

O'Rourke, James

From: Tim White <twhite@sanbornhead.com>
Sent: Thursday, May 11, 2023 9:50 AM
To: O'Rourke, James
Cc: Joe Gay (john.gay@casella.com); Kevin.Roy@CASELLA.COM; Bruce Grover; Kimberly Crosby; Russell Anderson; Matt Estabrooks
Subject: NCES – April 2023 notification of water quality results
Attachments: 20230511_NCES_Apr_Notify_Tbls.pdf

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Hi Jamie,

This email provides a comparison of groundwater results to background values for the April 2023 sampling event at the NCES Landfill – performed April 18 & 19. Note that PFAS results (MW-701 and B-918M) have not yet been reported by the laboratory, but will be summarized in the forthcoming April 2023 Report. Surface water results are also summarized below.

We have attached the following information:

- Table 1 compares November 2022 and April 2023 groundwater sampling results to background concentrations; December 2022 and March 2023 results for Stage VI Phase II replacement monitoring well sampling are also included on Table 1.
- Table 2 includes a discussion of initial background exceedances detected in release detection wells in April 2023.

Groundwater

- 1,4-dioxane was detected at two locations: B-304DR, and B-928D which was installed in September 2021 approximately 150 feet downgradient (north) of the B-304 wells. Concentrations ranged from 0.26 ug/l (B-928D) to 0.5 ug/l (B-304DR), below and above the AGQS (0.32 ug/l), respectively. 1,4-dioxane was not detected at the two upper wells (B-928U and B-304UR) in April 2023. The concentration at B-928D was the lowest recorded value since the well was initially sampled in September 2021. The concentration at B-304DR was at the lower end of the historical range of detections for this location (0.25 to 2.9 ug/l).
- Dichlorodifluoromethane (CFC12) was detected at B-927M at a concentration of 13 ug/l, which is within the range of concentrations detected at this location (7 to 21 ug/l). CFC12 was also detected at B-304DR at a concentration of 2.1 ug/l (primary) and 2.2 ug/l (duplicate), just above the laboratory reporting limit of 2 ug/l and at the low end of concentrations historically detected at this location (2.1 to 22 ug/l).
- As indicated on Table 2, B-919U indicated an initial detection of dissolved arsenic, which also exceeded the respective background concentration. The arsenic concentration at B-919U in April 2023 was less than the AGQS. The results from B-919U in April 2023 are not indicative of a new release.
- Other results were generally within the range of historical values, except three results which indicated period of record maximum concentrations:
 - Chloride B-918U – 46 mg/l. Previous maximum concentration was 31 mg/l in November 2016.
 - Manganese MW-701 – 1.3 mg/l. Previous maximum concentration was 1.2 mg/l in April 2018. The April 2023 value was above the AGQS (0.3 mg/l).

- Manganese B-927M – 0.26 mg/l. Previous maximum concentration was 0.25 mg/l in July 2021. The manganese concentration in April 2023 was within the range of values previously detected at the other two B-927 wells and was below the AGQS.

PFAS data have not yet been reported for MW-701 and B-918M. Other analytes at these locations were generally similar to previous results, with only minor exceptions discussed on Table 2. In total, the April 2023 data reported on Table 1 and 2 are not consistent with a new release.

Surface Water

- VOCs were not detected in the surface water samples (Main Seep [S-1] and SF-1) collected in April 2023.

-Tim

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TABLE 1
 Evaluation of Background Exceedances – Groundwater Samples – April 2023
 North Country Environmental Services, Inc.
 Bethlehem, New Hampshire
 Permit No. GWP-198704033-B-007

Sample Location	Sample Date	Sample Type	SU	uS/cm	C	mg/L	mg/L														ug/L														
			pH	Specific Conductance	Temperature	Bromide	Chemical Oxygen Demand (COD)	Chloride	Nitrate	Total Kjeldahl Nitrogen (TKN)	Antimony, Dissolved	Arsenic, Dissolved	Barium, Dissolved	Chromium, Dissolved	Iron, Dissolved	Lead, Dissolved	Manganese, Dissolved	Nickel, Dissolved	Dichlorodifluoromethane (CFCl2)	Dioxane (L,4-)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(e)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene
GW-1 (AGQS)								10		0.006	0.005	2	0.1		0.015	0.3	0.1	1000	0.32	420	420	2100	0.1	0.2	0.1	210	0.5	5	0.1	280	280	0.1	100	210	210
SMCL			6.5-8.5					250							0.3	0.05																			
Background 2022-11			6.5-9.3	186	5.6-13.5	0.1, 0.4 §	20	4	2.5	0.92	<0.001	0.0011	0.025	0.0014	0.64	<0.001	0.19	0.0027	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Background 2023-04			6.4-9.0	160	5.4-12.9	0.1, 0.4 §	15	1.8	2.5	0.92	<0.001	0.00051	0.025	0.0014	0.64	<0.001	0.19	0.0027	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Groundwater Management Wells Inside the GMZ – Impacts Anticipated from Former Unlined Landfill																																			
To be sampled in December 2022																																			
B-102S	11/1/2022	N																																	
B-102S	12/6/2022	N	6.85	109	10.7	<0.1	56	3	<0.5	<0.5	0.0013	<0.0005	0.12	<0.001	0.44	<0.001	4.6	0.0022	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B-102S	3/20/2023	N	6.61	115	9.3	<0.1	<10	3.7	0.5	<0.5	<0.001	<0.0005	0.09	<0.001	<0.05	<0.001	2	0.0019	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B-102S	4/19/2023	N																																	
B-102D	11/1/2022	N																																	
To be sampled in December 2022																																			
B-102D	12/1/2022	N	6.08	89	10.09	<0.1	<10	1.7	<0.5	<0.5	<0.001	0.061	0.0096	<0.001	9.9	<0.001	1.2	<0.001	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B-102D	3/20/2023	N	6.8	105	11.5	<0.1	<10	1.6	<0.5	0.61	<0.001	0.06	0.0092	<0.001	9.9	<0.001	1.2	<0.001	<2	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B-102D	4/19/2023	N																																	
Sampled in March 2023																																			
B-102S	11/1/2022	N	6.87	152	13.1	<0.1	<10	9.5	<0.5	<0.5							9.7		2.6	<2	<0.25														
B-103S	4/18/2023	N	7.1	125	11.7	<0.1	<10	4.3	<0.5	<0.5							8.3		2	<2	<0.25														
B-103D	11/1/2022	N	6.97	101	12.9	<0.1	<10	2	<0.5	<0.5							4.5		1.1	<2	<0.25														
B-103D	4/18/2023	N	7.08	101	12	<0.1	<10	2	<0.5	0.56							4.2		1.1	<2	<0.25														
MW-604	11/2/2022	N	7.18	298	12.9	<0.1	<10	25	<0.5	<0.5	<0.001	0.00061	0.091	<0.001	<0.05	<0.001	0.052	<0.001	<2	<0.25															
MW-604	4/18/2023	N																																	
Sampling not required as part of permit monitoring																																			

- Notes:
- Samples were collected by Sanborn Head on the dates indicated. Samples were analyzed by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire. Field duplicate samples are indicated by "FD" in the Sample Type column.
 - Only detected analytes which exceed background in one or more sample in the current rounds are presented herein. Blank cells for an analyte indicate not analyzed. Refer to the analytical laboratory reports for the complete list of parameters analyzed. Results are compared to their respective background values from time of sampling.
 - pH is presented in standard units (s.u.), specific conductance is presented in microSiemens per centimeter (uS/cm), and temperature is presented in degrees Celsius (C). Indicator parameter and metals results are presented in milligrams per liter (mg/L) which is equivalent to parts per million. Volatile organic compound (VOC) and Semi-volatile organic compound (SVOC) results are presented in micrograms per liter (ug/L) which is equivalent to parts per billion (ppb).
 - "§" indicates background value for bromide is 0.4 mg/L for wells within the groundwater management zone (GMZ) established for the site, and 0.1 mg/L for wells outside the GMZ. "<" indicates the analyte was not detected above the listed laboratory reporting limit. Blank cells indicate the sample was not analyzed for that analyte.
 - "GW-1" Groundwater Standards are from the New Hampshire Department of Environmental Services (NHDES) Contaminated Sites Risk Characterization and Management Policy (RCMP) (January 1998, with 2000 through 2018 revisions/addenda). GW-1 Groundwater Standards are intended to be equivalent to the AGQS promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). For analytes where GW-1 and AGQS values differ, the values presented in this table reflect the AGQS in the latest Env-Or 600 update. The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water. "SMCL" refers to the USEPA Secondary Maximum Contaminant Levels as presented in the National Primary Drinking Water Standards (May 2009). The SMCLs are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These analytes are not considered to present a risk to human health at the SMCL.
 - Bold values exceed the GW-1/AGQS. Italic values exceed the SMCL. Green shading indicates a concentration exceeds current background.
 - Refer to the report text and the text of Appendix A for further information about calculation and selection of background concentrations.

TABLE 2
Summary of Initial Background Concentration Exceedances
Release Detection Wells – NCES Landfill Bethlehem, NH
April 2023

Location	Analyte	Concentration / Value	Previous Max/Min	April 2023 Site Background (refer to Table 1)	GW-1 (AGQS)	SMCL	# of sampling events for analyte
Background Wells							
No initial exceedances of background							
Release Detection Wells Outside the GMZ							
No initial exceedances of background							
Release Detection Wells Inside the GMZ – Impacts Anticipated from Former Unlined Landfill							
B-919U	Arsenic, Dissolved	0.00056 mg/L	<0.0005 (Nov. 2022)	0.00051 mg/L	0.005 mg/L	NS	45
	Comments: The April 2023 results result indicated an initial arsenic detection at B-919U, which also represented an initial exceedance of the site background at this location, but was below the AGQS. VOCs were not detected and other analytes/parameters were within historical ranges. Given the general absence of other potential leachate indicators, including more soluble analytes, the data are not consistent with a new release.						
Groundwater Management Wells Inside the GMZ – Impacts Anticipated from Former Unlined Landfill							
No initial exceedances of background							

Notes:

mg/l = milligrams per liter, which are equivalent to parts per million (ppm)

1. The number of sampling events for an analyte includes primary samples and re-samples collected inclusive of the current monitoring period, but does not include field duplicates, if collected.
2. Refer to Appendix A of the Annual 2022 monitoring report for a discussion of methods used to develop background concentrations.
3. "GW-1" Groundwater Standards are from the New Hampshire Department of Environmental Services (NHDES) Contaminated Sites Risk Characterization and Management Policy (RCMP) (January 1998, with 2000 through 2018 revisions/addenda). GW-1 Groundwater Standards are intended to be equivalent to the AGQSs promulgated in Env-Or 600 (June 2015 with October 2016, September 2018, September 2019, May 2020, January 2021, and July 2021 amendments). For analytes where GW-1 and AGQS values differ, the values presented in this table reflect the AGQSs in the latest Env-Or 600 update. The AGQS/GW-1 Groundwater Standards are intended to be protective of groundwater as a source of drinking water.

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