TOWN OF JAMESTOWN RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
WATER DEPARTMENT

WATER SUPPLY SYSTEM MANAGEMENT PLAN
5-YEAR UPDATE
WATER QUALITY PROTECTION COMPONENT
UPDATE OF THE 2022 JAMESTOWN SOURCE WATER ASSESSMENT
AND PROTECTION PLAN
VOLUME II

Prepared for:

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ORIGINAL SUBMISSION - APRIL 2024

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SECTION 1
INTRODUCTION

Pare has prepared the following update of the 2022 Jamestown Source Water Assessment Plan (SWAP) for the Town of Jamestown Water Department (JWD) in accordance with the Guide to Updating Source Water Assessments and Protection Plans, Version 3 December 2010 (the Guide). These guidelines describe methods for obtaining and reviewing data pertinent in evaluating potential risks to the Jamestown wells within their Wellhead Protection Area (WHPA) and to the Carr (North) Pond Reservoir and the Watson (South) Pond Reservoir within their watershed. It should be noted that water from the Jamestown wells is pumped directly into the reservoir where it is mixed with reservoir water and therefore only the reservoirs were evaluated for this update to remain consistent with the 2015 Jamestown SWAP. Table 1 summarizes the risks evaluated for the wells and reservoirs.

Table 1. 2006 Updated Pollution Risk Rating

Wellhead Protection Area (WHPA)	Surface Water Supply Watersheds
1. High intensity land use throughout the WHPA.	1. High intensity land use throughout the watershed or subwatershed.
2. Pollution sources within inner protective radius (400 or 200 ft) of well.	2. Pollution sources within a 200-ft buffer to the reservoir and tributaries.
3. Pollution sources per acre throughout WHPA, excluding inner protective radius.	3. Pollution sources per acre throughout the watershed, including the 200-ft buffer to the reservoir and tributaries.
4. History of contaminant detects within last 5 years.	4. Reservoir nutrient enrichment status.
5. Bacteria detects in source water within 5 years.	5. Compliance with water quality criteria.
6. Maximum nitrogen (NO_3-N) concentration in last 5 years.	6. History of contaminant detects within last 5 years.

Source: Guide to Updating Source Water Assessments and Protection Plans, Version 3 – December 2010

SECTION 2
RISKS EVALUATED FOR CARR (NORTH) POND SURFACE WATER RESERVOIR

Risk Indicator 1: High Intensity Land Use throughout the watershed

- Land use changes were negligible.
- Method 1 (GIS) was used to create an updated map of land use (Appendix A).
- The watershed risk rating for high intensity land uses was ranked low in 2015 and was determined to be low in 2022.
- The determination identifies that there has been no major change in land use since the 2015 SWAP.

Risk Indicator 2: Mapped pollution sources within 200 ft of the drinking water reservoir and tributaries

- No Potential Source of Contaminant (PSC) sites were located within the 200-ft reservoir buffer during the windshield survey.
- GIS was used to create an updated map for Risk Indicator 2, however no PSC sites were identified using GIS (Appendix C).
- The risk rating remains low within the 200-ft buffer for 2022 and therefore identifies that there has been no change within the buffer since the 2015 SWAP.

Risk Indicator 3: Mapped pollution sources throughout the watershed including the 200 ft buffer to the drinking water reservoir and tributaries

- No PSC sites were located throughout the watershed during the windshield survey.
- Method 1 (GIS) was used to create an updated map of the sources throughout the watershed, however no PSC sites were identified using GIS (Appendix C).
- The pollution source rating per 10 acres throughout the watershed was ranked low in 2015 and was determined to be low for 2022.

Risk Indicator 4: Reservoir nutrient enrichment status (Clarity, Phosphorus and Chlorophyll a)

- By using Method 2 of the Guide, the trophic state of Carr Pond was determined to be low. High levels of disinfection byproducts, such as trihalomethanes, were not reported in the last five years, and no biodiversity impairments are listed on the 303d list in this area.

Risk Indicator 5: Listed on RIDEM 303d list

- The surface water reservoir (Carr Pond) or any of the tributaries to Carr Pond within the watershed are not on the list.
- The risk rating for Carr Pond therefore was determined to be low.

Risk Indicator 6: History of contaminant detects in source water within the last 5 years for reservoir outflow water.

- There has been no detection of regulated contaminants (excluding bacteria and nitrates). In accordance with the guide, trace detections occurred in the last 5 years and are less than 10% of the contaminant MCL and get a low risk rating.
- There has been a detection of a regulated contaminant that is well below the Maximum Contaminant Levels (MCL) set by the US EPA. In accordance with the guide, the detection is none or trace and gets a low risk rating. The regulated contaminant was Barium, with seven detections over the last five years. The detection indicates the need for continued monitoring and may indicate the need for future management and/or treatment.
- Sodium concentrations in groundwater did not exceed the US EPA 20 mg/L guidance level.
- With only trace detections, the risk rating was determined to be low for this update of the 2022 SWAP. In the 2022 SWAP, a risk rating of low was determined for Carr Pond due to detections of regulated contaminants that were none to trace.
- Data within the last 5 years is presented in an updated table in Appendix E.

TOTAL RANKING FOR CARR POND RESERVOIR

- The final risk rating for the Carr Pond Reservoir was determined to be low, which is consistent with the 2015 SWAP. In accordance with the Guide, a ranking of low does not mean that the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated.
- The final risk rating tables for the Carr Pond Reservoir are presented in Appendix F.

SECTION 3
RISKS EVALUATED FOR WATSON (SOUTH) POND SURFACE WATER RESERVOIR

Risk Indicator 1: High Intensity Land Use throughout the watershed

- Land use changes were negligible.
- Method 1 (GIS) was used to create an updated map of land use (Appendix A).
- The watershed risk rating for high intensity land uses was ranked medium in 2015 and was determined to be medium in 2022.
- The determination identifies that there has been no change in land use since the 2015 SWAP.

Risk Indicator 2: Mapped pollution sources within 200 ft of the drinking water reservoir and tributaries

- No PSC sites were located within the 200-ft reservoir buffer during the windshield survey.
- GIS was used to create an updated map for Risk Indicator 2, however no PSC sites were identified using GIS (Appendix C).
- The risk rating remains low within the 200-ft buffer for 2022 and therefore identifies that there has been no change within the buffer since the 2015 SWAP.

Risk Indicator 3: Mapped pollution sources throughout the watershed including the 200 ft buffer to the drinking water reservoir and tributaries

- One PSC site was located throughout the watershed during the windshield survey. A list of the PSCs within the watershed is presented in an updated table in Appendix D.
- Method 1 (GIS) was used to create an updated map of the sources throughout the watershed (Appendix C).
- Route 138 may present a low risk due to its location within the northern portion of the watershed.
- The pollution source rating per 10 acres throughout the watershed was ranked low in 2015 and was determined to be low for 2022.

Risk Indicator 4: Reservoir nutrient enrichment status (Clarity, Phosphorus and Chlorophyll a)

- By using Method 2 of the Guide, the trophic state of Watson Pond was determined to be moderate. High levels of disinfection byproducts, such as trihalomethanes, were not reported in the last five years, and no biodiversity impairments are listed on the 303d list in this area.

Risk Indicator 5: Listed on RIDEM 303d list

- The surface water reservoir (Watson Pond) or any of the tributaries to Watson Pond within the watershed are not on the list.
- Jamestown Brook is listed on the 2014 draft 303d list which feeds directly into Watson Pond. Jamestown Brook lists copper, iron, lead, and fecal coliforms as causes of impairment.
- The risk rating for Watson Pond therefore was determined to be low.

Risk Indicator 6: History of contaminant detects in source water within the last 5 years for reservoir outflow water.

- No violations of standards for regulated contaminants (excluding bacteria and nitrates) have been identified at Watson Pond. In accordance with the guide, trace detections occurred in the last 5 years and are less than 10% of the contaminant MCL and get a low risk rating.
- There has been a detection of a regulated contaminant that is well below the Maximum Contaminant Levels (MCL) set by the US EPA. In accordance with the guide, the detection is none or trace and gets a low risk rating. The regulated contaminant was Barium, with seven detections over the last five years. The detection indicates the need for continued monitoring and may indicate the need for future management and/or treatment.
- Sodium concentrations in groundwater did not exceed the US EPA 20 mg/L guidance level.
- With only trace detections, the risk rating was determined to be low for this update of the 2022 SWAP. In the 2022 SWAP, a risk rating of low was determined for Watson Pond due to detections of regulated contaminants that were none to trace.
- Data within the last 5 years is presented in an updated table in Appendix E.

TOTAL RANKING FOR WATSON POND RESERVOIR

- The final risk rating for the Watson Pond Reservoir was determined to be moderate, which is consistent with the 2015 SWAP. In accordance with the Guide, a ranking of moderate means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.
- The final risk rating tables for the Watson Pond Reservoir are presented in Appendix F.

SECTION 4
SUMMARY

RISK RATING

- The final risk rating for the Carr Pond Reservoir was determined to be **low**, which is consistent with the 2015 SWAP.
- The final risk rating for the Watson Pond Reservoir was determined to be **moderate**, which is consistent with the 2015 SWAP.

ACTIONS TAKEN BY THE JWD:

- See Section 6.0 Supply Management, of the updated WSSMP (dated October 2023).

SECTION 5
REFERENCES

RIDEM, 2018-2020. State of Rhode Island 2018-2020 303(d) List of Impaired Waters, February 2021.

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RINEMO, 2006. Guide to Updating Source Water Assessments and Protection Plans. Prepared by the RI DOH and URI Cooperative Extension NEMO Program in partnership with the RI Water Resources Board, October 2006.

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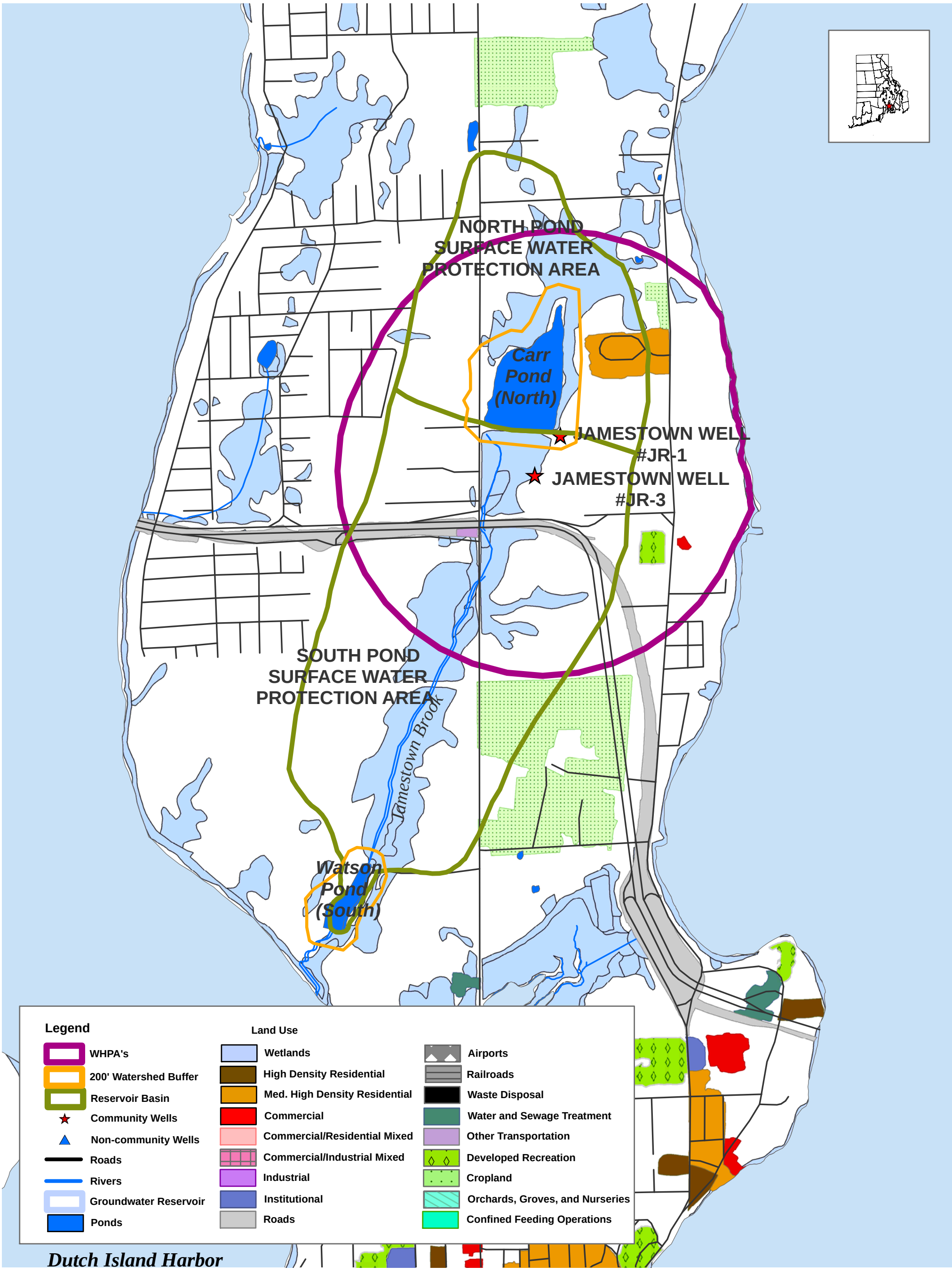
USEPA, 2007c. EnviroMapper for Water (Available online at: http://map8.epa.gov/scripts/esrimap.dll?name=NHDMAPPER&Cmd=ZoomInByEntity&th=0.3&im=on&SYS=303D&EntityID=RI0001006L-04). Accessed May 2007.

USEPA, 2006. 2006 Edition of the Drinking Water Standards and Health Advisories. Office of Water, USEPA, Washington, D.C., EPA 822-R-06-013, August 2006.

APPENDIX A

LAND USE UPDATE MAP



Town of Jamestown (SWAP Assessment)
High-Intensity Land Use Changes Identified in the Jamestown #JR-1 and #JR-3 WHPA's and North and South Pond Reservoir Watersheds

PARE CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

N

0 0.125 0.25 0.5
Miles

APPENDIX B

LAND USE UPDATE TABLE

Land Use Update Table (based on 2023 RIGIS data)

Land Use Category	Carr (North) Pond			Watson (South) Pond		
	Acres	% area	% change[1]	Acres	% area	% change[1]
[1] HD Res.(>8 /ac)	0.0	0.0%		0.0	0.0%	
[2] MHD Res.(4-7.9/ac)	10.6	5.1%		0.0	0.0%	
[3] MD Res.(1-3.9/ac)	9.9	4.7%		3.0	0.7%	
[4] MLD Res.(0.5-0.9/ac)	28.3	13.5%		17.7	3.9%	
[5] LD Res.(<0.5/ac)	44.5	21.2%		112.2	24.9%	
[6] Commercial	0.0	0.0%		0.0	0.0%	
[7] Industrial	0.0	0.0%		0.0	0.0%	
[8] Roads	0.0	0.0%		18.3	4.1%	
[9] Airports	0.0	0.0%		0.0	0.0%	
[10] Railroads	0.0	0.0%		0.0	0.0%	
[11] Junkyards	0.0	0.0%		0.0	0.0%	
[12] Recreation	3.2	1.5%		2.3	0.5%	
[13] Institution	0.0	0.0%		0.0	0.0%	
[14] Pasture	7.5	3.6%		30.4	6.7%	
[15] Cropland	0.0	0.0%		22.9	5.1%	
[16] Orchards	0.0	0.0%		0.0	0.0%	
[17] Brush	4.1	2.0%		17.1	3.8%	
[18] Forest	27.2	12.9%		119.4	26.5%	
[19] Barren	0.0	0.0%		0.0	0.0%	
[20] Wetland	47.7	22.7%		106.9	23.7%	
[21] Water	26.9	12.8%		0.1	0.0%	
Total (acres)	**209.9**	100%	0.0%	**450.3**	100%	0.0%

[1]Percentage change in land use category from 2022 Source Water Assessment to updated land use

Shaded categories are High Density land uses

APPENDIX C

POTENTIAL SOURCES OF CONTAMINANTS MAP

NORTH POND
SURFACE WATER
PROTECTION AREA

Carr
Pond
(North)

JAMESTOWN WELL
#JR-1

JAMESTOWN WELL
#JR-3

SOUTH POND
SURFACE WATER
PROTECTION AREA

Jamestown Brook

Watson
Pond
(South)

Dutch Island Harbor

Legend

- WHPA's
- 200' Watershed Buffer
- Reservoir Basin
- Community Wells
- Non-community Wells
- DEM RIPDES Permits
- Leaking Underground Storage Tanks
- Cerclis (Super Fund Sites)
- SWAP Identified Potential Contaminate Source
- Wetlands
- Groundwater Reservoir
- Groundwater Recharge Area
- Roads
- Rivers
- Ponds
- Municipal Boundary

Town of Jamestown (SWAP Assessment) Potential Pollutant Sources Identified in the Jamestown #JR-1 and #JR-3 WHPA's and North and South Pond Reservoir Watersheds

N

0 0.125 0.25 0.5
Miles

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8 BLACKSTONE VALLEY PLACE
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401-334-4100

APPENDIX D

POTENTIAL SOURCES OF CONTAMINANTS TABLES

Potential Sources of Contaminants

Watershed Name: Carr (North) Pond

Map ID #	Name of Potential Pollutant Source	Location of Potential Pollutant Source	Located within well radius or within 200 ft of surface water reservoir or tributary to reservoir?	Type of source[1]	Risk Ranking		
					Low	Medium	High
	NONE						

[1]Data sources:

WS: Windshield Survey for SWAP Update, May 2023
CERCLA: CERCLA Site File List Update (an update to 1997 RIDEM CERCLIS), downloaded from RIGIS in October 2007
RIPDES: National Pollutant Discharge Elimination System (NPDES) program in RI, downloaded from RIGIS in October 2007
SWAP 2022 WS: Data provided with 2022 SWAP report, includes sites recorded during 2023 windshield survey
LUST: RIDEM Leaking Underground Tanks in Rhode Island, December 1999, downloaded from RIGIS in October 2007
CERCLIS: RIDEM CERCLIS Potential Hazardous Waste Sites, January 1997, downloaded from RIGIS in October 2007

Potential Sources of Contaminants

Watershed Name: Watson (South) Pond

Map ID #	Name of Potential Pollutant Source	Location of Potential Pollutant Source	Located within well radius or within 200 ft of surface water reservoir or tributary to reservoir?	Type of source[1]	Risk Ranking		
					Low	Medium	High
1	Route 138	Route 138	No	WS - Highway	x		

[1]Data sources:

WS: Windshield Survey for SWAP Update, May 2023
CERCLA: CERCLA Site File List Update (an update to 1997 RIDEM CERCLIS), downloaded from RIGIS in October 2007
RIPDES: National Pollutant Discharge Elimination System (NPDES) program in RI, downloaded from RIGIS in October 2007
SWAP 2022 WS: Data provided with 2022 SWAP report, includes sites recorded during 2023 windshield survey
LUST: RIDEM Leaking Underground Tanks in Rhode Island, December 1999, downloaded from RIGIS in October 2007
CERCLIS: RIDEM CERCLIS Potential Hazardous Waste Sites, January 1997, downloaded from RIGIS in October 2007

APPENDIX E

CONTAMINANT DETECTIONS TABLE

CONTAMINANT DETECTIONS IN JAMESTOWN SURFACE WATER RESERVOIRS

Carr (North) Pond, PWS ID# RI1858419

Contaminant	Number Detects[1]	Maximum	MCL	Rank	Rating
Barium	0	0.013 mg/L	2 mg/L	Low	0

[1] Detection =Greater than 10% of the contaminant MCL

Watson (South) Pond, PWS ID# RI1858419

Contaminant	Number Detects[1]	Maximum	MCL	Rank	Rating
Barium	0	0.014 mg/L	2 mg/L	Low	0

[1] Detection =Greater than 10% of the contaminant MCL

APPENDIX F

POLLUTION RISK RATING TABLES

Surface Water Reservoir Risk Spreadsheet

Watershed Name: Carr Pond (North Pond)

RISK INDICATOR	RATING				2015		Update (2022)	
	Low 0	Medium 5	High 10	Extreme 25	Input	Rating	Input	Rating
Watershed land use								
1. High intensity land use	< 10%	10 - 14%	15 - 25%	> 25%	5.1%	0	5.1%	0
2. High intensity land use on highly impermeable soils throughout the watershed.	none	< 5%	> 5 - 15%	> 15%	< 5%	5	< 5%	5
3. High intensity land use located within 200 ft of reservoir and tributaries.	none	< 5%	> 5 - 15%	> 15%	0.0%	0	0.0%	0*
Existing or potential sources of contamination (PSC)								
4. Mapped pollution sources within the 200 foot buffer to reservoir and tributaries	None			Presence of one or more sources	0	0	0	0
5. Pollution sources (per 10 acres) throughout watershed, including the 200 foot buffer to reservoir and tributaries. (PSC/acres*10)	< 0.1	0.1 - 0.5	0.5 - 1	> 1	0.005	0	0.005**	0
Water quality								
6. Reservoir nutrient enrichment status (clarity, phosphorus, dissolved oxygen)	oligotrophic (O)	mesotrophic (M)	meso / eutrophpic (M/E)	eutrophic (E)	mesotrophic (M)	5	mesotrophic (M)	5
7. Compliance with water quality criteria based on 303(d) list (July 2015).	Fully supporting (all criteria)	Impaired tributary (minor, not affecting supply)	Impaired tributary (potential to affect supply)	Not fully supporting for drinking water	Fully supporting (all criteria)	0	Fully supporting (all standards)	0
8. History of contaminant detects within last 5 years at outflow sampling station.	none or Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	none or Trace[1]	0	none or Trace[1]	0
Maximum	*0*	*30*	*60*	*150*				
Overall Ranking - Sum of all pollution risk ratings.	**0 - 19**	**20 – 59**	**60 - 100**	**>100**		**10**		**10**
	Low	**Moderate**	**High**	**Extreme**		**Low**		**Low**

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

* = No High Intensity Land Use changes found during update, 2015 value utilized for consistency and to be conservative

** = No pollution sources found during update, 2015 value utilized for consistency and to be conservative

Surface Water Reservoir Risk Spreadsheet

Watershed Name: Watson Pond (South Pond)

RISK INDICATOR	RATING				2015		Update (2022)	
	Low 0	Medium 5	High 10	Extreme 25	Input	Rating	Input	Rating
Watershed land use								
1. High intensity land use	< 10%	10 - 14%	15 - 25%	> 25%	12.4%	5	12.4%	5
2. High intensity land use on highly impermeable soils throughout the watershed.	none	< 5%	> 5 - 15%	> 15%	> 5 - 15%	10	> 5 - 15%	10
3. High intensity land use located within 200 ft of reservoir and tributaries.	none	< 5%	> 5 - 15%	> 15%	2.5%	5	2.5%	5*
Existing or potential sources of contamination (PSC)								
4. Mapped pollution sources within the 200 foot buffer to reservoir and tributaries	None			Presence of one or more sources	0	0	0	0
5. Pollution sources (per 10 acres) throughout watershed, including the 200 foot buffer to reservoir and tributaries. (PSC/acres*10)	< 0.1	0.1 - 0.5	0.5 - 1	> 1	0.020	0	0.020**	0
Water quality								
6. Reservoir nutrient enrichment status (clarity, phosphorus, dissolved oxygen)	oligotrophic (O)	mesotrophic (M)	meso / eutrophpic (M/E)	eutrophic (E)	meso / eutrophpic (M/E)	10	meso / eutrophpic (M/E)	10
7. Compliance with water quality criteria based on 303(d) list (July 2015).	Fully supporting (all criteria)	Impaired tributary (minor, not affecting supply)	Impaired tributary (potential to affect supply)	Not fully supporting for drinking water	Fully supporting (all criteria)	0	Fully supporting (all criteria)	0
8. History of contaminant detects within last 5 years at outflow sampling station.	none or Trace[1]	≤1/2 MCL	>1/2 MCL	Violation	≤1/2 MCL	5	none or Trace[1]	0
Maximum	*0*	*30*	*60*	*150*				
Overall Ranking - Sum of all pollution risk ratings.	**0 - 19**	**20 – 59**	**60 - 100**	**>100**		**35**		**25**
	Low	**Moderate**	**High**	**Extreme**		**Moderate**		**Moderate**

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

* = No High Intensity Land Use changes found during update, 2015 value utilized for consistency and to be conservative

** = No pollution sources found during update, 2015 value utilized for consistency and to be conservative