List of Tables for Chapter 5 (MVSPA)

Table 5-1

Summary of Key Findings for HVA, SGRA, WHPAs - MVSPA

Mississippi - Rideau Source Protection Region

HVA, SGRA, or WHPA	Number of Wells	Size of HVA, SGRA, or WHPA (km^2)	Area of WHPA where Potential Significant Threats (not including DNAPL zone) may be present (km^2)	Area of WHPA where Potential Significant Threats (including DNAPL zone) may be present (km^2)	Number of Potential Significant Threats	Number of Issues	Number of Conditions
Highly Vulnerable Aquifers (HVA)	Not Applicable	4032	0	0	0	3	0
Significant Groundwater Recharge Areas (SGRA)	Not Applicable	413	0	0	0		0
Almonte Wellhead Protection Areas (WHPA)	5	18.9	1.4	8.0	93	0	0
Carp WHPA	2	5.7	0.7	1.0	137	0	1
Munster WHPA*	Not Applicable	1.5	0	0	Not Applicable	Not Applicable	Not Applicable
TOTALS	**7**		**2**	**9**	**230**	**3**	**1**

* Munster WHPA originates in the Rideau Valley Source Protection Area

Total WHPA area for all WHPA in Mississippi Valley Source Protection Area (km^2)	**26**

Compiled from: MRSPR Groundwater Technical Reports (see Appendix A-1)

Table 5-2

Summary of Potentially Significant Threats to Groundwater Based Municipal Drinking Water Systems - MVSPA

Mississippi - Rideau Source Protection Region

A) Significant Threats Count before Adjustment for Septic Systems and Residential Heating Oil Tanks

	Potential Significant Threats			
System Name (Municipality)	Line	Point	Poly*	Total
Almonte (Mississippi Mills)	3	4	26	33
Carp (City of Ottawa)	2	7	8	17
TOTAL	**5**	**11**	**34**	**50**
				[A]

B) Significant Threats Count for Septic Systems and Residential Heating Oil Tanks

* Clusters of residential septic systems and residential fuel oil tanks in the significant threats inventory are grouped together and represented as polygons, as it is often difficult to determine the exact number of systems/oil tanks in an area. Each polygon is counted once in the inventory, but represents multiple potentially significant threats. Based on a review of the sanitary sewer information, the *approximate* number of septic systems for all the groundwater based municipal drinking water systems in provided below. A 'worst-case' estimate (assuming everyone uses a residential heating oil tank) is also provided below.

System Name (Municipality)	Number of Polygons with septic systems	Approximate Number of Septic Systems	Number of Polygons with residential heating oil tanks	Worst Case Estimate of residential heating oil tanks
Almonte (Mississippi Mills)	1	5	4	60
Carp (City of Ottawa)	0	0	2	122
TOTAL	**1**	**5**	**6**	**182**
	[B]	[C]	[D]	[E]

C) Final Significant Threats Count

Total Number of Potential Significant Threats in the MRSPR		
Total number of significant threats (from above summary)	50	[A]
Total Approximate Septic Systems	5	[C]
Total Estimated heating oil tanks	182	[E]
Number of polys - septic systems	1	[B]
Number of polys - heating oil tanks	6	[D]
TOTAL SIGNIFICANT THREATS COUNT	**230**	A + C + E - B -D

Compiled from: Dillon Groundwater Threats and Issues Technical Report (see Appendix A-1)

Table 5-3
Summary of Potentially Significant Threats by Prescribed Drinking Water Threat Category for Groundwater Based Municipal Drinking Water Systems - MVSPA
Mississippi Valley Source Protection Area

	Prescribed Drinking Water Threat Category	Mississippi Valley Source Protection Area (1)
1	The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act*.	1
2	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	13
3	The application of agricultural source material to land.	3
4	The storage of agricultural source material.	0
5	The management of agricultural source material.	0
6	The application of non-agricultural source material to land.	0
7	The handling and storage of non-agricultural source material.	0
8	The application of commercial fertilizer to land.	3
9	The handling and storage of commercial fertilizer.	0
10	The application of pesticide to land.	3
11	The handling and storage of pesticide.	5
12	The application of road salt.	0
13	The handling and storage of road salt.	0
14	The storage of snow.	0
15	The handling and storage of fuel.	193
16	The handling and storage of a dense non-aqueous phase liquid (DNAPLS).	4
17	The handling and storage of an organic solvent.	0
18	The management of runoff that contains chemicals used in the de-icing of aircraft.	0
19	An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.	0
20	An activity that reduces the recharge of an aquifer.	0
21	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.	5
	Totals	**230**

(1) Total Significant Threats Count for each Prescribed Drinking Water Threats with adjustments for Septic Systems and Heating Oil Tanks

Compiled from: Dillon Groundwater Threats and Issues Technical Report (see Appendix A-1)

Table 5-4

Summary of Non--Municipal Drinking Water Issues - MRSPR

Mississippi - Rideau Source Protection Region

NON-MUNICIPAL Drinking Water Issue	Contaminants	Activity	Reference Number	Circumstance
		From Provincial Threats Tables		
Beckwith Groundwater Contamination (MVSPA and RVSPA)	trichloroethylene, vinyl chloride and 1,1 dichloroethene	The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.	1660	1. The land disposal of municipal waste within the meaning of clauses (a) and (b) of the definition of land disposal in Section 1 of Regulation 347 (General – Waste Management) made under the Environmental Protection Act, is undertaken at the site. 2. The fill area is at least 1 but not more than 10 hectares. 3. A discharge from the area where the waste is disposed may result in the presence of Trichloroethylene or another DNAPL that could degrade to Trichloroethylene in groundwater or surface water.
		The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.	1661	1. The land disposal of municipal waste within the meaning of clauses (a) and (b) of the definition of land disposal in Section 1 of Regulation 347 (General – Waste Management) made under the Environmental Protection Act, is undertaken at the site. 2. The fill area is at least 1 but not more than 10 hectares. 3. A discharge from the area where the waste is disposed may result in the presence of vinyl chloride or another DNAPL that could degrade to vinyl chloride in groundwater or surface water.
Crotch Lake Elevated Uranium (MVSPA)	uranium	Not Applicable because naturally occuring		
Village of Constance Groundwater Contamination (MVSPA)	nitrate	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	698	1. The system is an earth pit privy, privy vault, greywater system, cesspool, or a leaching bed system and its associated treatment unit. 2. The system is subject to the Ontario Building Code Act, 1992. 3. The discharge from the system may result in the presence of Nitrogen in groundwater or surface water.
Village of Lanark Groundwater Contamination (MVSPA)	nitrate and bacteriological parameters	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	698	1. The system is an earth pit privy, privy vault, greywater system, cesspool, or a leaching bed system and its associated treatment unit. 2. The system is subject to the Ontario Building Code Act, 1992. 3. The discharge from the system may result in the presence of Nitrogen in groundwater or surface water.
		The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	1956	1. The system is an earth pit privy, privy vault, greywater system, cesspool, or a leaching bed system and its associated treatment unit and is a sewage system as defined in section 1 of O.Reg. 350/06 (Building Code) made under the Building Code Act, 1992 or a sewage works as defined in Section 1 of the Ontario Water Resources Act. 2. A discharge from the system may result in the presence of one or more pathogens in groundwater or surface water
Cranberry Estates Groundwater Contamination (RVSPA)	nitrate and bacteriological parameters	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	698	1. The system is an earth pit privy, privy vault, greywater system, cesspool, or a leaching bed system and its associated treatment unit. 2. The system is subject to the Ontario Building Code Act, 1992. 3. The discharge from the system may result in the presence of Nitrogen in groundwater or surface water.
		The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	1956	1. The system is an earth pit privy, privy vault, greywater system, cesspool, or a leaching bed system and its associated treatment unit and is a sewage system as defined in section 1 of O.Reg. 350/06 (Building Code) made under the Building Code Act, 1992 or a sewage works as defined in Section 1 of the Ontario Water Resources Act. 2. A discharge from the system may result in the presence of one or more pathogens in groundwater or surface water

Compiled from: MRSPR Groundwater Technical Reports (see Appendix A-1)

Table 5-5

Risk to Almonte WHPAs Based on Managed Lands and Livestock Density.

Mississippi - Rideau Source Protection Region

WHPA Zone and Vul. Score	Percent Total Managed Lands	Risk for Over Application of Nutrients	Livestock Density (NU/acre)	Risk for Over-Application of ASM
NE Zone A #1 (10)	56.5	MODERATE	0.11	LOW
NE Zone A #2 (10)	54.1	MODERATE	0.00	LOW
NE Zone B (6)	56.1	MODERATE	0.22	LOW
NE Zone C (4)	0	LOW	0.00	LOW
NE Zone D (2)	0	LOW	0.00	LOW
SW Zone A #1 (10)	28.2	LOW	0.00	LOW
SW Zone A #2 (10)	38.4	LOW	0.00	LOW
SW Zone B (6)	7.1	LOW	0.00	LOW
SW Zone B (8)	50.3	MODERATE	0.00	LOW
SW Zone B (10)	6.1	LOW	0.04	LOW
SW Zone C (6)	25.2	LOW	0.03	LOW
SW Zone C (8)	9.2	LOW	0.00	LOW
SW Zone D (6)	91.2	HIGH	0.00	LOW

Compiled from: Dillon Managed Lands and Livestock Density Technical Report (see Appendix A-1)

Table 5-6

Summary of Potentially Significant Threats to Almonte Source Water and Prescribed Activities Considered
Mississippi - Rideau Source Protection Region

A) Significant Threats Count before Adjustment for Septic Systems and Residential Heating Oil Tanks

Land Use Activity	Prescribed Drinking Water Quality Threat Category											TOTAL
	The application of agricultural source material to land.	The application of pesticide to land.	The handling and storage of a dense non-aqueous phase liquid.	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard. O. Reg. 385/08, s. 3.	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.			The handling and storage of pesticide.	The handling and storage of commercial fertilizer.	The handling and storage of fuel.		
	Poly	Poly	Point	Poly	Line	Poly	Point	Poly	Poly	Point	Poly	
Municipal Fire-Fighting Services										1		**1**
Electric Power Generation, Transmission and Distribution										1		**1**
Sewage Treatment Facilities							1					**1**
Dry Cleaning and Laundry Services			1									**1**
Sewer Mainlines and Connections					3							**3**
Cattle Ranching and Farming				1								**1**
Other Animal Production				2							2	**4**
Other Crop Farming	2	2						2	2		3	**11**
Oilseed and Grain Farming	1	1						1	1		1	**5**
On-Site Septic Systems - Recreational/Residential						1						**1**
Residential Fuel/Hydrocarbon Storage											4	**4**
TOTAL	**3**	**3**	**1**	**3**	**3**	**1**	**1**	**3**	**3**	**2**	**10**	**33**

B) Significant Threats Count for Septic Systems and Residential Heating Oil Tanks

Clusters of residential septic systems and residential fuel oil tanks in the significant threats inventory are grouped together and represented as polygons. Each polygon is counted once in the inventory, but represents multiple potentially significant threats. Based on a review of the sanitary sewer information, there are approximately 5 septic systems in the 1 polygon. It is estimated that there could be up to 60 residential heating oil tanks in 4 polygons.

C) Final Significant Threats Count

Total Number of Potential Significant Threats in the MRSPR		
Total number of significant threats (from above summary)	33	[A]
Total Approximate Septic Systems	5	[C]
Total Estimated heating oil tanks	60	[E]
Number of polys - septic systems	1	[B]
Number of polys - heating oil tanks	4	[D]
TOTAL SIGNIFICANT THREATS COUNT	**93**	A + C + E - B -D

Compiled from: Dillon Groundwater Threats and Issues Technical Report (see Appendix A-1)

Table 5-7

Risk to Carp WHPAs Based on Managed Lands and Livestock Density.

Mississippi - Rideau Source Protection Region

WHPA Zone and Vul. Score	Percent Total Managed Lands	Risk for Over Application of Nutrients	Livestock Density (NU/acre)	Risk for Over Application of ASM
Zone A (10)	55.6	MODERATE	0.00	LOW
Zone B (8)	9.1	LOW	0.00	LOW
Zone B (10)	57.6	MODERATE	0.00	LOW
Zone C (6)	26.7	LOW	0.40	LOW
Zone C (8)	45.4	MODERATE	0.07	LOW
Zone D (6)	63.4	MODERATE	0.16	LOW

Compiled from: Dillon Managed Lands and Livestock Density Technical Report (see Appendix A-1)

Table 5-8

Summary of Potentially Significant Threats to Carp Source Water and Prescribed Activities Considered

Mississippi - Rideau Source Protection Region

A) Significant Threats Count before Adjustment for Septic Systems and Residential Heating Oil Tanks

Land Use Activity	Prescribed Drinking Water Quality Threat Category									TOTAL
	The application of pesticide to land.	The handling and storage of a dense non-aqueous phase liquid.	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard. O. Reg. 385/08, s. 3.	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.		The handling and storage of pesticide.	The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.	The handling and storage of fuel.		
	Poly	Point	Poly	Line	Poly	Point	Poly	Point	Poly	
Dry Cleaning and Laundry Services		2								**2**
Automotive Parts, Accessories and Tire Stores		1								**1**
Elementary and Secondary Schools								1		**1**
Municipal Fire-Fighting Services								1		**1**
Agricultural Supplies Wholesaler-Distributors						1				**1**
Pesticide storage						1				**1**
Sewer Mainlines and Connections				2						**2**
Oilseed and Grain Farming	2								1	**3**
Cattle Ranching and Farming			2							**2**
Waste Treatment and Disposal							1			**1**
Residential Fuel/Hydrocarbon Storage									2	**2**
TOTAL	**2**	**3**	**2**	**2**	**0**	**2**	**1**	**2**	**3**	**17**

B) Significant Threats Count for Septic Systems and Residential Heating Oil Tanks

Clusters of residential septic systems and residential fuel oil tanks in the significant threats inventory are grouped together and represented as polygons. Each polygon is counted once in the inventory, but represents multiple potentially significant threats. There are no septic systems. It is estimated that there could be up to 122 residential heating oil tanks in 2 polygons.

C) Final Significant Threats Count

Total Number of Potential Significant Threats in the MRSPR		
Total number of significant threats (from above summary)	17	[A]
Total Approximate Septic Systems	0	[C]
Total Estimated heating oil tanks	122	[E]
Number of polys - septic systems	0	[B]
Number of polys - heating oil tanks	2	[D]
TOTAL SIGNIFICANT THREATS COUNT	**137**	A + C + E - B -D

Compiled from: Dillon Groundwater Threats and Issues Technical Report (see Appendix A-1)