

MEMO

To: Peter Britz and CLG

From: Mike Deyling, Chris Buckman

Re: Proposed Coakley Landfill Groundwater Management Zone Expansion

Date: December 21, 2018

This memorandum is a supplement to the Groundwater Management Zone (GMZ) Expansion discussion presented in Section 3.2 of the 2018 Groundwater Management Permit (GMP) Renewal Application submitted on October 9, 2018. It is being submitted due to a recent change in the ambient groundwater quality standard (AGQS) for 1,4-dioxane and not due to changes in site conditions or groundwater quality.

On September 1, 2018, the New Hampshire Department of Environmental Services (NHDES) ambient groundwater quality standard (AGQS) for 1,4-dioxane was lowered from 3.0 micrograms per liter (ug/L) to 0.32 ug/L in an amendment to Env-Or 603.03 of the New Hampshire Code of Administrative Rules (CAR). As documented in multiple prior submittals and detailed in a letter issued by the NHDES to Peter Britz of the CLG dated September 14, 2018, historical concentrations of 1,4-dioxane at or above the revised AGQS were detected at 339 (339BHR) and 368 Breakfast Hill Road (designated as R-3 in the Coakley Site database). However, analysis of groundwater samples from 339BHR and R-3 collected during the April 2018 sampling event did not detect 1,4-dioxane above the laboratory detection limit of 0.25 ug/L. Based on the April 2018 analysis (most recent as of the application submittal date), an expansion to the GMZ was not proposed in the GMP renewal application.

Subsequent to submittal of the GMP and in accordance with the semiannual sampling events outlined in the project Sampling and Analysis Plan (SAP), 339 BHR and R-3 were sampled during the Fall 2018 with preliminary results reported by Eastern Analytical Laboratory on October 31, 2018. Analytical results detected 1,4-dioxane at concentrations of 0.56 ug/L and 0.39 ug/L for 339BHR and R-3, respectively. Fall 2018 results are consistent with minor fluctuations shown in historical concentrations and above the revised AGQS for 1,4-dioxane. Concentrations at these locations have been remarkably consistent for several years indicating general stability in groundwater conditions.

Pursuant to ENV-Or 607.07(a) of the CAR, an expansion of the GMZ is being proposed to establish a boundary beyond which 1,4-dioxane concentrations are interpreted to be below the current AGQS.

In response to the first-time detection of 1,4-dioxane above the recently lowered AGQS at 339 and 368 Breakfast Hill Road (R-3), bottled water was supplied to these properties by the CLG. Point of entry water treatment systems were then installed on November 8 and 9, 2018 with pre-

mid- and post-treatment samples collected on November 12, 2018. Concentrations of 1,4-dioxane in mid- and post-treatment samples at both property locations were below the laboratory detection limit of 0.2 ug/L, indicating that the water treatment systems are effective in reducing the concentration of 1,4-dioxane to below the AGQS.

GMZ EXPANSION DESCRIPTION

Expansion of the GMZ is being proposed due to the lowering of the 1,4-dioxane AGQS. While 1,4-dioxane concentrations have fluctuated historically, Site-wide data have generally shown declining or stable concentrations during the past 5 years since the previous GMP renewal was executed in 2013. The proposed GMZ expansion is illustrated in **Figure 1** and **Figure 2** and includes the residential property at 368 Breakfast Hill Road (R-3), an abutting vacant Lot to 368 Breakfast Hill Road (Tax Map 7, Lot 11A), and a portion (southeast corner) of the Breakfast Hill Golf Club property at 339 Breakfast Hill Road. Parcels included within the proposed GMZ expansion, including those within the current GMZ, are listed in **Table 1** with abutting parcels listed in **Table 2**.

The proposed expansion boundary was selected based on several factors that included the lowered AGQS for 1,4-dioxane, historic concentrations of 1,4-dioxane in groundwater samples collected from monitoring and residential water supply wells (**Table 3**), and anticipated downgradient attenuation of 1,4-dioxane.

East Boundary

- No detections of 1,4-dioxane above the laboratory detection limit (0.2 ug/L) in groundwater samples collected via interval packer sampling within the Chinburg Well (December 2017); and,
- Concentrations of 1,4-dioxane at adjoining residential water supply wells at 19 and 21 Stone Meadow Way below the laboratory detection limit (0.2 ug/L).

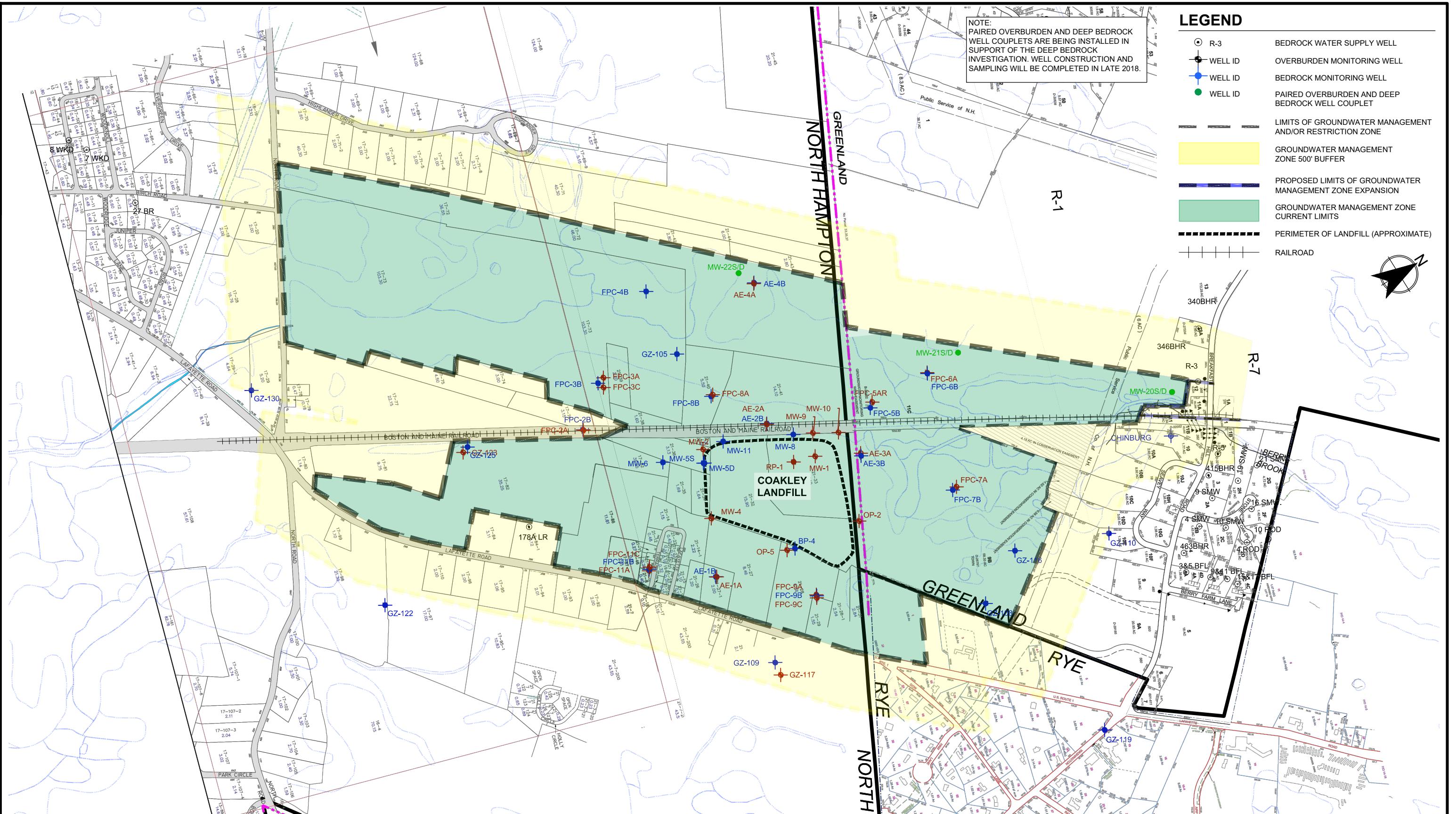
North Boundary

- Concentrations of 1,4-dioxane at 339 Breakfast Hill Road (0.56 ug/L) and 368 Breakfast Hill Road (0.39 ug/L), both slightly above the current AGQS (0.32 ug/L);
- Concentrations of 1,4-dioxane at newly installed bedrock boring MW-20 (0.41 ug/l); and,
- Anticipated attenuation of 1,4 dioxane concentrations downgradient (northeast) of the 339 Breakfast Hill Road property.

West Boundary

- Reported concentrations of 1,4-dioxane at residential water supply wells 340 and 346 Breakfast Hill Road below the laboratory detection limits (0.2 ug/L) (**Table 3**).

FIGURES



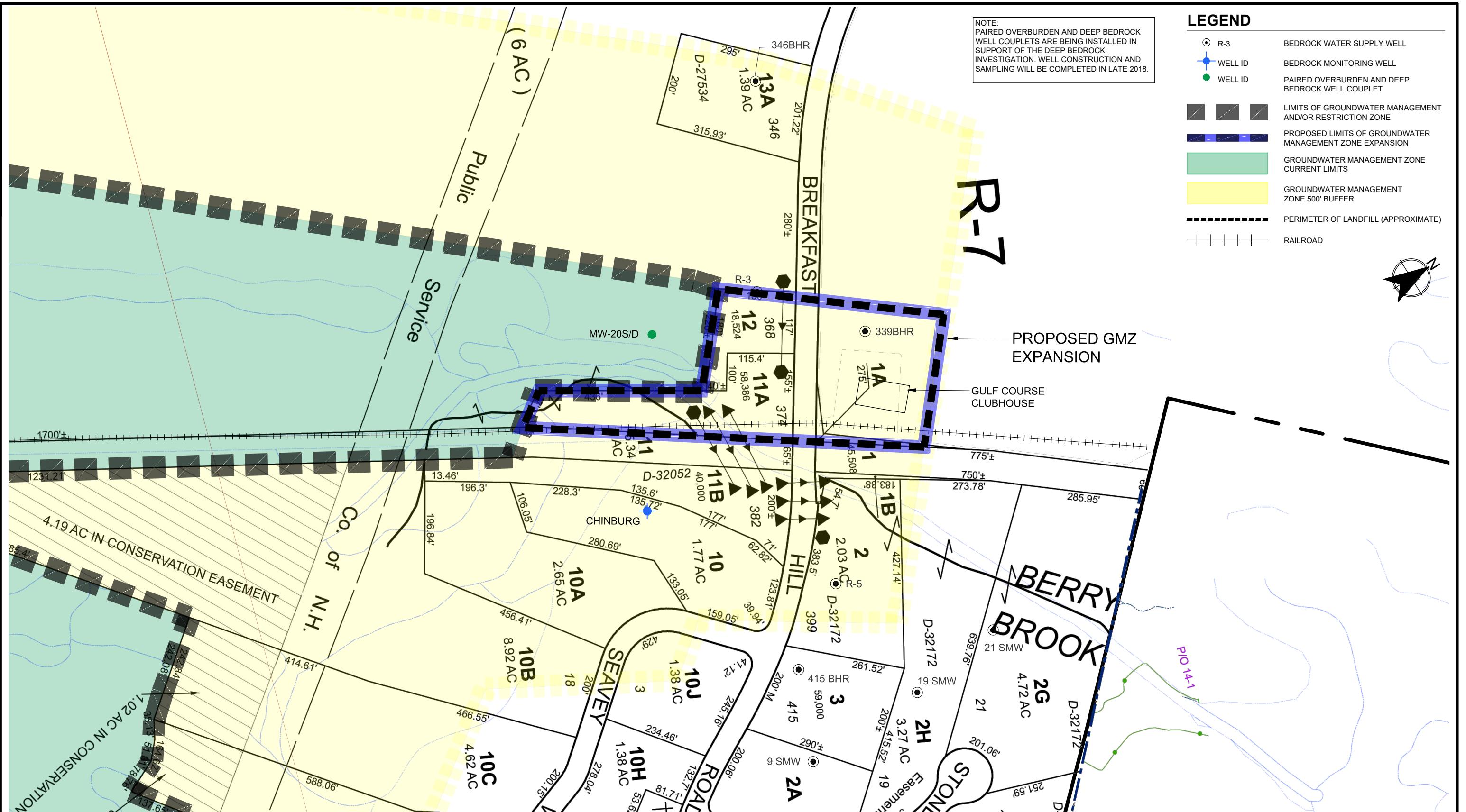
PROJECT TITLE:
COAKLEY LANDFILL SUPERFUND SITE
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE
SHEET TITLE:
SITE PLAN AND GROUNDWATER MANAGEMENT ZONE
TAX MAP OVERLAY

DWG: **FIGURE 1**

BY: BLQ REV:
DATE: 2018-10-03 REV DATE: 2018-10-18

JN: 10424.021 APPROVED BY: CB ISSUE:
SCALE: 1"=800' CHECKED BY: CB ISSUE DATE: 2018-10-05

NOTE:
1. INFORMATION SHOWN ON THIS PLAN IS COURTESY OF NH GRANIT
ONLINE MAP SERVICES.
FOR REVIEW
NOT FOR CONSTRUCTION



PROJECT TITLE:
COAKLEY LANDFILL SUPERFUND SITE
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE
SHEET TITLE:
PROPOSED GMZ EXPANSION AREA
TAX MAP OVERLAY

DWG: **FIGURE 2**

BY:	BLQ	REV:	BOUNDARY
DATE:	2018-12-05	REV DATE:	2018-12-19
JN:	10424.021	APPROVED BY:	CB
SCALE:	1"=200'	ISSUE:	
		CHECKED BY:	CB
		ISSUE DATE:	

NOTE:
1. INFORMATION SHOWN ON THIS PLAN COURTESY OF NH GRANIT
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TABLES

TABLE 1
 List of Parcels Within Proposed Groundwater Management Zone
 2018 Groundwater Management Permit Renewal Application
 Coakley Landfill - North Hampton, New Hampshire

Map	Lot	Owner	Property Address	Land Use	Is Public Water Available?	Property Deed Reference (Book/Page)	Institutional Control (1)	Access Agreement for Monitoring (2)	Groundwater Extraction Deed Restriction (3)	Well(s) on Property (4)
Town of Rye										
6	37	SNS LLC	0 Lafayette Road	Part of Map 21 / Lot 31 in North Hampton	Yes	5238/2463	GMZ Notice (2008)			
10	1	Malcolm E. Smith III	0 Lafayette Road	Commercial/Residential	Yes	5079/0262	GMZ Notice (2008)			
Town of North Hampton										
17	72	Mark Smith and Coleen Weeks	67 North Road	Frontage on North Road Developed	Yes	5545/1932	GMZ Notice (2008)	4151/794 (Expires Sept. 12, 2018)		AE-4A/B
17	73	Joseph F and Yolanda Fitzgerald	65 North Road	Residence on South Portion	Yes	3007/2807	GMZ Notice (2008)	Verbal (1992, ABO)		FPC-4A/B
17	82	Granite Post Green MHC	160 Lafayette Road	Mobile Home Park	Yes	5778/2869	GMZ Notice (2008)	Verbal (Pre OU-1 CD, ABO)		GZ-123, GZ-125
17	86	Margaret Fucci Rev Trt	180 Lafayette Road	Commercial	Yes	5694/2471	GMZ Notice (2008)			
17	87	Lori A Lessard Trustee	186 Lafayette Road	Commercial	Yes	2760/2099	GMZ Notice (2008)			
21	8	Joseph J and Helen M McKittrick	188 Lafayette Road	Residential	Yes	2641/2656	GMZ Notice (2008)			
21	10	John J Sr and Dorleena Wylie	8A Lafayette Terrace	Residential	Yes	4030/2567	GMZ Notice (2008)			
21	11	Seth McAlister	12A Lafayette Terrace	Residential	Yes	5044/102	GMZ Notice (2008)			
21	12	William and Christine Adinolfo	16A Lafayette Terrace	Residential	Yes	2963/1721	GMZ Notice (2008)			
21	14	Cory H. Towne-Kerr	20 Lafayette Terrace	Residential	Yes	5913/1735	GMZ Notice (2008)			
21	14-1	James A C Jones	40-42 Lafayette Terrace	Auto Body Shop	Yes	4451/1104	GMZ Notice (2008)			
21	15	Bridget O'Reilly	44 Lafayette Terrace	Residential	Yes	5800/0912	GMZ Notice (2008)			
21	16	Rodney K Booker Trustee	46 Lafayette Terrace	Residential	Yes	5196/2724	GMZ Notice (2008)			
21	17	Judith J and Bernard P Tracey	1 Lafayette Terrace	Residential	Yes	2450/687	GMZ Notice (2008)			
21	18	Beth Stevenson	3 Lafayette Terrace	Residential	Yes	5846/2099	GMZ Notice (2008)			
21	19	Richard P and Kimberly M Bartlett	5 Lafayette Terrace	Residential	Yes	3824/2799	GMZ Notice (2008)	Verbal (1992, ABO)		FPC-11A/B/C
21	20	Alexis J Perron III	9 Lafayette Terrace	Residential	Yes	3088/1774	GMZ Notice (2008)			
21	21	Brendon S. Macmahon	11 Lafayette Terrace	Residential	Yes	5895/2865	GMZ Notice (2008)			
21	22	Edward and Anita Gabree	15 Lafayette Terrace	Residential	Yes	3013/2221	GMZ Notice (2008)			
21	23	Brendon S. Macmahon	Part of 11 Lafayette Terrace	Residential	Yes	5895/2865	GMZ Notice (2008)			
21	24	Ryan J. Thompson	43 Lafayette Terrace	Residential	Yes	5462/0484	GMZ Notice (2008)			
21	25	ZCMMXIIVOOOOOIIIIISINH LTD Partnership	45 Lafayette Terrace	Residential	Yes	2530/1863	GMZ Notice (2008)			
21	26	Gozinta LLC	198 Lafayette Road	Service Shop	Yes	4275/904	GMZ Notice (2008)			
21	27	James AC Jones	206 Lafayette Road	North Hill Nursery (Horticultural Sales)	Yes	5558/2126	GMZ Notice (2008)	3211/1275 (Expires April 25, 2027)		MW-4 & Gas Probe M-5
21	27-1	JLCL Real Estate Development LLC	200 Lafayette Road	Shopping Center	Yes	5914/997	GMZ Notice (2008)	Not Registered (Yearly Auto-Renewal Clause)		AE-1A/B
21	28	Carolyn Beaulieu Trustee	216 Lafayette Road	Vacant	Yes	5392/2281	GMZ Notice (2008)	3198/1005 (Expires Jan. 22, 2027)		OP-5, BP-4 & Gas Probe M-6
21	28-1	Leo J Crotty Jr	216 Lafayette Road	Commercial	Yes	2475/1278	GMZ Notice (2008)			
21	29	Enginity Real Estate LLC	212 Lafayette Road	Commercial/Residential	Yes	5456/1958	GMZ Notice (2008)	Verbal (2001)		FPC-9A/B/C
21	31	SNS LLC	224 Lafayette Road	Commercial/Residential	Yes	5238/2463	GMZ Notice (2008)			
21	32	Coakley Landfill LLC	Coakley Landfill	Coakley Landfill	No	3117/2934	GW Restriction	3857/1189	3857/1189	RMW-3, MW-2, MW-8, MW-9, MW-10, MW-11
21	33	Coakley Landfill LLC	Coakley Landfill	Coakley Landfill	No	3117/2934	GW Restriction			
21	34	James A C Jones	Lafayette Road Rear	Vacant - Equipment Storage	Yes	4451/1102	GW Restriction		4001/133	
21	35	James A C Jones	Lafayette Terrace Rear	Vacant - Equipment Storage	Yes	4451/1102	GW Restriction		4001/137	
21	36	James A C Jones	Lafayette Terrace Rear	Vacant - Equipment Storage	Yes	4451/1102	GW Restriction	4001/137	4001/137	MW-5S, MW-5D, MW-6
21	37	Town of North Hampton	Atlantic Avenue	Vacant	No	3415/1661	GW Restriction		3857/1193	
21	38	Boston and Maine Corp. c/o Guilford Transportation, Inc.	North Road Rear	Vacant	No	See Note #5				
21	39	Joan, Breen and Denise Grenier-Winther, Susan Sherr, and Caryn Blake	North Road Rear	Vacant	No	5142/2979	GW Restriction		3857/1198	
21	40	Boston and Maine Corp. c/o Guilford Transportation, Inc.	North Road Rear	Vacant - Railroad Right of Way	No	See Note #5			Verbal (1992, ABO)	
21	41	Elmer M Sewall	North Road Rear	Vacant	No	1340/524	GMZ Notice (2008)	3211/1272 (No expiration date)		AE-2A/B
21	46	John J Sr and Dorleena L Wylie	10 Lafayette Terrace / Part of 8A	Residential - Part of Map 21 / Lot 10	Yes	3219/2588	GMZ Notice (2008)			
Town of Greenland										
R1	12	Patrick J. and Melisa A St. John	368 Breakfast Hill Road	Residential	No	5615/2540	GMZ Notice (Proposed)			R-3
R1	11A	Boston and Maine Corp. c/o Guilford Transportation, Inc.	390 Breakfast Hill Road	Vacant	No	573/105	GMZ Notice (Proposed)			
R1	11	Boston and Maine Corp. c/o Guilford Transportation, Inc.	Not Listed	Vacant - Railroad Right of Way	No	See Note #5				
R1	13	Elmer M Sewall Rev Trust 96 Barbara E Sewall Rev Trust 96	340 Breakfast Hill Road (Portion Only)	Portion of Property within GMZ is Vacant	No	3159/928	GMZ Notice (2008/Proposed)	3211/1268 (No Expiration date)		FPC-5A/B, FPC-6A/B
R1	9B	Town of Greenland	560 Breakfast Hill Road	Vacant - Formerly Part of Coakley Property	No	3454/1131	GMZ Notice (2008)	Coakley Landfill Inc. CD		AE-3A/B, OP-2, FPC-7A/B
R7	19	Breakfast Hill Golf Club LLC	339 Breakfast Hill Road	Golf Course	No	3380/1090				
R1	1A	Boston & Maine Corp	391 Breakfast Hill Road	Vacant Land	No	298/417				

Notes:

1. Institutional Controls: GMZ Notice = Use of Groundwater as a Drinking Water Supply is prohibited by the NHDES GMP GMZ; GMZ Notice (Proposed) = Property is proposed for inclusion into GMZ in 2013; GW Restriction = Refer to Note #3
2. Access Agreements: Book and Page with expiration date indicated if applicable; ABO = Agreement by Others; Coakley Landfill Inc. CD = access per Coakley Landfill Inc. Consent Decree; Agreements also allow access for other monitoring activities
3. Groundwater Extraction Deed Restrictions apply to all groundwater extraction, with the exception that groundwater extraction is allowed for carrying out the remedies specified in the OU-1 and OU-2 Consent Decrees
4. Note that well couplet FPC-2A/B is located in the rail road right of way and is not in the GMZ. Monitoring well not currently monitored are not included.
5. Three properties (right of ways) owned by Boston and Maine Corp. c/o Guilford Transportation, Inc., are located within the GMZ. However, there is no requirement for either a deed restriction or deed notice, because properties constituting rights of way are not subject to these requirements under New Hampshire law. Source: email from Andrew Hoffman (NHDES) to Coakley Landfill Group (August 2, 2005).

TABLE 2
 List of Parcels Adjacent to Groundwater Management Zone
 2018 Groundwater Management Permit Renewal Application
 Coakley Landfill - North Hampton, New Hampshire

Map	Lot	Owner	Property Address	Land Use	Is Public Water Available?	Property Deed Reference (Book/Page)	Institutional Control (1)	Access Agreement for Monitoring (2)	Groundwater Extraction Deed Restriction (3)	Well(s) on Property (4)
Town of Rye										
10	69	Investlogic, LLC	39 Dow Lane	Residential	Yes	5885/2827				
10	68	Connecting Point Realty, LLC	56 Dow Lane	Residential	Yes	4687/1869				
6	36	State of New Hampshire	0 Lafayette Road	NH DOT Yard	No	Not listed				
Town of North Hampton										
21	43	Mark Smith, Coleen Weeks, Brenda Smith	North Road Rear	Vacant Land	No	5545/1932				
21	42	Mark Smith, Coleen Weeks, Brenda Smith	North Road Rear	Vacant Land	No	5545/1932				
17	71	Walter E Nordstrom	North Road	Vacant Land	No	5545/1930				
20	12	MAC Properties Lafayette LLC	227 Lafayette Road	Vacant Land	No	5834/176				
21	1	J&S Greystone Village LLC	223 Lafayette Road	Office Building		5665/2352				
21	2	Yvon Cormier North Development Co LLC	219 Lafayette Road	Self Storage		5718/191				
21	3	Daniel Pelletier	215 Lafayette Road	Restaurant		4706/944				
21	4	Berkshire Real Estate LLC	209 Lafayette Road	Auto Sales/Repair		3728/2356				
21	5	James AC Jones	205 Lafayette Road	Vacant Land	No	4481/338				
21	6	James Jones	207 Lafayette Road	Auto Sales/Repair		4481/338				
21	7	Joseph Roy Realty LLC	203 Lafayette Road	Auto Sales/Repair		4838/2478				
21	7-200	Crown Properties & Home Sales LLC	203 Lafayette Road	Self Storage/Mobile Home Park		3194/2583				
18	16	Thirteen Acres, LLC	North Road	Vacant Land	No	4976/2320				
17	20	Michael C and Cheryl A Oiler Trustees	41 Birch Road	Residential		5386/1607				
17	28	Glemco Realty Corp	136 Lafayette Road	Office/Warehouse		5890/41				
17	29	Abella Properties LLC	144 Lafayette Road	Commercial		5789/2975				
17	77	John J Cafarella Trustee, Lacey Teddy Trust	41 North Road	Residential		5918/2931				
17	75	John F. Fitzgerald	North Road	Vacant Land	No					
17	74	Town of North Hampton	North Road	Vacant Land	No	3415/1661				
17	76	Boston & Maine Corp	North Road	Vacant Land	No					
17	81	Peter C Rhoades	Lafayette Road	Vacant Land	No	5527/2373				
17	80	Peter C Rhoades	148 Lafayette Road	Residential		5527/2373				
17	98	Mary D Hale Trustee, Mary D Hale Rev Trust	Lafayette Road	Vacant Land	No	5599/614				
17	99	Seacoast Birth and Family Connection LLC	165 Lafayette Road	Residential		5557/336				
17	97	Henry O McFarland, Mcfarland Realty Trust	175 Lafayette Road	Auto Sales/Repair		3799/2051				
17	110	Henry O McFarland, Mcfarland Realty Trust	177 Lafayette Road	Vacant Land	No	3799/2051				
17	96	One Seventy Nine Lafayette Road RLTY LLC	179-181 Lafayette Road	Commercial		5294/31				
17	94	James AC Jones	187 Lafayette Road	Commercial		3661/1384				
17	93	David B Tilton	193 Lafayette Road	Warehouse		2339/413				
17	92	David B Tilton Family Limited Partnership	195 Lafayette Road	Accessory Building		5087/520				
17	84	Henry O McFarland, Mcfarland Realty Trust	170 Lafayette Road	Commercial		3799/2051				
17	84-1	Dean E and Cora A Atevens Trustee, Dean E and Cora A Stevens Trust	172-178 Lafayette Road	Commercial/Residential		3049/461				
Town of Greenland										
R7	15*	Breakfast Hill Golf Club LLC	Breakfast Hill Road	Golf Course	No	5181/1544				
R7	19	Breakfast Hill Golf Club LLC	339 Breakfast Hill Road	Golf Course	No	3380/1090				
R7	17*	Boston & Maine Corp	Not Listed	Vacant - Railroad Right of Way	No	See Note #5				
R7	11*	Richard and Mary Coombs	22 Coombs Farm Road	Residential		1774/47				
R7	88*	Paul J and Marianne J Moores Revocable Trust	56 Windsor Green Road	Residential		5781/640				
R7	87*	Richard B and Kerri L Winsor	48 Windsor Green Road	Residential		3454/1088				
R7	84*	Rhonda Fendelett, Quentin Family Rev Trust	40 Windsor Green Road	Residential		5873/2605				
R7	83*	Paul and Teresa M Vitagliano	32 Windsor Green Road	Residential		5871/0071				
R7	80*	Ira S. and Jennifer B Lehrer	26 Windsor Green Road	Residential		5541/0366				
R7	79*	Joseph C and Lyn F Leddy	18 Windsor Green Road	Residential		3556/0881				
R7	22*	Alan P Eves	192 Breakfast Hill Road	Residential		4830/439				
R7	75*	Hachemi E Aliouche	2 Windsor Green Road	Residential						
R7	76*	Michael Loomis	10 Windsor Green Road	Residential		3489/2830				
R8	1*	Town of Greenland	00 Ocean Road	Vacant Land	No	3346/1011				
R8	3*	Eric C and Catherine M Colen Trustees, E and C Colen Family Revocable Trust of 2007	00 Ocean Road	Vacant Land	No	4856/168				
R1	10B	Taylor Albertini	18 Seavey Way	Residential		5917/1753				
R1	11B	William L and Tina Wati P Boddy	382 Breakfast Hill Road	Vacant Land	No	4377/563				
R1	10C	Chinberg Development LLC	C Seavey Way	Vacant Land	No	5823/583				
R1	10D	Chinberg Development LLC	36 Seavey Way	Vacant Land	No	5823/583				
R1	9A	Bethany Church of Rye, NH Inc	500 Breakfast Hill Road	Church		3377/2059				
R1	1	Boston & Maine Corp	Not Listed	Vacant - Railroad Right of Way	No	See Note #5				

Notes:

- Institutional Controls: GMZ Notice = Use of Groundwater as a Drinking Water Supply is prohibited by the NHDES GMP GMZ; GMZ Notice (Proposed) = Property is proposed for inclusion into GMZ in 2013; GW Restriction = Refer to Note #3
- Access Agreements: Book and Page with expiration date indicated if applicable; ABO = Agreement by Others; Coakley Landfill Inc. CD = access per Coakley Landfill Inc. Consent Decree; Agreements also allow access for other monitoring activities
- Groundwater Extraction Deed Restrictions apply to all groundwater extraction, with the exception that groundwater extraction is allowed for carrying out the remedies specified in the OU-1 and OU-2 Consent Decrees
- Note that well couplet FPC-2A/B is located in the rail road right of way and is not in the GMZ. Monitoring well not currently monitored are not included.
- Three properties (right of ways) owned by Boston and Maine Corp. c/o Guilford Transportation, Inc., are located within the GMZ. However, there is no requirement for either a deed restriction or deed notice, because properties constituting rights of way are not subject to these requirements under New Hampshire law. Source: email from Andrew Hoffman (NHDES) to Coakley Landfill Group (August 2, 2005).

* - Property abuts parcel where the GMZ is a surveyed subdivision of the primary parcel.

TABLE 3
 Summary of Analytical Results for Off-Site Water Supply Wells
 Coakley Landfill - North Hampton, New Hampshire

SAMPLE IDENTIFICATION	EPA CL	NHDES AGQS	EPA MCL	67 RCD	67 RCD	67 RCD	67 RCD	4 SMW	4 SMW Post	4 SMW	4 SMW	4 SMW	9 SMW	9 SMW Post	9 SMW	9 SMW	9 SMW	10 SMW	10 SMW Post	10 SMW	10 SMW	10 SMW	10 SMW			
DATE SAMPLED				26-May-16	26-Jan-17	12-Sep-17	7-May-18	4-Oct-18	26-May-16	25-Jan-17	13-Sep-17	25-Apr-18	1-Oct-18	26-May-16	25-Jan-17	19-Sep-17	24-Apr-18	26-Sep-18	25-May-16	25-May-16	24-Jan-17	12-Sep-17	25-Apr-18	25-Sep-18		
VOLATILE ORGANIC COMPOUNDS																										
Methyl tert-butyl ether (ug/L)	-	13	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Toluene (ug/L)	-	1000	1000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1,4-dioxane (ug/L)	3	0.32	-	<0.25	<0.25	<0.25	<0.25	<0.2	<0.25	NA	<0.25	<0.25	<0.25	<0.2	<0.25	NA	<0.25	<0.25	<0.2	<0.25	<0.25	<0.25	<0.25	<0.2		
METALS																										
Arsenic, total (mg/L)	0.01	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Manganese, total (mg/L)	0.3	0.84	-	0.173	0.21	0.23	<0.005	<0.005	0.143	<0.005	0.034	0.12	0.048	0.088	0.143	<0.005	0.14	0.12	0.13	0.14	0.143	<0.005	0.088	0.240	0.120	0.270
FIELD PARAMETERS																										
Temperature (degrees Celcius)	-	-	-	11	8	12	11	12	12	NA	12	13	11	12	11	NA	9	11	10	12	11	NA	11	11	12	
pH (standard units)	-	-	-	7.7	7.5	7.2	7.9	7.4	6.8	NA	6.6	6.9	6.6	6.6	7.9	NA	8.2	7.4	8.1	8.2	6.8	NA	6.8	6.7	6.6	
Conductivity (uS/cm)	-	-	-	286	256	310	322	352	663	NA	522	683	572	654	435	NA	346	434	390	415	411	NA	323	577	237	498
Dissolved Oxygen (mg/L)	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	NA	0.9	0.9	0.9	0.7	4.5	NA	<0.5	<0.5	<0.5	<0.5	3.3	NA	3.6	1.2	6.2	3.5
Turbidity (NTU)	-	-	-	<5	<5	8	5	<5	<5	NA	<5	<5	<5	<5	5	NA	<5	<5	<5	<5	NA	<5	7	<5	9	
Oxidation/Reduction Potential (mV)	-	-	-	-140	-136	-92	40	126	93	NA	153	50	136	138	-194	NA	-205	171	-160	-222	53	NA	74	60	130	177
PER- & POLY-FLUORINATED ALKYL SUBSTANCES BY MODIFIED 537 - (ng/L)																										
Date Sampled	EPA HA	NHDES AGQS		67 RCD	67 RCD	67 RCD	67 RCD	4 SMW	4 SMW Post	4 SMW	4 SMW	4 SMW	9 SMW	9 SMW Post	9 SMW	9 SMW	9 SMW	10 SMW	10 SMW Post	10 SMW	10 SMW	10 SMW	10 SMW			
				NA	26-Jan-17	12-Sep-17	7-May-18	2-Oct-18	11-Jul-16	NA	25-Jan-17	13-Sep-17	25-Apr-18	1-Oct-18	11-Jul-16	NA	25-Jan-17	19-Sep-17	24-Apr-18	11-Jul-16	NA	24-Jan-17	12-Sep-17	25-Apr-18	25-Sep-18	
Perfluorobutanesulfonic acid (PFBS)	---	---		NA	<8	<2.30	<2.19	<1.84	<16	NA	<8	<2.33	<2.2	<1.78	<16	NA	<8	<2.46	<2.18	<1.95	<16	NA	<8	<2.27	<2.2	<1.77
Perfluoroheptanoic acid (PFHPA)	---	---		NA	<8	<2.72	<2.58	<0.61	22B	NA	<8	<2.75	<2.59	0.791	<16	NA	<8	<2.90	<2.58	<0.65	77B	NA	<8	<2.68	<2.6	<0.58
Perfluorohexanesulfonic acid (PFHxS)	---	---		NA	<8	<1.23	<1.17	<0.97	<8	NA	<8	2.523	<1.17	<0.94	<8	NA	<8	<1.31	3.583	3.971	<8	NA	<8	1.991	<1.17	<0.93
Perfluorooctanoic acid (PFOA)	70	70		NA	<8	2.03J	<1.15	<0.67	<8	NA	<8	4.57J	2.29J	2.08J	<8	NA	<8	<1.29	2.39J	2.32J	<8	NA	<8	2.81J	<1.15	<0.64
Perfluorononanoic acid (PFNA)	---	---		NA	<8	<2.19	<2.09	<0.83	<8	NA	<8	<2.22	<2.09	<0.81	<8	NA	<8	<2.35	<2.08	<0.88	<8	NA	<8	<2.16	<2.1	<0.80
Perfluorooctanesulfonic (PFOS)	70	70		NA	<8	<1.10	<1.04	<0.83	<16	NA	<8	1.87J	1.21J	<0.80	<16	NA	<8	<1.17	<1.04	<0.88	<16	NA	<8	<1.08	<1.05	<0.80
Combination of PFOA and PFOS	---	70		NA	ND	2.03J	ND	ND	ND	NA	ND	6.44J	3.5J	2.08J	ND	NA	ND	ND	2.39J	2.32J	ND	NA	ND	2.81J	ND	ND

TABLE 3
 Summary of Analytical Results for Off-Site Water Supply Wells
 Coakley Landfill - North Hampton, New Hampshire

SAMPLE IDENTIFICATION	EPA CL	NHDES AGQS	EPA MCL	16 SMW	16 SMW Post	16 SMW	16 SMW	16 SMW	19 SMW	19 SMW Post	19 SMW	19 SMW	21 SMW	21 SMW Post	21 SMW	21 SMW Dup	21 SMW	21 SMW Dup	21 SMW	21 SMW Dup	4 ROD	4 ROD Post	4 ROD	4 ROD	4 ROD					
DATE SAMPLED				27-May-16	27-May-16	26-Jan-17	18-Sep-17	23-Apr-18	26-Sep-18	27-May-16	23-Jan-17	13-Sep-17	7-May-18	26-Sep-18	25-May-16	23-Jan-17	12-Sep-17	25-Apr-18	25-Sep-18	25-Sep-18	26-May-16	26-May-16	23-Jan-17	18-Sep-17	26-Apr-18	3-Oct-18				
VOLATILE ORGANIC COMPOUNDS																														
Methyl tert-butyl ether (ug/L)	-	13	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA					
Toluene (ug/L)	-	1000	1000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA					
1,4-dioxane (ug/L)	3	0.32	-	<0.25	NA	<0.25	<0.25	<0.2	<0.25	NA	<0.25	<0.25	<0.2	<0.25	NA	<0.25	<0.25	<0.25	<0.25	<0.2	<0.2	<0.25	<0.25	<0.25	<0.2					
METALS																														
Arsenic, total (mg/L)	0.01	0.01	0.01	0.011	<0.001	<0.001	<0.001	0.0014	0.002	<0.001	<0.001	<0.001	0.0012	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001					
Manganese, total (mg/L)	0.3	0.84	-	2.13	0.016J	0.028	0.017	0.020	0.91	0.153	0.009J	0.063	0.075	0.18	0.21	0.063	<0.005J	0.064	0.070	0.070	0.079	0.078	0.089	0.088	0.343	<0.005J				
FIELD PARAMETERS																														
Temperature (degrees Celcius)	-	-	-	10	NA	10	13	9	13	10	NA	10	11	10	12	11	NA	11	11	NA	10	11	NA	10	12	10	11			
pH (standard units)	-	-	-	7.5	NA	7.3	7.1	7.3	7.5	8.0	NA	8.3	8.0	7.5	7.8	8.5	NA	8.4	8.0	NA	8.4	NA	8.4	NA	7.0	7.1	6.6	6.9		
Conductivity (uS/cm)	-	-	-	549	NA	428	586	408	620	852	NA	705	750	820	830	681	NA	671	707	NA	652	NA	739	NA	609	NA	589	626	616	638
Dissolved Oxygen (mg/L)	-	-	-	1	NA	0.8	0.9	1.3	0.6	0.5	NA	<0.5	0.6	<0.5	<0.5	0.6	NA	0.6	<0.5	NA	<0.5	NA	1.1	NA	<0.5	<0.5	0.6	0.6		
Turbidity (NTU)	-	-	-	<5	NA	9	<5	<5	<5	NA	<5	<5	<5	<5	<5	NA	<5	6	NA	<5	NA	<5	NA	<5	<5	<5	<5	<5		
Oxidation/Reduction Potential (mV)	-	-	-	75	NA	159	52	18	149	-167	NA	-188	-172	-137	-114	-188	NA	-167	-125	NA	-106	NA	-183	NA	-37	NA	-50	-13	-27	-10
PER- & POLY-FLUORINATED ALKYL SUBSTANCES BY MODIFIED 537 - (ng/L)																														
Date Sampled	EPA HA	NHDES AGQS		16 SMW	16 SMW Post	16 SMW	16 SMW	16 SMW	19 SMW	19 SMW Post	19 SMW	19 SMW	21 SMW	21 SMW Post	21 SMW	21 SMW Dup	21 SMW	21 SMW Dup	21 SMW	21 SMW Dup	4 ROD	4 ROD Post	4 ROD	4 ROD	4 ROD					
Perfluorobutanesulfonic acid (PFBS)	---	---		NA	NA	<8	<2.23	<2.21	<1.85	<16	NA	<8	<2.21	<2.23	<1.79	<16	NA	<8	<2.24	<2.27	<2.33	<2.24	<1.86	<1.83	<16	NA	<8	4.05J+	4.85J	4.76
Perfluorooctanoic acid (PFOA)	---	---		NA	NA	<8	<2.63	<2.61	1.02J	918	NA	<8	<2.60	<2.63	<0.59	<16	NA	<8	<2.64	<2.67	<2.74	<2.64	<0.60	<16	NA	<8	<2.59	<2.61	<0.61	
Perfluorohexanesulfonic acid (PFHxS)	---	---		NA	NA	<8	<1.19	<1.18	<0.98	<8	NA	<8	<1.18	<1.19	1.41J	<8	NA	<8	<1.20	<1.21	<1.24	<1.19	1.33J	1.01J	<8	<8	1.68J	2.56J	<0.98	
Perfluorooctanoic acid (PFOA)	70	70		NA	NA	<8	<1.17	2.92J	1.52J	<8	NA	<8	1.77J	<1.17	<0.65	<8	NA	<8	2.21J	<1.19	<1.22	<1.17	<0.68	<0.66	<8	NA	<8	<1.15	1.18J	0.74J
Perfluorononanoic acid (PFNA)	---	---		NA	NA	<8	<2.13	<2.11	<0.84	<8	NA	<8	<2.10	<2.12	<0.81	<8	NA	<8	<2.14	<2.16	<2.22	<2.13	<0.84	<0.83	<8	NA	<8	<2.09	<2.11	<0.84
Perfluorooctanesulfonic acid (PFOS)	70	70		NA	NA	<8	<1.06	<1.05	<0.83	<16	NA	<8	<1.05	<1.06	<0.81	<16	NA	<8	<1.07	<1.08	<1.11	<1.07	<0.84	<0.82	<16	NA	<8	<1.05	<1.05	<0.83
Combination of PFOA and PFOS	---	70		NA	NA	ND	ND	2.92J	1.52J	ND	NA	ND	1.77J	ND	ND	NA	ND	2.21J	ND	ND	ND	ND	ND	NA	ND	ND	1.18J	0.74J		

TABLE 3
 Summary of Analytical Results for Off-Site Water Supply Wells
 Coakley Landfill - North Hampton, New Hampshire

SAMPLE IDENTIFICATION	EPA CL	NHDES AGQS	EPA MCL	340 BHR 11-Jul-16	340 BHR 27-Jan-17	340 BHR 21-Sep-17	340 BHR 27-Apr-18	340 BHR NA	463 BHR 24-Jan-17	463 BHR 13-Sep-17	463 BHR 26-Apr-18	463 BHR 26-Sep-18	463 BHR 14-Sep-17	7 WKD 26-Apr-18	7 WKD 2-OCT-18	7 WKD 14-Sep-17	8 WKD 26-Apr-18	8 WKD 3-Oct-18	8 WKD 14-Sep-17	27 BR 7-May-18	27 BR 27-Sep-18	27 BR 19-Sep-17	178A LR 1-May-18	178A LR 27-Sep-18	178A LR 2-Oct-18	67 NR	
DATE SAMPLED																											
VOLATILE ORGANIC COMPOUNDS																											
Methyl tert-butyl ether (ug/L)	-	13	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Toluene (ug/L)	-	1000	1000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1,4-dioxane (ug/L)	3	0.32	-	NA	<0.25	<0.25	<0.25	<0.20	NA	<0.25	<0.25	<0.25	<0.20	<0.25	<0.25	<0.20	<0.25	<0.25	<0.20	<0.25	<0.25	<0.20	0.29	<0.25	0.21	<0.20	
METALS																											
Arsenic, total (mg/L)	0.01	0.01	0.01	NA	<0.001	<0.001	<0.001	<0.001	NA	0.006	0.010	0.003	0.0026	<0.001	<0.001	0.001	0.002	0.002	0.0016	<0.001	<0.001	0.0012	0.001	<0.001	<0.001	<0.001	
Manganese, total (mg/L)	0.3	0.84	-	NA	0.011	0.013	0.014	0.024	NA	0.16	0.22	0.18	0.18	<0.005	0.006	<0.005	0.053	0.056	0.071	<0.005	<0.005	0.057	0.036	0.038	<0.005	0.036	
FIELD PARAMETERS																											
Temperature (degrees Celcius)	-	-	-	NA	11	14	11	14	NA	10	12	11	19	14	12	9	13	16	10	15	14	11	14	17			
pH (standard units)	-	-	-	NA	6.6	6.4	6.5	6.6	NA	7.7	7.4	7.6	7.6	6.9	7.1	7.1	7.7	7.6	7.9	6.3	7.2	6.5	7.3	6.4	7.5	6.2	
Conductivity (uS/cm)	-	-	-	NA	140	173	148	249	NA	646	735	714	761	698	715	873	323	299	333	407	398	421	349	407	387	166	
Dissolved Oxygen (mg/L)	-	-	-	NA	1.2	4.8	5.1	4.8	NA	3	3.3	<0.5	<0.5	2.8	4.6	4.5	<0.5	<0.5	0.7	6.4	9.8	5.6	0.8	0.9	0.7	5.4	
Turbidity (NTU)	-	-	-	NA	<5	<5	<5	<5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Oxidation/Reduction Potential (mV)	-	-	-	NA	151	158	151	190	NA	-70	-64	-38	-115	110	113	107	-109	-63	-100	170	111	168	133	122	121	151	
PER- & POLY-FLUORINATED ALKYL SUBSTANCES BY MODIFIED 537 - (ng/L)																											
Date Sampled	EPA HA	NHDES AGQS		340 BHR 11-Jul-16	340 BHR 27-Jan-17	340 BHR 21-Sep-17	340 BHR 27-Apr-18	340 BHR NA	463 BHR 11-Jul-16	463 BHR 24-Jan-17	463 BHR 13-Sep-17	463 BHR 26-Apr-18	463 BHR 26-Sep-18	463 BHR 14-Sep-17	7 WKD 26-Apr-18	7 WKD 2-OCT-18	7 WKD 14-Sep-17	8 WKD 26-Apr-18	8 WKD 3-Oct-18	8 WKD 14-Sep-17	27 BR 7-May-18	27 BR 27-Sep-18	27 BR 19-Sep-17	178 ALR 1-May-18	178 ALR 27-Sep-18	178 ALR 2-Oct-18	67 NR
Perfluorobutanesulfonic acid (PFBS)	---	---		<16	<8	<2.33	<2.16	<1.84	<16	<8	<2.26	<2.26	<1.79	<2.28	3.11J	2.57J	<2.30	<2.22	<1.84	3.98J	5.18J	4.86J	<2.27	2.68J	2.39J	<1.81	
Perfluoroheptanoic acid (PFHpA)	---	---		<16	<8	<2.74	<2.55	<0.61	<16	<8	<2.66	<2.67	<0.59	<2.68	3.88J	2.97J	<2.72	<2.62	<0.61	<2.74	<2.59	3.29J	<2.68	<2.63	2.49J	<0.60	
Perfluorohexanesulfonic acid (PFHxS)	---	---		<8	<8	<1.24	<1.15	0.983	11	<8	7.17J	7.8J	7.15	4.24J	5.07J	3.02J	2.50J	2.68J	2.01J	<1.24	<1.17	1.48J	<1.21	2.2J	2.21J	<0.96	
Perfluorooctanoic acid (PFOA)	70	70		<8	<8	<1.22	<1.13	0.87J	<8	<8	<1.18	1.21J	2.15J	6.06J	9.68J	9.01	<1.21	<1.16	0.90J	2.75J	4.54J	7.9J	3.72J	7.49J	7.23	<0.66	
Perfluorononanoic acid (PFNA)	---	---		<16	<8	<2.22	<2.06	<0.83	<16	<8	<2.15	<2.15	<0.81	<2.17	<2.09	<0.84	<2.19	<2.12	<0.84	<2.21	<2.09	0.85J	<2.16	<2.12	<0.79	<0.82	
Perfluorooctanesulfonic (PFOS)	70	70		<8	<8	<1.11	<1.03	<0.83	8.1	<8	4.66J	9.46J	3.22	3.62J	6.9J	5.73	<1.10	<1.06	<0.83	6.11J	5.17J	1.09	1.14J	5.19J	3.46J	<0.82	
Combination of PFOA and PFOS	---	70		ND	ND	ND	ND	0.87J	8.1	ND	4.66J	10.67J	5.37	9.68J	16.58J	14.74	ND	ND	0.90J	8.86J	9.71J	8.99	4.86J	12.68J	10.69	ND	