13:00	
Sulfate	300.0	**422**		mg/L	2.5	0.9	5	NA	3/2/12 05:35	

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10).

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

March 08, 2012

Client: Columbia Analytical
Address: 9143 Phillips Hwy, Ste 200
Jacksonville, FL 32256

Received: 3/2/2012
Project #: J1200974

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	LOQ	Run	Analyst
J1200974-001	1204782-01	28-Feb-12	TOX	0.5	mg/L	L	9020	1	0.1	07-Mar-12	CXS
J1200974-002	1204782-02	28-Feb-12	TOX	ND	mg/L	L	9020	1	0.1	07-Mar-12	CXS
J1200974-003	1204782-03	28-Feb-12	TOX	0.6	mg/L	L	9020	1	0.1	07-Mar-12	CXS
J1200974-004	1204782-04	28-Feb-12	TOX	ND	mg/L	L	9020	1	0.1	06-Mar-12	CXS
J1200974-005	1204782-05	28-Feb-12	TOX	ND	mg/L	L	9020	1	0.1	06-Mar-12	CXS
J1200974-006	1204782-06	28-Feb-12	TOX	ND	mg/L	L	9020	1	0.1	06-Mar-12	CXS
J1200974-007	1204782-07	28-Feb-12	TOX	0.7	mg/L	L	9020	1	0.1	07-Mar-12	CXS
J1200974-008	1204782-08	28-Feb-12	TOX	0.4	mg/L	L	9020	1	0.1	07-Mar-12	CXS
J1200974-009	1204782-09	28-Feb-12	TOX	ND	mg/L	L	9020	1	0.1	06-Mar-12	CXS

Sample results have been qualified by URS based on data review results, which is modeled after USEPA NFG for Superfund Organic and Inorganic Methods Data Review (EPA, June 08 and Jan 10)

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Columbia Analytical Services™

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

SR # J1200974

9143 Philips Highway, Ste 200 • Jacksonville, FL 32256 (904) 739-2277 • 800-695-7222 x06 • FAX (904) 739-2011 PAGE 1 OF 1

www.caslab.com

J1200974
URS Corporation
IP Riegelwood Landfill Monitoring

Project Name: IP Riegelwood Landfill	Project Number: 31828323.00001
Project Manager: Conan Fitzgerald	Email Address: martha.meyers-lee@urs.com
Company/Address: URS Corporation, 1600 Perimeter Park Dr. Suite 400, Morrisville, NC 27560	
Phone #: 919-461-1100	FAX#: 919-461-1415
Sampler's Signature: Jerry Maciejewski	Sampler's Printed Name: Jerry Maciejewski

ANALYSIS REQUESTED (Include Method Number and

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	TOC	TOX	metals - refer to PO	COD	TDS, BOD, pH, Cond, Fl, Cl, NO3, SO4	O phos										REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE						3	3	2	3	0	0										
Primary		2-28-12	1230	GW	6	X	X	X	X	X	X										
Secondary		↓	1245	↓	↓	X	X	X	X	X	X										
Underdrain		↓	1300	↓	↓	X	X	X	X	X	X										
MW-1A		↓	0756	↓	↓	X	X	X	X	X											
MW-1B		↓	0750	↓	↓	X	X	X	X	X											
MW-4A		↓	0945	↓	↓	X	X	X	X	X											
MW-5A		↓	1110	↓	↓	X	X	X	X	X											
MW-7A		↓	0856	↓	↓	X	X	X	X	X											
MW-8A		↓	1030	↓	↓	X	X	X	X	X											

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 _____

SPECIAL INSTRUCTIONS/COMMENTS

There are 2 coolers for this COC
refer to martha_meyers_lee@urs.com for analyte list and methods

See QAPP ☐ 1.6 1.8

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
X STANDARD
REQUESTED FAX DATE _____
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
____ V. Speicalized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO# refer to martha_meyers_lee
BILL TO:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: TDL CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Jerry Maciejewski	Signature: Shawn Lafferty	Signature	Signature	Signature	Signature
Printed Name: Jerry Maciejewski	Printed Name: Shawn Lafferty	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS Corporation	Firm: ACS CAS JAX	Firm	Firm	Firm	Firm
Date/Time: 2-28-12/1900	Date/Time: 2-29-12 1100	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Retained by Client

JSCOC-3/11

ACCREDITED IN ACCORDANCE WITH nelac

Columbia Analytical Services™

Now part of the ALS Group

9143 Philips Highway
Suite 200
Jacksonville, FL 32256

Confirmation of Sample Receipt

To:	Martha Meyers-Lee	**From:**	Craig Myers
Email:	Martha_Meyers-Lee@URSCorp.com	**Email:**	CMyers@caslab.com
Fax:	919-461-1415	**Fax:**	904-739-2011
Phone:	919-461-1519	**Phone:**	904-739-2277 x4409

Samples for analysis have been received by Columbia Analytical Services on 2/29/12 and assigned our Service Request number **J1200974**. **Please verify the following information and notify me of any corrections as soon as possible.**

The estimated completion date for this work is: **3/14/12**

Client: URS Corporation
Project: IP Riegelwood Landfill Monitoring/31828323.00001

PO Number: 245639.US

EDD Required: Yes

Tier: III

Report To: Martha Meyers-Lee
URS Corporation
1600 Perimeter Park Drive
Morrisville, NC 27560-

Billing Address: Accounts Payable -Transcepta
URS Corporation
urs.invoices@submit.transcepta.com

Comments:

Thank you for your business!

A - Test is Authorized H - Test is On Hold P - Test is Authorized for Prep Only C - Test has been Cancelled * - Test has assigned QC

				120.1 Cond Spec	300.0 Chloride	300.0 F	300.0 NO3	300.0 O Phos	300.0 SO4	410.4 COD T	6010C Metals R	7470A Hg T	None Misc Out 1	SM 2540 C TDS	SM 4500-H+ B pH
J1200974-001	Primary	Water	2/28/12 1230	A	A	A	A	A	A	A	A	A	A	A	A
J1200974-002	Secondary	Water	2/28/12 1245	A	A	A	A	A	A	A	A	A	A	A	A
J1200974-003	Under Drain	Water	2/28/12 1300	A	A	A	A	A	A	A	A	A	A	A	A
J1200974-004	MW-1A	Water	2/28/12 0756	A	A	A	A		A	A	A	A	A	A	A
J1200974-005	MW-1B	Water	2/28/12 0750	A	A	A	A		A	A	A	A	A	A	A
J1200974-006	MW-4A	Water	2/28/12 0945	A	A	A	A		A	A	A	A	A	A	A
J1200974-007	MW-5A	Water	2/28/12 1110	A	A	A	A		A	A	A	A	A	A	A
J1200974-008	MW-7A	Water	2/28/12 0856	A	A	A	A		A	A	A	A	A	A	A
J1200974-009	MW-8A	Water	2/28/12 1030	A	A	A	A		A	A	A	A	A	A	A

Test Comments:

Group	Test/Method	Samples	Comments
SubLab	None/Misc Out 1	1-9	Total Organic Halogens (TOX) by EPA Method 9020 sent to Summit Labs
Metals	6010C/Metals R	4-6	As,Ba,Cd,Cr,Cu,Fe,Pb,Mn,Se,Ag,V,Zn
Metals	6010C/Metals R	2, 7-9	As,Ba,Cd,Cr,Cu,Fe,Pb,Mn,Se,Ag,V,Zn Added 1mL of HNO3 @ 1550 on 2/29/12
Metals	6010C/Metals R	3	As,Ba,Cd,Cr,Cu,Fe,Pb,Mn,Se,Ag,V,Zn Added 2mL of HNO3 @ 1550 on 2/29/12
Metals	6010C/Metals R	1	As,Ba,Cd,Cr,Cu,Fe,Pb,Mn,Se,Ag,V,Zn Added 3mL of HNO3 @ 1550 on 2/29/12 was unable to preserve.

				SM 5210 B BOD 5 Day	SM 5310 B TOC T
J1200974-001	Primary	Water	2/28/12 1230	A	A
J1200974-002	Secondary	Water	2/28/12 1245	A	A
J1200974-003	Under Drain	Water	2/28/12 1300	A	A
J1200974-004	MW-1A	Water	2/28/12 0756	A	A
J1200974-005	MW-1B	Water	2/28/12 0750	A	A
J1200974-006	MW-4A	Water	2/28/12 0945	A	A
J1200974-007	MW-5A	Water	2/28/12 1110	A	A
J1200974-008	MW-7A	Water	2/28/12 0856	A	A
J1200974-009	MW-8A	Water	2/28/12 1030	A	A

APPENDIX B

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. MW-1A

WELL NO. MW-1A

DATE/TIME COLLECTED 2-28-12 @ 0756

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD Perstaltic pump with 1/8" tubing

SAMPLE MEDIA: (Groundwater) Surface Water Waste Water

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4,
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date: 2-28-12

Time Started: 0732

Time Completed: 0810

Well Depth (ft. BTOC): 29.50

Depth to Water (ft BTOC): 16.64

Actual Purge (liters): 8 t

Purge rate (liters/min): .33 t/min

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
0738	2t	16.62	16.91	.206	2.36	4.32	404.3	2.78
0741	3t	16.64	17.03	.181	2.03	4.29	416.7	2.66
0744	4t	16.64	17.10	.170	1.74	4.28	417.0	2.55
0747	5t	16.64	17.15	.166	1.47	4.27	410.2	2.64
0750	6t	16.64	17.18	.164	1.28	4.27	405.6	2.42
0753	7t	16.65	17.18	.163	1.22	4.28	402.1	2.76
0756	8t	16.65	17.16	.163	1.19	4.28	401.8	2.39

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. MW-1B

WELL NO. MW-1B

DATE/TIME COLLECTED 2-28-12 @ 0750

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD Perstaltic pump with 1/8" tubing

SAMPLE MEDIA: (Groundwater) Surface Water Waste Water

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4,
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date: 2-28-12

Time Started: 0731

Time Completed: 0805

Well Depth (ft. BTOC): 50.00

Depth to Water (ft BTOC): 16.11

Actual Purge (liters): 6 L

Purge rate (liters/min): .33 L/min

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
0737	2 L	18.14	17.01	.309	7.44	7.37	-14.6	3.79
0740	3 L	19.22	17.29	.309	7.19	7.22	-14.1	3.88
0743	4 L	20.49	17.45	.309	7.06	7.12	-12.0	3.95
0746	5 L	21.61	17.46	.308	7.07	7.10	-11.9	3.76
0749	6 L	22.83	17.46	.308	7.02	7.10	-11.3	3.72

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. MW-4A

WELL NO. MW-4A

DATE/TIME COLLECTED 2-28-12 @ 0945

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD Perstaltic pump with 1/8" tubing

SAMPLE MEDIA: (Groundwater) Surface Water Waste Water

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4,
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date: 2-28-12

Time Started: 0920

Time Completed: 0955

Well Depth (ft. BTOC): 11.90

Depth to Water (ft BTOC): 6.18

Actual Purge (liters): 8 t

Purge rate (liters/min): .33 t/min

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
0926	2t	6.43	14.95	.176	5.84	4.39	203.9	284
0929	3t	6.45	15.15	.177	4.28	4.25	189.6	1.69
0932	4t	6.48	15.35	.178	2.90	4.23	148.1	4.86
0935	5t	6.50	15.38	.178	2.19	4.25	125.0	1.53
0938	6t	6.51	15.38	.177	2.01	4.26	112.2	1.27
0941	7t	6.51	15.38	.177	1.94	4.27	108.8	<1
0944	8t	6.52	15.38	.177	1.89	4.27	104.6	<1

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. MW-5A

WELL NO. MW-5A

DATE/TIME COLLECTED 2-28-12 @ 1110

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD Perstaltic pump with 1/8" tubing

SAMPLE MEDIA: (Groundwater) Surface Water Waste Water

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4,
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date: 2-28-12

Time Started: 1049

Time Completed: 1117

Well Depth (ft. BTOC): 20.00

Depth to Water (ft BTOC): 9.31

Actual Purge (liters): 7 L

Purge rate (liters/min): .33 L/min

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
1055	2 L	9.32	15.69	1.992	2.01	6.72	-46.9	6.73
1058	3 L	9.32	15.76	2.022	2.34	6.74	-63.9	5.88
1101	4 L	9.33	15.79	2.035	2.86	6.75	-80.6	4.98
1104	5 L	9.33	15.77	2.039	2.96	6.75	-83.7	5.62
1107	6 L	9.34	15.77	2.040	3.03	6.75	-86.6	5.35
1110	7 L	9.34	15.76	2.041	3.07	6.75	-87.6	4.97

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

Sample had a slight brown hat (coffee color)

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. MW-7A

WELL NO. MW-7A

DATE/TIME COLLECTED 2-28-12 @ 0856

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD Perstaltic pump with 1/8" tubing

SAMPLE MEDIA: (Groundwater) Surface Water Waste Water

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4,
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date 2-28-12

Time Started 0835

Time Completed 0912

Well Depth (ft. BTOC) 13.00

Depth to Water (ft BTOC) 3.04

Actual Purge (liters) 7 t

Purge rate (liters/min) .33 t

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
0841	2 t	5.29	13.68	.785	1.67	7.07	-29.7	70.1
0844	3 t	6.14	13.67	.785	1.63	7.04	-33.9	72.9
0847	4 t	6.35	13.65	.786	1.72	7.04	-34.9	88.7
0850	5 t	6.60	13.70	.789	1.59	7.02	-41.8	90.3
0853	6 t	6.85	13.76	.798	1.47	7.01	-44.7	96.4
0856	7 t	7.13	13.83	.800	1.43	7.01	-47.2	94.0

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. Primary

WELL NO. Primary

DATE/TIME COLLECTED 2-28-12 @ 1230

SAMPLE METHOD through pumping system (Pump #1)

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE MEDIA: Groundwater Surface Water Waste Water Leachate

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4, Ophos
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date 2-28-12

Time Started 1220

Time Completed 1235

Well Depth (ft. BTOC) —

Depth to Water (ft BTOC) —

Actual Purge (liters) —

Purge rate (liters/min) —

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
-	—	—	—	—	—	—	—	—
1230	—	—	19.85	14.13	2.22	7.83	-282.1	199

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

- 2 voas had some bran develop as they were filled
- used pump #1 from control panel & most Northern discharge sample port

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. Secondary

WELL NO. Secondary

DATE/TIME COLLECTED 2-28-12 @ 1245

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE METHOD through pumping system

SAMPLE MEDIA: **Groundwater** **Surface Water** **Waste Water** Leachate

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4, Ophos
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date 2-28-12

Time Started 1235

Time Completed 1255

Well Depth (ft. BTOC) —

Depth to Water (ft BTOC) —

Actual Purge (liters) —

Purge rate (liters/min) —

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
1245	—	—	23.43	2.201	1.52	6.77	-136.1	78.9

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

Used pump #3 in control panel and Southern most discharge pipe - the pipe is a smaller diameter ~1½-2" compared to primary - turn back to auto

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: IP Riegelwood Landfill

PROJECT NO. 31828323.00001

SAMPLE NO. Under Drain

WELL NO. Underdrain

DATE/TIME COLLECTED 2-28-12 @ 1300

SAMPLE METHOD bailer to collect sample

PERSONNEL Jerry Maciejewski, Duncan Briley

SAMPLE MEDIA: **Groundwater** **Surface Water** **Waste Water**

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 40ml Amber	H2SO4	TOC
1 - 1L Poly	None	TDS, BOD, pH, Cond, Cl, F, NO3, SO4, Ophos
1 - 1L Amber	H2SO4/Orange	TOX
1 - 250ml Poly	HNO3/Red	Metals 200.7
1 - 125ml Poly	H2SO4	COD

WELL PURGING DATA

Date 2-28-12

Time Started 1258

Time Completed 1315

Well Depth (ft. BTOC) —

Depth to Water (ft BTOC) 29.41

Actual Purge (liters) —

Purge rate (liters/min) —

FIELD MEASUREMENTS

Time	Amount Purged (Liters)	Depth to Water (ft)	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Redox (mV)	Turbidity (NTUs)
1300	—	29.41	22.49	2.997	4.96	7.08	-51.1	49.1

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	NA
Water Quality Meter	YSI 556-MPS	pH 4 &7, Cond., Zobell's Solutions
Turbidity Meter	Lamotte 20/20	1 NTU & 10 NTU Solutions

GENERAL COMMENTS

-used bailer to collect water from sump which is just outside gate to main landfill/center area by Oxygen tank

TABLE 2
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-1A																															2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012			
	SEPT	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	AUG	FEB			
BOD, mg/L	<2	<2	<2	<2	5	12	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 5	< 2	<5	<2.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NS	2 U	2 U	2 U	2 U	2 U	4 U	NE	NE
COD, mg/L	<5	6.34	6.27	<5	46	<5.0	<5.0	<5.0	<5.0	25	<5.0	7	<20.0	< 20	< 20	<20	21	<20	<20	<20	<20	<20	<20	25 U	25 U	25 U	25 U	4 J	51	16 U	NE	NE
TOX, mg/L	0.0179	0.0119	0.02	<0.005	0.015	<0.010	0.022	0.0271	0.0173	0.0299	0.0156	0.022	<.010	0.013	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	0.0092	0.026	0.03	0.04	3.8	0.1 U	0.0214 B	0.12	0.1 U	NE	NE
TOC, as C, mg/L	4.99	2.01	2.46	1.72	7	3.3	2.1	3.64	3.40	2.90	<0.5	4.3	2.3	2.6	1.3	1.8	3.8	2.3	2.8	1.9	3.7	43	2.7	8.5	7	0.05 U	22.3	1.8	1.7	2.4	NE	NE
TDS, mg/L	90	110	110	113	96.4	31	103	123	116	112	133	111	110	100	99	94	210	62	90	86	200	260	74	82	20 U	64	82	83	90	90	500	NE
pH, s.u.	**4.75**	**4.37**	**4.22**	**4.19**	**4.34**	**3.97**	**4.23**	**4.03**	**3.82**	**3.90**	**4.02**	**3.72**	**4.20**	6.6	**4.1**	**4.4**	6.8	**3.9**	**5.2**	**4.4**	6.7	7.9	**4.6**	**4.4** J	**4.5** J	4 J	**4.5** J	**4.1** J	**4.85** J	**4.34** J	6.5-8.5	NE
Conductivity, umohs/cm	159	189	194	188	178	187.5	176	190	193	188	198	194	190	200	170	170	320	170	150	170	320	410	160	187	170	177	159	153	150	159	NE	NE
Sulfate, mg/L	29.2	52.2	53.9	61.7	63.5	39	36	61	58	35	59	49	62	55	50	54	38	40	33	42	21	51	42	38.2	35.1	46.1	42	46	47.4	43.2	250	250
Chloride, as Cl, mg/L	20.8	12.9	19.7	13.3	14.5	20.5	22.5	9.2	8.2	11.0	8.4	8.8	6.2	9.6	8.3	10.0	11.0	13	12	15	4.8	5.8	14	15.6	8.8	8.2	10	9.25	8.84	11.4	250	NE
Fluoride, as F, mg/L	<0.1	<0.1	<0.1	<0.1	0.14	0.49	0.17	<0.2	0.17	0.16	0.12	0.2	0.2	< 0.100	0.11	<0.100	<0.100	<0.10	0.32	<0.10	0.15	0.069	<0.10	0.1 U	0.1 U	0.1 U	0.1 U	0.13 J	0.2 J	0.18 J	2	2
Nitrate, as NO3-N, mg/L	<0.1	<0.5	<0.5	<0.1	0.09	0.17	0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	< 0.100	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	0.097	<0.10	0.1 U	0.1 U	0.1 U	0.1 U	0.19 J	0.04 U	0.03 U	10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	<0.025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.026**	**0.031**	<0.020	<0.020	<0.020	<0.020	**0.018**	0.00028	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.003 U	0.0043 B	0.0061 J	0.010	0.010
Barium, as Ba, mg/L	0.082	0.129	0.114	0.152	0.141	0.121	<0.1	0.148	0.156	0.148	0.148	0.139	0.16	0.150	0.140	0.120	0.020	0.11	0.12	0.12	<0.0050	0.028	0.12	0.0839	0.122	0.106	0.104	0.099	0.109	0.104	0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0050	<0.005	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0005	<0.0005	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.0001 B	0.0002 U	0.002	0.001
Chromium, as Cr, mg/L	0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.010	< 0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.00063 B	0.0004 U	0.00046 B	0.00053 J	0.001 U	0.001 U	0.00071 J	0.010	0.010
Copper, as Cu, mg/L	0.009	<0.005	<0.005	<0.005	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.0050	<0.0010	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.0004 U	0.002 U	1	0.010
Iron, as Fe, mg/L	**0.834**	**1.5**	**1.96**	**2.52**	**2.28**	**1.97**	**2.63**	**2.73**	**3.31**	**2.35**	**2.34**	**2.56**	**2.6**	**2.80**	**1.90**	**1.60**	**12.00**	**0.34**	**1.2**	**1.7**	<0.10	**14**	**1.4**	**0.821**	**2.28**	**0.969**	**1.65**	**0.78**	**1.64**	**0.909**	0.300	0.300
Lead, as Pb, mg/L	<0.020	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	< 0.005	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.0007 U	0.004 U	0.015	0.010
Manganese, as Mn, mg/L	<0.010	0.017	0.0225	0.0212	0.0244	0.0169	0.017	**0.0757**	0.0249	0.0208	0.0195	0.0201	0.03	0.020	0.017	0.018	**0.330**	0.016	0.02	0.014	0.026	**0.32**	0.013	0.0095	0.0173	0.0146	0.0139	0.012	0.015	0.014	0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00007 U	0.00007 U	0.00007 U	0.00007 U	0.00008 U	0.00002 U	0.00002 U	0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	< 0.010	0.01	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0050	0.00081	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.005 U	0.004 U	0.007 U	0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	< 0.0050	< 0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.032**	<0.010	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.001 U	0.0006 U	0.002 U	0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.010	< 0.010	< 0.010	<0.010	<0.010	<0.010	<0.010	**0.012**	<0.010	**0.0044**	**0.013**	**0.0057**	**0.0136**	**0.0041** J	**0.0051**	0.002 U	**0.0043** J	**0.0037** J	0.0003 (I)	0.025
Zinc, as Zn, mg/L	0.01	0.01	<0.100	0.0218	<0.02	<0.02	<0.02	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.044	0.032	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.050	0.025	0.0038 B	0.0093 B	0.0065 B	0.0017 J	0.004 J	0.0039 J	0.0054 BJ	1	0.010

NOTES:
< Symbol = Below Laboratory Detectable Limits
2L Std - Title 15, North Carolina Administrative Code, Subchapter 2L, class GA groundwater standard.
I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.0003 mg/L
SWSL - Solid Waste Section Limits - target laboratory method detection limits
Bold text denotes results that exceed NC groundwater standards
Data is reported in milligrams per liter (mg/L) unless otherwise noted
NA = Not Analyzed
NE = Not Established
Refer to laboratory reports for actual sample dates

BOD = Biological oxygen demand
COD = Chemical oxygen demand
s.u. = Standard units
TDS = Total Dissolved Solids
TOC = Total organic carbon
TOX = Total organic halides
umohs/cm = micromhos per centimeter

Qualifiers (Q):

U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

TABLE 2 Continued
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-1B																															2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012			
	SEPT	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	AUG	FEB			
BOD, mg/L	<2	<2	<2	<2	>27*	2	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 5	< 2	<5	<2.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NS	2 U	2 U	2 U	2 U	2 U	4 U	NE	NE
COD, mg/L	9.47	8.46	6.55	5.18	6.00	9	5	<5.0	<5.0	<5.0	27	6	<20	< 20	94	<20	<20	<20	<20	<20	<20	<20	<20	25 U	25 U	25 U	25 U	4 J	2 J	16 U	NE	NE
TOX, mg/L	0.007	0.0	0.01	<0.005	<0.01	<0.020	<0.01	0.0463	0.0171	0.0443	0.0195	0.03	<0.010	NR	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	0.015	0.033	0.02	0.04	5	0.1 U	0.0186 B	0.0982	0.1 U	NE	NE
TOC, as C, mg/L	8.19	1.54	<0.100	1.02	8.40	5.3	1.7	3.18	16.80	<0.5	<0.5	5.50	1.90	2.3	1.3	1.0	2.1	1.6	2.4	1.5	4	2.4	4	15.6	4.6	0.4	10.8	1.8	1.7	1.9	NE	NE
TDS, mg/L	293	367	352	391	387	290	411	360	394	339	364	293	320	280	320	310	100	160	190	180	110	76	280	312	36	228	282	269	317	238	500	NE
pH, s.u.	7.38	7.42	7.19	7.35	7.27	7.37	7.26	7.47	7.64	7.35	7.42	7.41	7.30	**6.4**	6.9	7.4	**5.0**	6.5	6.8	6.8	**4.4**	**4.8**	7.2	7.5 J	**6.4** J	7.4 J	7.2 J	6.85 J	7.75 J	7.63 J	6.5-8.5	NE
Conductivity, umohs/cm	449	499	554	564	543	583	599	501	610	513	596	442	540	480	540	500	160	310	280	290	160	160	480	585	265	431	506	424	522	363	NE	NE
Sulfate Turbidimetric, mg/L	30	48.2	55.2	56.7	49.0	50.0	44.5	49	51	38	60.0	35	42	39	40	34	38	20	15	20	48	48	37	31.6	9.9	22.2	26.1	27.5	24.4	20.2	250	250
Chloride, as Cl, mg/L	9.01	7.40	12.60	10.00	12.90	13.5	14.0	7.9	6.1	8.1	6.4	12.0	8.0	6.4	5.6	6.4	11.0	6.5	4.2	4.8	11	14	5	12.3	10.3	8.9	8.4	6.19	5.28	9.32	250	NE
Fluoride, as F, mg/L	0.138	0.155	0.145	0.162	0.150	0.44	0.15	<0.2	0.15	0.13	0.12	0.19	0.15	0.18	0.18	0.14	<0.100	<0.10	0.11	0.12	0.15	0.13	0.14	0.1 U	0.17	0.11	0.1 U	0.13 J	0.25	0.19 J	2	2
Nitrate, as NO3-N, mg/L	0.11	<0.5	<0.5	<0.1	0.08	0.33	0.13	<0.2	<0.2	0.38	0.2	0.45	<0.1	< 0.100	0.22	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	0.1 U	0.1 U	0.1 U	0.1 U	0.19 J	0.2	0.18 J	10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	<0.025	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	<0.010	<0.020	<0.020	<0.020	<0.020	<0.020	**0.31**	<0.0050	0.0018	0.0044 U	0.0027 U	0.0097	0.0075	0.003 U	0.0076 B	0.0072 J	0.010	0.010
Barium, as Ba, mg/L	0.054	0.041	0.044	0.038	<0.1	<0.1	<0.1	<0.100	<0.100	<0.100	<0.100	<0.0100	0.022	0.016	0.049	0.024	0.095	0.013	0.018	0.016	0.2	0.12	0.022	0.0186	0.0149	0.016	0.0261	0.022	0.032	0.017	0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0050	<0.005	<0.0100	<0.005	< 0.005	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.00007 U	0.0002 U	0.002	0.001
Chromium, as Cr, mg/L	**0.012**	<0.010	<0.010	<0.010	<0.01	<0.01	<0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	**0.028**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0035	<0.010	0.0032 B	0.0004 U	0.0004 U	0.0004 U	0.001 U	0.001 U	0.0007 J	0.010	0.010
Copper, as Cu, mg/L	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0101	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0050	<0.0010	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.0004 U	0.002 U	1	0.010
Iron, as Fe, mg/L	**1.30**	**0.665**	**1.79**	**0.37**	<0.1	**1.28**	<0.1	0.212	**0.508**	**1.37**	<0.0102	**0.38**	**0.38**	0.29	**11.00**	**3.70**	**5.40**	**3.00**	**3.1**	**3.5**	**11**	**1.9**	**1.4**	**0.639**	**0.676**	**4.64**	**2.53**	**0.94**	**1.76**	**0.851**	0.300	0.300
Lead, as Pb, mg/L	**0.023**	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0103	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.0007 U	0.004 U	0.015	0.010
Manganese, as Mn, mg/L	**0.077**	0.046	**0.072**	0.028	0.026	0.0486	<0.01	<0.0100	0.0161	0.0429	<0.0104	0.0136	<0.01	0.010	**0.130**	**0.300**	0.015	0.047	**0.16**	0.05	**1.2**	0.015	0.041	0.0252	0.0095	**0.0984**	**0.0794**	0.045	**0.081**	0.043	0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0105	<0.0003	<0.0002	< 0.0002	< 0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00007 U	0.00007 U	0.00007 U	0.00007 U	0.00008 U	0.00002 U	0.00002 U	0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	<0.0100	0.0142	<0.0100	<0.0106	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0050	0.00039	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.005 U	0.004 U	0.007 U	0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.01	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0107	<0.0100	<0.005	< 0.005	< 0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0061	<0.010	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.001 U	0.0006 U	0.002 U	0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0108	<0.0500	<0.010	< 0.010	< 0.010	<0.010	**0.015**	<0.010	<0.010	<0.010	<0.010	**0.015**	<0.010	0.0013 B	**0.00065** J	**0.0019** J	**0.0016** J	0.002 U	0.002 U	**0.0021** J	0.0003 (I)	0.025
Zinc, as Zn, mg/L	0.021	0.012	<0.100	0.0149	<0.02	<0.02	<0.02	<0.0200	<0.0200	<0.0200	<0.0109	<0.0200	<0.030	< 0.030	0.054	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.050	<0.010	0.0059 B	0.0083 B	0.003 B	0.0004 U	0.004 J	0.0072 J	0.002 U	1	0.010

NOTES:
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TABLE 2 Continued
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-4A																															2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012			
	SEPT	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	AUG	FEB			
BOD, mg/L	<2	<2	<2	<2	4	4	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 5	<2	<5	<2.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2 UJ	2 UJ	2 U	2 UJ	2 U	2 U	4 U		NE	NE
COD, mg/L	16.7	9.52	11.3	14.5	10	16	9.8	12	6	22	41	<5.0	<20	< 20	27	24	< 20	<20	<20	<20	<20	18	13	25 U	29.5	25 U	25 U	17 J	9 J	16 U		NE	NE
TOX, mg/L	0.047	0.039	0.041	0.013	<0.01	0.037	0.019	0.0329	0.0297	0.0255	0.0215	0.027	<0.010	0.018	<0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	0.019	0.048	0.02	0.06	8.8	0.1	0.586	0.018 U	0.1 U		NE	NE
TOC, as C, mg/L	6.33	4.65	2.06	3.24	7.2	5.3	5	4.99	4.7	3.1	2.7	3.4	4.4	6.7	6.2	6.3	3.4	6.7	5.7	5.6	7.3	4.7	7.8	14.2	5.6	0.5	13.2	7.6	4.8	3.9		NE	NE
TDS, mg/L	104	155	131	170	117	35	108	153	112	104	186	77	120	190	160	200	200	180	210	110	88	160	95	108	160	174	183	270	152	134		500	NE
pH, s.u.	**5.00**	**5.72**	**5.31**	**5.08**	**5.60**	**5.17**	**4.72**	**5.05**	**4.64**	**4.65**	**4.61**	**4.66**	**5.40**	**5.9**	**4.7**	**4.8**	**4.8**	**5.0**	**4.7**	**5.2**	**3.9**	**4.2**	**4.5**	**4.6 J**	**4.7 J**	**5.1 J**	**4.9 J**	**4.41 J**	**4.49 J**	**4.74 J**		6.5-8.5	NE
Conductivity, umohs/cm	158	224	202	269	222	198.4	157	216.7	179	152	125	122	200	270	280	310	240	320	310	190	230	250	160	240	205	339	311	436	245	210		NE	NE
Sulfate Turbidimetric, mg/L	30.6	36.4	40	72.4	48.8	39	34	60	41	35	28	29	46	60	51	75	52	82	77	54	75	76	43	43.7	37.7	84.1	64.2 J	113	58	53.1		250	250
Chloride, as Cl, mg/L	20.2	28.9	29	29	26.5	25.5	29.5	19	17	16	13	9.8	19	24	34	34	24	31	28	10	16	22	14	24.1	26.6	28.9	33.2	50.5	26.4	22.2		250	NE
Fluoride, as F, mg/L	<0.1	<0.1	<0.1	<0.1	0.29	0.42	0.2	<0.2	0.15	0.11	<0.10	0.18	<0.10	< 0.100	< 0.100	0.110	0.120	0.180	0.12	<0.10	<0.10	<0.10	0.081	0.1 U	0.1 U	0.14	0.1 U	0.14 J	0.17 J	0.16 J		2	2
Nitrate, as NO3-N, mg/L	<0.1	<0.1	<0.1	<0.1	0.06	0.22	0.26	<0.2	<0.2	0.38	<0.2	<0.2	<0.1	< 0.100	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	0.018	0.1 U	0.1 U	0.1 U	0.1 U	0.04 U	0.04 U	0.03 U		10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	<0.025	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0010	<0.0010	0.0027 U	0.0027 U	0.0027 U	0.0028 J	0.003 U	0.0035 B	0.0045 J		0.010	0.010
Barium, as Ba, mg/L	0.093	0.04	0.0344	0.0683	<0.1	<0.1	<0.1	<0.100	<0.100	<0.100	<0.100	<0.0100	0.043	0.075	0.066	0.081	0.074	0.071	0.087	0.039	<0.0050	0.051	0.047	0.0668	0.0612	0.0579	0.0728	0.11	0.059	0.042		0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0050	<0.005	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	0.00022	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.0012 J	0.0002 U		0.002	0.001
Chromium, as Cr, mg/L	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	**0.02**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0018 B	0.00046 J	0.00098 B	0.0004 U	0.001 B	0.001 U	0.0005 U		0.010	0.010
Copper, as Cu, mg/L	0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	0.062	<0.0010	<0.0010	0.00075 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.0017 B	0.002 U		1	0.010
Iron, as Fe, mg/L	**13.3**	**1.67**	**5.32**	**2.09**	**2.59**	**5.61**	**1.2**	**3.51**	**0.345**	0.239	<0.100	**0.519**	**6.1**	**10**	**9.2**	**9.3**	**3.8**	**11.0**	**9**	**8.6**	<0.10	**6.6**	**0.7**	**1.9**	**4.22**	**5.32**	**8.81**	**7.5**	**5.91**	**4.05**		0.300	0.300
Lead, as Pb, mg/L	<0.020	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.0007 U	0.004 U		0.015	0.010
Manganese, as Mn, mg/L	**0.076**	**0.096**	**0.053**	**0.058**	**0.055**	0.0472	0.0397	0.0480	0.0394	0.0423	0.0301	0.0276	**0.054**	**0.078**	**0.120**	**0.110**	0.048	**0.061**	**0.064**	0.04	0.025	**0.062**	0.024	**0.0507**	0.0391	**0.0501**	**0.0577**	**0.088**	0.052	0.049		0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	< 0.0002	< 0.00020	< 0.00020	< 0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00007 U	0.00007 U	0.00007 U	0.00014 J	0.00008 U	0.00002 U	0.00002 U		0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.00066	0.00069	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.005 U	0.004 U	0.007 U		0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.01	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0002 U	0.0001 U	0.0001 U	0.0001 U	0.001 U	0.0006 U	0.002 U		0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.010	< 0.010	< 0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.00045 B	**0.0029** J	**0.0011** J	**0.002** J	0.002 U	0.002 U	0.002 U		0.0003 (I)	0.025
Zinc, as Zn, mg/L	0.035	0.038	<0.100	0.019	<0.02	0.0473	<0.02	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.030	< 0.030	< 0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.0035	0.0064	0.0178 B	0.0385	0.0239	0.0112	0.034	0.017 J	0.0072 BJ		1	0.010

NOTES:

< Symbol = Below Laboratory Detectable Limits
2L Std - Title 15, North Carolina Administrative Code, Subchapter 2L, class GA groundwater standard.
I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.0003 mg/L
SWSL - Solid Waste Section Limits - target laboratory method detection limits
Bold text denotes results that exceed NC ground-water standards
Data is reported in milligrams per liter (mg/L) unless otherwise noted
NA = Not Analyzed
NE = Not Established
Refer to laboratory reports for actual sample dates

BOD = Biological oxygen demand
COD = Chemical oxygen demand
s.u. = Standard units
TDS = Total Dissolved Solids
TOC = Total organic carbon
TOX = Total organic halides
umohs/cm = micromhos per centimeter

Qualifiers (Q):

U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
UJ	The analyte was not detected and the associated detection limit is estimated

TABLE 2 Continued
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-5A																														2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		
	SEPT.	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	AUG	FEB		
BOD, mg/L	11.5	4.23	8.96	10.9	9	12	4	4	<2.0	3	**10**	16	4	< 5	<5	<5	3	<5.0	<5.0	6.3	<5.0	<5.0	9.6	3.7 J	5.8 J	10.9	6.3	5.3	2.5	3.8	NE	NE
COD, mg/L	203	193	99.9	181	107	212	125	222	171	93	166	66	160	110	190	52	93	95	120	120	92	74	66	74.5	86.1	138	114	124	94	131	NE	NE
TOX, mg/L	3.58	2.5	1.4	3.37	0.099	2.46	1.22	2.68	1.4	0.502	0.574	0.25	1.6	0.870	<4.0	0.170	< 1.00	<5.0	<5.0	<0.10	<2.0	0.35	0.46	0.2	0.37	41.1	0.8	3.36	0.982	0.7	NE	NE
TOC, as C, mg/L	105	62.2	23	46.3	23.5	81.5	22.3	90.3	75.6	7.5	<0.5	30.1	49	40	56	16	13	27	33	<1.0	37	31	35	34.3	30.4	0.8	46.6	45.4	30.8	44.8	NE	NE
TDS, mg/L	**2390**	**1700**	**954**	**1820**	**1116**	**1599**	**1216**	**2220**	**1847**	**1540**	**879**	**704**	**1400**	160	**1,600**	**640**	**970**	**850**	**960**	**1100**	**980**	**1100**	**1000**	**1050**	**1180**	**840**	**1150**	**894**	**934**	**1320**	500	NE
pH, s.u.	6.81	6.87	6.51	6.72	6.67	6.71	6.61	6.71	6.96	7.53	7.24	7.54	6.9	**6.4**	6.5	7.3	6.9	6.8	6.7	6.7	6.8	7.6	7	7.2 J	7.5 J	6.7 J	6.8 J	6.71 J	7.3 J	6.94 J	6.5-8.5	NE
Conductivity, umohs/cm	3260	2880	1590	3170	1703	3146	1792	2581	2564	1557	1808	1126	2300	1,900	2,900	1,100	1,800	1,500	1700	1900	1700	1800	1700	1940	1800	1700	1600	1580	1660	2190	NE	NE
Sulfate Turbidimetric, mg/L	25.6	65.2	55.9	26.7	42	62.0	78.0	49	29	21	43.0	32	57	110	<5.0	9.5	<5.00	<5.0	5	<5.0	<5.0	4.1	3.6	5 U	R	5 U	**568**	5.19	1.15	12.8	250	250
Chloride, as Cl, mg/L	**600**	**265**	249	479	**119**	**396**	211	**440**	**300**	130	150	95	**280**	170	**410**	64	180	170	170	220	170	130	130	115	160	177	234	175	141	**278**	250	NE
Fluoride, as F, mg/L	0.104	<0.1	<0.1	<0.1	0.17	0.34	0.21	<0.2	0.27	<0.10	0.1	0.46	0.13	< 0.100	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	0.12	0.13	0.1 U	0.1 U	0.1 J	0.19 J	0.18 J	2	2
Nitrate, as NO3-N, mg/L	0.835	0.948	0.344	5.09	0.57	0.13	0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.100	< 0.100	< 0.100	<0.100	0.26	<0.10	<0.10	<0.10	<0.10	<0.10	0.24	0.1 U	0.1 U	0.1 U	0.1 U	0.04 U	0.2 J	0.03 U	10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	<0.025	<0.01	<0.01	<0.01	<0.0100	<0.0100	**0.0113**	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.00059	0.00066	0.0066	0.0033 J	0.0027 U	0.0031 J	0.003 U	0.0067 B	0.0092 J	0.010	0.010
Barium, as Ba, mg/L	0.181	0.193	0.0583	0.032	<0.1	0.139	<0.1	0.112	0.159	<0.100	0.111	<0.0100	0.18	0.140	0.190	0.052	0.032	0.088	0.12	0.13	0.011	0.11	0.12	0.093	0.0968	0.0975	0.13	0.11	0.102	0.141	0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0050	<0.005	<0.0100	<.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.00007 U	0.00037 BJ	0.002	0.001
Chromium, as Cr, mg/L	**0.014**	**0.012**	<0.010	<0.010	<0.01	<0.01	<0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	**0.015**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0103	0.0016 J	0.0036 J	0.0033 J	0.004 B	0.0018 J	0.0047 J	0.010	0.010
Copper, as Cu, mg/L	0.005	<0.005	<0.005	<0.010	<0.02	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.0010	0.0009	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.00049 B	0.0046 J	1	0.010
Iron, as Fe, mg/L	**3.01**	**6.05**	**2.6**	**1.93**	**1.36**	**3.79**	**0.805**	**5.15**	**17.9**	**1.71**	**4.21**	0.248	**1.8**	**21**	**4.7**	**0.6**	0.1	**1.5**	**2**	**1.5**	**0.31**	**0.46**	**2.4**	**0.44**	0.247	**0.762**	**0.608**	**0.53**	0.261	**0.308**	0.300	0.300
Lead, as Pb, mg/L	**0.036**	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.002 B	0.0007 U	0.004 U	0.015	0.010
Manganese, as Mn, mg/L	**0.650**	**0.745**	**0.183**	**0.386**	**0.273**	**0.279**	**0.166**	**0.995**	**0.572**	**0.252**	**0.259**	**0.235**	**0.730**	**0.540**	**0.730**	**0.190**	0.016	**0.270**	**0.37**	**0.45**	<0.010	**0.34**	**0.18**	**0.232**	**0.26**	**0.278**	**0.332**	**0.33**	**0.227**	**0.251**	0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	<0.0002	<0.0002	<0.00020	<0.00020	0.00007 U	0.00007 U	0.00007 U	0.00007 U	0.00008 U	0.00002 U	0.00002 U	0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	0.0117	0.0159	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0018	0.0014	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.005 U	0.004 U	0.007 U	0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.01	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.010	<0.010	<0.010	**0.046**	<0.010	<0.010	<0.010	<0.010	0.00035 J	0.00016 J	0.0001 U	0.0001 U	0.001 U	0.001 B	0.002 U	0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.010	**0.014**	**0.012**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0041**	**0.0077**	**0.0042 J**	**0.0052**	**0.0096**	**0.0077**	**0.005 J**	**0.0024 J**	0.002 U	0.0003 (I)	0.025
Zinc, as Zn, mg/L	<0.010	0.029	<0.100	<0.01	<0.02	<0.02	<0.02	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.030	< 0.030	0.063	<0.030	<0.030	<0.030	<0.030	<0.030	1.0	0.0042	0.0084	0.0023 B	0.0083 B	0.004 B	0.0004 U	0.007 J	0.008 J	0.004 BJ	1	0.010

NOTES:
< Symbol = Below Laboratory Detectable Limits
2L Std - Title 15, North Carolina Administrative Code, Subchapter 2L, class GA groundwater standard.
I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.0003 mg/L
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Bold text denotes results that exceed NC ground-water standards
Data is reported in milligrams per liter (mg/L) unless otherwise noted
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Refer to laboratory reports for actual sample dates

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COD = Chemical oxygen demand
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TDS = Total Dissolved Solids
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umohs/cm = micromhos per centimeter

Qualifiers (Q):

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TABLE 2 Continued
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-7A																															2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012			
	SEPT	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR.	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	AUG	FEB			
BOD, mg/L	4.02	6.02	<2	<2	3	2	<1.0	2	<2.0	<2.0	<2.0	3	<2.0	< 5	<5	<5	<2.00	<5.0	<5.0	<5.0	<5.0	<5.0	11	2 UJ	2.9 J	2 U	15 J	5.1	5.5	2.9	NE	NE
COD, mg/L	115	179	156	154	108	118	114	154	96	132	157	61	110	110	120	130	130	120	120	140	120	63	25	57.3	117	117	126	69	91	48	NE	NE
TOX, mg/L	2.560	2.28	1.97	2.21	0.540	1.02	1.4	1.79	0.976	0.914	0.964	0.91	1.5	1.30	12.00	1.60	< 5.0	<5.0	<5.0	0.51	<20	1.1	0.82	0.6	0.04	45.4	1.1	0.449	0.442	0.4	NE	NE
TOC, as C, mg/L	47.2	35	28.6	25.8	43.1	31.3	50.2	55.8	41.4	22.4	<0.5	29.7	32	42	34	37	50	35	35	35	43	28	24	24.6	34.3	1	55.4	26.7	27.2	17.1	NE	NE
TDS, mg/L	**1370**	**1390**	**1190**	**1230**	**1200**	**832**	**1596**	**1740**	**1501**	**2110**	**1354**	**1168**	**1100**	**1400**	**1200**	**1400**	**1100**	**1000**	**1200**	**1200**	**1000**	**1100**	**740**	**1010**	**1020**	**1250**	**1190**	**770**	**1030**	**680**	500	NE
pH, s.u.	6.79	6.83	6.59	6.7	6.74	6.94	6.79	6.86	7.07	6.86	6.84	6.66	6.9	6.7	6.9	6.8	6.9	6.9	7.2	7.0	6.9	7.4	6.5	7 J	6.8 J	6.9 J	6.9 J	6.86 J	7.25 J	7.25 J	6.5-8.5	NE
Conductivity, umohs/cm	2190	2520	2290	2160	2250	1456	1445	2096	1628	1546	1928	1784	1800	2,200	2,100	2,200	1,600	1,800	2000	2000	1700	1900	1200	1950	1790	2410	1980	1300	1750	1070	NE	NE
Sulfate Turbidimetric, mg/L	0.395	2.26	0.824	7.22	<5.0	<5.0	<5.0	31	38	23	36	28	61	81	71	78	61	45	59	41	41	53	120	69	48.7 J	76.2	56	57.3	80.1	58.3	250	250
Chloride, as Cl, mg/L	**515**	**527**	**550**	**437**	**477**	**274**	**281**	**360**	230	**260**	**330**	**320**	250	**290**	250	**260**	180	170	200	200	200	**270**	160	232 J	193	223	227	144	186	114	250	NE
Fluoride, as F, mg/L	0.134	0.101	0.108	0.103	0.58	0.49	0.26	0.28	0.32	0.27	0.1	0.25	<0.100	0.140	0.120	<0.100	<0.100	0.110	0.13	<0.10	0.12	0.05	0.18	0.2	0.23	0.13	0.1 U	0.17 J	0.2	0.21	2	2
Nitrate, as NO3-N, mg/L	<0.1	<0.1	<0.1	<0.1	0.03	0.16	0.39	<0.2	<0.2	<0.2	<0.2	<0.2	<0.100	< 0.100	< 0.100	<0.100	0.17	<0.10	<0.10	<0.10	<0.10	<0.10	0.27	0.1 U	0.1 U	0.1 U	0.1 U	0.19 J	0.2	0.18 J	10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	**0.0338**	<0.01	**0.0191**	**0.0105**	**0.017**	<0.0100	**0.0109**	**0.0136**	<0.0100	**0.016**	**0.013**	<0.010	<0.020	**0.035**	<0.020	**0.024**	**0.026**	<0.020	**0.016**	0.003	**0.0135**	**0.0394**	**0.0165**	**0.0146**	**0.029**	**0.02**	**0.023**	0.010	0.010
Barium, as Ba, mg/L	0.073	0.075	0.0704	0.0876	<0.1	<0.1	<0.1	<0.100	<0.100	<0.100	<0.100	<0.0100	0.052	0.062	0.042	0.059	0.065	0.037	0.054	0.056	0.07	0.062	0.071	0.0438	0.0782	0.0497	0.0433	0.06	0.052	0.029	0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0050	<0.005	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.0011 J	0.00032 BJ	0.002	0.001
Chromium, as Cr, mg/L	<0.010	<0.010	**0.0106**	**0.0288**	<0.01	<0.01	<0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	**0.032**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0028 B	0.0018 J	0.003 J	0.0033 J	0.005 B	0.0038 J	0.0097 J	0.010	0.010
Copper, as Cu, mg/L	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	0.18	<0.0010	0.0014	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.0011 B	0.002 J	1	0.010
Iron, as Fe, mg/L	**39.8**	**40.9**	**37**	**57.4**	**23.2**	**21.4**	**11.4**	**24.4**	**16.1**	**15.6**	**17.3**	**33.7**	**23**	**30**	**15**	**22.0**	**31.0**	**14.0**	**21**	**30**	**12**	**28**	**4.4**	**16.9**	**36**	**24.9**	**16**	**40**	**19.7**	**16.2**	0.300	0.300
Lead, as Pb, mg/L	0.027	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	0.0051	0.0072	0.0057	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.003 B	0.0007 U	0.004 U	0.015	0.010
Manganese, as Mn, mg/L	**0.795**	**0.794**	**0.691**	**0.759**	**0.522**	**0.352**	**0.267**	**0.404**	**0.402**	**0.396**	**0.463**	**0.447**	**0.490**	**0.610**	**0.360**	**0.520**	**0.230**	**0.340**	**0.34**	**0.51**	**0.079**	**0.68**	**0.094**	**0.511**	**0.409**	**0.505**	**0.398**	**0.31**	**0.374**	**0.18**	0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	0.00007 U	0.00007 U	0.00007 U	0.00007 U	0.00008 U	0.00002 U	0.00002 U	0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0045	0.00081	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.005 U	0.004 U	0.007 U	0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.02	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.0064	< 0.0050	< 0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	**0.022**	<0.010	<0.010	0.00029 U	0.00011 J	0.0001 U	0.0001 U	0.001 U	0.0006 U	0.002 U	0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	**0.011**	**0.022**	**0.01**	**0.014**	**0.017**	**0.014**	**0.014**	**0.028**	<0.010	**0.0091**	**0.0041**	**0.0058**	**0.0225**	**0.0111**	**0.0126**	**0.013** J	**0.0075** J	**0.016** J	0.0003 (I)	0.025
Zinc, as Zn, mg/L	<0.010	0.017	<0.100	0.0348	<0.02	<0.02	<0.02	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.072	< 0.030	< 0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.67	<0.010	0.0093	0.0021 B	0.0085 B	0.0054 B	0.0004 U	0.011 J	0.023	0.0045 BJ	1	0.010

NOTES:
< Symbol = Below Laboratory Detectable Limits
2L Std - Title 15, North Carolina Administrative Code, Subchapter 2L, class GA groundwater standard.
I - Ground Water Protection Standard (used when no 2L Standards are established). *The GWP Standard for vanadium is 0.0003 mg/L
SWSL - Solid Waste Section Limits - target laboratory method detection limits
Bold text denotes results that exceed NC ground-water standards
Data is reported in milligrams per liter (mg/L) unless otherwise noted
NA = Not Analyzed
NE = Not Established
Refer to laboratory reports for actual sample dates

BOD = Biological oxygen demand
COD = Chemical oxygen demand
s.u. = Standard units
TDS = Total Dissolved Solids
TOC = Total organic carbon
TOX = Total organic halides
umohs/cm = micromhos per centimeter

Qualifiers (Q):

U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
UJ	The analyte was not detected and the associated detection limit is estimated

TABLE 2 Continued
HISTORICAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA

PARAMETER	MONITORING WELL MW-8A																															2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011	2012		
	SEPT.	APRIL	SEPT	MAR	NOV	MAR	SEPT	MAR.	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	SEPT	MAR	AUG	MAR	AUG	FEB	FEB				
BOD, mg/L	3.48	<2	<2	<2	4	4	<1.0	<2.0	<2.0	6	<2.0	<2.0	<2.0	< 5	<5	<5	<2.00	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2 UJ	2 UJ	2 U	2 UJ	2 U	4 U	NE	NE
COD, mg/L	110	19.3	12.6	9.96	46	8	<5.0	6	<5.0	7	59	8	<20	< 20	30	<20	<20	<20	<20	<20	<20	<20	5.9	25 U	25 U	25 U	25 U	13 J	16 U	NE	NE
TOX, mg/L	0.012	0.028	0.014	0.028	<0.01	<0.010	0.018	0.0217	0.0198	0.0397	0.041	0.014	<0.01	< 0.010	<100	<0.100	<0.100	<5.0	<0.10	0.56	<0.10	0.03	0.018	0.07	0.05	7.7	0.1 U	0.271	0.1 U	NE	NE
TOC, as C, mg/L	5.04	4.65	3.42	2.11	8.4	3.4	3.9	4	3.3	<0.5	<0.5	4.4	5.9	4	5.2	3.4	6.5	3.0	4	2.9	9	3.9	6.2	35.1	11.2	0.4	17	3.4	3.3	NE	NE
TDS, mg/L	448	407	464	346	337	256	448	295	480	418	**862**	399	**500**	**1,100**	**580**	400	480	330	350	300	370	**730**	**510**	**718**	**1020**	**580**	**998**	495	**872**	500	NE
pH, s.u.	7.32	7.24	7.02	7.03	6.86	7.13	6.89	7.39	7.49	7.44	7.04	7.47	7.1	6.5	6.5	6.9	7.0	6.8	6.8	7.0	7	7.6	6.6	6.5 J	6.7 J	6.9 J	6.7 J	6.87 J	6.84 J	6.5-8.5	NE
Conductivity, umohs/cm	662	634	701	547	526	619	667	505	670	602	965	442	790	710	830	670	780	600	600	600	640	990	770	1110	1300	836	1250	739	1070	NE	NE
Sulfate Turbidimetric, mg/L	134	26.5	111	80.3	33	43	74	32	100	30	**290**	28	91	70	130	68	38	21	9.8	13	20	**370**	89	**318**	**452**	233	**259**	156	**422**	250	250
Chloride, as Cl, mg/L	9.6	3.82	12.2	6.76	11	13.5	8.5	2.0	3.9	3.9	4.0	2.1	4.4	3	3.0	3.0	4.4	3.8	1.7	2.8	5.1	3.2	2	6.5	7	5 U	6.7	3.68	3.36	250	NE
Fluoride, as F, mg/L	0.118	0.183	0.168	0.187	0.23	0.45	0.26	<0.2	0.35	0.17	<0.10	0.3	<0.100	0.220	0.320	0.240	0.360	0.220	0.16	0.2	0.21	0.12	0.19	0.21	0.3	0.1 U	0.1 U	0.19 J	0.23	2	2
Nitrate, as NO3-N, mg/L	<0.1	<0.1	<0.1	<0.1	0.07	0.19	0.37	<0.2	<0.2	0.38	0.22	<0.2	<0.100	< 0.100	< 0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.1 U	0.1 U	0.1 U	0.1 U	0.04 U	0.03 U	10	10
Arsenic, as As, mg/L	<0.025	<0.025	<0.025	<0.025	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	**0.011**	<0.0100	<0.010	< 0.010	< 0.010	<0.020	0.021	<0.020	<0.020	<0.020	**0.022**	<0.0010	0.00034	0.0082	0.0074	0.0046 J	0.0073	0.003 U	**0.011**	0.010	0.010
Barium, as Ba, mg/L	0.09	0.054	0.0601	0.0691	<0.1	<0.1	<0.1	<0.100	<0.100	<0.100	0.164	<0.0100	0.081	0.080	0.110	0.072	0.100	0.079	0.13	0.1	0.089	0.074	0.085	0.0526	0.0757	0.0494	0.0578	0.072	0.042	0.700	0.100
Cadmium, as Cd, mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0050	<0.005	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.001 U	0.00021 BJ	0.002	0.001
Chromium, as Cr, mg/L	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.02	<0.0100	<0.0100	<0.0100	**0.0259**	<0.0100	<0.010	< 0.010	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	**0.015**	<0.010	<0.010	0.0019 B	0.002 J	0.00063 B	0.00041 J	0.001 B	0.0005 U	0.010	0.010
Copper, as Cu, mg/L	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	0.32	0.0021	0.001	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.002 U	0.0022 J	1	0.010
Iron, as Fe, mg/L	**0.832**	**4.24**	**0.68**	**0.85**	**0.25**	0.258	0.198	0.230	0.289	**0.310**	**4.33**	0.190	**0.390**	**0.68**	**5.50**	**2.30**	**8.40**	**0.47**	**1**	**0.82**	**5.7**	**0.33**	0.21	**5.61**	**27.6**	**1.68**	**16.4**	**0.95**	**7.15**	0.300	0.300
Lead, as Pb, mg/L	**0.02**	<0.020	<0.020	<0.020	<0.01	<0.01	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.004 U	0.004 U	0.004 U	0.004 U	0.002 B	0.004 U	0.015	0.010
Manganese, as Mn, mg/L	**0.123**	**0.171**	**0.172**	**0.016**	0.035	0.0109	**0.066**	0.0134	0.0231	0.0158	**2.29**	**0.275**	**0.500**	**0.280**	**2.000**	**0.068**	**0.800**	**0.180**	**0.1**	0.04	**0.077**	0.015	0.011	**0.143**	**2.05**	**0.0547**	**1.03**	0.024	**0.673**	0.050	0.050
Mercury, as Hg, mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00007 U	0.00007 U	0.00007 U	0.00007 U	0.00008 U	0.00002 U	0.001	0.0002
Selenium, as Se, mg/L	<0.100	<0.100	<0.100	<0.100	<0.01	<0.01	<0.01	<0.0100	0.0114	<0.0100	<0.0100	<0.0100	<0.010	< 0.010	< 0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0010	0.00051	0.0038 U	0.0072 J	0.0038 U	0.0038 U	0.005 U	0.007 U	0.020	0.010
Silver, as Ag, mg/L	<0.015	<0.015	<0.015	<0.015	<0.01	<0.02	<0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.005	< 0.0050	< 0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0033	<0.010	0.001 J	0.001 J	0.0001 U	0.00024 J	0.001 U	0.002 U	0.020	0.010
Vanadium, mg/L	NA	NA	NA	NA	NA	<0.05	<0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.010	< 0.010	< 0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.00074 B	**0.0036** J	**0.00084** J	0.0002 U	0.002 U	0.002 U	0.0003 (I)	0.025
Zinc, as Zn, mg/L	<0.010	0.015	<0.100	<0.01	<0.02	<0.02	<0.02	<0.0200	<0.0200	<0.0200	0.0244	<0.0200	<0.030	< 0.030	< 0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.4	0.017	0.01	0.007 B	0.0362	0.0085 B	0.0066 J	0.009 J	0.0036 BJ	1	0.010

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