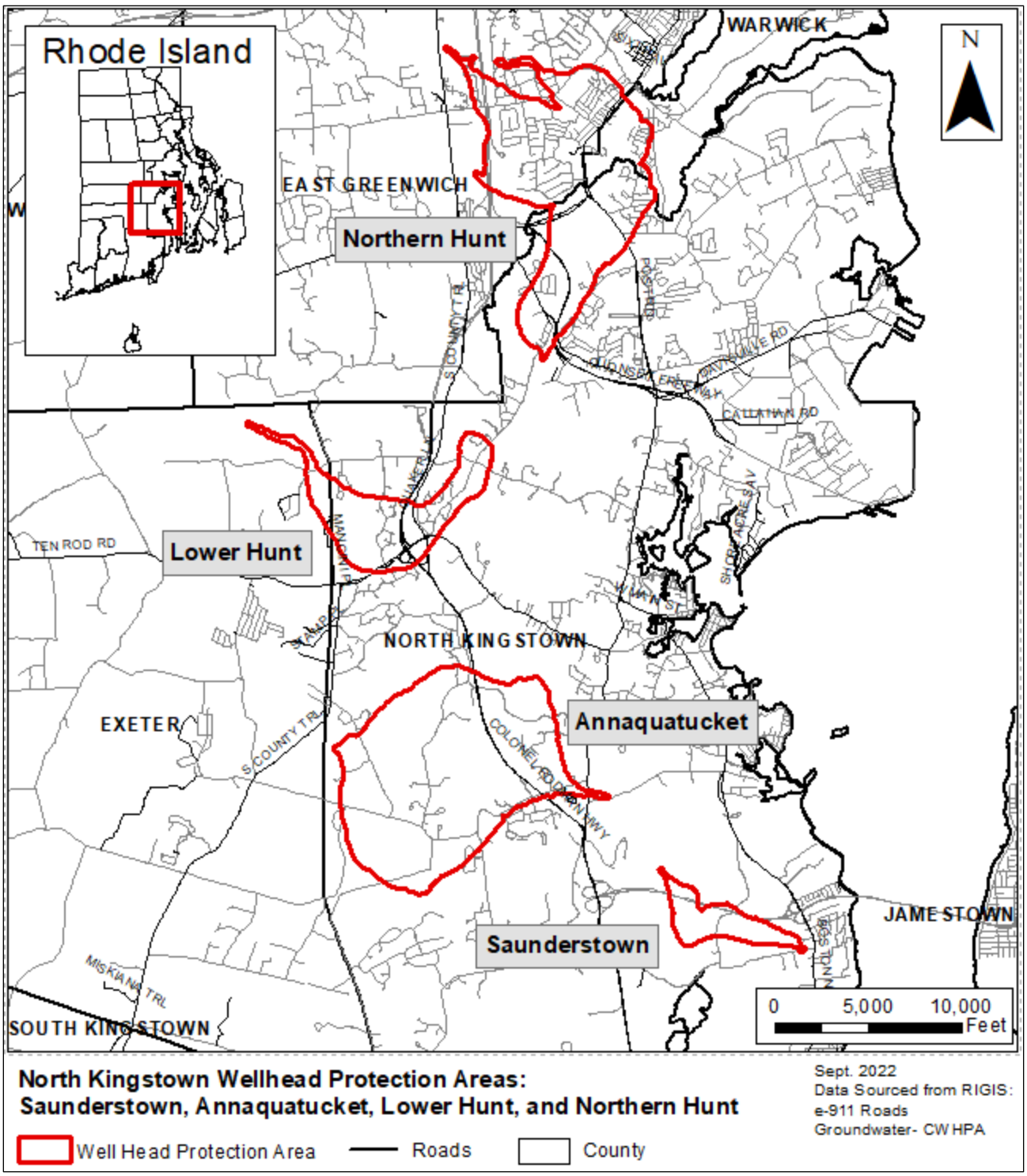


North Kingstown Source Water Assessment (2022)

Prepared by URI Cooperative Extension NEMO Program for the North Kingstown Water Department, Sep. 2022

TABLE OF CONTENTS

2022 Source Water Assessment:
NORTH KINGSTOWN WELLHEAD PROTECTION AREAS:
Saunderstown, Annaquatucket, Lower Hunt, and Northern Hunt

SUMMARY

This Source Water Assessment focuses on four community wellhead protection areas (WHPAs) located primarily in North Kingstown within the Hunt-Annaquatucket-Pettaquamscut sole source aquifer. The assessment was originally completed in 2003 and updated in 2018 to identify pollution risks and provide information for local land use planning and protection of the water supplies. This 2022 update utilizes the 2020 land use mapping provided by Rhode Island Geographic Information System (RIGIS), water quality monitoring data from April 2017-April 2022 taken at the 12 wells within the four WHPAs, Sanitary Surveys completed in 2016 and 2019, and the online Environmental Resource Map managed by Rhode Island Department of Environmental Management (DEM).

The North Kingstown Water Department and Quonset Point Industrial Park own and operate these wellfields. The Saunderstown and Annaquatucket WHPAs are located entirely in North Kingstown; the Lower Hunt WHPA extends into Exeter, and the Northern Hunt WHPA extends into East Greenwich. The WHPAs have a total of 12 wells as summarized in Table 1. Given the span of the WHPAs across municipalities, coordination among the three communities in WHPA planning and protection is even more important.

The WHPAs range in size from 269 acres to 2,338 acres and the land uses are summarized in Table 6. Results of the pollution risk assessment for the WHPAs are summarized in Tables 2 to 5. Overall, the WHPAs were given scores between 15 and 40. The table below summarizes those ratings. Note that a LOW ranking does not mean the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated. A MODERATE ranking means that the water is more likely to become contaminated one day. Regardless of score, protection efforts are important to assure continued water quality. *These results cannot be compared directly to previous assessments given changes in wellhead delineations over the years based on refined hydrogeologic modeling by USGS, and due to new contaminants now included in the current analysis such as PFAS.*

For further information please contact the North Kingstown Water Department located at 100 Fairway Drive, North Kingstown, RI 02852 (401) 294-3331. Additional information on this assessment is included below.

WHPA Pollution Risk Rating Summary

WHPA	2022 Ranking	Rating	2018 Rating
Saunderstown	15	Low	25
Annaquatucket	25	Moderate	55
Lower Hunt	30	Moderate	15
Northern Hunt	40	Moderate	50

Table 1. Town of North Kingstown Public Wells by WHPA

WELL NAME	STATUS	WHPA Name
GRAVEL PACKED WELL #3	A	Saunderstown
GRAVEL PACKED WELL #7	A	Saunderstown
GRAVEL PACKED WELL #8	A	Saunderstown
GRAVEL PACKED WELL #1	A	Annaquatucket
GRAVEL PACKED WELL #2	A	Annaquatucket
GRAVEL PACKED WELL #4	A	Annaquatucket
GRAVEL PACKED WELL #5A	A	Annaquatucket
GRAVEL PACKED WELL #11	A	Annaquatucket
GRAVEL PACKED WELL #6	A	Lower Hunt[1]
GRAVEL DEV. WELL #9	A	Northern Hunt[2]
GRAVEL DEV. WELL #10	A	Northern Hunt[3]
GRAVEL DEV. WELL #10A	PENDING	Northern Hunt

[1] Previously referred to as Wickford Junction
[2] Well located in Warwick
[3] Well located in E. Greenwich

2022 Source Water Assessment:
NORTH KINGSTOWN WELLHEAD PROTECTION AREAS:
Saunderstown, Annaquatucket, Lower Hunt, and Northern Hunt

REPORT

UNDERSTANDING THE ASSESSMENT

WHY WAS THE ASSESSMENT DONE?

The Safe Drinking Water Act (SDWA) Amendments of 1996 required states to develop and implement source water assessment programs (SWAPs) to analyze existing and potential threats to the quality of the public drinking water throughout the state. Using these programs, most states have completed source water assessments for every public water system -- from major metropolitan areas to the smallest towns. Even schools, restaurants, and other public facilities that have wells or surface water supplies have been assessed. A source water assessment is a study and report, unique to a water system that provides basic information about the water used to provide drinking water. States are working with local communities and public water systems to identify protection measures to address potential threats to sources of drinking water. In Rhode Island, RI HEALTH's Office of Drinking Water Quality administers the Source Water Assessment Program.

WHAT AREA WAS EVALUATED FOR THIS ASSESSMENT?

The source water protection area, the area evaluated for this assessment, is the critical area surrounding a public water supply well or an intake on a surface source. For a public water supply well, this is the wellhead protection area (WHPA). The WHPA is the estimated area from which groundwater and surface water will flow from under severe pumping conditions. This can also be stated as the maximum estimated area that water withdrawn from the well will ever be drawn from. For most bedrock wells, this area is a volume dependent circle. For wells in sand and gravel this area is generally not a circle, but an irregular shape determined by sedimentary deposits and pumping rate. The source protection area for surface water sources is generally the watershed of the surface waterbody.

WILL THE POTENTIAL CONTAMINATION SOURCES IDENTIFIED IN THE SANITARY SURVEY CONTAMINATE MY SOURCE?

Potential contamination sources identified in sanitary surveys are facilities that typically use, produce, handle or store contaminants of concern, which, if improperly managed, could find their way to a source of public drinking water. It is important to understand that a release may never occur from a potential contamination source, provided it is using good management practices. Many potential contamination sources are regulated at the federal level, the state level, or both, to reduce the risk of a release. There are several methods that water systems can use to work cooperatively with potential contamination sources. These often involve educational visits and inspections of stored materials.

HOW SHOULD THIS ASSESSMENT BE USED?

This assessment should be used to plan for improved protection of public drinking water sources. Additional information may also be useful such as identification of the 100-year flood plain, tax map information, soils information or high-density development areas. This assessment is a good starting place for planning protection programs. Communities should act now to protect valuable water supply resources; once contamination occurs clean-up is costly and sometimes technically infeasible. Additionally, unprotected watersheds and wellheads can lead to deterioration of water quality that may eventually lead to higher treatment costs.

Table 2. Risk Rating for Saunderstown WHPA

Wellhead Protection Area Risk Spreadsheet

WHPA Name: North Kingstown- Saunderstown WHPA Wells # 3, 7, 8
Well Identification Number: PWS# 1559517-03, 1559517-09, 1559517-10

RISK INDICATOR	Instructions See Update Guide page number	RATING				Supplier- North Kingstown	
		Low 0	Medium 5	High 10	Extreme 25	Input	Rating
Wellhead Protection Area land use							
1. High intensity land use	pp. 6 - 9	< 10%	10 - 24%	25 - 40%	> 40%	**5%**	**0**
Existing or potential pollution sources							
2. Pollution sources within inner protective radius (400 ft of well)	p. 10	0	1	2-3	>3	**0**	**0**
3. Pollution sources per acre throughout WHPA, excluding inner protective radius. Multiply this number by 10.	p. 11 - 14	< 0.1	0.1 - 0.5	0.5 - 1	> 1	**0.43**	**5**
Water quality							
4. History of contaminant detects within last 5 years.	pp. 15 - 17	Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	**>1/2 MCL *A**	**10**
5. Source water Bacteria detects within 5 years.	pp. 15 - 17	none	Total coliform detection	Fecal coliform detected; cause identified and corrected	Fecal coliform violation	**None *B**	**0**
6. Maximum nitrogen (NO_3-N) concentration in last 5 years.	pp. 15 - 17	≤ .5 mg/l	.5 - 2 mg/l	> 2 - 5 mg/l	> 5 mg/l	**0.18 mg/l *C**	**0**
Maximum		*0*	*30*	*60*	*150*		
Overall Ranking - Sum of all pollution risk ratings.	p. 18	**0 - 19**	**20 – 59**	**60 - 100**	**>100**	***D**	**15**

Notes: [1] Trace = Less than 10% of the contaminant MCL

*A - Detections of both cadmium and Total PFAS were greater than half the level considered acceptable by US EPA. Detection of pentachlorophenol was less than half of the level considered acceptable by US EPA. Trace amounts (less than 10% of MCL) of barium and chromium were detected. This indicates the need for continued monitoring. There was a violation of the secondary drinking water standard for Manganese. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).

*B - Fecal coliform bacteria were not detected. Total coliform bacteria were detected 2 times resulting in a 1% positivity rate over the 5-year period.

*C - Nitrate levels in groundwater have been consistently low.

*D - An overall ranking of LOW does not mean the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated.

Table 3. Risk Rating for Annaquatucket WHPA

Wellhead Protection Area Risk Spreadsheet

WHPA Name: North Kingstown- Annaquatucket WHPA Wells # 1, 2, 4, 5A, 11

Well Identification Number: PWS# 1559517-01, 1559517-02, 1559517-04, 1559517-11, 1559517-12

RISK INDICATOR	Instructions See Update Guide page number	RATING				Supplier- North Kingstown	
		Low 0	Medium 5	High 10	Extreme 25	Input	Rating
Wellhead Protection Area land use							
1. High intensity land use	pp. 6 - 9	< 10%	10 - 24%	25 - 40%	> 40%	**23%**	**5**
Existing or potential pollution sources							
2. Pollution sources within inner protective radius (400 ft of well)	p. 10	0	1	2-3	>3	**0**	**0**
3. Pollution sources per acre throughout WHPA, excluding inner protective radius. Multiply this number by 10.	p. 11 - 14	< 0.1	0.1 - 0.5	0.5 - 1	> 1	**0.14**	**5**
Water quality							
4. History of contaminant detects within last 5 years.	pp. 15 - 17	Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	**≤1/2 MCL *A**	**5**
5. Source water Bacteria detects within 5 years.	pp. 15 - 17	none	Total coliform detection	Fecal coliform detected; cause identified and corrected	Fecal coliform violation	**None *B**	**0**
6. Maximum nitrogen (NO_3-N) concentration in last 5 years.	pp. 15 - 17	≤ .5 mg/l	.5 - 2 mg/l	> 2 - 5 mg/l	> 5 mg/l	**4.66 mg/l *C**	**10**
Maximum		*0*	*30*	*60*	*150*		
Overall Ranking - Sum of all pollution risk ratings.	p. 18	**0 - 19**	**20 – 59**	**60 - 100**	**>100**	***D**	**25**

Notes:

[1] Trace = Less than 10% of the contaminant MCL

*A Detections of Total PFAS were greater than half the level considered acceptable by US EPA. Trace amounts (less than 10% of MCL) of barium and chromium were detected. This indicates the need for continued monitoring.

*B - Fecal coliform bacteria were not detected. Total coliform bacteria were detected 2 times resulting in a 1% positivity rate over the 5-year period.

*C - Nitrate levels in groundwater are higher than background levels, which may indicate contribution from human activity.

*D – An overall ranking of MODERATE means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.

Table 4. Risk Rating for Lower Hunt WHPA

Wellhead Protection Area Risk Spreadsheet

WHPA Name: North Kingstown- Lower Hunt WHPA Wells # 6

Well Identification Number: PWS# 1559517-06

RISK INDICATOR	Instructions See Update Guide page number	RATING				Supplier- North Kingstown	
		Low 0	Medium 5	High 10	Extreme 25	Input	Rating
Wellhead Protection Area land use							
1. High intensity land use	pp. 6 - 9	< 10%	10 - 24%	25 - 40%	> 40%	**22%**	**5**
Existing or potential pollution sources							
2. Pollution sources within inner protective radius (400 ft of well)	p. 10	0	1	2-3	>3	**0**	**0**
3. Pollution sources per acre throughout WHPA, excluding inner protective radius. Multiply this number by 10.	p. 11 - 14	< 0.1	0.1 - 0.5	0.5 - 1	> 1	**0.23**	**5**
Water quality							
4. History of contaminant detects within last 5 years.	pp. 15 - 17	Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	**>1/2 MCL *A**	**10**
5. Source water Bacteria detects within 5 years.	pp. 15 - 17	none	Total coliform detection	Fecal coliform detected; cause identified and corrected	Fecal coliform violation	**None *B**	**0**
6. Maximum nitrogen (NO_3-N) concentration in last 5 years.	pp. 15 - 17	≤ .5 mg/l	.5 - 2 mg/l	> 2 - 5 mg/l	> 5 mg/l	**2.19 mg/l *C**	**10**
Maximum		*0*	*30*	*60*	*150*		
Overall Ranking - Sum of all pollution risk ratings.	p. 18	**0 - 19**	**20 – 59**	**60 - 100**	**>100**	***D**	**30**

Notes: Fill in all blank spaces.

[1] Trace = Less than 10% of the contaminant MCL

*A - Detection of Total PFAS was greater than half the level considered acceptable by US EPA. Trace amounts (less than 10% of MCL) of barium and chromium were detected. This indicates the need for continued monitoring. Detection of fluoride was less than half of the level considered acceptable by US EPA secondary drinking water standard. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).

*B - Bacteria have not been detected.

*C - Nitrate levels in groundwater are higher than background levels, which may indicate contribution from human activity.

*D - A ranking of MODERATE means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.

Table 5. Risk Rating for Northern Hunt WHPA

Wellhead Protection Area Risk Spreadsheet

WHPA Name: North Kingstown- Northern Hunt WHPA Wells # 9 and 10

Well Identification Number: PWS# PWS# 1559517-07 and 1559517-08

RISK INDICATOR	Instructions See Update Guide page number	RATING				Supplier- North Kingstown	
		Low 0	Medium 5	High 10	Extreme 25	Input	Rating
Wellhead Protection Area land use							
1. High intensity land use	pp. 6 - 9	< 10%	10 - 24%	25 - 40%	> 40%	**34%**	**10**
Existing or potential pollution sources							
2. Pollution sources within inner protective radius (400 ft of well)	p. 10	0	1	2-3	>3	**3**	**10**
3. Pollution sources per acre throughout WHPA, excluding inner protective radius. Multiply this number by 10.	p. 11 - 14	< 0.1	0.1 - 0.5	0.5 - 1	> 1	**0.49**	**5**
Water quality							
4. History of contaminant detects within last 5 years.	pp. 15 - 17	Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	**≤1/2 MCL *A**	**5**
5. Source water Bacteria detects within 5 years.	pp. 15 - 17	none	Total coliform detection	Fecal coliform detected; cause identified and corrected	Fecal coliform violation	**None *B**	**0**
6. Maximum nitrogen (NO_3-N) concentration in last 5 years.	pp. 15 - 17	≤ .5 mg/l	.5 - 2 mg/l	> 2 - 5 mg/l	> 5 mg/l	**3.74 mg/l *C**	**10**
Maximum		*0*	*30*	*60*	*150*		
Overall Ranking - Sum of all pollution risk ratings.	p. 18	**0 - 19**	**20 – 59**	**60 - 100**	**>100**	***D**	**40**

Notes: Fill in all blank spaces.

[1] Trace = Less than 10% of the contaminant MCL

*A - Detection of Total PFAS was less than half the level considered acceptable by US EPA. Trace amounts (less than 10% of MCL) of barium and chromium were detected; this indicates the need for continued monitoring.

*B - Bacteria have not been detected.

*C - Nitrate levels in groundwater are higher than background levels, which may indicate contribution from human activity.

*D - A ranking of MODERATE means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.

EXPLANATION & DETERMINATION OF POLLUTION RISK FACTORS

Overview

This Source Water Assessment was completed using the "Guide to Updating Source Water Assessments and Protection Plans, Version 3 - 2010" (Guide). All risk indicator ratings were obtained from the "Guide". A summary of methods as well as calculated risks is presented here.

Risk Factor 1. High Intensity Land Use

High intensity land use was determined using Rhode Island GIS (RIGIS) land use data (2020 data). Land uses within the WHPA were calculated using ArcMap 10 (ESRI). The percentage of high intensity land use in the WHPA under study is then compared to the rating scale for risk indicator 1, High Intensity Land Use.

Risk Indicator	Rating			
	Low (0)	Medium (5)	High (10)	Extreme (25)
1. High Intensity Land Use	<10%	10-24%	25-50%	>50%

High Intensity Land Use Change 2018-2022

	2018 Report (2003/2004 data)	2020 Report (2020 data)	Difference (2018-2022 Report)
WHPA	**% HILU Area**	**% HILU Area**	**% HILU Area**
Saunderstown	4.83	4.94	+0.11
Annaquatucket	22.80	23.44	+0.64
Lower Hunt	21.82	21.92	+0.10
Northern Hunt	33.73	33.80	+1.13

Table 6. Land Use Summary (2020 Land Use)

		Saunderstown		Annaquatucket		Lower Hunt		Northern Hunt	
LULC 2020	Description	Area (Ac)	Percent	Area (Ac)	Percent	Area (Ac)	Percent	Area (Ac)	Percent
111	High Density Residential (<1/8 acre lots)*			9.32	0.40%			81.83	4.19%
112	Medium High Density Residential (1/4 to 1/8 acre lots)*			40.79	1.74%	58.47	7.89%	254.73	13.04%
113	Medium Density Residential (1 to 1/4 acre lots)	2.50	0.93%	219.33	9.38%	119.44	16.12%	390.75	20.01%
114	Medium Low Density Residential (1 to 2 acre lots)	0.57	0.21%	43.83	1.87%	2.27	0.31%	33.12	1.70%
115	Low Density Residential (>2 acre lots)	9.03	3.36%	26.16	1.12%	2.98	0.40%	2.58	0.13%
120	Commercial (sale of products and services)*			23.46	1.00%	40.36	5.45%	111.75	5.72%
130	Industrial (manufacturing, design, assembly, etc.)*			25.13	1.08%	7.74	1.05%	43.95	2.25%
141	Roads (divided highways >200' plus related facilities)*	12.63	4.70%	19.66	0.84%	35.13	4.74%	92.18	4.72%
143	Railroads (and associated facilities)*			12.45	0.53%			22.17	1.13%
145	Waste Disposal (landfills, junkyards, etc.)*			9.06	0.39%			10.92	0.56%
146	Power Lines (100' or more width)*			42.57	1.82%	10.28	1.39%	10.97	0.56%
161	Developed Recreation (all recreation)			20.13	0.86%	32.81	4.43%	53.21	2.72%
162	Vacant Land	1.09	0.41%	7.32	0.31%	5.52	0.74%	11.79	0.60%
163	Cemeteries							24.57	1.26%
170	Institutional (schools, hospitals, churches, etc.)*	0.64	0.24%	1.65	0.07%	7.25	0.98%	31.05	1.59%
210	Pasture (agricultural not suitable for tillage)	9.55	3.56%	39.31	1.68%	19.10	2.58%	7.65	0.39%
220	Cropland (tillable)*			328.36	14.05%	3.17	0.43%	0.56	0.03%
230	Orchards, Groves, Nurseries*			35.39	1.51%				
300	Brushland (shrub and brush areas, reforestation)	3.20	1.19%	15.56	0.67%	5.41	0.73%	10.05	0.51%
410	Deciduous Forest (>80% hardwood)	202.89	75.55%	647.85	27.71%	302.06	40.78%	485.98	24.88%
420	Softwood Forest (>80% softwood)	4.50	1.67%	60.16	2.57%	29.54	3.99%	74.07	3.79%
430	Mixed Forest	4.58	1.71%	305.31	13.06%	47.80	6.45%	154.21	7.90%
500	Water	11.07	4.12%	88.97	3.81%	5.45	0.74%	12.58	0.64%
600	Wetland	6.29	2.34%	40.52	1.73%	6.00	0.81%	21.19	1.09%
740	Mines, Quarries and Gravel Pits			267.81	11.46%			3.42	0.18%
750	Transitional Areas (urban open)			7.51	0.32%			7.91	0.40%

Grand Total	**268.55**	**100.00 %**	**2337.59**	**100.00 %**	**740.78**	**100.00 %**	**1953.17**	**100.00 %**
*** High Intensity Land Use (HILU)**	**13.27**	**4.94%**	**547.84**	**23.44%**	**162.40**	**21.92%**	**660.10**	**33.80%**

Impervious Surface Analysis: Additional Optional Land Use Assessment Step:

Although an impervious cover analysis is not included as a risk assessment indicator it is an important consideration when performing a pollution risk assessment. A high amount of impervious surface generally is associated with higher amounts of stormwater runoff. Stormwater runoff can transport harmful contaminants into surface water bodies as it flows over impervious surfaces such as roads, parking lots and commercial facilities. Impervious surfaces also impede precipitation from reaching groundwaters, reducing recharge. The risk rating scale for percentage of impervious surface is as follows:

Risk Indicator	Rating			
	Low	Medium	High	Extreme
Percentage of impervious surface in WHPA	<10%	10-14%	15-25%	>25%

Impervious surface coverage for the WHPAs protecting North Kingstown was calculated in ArcMap 10 (ESRI) using the Rhode Island Impervious Surface Coverage (2020) available from RIGIS (Rhode Island Geographic Information System). The percentage of impervious surface found in the WHPA protecting North Kingstown in shown below.

WHPA	Total Acres	Impervious Acres	% Impervious Area	Rating
Saunderstown	268.55	13.38	4.98	Low
Annaquatucket	2337.59	207.76	8.89	Low
Lower Hunt	740.78	132.69	17.91	High
Northern Hunt	1953.17	514.46	26.34	Extreme

Impervious Change 2018-2022

	2018 Report (2011 Impervious Surface Coverage)	2020 Report (2020 Impervious Surface Coverage)	Difference (2018-2022 Report)
WHPA	% Impervious Area	% Impervious Area	% Impervious Area
Saunderstown	4.75	4.98	+0.23
Annaquatucket	8.83	8.89	+0.06
Lower Hunt	17.71	17.91	+0.20
Northern Hunt	25.22	26.34	+1.12

Risk Factors 2 & 3: Pollution Sources Within Inner Protective Radius and Per Acre Throughout the WHPA

Information on the presence or absence of pollution sources within the inner protective radius of the wells and WHPAs under study were determined using the Rhode Island DEM Environmental Resource Map.

(https://ridemgis.maps.arcgis.com/apps/webappviewer/index.html?id=87e104c8adb449eb9f905e5f18020de5).

Additionally, Sanitary Surveys completed in 2016, 2019, and 2022 were obtained through the Rhode Island Department of Health (RIDOH). Review of the Sanitary Surveys did not identify any applicable pollution sources.

The number of pollution sources in the 400' Inner Protective Radius of each well and WHPA Outside of the IPR were compared to the following rating scale and ranked for Risk Indicator 2- Pollution Sources Within Inner Protective Radius and Risk Indicator 3 -Per Acre Throughout the WHPA, respectively.

Tables below show potential sources of contaminants in each well.

Risk Indicator	**Rating**			
	Low (0)	Medium (5)	High (10)	Extreme (25)
2. Pollution sources within inner protective radius (400 ft of 200 ft of well)	0	1	2-3	>3
3. Pollution sources per acre throughout WHPA, excluding inner protective radius (multiply by 10)	<0.1	0.1-0.5	0.5-1	>1

Potential Sources of Contaminants

Source : RI Environmental Resource Map, RIDEM

As of 6/26/2022

Saunderstown WHPA

The Area Reserved for Protection of the Well =400' Radius around each well	*Gravel Packed Well #3*		*Gravel Packed Well #7*		*Gravel Packed Well #8*	
Regulated Facilities	***IPR (400')***	***Outside IPR***	***IPR (400')***	***Outside IPR***	***IPR (400')***	***Outside IPR***
CERCLIS	0	0	0	0	0	0
Environmental Land Use Restriction	0	0	0	0	0	0
EPA Superfund	0	0	0	0	0	0
EPCRA Tier II	0	0	0	0	0	0
2021 RIDEM Site Investigation and Remediation (1)	0	1	0	1	0	1
RIPDES Permit	0	0	0	0	0	0
Stormwater Outfall (10)	0	10	0	10	0	10
Storage Tank Above Ground (2016)	0	0	0	0	0	0
Storage Tank Underground (2021)	0	0	0	0	0	0
Storage Tank Underground LUST (2021)	0	0	0	0	0	0
Stormwater Multi-Sector General Permit	0	0	0	0	0	0
Closed Landfill	0	0	0	0	0	0
Dams	0	0	0	0	0	0
Stormwater Construction general permit	0	0	0	0	0	0
Wastewater treatment facility discharge	0	0	0	0	0	0
TOTAL	**0**	**11**	**0**	**11**	**0**	**11**
WHPA Acres		**268.55**		**268.55**		**268.55**
400' Radius Acres		**11.48**		**11.48**		**11.48**
WHPA Acres-Inner Radius		**257.07**		**257.07**		**257.07**
Sources/Acre		**0.04**		**0.04**		**0.04**
Sources/Acre*10=Rating Score		**0.43**		**0.43**		**0.43**

Potential Sources of Contaminants

Source : RI Environmental Resource Map, RIDEM

All Checked 6/26/2022

Annaquatucket WHPA

The Area Reserved for Protection of the Well =400' Radius around each well

Regulated Facilities	*Gravel Packed Well #1*		*Gravel Packed Well #2*		*Gravel Packed Well #4*		*Gravel Packed Well #5A*		*Gravel Packed Well #11*	
	IPR (400')	*Out-side IPR*	*IPR (400')*	*Out-side IPR*	*IPR (400')*	*Out-side IPR*	*IPR (400')*	*Out-side IPR*	*IPR (400')*	*Out-side IPR*
CERCLIS (1)	0	1	0	1	0	1	0	1	0	1
Environmental Land Use Restriction (1)	0	1	0	1	0	1	0	1	0	1
EPA Superfund	0	0	0	0	0	0	0	0	0	0
EPCRA Tier II (3)	0	3	0	3	0	3	0	3	0	3
2021 RIDEM Site Investigation and Remediation (5)	0	5	0	5	0	5	0	5	0	5
RIPDES Permit (2)	0	2	0	2	0	2	0	2	0	2
Stormwater Outfall (8)	0	8	0	8	0	8	0	8	0	8
Storage Tank Above Ground (2016)	0	0	0	0	0	0	0	0	0	0
Storage Tank Underground (2021) (5)	0	5	0	5	0	5	0	5	0	5
Storage Tank Underground LUST (2021) (2)	0	2	0	2	0	2	0	2	0	2
Stormwater Multi-Sector General Permit (2)	0	2	0	2	0	2	0	2	0	2
Closed Landfill (2)	0	2	0	2	0	2	0	2	0	2
Dams (1)	0	1	0	1	0	1	0	1	0	1
Stormwater Construction general permit (1)	0	1	0	1	0	1	0	1	0	1
Wastewater treatment facility discharge	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**33**	**0**	**33**	**0**	**33**	**0**	**33**	**0**	**33**
WHPA Acres		**2,337.60**		**2,337.60**		**2,337.60**		**2,337.60**		**2,337.60**
400' Radius Acres		**11.48**		**11.48**		**11.48**		**11.48**		**11.48**
WHPA Acres-Inner Radius		**2,326.11**		**2,326.11**		**2,326.11**		**2,326.11**		**2,326.11**
Sources/Acre		**0.014**		**0.014**		**0.014**		**0.014**		**0.014**
Sources/Acre*10=Rating Score		**0.14**		**0.14**		**0.14**		**0.14**		**0.14**

Potential Sources of Contaminants

Source : RI Environmental Resource Map, RIDEM

As of 6/26/2022

Lower Hunt WHPA

The Area Reserved for Protection of the Well =400' Radius around each well	*Gravel Packed Well #6*	
Regulated Facilities	***IPR (400')***	***Outside IPR***
CERCLIS	0	0
Environmental Land Use Restriction	0	0
EPA Superfund	0	0
EPCRA Tier II (2)	0	2
2021 RIDEM Site Investigation and Remediation (1)	0	1
RIPDES Permit	0	0
Stormwater Outfall (8)	0	8
Storage Tank Above Ground (2016) (1)	0	1
Storage Tank Underground (2021) (4)	0	4
Storage Tank Underground LUST (2021) (1)	0	1
Stormwater Multi-Sector General Permit	0	0
Closed Landfill	0	0
Dams	0	0
Stormwater Construction general permit	0	0
Wastewater treatment facility discharge	0	0
TOTAL	**0**	**17**
WHPA Acres		**740.78**
400' Radius Acres		**11.48**
WHPA Acres-Inner Radius		**729.30**
Sources/Acre		**0.023**
Sources/Acre*10=Rating Score		**0.23**

Potential Sources of Contaminants

Source: RI Environmental Resource Map, RIDEM

As of 6/26/2022

Northern Hunt WHPA

The Area Reserved for Protection of the Well =400' Radius around each well	*Gravel Development Well #9*		*Gravel Development Well #10*	
Regulated Facilities	***IPR (400')***	***Outside IPR***	***(400')***	***Outside IPR***
CERCLIS	0	0	0	0
Environmental Land Use Restriction (2)	0	2	0	2
EPA Superfund	0	0	0	0
EPCRA Tier II (5)	2	3	1	4
2021 RIDEM Site Investigation and Remediation (8)	1	7	1	7
RIPDES Permit (1)	0	1	0	1
Stormwater Outfall (45)	0	45	1	44
Storage Tank Above Ground (2016) (1)	0	1	0	1
Storage Tank Underground (2021) (30)	0	30	0	30
Storage Tank Underground LUST (2021) (6)	0	6	0	6
Stormwater Multi-Sector General Permit	0	0	0	0
Closed Landfill	0	0	0	0
Dams	0	0	0	0
Stormwater Construction general permit (1)	0	1	0	1
Wastewater treatment facility discharge	0	0	0	0
TOTAL	**3**	**96**	**3**	**96**
WHPA Acres		**1,953.17**		**1,953.17**
400' Radius Acres		**11.58**		**11.58**
WHPA Acres-Inner Radius		**1,941.69**		**1,941.69**
Sources/Acre		**0.05**		**0.05**
Sources/Acre*10=Rating Score		**0.49**		**0.49**

Risk Factor 4, 5 & 6: History of Contaminant, Bacteria and Nitrate-Nitrogen Detections

Laboratory results for samples collected from the wells were obtained from Rhode Island Department of Health (RIDOH) and used to determine risk factors 4, 5 and 6. Only the well with the highest risk rating score within each WHPA is used to report these risk factors. Tables below show detected contaminants in each well.

Risk Factor 4 - History of contaminant detections within the last five years

This was determined by reviewing all contaminant detections in the laboratory records (excluding bacteria, nitrogen). A risk rating for each contaminant above the detection limit was then assigned based on the Maximum Contaminant Level (MCL). The MCL is based on either Rhode Island or EPA drinking water standards and advisory levels. The highest risk rating observed was used to set the total risk rating for the WHPA.

No violations of the standards for regulated contaminants (excluding bacteria and nitrates) were identified in the WHPAs. However, there have been detections Total PFAS less than half the levels considered acceptable by USEPA in Annaquatucket and Northern Hunt, and greater than half the levels considered acceptable by USEPA in Saunderstown and Lower Hunt. Saunderstown also had a detection of cadmium greater than half the levels considered acceptable by USEPA and a detection of pentachlorophenol less than half the levels considered acceptable by USEPA. All WHPAs had detections at trace amounts (less than 10% of MCL) of barium and chromium. These results indicate the need for continued monitoring and may indicate the need for future management and/or treatment. Additionally, there were violations of the secondary drinking water standard for manganese and fluoride. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).

Sodium levels have exceeded 20 mg/L in all WHPAs. Calcium, sodium, and magnesium data are not analyzed as contaminants (risk factor 4) as they are naturally occurring. However, sodium is reviewed when levels consistently approach or exceed 20 mg/L because sodium and chloride are indicators of contamination from road salt and can also indicate the presence of other runoff pollutants. The EPA lists sodium on the "drinking water advisory" list with 20 mg/L as the guidance level for those on a restricted sodium diet (EPA 822-R-09-011, 2009 Edition of the Drinking Water Standards and Health Advisories, October 2009). This is not an official contamination level; however, sodium concentrations approaching or exceeding 20 mg/L should be reported.

Risk Factor 5 - Source Water Bacteria Detections within the last five years

This was determined by viewing all available bacteria data in the laboratory record for all the wells in the WHPA. The number of bacteria sample detections were used to determine the risk rating. Risk factor 5 for all WHPAs was set at Low – Less than 5% of samples have detected total coliform in last 5 years. However, there were Total Coliform Bacteria detects for the Saunderstown and Annaquatucket WHPA (less than 5% of samples). Corrective action was taken, and re-sampling revealed that the problem has been corrected.

Risk Factor 6 - Maximum nitrate-nitrogen (N03-N) concentration in the last five years

This was determined by viewing all detections of nitrate-nitrogen in the laboratory record for all the wells in the WHPA. Risk factor 6 for Saunderstown was set to Low- (≤.5 mg/l), nitrate levels in groundwater have been consistently low. Risk factor 6 for Annaquatucket, Northern Hunt, and Lower Hunt was set to High- (>2-5 mg/l), nitrate levels in groundwater are higher than background levels, which may indicate contribution from human activity. The yearly maximum and average nitrogen values for each WHPA were plotted and the data reviewed for trends. There does not appear to be an observable upward trend in the Saunderstown WHPA and a downward trend in the Northern Hunt, Lower Hunt, and Annaquatucket WHPAs.

Risk Indicator	Rating			
	Low (0)	Medium (5)	High (10)	Extreme (25)
4. History of contaminant detections within the last 5 years	Trace (Maximum value is less than 10% of MCL)	Less than ½ MCL	Greater than ½ MCL	Greater than MCL (violation)
5. Source water bacteria detections within the last 5 years	Less than 5% of samples have detected total coliform in last 5 years	Greater than 5% of samples have detected total coliform	One or more Fecal coliform sample exhibits a detection	One or more Fecal coliform samples is above water quality standards
6. Maximum nitrate-nitrogen (N03-N) concentration in the last 5 years	<0.5 mg/L N03-N	0.5-2 mg/L N03-N	2-5 mg/L N03-N	>5 mg/L N03-N

WHPA Name: Saunderstown

Supplier- North Kingstown

Saunderstown WHPA-North Kingstown: Well 3

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.015	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Nitrate as N	10	mg/l	0.13	Low	0
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rate		
Contaminants - Low (0)	**Nitrates- Low (0)**	**Bacteria- Low (0)**

- Violation of the secondary drinking water standard for Manganese. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003). http://water.epa.gov/drink/contaminants/index.cfm#Secondary
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Nickel
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population.

WHPA Name: Saunderstown
Supplier- North Kingstown

Saunderstown WHPA-North Kingstown: Well 7

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.008	low	0
RI1559517	Cadmium	0.005	mg/l	0.004	high	10
RI1559517	Chromium	0.1	mg/l	0.002	low	0
RI1559517	Total PFAS	20	ppt	10.63	high	10
RI1559517	Nitrate as N	10	mg/l	0.13	Low	0
RI1559517	Total Coliform	5%	0	1/178 Pos. Samples (<1%)	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rate		
Contaminants - High (10)	**Nitrates- Low (0)**	**Bacteria- Medium (5)**

- In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS. TOTAL PFAS = PFDA+ PFNA+ PFOS+ PFOA+ PFHxS+ PFHpA
- Violation of the secondary drinking water standard for Manganese. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have been detected- 1 positive sample in Jul. 2021. Repeat testing weekly resulted in no additional positive samples. <1% of detects in the past 5 years.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Nickel, PERFLUOROBUTANESULFONIC ACID (PFBS), PERFLUOROHEXANOIC ACID (PFHXA), PERFLUOROPENTANOIC ACID (PFPEA)
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population.

WHPA Name: Saunderstown

Supplier- North Kingstown

Saunderstown WHPA-North Kingstown: Well 8

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.007	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Pentachlorophenol	0.001	mg/l	0.00014	medium	5
RI1559517	Nitrate as N	10	mg/l	0.18	Low	0
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rate		
Contaminants - Medium (5)	**Nitrates- Low (0)**	**Bacteria- Low (0)**

- Violation of the secondary drinking water standard for Manganese. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Pentachlorophenol (PCP) is an industrial, wood preservative used mainly to treat utility poles and cross arms.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Sodium concentrations have exceeded 10 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Annaquatucket

Supplier- North Kingstown

Annaquatucket WHPA-North Kingstown: Well 1

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.008	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Nitrate as N	10	mg/l	1.39	medium	5
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rate		
Contaminants - Low (0)	**Nitrates- Medium (5)**	**Bacteria- Low (0)**

- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Nickel
- Sodium concentrations are less than 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Annaquatucket

Supplier- North Kingstown

Annaquatucket WHPA-North Kingstown: Well 2

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.006	low	0
RI1559517	Nitrate as N	10	mg/l	1.63	medium	5
RI1559517	Total Coliform	5%	0	2/207 Pos. Samples (<1%)	Low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Low (0)	**Nitrates- Medium (5)**	**Bacteria- Low (0)**

- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have been detected- 2 positive samples in Dec. 2021, 2 weeks in a row. Continued testing weekly resulted in no additional positive samples. <1% of detects in the past 5 years.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Annaquatucket

Supplier- North Kingstown

Annaquatucket WHPA-North Kingstown: Well 4

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.006	low	0
RI1559517	Nitrate as N	10	mg/l	2.34	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Low (0)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: DCPA and Nickel
- Sodium concentrations are less than 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Annaquatucket

Supplier- North Kingstown

Annaquatucket WHPA-North Kingstown: Well 5A

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.006	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Total PFAS	20	ppt	6.32	medium	5
RI1559517	Nitrate as N	10	mg/l	2.71	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Medium (5)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS. TOTAL PFAS = PFDA+ PFNA+ PFOS+ PFOA+ PFHxS+ PFHpA
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: DCPA and PERFLUOROBUTANESULFONIC ACID (PFBS)
- Sodium concentrations are less than 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Annaquatucket

Supplier- North Kingstown

Annaquatucket WHPA-North Kingstown: Well 11

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.007	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Nitrate as N	10	mg/l	4.66	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Low (0)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: DCPA, Nickel, and PERFLUOROBUTANESULFONIC ACID (PFBS)
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Lower Hunt

Supplier- North Kingstown

Lower Hunt WHPA-North Kingstown: Well 6

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.011	low	0
RI1559517	Chromium	0.1	mg/l	0.002	low	0
RI1559517	Total PFAS	20	ppt	19.07	high	10
RI1559517	Nitrate as N	10	mg/l	2.19	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - High (10)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS. TOTAL PFAS = PFDA+ PFNA+ PFOS+ PFOA+ PFHxS+ PFHpA
- Violation of the secondary drinking water standard for Fluoride. The National Secondary Drinking Water Standards are non-enforceable guidelines for contaminants that may cause cosmetic effects (i.e.: skin or tooth discoloration) or aesthetic effects (i.e.: taste, odor or color) in drinking water (EPA, 2003).
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Nickel, PERFLUOROHEXANOIC ACID (PFHXA), PERFLUOROPENTANOIC ACID (PFPEA), and PERFLUOROBUTANOIC ACID (PFBA).
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Northern Hunt

Supplier- North Kingstown

Northern Hunt WHPA-North Kingstown: Well 9

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.012	low	0
RI1559517	Total PFAS	20	ppt	7.76	medium	5
RI1559517	Nitrate as N	10	mg/l	3.04	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Medium (5)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS. TOTAL PFAS = PFDA+ PFNA+ PFOS+ PFOA+ PFHxS+ PFHpA
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Chloroform, PERFLUOROHEXANOIC ACID (PFHXA), PERFLUOROPENTANOIC ACID (PFPEA)
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

WHPA Name: Northern Hunt

Supplier- North Kingstown

Northern Hunt WHPA-North Kingstown: Well 10

PWSID	Contaminants	MCL[NOTE 1]	Units	Max	Rank	Rating
RI1559517	Barium	2	mg/l	0.01	low	0
RI1559517	Chromium	0.1	mg/l	0.001	low	0
RI1559517	Total PFAS	20	ppt	7.24	medium	5
RI1559517	Nitrate as N	10	mg/l	3.74	high	10
RI1559517	Total Coliform	5%	0	0%	low	0
RI1559517	Fecal Coliform	5%	0	0%	low	0

NOTE 1: MCL: Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

Overall Well Rating		
Contaminants - Medium (5)	**Nitrates- High (10)**	**Bacteria- Low (0)**

- In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS. TOTAL PFAS = PFDA+ PFNA+ PFOS+ PFOA+ PFHxS+ PFHpA
- No violations for primary regulated contaminants have been identified. However, there have been detections below levels considered acceptable by US EPA. This indicates the need for continued monitoring.
- Total coliform bacteria have not been detected.
- Nitrate levels in groundwater are somewhat higher than background levels, which may indicate contribution from human activity.
- Detections of unregulated contaminants: Chloroform, Nickel, PERFLUOROHEXANOIC ACID (PFHXA), and PERFLUOROPENTANOIC ACID (PFPEA)
- Sodium concentrations have exceeded 20 mg/l. At the present time the EPA guidance level for sodium in drinking water is 20 mg/L. This value was developed for those individuals restricted to a total sodium intake of 500 mg/day and should not be extrapolated to the entire population

REFERENCES

Friesz, P.J, 2012, Evaluating Prediction Uncertainty of Areas Contributing Recharge to Well Fields of Multiple Water Suppliers in the Hunt- Annaquatucket, Pettaquamscutt River Basins, Rhode Island: U.S. Geological Survey Scientific Investigations Report 2012-5114, 46p, at http://pubs.usgs.gov/sir/2012/5114/.

Rhode Island Department of Environmental Management, Geospatial Data, Available at https://dem.ri.gov/online-services/data-maps.

Rhode Island Geographic Information Systems (RIGIS), Geospatial Data, Available at http://www.edc.uri.edu/RIGIS/.

Rhode Island Department of Health, 2016 and 2019, Sanitary Survey Report for the North Kingstown Town of Public Community Water System. Obtained from Rhode Island Department of Health.

Rhode Island Department of Health and URI NEMO Program, 2010, Guide to Updating Source Water Assessments and Protection Plans.

Rhode Island and Providence Plantations, Rules and Regulations Pertaining to public Drinking Water, as Amended April 2009, R46-13-DWQ

URI NEMO Program, 2018 Source Water Assessment, North Kingstown Wellhead Protection Areas.

USEPA National Primary Drinking Water Regulations (Factsheet), EPA 816-F-09-004, May 2009

2009 Edition of the Drinking Water Standards and Health Advisories, October 2009, EPA 822-R-09-011

2022 Source Water Assessment:
NORTH KINGSTOWN WELLHEAD PROTECTION
AREAS: Saunderstown, Annaquatucket, Lower Hunt, and Northern Hunt

APPENDIX: Laboratory Data

Laboratory Results (Contaminant Detects): Saunderstown

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1º MCL[NOTE 1]	1º MCL Units	2º MCL[NOTE 2]	2º MCL Units
GRAV.PACKED WELL #3	30-Mar-20	2001608-03_WL68	BARIUM	0.015	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #3	30-Mar-20	2001608-03_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV.PACKED WELL #3	21-May-19	1905696-01	MANGANESE	0.172	MG/L	-	-	0.05	MG/L
GRAV.PACKED WELL #3	30-Mar-20	2001608-03_WL68	NICKEL	0.006	MG/L	-	-	-	-
GRAV.PACKED WELL #3	30-Mar-20	2001608-03_WL16	NITRATE	0.19	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #3	27-Mar-18	1801525-05_WL16	NITRATE-NITRITE	0.06	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #3	14-Mar-19	1901345-04_WL16	NITRATE-NITRITE	0.06	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #3	25-Mar-21	2101592-07_WL16	NITRATE-NITRITE	0.13	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #3	21-Mar-22	2201380-09_WL16	NITRATE-NITRITE	0.07	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #3	21-Mar-22	2201380-10_WL16	NITRATE-NITRITE	0.06	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #3	27-Mar-18	1801525-05_WL71	SODIUM	35.2	MG/L	-	-	-	-
GRAV.PACKED WELL #3	14-Mar-19	1901345-04_WL71	SODIUM	33.2	MG/L	-	-	-	-
GRAV.PACKED WELL #3	30-Mar-20	2001608-03_WL71	SODIUM	33.6	MG/L	-	-	-	-
GRAV.PACKED WELL #3	25-Mar-21	2101592-07_WL71	SODIUM	55.7	MG/L	-	-	-	-
GRAV.PACKED WELL #3	21-Mar-22	2201380-10_WL71	SODIUM	34.5	MG/L	-	-	-	-
GRAV.PACKED WELL #3	21-Mar-22	2201380-09_WL71	SODIUM	33.4	MG/L	-	-	-	-

NOTE 1: 1º MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2º MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCE N-TRATIO N	UNITS	1º MCL[NOTE 1]	1º MCL Units	2º MCL[NOTE 2]	2º MCL Units
GRAV.PACKED WELL #7	30-Mar-20	2001608-05_WL68	BARIUM	0.008	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #7	21-Apr-20	2001727-01_WL68	BARIUM	0.006	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #7	30-Mar-20	2001608-05_WL68	CADMIUM	0.004	MG/L	0.005	MG/L	-	-
GRAV.PACKED WELL #7	30-Mar-20	2001608-05_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV.PACKED WELL #7	21-Apr-20	2001727-01_WL68	CHROMIUM	0.002	MG/L	0.1	MG/L	-	-
GRAV.PACKED WELL #7	20-Jul-21	D107310-07	COLIFORM (TCR)	1	Pos. Sample	*1	-	-	-
GRAV.PACKED WELL #7	21-May-19	1905696-02	MANGANESE	0.463	MG/L	-	-	0.05	MG/L
GRAV.PACKED WELL #7	30-Mar-20	2001608-05_WL68	NICKEL	0.006	MG/L	-	-	-	-
GRAV.PACKED WELL #7	21-Mar-22	2201380-05_WL16	NITRATE-NITRITE	0.13	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	PERFLUOROBUTANESULFONIC ACID (PFBS)	4.39	NG/L	-	-	-	-

GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	PERFLUOROCTANE SULFONIC ACID (PFOS)	4.32	NG/L	-	-	-	-
GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	PERFLUOROCTANOIC ACID (PFOA)	6.31	NG/L	-	-	-	-
GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	PERFLUOROHEXANOIC ACID (PFHXA)	6.92	NG/L	-	-	-	-
GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	PERFLUOROPENTANOIC ACID (PFPEA)	6.34	NG/L	-	-	-	-
GRAV.PACKED WELL #7	27-Mar-18	1801525-06_WL71	SODIUM	25.2	MG/L	-	-	-	-
GRAV.PACKED WELL #7	14-Mar-19	1901345-05_WL71	SODIUM	28.2	MG/L	-	-	-	-
GRAV.PACKED WELL #7	30-Mar-20	2001608-05_WL71	SODIUM	27.9	MG/L	-	-	-	-
GRAV.PACKED WELL #7	25-Mar-21	2101592-03_WL71	SODIUM	21.7	MG/L	-	-	-	-
GRAV.PACKED WELL #7	21-Mar-22	2201380-05_WL71	SODIUM	19.2	MG/L	-	-	-	-
GRAV.PACKED WELL #7	11-Apr-19	1901675-06_TO20	TOTAL PFOS AND PFOA	10.6	NG/L	*2	-	-	-

NOTE 1: 1º MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2º MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

*1 A routine sample that is fecal coliform-positive or E. coli-positive triggers repeat samples- -if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or E. coli negative triggers repeat samples--if any repeat sample is fecal coliform-positive or E. coli-positive, the system has an acute MCL violation.

*2 In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1º MCL[NOTE 1]	1º MCL Units	2º MCL[NOTE 2]	2º MCL Units
GRAV.PACKED WELL #8	30-Mar-20	2001608-04_WL68	BARIUM	0.007	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #8	21-May-19	1905696-03	MANGANESE	0.303	MG/L	-	-	0.05	MG/L
GRAV.PACKED WELL #8	30-Mar-20	2001608-04_WL16	NITRATE	0.1	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #8	25-Mar-21	2101592-02_WL16	NITRATE-NITRITE	0.14	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #8	21-Mar-22	2201380-08_WL16	NITRATE-NITRITE	0.18	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #8	01-Sep-20	2003789-09_PE21	PENTACHLOROPHENOL	0.14	UG/L	0.001	MG/L	-	-
GRAV.PACKED WELL #8	27-Mar-18	1801525-07_WL71	SODIUM	16.5	MG/L	-	-	-	-
GRAV.PACKED WELL #8	14-Mar-19	1901345-06_WL71	SODIUM	17.7	MG/L	-	-	-	-
GRAV.PACKED WELL #8	30-Mar-20	2001608-04_WL71	SODIUM	16.9	MG/L	-	-	-	-
GRAV.PACKED WELL #8	25-Mar-21	2101592-02_WL71	SODIUM	12.5	MG/L	-	-	-	-
GRAV.PACKED WELL #8	21-Mar-22	2201380-08_WL71	SODIUM	10.9	MG/L	-	-	-	-

NOTE 1: 1º MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2º MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

Laboratory Results (Contaminant Detects): Annaquatucket

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1º MCL[NOTE 1]	1º MCL Units	2º MCL[NOTE 2]	2º MCL Units
GRAV.PACKED WELL #1	30-Mar-20	2001608-08_WL68	BARIUM	0.008	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #1	30-Mar-20	2001608-08_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV.PACKED WELL #1	30-Mar-20	2001608-08_WL68	NICKEL	0.018	MG/L	-	-	-	-
GRAV.PACKED WELL #1	30-Mar-20	2001608-08_WL16	NITRATE	1.07	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #1	27-Mar-18	1801525-01_WL16	NITRATE-NITRITE	1.34	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #1	14-Mar-19	1901345-10_WL16	NITRATE-NITRITE	1.29	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #1	14-Mar-19	1901345-09_WL16	NITRATE-NITRITE	1.28	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #1	25-Mar-21	2101592-01_WL16	NITRATE-NITRITE	1.12	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #1	21-Mar-22	2201380-01_WL16	NITRATE-NITRITE	1.39	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #1	27-Mar-18	1801525-01_WL71	SODIUM	44	MG/L	-	-	-	-
GRAV.PACKED WELL #1	14-Mar-19	1901345-10_WL71	SODIUM	45.2	MG/L	-	-	-	-
GRAV.PACKED WELL #1	14-Mar-19	1901345-09_WL71	SODIUM	42.2	MG/L	-	-	-	-
GRAV.PACKED WELL #1	30-Mar-20	2001608-08_WL71	SODIUM	40	MG/L	-	-	-	-
GRAV.PACKED WELL #1	25-Mar-21	2101592-01_WL71	SODIUM	33	MG/L	-	-	-	-
GRAV.PACKED WELL #1	21-Mar-22	2201380-01_WL71	SODIUM	30.3	MG/L	-	-	-	-

NOTE 1: 1º MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2º MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1º MCL[NOTE 1]	1º MCL Units	2º MCL[NOTE 2]	2º MCL Units
GRAV.PACKED WELL #2	30-Mar-20	2001608-09_WL68	BARIUM	0.006	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #2	14-Dec-21	D112160-02	COLIFORM (TCR)	1	Pos. Sample	*1	-	-	-
GRAV.PACKED WELL #2	17-Dec-21	D112214-01	COLIFORM (TCR)	1	Pos. Sample	*1	-	-	-
GRAV.PACKED WELL #2	30-Mar-20	2001608-09_WL16	NITRATE	1.21	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #2	27-Mar-18	1801525-02_WL16	NITRATE-NITRITE	1.49	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #2	14-Mar-19	1901345-01_WL16	NITRATE-NITRITE	1.21	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #2	30-Apr-21	2101959-01_WL16	NITRATE-NITRITE	1.18	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #2	21-Mar-22	2201380-02_WL16	NITRATE-NITRITE	1.63	MG/L	1	MG/L	-	-

GRAV.PACKED WELL #2	27-Mar-18	1801525-02_WL71	SODIUM	24.6	MG/L	-	-	-	-
GRAV.PACKED WELL #2	14-Mar-19	1901345-01_WL71	SODIUM	26.7	MG/L	-	-	-	-
GRAV.PACKED WELL #2	30-Mar-20	2001608-09_WL71	SODIUM	22.7	MG/L	-	-	-	-
GRAV.PACKED WELL #2	30-Apr-21	2101959-01_WL71	SODIUM	24.6	MG/L	-	-	-	-
GRAV.PACKED WELL #2	21-Mar-22	2201380-02_WL71	SODIUM	19.2	MG/L	-	-	-	-

NOTE 1: 1^{o} MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2^{o} MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

*A routine sample that is fecal coliform-positive or E. coli-positive triggers repeat samples- -if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or E. coli negative triggers repeat samples--if any repeat sample is fecal coliform-positive or E. coli-positive, the system has an acute MCL violation.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1^{o} MCL[NOTE 1]	1^{o} MCL Units	2^{o} MCL[NOTE 2]	2^{o} MCL Units
GRAV.PACKED WELL #4	30-Mar-20	2001608-02_WL68	BARIUM	0.006	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #4	01-Sep-20	2003789-07_PE21	DCPA	0.67	UG/L	-	-	-	-
GRAV.PACKED WELL #4	30-Mar-20	2001608-02_WL68	NICKEL	0.005	MG/L	-	-	-	-
GRAV.PACKED WELL #4	30-Mar-20	2001608-02_WL16	NITRATE	2.77	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #4	27-Mar-18	1801525-03_WL16	NITRATE-NITRITE	1.92	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #4	14-Mar-19	1901345-02_WL16	NITRATE-NITRITE	2.12	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #4	25-Mar-21	2101592-04_WL16	NITRATE-NITRITE	1.93	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #4	21-Mar-22	2201380-03_WL16	NITRATE-NITRITE	2.34	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #4	27-Mar-18	1801525-03_WL71	SODIUM	17.5	MG/L	-	-	-	-
GRAV.PACKED WELL #4	14-Mar-19	1901345-02_WL71	SODIUM	17.1	MG/L	-	-	-	-
GRAV.PACKED WELL #4	30-Mar-20	2001608-02_WL71	SODIUM	17.6	MG/L	-	-	-	-
GRAV.PACKED WELL #4	25-Mar-21	2101592-04_WL71	SODIUM	16.4	MG/L	-	-	-	-
GRAV.PACKED WELL #4	21-Mar-22	2201380-03_WL71	SODIUM	18.1	MG/L	-	-	-	-

NOTE 1: 1^{o} MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2^{o} MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1° MCL[NOTE 1]	1° MCL Units	2° MCL[NOTE 2]	2° MCL Units
GRAV. PACKED WELL #5A	30-Mar-20	2001608-07_WL68	BARIUM	0.006	MG/L	2	MG/L	-	-
GRAV. PACKED WELL #5A	30-Mar-20	2001608-07_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV. PACKED WELL #5A	21-Aug-17	1703965-06_PE21	DCPA	2.3	UG/L	-	-	-	-
GRAV. PACKED WELL #5A	30-Mar-20	2001608-07_PE21	DCPA	1.6	UG/L	-	-	-	-
GRAV. PACKED WELL #5A	01-Sep-20	2003789-04_PE21	DCPA	1.9	UG/L	-	-	-	-
GRAV. PACKED WELL #5A	30-Mar-20	2001608-07_WL16	NITRATE	1.88	MG/L	10	MG/L	-	-
GRAV. PACKED WELL #5A	27-Mar-18	1801525-04_WL16	NITRATE-NITRITE	2.71	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #5A	14-Mar-19	1901345-03_WL16	NITRATE-NITRITE	3	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #5A	25-Mar-21	2101592-05_WL16	NITRATE-NITRITE	2.26	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #5A	21-Mar-22	2201380-04_WL16	NITRATE-NITRITE	2.6	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #5A	11-Apr-19	1901675-11_TO20	PERFLUOROBUTANESULFONIC ACID (PFBS)	5.23	NG/L	-	-	-	-
GRAV. PACKED WELL #5A	11-Apr-19	1901675-11_TO20	PERFLUOROCTANE SULFONIC ACID (PFOS)	6.32	NG/L	-	-	-	-
GRAV. PACKED WELL #5A	27-Mar-18	1801525-04_WL71	SODIUM	13.8	MG/L	-	-	-	-
GRAV. PACKED WELL #5A	14-Mar-19	1901345-03_WL71	SODIUM	13.3	MG/L	-	-	-	-
GRAV. PACKED WELL #5A	30-Mar-20	2001608-07_WL71	SODIUM	12.6	MG/L	-	-	-	-
GRAV. PACKED WELL #5A	25-Mar-21	2101592-05_WL71	SODIUM	13	MG/L	-	-	-	-
GRAV. PACKED WELL #5A	21-Mar-22	2201380-04_WL71	SODIUM	13.8	MG/L	-	-	-	-
GRAV. PACKED WELL #5A	11-Apr-19	1901675-11_TO20	TOTAL PFOS AND PFOA	6.32	NG/L	*2	-	-	-

NOTE 1: 1° MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2° MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

*2 In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1° MCL[NOTE 1]	1° MCL Units	2° MCL[NOTE 2]	2° MCL Units
GRAV. PACKED WELL #11	25-Apr-17	1701959-03_WL68	BARIUM	0.007	MG/L	2	MG/L	-	-
GRAV. PACKED WELL #11	21-Apr-20	2001727-04_WL68	BARIUM	0.007	MG/L	2	MG/L	-	-
GRAV. PACKED WELL #11	21-Apr-20	2001727-04_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV. PACKED WELL #11	25-Apr-17	1701959-03_PE21	DCPA	8.1	UG/L	-	-	-	-
GRAV. PACKED WELL #11	07-Nov-17	1704908-02_PE21	DCPA	4.5	UG/L	-	-	-	-

GRAV. PACKED WELL #11	21-Apr-20	2001727-04_PE21	DCPA	4.6	UG/L	-	-	-	-
GRAV. PACKED WELL #11	16-Nov-20	2004610-03_PE21	DCPA	4.3	UG/L	-	-	-	-
GRAV. PACKED WELL #11	21-Apr-20	2001727-04_WL68	NICKEL	0.02	MG/L	-	-	-	-
GRAV. PACKED WELL #11	25-Apr-17	1701959-03_WL16	NITRATE	4.42	MG/L	10	MG/L	-	-
GRAV. PACKED WELL #11	01-Sep-20	2003789-10_WL16	NITRATE	4.62	MG/L	10	MG/L	-	-
GRAV. PACKED WELL #11	01-Sep-20	2003789-01_WL16	NITRATE	4.52	MG/L	10	MG/L	-	-
GRAV. PACKED WELL #11	21-Aug-17	1703965-07_WL16	NITRATE-NITRITE	4.34	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	07-Nov-17	1704908-02_WL16	NITRATE-NITRITE	4.66	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	27-Mar-18	1801525-08_WL16	NITRATE-NITRITE	2.12	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	23-Apr-18	1801812-02_WL16	NITRATE-NITRITE	4.37	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	24-Sep-18	1804186-01_WL16	NITRATE-NITRITE	3.91	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	11-Sep-19	1904187-02_WL16	NITRATE-NITRITE	4.54	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	11-Sep-19	1904187-01_WL16	NITRATE-NITRITE	4.48	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	15-Sep-21	2104371-04_WL16	NITRATE-NITRITE	4.29	MG/L	1	MG/L	-	-
GRAV. PACKED WELL #11	11-Apr-19	1901675-02_TO20	PERFLUOROBUTANESULFONIC ACID (PFBS)	9.86	NG/L	-	-	-	-
GRAV. PACKED WELL #11	27-Mar-18	1801525-08_WL71	SODIUM	39.9	MG/L	-	-	-	-
GRAV. PACKED WELL #11	14-Mar-19	1901345-08_WL71	SODIUM	12.5	MG/L	-	-	-	-
GRAV. PACKED WELL #11	30-Mar-20	2001608-01_WL71	SODIUM	11.1	MG/L	-	-	-	-
GRAV. PACKED WELL #11	21-Mar-22	2201380-07_WL71	SODIUM	10.8	MG/L	-	-	-	-

NOTE 1: 1º MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2º MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

Laboratory Results (Contaminant Detects): Lower Hunt

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1° MCL[NOTE 1]	1° MCL Units	2° MCL[NOTE 2]	2° MCL Units
GRAV.PACKED WELL #6	25-Apr-17	1701959-02_WL68	BARIUM	0.011	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #6	21-Apr-20	2001727-03_WL68	BARIUM	0.009	MG/L	2	MG/L	-	-
GRAV.PACKED WELL #6	21-Apr-20	2001727-03_WL68	CHROMIUM	0.002	MG/L	0.1	MG/L	-	-
GRAV.PACKED WELL #6	25-Apr-17	1701959-02_WL21	FLUORIDE	0.23	MG/L	-	-	2	MG/L
GRAV.PACKED WELL #6	25-Apr-17	1701959-02_WL68	NICKEL	0.01	MG/L	-	-	-	-
GRAV.PACKED WELL #6	25-Apr-17	1701959-02_WL16	NITRATE	2.53	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #6	21-Apr-20	2001727-03_WL16	NITRATE	1.98	MG/L	10	MG/L	-	-
GRAV.PACKED WELL #6	23-Apr-18	1801812-01_WL16	NITRATE-NITRITE	2.19	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	25-Apr-19	1901817-02_WL16	NITRATE-NITRITE	1.97	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	22-Apr-21	2101880-04_WL16	NITRATE-NITRITE	2.08	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	22-Apr-21	2101880-03_WL16	NITRATE-NITRITE	2.06	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	25-Apr-22	2201702-02_	NITRATE-NITRITE	1.62	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	25-Apr-22	2201702-03_	NITRATE-NITRITE	1.6	MG/L	1	MG/L	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	PERFLUOROBUTANOIC ACID	9.63	NG/L	-	-	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	PERFLUOROCTANOIC ACID (PFOA)	14.4	NG/L	-	-	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	PERFLUOROHEPTANOIC ACID (PFHPA)	4.67	NG/L	-	-	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	PERFLUOROHEXANOIC ACID (PFHXA)	17	NG/L	-	-	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	PERFLUOROPENTANOIC ACID (PFPEA)	15.7	NG/L	-	-	-	-
GRAV.PACKED WELL #6	25-Apr-17	1701959-02_WL71	SODIUM	27.6	MG/L	-	-	-	-
GRAV.PACKED WELL #6	23-Apr-18	1801812-01_WL71	SODIUM	28.7	MG/L	-	-	-	-
GRAV.PACKED WELL #6	25-Apr-19	1901817-02_WL71	SODIUM	26.1	MG/L	-	-	-	-
GRAV.PACKED WELL #6	21-Apr-20	2001727-03_WL71	SODIUM	27	MG/L	-	-	-	-
GRAV.PACKED WELL #6	22-Apr-21	2101880-03_WL71	SODIUM	28.3	MG/L	-	-	-	-
GRAV.PACKED WELL #6	22-Apr-21	2101880-04_WL71	SODIUM	28	MG/L	-	-	-	-
GRAV.PACKED WELL #6	25-Apr-22	2201702-02_WL71	SODIUM	25.4	MG/L	-	-	-	-
GRAV.PACKED WELL #6	25-Apr-22	2201702-03_WL71	SODIUM	23.3	MG/L	-	-	-	-
GRAV.PACKED WELL #6	11-Apr-19	1901675-05_TO20	TOTAL PFOS AND PFOA	14.4	NG/L	*2	-	-	-

NOTE 1: 1° MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2° MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

*2 In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS.

Laboratory Results (Contaminant Detects): Northern Hunt

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1° MCL[NOTE 1]	1° MCL Units	2° MCL[NOTE 2]	2° MCL Units
GRAV.DEV. WELL #9	30-Mar-20	2001608-06_WL68	BARIUM	0.012	MG/L	2	MG/L	-	-
GRAV.DEV. WELL #9	27-Mar-18	1801525-10_TO12	CHLOROFORM	1.3	UG/L	-	-	-	-
GRAV.DEV. WELL #9	14-Mar-19	1901345-07_TO12	CHLOROFORM	1.5	UG/L	-	-	-	-
GRAV.DEV. WELL #9	30-Mar-20	2001608-06_TO12	CHLOROFORM	1.3	UG/L	-	-	-	-
GRAV.DEV. WELL #9	25-Mar-21	2101592-08_TO12	CHLOROFORM	1.6	UG/L	-	-	-	-
GRAV.DEV. WELL #9	21-Mar-22	2201380-06_TO12	CHLOROFORM	1.6	UG/L	-	-	-	-
GRAV.DEV. WELL #9	30-Mar-20	2001608-06_WL16	NITRATE	2.69	MG/L	10	MG/L	-	-
GRAV.DEV. WELL #9	27-Mar-18	1801525-10_WL16	NITRATE-NITRITE	2.86	MG/L	1	MG/L	-	-
GRAV.DEV. WELL #9	14-Mar-19	1901345-07_WL16	NITRATE-NITRITE	3.04	MG/L	1	MG/L	-	-
GRAV.DEV. WELL #9	25-Mar-21	2101592-08_WL16	NITRATE-NITRITE	2.04	MG/L	1	MG/L	-	-
GRAV.DEV. WELL #9	21-Mar-22	2201380-06_WL16	NITRATE-NITRITE	2.25	MG/L	1	MG/L	-	-
GRAV.DEV. WELL #9	11-Apr-19	1901675-10_TO20	PERFLUOROCTANOIC ACID (PFOA)	7.76	NG/L	-	-	-	-
GRAV.DEV. WELL #9	11-Apr-19	1901675-10_TO20	PERFLUOROHEXANOIC ACID (PFHXA)	5.69	NG/L	-	-	-	-
GRAV.DEV. WELL #9	11-Apr-19	1901675-10_TO20	PERFLUOROPENTANOIC ACID (PFPEA)	4.25	NG/L	-	-	-	-
GRAV.DEV. WELL #9	27-Mar-18	1801525-10_WL71	SODIUM	41.4	MG/L	-	-	-	-
GRAV.DEV. WELL #9	14-Mar-19	1901345-07_WL71	SODIUM	40.5	MG/L	-	-	-	-
GRAV.DEV. WELL #9	30-Mar-20	2001608-06_WL71	SODIUM	38.7	MG/L	-	-	-	-
GRAV.DEV. WELL #9	25-Mar-21	2101592-08_WL71	SODIUM	39	MG/L	-	-	-	-
GRAV.DEV. WELL #9	21-Mar-22	2201380-06_WL71	SODIUM	43.2	MG/L	-	-	-	-
GRAV.DEV. WELL #9	11-Apr-19	1901675-10_TO20	TOTAL PFOS AND PFOA	7.76	NG/L	*2	-	-	-

NOTE 1: 1° MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2° MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

*2 In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS.

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCEN-TRATION	UNITS	1° MCL[NOTE 1]	1° MCL Units	2° MCL[NOTE 2]	2° MCL Units
GRAV.DEV.WELL #10	25-Apr-17	1701959-01_WL68	BARIUM	0.01	MG/L	2	MG/L	-	-
GRAV.DEV.WELL #10	21-Apr-20	2001727-02_WL68	BARIUM	0.009	MG/L	2	MG/L	-	-
GRAV.DEV.WELL #10	07-Nov-17	1704908-03_TO12	CHLOROFORM	2	UG/L	-	-	-	-
GRAV.DEV.WELL #10	12-Dec-18	1804955-01_TO12	CHLOROFORM	1.9	UG/L	-	-	-	-
GRAV.DEV.WELL #10	19-Dec-19	1905187-01_TO12	CHLOROFORM	2.6	UG/L	-	-	-	-
GRAV.DEV.WELL #10	30-Dec-20	2004997-01_TO12	CHLOROFORM	4	UG/L	-	-	-	-
GRAV.DEV.WELL #10	21-Apr-20	2001727-02_WL68	CHROMIUM	0.001	MG/L	0.1	MG/L	-	-
GRAV.DEV.WELL #10	21-Apr-20	2001727-02_WL68	NICKEL	0.087	MG/L	-	-	-	-
GRAV.DEV.WELL #10	25-Apr-17	1701959-01_WL16	NITRATE	3.7	MG/L	10	MG/L	-	-
GRAV.DEV.WELL #10	21-Apr-20	2001727-02_WL16	NITRATE	3.1	MG/L	10	MG/L	-	-
GRAV.DEV.WELL #10	27-Mar-18	1801525-09_WL16	NITRATE-NITRITE	3.74	MG/L	1	MG/L	-	-
GRAV.DEV.WELL #10	25-Apr-19	1901817-01_WL16	NITRATE-NITRITE	3.46	MG/L	1	MG/L	-	-
GRAV.DEV.WELL #10	22-Apr-21	2101880-01_WL16	NITRATE-NITRITE	2.84	MG/L	1	MG/L	-	-
GRAV.DEV.WELL #10	11-Apr-19	1901675-09_TO20	PERFLUOROCTANOIC ACID (PFOA)	7.24	NG/L	-	-	-	-
GRAV.DEV.WELL #10	11-Apr-19	1901675-09_TO20	PERFLUOROHEXANOIC ACID (PFHXA)	7.18	NG/L	-	-	-	-
GRAV.DEV.WELL #10	11-Apr-19	1901675-09_TO20	PERFLUOROPENTANOIC ACID (PFPEA)	5.22	NG/L	-	-	-	-
GRAV.DEV.WELL #10	25-Apr-17	1701959-01_WL71	SODIUM	28.4	MG/L	-	-	-	-
GRAV.DEV.WELL #10	27-Mar-18	1801525-09_WL71	SODIUM	30.1	MG/L	-	-	-	-
GRAV.DEV.WELL #10	25-Apr-19	1901817-01_WL71	SODIUM	30.8	MG/L	-	-	-	-
GRAV.DEV.WELL #10	21-Apr-20	2001727-02_WL71	SODIUM	29.2	MG/L	-	-	-	-
GRAV.DEV.WELL #10	22-Apr-21	2101880-01_WL71	SODIUM	28.6	MG/L	-	-	-	-
GRAV.DEV.WELL #10	11-Apr-19	1901675-09_TO20	TOTAL PFOS AND PFOA	7.24	NG/L	*2	-	-	-

NOTE 1: 1° MCL: Primary Maximum Contaminant Limit is the highest level of a contaminant that is allowed in drinking water.

NOTE 2: 2° MCL: Secondary Maximum Contaminant Limit. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

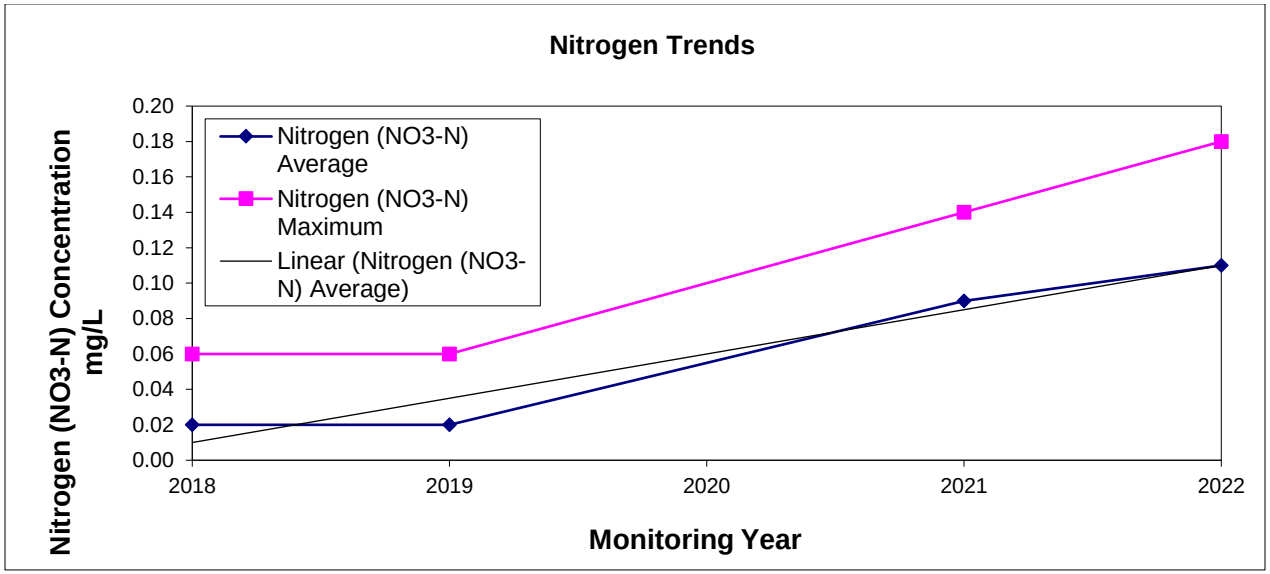
*2 In July 2022 Rhode Island adopted H7233 authorizing RIDOH to establish MCLs for PFAS in drinking water and to set interim standards. The interim drinking water standard level of twenty parts per trillion (20 ppt) has been established and is used in this analysis. On or before July 1, 2023, all public water systems in the state (except transient, non-community) shall conduct monitoring for PFAS.

Wellhead Protection Area Nitrogen Trend Table

WHPA Name: North Kingstown- Saunderstown, Well # 3, 7, and 8

Well Identification Number: PWS# 1559517-03, 1559517-09, 1559517-10

RISK INDICATOR	Instructions: see associated section number:	Year			
		2018	2019	2021	2022
Nitrogen (NO3-N) Average (mg/L)		0.02	0.02	0.09	0.11
Nitrogen (NO3-N) Maximum (mg/L)		0.06	0.06	0.14	0.18



Laboratory Results (Nitrate-Nitrite): Saunderstown

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCENTRATION	UNITS
GRAV.PACKED WELL #3	27-Mar-18	1801525-05_WL16	NITRATE-NITRITE	0.06	MG/L
GRAV.PACKED WELL #7	27-Mar-18	1801525-06_WL16	NITRATE-NITRITE	0	MG/L
GRAV.PACKED WELL #8	27-Mar-18	1801525-07_WL16	NITRATE-NITRITE	0	MG/L
GRAV.PACKED WELL #3	14-Mar-19	1901345-04_WL16	NITRATE-NITRITE	0.06	MG/L
GRAV.PACKED WELL #7	14-Mar-19	1901345-05_WL16	NITRATE-NITRITE	0	MG/L
GRAV.PACKED WELL #8	14-Mar-19	1901345-06_WL16	NITRATE-NITRITE	0	MG/L
GRAV.PACKED WELL #8	25-Mar-21	2101592-02_WL16	NITRATE-NITRITE	0.14	MG/L
GRAV.PACKED WELL #3	25-Mar-21	2101592-07_WL16	NITRATE-NITRITE	0.13	MG/L

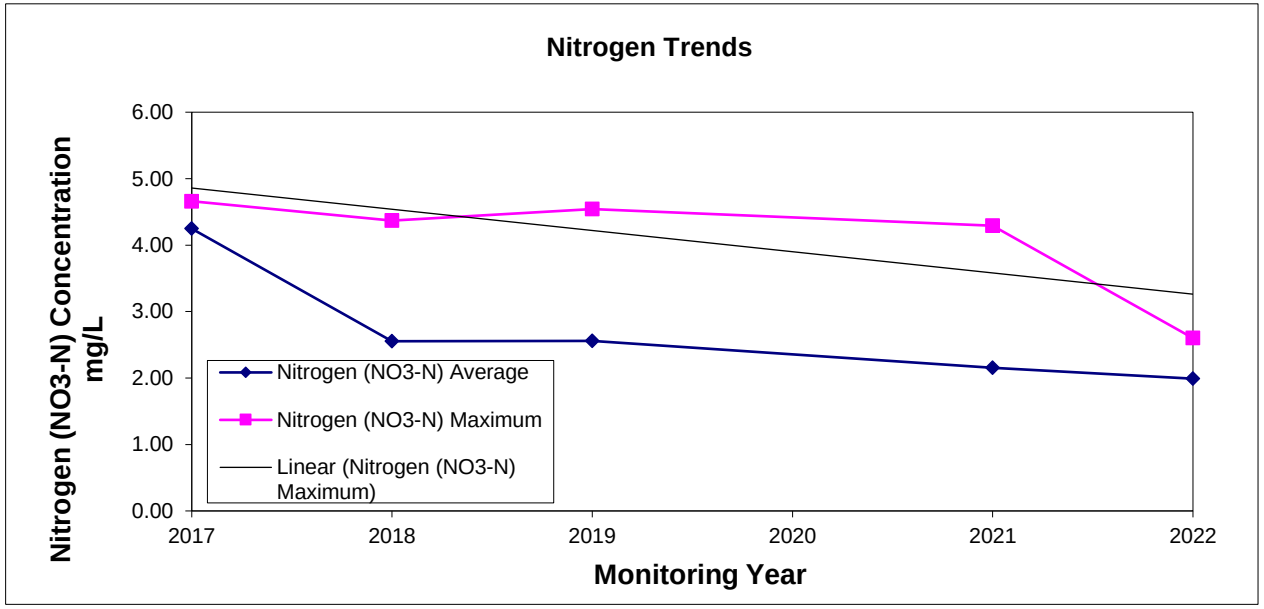
GRAV.PACKED WELL #7	25-Mar-21	2101592-03_WL16	NITRATE-NITRITE	0	MG/L
GRAV.PACKED WELL #8	21-Mar-22	2201380-08_WL16	NITRATE-NITRITE	0.18	MG/L
GRAV.PACKED WELL #7	21-Mar-22	2201380-05_WL16	NITRATE-NITRITE	0.13	MG/L
GRAV.PACKED WELL #3	21-Mar-22	2201380-09_WL16	NITRATE-NITRITE	0.07	MG/L
GRAV.PACKED WELL #3	21-Mar-22	2201380-10_WL16	NITRATE-NITRITE	0.06	MG/L

Includes Field Duplicates

Wellhead Protection Area Nitrogen Trend Table

WHPA Name: North Kingstown- Annaquatucket, Well # 1, 2, 4, 5A, and 11
Well Identification Number: PWS# 1559517-01, 1559517-02, 1559517-04, 1559517-11, 1559517-12

RISK INDICATOR	Instructions: see associated section number:	Year				
		2017	2018	2019	2021	2022
Nitrogen (NO3-N) Average (mg/L)		4.25	2.55	2.56	2.16	1.99
Nitrogen (NO3-N) Maximum (mg/L)		4.66	4.37	4.54	4.29	2.6



Laboratory Results (Nitrate-Nitrite): Annaquatucket

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCENTRATION	UNITS
GRAVEL PACKED WELL # 11	21-Aug-17	1703965-07_WL16	NITRATE-NITRITE	4.34	MG/L
GRAVEL PACKED WELL # 11	07-Nov-17	1704908-02_WL16	NITRATE-NITRITE	4.66	MG/L
GRAVEL PACKED WELL # 5A	27-Mar-18	1801525-04_WL16	NITRATE-NITRITE	2.71	MG/L
GRAVEL PACKED WELL # 11	27-Mar-18	1801525-08_WL16	NITRATE-NITRITE	2.12	MG/L
GRAVEL PACKED WELL # 4	27-Mar-18	1801525-03_WL16	NITRATE-NITRITE	1.92	MG/L
GRAVEL PACKED WELL # 2	27-Mar-18	1801525-02_WL16	NITRATE-NITRITE	1.49	MG/L
GRAVEL PACKED WELL # 1	27-Mar-18	1801525-01_WL16	NITRATE-NITRITE	1.34	MG/L
GRAVEL PACKED WELL # 11	23-Apr-18	1801812-02_WL16	NITRATE-NITRITE	4.37	MG/L
GRAVEL PACKED WELL # 11	24-Sep-18	1804186-01_WL16	NITRATE-NITRITE	3.91	MG/L
GRAVEL PACKED WELL # 5A	14-Mar-19	1901345-03_WL16	NITRATE-NITRITE	3	MG/L
GRAVEL PACKED WELL # 4	14-Mar-19	1901345-02_WL16	NITRATE-NITRITE	2.12	MG/L
GRAVEL PACKED WELL # 1	14-Mar-19	1901345-10_WL16	NITRATE-NITRITE	1.29	MG/L
GRAVEL PACKED WELL # 1	14-Mar-19	1901345-09_WL16	NITRATE-NITRITE	1.28	MG/L
GRAVEL PACKED WELL # 2	14-Mar-19	1901345-01_WL16	NITRATE-NITRITE	1.21	MG/L
GRAVEL PACKED WELL # 11	11-Sep-19	1904187-02_WL16	NITRATE-NITRITE	4.54	MG/L
GRAVEL PACKED WELL # 11	11-Sep-19	1904187-01_WL16	NITRATE-NITRITE	4.48	MG/L
GRAVEL PACKED WELL # 5A	25-Mar-21	2101592-05_WL16	NITRATE-NITRITE	2.26	MG/L
GRAVEL PACKED WELL # 4	25-Mar-21	2101592-04_WL16	NITRATE-NITRITE	1.93	MG/L
GRAVEL PACKED WELL # 1	25-Mar-21	2101592-01_WL16	NITRATE-NITRITE	1.12	MG/L
GRAVEL PACKED WELL # 2	30-Apr-21	2101959-01_WL16	NITRATE-NITRITE	1.18	MG/L
GRAVEL PACKED WELL # 11	15-Sep-21	2104371-04_WL16	NITRATE-NITRITE	4.29	MG/L
GRAVEL PACKED WELL # 5A	21-Mar-22	2201380-04_WL16	NITRATE-NITRITE	2.6	MG/L
GRAVEL PACKED WELL # 4	21-Mar-22	2201380-03_WL16	NITRATE-NITRITE	2.34	MG/L
GRAVEL PACKED WELL # 2	21-Mar-22	2201380-02_WL16	NITRATE-NITRITE	1.63	MG/L
GRAVEL PACKED WELL # 1	21-Mar-22	2201380-01_WL16	NITRATE-NITRITE	1.39	MG/L

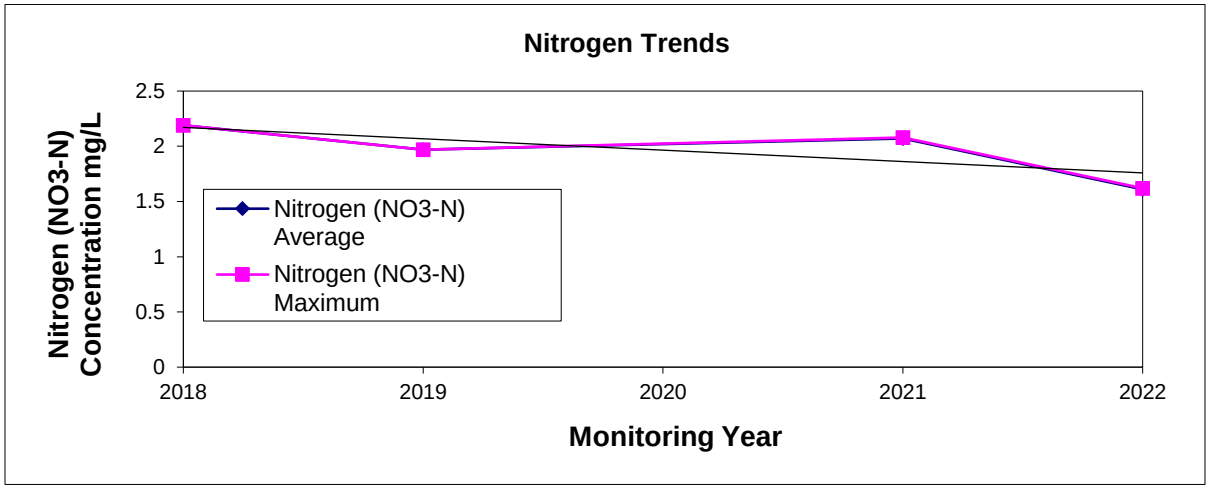
Includes Field Duplicates

Wellhead Protection Area Nitrogen Trend Table

WHPA Name: North Kingstown- Lower Hunt, Well # 6

Well Identification Number: PWS# 1559517-06

RISK INDICATOR	Instructions: see associated section number:	Year			
		2018	2019	2021	2022
Nitrogen (NO3-N) Average (mg/L)		2.19	1.97	2.07	1.61
Nitrogen (NO3-N) Maximum (mg/L)		2.19	1.97	2.08	1.62



Laboratory Results (Nitrate-Nitrite): Lower Hunt

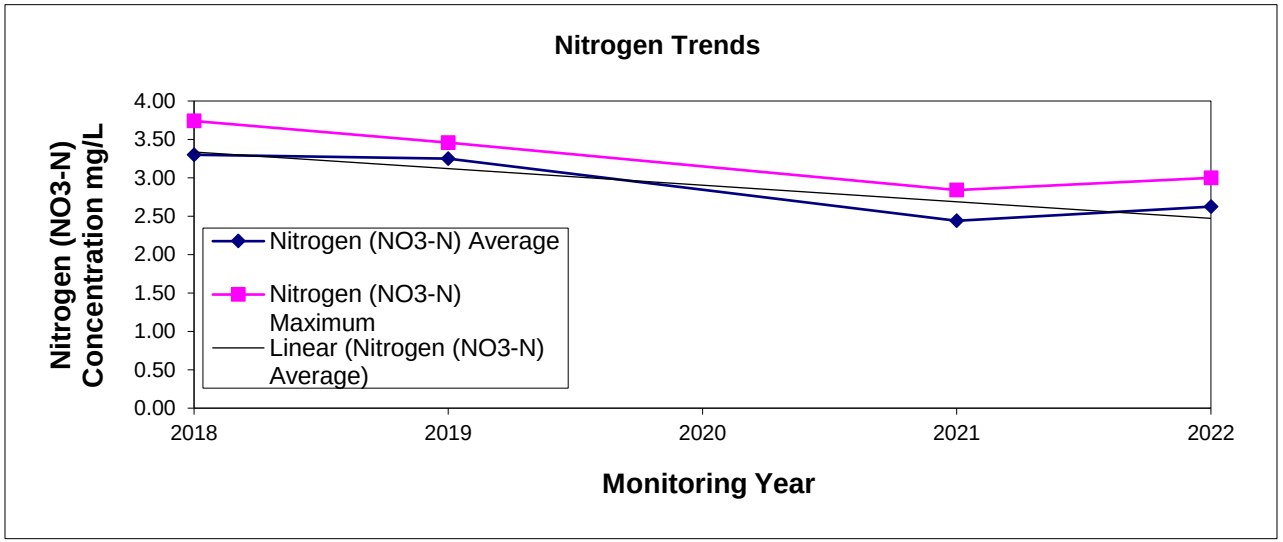
DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCENTRATION	UNITS
GRAV.PACKED WELL #6	23-Apr-18	1801812-01_WL16	NITRATE-NITRITE	2.19	MG/L
GRAV.PACKED WELL #6	25-Apr-19	1901817-02_WL16	NITRATE-NITRITE	1.97	MG/L
GRAV.PACKED WELL #6	22-Apr-21	2101880-04_WL16	NITRATE-NITRITE	2.08	MG/L
GRAV.PACKED WELL #6	22-Apr-21	2101880-03_WL16	NITRATE-NITRITE	2.06	MG/L
GRAV.PACKED WELL #6	25-Apr-22	2201702-02_	NITRATE-NITRITE	1.62	MG/L
GRAV.PACKED WELL #6	25-Apr-22	2201702-03_	NITRATE-NITRITE	1.6	MG/L

Includes Field Duplicates

Wellhead Protection Area Nitrogen Trend Table

WHPA Name: North Kingstown- Northern Hunt, Well # 9 and 10
Well Identification Number: PWS# 1559517-07 and 1559517-08

RISK INDICATOR	Instructions: see associated section number:	Year			
		2018	2019	2021	2022
Nitrogen (NO3-N) Average (mg/L)		3.30	3.25	2.44	2.63
Nitrogen (NO3-N) Maximum (mg/L)		3.74	3.46	2.84	3.00



Laboratory Results (Nitrate-Nitrite): Northern Hunt

DESCRIPTION_TEXT	COLLECTION DATE	SAMPLE #	ANALYTE NAME	CONCENTRATION	UNITS
GRAV.DEV.WELL #10	27-Mar-18	1801525-09_WL16	NITRATE-NITRITE	3.74	MG/L
GRAV.DEV. WELL #9	27-Mar-18	1801525-10_WL16	NITRATE-NITRITE	2.86	MG/L
GRAV.DEV. WELL #9	14-Mar-19	1901345-07_WL16	NITRATE-NITRITE	3.04	MG/L
GRAV.DEV.WELL #10	25-Apr-19	1901817-01_WL16	NITRATE-NITRITE	3.46	MG/L
GRAV.DEV. WELL #9	25-Mar-21	2101592-08_WL16	NITRATE-NITRITE	2.04	MG/L
GRAV.DEV.WELL #10	22-Apr-21	2101880-01_WL16	NITRATE-NITRITE	2.84	MG/L
GRAVEL DEV. WELL #10A	13-Jan-22	2201-00616-001A	NITRATE-NITRITE	3	MG/L
GRAV.DEV. WELL #9	21-Mar-22	2201380-06_WL16	NITRATE-NITRITE	2.25	MG/L

Includes Field Duplicates