October 23, 2014

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

Re: Semi-Annual Groundwater
Compliance Monitoring Results (August 2014)
Permit No. 24-02
International Paper, Riegelwood, North Carolina
URS Project No. 31829654

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 2014 second 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 August 19, 2014. The sampling event included the collection of four water samples associated with the leachate collection system, designated Primary Cell 1, Secondary Cell 1, Primary Cell 2 and Under-Drain. The Secondary liner section for Cell 2 was dry, and so no sample could be collected. Concurrently, groundwater samples from monitoring wells MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, and MW-8A were collected. All samples were submitted to ALS (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 –Landfill Cell 1 Analysis Results
- Figure 1 – Site Map
- Figure 2 – Liner System Schematic
- Appendix A – Data Validation Checklist with Qualified Results
- Appendix B – Field Activity Documentation

URS Corporation
1600 Perimeter Park, Suite 400
Morrisville, NC 27560
Tel: 919.461.1100
Fax: 919.461.1415

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, 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	August 19, 2014

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 — Senior Project Manager — (919) 461-1100

Facility Representative Name (Print) — Title — (Area Code) Telephone Number

Signature — 10/22/14 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)

Revised 6/2009

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 was detected at concentrations above NC2L groundwater standards in one or more of these wells, indicating that this metal is naturally present in groundwater at elevated concentrations. The pH measured in MW-1A was measured to be 4.45 standard units, consistent with previous historic results, indicating that shallow groundwater is naturally acidic.

Vanadium was detected in four monitoring wells and a blank sample, with only one monitoring well exceeding the NC2L standard. This detection was in MW-7A. Historically, vanadium has been detected most frequently in the background wells and MW-7A, indicating that it is naturally occurring. Historically vanadium appears sporadically in primary samples.

Iron was detected in all six monitoring wells above the groundwater standard. The results were within the historic range of results for this naturally occurring mineral. Manganese was detected in four of the six wells at concentrations exceeding the NC2L standard during, although all the general trend of manganese detections indicated a decrease from previous analyses.

Besides the results discussed above, well MW-4A was found to be 5.68, which is below the groundwater standard range of 6.5 – 8.5 standard units. 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 Total Dissolved Solids (TDS) above 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 was found to have an exceedance of the 2L standard for Arsenic and TDS. Arsenic is demonstrated to be naturally occurring by historic results in the background wells where it has been detected as high as 31 µg/L in MW-1A and 300 µg/L in MW-1B. The TDS result is established above to be naturally occurring.

Well MW-8A: TDS, established above as naturally occurring, was detected above the NC 2L standard, but within historic ranges for this well. Sulfate was detected above the 2L groundwater standard. Sulfate has historically been detected at similar levels in this well. Cadmium, which was detected in this well during the last monitoring event for the first time, was not detected in this well. The February 2014 Cadmium result appears anomalous, since cadmium was not detected in any other monitoring wells, nor has it been detected above quantitation limits in the leachate samples (Table 3) for several monitoring events.

TABLES

TABLE 1
SEMI-ANNUAL GROUNDWATER ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA
AUGUST 2014 EVENT

		Monitoring Well:	MW-1A		MW-1B		MW-4A		MW-5A		MW-7A		MW-8A			
		Collection Date:	8/19/2014		8/19/2014		8/19/2014		8/19/2014		8/19/2014		8/19/2014		*2L*	
Method	Parameter	Units	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	*Standard*	*SWSL*
SW-846 6010C	Arsenic	ug/l	3.6	U	3.6	U	3.6	U	3.6	U	23		3.6	U	10	10
SW-846 6010C	Barium	ug/l	106		15		53		165		38		44		700	100
SW-846 6010C	Cadmium	ug/l	0.17	U	0.17	U	0.17	U	0.19	JB	0.23	JB	0.45	JB	2	1
SW-846 6010C	Chromium	ug/l	0.41	U	0.41	U	0.68	J	3.5	J	2.8	J	0.41	U	10	10
SW-846 6010C	Copper	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	1,000	10
SW-846 6010C	Iron	ug/l	1360		751		15600		443		21900		15900		300	300
SW-846 6010C	Lead	ug/l	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	15	10
SW-846 6010C	Manganese	ug/l	13		33		55		303		209		1080		50	50
SW-846 6010C	Selenium	ug/l	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	20	10
SW-846 6010C	Silver	ug/l	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.4	J	20	10
SW-846 6010C	Vanadium	ug/l	7.3	JB	3.2	JB	4.5	JB	1.6	U	14	J	1.6	U	0.3 (I)	25
SW-846 6010C	Zinc	ug/l	6.6	JB	1.4	U	4.5	JB	1.4	U	3.4	JB	6.4	JB	1,000	10
SW-846 7470A	Mercury	ug/l	0.012	U	0.012	U	0.052	J	0.012	U	0.039	J	0.02	J	1	0.2
EPA 120.1	Specific Conductance	umhos/cm	155		238		285		2050		1240		1040		NE	NE
EPA 300.0	Chloride	mg/l	6.1		7		35.8		165		128		4.1		250	NE
EPA 300.0	Fluoride	mg/l	0.14	J	0.11	J	0.1	J	0.11	J	0.15	J	0.29		2	2,000
EPA 300.0	Nitrate	mg/l	0.03	U	0.03	UJ	0.03	U	0.03	U	0.03	UJ	0.03	U	10	10,000
EPA 300.0	Sulfate	mg/l	50.4		14.5		57.6		141		50.3		448		250	250,000
EPA 410.4	Chemical oxygen demand	mg/l	16	U	23		36		139		61		16	U	NE	NE
SM 2540C	Total Dissolved Solids	mg/l	97		171		193		1270		818		896		500	NE
SM 4500H	pH	s.u.	4.45	J	6.98	J	5.68	J	7.17	J	7.48	J	6.9	J	6.5-8.5	NE
SM 5210B	Biochemical oxygen demand	mg/l	47	UJ	47	UJ	47	UJ	47	UJ	47	UJ	47	UJ	NE	NE
SM 5310B	Total Organic Carbon	mg/l	2.1		1.5		8.3		42.1		22.6		3.7		NE	NE
SW-846 9020B	Total Organic Halides	mg/l	0.1	U	0.1	U	0.1	U	0.84		0.45		0.1	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

mg/L = Milligrams per Liter

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

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		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4 UJ	39.4 J	4 U	2 U	47 UJ	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	16 U	16 U	16 U	34	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	0.1 UJ	0.08 U	0.43	0.08 U	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	1.8	27.5	2.1	2	2.1	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	96	85	94	93	97	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	4.4 J	4.37 J	4.49 J	4.39 J	4.45 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	151	146	148	152	155	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	49.5	51 J	47.1	45.6	50.4	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	8.19	6.73	7.73	7.53	6.1	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	0.18 J	0.17 J	0.19 J	0.2	0.14 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	0.03 U	0.03 U	0.03 U	0.03 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	0.0042 J	0.004 J	0.004 J	0.0036 U	0.0036 U	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	0.105	0.111	0.1	0.106	0.106	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	0.0002 U	0.00017 U	0.00017 U	0.00017 U	0.00017 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	0.0005 U	0.00041 U	0.00079 BJ	0.0052 BJ	0.00041 U	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	0.002 U	0.002 U	0.002 U	0.002 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	1.34	0.865	2.83	0.803	1.36	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	0.014	0.015	0.013	0.014	0.013	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	0.000012 BJ	0.000012 U	0.000012 U	0.000012 U	0.000012 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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0012 U	0.0012 U	0.0012 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	0.002 U	0.002 J	0.024	0.0066 J	0.0073 JB	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	0.0044 BJ	0.0067 BJ	0.018 BJ	0.015 BJ	0.0066 JB	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
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-1B																																				2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4 UJ	32.2 J	4 U	2 U	47 UJ	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	16 U	16 U	16 U	16 U	23	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	0.1 U	0.078 J	0.27	0.08 U	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	2.1	42.3	1.8	2	1.5	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	271	290	203	240	171	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	7.43 J	7.43 J	6.93 J	7.49 J	6.98 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	393	439	316	355	238	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	27.2	22	15.1	19.6	14.5	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	8.79	10	8.69	8.43	7	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	0.16 J	0.15 J	0.18 J	0.17 J	0.11 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	0.18 J	0.17 J	0.16 J	0.24	0.03 UJ	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	0.0071 J	0.006 J	0.0062 J	0.0057 J	0.0036 U	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	0.021	0.022	0.027	0.019	0.015	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	0.0002 U	0.00017 U	0.00017 U	0.00017 U	0.00017 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	0.00099 BJ	0.00061 J	0.0011 BJ	0.00078 BJ	0.00041 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	<0.0101	<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	0.002 U	0.002 U	0.002 U	0.0035 J	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	1.47	1.47	2.19	1.08	0.751	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	0.094	0.083	0.142	0.081	0.033	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	0.000012 U	0.000012 U	0.000012 U	0.000012 U	0.000012 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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0012 J	0.0017 J	0.0012 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	0.0039 J	0.0045 J	0.0047 J	0.0056 J	0.0032 JB	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	0.002 U	0.0014 U	0.0014 U	0.0045 BJ	0.0014 U	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-4A																																			2L Std	SWSL
	1997	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4 UJ	26.8 J	4 U	2 U	47 UJ	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	16 U	16 U	21	25	36	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	0.1 U	0.08 U	0.45	0.08 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	3.6	16.3	7.1	7.8	8.3	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	106	114	220	204	193	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	5.15 J	4.77 J	5.69 J	4.97 J	5.68 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	158	175	342	307	285	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	39.6	45	85.7	79.4	57.6	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	16.1	17.9	35.6	34.3	35.8	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	0.14 J	0.14 J	0.16 J	0.16 J	0.1 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	0.03 U	0.03 U	0.16 J	0.03 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	0.004 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	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	0.033	0.042	0.077	0.07	0.053	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	0.0002 U	0.00017 U	0.00019 BJ	0.00021 J	0.00017 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	0.0005 U	0.00041 U	0.00099 BJ	0.00071 BJ	0.00068 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	0.062	<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	0.002 U	0.002 U	0.002 U	0.002 U	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	7.03	1.26	10.8	12.6	15.6	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	0.038	0.046	0.077	0.06	0.055	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	0.000012 U	0.000012 U	0.000012 U	0.000012 U	0.000052 J	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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0012 U	0.0012 U	0.0012 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	0.002 U	0.0016 U	0.0016 U	0.009 J	0.0045 JB	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	0.0025 BJ	0.0048 BJ	0.01 BJ	0.014 BJ	0.0045 JB	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		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4.1 J	33.8 J	4 U	3.3 J	47 UJ	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	98 J	155	105	214	139	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	0.5	1.1	1	0.91	0.84	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	30.7	158	35.6	45.6	42.1	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	1110	1250	1000	1260	1270	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	6.94 J	6.91 J	6.9 J	7.28 J	7.17 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	1770	2020	1660	2040	2050	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	1.12	11	118	90.8	141	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	188	234	129	207	165	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	0.17 J	0.15 J	0.19 J	0.16 J	0.11 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	0.15 J	0.19 J	0.16 J	0.03 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	0.0113	<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	0.0058 J	0.0054 J	0.0053 J	0.0058 J	0.0036 U	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	0.114	0.134	0.137	0.133	0.165	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	0.0002 U	0.0034 J	0.00017 U	0.00017 U	0.00019 JB	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	0.0022 BJ	0.0056 J	0.0027 BJ	0.0031 BJ	0.0035 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	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	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	0.138	0.306	1.23	0.8	0.443	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	0.244	0.226	0.425	0.461	0.303	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	0.000012 U	0.000012 U	0.000012 U	0.000012 U	0.000012 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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0013 J	0.0023 J	0.0012 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	0.002 U	0.0097 J	0.0016 U	0.014 J	0.0016 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	0.002 U	0.0018 BJ	0.0014 U	0.0058 BJ	0.0014 U	1	0.010

NOTES:
< Symbol = Below Laboratory Detectable Limits
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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		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4 UJ	50.9 J	4 U	6.4 J	47 UJ	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	71	49	53	75	61	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	0.7	0.6	0.96	0.28	0.45	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	23.8	100	18.4	22.4	22.6	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	1080	848	690	1010	818	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	7.06 J	7.12 J	7.17 J	7.48 J	7.48 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	1640	1240	1120	1540	1240	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	55.5	50.1	36	45.5	50.3	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	196	141	119	180	128	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	0.18 J	0.18 J	0.26	0.18 J	0.15 J	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	0.03 U	0.17 J	0.14 J	0.15 J	0.03 UJ	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	0.015	0.013	0.016	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	0.038	0.036	0.032	0.04	0.038	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	0.0002 U	0.001 J	0.0002 BJ	0.00056 J	0.00023 JB	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	0.0021 BJ	0.006 J	0.0027 BJ	0.0019 BJ	0.0028 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	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	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	13.4	14.5	12.4	22.9	21.9	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	0.301	0.232	0.211	0.337	0.209	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	0.000012 U	0.000016 J	0.000012 U	0.000012 U	0.000039 J	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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0012 U	0.0016 J	0.0012 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	0.002 J	0.01 J	0.0055 J	0.012 J	0.014 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	0.002 U	0.0031 BJ	0.0014 U	0.0064 BJ	0.0034 JB	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		2013		2014			
	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	AUG	FEB	AUG	FEB	AUG		
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	4 UJ	26.1 J	4 U	2 U	47 UJ	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	22	16 U	16 U	21	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	0.1 U	0.08 U	0.61	0.08 U	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	3.9	66.8	4	3.1	3.7	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	1210	511	836	620	896	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	6.68 J	7.02 J	6.64 J	7.47 J	6.9 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	1360	747	1060	827	1040	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	631	131	424	228	448	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	5.02	2.2	3.45	3.22	4.1	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	0.51	0.22	0.36	0.27	0.29	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	0.03 U	0.03 U	0.03 U	0.03 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	0.009 J	0.0051 J	0.0071 J	0.0067 J	0.0036 U	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	0.046	0.041	0.056	0.028	0.044	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	0.0002 U	0.00017 U	0.00017 U	0.0042 J	0.00045 JB	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	0.0005 U	0.00041 U	0.00041 U	0.0011 BJ	0.00041 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	0.002 U	0.002 U	0.002 U	0.0034 J	0.002 U	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	38.9	2.67	30	9.47	15.9	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	0.004 U	0.0033 U	0.0033 U	0.0033 U	0.0033 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	1.67	0.082	1.19	0.132	1.08	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	0.000012 U	0.000012 U	0.000012 U	0.000012 U	0.00002 J	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	0.007 U	0.0062 U	0.0062 U	0.0062 U	0.0062 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	0.002 U	0.0012 U	0.0024 J	0.003 J	0.0014 J	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	0.002 U	0.0016 U	0.0016 U	0.0051 J	0.0016 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	0.002 U	0.0033 BJ	0.012 BJ	0.018 BJ	0.0064 JB	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 3
NEW LANDFILL CELL 1 and 2 ANALYSIS RESULTS
INTERNATIONAL PAPER
RIEGELWOOD, NORTH CAROLINA
AUGUST 2014 EVENT

		Client Sample ID:	Primary Leachate Collection System-Cell 1		Secondary Leachate Collection System-Cell 1		Primary Leachate Collection System-Cell 2		Under-Drain Leachate Collection System-Cell 1		2L Standard	SWSL
		Collect Date:	8/19/2014		8/19/2014		8/19/2014		8/19/2014			
Method	Parameter	Units	Value	Q	Value	Q	Value	Q	Value	Q		
SW-846 6010C	Arsenic	ug/l	116	J	7.3	J	17		5.6	J	10	10
SW-846 6010C	Barium	ug/l	201	J	28		119		165		700	100
SW-846 6010C	Cadmium	ug/l	0.53	JB	0.33	JB	0.27	JB	0.41	JB	2	1
SW-846 6010C	Chromium	ug/l	101	J	424		15		27		10	10
SW-846 6010C	Copper	ug/l		R	2	U	2.2	J	3.6	J	1,000	10
SW-846 6010C	Iron	ug/l	4240	J	19800		18500		33600		300	300
SW-846 6010C	Lead	ug/l	3.5	J	3.3	U	4.5	J	3.3	U	15	10
SW-846 6010C	Manganese	ug/l	373	J	934		376		772		50	50
SW-846 6010C	Selenium	ug/l		R	6.2	U	6.2	U	6.2	U	20	10
SW-846 6010C	Silver	ug/l	2.2	J	1.2	U	1.2	U	1.2	U	20	10
SW-846 6010C	Vanadium	ug/l	800	J	22		18	J	69		0.3 (I)	25
SW-846 6010C	Zinc	ug/l	18	J	51		7.8	JB	6.1	JB	1,000	10
SW-846 7470A	Mercury	ug/l	0.048	J	0.012	U	0.077	J	0.076	J	1	0.2
EPA 120.1	Specific Conductance	umhos/cm	7920		2400		1700		2760		NE	NE
EPA 300.0	Chloride	mg/l	164		43.3		74.1		206		250	NE
EPA 300.0	Fluoride	mg/l	0.07	U	0.35		0.02	U	0.14	J	2	2
EPA 300.0	Nitrate	mg/l	0.2	U	0.03	U	0.03	U	0.03	U	10	10
EPA 300.0	Orthophosphate	mg/l	1.12		0.02	U	0.02	U	0.02	U	NE	NE
EPA 300.0	Sulfate	mg/l	484		912		9.7		115		250	250
EPA 410.4	Chemical oxygen demand	mg/l	1130		129		366		244		NE	NE
SM 2540C	Total Dissolved Solids	mg/l	7040		1730		1340	J	1820		500	NE
SM 4500H	Laboratory pH	s.u.	7.89	J	6.23	J	7.12	J	7.17	J	6.5-8.5	NE
SM 5210B	Biochemical oxygen demand	mg/l	120	J	47	UJ	138		410	J	NE	NE
SM 5310B	Total Organic Carbon	mg/l	28.1		36.8		12.6		53.6		NE	NE
SW-846 9020B	Total Organic Halides	mg/l	0.9		0.1	U	0.47		0.65		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

mg/L = Milligrams per Liter

NE = Not Established

s.u. = Standard unit

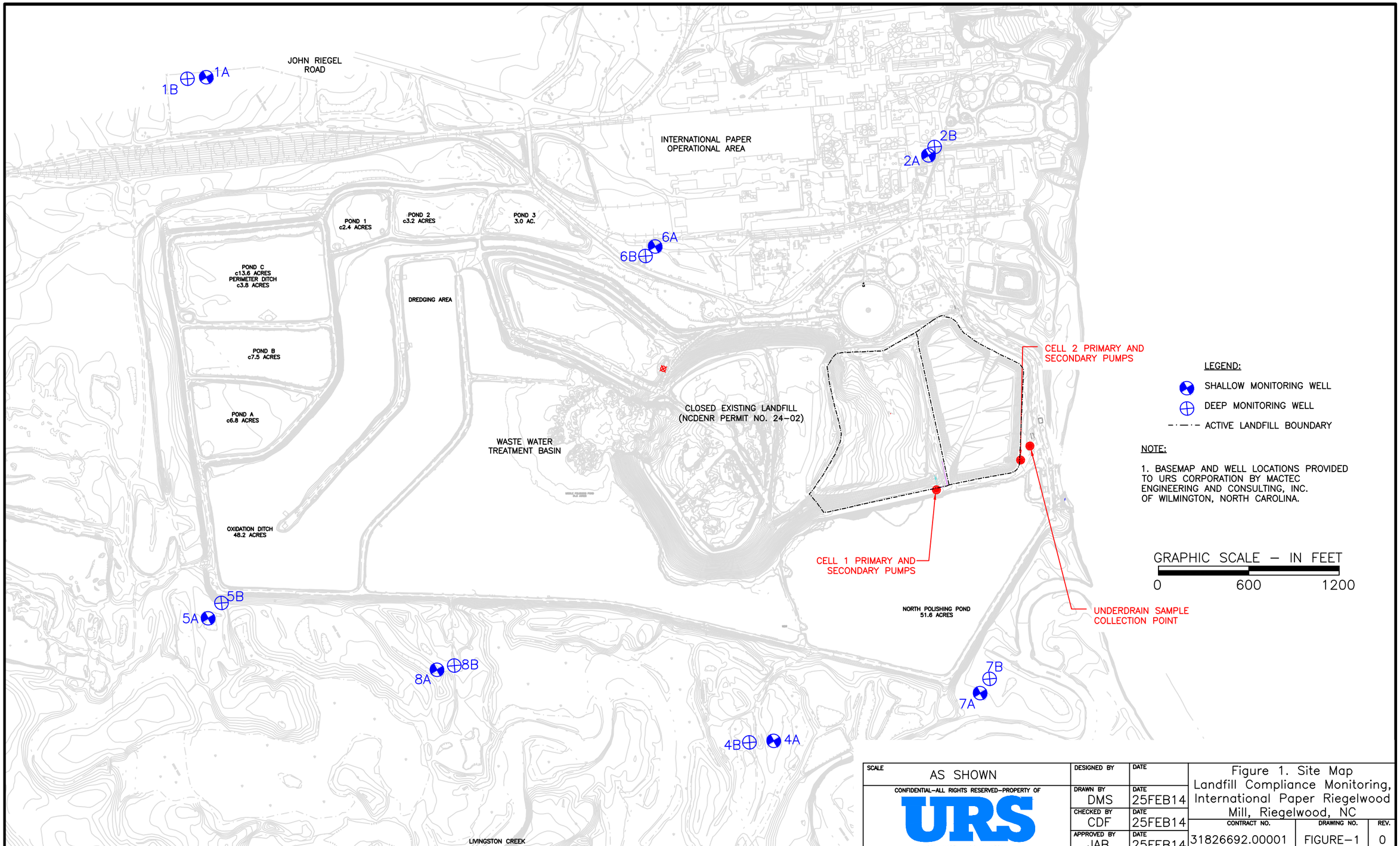
ug/L = Micrograms per Liter

umhos/cm = Micromhos per centimeter

Qualifiers (Q):

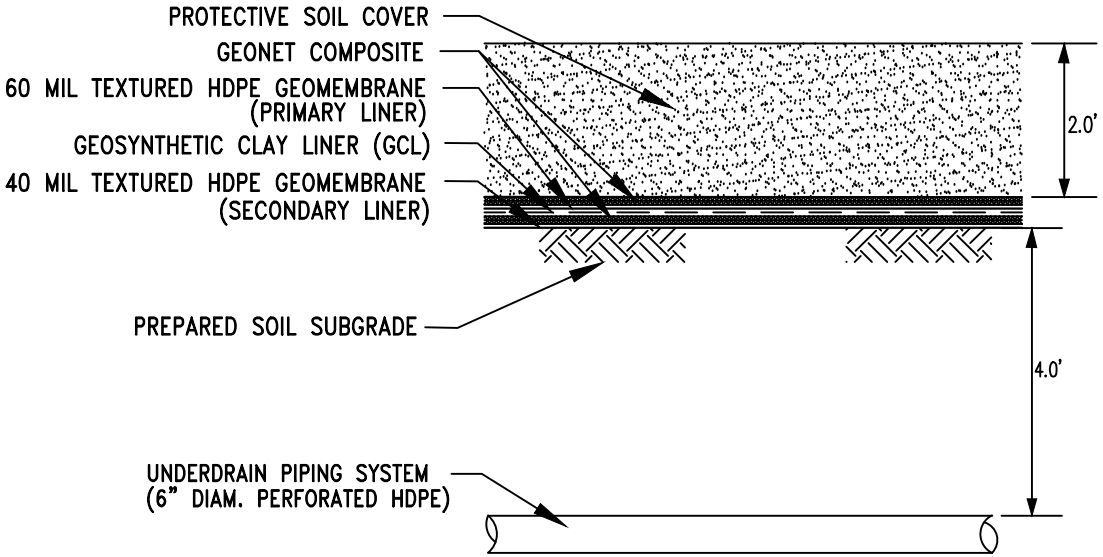
U	The analyte was analyzed for, but was not detected above the associated detection limit.
B	The analyte was detected in a laboratory blank at a similar concentration.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample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

FIGURES



SCALE	DESIGNED BY	DATE	Figure 1. Site Map Landfill Compliance Monitoring, International Paper Riegelwood Mill, Riegelwood, NC		
AS SHOWN					
CONFIDENTIAL–ALL RIGHTS RESERVED–PROPERTY OF URS RDU, NORTH CAROLINA 27560	DRAWN BY DMS	DATE 25FEB14			
	CHECKED BY CDF	DATE 25FEB14	CONTRACT NO. 31826692.00001	DRAWING NO. FIGURE–1	REV. 0
	APPROVED BY JAB	DATE 25FEB14			

P:\Jobs4_Projects\International Paper\IP – Riegelwood Geosciences\31829654 Landfill 2014 GWM\5 Deliverables\5.1 Working Documents\Figure 2_DMS 2.28.14.dwg March 18, 2014 – 9:13 AM



SCALE	DESIGNED BY	DATE	Figure 2. Base Liner System Landfill Compliance Monitoring, International Paper Riegelwood Mill, Riegelwood, NC		
AS SHOWN					
CONFIDENTIAL–ALL RIGHTS RESERVED–PROPERTY OF URS RDU, NORTH CAROLINA 27560	DRAWN BY DMS	DATE 25FEB14			
	CHECKED BY CDF	DATE 25FEB14	CONTRACT NO.	DRAWING NO.	REV.
	APPROVED BY JAB	DATE 25FEB14	31826692.00001	FIGURE–2	0

APPENDIX A

DATA VALIDATION CHECKLIST

WITH QUALIFIED RESULTS

Data Validation Checklist
Organic and Inorganic Analyses

Project:	IP – Riegelwood, NC (Landfill Monitoring)	Project No:	31829654.00001
Work Order:	J1406371 & J1406372	Methods:	EPA 120.1 (Specific Conductance), 300.0 (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:	ALS Environmental,[2] Jacksonville, FL	Associated Sample IDs:	MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, MW-8A, Primary-1, Secondary-1, Primary-2, & Underdrain
Sample Matrix:	Water	Date(s) Sampled:	08/19/2014
Reviewer:	Jenine Abbassi, URS Corporation	Date:	10/07/2014
Concurrence[3]:	Martha Meyers-Lee, URS Corporation	Date:	10/20/2014

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). J1406371-002 and -005 were analyzed for nitrate outside of holding time. J-flag results. ○ ≤ 28 days (Chloride, Fluoride, and Sulfate)	J
	✓			• 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	

[1] As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, V, and Zn
[2] ALS subcontracted the TOX analysis to Summit Environmental Technologies, Inc. of Cuyahoga Falls, OH. TOX analyses were conducted under Work Order numbers 14082273 and 14082274.
[3] Independent Technical Reviewer

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
2. Were sample storage and preservation requirements met?	✓			• Temperatures of sample containers upon receipt were 2.4 and 2.3°C (≤6°C).	
		✓		• The laboratory verified that all samples, except MW-5A, MW-7A, Primary-1, Primary-2, and Underdrain (J1406371-004 and 005, and J1406372-001, -003, and -004 respectively), were properly preserved in the field.	
				• The pH of the metals bottles provided for MW-5A, MW-7A, Primary-1, Primary-2, and Underdrain was >2 upon receipt at the lab. The laboratory adjusted the pH of all samples, except Primary-1, with the addition of nitric acid prior to the analysis. The laboratory was unable to adjust the pH of the Primary-1 sample due to matrix interference. Therefore, Primary-1 metal results are biased low (J- and R).	J-/R
				• The pH of the COD, TOX, and TOC bottles provided for Primary-1 was >2 upon receipt at the laboratory. The laboratory adjusted the pH of the sample bottles with the addition of appropriate 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-06662-02	
	✓			• EPA 7470: MB-06646-04 & MB-06550-02	
	✓			• EPA 120.1: J1406371-MB1 & J1406372-MB1	
	✓			• EPA 300: J1406371-MB1, J1406371-MB2, J1406372-MB1, & J1406372-MB2	
	✓			• EPA 410.4: J1406371-MB1 & J1406372-MB1	
			✓	• SM 4500-H: Not applicable	
	✓			• SM 2540C: J1406371-MB1 & J1406372-MB1	
	✓			• SM 5210B: J1406371-MB1 & J1406372-MB1	
	✓			• SM 5310B: J1406371-MB1, J1406372-MB1, & J1406372-MB2	
	✓			• EPA 9020B: MB-R23453 & MB-R23387	

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: • CCB of 8/31/14 @ 17:07: Vanadium @ 2.010 J µg/L (RL 20.000, MDL 1.600) • CCB of 8/31/14 @ 18:22: Vanadium @ 2.080 J µg/L (RL 20.000, MDL 1.600) • CCB of 8/31/14 @ 19:25: o Cadmium @ 0.176 J µg/L (RL 5.000, MDL 0.170) o Vanadium @ 1.980 J µg/L (RL 20.000, MDL 1.600) • MB of 8/31/14 @ 16:03: o Vanadium @ 2.060 J µg/L (RL 20.000, MDL 1.600) o Zinc @ 1.580 µg/L (RL 20.000, MDL 1.400) • SM 5310B, J1406372-MB2: TOC @ 0.09 J mg/L (RL 1.0, MDL 0.09)	
5. Were target analytes reported in field blank analyses (e.g., trip, ~~ambient, field, or equipment~~) above the DL?			✓		
6. Were analytes detected in samples at concentrations similar to that observed in the blanks?	✓	✓		All detected TOC sample results were greater than the RL; therefore, qualification of data is not warranted. Metal blank contamination action levels (BCALs): • Cadmium @ 0.88 µg/L (0.176 x 5) • Vanadium @ 10.4 µg/L (2.080 x 5) • Zinc @ 7.9 µg/L (1.580 x 5) Metals sample results that were less than the BCAL, adjusted for sample dilution, have been B-flagged.	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-06662-01 (LCS Only)	
	✓			• EPA 7470: LCS-06646-03 & LCS-06550-01 (LCS Only)	

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
	✓			• EPA 120.1: J1406371-LCS1(LCS Only), J1406372-LCS3, & J1406372-DLCS3 (LCS & LCSD)	
	✓			• EPA 300: J1406371-LCS1, J1406371-LCS2, J1406372-LCS1, & J1406372-LCS2 (LCS Only)	
	✓			• EPA 410.4: J1406371-LCS1 & J1406372-LCS1 (LCS Only)	
			✓	• SM 4500-H: Not applicable	
	✓			• SM 2540C: J1406371-LCS1 & J1406372-LCS1 (LCS Only)	
	✓			• SM 5210B: J1406371-LCS1& J1406372-LCS1 (LCS Only)	
	✓			• SM 5310B: J1406371-LCS1, J1406372-LCS1, & J1406372-LCS2 (LCS Only)	
	✓			• EPA 9020B: LCS-R23453 & LCSD-R23453 (LCS and LCSD) & LCS-R23387 (LCS Only)	
10. Were LCS recoveries within lab/project[4] specifications?	✓				
11. Were LCS/LCSD RPD within lab specifications?	✓			LCS only for all analyses, except EPA 9020B.	
12. Was a MS/MSD pair analyzed with each batch?	✓			• EPA 6010: J1406337-001 (Batch), MS/MSD	
	✓			• EPA 7470: J1406436-001 (Batch) & J1406271-002 (Batch), MS/MSD	
			✓	• EPA 120.1: Not applicable	
	✓			• EPA 300: J1406371-001 (MW-1A) & J1406359-003 (Batch), MS only	
	✓			• EPA 410.4: J1406367-001 (Batch) & J1406385-001 (Batch), MS only	
			✓	• SM 4500-H: Not applicable	
			✓	• SM 2540C: Not applicable	
			✓	• SM 5210B: Not applicable	
	✓			• SM 5310B: J1406431-002 and -003 (Batch), & J1406640-001 (Batch), MS only	
	✓			• EPA 9020B: 14082698-003 (Batch) & 14082281-002 (Batch), MS/MSD	
13. Is the MS/MSD parent sample a project-specific sample?	✓	✓		See above.	

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

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
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: Data not included in data package	
			✓	• EPA 7470: Data not included in data package	
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.*			✓		
19. Was a post-digestion spike analysis conducted whenever the MS or serial dilution results did not meet QC limits?			✓	• EPA 6010: Data not included in data package	
			✓	• EPA 7470: Data not included in data package	
20. Were laboratory/project specifications met during the PDS analysis? *Only QC results for project samples are evaluated.*			✓		
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	
			✓	• EPA 7470: Not applicable	
	✓			• EPA 120.1: o J1406371-001 (MW-1A) o J1406372-004 (Underdrain)	
	✓			• EPA 300: J1406371-001 (MW-1A) & J1406359-003 (Batch)	
	✓			• EPA 410.4: J1406367-001 (Batch) & J1406385-001 (Batch)	
	✓			• SM 4500-H: J1406352-001 (Batch) & J1406412-001 (Batch)	
	✓			• SM 2540C: J1406371-001 (MW-1A)	
	✓			• SM 5210B: J1406371-001 (MW-1A)	
	✓			• SM 5310B: J1406431-002 and -003 (Batch), & J1406640-001 (Batch)	
			✓	• EPA 9020B: 1402274-001 (MW-1A) & 14082273-001 (Primary-1)	
23. Does laboratory duplicate results meet lab specifications? *Only QC results for project samples are evaluated.*	✓				

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
24. Were initial and continuing calibration standards analyzed at the lab/project-specified frequency for each instrument?	✓			EPA 120.1, 300, 410.4, 6010, and 7470, SM 4500-H, and 5310B	
25. Were these results within lab/project specifications?		✓		EPA 300, CCV of 8/21/14 @ 17:14: Fluoride @ 111.8%R (90-110). Qualification of data is not required, as a high percent recovery is indicative of a positive bias and fluoride was not detected in associated samples.	
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.	✓			According to the Case Narrative: • Sample Underdrain (J1406372-004) exhibited signs of potential toxicity for the biological oxygen demand analysis, yielding successively lower results as the sample dilution decreased. • The dilution series for samples Secondary-1, MW-1A, MW-1B, MW-4A, MW-5A, MW-7A, and MW-8A (J1406372-002, J1406371-001, -002, -003, -004, -005, and -006, respectively) did not meet the oxygen depletion criterion of at least 2 mg/L. • The incorrect sample dilutions were chosen for sample J1406372-001 and none of the aliquots met the criteria of oxygen depletion of at least 2 and residual of 1. BOD results for the above mentioned samples are estimated (J/UJ). In addition, the TDS result for sample Primary-2 (J1406372-003) is estimated per comments included in the raw data indicating that the sample required additional drying time to obtain representative results. Refer to **Attachment A** for additional comments.	J/UJ

Data Validation Checklist (Continued)

Review Questions	Yes	No	N/A	Samples (Analytes) Affected/Comments	Flag
Comments: Batch QC sample results are not included in the QC summary section of the laboratory reports. According to the ALS Project Manager, MS/MSD and/or laboratory duplicate analyses are conducted at a frequency of 5% for the following parameters: • Lab Duplicates: Anions (Chloride, Nitrate, and Sulfate), BOD, COD, Conductivity, pH, TDS, and TOC • Matrix Spikes: Anions (Chloride, Nitrate, and Sulfate), COD, Metals, and TOC					
All sample concentrations that are less than the MRL, but greater than the MDL are estimated (J).					
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
B Blank contamination exists
UJ Not detected and the detection limit is estimated
R Unusable data

ATTACHMENT A

CASE NARRATIVE

ALS ENVIRONMENTAL, USA GROUP CORP.

Client:	URS Corporation	**Service Request No.:**	J1406371
Project:	IP Riegelwood Landfill	**Date Received:**	08/21/2014
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. 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

Six water samples were received for analysis at ALS Environmental on 08/21/2014. 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:

No significant data anomalies were noted with this analysis.

General Chemistry Analyses:

Method 300.0 (Nitrate): Samples J1406371-002 and -005 were received with insufficient hold time remaining to complete the analysis within the recommended limit. The analysis was performed as soon as possible after receipt by the laboratory. The samples were analyzed approximately five minutes past the hold time. The data is flagged to indicate the holding time violation.

Method 300.0: The upper control criterion was exceeded for the following analytes in the Continuing Calibration Verification (CCV): Fluoride. The field samples reported from this sequence did not contain the analyte in question above the Method Reporting Limit (MRL). Since the apparent problem equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method SM5210B (BOD): The sample dilution series for samples J1406371-001, -001Duplicate, -002, -003, -004, -005, and -006 did not meet the oxygen depletion criterion of at least 2 mg/L. The reported results are based on the highest dilution performed and are therefore the minimum values possible for these samples. The analysis could not be repeated because holding time for the test had expired.

Subcontracted Analytical Parameters:

The samples were delivered to Summit Labs in Cuyahoga Falls, OH on 08/22/2014 for EPA Method 9020 determination. The certified analytical report has been included in its entirety in Appendix A: Subcontracted Analytical Results.

Approved by _____ **Date** 9/17/14

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **14082274**
Date: **8/29/2014**

CLIENT: ALS Environmental, Inc.
Project: J1406371

This report in its entirety consists of the documents listed below. All documents contain the Summit Environmental Technologies, Inc. Work Order Number assigned to this report.

Paginated Report including: Cover Letter, Case Narrative, Analytical Results, Applicable Quality Control Summary Reports and copies of the Chain of Custody Documents supplied with this sample set.

Concentrations reported with a J flag in the Qual field are values below the Limit of Quantitation (LOQ) but greater than the established Limit of Detection (LOD). There is greater uncertainty associated with these results and data should be considered as estimated.

Method numbers, unless specified as SM (Standard Methods) or ASTM, are EPA methods.

Estimated uncertainty values are available upon request.

Any comments or problems with the analytical events associated with this report are noted below.

ALS ENVIRONMENTAL, USA GROUP CORP.

Client:	URS Corporation	**Service Request No.:**	J1406372
Project:	IP Riegelwood Landfill	**Date Received:**	08/21/2014
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. 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

Four water samples were received for analysis at ALS Environmental on 08/21/2014. 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 J1406372-001. The sample matrix contained excessive amounts of organic matter that subsequently reduced the potassium permanganate added during sample preparation. An excess of oxidized permanganate must be maintained throughout the prep process in order to ensure no loss of mercury as vapor. As a result, a lesser amount of sample was utilized and the resulting reporting limits adjusted accordingly.

General Chemistry Analyses:

Method 5210B (BOD): Sample J1406372-004 exhibited signs of potential toxicity for the BOD analysis, yielding successively lower results as the sample dilution decreased. The result for BOD for this sample should be considered an estimate.

Method 5210B (BOD): The dilution series for sample J1406372-002 did not meet the oxygen depletion criterion of at least 2 mg/L. The reported result is based on the highest dilution performed and is therefore the minimum value possible for this sample. The analysis could not be repeated because holding time for the test had expired.

Method 5210B (BOD): The incorrect sample dilutions were chosen for sample J1406372-001. Sample aliquots of 0.5, 1, and 3 mL were prepared and none of them met the criteria of oxygen depletion of at least 2 and residual of 1. Individual results are as follows: 100.8mg/L, 107.1mg/L, and 152.6mg/L. The average result has been reported and should be considered an estimate.

Method 300.0: The reporting limit is elevated for all analytes analyzed by IC in sample J1406372-001. This sample had high conductivity, which precluded its analysis without prior dilution via this technique.

Subcontracted Analytical Parameters:

The samples were delivered to Summit Labs in Cuyahoga Falls, OH on 08/22/2014 for EPA Method 9020 determination. The certified analytical report has been included in its entirety in Appendix A: Subcontracted Analytical Results.

Approved by _____ **Date** 9/17/14

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **14082273**
Date: **8/28/2014**

CLIENT: ALS Environmental, Inc.
Project: J1406372

This report in its entirety consists of the documents listed below. All documents contain the Summit Environmental Technologies, Inc. Work Order Number assigned to this report.

Paginated Report including: Cover Letter, Case Narrative, Analytical Results, Applicable Quality Control Summary Reports and copies of the Chain of Custody Documents supplied with this sample set.

Concentrations reported with a J flag in the Qual field are values below the Limit of Quantitation (LOQ) but greater than the established Limit of Detection (LOD). There is greater uncertainty associated with these results and data should be considered as estimated.

Method numbers, unless specified as SM (Standard Methods) or ASTM, are EPA methods.

Estimated uncertainty values are available upon request.

Any comments or problems with the analytical events associated with this report are noted below.

ATTACHMENT B

QUALIFIED SAMPLE RESULTS

Total Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: URS Corporation SDG No.: J1406371 Method Type:

Sample ID: J1406371-001 Client ID: MW-1A

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	3.6	ug/L	U		6010C	3.6	10	1.00	8/31/2014	17:22:56
Barium	106	ug/L			6010C	0.22	10	1.00	8/31/2014	17:22:56
Cadmium	0.17	ug/L	U		6010C	0.17	5.0	1.00	8/31/2014	17:22:56
Chromium	0.41	ug/L	U		6010C	0.41	10	1.00	8/31/2014	17:22:56
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:22:56
Iron	1360	ug/L			6010C	2.5	100	1.00	8/31/2014	17:22:56
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:22:56
Manganese	13	ug/L			6010C	2.3	10	1.00	8/31/2014	17:22:56
Mercury	0.012	ug/L	U		7470A	0.012	0.10	1.00	9/3/2014	13:20:46
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:22:56
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	17:22:56
Vanadium	7.3	ug/L	~~J~~ BJ		6010C	~~1.8~~ 1.6	20	1.00	8/31/2014	17:22:56
Zinc	6.6	ug/L	~~J~~ BJ		6010C	~~1.8~~ 1.4	20	1.00	8/31/2014	17:22:56

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.: J1406371 Method Type:

Sample ID: J1406371-002 Client ID: MW-1B

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	3.6	ug/L	U		6010C	3.6	10	1.00	8/31/2014	17:28:01
Barium	15	ug/L			6010C	0.22	10	1.00	8/31/2014	17:28:01
Cadmium	0.17	ug/L	U		6010C	0.17	5.0	1.00	8/31/2014	17:28:01
Chromium	0.41	ug/L	U		6010C	0.41	10	1.00	8/31/2014	17:28:01
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:28:01
Iron	751	ug/L			6010C	2.5	100	1.00	8/31/2014	17:28:01
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:28:01
Manganese	33	ug/L			6010C	2.3	10	1.00	8/31/2014	17:28:01
Mercury	0.012	ug/L	U		7470A	0.012	0.10	1.00	9/3/2014	13:21:54
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:28:01
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	17:28:01
Vanadium	3.2	ug/L	BJ		6010C	~~1.62~~ 1.6	20	1.00	8/31/2014	17:28:01
Zinc	1.4	ug/L	U		6010C	1.4	20	1.00	8/31/2014	17:28:01

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.:** J1406371 **Method Type:**

Sample ID: J1406371-003 **Client ID:** MW-4A

Matrix: WATER **Date Received:** 8/21/2014 **Level:** LOW

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

Prep Batch ID: 216740 **Prep Date:** 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	3.6	ug/L	U		6010C	3.6	10	1.00	8/31/2014	17:32:30
Barium	53	ug/L			6010C	0.22	10	1.00	8/31/2014	17:32:30
Cadmium	0.17	ug/L	U		6010C	0.17	5.0	1.00	8/31/2014	17:32:30
Chromium	0.68	ug/L	J		6010C	0.41	10	1.00	8/31/2014	17:32:30
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:32:30
Iron	15600	ug/L			6010C	2.5	100	1.00	8/31/2014	17:32:30
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:32:30
Manganese	55	ug/L			6010C	2.3	10	1.00	8/31/2014	17:32:30
Mercury	0.052	ug/L	J		7470A	0.012	0.10	1.00	9/3/2014	13:23:01
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:32:30
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	17:32:30
Vanadium	4.5	ug/L	J BJ		6010C	~~1.6~~ 1.6 mdl	20	1.00	8/31/2014	17:32:30
Zinc	4.5	ug/L	J BJ		6010C	~~1.8~~ 1.4 mdl	20	1.00	8/31/2014	17:32:30

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.: J1406371 Method Type:

Sample ID: J1406371-004 Client ID: MW-5A

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	3.6	ug/L	U		6010C	3.6	10	1.00	8/31/2014	17:37:25
Barium	165	ug/L			6010C	0.22	10	1.00	8/31/2014	17:37:25
Cadmium	0.19	ug/L	J B		6010C	0.17	5.0	1.00	8/31/2014	17:37:25
Chromium	3.5	ug/L	J		6010C	0.41	10	1.00	8/31/2014	17:37:25
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:37:25
Iron	443	ug/L			6010C	2.5	100	1.00	8/31/2014	17:37:25
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:37:25
Manganese	303	ug/L			6010C	2.3	10	1.00	8/31/2014	17:37:25
Mercury	0.012	ug/L	U		7470A	0.012	0.10	1.00	9/3/2014	13:24:09
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:37:25
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	17:37:25
Vanadium	1.6	ug/L	U		6010C	1.6	20	1.00	8/31/2014	17:37:25
Zinc	1.4	ug/L	U		6010C	1.4	20	1.00	8/31/2014	17:37:25

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.:** J1406371 **Method Type:**

Sample ID: J1406371-005 **Client ID:** MW-7A

Matrix: WATER **Date Received:** 8/21/2014 **Level:** LOW

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

Prep Batch ID: 216740 **Prep Date:** 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	23	ug/L			6010C	3.6	10	1.00	8/31/2014	17:46:58
Barium	38	ug/L			6010C	0.22	10	1.00	8/31/2014	17:46:58
Cadmium	0.23	ug/L	J B		6010C	0.17	5.0	1.00	8/31/2014	17:46:58
Chromium	2.8	ug/L	J		6010C	0.41	10	1.00	8/31/2014	17:46:58
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:46:58
Iron	21900	ug/L			6010C	2.5	100	1.00	8/31/2014	17:46:58
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:46:58
Manganese	209	ug/L			6010C	2.3	10	1.00	8/31/2014	17:46:58
Mercury	0.039	ug/L	J		7470A	0.012	0.10	1.00	9/3/2014	13:25:18
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:46:58
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	17:46:58
Vanadium	14	ug/L	J		6010C	1.6	20	1.00	8/31/2014	17:46:58
Zinc	3.4	ug/L	~~U~~ BJ		6010C	~~1.6~~ 14	20	1.00	8/31/2014	17:46:58

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.:** J1406371 **Method Type:**

Sample ID: J1406371-006 **Client ID:** MW-8A

Matrix: WATER **Date Received:** 8/21/2014 **Level:** LOW

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

Prep Batch ID: 216740 **Prep Date:** 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	3.6	ug/L	U		6010C	3.6	10	1.00	8/31/2014	17:56:09
Barium	44	ug/L			6010C	0.22	10	1.00	8/31/2014	17:56:09
Cadmium	0.45	ug/L	J B		6010C	0.17	5.0	1.00	8/31/2014	17:56:09
Chromium	0.41	ug/L	U		6010C	0.41	10	1.00	8/31/2014	17:56:09
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	17:56:09
Iron	15900	ug/L			6010C	2.5	100	1.00	8/31/2014	17:56:09
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	17:56:09
Manganese	1080	ug/L			6010C	2.3	10	1.00	8/31/2014	17:56:09
Mercury	0.020	ug/L	J		7470A	0.012	0.10	1.00	9/3/2014	13:26:26
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	17:56:09
Silver	1.4	ug/L	J		6010C	1.2	10	1.00	8/31/2014	17:56:09
Vanadium	1.6	ug/L	U		6010C	1.6	20	1.00	8/31/2014	17:56:09
Zinc	6.4	ug/L	~~J~~ BJ		6010C	~~1.4~~ 1.4 marke	20	1.00	8/31/2014	17:56:09

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.: J1406372 Method Type:

Sample ID: J1406372-001 Client ID: Primary-1

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	116	ug/L	J-		6010C	3.6	10	1.00	8/31/2014	18:00:23
Barium	201	ug/L	J-		6010C	0.22	10	1.00	8/31/2014	18:00:23
Cadmium	0.53	ug/L	J b		6010C	0.17	5.0	1.00	8/31/2014	18:00:23
Chromium	101	ug/L	J-		6010C	0.41	10	1.00	8/31/2014	18:00:23
Copper	~~2.0~~	ug/L	~~U~~ R		6010C	~~2.0~~	~~10~~	1.00	8/31/2014	18:00:23
Iron	4240	ug/L	J-		6010C	2.5	100	1.00	8/31/2014	18:00:23
Lead	3.5	ug/L	J-		6010C	3.3	10	1.00	8/31/2014	18:00:23
Manganese	373	ug/L	J-		6010C	2.3	10	1.00	8/31/2014	18:00:23
Mercury	0.048	ug/L	J-		7470A	0.024	0.20	1.00	8/26/2014	15:44:26
Selenium	~~6.2~~	ug/L	~~U~~ R		6010C	~~6.2~~	~~10~~	1.00	8/31/2014	18:00:23
Silver	2.2	ug/L	J-		6010C	1.2	10	1.00	8/31/2014	18:00:23
Vanadium	800	ug/L	J-		6010C	1.6	20	1.00	8/31/2014	18:00:23
Zinc	18	ug/L	J-		6010C	1.4	20	1.00	8/31/2014	18:00:23

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.: J1406372 Method Type:

Sample ID: J1406372-002 Client ID: Secondary-1

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	7.3	ug/L	J		6010C	3.6	10	1.00	8/31/2014	18:09:41
Barium	28	ug/L			6010C	0.22	10	1.00	8/31/2014	18:09:41
Cadmium	0.33	ug/L	J β		6010C	0.17	5.0	1.00	8/31/2014	18:09:41
Chromium	424	ug/L			6010C	0.41	10	1.00	8/31/2014	18:09:41
Copper	2.0	ug/L	U		6010C	2.0	10	1.00	8/31/2014	18:09:41
Iron	19800	ug/L			6010C	2.5	100	1.00	8/31/2014	18:09:41
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	18:09:41
Manganese	934	ug/L			6010C	2.3	10	1.00	8/31/2014	18:09:41
Mercury	0.012	ug/L	U		7470A	0.012	0.10	1.00	8/26/2014	15:45:36
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	18:09:41
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	18:09:41
Vanadium	22	ug/L			6010C	1.6	20	1.00	8/31/2014	18:09:41
Zinc	51	ug/L			6010C	1.4	20	1.00	8/31/2014	18:09:41

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.: J1406372 Method Type:

Sample ID: J1406372-003 Client ID: Primary-2

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	17	ug/L			6010C	3.6	10	1.00	8/31/2014	18:27:18
Barium	119	ug/L			6010C	0.22	10	1.00	8/31/2014	18:27:18
Cadmium	0.27	ug/L	J B		6010C	0.17	5.0	1.00	8/31/2014	18:27:18
Chromium	15	ug/L			6010C	0.41	10	1.00	8/31/2014	18:27:18
Copper	2.2	ug/L	J		6010C	2.0	10	1.00	8/31/2014	18:27:18
Iron	18500	ug/L			6010C	2.5	100	1.00	8/31/2014	18:27:18
Lead	4.5	ug/L	J		6010C	3.3	10	1.00	8/31/2014	18:27:18
Manganese	376	ug/L			6010C	2.3	10	1.00	8/31/2014	18:27:18
Mercury	0.077	ug/L	J		7470A	0.012	0.10	1.00	8/26/2014	15:46:46
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	18:27:18
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	18:27:18
Vanadium	18	ug/L	J		6010C	1.6	20	1.00	8/31/2014	18:27:18
Zinc	7.8	ug/L	~~J~~ BJ		6010C	~~1.4~~ 1.4	20	1.00	8/31/2014	18:27:18

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.: J1406372 Method Type:

Sample ID: J1406372-004 Client ID: Underdrain

Matrix: WATER Date Received: 8/21/2014 Level: LOW

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

Prep Batch ID: 216740 Prep Date: 8/28/2014

Analyte	Concentration	Units	C	Qual	Method	MDL	MRL	Dil	Analytical Date	Analytical Time
Arsenic	5.6	ug/L	J		6010C	3.6	10	1.00	8/31/2014	18:36:36
Barium	165	ug/L			6010C	0.22	10	1.00	8/31/2014	18:36:36
Cadmium	0.41	ug/L	J B		6010C	0.17	5.0	1.00	8/31/2014	18:36:36
Chromium	27	ug/L			6010C	0.41	10	1.00	8/31/2014	18:36:36
Copper	3.6	ug/L	J		6010C	2.0	10	1.00	8/31/2014	18:36:36
Iron	33600	ug/L			6010C	2.5	100	1.00	8/31/2014	18:36:36
Lead	3.3	ug/L	U		6010C	3.3	10	1.00	8/31/2014	18:36:36
Manganese	772	ug/L			6010C	2.3	10	1.00	8/31/2014	18:36:36
Mercury	0.076	ug/L	J		7470A	0.012	0.10	1.00	8/26/2014	15:47:53
Selenium	6.2	ug/L	U		6010C	6.2	10	1.00	8/31/2014	18:36:36
Silver	1.2	ug/L	U		6010C	1.2	10	1.00	8/31/2014	18:36:36
Vanadium	69	ug/L			6010C	1.6	20	1.00	8/31/2014	18:36:36
Zinc	6.1	ug/L	~~J~~ BJ		6010C	~~1.40~~ 1.4	20 MMLL	1.00	8/31/2014	18:36:36

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).

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406371
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1335
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	MW-1A		
Lab Code:	J1406371-001	**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	ND	U J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	2.1		mg/L	1.0	0.09	1	NA	8/28/14 07:24	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	8/25/14	8/25/14 17:47	
Chloride	300.0	6.1		mg/L	1.0	0.2	1	NA	8/21/14 13:29	
Conductivity at 25 Degrees Celsius	120.1	155		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:29	
Fluoride	300.0	0.14	J	mg/L	0.20	0.02	1	NA	8/21/14 13:29	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 13:29	
pH	SM 4500-H+ B	4.45	J	pH Units			1	NA	8/22/14 20:19	H
Solids, Total Dissolved	SM 2540 C	97		mg/L	10	10	1	NA	8/25/14 16:29	
Sulfate	300.0	50.4		mg/L	1.0	0.2	1	NA	8/21/14 13:29	

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)

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406371
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1340
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	MW-1B		
Lab Code:	J1406371-002	**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	ND	U J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	1.5		mg/L	1.0	0.09	1	NA	8/28/14 07:40	
Chemical Oxygen Demand, Total	410.4	23		mg/L	20	16	1	8/25/14	8/25/14 17:48	
Chloride	300.0	7.0		mg/L	1.0	0.2	1	NA	8/21/14 13:45	
Conductivity at 25 Degrees Celsius	120.1	238		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:32	
Fluoride	300.0	0.11	J	mg/L	0.20	0.02	1	NA	8/21/14 13:45	
Nitrate as Nitrogen	300.0	ND	UJ	mg/L	0.20	0.03	1	NA	8/21/14 13:45	
pH	SM 4500-H+ B	6.98	J	pH Units			1	NA	8/22/14 20:23	H
Solids, Total Dissolved	SM 2540 C	171		mg/L	10	10	1	NA	8/25/14 16:29	
Sulfate	300.0	14.5		mg/L	1.0	0.2	1	NA	8/21/14 13:45	

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)

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406371
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1440
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	MW-4A		
Lab Code:	J1406371-003	**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	ND	U J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	8.3		mg/L	1.0	0.09	1	NA	8/28/14 07:57	
Chemical Oxygen Demand, Total	410.4	36		mg/L	20	16	1	8/25/14	8/25/14 17:49	
Chloride	300.0	35.8		mg/L	1.0	0.2	1	NA	8/21/14 14:33	
Conductivity at 25 Degrees Celsius	120.1	285		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:34	
Fluoride	300.0	0.1	J	mg/L	0.20	0.02	1	NA	8/26/14 06:57	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 14:33	
pH	SM 4500-H+ B	5.68	J	pH Units			1	NA	8/22/14 20:27	H
Solids, Total Dissolved	SM 2540 C	193		mg/L	10	10	1	NA	8/25/14 16:29	
Sulfate	300.0	57.6		mg/L	1.0	0.2	1	NA	8/21/14 14:33	

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)

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406371
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1605
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	MW-5A		
Lab Code:	J1406371-004	**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 J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	42.1		mg/L	1.0	0.09	1	NA	8/28/14 08:13	
Chemical Oxygen Demand, Total	410.4	139		mg/L	20	16	1	8/25/14	8/25/14 17:49	
Chloride	300.0	165		mg/L	1.0	0.2	1	NA	8/21/14 14:49	
Conductivity at 25 Degrees Celsius	120.1	2050		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:36	
Fluoride	300.0	0.11	J	mg/L	0.20	0.02	1	NA	8/26/14 07:13	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 14:49	
pH	SM 4500-H+ B	7.17	J	pH Units			1	NA	8/22/14 20:31	~~H~~
Solids, Total Dissolved	SM 2540 C	1270		mg/L	40	40	4	NA	8/25/14 16:29	
Sulfate	300.0	141		mg/L	10	2	10	NA	8/26/14 07:29	

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)

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406371
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1450
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	MW-7A		
Lab Code:	J1406371-005	**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 J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	22.6		mg/L	1.0	0.09	1	NA	8/28/14 08:27	
Chemical Oxygen Demand, Total	410.4	61		mg/L	20	16	1	8/25/14	8/25/14 17:49	
Chloride	300.0	128		mg/L	1.0	0.2	1	NA	8/21/14 15:05	
Conductivity at 25 Degrees Celsius	120.1	1240		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:40	
Fluoride	300.0	0.15	J	mg/L	0.20	0.02	1	NA	8/26/14 08:17	
Nitrate as Nitrogen	300.0	ND	UJ	mg/L	0.20	0.03	1	NA	8/21/14 15:05	
pH	SM 4500-H+ B	7.48	J	pH Units			1	NA	8/22/14 20:37	H
Solids, Total Dissolved	SM 2540 C	818		mg/L	20	20	2	NA	8/25/14 16:29	
Sulfate	300.0	50.3		mg/L	1.0	0.2	1	NA	8/21/14 15:05	

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).

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill/31829654.00001
Sample Matrix: Water

Service Request: J1406371
Date Collected: 8/19/14 1540
Date Received: 8/21/14

Sample Name: MW-8A
Lab Code: J1406371-006

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 J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	3.7		mg/L	1.0	0.09	1	NA	8/28/14 08:44	
Chemical Oxygen Demand, Total	410.4	ND	U	mg/L	20	16	1	8/25/14	8/25/14 17:50	
Chloride	300.0	4.1		mg/L	1.0	0.2	1	NA	8/21/14 15:21	
Conductivity at 25 Degrees Celsius	120.1	1040		µMHOS/cm	1.0	1.0	1	NA	8/29/14 17:43	
Fluoride	300.0	0.29	J	mg/L	0.20	0.02	1	NA	8/26/14 08:33	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 15:21	
pH	SM 4500-H+ B	6.90	J	pH Units			1	NA	8/22/14 20:42	H
Solids, Total Dissolved	SM 2540 C	896		mg/L	20	20	2	NA	8/25/14 16:29	
Sulfate	300.0	448		mg/L	10	2	10	NA	8/26/14 08:49	

J MMeyerslee 10/18/2014

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)

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406372
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1630
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	Primary-1		
Lab Code:	J1406372-001	**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	120	X J	mg/L	2.0	2.0	1	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	28.1		mg/L	5.0	0.5	5	NA	9/2/14 18:49	
Chemical Oxygen Demand, Total	410.4	1130		mg/L	20	16	1	8/25/14	8/25/14 17:50	
Chloride	300.0	164		mg/L	5.0	0.6	5	NA	8/21/14 15:37	
Conductivity at 25 Degrees Celsius	120.1	7920		µMHOS/cm	1.0	1.0	1	NA	8/28/14 17:49	
Fluoride	300.0	ND	U	mg/L	1.0	0.07	5	NA	8/21/14 15:37	
Nitrate as Nitrogen	300.0	ND	U	mg/L	1.0	0.2	5	NA	8/21/14 15:37	
Orthophosphate as Phosphorus	300.0	1.12		mg/L	0.50	0.09	5	NA	8/21/14 15:37	
pH	SM 4500-H+ B	7.89	J	pH Units			1	NA	8/22/14 22:51	H
Solids, Total Dissolved	SM 2540 C	7040		mg/L	200	200	20	NA	8/25/14 16:29	
Sulfate	300.0	484		mg/L	5.0	0.9	5	NA	8/21/14 15:37	

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-540-R-99-008, June 1999, Rev 00

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406372
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1645
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	Secondary-1		
Lab Code:	J1406372-002	**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	ND	U J	mg/L	47	47	23.33	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	**36.8**		mg/L	1.0	0.09	1	NA	8/28/14 09:53	
Chemical Oxygen Demand, Total	410.4	**129**		mg/L	20	16	1	8/25/14	8/25/14 17:51	
Chloride	300.0	**43.3**		mg/L	1.0	0.2	1	NA	8/21/14 15:53	
Conductivity at 25 Degrees Celsius	120.1	**2400**		µMHOS/cm	1.0	1.0	1	NA	8/28/14 17:54	
Fluoride	300.0	**0.35**		mg/L	0.20	0.02	1	NA	8/26/14 09:05	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 15:53	
Orthophosphate as Phosphorus	300.0	ND	U	mg/L	0.10	0.02	1	NA	8/21/14 15:53	
pH	SM 4500-H+ B	6.23	J	pH Units			1	NA	8/22/14 22:58	~~H~~ P
Solids, Total Dissolved	SM 2540 C	**1730**		mg/L	40	40	4	NA	8/25/14 16:29	
Sulfate	300.0	**912**		mg/L	10	2	10	NA	8/26/14 09:21	

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).

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client: URS Corporation
Project: IP Riegelwood Landfill/31829654.00001
Sample Matrix: Water

Service Request: J1406372
Date Collected: 8/19/14 1700
Date Received: 8/21/14

Sample Name: Primary-2
Lab Code: J1406372-003

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	138	~~J~~	mg/L	2.0	2.0	1	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	12.6		mg/L	5.0	0.5	5	NA	9/2/14 19:07	
Chemical Oxygen Demand, Total	410.4	366		mg/L	20	16	1	8/25/14	8/25/14 17:57	
Chloride	300.0	74.1		mg/L	1.0	0.2	1	NA	8/21/14 16:09	
Conductivity at 25 Degrees Celsius	120.1	1700		µMHOS/cm	1.0	1.0	1	NA	8/28/14 17:57	
Fluoride	300.0	ND	U	mg/L	0.20	0.02	1	NA	8/21/14 16:09	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 16:09	
Orthophosphate as Phosphorus	300.0	ND	U	mg/L	0.10	0.02	1	NA	8/21/14 16:09	
pH	SM 4500-H+ B	7.12	J	pH Units			1	NA	8/22/14 23:04	~~H~~
Solids, Total Dissolved	SM 2540 C	1340	~~X~~ J	mg/L	20	20	2	NA	8/25/14 16:29	
Sulfate	300.0	9.7		mg/L	1.0	0.2	1	NA	8/21/14 16:09	

(*) Flagging error
JA
10/9/14

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	URS Corporation	**Service Request:**	J1406372
Project:	IP Riegelwood Landfill/31829654.00001	**Date Collected:**	8/19/14 1725
Sample Matrix:	Water	**Date Received:**	8/21/14
Sample Name:	Underdrain		
Lab Code:	J1406372-004	**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	410	X J	mg/L	2.0	2.0	1	NA	8/21/14 09:50	
Carbon, Total Organic (TOC)	SM 5310 B	53.6		mg/L	1.0	0.09	1	NA	8/28/14 10:22	
Chemical Oxygen Demand, Total	410.4	244		mg/L	20	16	1	8/25/14	8/25/14 17:57	
Chloride	300.0	206		mg/L	10	2	10	NA	8/26/14 09:53	
Conductivity at 25 Degrees Celsius	120.1	2760		µMHOS/cm	1.0	1.0	1	NA	8/28/14 18:08	
Fluoride	300.0	0.14	J	mg/L	0.20	0.02	1	NA	8/26/14 09:37	
Nitrate as Nitrogen	300.0	ND	U	mg/L	0.20	0.03	1	NA	8/21/14 16:25	
Orthophosphate as Phosphorus	300.0	ND	U	mg/L	0.10	0.02	1	NA	8/21/14 16:25	
pH	SM 4500-H+ B	7.17	J	pH Units			1	NA	8/22/14 23:09	~~H~~
Solids, Total Dissolved	SM 2540 C	1820		mg/L	40	40	4	NA	8/25/14 16:29	
Sulfate	300.0	115		mg/L	10	2	10	NA	8/26/14 09:53	

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-540-R-99-008)

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

WO#: 14082274
Date Reported: 8/29/2014
Company: ALS Environmental, Inc.
Address: 9143 Philips HWY
Jacksonville FL 32256

Received: 8/22/2014
Project#: J1406371

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-001	001	8/19/2014	Total Organic Halides	ND	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-002	002	8/19/2014	Total Organic Halides	ND	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-003	003	8/19/2014	Total Organic Halides	ND	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-004	004	8/19/2014	Total Organic Halides	0.84	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-005	005	8/19/2014	Total Organic Halides	0.45	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406371-006	006	8/19/2014	Total Organic Halides	ND	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/28/2014	JRK

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.
3310 Win St
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

WO#: 14082273
Date Reported: 8/28/2014
Company: ALS Environmental, Inc.
Address: 9143 Philips HWY
Jacksonville FL 32256
Received: 8/22/2014
Project#: J1406372

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406372-001	001	8/19/2014	Total Organic Halides	0.90	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/27/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406372-002	002	8/19/2014	Total Organic Halides	ND	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/27/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406372-003	003	8/19/2014	Total Organic Halides	0.47	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/27/2014	JRK

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
J1406372-004	004	8/19/2014	Total Organic Halides	0.65	mg/L	Non-Potable Water	EPA 9020	1	0.10	8/27/2014	JRK

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).

APPENDIX B

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill — PROJECT NO. 31829654.00001

SAMPLE NO. MW-1A — WELL NO. MW-1A

DATE/TIME COLLECTED 8-19-14 / 1335 — PERSONNEL Duncan Briley, Stewart Farling

SAMPLE METHOD Peristaltic pump

SAMPLE MEDIA: (Groundwater) Surface Water

SAMPLE QA SPLIT: YES (NO) — SPLIT SAMPLE NO. —

SAMPLE QC DUPLICATE: YES (NO) — DUPLICATE SAMPLE NO. —

MS/MSD REQUESTED YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-2014	Well Depth (ft. BTOC)	29.50
Time Started	1315	Depth to Water (ft BTOC)	13.94'
Time Completed	1340	Water Column Length	15.56
Hnu Measurements	NA	Volume of Water in Well (~~liters~~)	2.54 gallon
Background	NA	Purge Rate (liters/min)	.33
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	~~13.94~~ 0
Well Head	NA	Amount Purged (liters)	6 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1315	—	—	—	—	—	—	—
1321	2 L	3.42	22.54	0.132	1.48	243.8	1.76
1324	3 L	3.08	22.90	0.129	0.97	258.7	1.70
1327	4 L	3.09	22.15	0.129	0.97	254.2	3.89
1330	5 L	3.13	22.36	0.130	1.02	247.8	2.93
1333	6 L	3.15	22.47	0.130	1.09	245.7	2.11

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 451 556	NA
Water Quality Meter	HANNA	Factory Standards Check complete
Turbidity Meter		

GENERAL COMMENTS Final DTW = 13.94

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: MW-1B
WELL NO.: MW-1B
DATE/TIME COLLECTED: 1340
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater / Surface Water
SAMPLE QA SPLIT: YES / NO — SPLIT SAMPLE NO.: –
SAMPLE QC DUPLICATE: YES / NO — DUPLICATE SAMPLE NO.: –
MS/MSD REQUESTED: YES / NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date: 8-19-14
Time Started: 1310
Time Completed: 1350
Hnu Measurements: NA
Background: NA
Breathing Zone: NA
Well Head: NA

Well Depth (ft. BTOC): 50'
Depth to Water (ft BTOC): 10.28
Water Column Length: 39.72
Volume of Water in Well ~~(liters)~~: 6.35 gallon
Purge Rate (liters/min): 0.33 L/min
Level of Drawdown (ft. BTOC): 13.02
Amount Purged (liters): ~~0.33 L/min~~ SBF 8-19-14

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1310							
1316	2	7.13	21.00	0.216	5.43	11.0	6.26
1319	3	6.62	21.13	0.212	5.00	20.2	5.85
1322	4	6.30	21.76	0.212	4.97	31.2	5.33
1325	5	6.14	20.75	0.212	4.78	37.1	4.91
1328	6	6.04	20.54	0.213	5.18	42.0	4.53
1331	7	6.02	20.26	0.213	4.98	43.2	4.56

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	NA
Water Quality Meter	YSI 556	Factory Stds.
Turbidity Meter	HANNA	check complete

GENERAL COMMENTS

Final DTW is 24.00 Ft. BTOC.

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill — PROJECT NO. 31829654.00001

SAMPLE NO. MW-4A — WELL NO. MW-4A

DATE/TIME COLLECTED: 8-19-14 / 1440 — PERSONNEL: Duncan Briley, Stewart Farling

SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater — Surface Water

SAMPLE QA SPLIT: YES — NO — SPLIT SAMPLE NO. —

SAMPLE QC DUPLICATE: YES — NO — DUPLICATE SAMPLE NO. —

MS/MSD REQUESTED: YES — NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	~~13.00~~ 11.9
Time Started	1420	Depth to Water (ft BTOC)	4.59
Time Completed	1445	Water Column Length	~~8.41~~ 7.31
Hnu Measurements	NA	Volume of Water in Well ~~(liters)~~	1.17 gallon
Background	NA	Purge Rate (liters/min)	0.33
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	0.17
Well Head	NA	Amount Purged (liters)	6L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1420	—	—	—	—	—	—	—
1426	2L	4.61	23.21	0.258	0.90	118.5	7.35
1429	3L	4.40	23.19	0.256	0.75	124.9	7.05
1432	4L	4.38	23.37	0.256	0.69	123.8	5.20
1435	5L	4.31	22.69	0.249	0.68	112.2	3.40
1438	6L	4.29	22.60	0.244	0.67	111.9	2.97

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst 100'	—
Water Quality Meter	YSI 556	Factory Std
Turbidity Meter	HANNA	Check compute

GENERAL COMMENTS: First DTW: 4.76'

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: MW-5A
WELL NO.: MW-5A
DATE/TIME COLLECTED: 8-19-14/1605
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater Surface Water
SAMPLE QA SPLIT: YES NO — SPLIT SAMPLE NO. —
SAMPLE QC DUPLICATE: YES NO — DUPLICATE SAMPLE NO. —
MS/MSD REQUESTED: YES NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date: 8-19-14
Time Started: 1550
Time Completed:
Hnu Measurements: NA
Background: NA
Breathing Zone: NA
Well Head: NA

Well Depth (ft. BTOC): 20.00
Depth to Water (ft BTOC): 9.65
Water Column Length: 10.35
Volume of Water in Well ~~(liters)~~: 1.60 gallon
Purge Rate (liters/min): 0.33
Level of Drawdown (ft. BTOC): 0.02
Amount Purged (liters): 5.0

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1550	—	—	—	—	—	—	—
1556	2	6.53	22.65	1.859	0.20	-66.0	3.54
1559	3	6.53	22.69	1.855	0.18	-69.9	3.01
1602	4	6.55	22.69	1.865	0.16	-66.3	5.67
1605	5	6.56	22.70	1.868	0.16	-67.5	3.54

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	—
Water Quality Meter	YSI 556	Factory Standards
Turbidity Meter	Hach	Check Complete

GENERAL COMMENTS Final DTW = 9.67 FT BTOC.

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: MW-7A
WELL NO.: MW-7A
DATE/TIME COLLECTED: 8-19-14 / 1450
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater / Surface Water
SAMPLE QA SPLIT: YES / NO — SPLIT SAMPLE NO. —
SAMPLE QC DUPLICATE: YES / NO — DUPLICATE SAMPLE NO. —
MS/MSD REQUESTED: YES / NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date: 8-19-14
Time Started: 1433
Time Completed: 1510
Hnu Measurements: NA
Background: NA
Breathing Zone: NA
Well Head: NA

Well Depth (ft. BTOC): 13.00
Depth to Water (ft BTOC): 3.11
Water Column Length: 9.89
Volume of Water in Well ~~(liters)~~: 1.59 gallon
Purge Rate (liters/min): 0.33 L/min
Level of Drawdown (ft. BTOC): —
Amount Purged (liters): 5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1433	—	—	—	—	—	—	—
1439	2	6.75	21.67	1.238	0.64	-106.0	52.7
1442	3	6.71	21.79	1.241	0.39	-97.0	29.3
1445	4	6.73	21.84	1.236	0.26	-90.4	26.1
1448	5	6.75	21.71	1.234	0.27	-87.6	22.9

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	SOLINST	NA
Water Quality Meter	YSI 556	FACTORY STDS
Turbidity Meter	HANNA	CHECK COMPLETE

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: MW-8A
WELL NO.: MW-8A
DATE/TIME COLLECTED: 8-19-2014 / 1540
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater (circled) Surface Water
SAMPLE QA SPLIT: YES NO (circled) — SPLIT SAMPLE NO.: —
SAMPLE QC DUPLICATE: YES NO (circled) — DUPLICATE SAMPLE NO.: —
MS/MSD REQUESTED: YES NO (circled)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	12.50
Time Started	1515	Depth to Water (ft BTOC)	4.11
Time Completed	1555	Water Column Length	8.39
Hnu Measurements	NA	Volume of Water in Well (~~liters~~)	1.34
Background	NA	Purge Rate (liters/min)	.33
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	2.28
Well Head	NA	Amount Purged (liters)	6.0

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1515	—	—	—	—	—	—	—
1521	2L	6.11	22.61	1.025	0.82	-25.6	43.2
1524	3L	6.09	23.10	1.027	0.80	-14.4	29.6
1527	4L	6.13	23.23	1.008	0.81	-7.9	15.6
1530	5L	6.13	23.26	1.001	0.81	-2.9	10.8
1533	6L	6.14	23.33	0.997	0.81	-0.1	8.6

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	—
Water Quality Meter	YSI 556	Factory Stds
Turbidity Meter	Hach 2100	Check Complete

GENERAL COMMENTS Final DTW = 6.39'

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001

SAMPLE NO.: ~~Primary-2~~ Primary-1
WELL NO.: Primary-1

DATE/TIME COLLECTED: 8-19-14 / 1630
PERSONNEL: Duncan Briley, Stewart Farling

SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA:	Groundwater	Surface Water
SAMPLE QA SPLIT:	YES	NO
SAMPLE QC DUPLICATE:	YES	NO
MS/MSD REQUESTED	YES	NO

SPLIT SAMPLE NO.: —
DUPLICATE SAMPLE NO.: —

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	NA
Time Started	1625	Depth to Water (ft BTOC)	NA
Time Completed	1630	Water Column Length	NA
Hnu Measurements	NA	Volume of Water in Well (liters)	NA
Background	NA	Purge Rate (liters/min)	NA
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	NA
Well Head	NA	Amount Purged (liters)	NA

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1625		7.40	26.00	8.294	0.54	-240.5	17.0

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	—
Water Quality Meter	YSI 556	Factory Stds
Turbidity Meter	Hanna	Check Compared

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: Secondary - 1
WELL NO.: Secondary
DATE/TIME COLLECTED: 8-19-14 / 1645
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: (Groundwater) Surface Water
SAMPLE QA SPLIT: YES (NO)
SAMPLE QC DUPLICATE: YES (NO)
MS/MSD REQUESTED: YES (NO)
SPLIT SAMPLE NO.: —
DUPLICATE SAMPLE NO.: —

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	NA
Time Started	1640	Depth to Water (ft BTOC)	NA
Time Completed	1645	Water Column Length	NA
Hnu Measurements	NA	Volume of Water in Well (liters)	NA
Background	NA	Purge Rate (liters/min)	NA
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	NA
Well Head	NA	Amount Purged (liters)	NA

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1640		7.86	24.93	2.374	1.54	-191.0	29.8

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	—
Water Quality Meter	YSI 556	Factory Stds
Turbidity Meter	Hanna	check & compute

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001

SAMPLE NO.: Primary -2
WELL NO.: Primary-2

DATE/TIME COLLECTED: 8-19-14/ 1700
PERSONNEL: Duncan Briley, Stewart Farling

SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater — Surface Water
SAMPLE QA SPLIT: YES — NO
SAMPLE QC DUPLICATE: YES — NO
MS/MSD REQUESTED: YES — NO

SPLIT SAMPLE NO.: –
DUPLICATE SAMPLE NO.: –

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	NA
Time Started	1655	Depth to Water (ft BTOC)	NA
Time Completed	1700	Water Column Length	NA
Hnu Measurements	NA	Volume of Water in Well (liters)	NA
Background	NA	Purge Rate (liters/min)	NA
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	NA
Well Head	NA	Amount Purged (liters)	NA

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1655		6.63	28.52	1.680	1.92	-175.6	87.5

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	–
Water Quality Meter	YSI 556	Factory Stds.
Turbidity Meter	Hanna	Check compare

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001

SAMPLE NO.: Secondary - 2
WELL NO.: Secondary

DATE/TIME COLLECTED: 8-19-14 / 1715
PERSONNEL: Duncan Briley, Stewart Farling

SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: Groundwater / Surface Water
SAMPLE QA SPLIT: YES / NO — SPLIT SAMPLE NO.: —
SAMPLE QC DUPLICATE: YES / NO — DUPLICATE SAMPLE NO.: —
MS/MSD REQUESTED: YES / NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	NA
Time Started	1710	Depth to Water (ft BTOC)	NA
Time Completed	—	Water Column Length	NA
Hnu Measurements	NA	Volume of Water in Well (liters)	NA
Background	NA	Purge Rate (liters/min)	NA
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	NA
Well Head	NA	Amount Purged (liters)	NA

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1710	—	—	—	—	—	—	—

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe		
Water Quality Meter		
Turbidity Meter		

GENERAL COMMENTS: Dry. No volume for collecting parameters.

WATER SAMPLE COLLECTION FIELD SHEET
(Low-Flow)

GENERAL INFORMATION

SITE NAME: IP-Riegelwood: Landfill
PROJECT NO.: 31829654.00001
SAMPLE NO.: Underdrain
WELL NO.: Underdrain
DATE/TIME COLLECTED: 8-19-14/ 1725
PERSONNEL: Duncan Briley, Stewart Farling
SAMPLE METHOD: Peristaltic pump

SAMPLE MEDIA: (Groundwater) Surface Water
SAMPLE QA SPLIT: YES NO — SPLIT SAMPLE NO.: —
SAMPLE QC DUPLICATE: YES NO — DUPLICATE SAMPLE NO.: —
MS/MSD REQUESTED: YES NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2-40ml Amber Vials	HCL	TOC
1-250ml HDPE	H2SO4	COD
1-500ml Poly	HNO3	6010C Metals
1-1L HDPE	None	Cond/Anions/TDS/pH/BOD
1-1LAmber	H2SO4	TOX

WELL PURGING DATA

Date	8-19-14	Well Depth (ft. BTOC)	NA
Time Started	1725	Depth to Water (ft BTOC)	NA
Time Completed	1730	Water Column Length	NA
Hnu Measurements	NA	Volume of Water in Well (liters)	NA
Background	NA	Purge Rate (liters/min)	NA
Breathing Zone	NA	Level of Drawdown (ft. BTOC)	NA
Well Head	NA	Amount Purged (liters)	NA

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1725	—	7.50	24.24	2.498	5.34	-74.9	19.3

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Solinst	—
Water Quality Meter	YSI 556	Factory Std
Turbidity Meter	Hanna	Check Complete

GENERAL COMMENTS

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

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

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SR#

CAS Contract

Project Name: IP Ridgewood Landfill	Project Number: 31829654.00001
Project Manager: Susan Fitzgerald	Email Address: susan.fitzgerald@urs.com
Company/Address: URS Corporation, 1600 Perimeter Park Dr Suite 400, Morrisville, NC 27560	
Phone #: 919-461-1519	FAX #:
Sampler's Signature:	Sampler's Printed Name: Duncan Briley

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	SM 5310B-TOC	EPA 410.4-COD	SM 5210B-BOD	EPA 300.0 Cl, F, NO3, SO4	SW846 9060-TOC	SW846 Total Metals	EPA 120.1-Cond	SM 2540C-TDS	SM 4500H-B pH	EPA 300.0 Cations					REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE					1	3	0	0	3	2	0	0	0	0					
NUMBER OF CONTAINERS																			
Primary-1		8-19-14	1630	GW	X	X	X	X	X	X	X	X	X	X					
Secondary-1		8-19-14	1645	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
Primary-2		8-19-14	1700	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
~~Secondary-2~~		~~8-19-14~~		~~GW~~															NOT COLLECTED
Underdrain		8-19-14	1725	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					

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

- refer to martha.meyers-lee@urs.com for analytes and detections
- There are 2 COC's - Seperate reports
- There are 3 Coolers in Shipment

See QAPP ☐

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. Specialized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO #
BILL TO:

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

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

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

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

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PAGE 1 OF 1

SR#

CAS Contract

Project Name: IP Ringwood Landfill	Project Number: 31829654.00001
Project Manager: Coreen Fitzgerald	Email Address: coreen.fitzgerald@urs.com
Company/Address: URS Corp. 1600 Perimeter Park Dr. Suite 400 Morrisville, NC 27560	
Phone #: 919-461-1519	FAX #:
Sampler's Signature:	Sampler's Printed Name: Doreen Briley

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	SM 5310B-TOC	EPA 410.4-COD	SM 5210B-BOD	EPA 300.0 Cl, F, NO3, SO4	SW846 9020 TOX	SW846 Total Metals	EPA 1001-COND	SM 2540C-TDS	SM 4500H-B pH	REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE					1	3	0	0	3	2	0	0	0	
NUMBER OF CONTAINERS														
MW-1A		8-19-14	1335	GW	X	X	X	X	X	X	X	X	X	
MW-1B		8-19-14	1340	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	
MW-4A		8-19-14	1410	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	
MW 5A		8-19-14	1605	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	
MW-7A		8-19-14	1450	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	
MW-8A		8-19-14	1540	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	

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

- Refer to martha.meyers-lee@urs.com for analytes and detections
- There are two COC's with this shipment - Seperate reports
- There are 3 coolers with this shipment

See QAPP ☐

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. Specialized Forms / Custom Report

Edata ____ Yes ____ No

INVOICE INFORMATION

PO #

BILL TO:

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

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

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

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FedEx Express *NEW Package US Airbill*

FedEx Tracking Number 8061 7501 8437

Form ID No. 0200 Sender's Copy

1 From *Please print and press hard.*

Date 8-20-14 Sender's FedEx Account Number 0276-0775-6

Sender's Name STEWART FARLING Phone (252) 312-9016

Company URS CORPORATION

Address 1600 PERIMETER PARK DR. STE 400 Dept./Floor/Suite/Room

City MORRISVILLE State NC ZIP 27560

2 Your Internal Billing Reference First 24 characters will appear on invoice.

3 To Recipient's Name SAMPLE RECEIVING Phone (904) 739-2277

Company ALS ENVIRONMENTAL

Address 9143 PHILIPS HIGHWAY STE 200 Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City JACKSONVILLE State FL ZIP 32256

☐ HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

☐ HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Easy new Peel-and-Stick airbill. No pouch needed.
Apply airbill directly to your package. See directions on back.

4 Express Package Service * To most locations.
NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

- [x] FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- [ ] FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

☐ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

☒ No ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. ☐ Dry Ice Dry ice, 9, UN 1845 ____ x ____ kg

☐ Cargo Aircraft Only

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below.

☒ Sender Acct. No. in Section 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

FedEx Acct. No. Credit Card No. Exp. Date

Total Packages 4 Total Weight ____ lbs. Total Declared Value† $ ____ .00

†Our liability is limited to US$100 unless you declare a higher value. See back for details. By using this Airbill you agree to the service conditions on the back of this Airbill and in the current FedEx Service Guide, including terms that limit our liability.

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