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Industrial Water Use

2009



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Industrial Water Use

2009

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- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Preface

The *Industrial Water Survey* was re-instituted by Statistics Canada as a biennial survey in 2005 after a hiatus of almost ten years. This publication presents the results of the 2009 version of the survey which gathered information on the intake and discharge of water by industrial users in manufacturing industries, mining industries and thermal-electric generating industries.

The information collected from industrial water users included: monthly and annual total water intake and discharge; water intake by source and kind; water intake treatment; water intake by purpose; water recirculation or reuse by purpose; water discharge and its treatment. Also, water acquisition costs, treatment costs and operating and maintenance expenses related to water intake and discharge were collected.

Highlights

- Total water intake in 2009 by all three industry groups surveyed was 32.3 billion cubic metres. The thermal-electric power producers withdrew 81.6% of this total, manufacturing industries took almost 16.9% of the total and the mining industries were responsible for the remaining 1.5% of the total water intake.
- Total wastewater discharge in 2009 for the three industry groups was 31.3 billion cubic metres. The thermal-electric power producers accounted for 82.4% of this total, manufacturing industries discharged 15.6% of the total and the mining industries were responsible for 2.0% of the total water discharge.
- The thermal-electric power producers accounted for 48.8% of the 8.6 billion cubic metres of recirculated water noted in the survey while manufacturing industries recirculated 33.2% of this total and mining industries the remaining 17.9%.
- Total water costs for the three major industry components measured in the survey were \$1,706.9 million.

For purposes of the **Industrial Water Survey**, 'Thermal-electric Power Generation' is defined as 'Fossil-Fuel Electric Power Generation (NAICS 221112)' and 'Nuclear Electric Power Generation (NAICS 221113)'. The mining industries surveyed were the coal mines (NAICS 2121), metal mines (NAICS 2122) and non-metallic mineral mines (NAICS 2123, excluding NAICS 21232 - sand, gravel, clay, and ceramic and refractory minerals mining and quarrying). The manufacturing industries are defined by NAICS 31 – 33. Further information on coverage can be found in the section "Data Quality, Concepts and Methodology".

Analysis

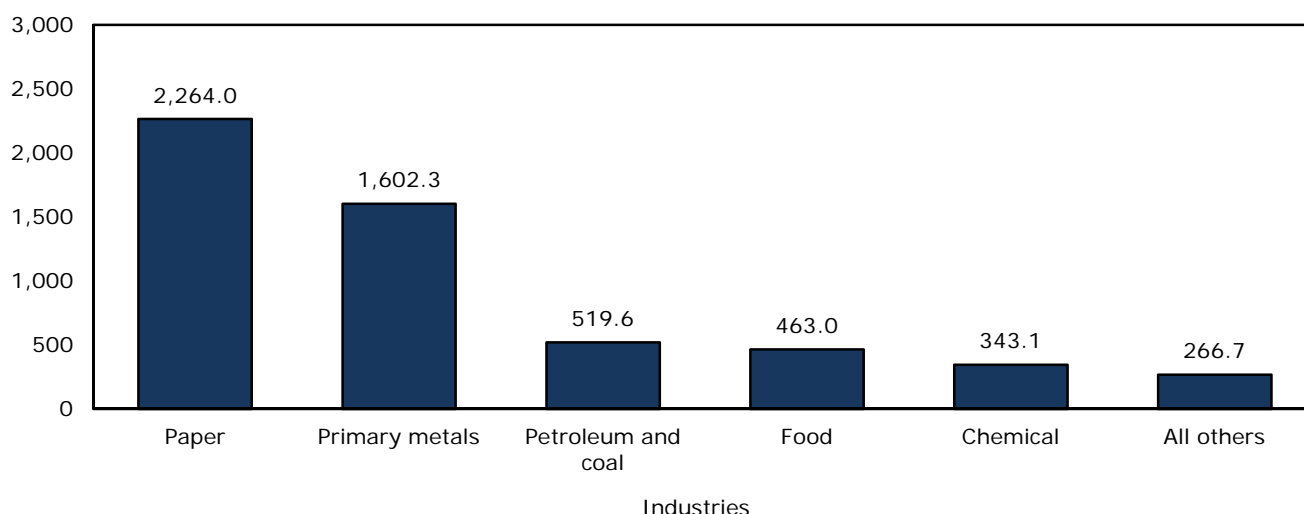
Manufacturing industries

Intake water – Source, purpose and treatment

Total water intake by Canadian manufacturing industries in 2009 was 5,458.7 million cubic metres. As indicated in Chart 1, five industries accounted for over 95% of the 2009 intake. The largest quantity of water withdrawn was by the paper industries, at 41.5% of the total. This was followed by the primary metal industries at 29.4% and the petroleum and coal industries at 9.5% of the total water intake by manufacturing industries. The food industries accounted for 8.5% of water withdrawals and the chemical industries, another 6.3%.

Chart 1
Water intake in manufacturing, 2009

millions of cubic metres



Source(s): Statistics Canada, Industrial Water Survey, 2009 (survey no. 5120).

Geographically, manufacturers located in Ontario and Quebec accounted for most of the water intake, with Ontario taking 42.8% of the total and Quebec responsible for another 24.7% of the total. British Columbia manufacturers took a 16.0% share of the total intake and the Prairies were responsible for 7.0%. When the results are aggregated by drainage region, 60.9% of water intake was derived from the Great Lakes – St. Lawrence basin. The Pacific Coastal basin and the Fraser – Lower Mainland basin combined for 11.5% of the total water intake.

Self-supplied surface freshwater (lakes, rivers, etc.) was the source of 78.4% of manufacturers' water supply and 12.6% came from public utilities (that also tend to source from surface freshwater). The paper industries accounted for 45.0% of the surface freshwater withdrawals and the primary metal industries took another 35.6%. Almost 34% of the water taken from public utilities by manufacturers was taken by the food industries. The paper industries took another 27.9%.

Geographically, 49.0% of the surface freshwater taken by manufacturers occurred in Ontario and 24.0% was taken in Quebec. British Columbia accounted for another 16.3%. Quebec manufacturers were responsible for 34.8% of

the water intake from public utilities and Ontario took 31.0% of the total. These results are also reflected by drainage region where 63.6% of manufacturers' withdrawals from public utilities occurred in the Great Lakes – St. Lawrence drainage region and 66.3% of the surface freshwater withdrawn also came from that drainage region.

The major purposes of the initial use of water by manufacturers are for process (47.6% of total intake) and for cooling, condensing and steam (42.0% of the total). The paper industries used 73.9% of their water intake for processing and 22.3% for cooling, condensing and steam. The primary metal industries, on the other hand, used 28.0% for processing and 55.5% for cooling, condensing and steam.

Many manufacturing establishments need to treat their water before it can be used in their processes or for cooling, condensing or steam generation. Often they must use several treatment processes, such as screening, followed by filtration and chlorination, prior to using the water. This can result in the same intake water being counted several times if it has been used in several treatment processes, which must be kept in mind when examining Table 6.

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Table 1 Water use parameters in manufacturing industries, by industry group, 2009

Table group 2 **Water use parameters in manufacturing industries, 2009**

Table 2-1 Provinces and territories

Table 2-2 Drainage regions

Table 3 Water intake in manufacturing industries, by month and industry group, 2009

Table 4 Water intake in manufacturing industries, by source and industry group, 2009

Table group 5 **Water intake in manufacturing industries, by source, 2009**

Table 5-1 Provinces and territories

Table 5-2 Drainage regions

Table 6 Intake water treatment in manufacturing industries, by type of treatment and industry group, 2009

Table 7 Water intake in manufacturing industries, by purpose of initial use and industry group, 2009

Water recirculation

In this survey, water recirculation is defined as the process of using the same water more than once by the facility. The water must leave a system or sub-system and re-enter it or be used in a different sub-system. The recirculation of water reduces the need for the facility to take in "new" water.

The 2009 survey indicates 2,872.2 million cubic metres of water was reported as recirculated water. The primary metals industry accounted for 53.2% of this volume of recirculated water. The paper industries reported recirculation volumes representing 36.4% of the total.

The recirculation rate for manufacturing (recirculated water as a percentage of intake) stood at 52.6%. The primary metals industry indicated a recirculation rate of 95.4%.

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Table 2-1 Provinces and territories

Table 2-2 Drainage regions

Table 8 Water recirculation in manufacturing industries, by purpose and industry group, 2009

Wastewater – Treatments and points of discharge

Total water discharged by the manufacturing industries was 4,879.9 million cubic metres. Most of this water (76.8%) was discharged to surface freshwater bodies and to tidewater (11.2%). The balance was discharged to public/municipal sewers, groundwater or other points.

Respondents were asked to report only the highest level of treatment their discharge underwent. This was done in order to eliminate double-counting of water that underwent more than one treatment type and to highlight the most advanced treatment. Of the water discharged by manufacturers, 34.3% was not treated before being released. The most advanced level of treatment for 17.8% of the total discharge was primary treatment while 38.7% of the total effluent underwent secondary or biological treatment as its highest level of treatment before discharge. Only 9.1% underwent tertiary or advanced treatment.

The paper industries accounted for 45.6% of the total water discharged by manufacturers and 79.2% of their discharge went to surface freshwater bodies. The paper industries put 76.0% of their water discharge through secondary or biological treatment. The primary metal industries were responsible for 27.9% of the total water discharged by manufacturers with surface freshwater bodies the destination for 93.7% of their discharge. Most of their discharge (48.0%) went untreated with 17.1% undergoing primary or mechanical treatment while the remaining 35.0% underwent secondary or biological treatment or tertiary or advanced treatment. The petroleum and coal industries were responsible for 8.6% of total manufacturing water discharge with 77.5% of their discharged water going to the freshwater surfaces. Of this discharge, 19.1% underwent no treatment with 67.3% undergoing primary or mechanical treatment while the remaining 13.6% underwent secondary or biological treatment or tertiary or advanced treatment.

Distribution of water discharge by geographic location reflects a similar trend as water intake in that the Great Lakes - St. Lawrence drainage region and the Pacific Coastal drainage region not only saw the largest water withdrawals, but also the largest discharges.

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Table 1 Water use parameters in manufacturing industries, by industry group, 2009

Table group 2 **Water use parameters in manufacturing industries, 2009**

Table 2-1 Provinces and territories

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Table 9 Water discharge in manufacturing industries, by point of discharge and industry group, 2009

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Table 10-2 Drainage regions

Table 11 Water discharge in manufacturing industries, by type of final treatment and industry group, 2009

Table group 12 **Water discharge in manufacturing industries, by type of final treatment, 2009**

Table 12-1 Provinces and territories

Table 12-2 Drainage regions

Water consumption

Water consumption (intake minus discharge) provides an indication of the amount of water lost during production, most commonly through the incorporation of water into the products or through evaporation. The consumption rate expresses this consumption as a percentage of water intake.

In 2009, water consumption for manufacturing industries was estimated at 578.8 million cubic metres or 10.6% of the total water intake of 5,458.7 million cubic metres. Of this total water consumption, the primary metals industries were the largest consumers of water, consuming 242.9 million cubic metres or 42.0% of the total consumed water. The petroleum and coal industries were the next largest consumers of water at 100.0 million cubic metres or 17.3% of the total consumed water. The chemical industries were also significant consumers at 16.7%.

Tables

Table 1 Water use parameters in manufacturing industries, by industry group, 2009

Table group 2 **Water use parameters in manufacturing industries, 2009**

Table 2-1 Provinces and territories

Table 2-2 Drainage regions

Water costs

The *Industrial Water Survey* collected cost information on the acquisition of water, on the treatment of intake water before use, on wastewater treatments and on costs related to the recirculation of water. Excluded from the determination of water costs were capital costs or depreciation of self-supplied water acquisition facilities. The costs of water acquisition were defined to include amounts paid to public utilities for water, amounts paid to provincial or territorial ministries for a licence to take water and for operation and maintenance costs incurred in the upkeep of self-supplied water acquisition facilities. The cost of wastewater treatment was defined as the operation and maintenance costs of in-house treatment, though it may include sewer surcharges by the public utilities.

The cost of water acquisition in 2009 was \$478.4 million. The largest portion of the acquisition costs was attributable to public utilities, which accounted for 74.4% of the total costs. Payments for operation and maintenance costs were responsible for another 24.8% of the total acquisition costs while licensing fees contributed only 0.8% of the total.

At the national level, water acquisition was responsible for 34.7% of the total water costs. However, acquisition costs in Ontario accounted for 45.8% of total water costs in that province.

Costs for treatment of intake water before it was used totalled \$205.2 million. Just over 87% of these costs were borne by five industries, with the paper industries paying 37.3% of the total, chemical industries at 29.7%, food industries at 8.5%, primary metal industries at 6.7% and petroleum and coal industries spending 5.0%.

The costs related to the recirculation of water were \$121.0 million in 2009. The primary metals industries spent \$53.4 million on the recirculation of water and the paper industries spent \$41.2 million.

The total 2009 cost of wastewater treatment was \$575.7 million. Of this total, the paper industries spent \$274.1 million or 47.6% of the total. The food industries spent \$100.0 million or 17.4% of the total and the chemical industries accounted for \$77.7 million or 13.5% of the total spent on the treatment of water discharge. The primary metals industries spent \$61.8 million or 10.7% of the total.

Total water costs in the manufacturing industries in 2009 were \$1,380.3 million. As indicated in Chart 2, costs for the treatment of effluent accounted for 41.7% of the total costs while treatment of intake water before it was used represented another 14.9% of total costs. Costs related to the acquisition of water were 34.7% of total costs and costs related to the recirculation of water were another 8.8% of the total.

Tables

Table 13 Water acquisition costs in manufacturing industries, by industry group, 2009

Table group 14 **Water acquisition costs in manufacturing industries, 2009**

Table 14-1 Provinces and territories

Table 14-2 Drainage regions

Table 15 Total water costs in manufacturing industries, by water cost component and industry group, 2009

Table group 16 **Total water costs in manufacturing industries, by water cost component, 2009**

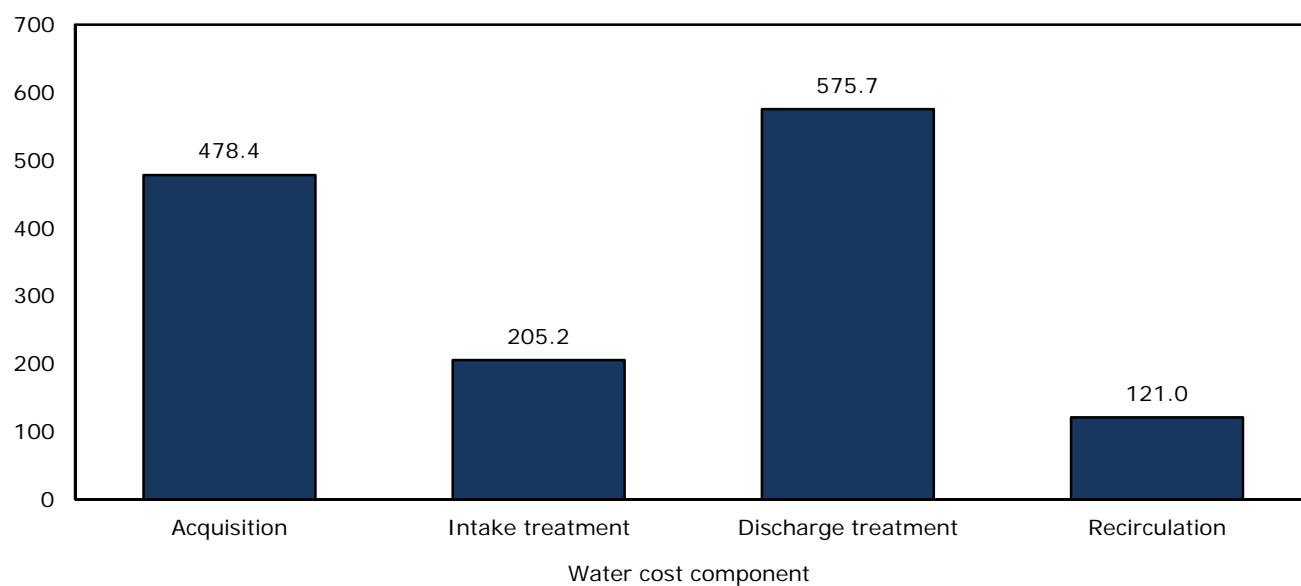
Table 16-1 Provinces and territories

Table 16-2 Drainage regions

Chart 2

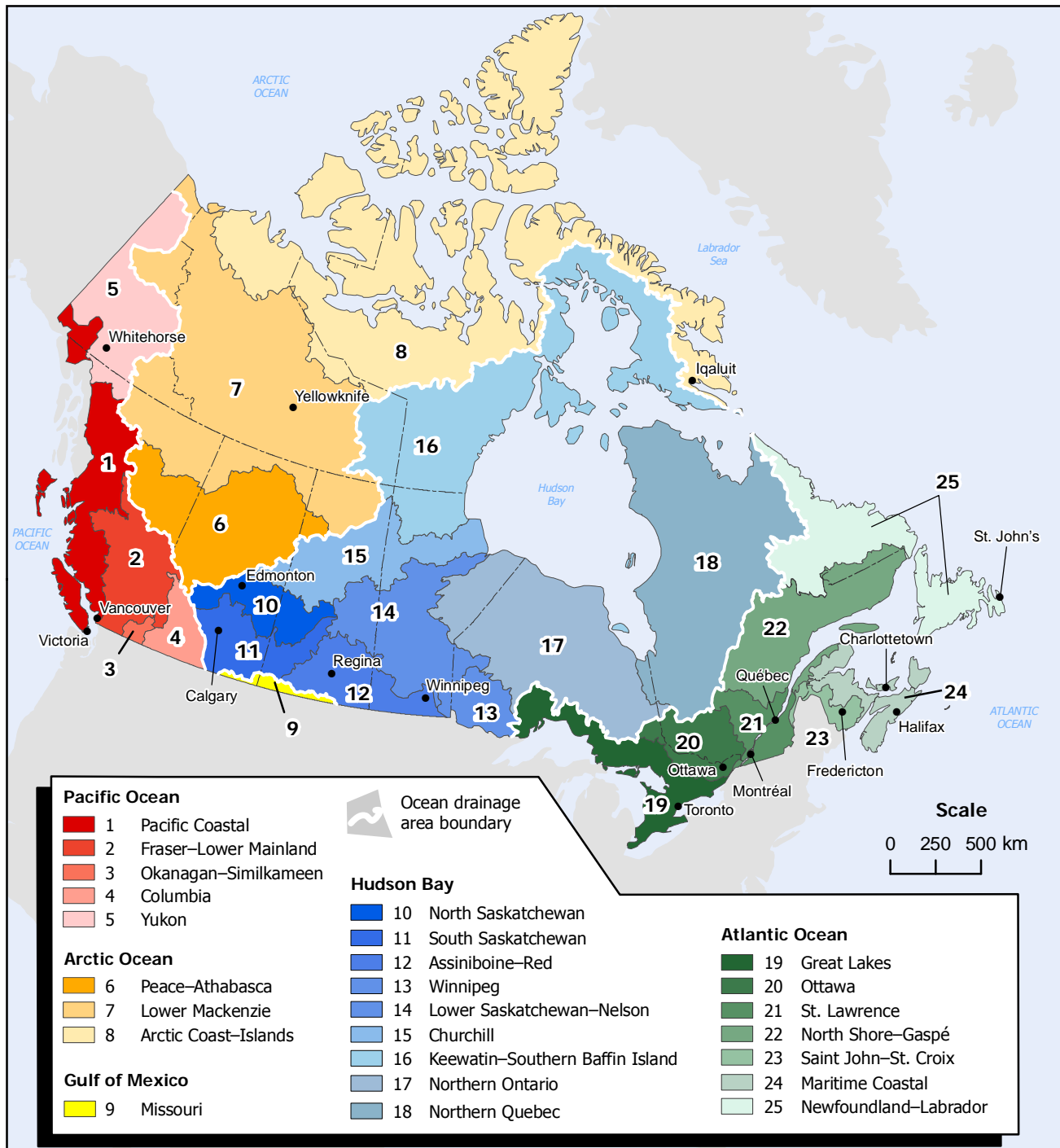
Water costs in manufacturing by cost component, 2009

millions of dollars



Source(s): Statistics Canada, Industrial Water Survey, 2009 (survey no. 5120).

Map 1
Ocean drainage areas and drainage regions of Canada



Source(s): Pearse, P.H., F. Bertrand and J.W. MacLaren, 1985, *Currents of Change: Final Report of the Inquiry on Federal Water Policy*, Environment Canada, Ottawa.
Statistics Canada, Environment Accounts and Statistics Division, 2009, special tabulation.

Mining industries

Total water intake by the mining industries surveyed in 2009 was 497.2 million cubic metres. Most of this water (74.9%) was withdrawn by the metal mines. The amount of water recirculated by the mining industries was 1,547.7 million cubic metres, which when combined with the volume of water intake, resulted in gross water use of 2,044.9 million cubic metres. The recirculation rate of water in 2009 was 311.3%. The total volume of water discharged by the mining industries surveyed in 2009 was 620.4 million cubic metres. The discharge volumes were higher than the intake volumes of water due to the necessity of many operators to de-water their mines of groundwater in order to carry out their operations. This “mine water” amounted to 235.8 million cubic metres in 2009.

The source for most water withdrawn by the mining industries (77.2%) was self-supplied surface freshwater (i.e., rivers, lakes). Process water was the major use for water in the mining industries, accounting for 72.5% of the total intake. Another 16.8% was used for cooling, condensing and steam. Almost all water recirculated (98.1%) by the mining industry was used for process activities.

In the same way that most water intake was sourced from surface freshwater, most wastewater discharge (72.8%) was returned to surface freshwater. Another 10.8% was discharged to tailing ponds while 9.0% was discharged to groundwater. Most of the discharge to tailing ponds was made by metal mines. Of the total 620.4 million cubic metres of water discharged by mining operations, 59.9% was not treated before discharge and 31.2% underwent primary or mechanical treatment. Tertiary or advanced treatments were given to 8.8% of wastewater and 0.2% underwent secondary or biological treatments.

Total costs related to water use in the mining industries in 2009 was \$165.7 million dollars. Costs for the treatment of effluent accounted for 42.6% of the total costs while treatment of intake water before it was used represented another 11.3% of total costs. Costs related to the acquisition of water were 16.8% of total costs and costs related to the recirculation of water were another 29.3% of the total.

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Table 20 Intake water treatment in mineral extraction industries, by type of treatment, industry group and region, 2009

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Table 22 Water recirculation in mineral extraction industries, by purpose, industry group and region, 2009

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Table 25 Water acquisition costs in mineral extraction industries, by industry group and region, 2009

Table 26 Total water costs in mineral extraction industries, by water cost component, industry group and region, 2009

Thermal-electric power producers

Producers of thermal-electric power were the largest users of water in the industrial sectors covered by this survey, with almost all of the water (99.3%) used for cooling, condensing and steam. Total water intake by this industry was 26,345.5 million cubic metres. The volume of water recirculated in this industry was 4,220.0 million cubic metres, which when combined with water withdrawals equal gross water use of 30,565.5 million cubic metres. Total

discharge of water was 25,838.4 million cubic metres, of which 94.6% went to surface freshwater bodies. Most of this water (58.9%) was not treated before discharge.

Total costs of water for the thermal-electric power generators were \$161.0 million. Costs related to the acquisition of water accounted for 49.1% of the total costs. Included in these acquisition costs are payments to public utilities, operation and maintenance costs related to acquiring water and licencing or permit fees required to acquire water. Costs related to the treatment of intake water accounted for 36.3% of the total costs and costs related to the recirculation of water accounted for 8.7%. The remaining 5.9% of costs were attributable to the discharge of water.

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Table 33 Water discharge in thermal-electric power generation industries, by point of discharge, region and type of final treatment, 2009

Table 34 Water discharge in thermal-electric power generation industries, by type of final treatment and region, 2009

Table 35 Water acquisition costs in thermal-electric power generation industries, by region, 2009

Table 36 Total water costs in thermal-electric power generation industries, by water cost component and region, 2009

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153-0048	Water use parameters in manufacturing industries, by provinces, territories and drainage regions, biennial
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Selected surveys from Statistics Canada

5120	Industrial Water Survey
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Selected summary tables from Statistics Canada

- *Production of selected minerals and fuels by province and territory, 2007*
- *Water use parameters in manufacturing industries, by industry group, Canada*

Statistical tables

Table 1
Water use parameters in manufacturing industries, by industry group, 2009

	Intake		Recirculation		Recirculation rate ¹	Gross water use ²		Discharge		Consumption ³	Consumption rate ⁴	
	millions of cubic metres	%	millions of cubic metres	%		millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	
Total	5,458.7^B	100.0	2,872.2^D	100.0	52.6	8,330.9	100.0	4,879.9^B	100.0	578.8	100.0	10.6
Food	463.0 ^D	8.5	95.8 ^B	3.3	20.7	558.8	6.7	390.9 ^D	8.0	72.1	12.5	15.6
Beverage and tobacco	55.4 ^D	1.0	1.6 ^D	0.1	2.9	57.0	0.7	45.4 ^D	0.9	10.0	1.7	18.1
Textile mills	0.8 ^B	0.0	F	F	F	F	F	0.8 ^B	0.0	0.0	0.0	0.0
Textile products	5.7 ^E	0.1	F	F	F	F	F	5.2 ^E	0.1	0.5	0.1	8.8
Wood	34.5 ^E	0.6	10.0 ^E	0.3	29.0	44.5	0.5	28.0 ^E	0.6	6.5	1.1	18.8
Paper	2,264.0 ^B	41.5	1,045.3 ^C	36.4	46.2	3,309.3	39.7	2,226.9 ^B	45.6	37.1	6.4	1.6
Petroleum and coal	519.6 ^E	9.5	x	x	x	x	x	419.6 ^E	8.6	100.0	17.3	19.2
Chemicals	343.1 ^B	6.3	36.9 ^A	1.3	10.8	380.0	4.6	246.5 ^B	5.1	96.6	16.7	28.2
Plastics and rubber	34.5 ^D	0.6	6.2 ^E	0.2	18.0	40.7	0.5	31.2 ^D	0.6	3.3	0.6	9.6
Non-metallic minerals	55.7 ^D	1.0	5.4 ^E	0.2	9.7	61.1	0.7	49.6 ^D	1.0	6.1	1.1	11.0
Primary metals	1,602.3 ^E	29.4	1,529.3 ^E	53.2	95.4	3,131.6	37.6	1,359.4 ^D	27.9	242.9	42.0	15.2
Fabricated metals	18.9 ^E	0.3	F	F	F	F	F	17.4 ^E	0.4	1.5	0.3	7.9
Machinery	3.2 ^E	0.1	F	F	F	F	F	3.0 ^E	0.1	0.2	0.0	6.2
Computers and electronics ⁵	F	F	F	F	F	F	F	F	F	F	F	F
Electrical products ⁵	x	x	0.0	0.0	x	x	x	x	x	x	x	x
Transportation equipment	33.6 ^E	0.6	2.1 ^E	0.1	6.2	35.7	0.4	32.3 ^E	0.7	1.3	0.2	3.9
Miscellaneous	5.8 ^E	0.1	F	F	F	F	F	5.6 ^E	0.1	0.2	0.0	3.4
Other ⁶	14.2 ^D	0.3	F	F	F	F	F	14.0 ^D	0.3	0.2	0.0	1.4

1. Recirculation rate = Amount of recirculated water as a percent of intake. The same water can leave a sub-system and re-enter it or is used in another sub-system many times, resulting in a recirculation rate > 100%.

2. Gross water use = Intake + Recirculation.

3. Consumption = Intake - Discharge.

4. Consumption rate = Consumption as a percentage of Intake.

5. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

6. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0047.

Table 2-1
Water use parameters in manufacturing industries, 2009 — Provinces and territories

	Intake		Recirculation		Recirculation rate ¹	Gross water use ²		Discharge		Consumption ³	Consumption rate ⁴	
	millions of cubic metres	%	millions of cubic metres	%		millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	
Canada	5,458.7^B	100.0	2,872.2^D	100.0	52.6	8,330.9	100.0	4,879.9^B	100.0	578.8	100.0	10.6
Newfoundland and Labrador	F	F	F	F	F	F	F	F	F	F	F	F
Prince Edward Island	F	F	F	F	F	F	F	F	F	F	F	F
Nova Scotia	256.8 ^D	4.7	117.1 ^E	4.1	45.6	373.9	4.5	245.1 ^E	5.0	11.7	2.0	4.6
New Brunswick	219.6 ^C	4.0	95.8 ^D	3.3	43.6	315.4	3.8	211.9 ^C	4.3	7.7	1.3	3.5
Quebec	1,350.3 ^C	24.7	830.2 ^D	28.9	61.5	2,180.5	26.2	1,293.8 ^C	26.5	56.5	9.8	4.2
Ontario	2,336.6 ^D	42.8	1,343.0 ^E	46.8	57.5	3,679.6	44.2	2,033.5 ^D	41.7	303.1	52.4	13.0
Manitoba	87.8 ^B	1.6	161.7 ^E	5.6	184.2	249.5	3.0	81.1 ^B	1.7	6.7	1.2	7.6
Saskatchewan	17.9 ^E	0.3	4.1 ^B	0.1	22.9	22.0	0.3	9.8 ^E	0.2	8.1	1.4	45.3
Alberta	274.6 ^C	5.0	86.2 ^D	3.0	31.4	360.8	4.3	214.9 ^C	4.4	59.7	10.3	21.7
British Columbia	873.3 ^D	16.0	233.3 ^D	8.1	26.7	1,106.6	13.3	748.3 ^D	15.3	125.0	21.6	14.3
Yukon, Northwest Territories and Nunavut	0.0 ^A	0.0	x	x	x	x	x	0.0 ^A	0.0	0.0	0.0	0.0

1. Recirculation rate = Amount of recirculated water as a percent of intake. The same water can leave a sub-system and re-enter it or is used in another sub-system many times, resulting in a recirculation rate > 100%.

2. Gross water use = Intake + Recirculation.

3. Consumption = Intake - Discharge.

4. Consumption rate = Consumption as a percentage of Intake.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0047 and 153-0048.

Table 2-2
Water use parameters in manufacturing industries, 2009 — Drainage regions

	Intake		Recirculation		Recirculation rate ¹	Gross water use ²		Discharge		Consumption ³	Consumption rate ⁴	
	millions of cubic metres	%	millions of cubic metres	%		millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	
Canada	5,458.7^B	100.0	2,872.2^D	100.0	52.6	8,330.9	100.0	4,879.9^B	100.0	578.8	100.0	10.6
Pacific Coastal	387.2 ^E	7.1	94.3 ^E	3.3	24.4	481.5	5.8	349.6 ^E	7.2	37.6	6.5	9.7
Fraser - Lower Mainland	242.9 ^D	4.4	111.3 ^D	3.9	45.8	354.2	4.3	199.8 ^D	4.1	43.1	7.4	17.7
Okanagan - Similkameen	0.0 ^D	0.0	x	x	x	x	x	F	F	F	F	F
Columbia	235.1 ^E	4.3	F	F	F	F	F	F	F	F	F	F
Yukon	0.0 ^B	0.0	x	x	x	x	x	0.0 ^B	0.0	0.0	0.0	0.0
Peace - Athabasca	187.0 ^D	3.4	79.8 ^E	2.8	42.7	266.8	3.2	179.4 ^D	3.7	7.6	1.3	4.1
Lower Mackenzie	0.0 ^A	0.0	x	x	x	x	x	0.0 ^A	0.0	0.0	0.0	0.0
Arctic Coast - Islands	..	..	..	..	..	..	..	..	..	..	..	..
Missouri	0.0 ^A	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ^A	0.0	0.0	0.0	0.0
North Saskatchewan	34.7 ^C	0.6	4.5 ^A	0.2	13.0	39.2	0.5	16.7 ^E	0.3	18.0	3.1	51.9
South Saskatchewan	69.0 ^C	1.3	8.3 ^C	0.3	12.0	77.3	0.9	33.6 ^D	0.7	35.4	6.1	51.3
Assiniboine - Red	38.6 ^D	0.7	F	F	F	F	F	26.1 ^E	0.5	12.5	2.2	32.4
Winnipeg	94.5 ^A	1.7	15.3 ^A	0.5	16.2	109.8	1.3	98.8 ^A	2.0	-4.3	-0.7	-4.6
Lower Saskatchewan - Nelson	50.2 ^A	0.9	x	x	x	x	x	50.8 ^A	1.0	-0.6	-0.1	-1.2
Churchill	x	x	x	x	x	x	x	x	x	x	x	x
Keewatin - Southern Baffin Island	x	x	0.0	0.0	x	x	x	x	x	x	x	x
Northern Ontario	76.9 ^A	1.4	x	x	x	x	x	79.3 ^A	1.6	-2.4	-0.4	-3.1
Northern Quebec	x	x	1.7 ^B	0.1	x	x	x	x	x	x	x	x
Great Lakes ⁵	3,324.8 ^C	60.9	2,109.4 ^D	73.4	63.4	5,434.2	65.2	2,959.8 ^C	60.7	365.0	63.1	11.0
Ottawa ⁵	..	..	..	..	..	..	..	..	..	..	..	..
St. Lawrence ⁵	..	..	..	..	..	..	..	..	..	..	..	..
North Shore - Gaspé	131.3 ^C	2.4	47.6 ^D	1.7	36.3	178.9	2.1	130.6 ^C	2.7	0.7	0.1	0.5
Saint John - St. Croix	180.1 ^C	3.3	80.0 ^D	2.8	44.4	260.1	3.1	173.7 ^C	3.6	6.4	1.1	3.6
Maritime Coastal	360.6 ^D	6.6	133.7 ^E	4.7	37.1	494.3	5.9	347.1 ^D	7.1	13.5	2.3	3.7
Newfoundland - Labrador	F	F	F	F	F	F	F	F	F	F	F	F

1. Recirculation rate = Amount of recirculated water as a percent of intake. The same water can leave a sub-system and re-enter it or is used in another sub-system many times, resulting in a recirculation rate > 100%.

2. Gross water use = Intake + Recirculation.

3. Consumption = Intake - Discharge.

4. Consumption rate = Consumption as a percentage of Intake.

5. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0047 and 153-0048.

Table 3
Water intake in manufacturing industries, by month and industry group, 2009

	January	February	March	April	May	June	July	August	September	October	November	December
	millions of cubic metres											
Total	433.6^B	402.6^B	431.3^C	409.0^C	439.7^C	461.9^B	497.8^B	510.3^B	496.4^B	476.5^B	453.6^B	445.8^C
Food	31.1 ^C	29.1 ^C	30.7 ^C	32.4 ^C	38.0 ^D	47.8 ^D	48.6 ^D	49.7 ^D	51.7 ^D	41.2 ^D	34.0 ^C	28.7 ^C
Beverage and tobacco	4.4 ^D	4.4 ^D	4.8 ^D	4.8 ^D	5.0 ^D	5.3 ^D	4.8 ^D	4.2 ^E	5.0 ^D	4.7 ^D	4.6 ^D	3.2 ^D
Textile mills	0.1 ^A	0.1 ^A	0.1 ^A	0.1 ^B	0.1 ^A	0.1 ^A	0.1 ^B	0.1 ^B	0.1 ^A	0.1 ^B	0.1 ^B	0.1 ^C
Textile products	0.4 ^E	0.4 ^E	0.4 ^E	0.4 ^D	0.5 ^E	0.6 ^E	0.4 ^E	0.7 ^E	0.6 ^E	0.5 ^E	0.5 ^E	0.4 ^E
Wood	2.6 ^E	2.7 ^E	2.8 ^E	2.4 ^E	2.6 ^E	3.0 ^E	3.4 ^E	3.9 ^E	3.6 ^E	2.7 ^E	2.5 ^E	2.5 ^E
Paper	181.6 ^B	167.7 ^B	171.5 ^B	165.4 ^B	181.8 ^B	189.3 ^B	209.6 ^B	209.9 ^B	201.1 ^C	201.8 ^B	192.0 ^B	192.4 ^B
Petroleum and coal	43.2 ^E	F	F	39.1 ^E	42.6 ^E	41.0 ^E	46.6 ^E	46.6 ^E	44.9 ^E	45.5 ^E	39.8 ^E	41.1 ^E
Chemicals	26.0 ^B	23.9 ^B	26.8 ^B	26.0 ^B	28.9 ^B	30.0 ^B	34.5 ^B	34.8 ^B	32.8 ^B	28.4 ^B	26.2 ^B	25.0 ^B
Plastics and rubber	2.4 ^D	2.5 ^D	2.7 ^D	2.6 ^D	2.7 ^D	3.4 ^D	3.0 ^D	3.3 ^D	3.2 ^D	3.1 ^D	3.1 ^D	2.6 ^D
Non-metallic minerals	3.6 ^D	3.5 ^D	3.6 ^D	4.1 ^D	4.4 ^D	5.4 ^E	6.3 ^E	6.6 ^E	5.5 ^D	4.6 ^D	4.3 ^D	3.8 ^D
Primary metals	132.3 ^D	121.9 ^D	133.7 ^E	125.0 ^E	126.4 ^E	129.7 ^E	133.8 ^E	143.4 ^E	140.0 ^E	136.0 ^D	140.0 ^E	140.0 ^E
Fabricated metals	1.4 ^E	1.3 ^E	1.3 ^E	1.5 ^E	1.5 ^E	1.6 ^E	2.0 ^E	2.0 ^E	2.0 ^E	1.4 ^E	1.5 ^E	1.5 ^E
Machinery	0.2 ^E	0.2 ^E	0.2 ^E	0.2 ^E	0.2 ^E	0.3 ^D	0.3 ^E	0.3 ^E	0.3 ^E	0.3 ^E	0.3 ^E	0.3 ^D
Computers and electronics ¹	F	F	F	F	F	F	F	F	F	F	F	F
Electrical products ¹	x	x	x	x	x	x	x	x	x	x	x	x
Transportation equipment	2.2 ^E	2.4 ^E	2.9 ^E	3.0 ^E	3.1 ^E	2.6 ^E	2.5 ^E	2.9 ^E	3.2 ^E	3.9 ^E	2.6 ^E	2.3 ^D
Miscellaneous	0.5 ^E	0.4 ^E	0.5 ^E	0.4 ^E	0.4 ^E	0.4 ^E	0.3 ^E	0.5 ^E	0.6 ^E	F	0.5 ^E	0.5 ^E
Other ²	1.1 ^D	1.1 ^D	1.1 ^D	1.1 ^D	1.2 ^D	1.2 ^D	1.2 ^D	1.2 ^D	1.2 ^D	1.2 ^D	1.3 ^D	1.2 ^D

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0049.

Table 4
Water intake in manufacturing industries, by source and industry group, 2009

	Freshwater source				Saline water source			Total water intake
	Municipal	Self-supplied			Self-supplied			
		Surface water bodies	Groundwater	Other	Groundwater	Tidewater	Other	
millions of cubic metres								
Total	685.3 ^C	4,281.7 ^C	149.1 ^D	122.5 ^D	F	215.6 ^E	F	5,458.7 ^B
Food	230.6 ^D	79.9 ^D	27.0 ^D	F	F	123.1 ^E	0.0	463.0 ^D
Beverage and tobacco	20.4 ^C	28.2 ^E	6.8 ^D	0.0 ^E	0.0	0.0	0.0	55.4 ^D
Textile mills	x	0.0	x	0.0	0.0	0.0	0.0	0.8 ^B
Textile products	5.7 ^E	0.0	F	0.0	0.0	0.0	0.0	5.7 ^E
Wood	15.8 ^E	F	F	F	0.0	0.0	0.0	34.5 ^E
Paper	191.4 ^E	1,925.6 ^C	88.5 ^E	58.4 ^E	0.0	0.0	0.0	2,264.0 ^B
Petroleum and coal	28.9 ^E	F	x	3.9 ^A	0.0	x	0.0	519.6 ^E
Chemicals	31.9 ^D	242.9 ^B	x	51.5 ^E	0.0	F	0.0	343.1 ^B
Plastics and rubber	22.3 ^D	F	1.8 ^E	F	F	0.0	0.0	34.5 ^D
Non-metallic minerals	12.2 ^E	39.4 ^D	x	F	0.0	0.0	F	55.7 ^D
Primary metals	60.4 ^D	1,526.1 ^E	x	5.0 ^E	0.0	x	0.0	1,602.3 ^E
Fabricated metals	18.7 ^E	F	0.1 ^D	F	0.0	0.0	0.0	18.9 ^E
Machinery	x	0.0	F	F	0.0	0.0	0.0	3.2 ^E
Computers and electronics ¹	F	0.0	F	F	0.0	0.0	0.0	F
Electrical products ¹	x	0.0	F	0.0	0.0	0.0	0.0	x
Transportation equipment	19.7 ^C	F	F	F	0.0	0.0	0.0	33.6 ^E
Miscellaneous	5.6 ^E	0.0	F	0.0	0.0	0.0	0.0	5.8 ^E
Other ²	14.1 ^D	0.0	F	0.0	0.0	0.0	0.0	14.2 ^D
percent								
Percentage of total water intake	12.6	78.4	2.7	2.2	F	3.9	F	100.0

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0050.

Table 5-1

Water intake in manufacturing industries, by source, 2009 — Provinces and territories

	Freshwater source				Saline water source			Total water intake
	Municipal	Self-supplied			Self-supplied			
		Surface water bodies	Groundwater	Other	Groundwater	Tidewater	Other	
millions of cubic metres								
Canada	685.3 ^C	4,281.7 ^C	149.1 ^D	122.5 ^D	F	215.6 ^E	F	5,458.7 ^B
Newfoundland and Labrador	x	x	0.1 ^A	x	0.0	F	0.0	F
Prince Edward Island	F	0.0	F	0.0	0.0	0.0	0.0	F
Nova Scotia	16.7 ^E	x	x	F	0.0	150.7 ^E	0.0	256.8 ^D
New Brunswick	72.4 ^E	129.2 ^D	5.1 ^E	1.6 ^D	0.0	11.4 ^A	0.0	219.6 ^C
Quebec	238.8 ^D	1,027.9 ^D	69.8 ^E	x	F	F	0.0	1,350.3 ^C
Ontario	212.7 ^C	2,098.4 ^D	x	11.3 ^E	F	0.0	F	2,336.6 ^D
Manitoba	15.2 ^E	x	x	0.1 ^E	F	0.0	0.0	87.8 ^B
Saskatchewan	12.7 ^E	x	x	x	0.0	0.0	0.0	17.9 ^E
Alberta	29.2 ^D	229.9 ^C	F	x	0.0	0.0	0.0	274.6 ^C
British Columbia	F	699.4 ^D	x	x	0.0	x	0.0	873.3 ^D
Yukon, Northwest Territories and Nunavut	0.0 ^B	x	x	x	0.0	0.0	0.0	0.0 ^A
percent								
Percentage of total water intake	12.6	78.4	2.7	2.2	F	3.9	F	100.0

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0050 and 153-0051.

Table 5-2
Water intake in manufacturing industries, by source, 2009 — Drainage regions

	Freshwater source				Saline water source			Total water intake
	Municipal	Self-supplied			Self-supplied			
		Surface water bodies	Groundwater	Other	Groundwater	Tidewater	Other	
millions of cubic metres								
Canada	685.3 ^C	4,281.7 ^C	149.1 ^D	122.5 ^D	F	215.6 ^E	F	5,458.7 ^B
Pacific Coastal	10.3 ^D	338.9 ^E	F	F	0.0	x	0.0	387.2 ^E
Fraser - Lower Mainland	x	166.3 ^E	x	33.5 ^E	0.0	0.0	0.0	242.9 ^D
Okanagan - Similkameen	0.0 ^D	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ^D
Columbia	F	F	x	0.0	0.0	0.0	0.0	235.1 ^E
Yukon	x	0.0	x	x	0.0	0.0	0.0	0.0 ^B
Peace - Athabasca	x	165.8 ^D	F	F	0.0	0.0	0.0	187.0 ^D
Lower Mackenzie	x	x	0.0	0.0	0.0	0.0	0.0	0.0 ^A
Arctic Coast - Islands	..	..	..	..	..	..	..	..
Missouri	0.0 ^A	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ^A
North Saskatchewan	12.6 ^E	18.0 ^A	F	x	0.0	0.0	0.0	34.7 ^C
South Saskatchewan	14.8 ^E	46.0 ^D	F	4.1 ^E	0.0	0.0	0.0	69.0 ^C
Assiniboine - Red	19.6 ^E	0.0	x	x	F	0.0	0.0	38.6 ^D
Winnipeg	x	91.3 ^A	F	x	0.0	0.0	0.0	94.5 ^A
Lower Saskatchewan - Nelson	0.3 ^E	x	x	F	0.0	0.0	0.0	50.2 ^A
Churchill	0.0 ^D	x	x	x	0.0	0.0	0.0	x
Keewatin - Southern Baffin Island	x	0.0	0.0	0.0	0.0	0.0	0.0	x
Northern Ontario	x	x	0.0 ^E	0.0	0.0	0.0	0.0	76.9 ^A
Northern Quebec	2.2 ^E	x	F	0.0	0.0	0.0	0.0	x
Great Lakes ¹	436.1 ^C	2,839.2 ^D	x	23.5 ^D	F	0.0	F	3,324.8 ^C
Ottawa ¹	..	..	..	..	..	..	..	..
St. Lawrence ¹	..	..	..	..	..	..	..	..
North Shore - Gaspé	8.7 ^C	120.0 ^D	F	F	F	F	0.0	131.3 ^C
Saint John - St. Croix	71.4 ^E	100.0 ^D	2.7 ^C	x	0.0	x	0.0	180.1 ^C
Maritime Coastal	20.0 ^D	74.1 ^E	F	F	0.0	157.7 ^E	0.0	360.6 ^D
Newfoundland - Labrador	9.2 ^E	x	0.1 ^A	x	0.0	F	0.0	F
percent								
Percentage of total water intake	12.6	78.4	2.7	2.2	F	3.9	F	100.0

1. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0050 and 153-0051.

Table 6
Intake water treatment in manufacturing industries, by type of treatment and industry group, 2009

	Screening	Filtration	Chlorination and disinfection	Corrosion and slime control	Alkalinity control	Hardness	Coagulation and flocculation	Other treatments
millions of cubic metres								
Total	3,374.3^C	1,558.8^C	1,492.1^D	382.1^D	275.8^D	319.9^D	730.5^D	94.8^E
Food	61.5 ^D	F	85.5 ^E	5.7 ^E	5.5 ^E	F	F	10.4 ^E
Beverage and tobacco	F	13.0 ^D	4.5 ^E	0.3 ^C	4.9 ^E	F	x	2.0 ^E
Textile mills	0.0	x	0.0	0.0	0.0	x	0.0	0.0
Textile products	F	F	F	F	F	F	F	F
Wood	F	5.3 ^D	F	F	8.5 ^E	8.6 ^E	x	F
Paper	1,412.2 ^C	978.0 ^C	638.5 ^D	178.3 ^E	190.8 ^E	132.6 ^C	609.0 ^D	F
Petroleum and coal	F	31.4 ^C	130.4 ^E	110.3 ^C	33.7 ^E	33.3 ^E	22.9 ^A	x
Chemicals	208.1 ^B	44.5 ^C	113.5 ^C	31.6 ^C	25.4 ^D	31.1 ^B	35.9 ^B	17.6 ^B
Plastics and rubber	1.4 ^C	3.4 ^E	0.7 ^E	2.9 ^E	2.6 ^E	4.1 ^E	F	F
Non-metallic minerals	13.2 ^E	x	F	F	0.0	F	F	x
Primary metals	1,196.4 ^E	223.4 ^E	518.3 ^E	44.6 ^E	3.4 ^E	15.1 ^D	3.2 ^D	7.0 ^E
Fabricated metals	0.0	F	0.0	F	F	F	0.0	F
Machinery	0.0	0.0	0.0	F	0.0	F	0.0	0.0
Computers and electronics ¹	F	F	F	F	0.0	F	0.0	F
Electrical products ¹	F	F	F	0.0	0.0	0.0	0.0	0.0
Transportation equipment	F	F	0.1 ^E	0.2 ^E	F	0.7 ^E	0.0	0.8 ^D
Miscellaneous	0.0	x	x	0.0 ^E	0.0	x	0.0	F
Other ²	0.0	0.0	F	0.0	F	F	0.0	0.0
percent								
Percentage of total water intake	61.8	28.6	27.3	7.0	5.1	5.9	13.4	1.7

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0050 and 153-0067.

Table 7
Water intake in manufacturing industries, by purpose of initial use and industry group, 2009

	Process water	Cooling, condensing and steam	Sanitary service and domestic use	Other	Total water intake
millions of cubic metres					
Total	2,598.5^B	2,294.2^C	189.6^D	376.4^E	5,458.7^B
Food	295.3 ^D	119.7 ^C	40.7 ^E	F	463.0 ^D
Beverage and tobacco	17.9 ^C	32.7 ^E	x	x	55.4 ^D
Textile mills	x	F	0.1 ^C	0.0	0.8 ^B
Textile products	F	1.4 ^E	0.9 ^E	F	5.7 ^E
Wood	13.3 ^E	12.8 ^E	8.0 ^E	F	34.5 ^E
Paper	1,674.1 ^B	504.4 ^C	73.1 ^E	F	2,264.0 ^B
Petroleum and coal	67.5 ^E	F	3.1 ^E	92.2 ^C	519.6 ^E
Chemicals	41.3 ^C	295.8 ^B	4.8 ^D	1.3 ^C	343.1 ^B
Plastics and rubber	3.6 ^D	20.4 ^D	x	F	34.5 ^D
Non-metallic minerals	13.3 ^E	37.0 ^D	x	F	55.7 ^D
Primary metals	448.2 ^D	889.4 ^E	x	F	1,602.3 ^E
Fabricated metals	6.2 ^D	0.8 ^E	9.3 ^E	F	18.9 ^E
Machinery	0.6 ^E	F	1.5 ^D	0.0	3.2 ^E
Computers and electronics ¹	F	F	F	F	F
Electrical products ¹	F	F	x	0.0	x
Transportation equipment	8.6 ^D	F	6.1 ^B	0.5 ^E	33.6 ^E
Miscellaneous	1.4 ^E	F	2.7 ^E	F	5.8 ^E
Other ²	2.1 ^E	F	10.5 ^D	F	14.2 ^D
percent					
Percentage of total water intake	47.6	42.0	3.5	6.9	100.0

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0050 and 153-0068.

Table 8
Water recirculation in manufacturing industries, by purpose and industry group, 2009

	Process water	Cooling, condensing and steam	Other	Total water recirculation
	millions of cubic metres			
Total	1,555.0^D	1,245.3^D	F	2,872.2^D
Food	x	77.2 ^C	F	95.8 ^B
Beverage and tobacco	0.4 ^B	x	F	1.6 ^D
Textile mills	0.0	F	0.0	F
Textile products	F	0.0	F	F
Wood	x	x	F	10.0 ^E
Paper	682.8 ^D	344.5 ^D	F	1,045.3 ^C
Petroleum and coal	x	x	x	x
Chemicals	4.5 ^B	31.7 ^A	0.7 ^A	36.9 ^A
Plastics and rubber	3.6 ^E	x	F	6.2 ^E
Non-metallic minerals	F	x	F	5.4 ^E
Primary metals	837.9 ^E	641.5 ^E	F	1,529.3 ^E
Fabricated metals	F	F	F	F
Machinery	F	F	0.0	F
Computers and electronics ¹	0.0	0.0	F	F
Electrical products ¹	0.0	0.0	0.0	0.0
Transportation equipment	1.2 ^E	F	F	2.1 ^E
Miscellaneous	F	F	0.0 ^A	F
Other ²	F	F	0.0	F
	percent			
Percentage of total water recirculation	54.1	43.4	F	100.0

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0069.

Table 9
Water discharge in manufacturing industries, by point of discharge and industry group, 2009

	Public and municipal utilities	Surface water bodies	Tidewater ¹	Groundwater	Other	Total water discharge	Percentage of total water discharge
	millions of cubic metres						%
Total	410.1^B	3,746.6^C	547.8^D	82.3^E	93.2^E	4,879.9^B	100.0
Food	162.4 ^C	75.7 ^D	128.2 ^E	4.9 ^E	19.7 ^E	390.9 ^D	8.0
Beverage and tobacco	16.4 ^C	F	x	1.6 ^D	x	45.4 ^D	0.9
Textile mills	x	0.0	0.0	x	0.0	0.8 ^B	0.0
Textile products	5.1 ^E	F	F	F	0.0 ^B	5.2 ^E	0.1
Wood	8.6 ^E	F	0.0	F	F	28.0 ^E	0.6
Paper	48.5 ^E	1,764.7 ^C	310.0 ^E	F	F	2,226.9 ^B	45.6
Petroleum and coal	F	325.1 ^E	x	F	0.9 ^D	419.6 ^E	8.6
Chemicals	24.7 ^E	202.4 ^B	F	x	x	246.5 ^B	5.1
Plastics and rubber	15.6 ^C	14.9 ^E	F	F	F	31.2 ^D	0.6
Non-metallic minerals	x	39.9 ^D	0.0	F	F	49.6 ^D	1.0
Primary metals	52.5 ^E	1,274.1 ^D	x	F	F	1,359.4 ^D	27.9
Fabricated metals	17.1 ^E	0.0	0.0	0.2 ^E	F	17.4 ^E	0.4
Machinery	2.3 ^E	F	0.0	F	F	3.0 ^E	0.1
Computers and electronics ²	F	F	0.0	F	0.0	F	F
Electrical products ²	x	0.0	0.0	F	F	x	x
Transportation equipment	13.9 ^C	F	F	F	0.0 ^E	32.3 ^E	0.7
Miscellaneous	x	0.0	0.0	F	F	5.6 ^E	0.1
Other ³	13.9 ^D	0.0	0.0	F	0.0 ^A	14.0 ^D	0.3
	percent						
Percentage of total water discharge	8.4	76.8	11.2	1.7	1.9	100.0	..

1. For 2005, tidewater is included in surface water bodies and other points of discharge. As of 2007, it appears separately.

2. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

3. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0070.

Table 10-1**Water discharge in manufacturing industries, by point of discharge, 2009 — Provinces and territories**

	Public and municipal utilities	Surface water bodies	Tidewater ¹	Groundwater	Other	Total water discharge	Percentage of total water discharge
	millions of cubic metres						%
Canada	410.1^B	3,746.6^C	547.8^D	82.3^E	93.2^E	4,879.9^B	100.0
Newfoundland and Labrador	9.5 ^E	F	F	0.1 ^A	0.0 ^C	F	F
Prince Edward Island	F	0.0	F	F	0.0	F	F
Nova Scotia	x	F	187.3 ^E	0.1 ^E	F	245.1 ^E	5.0
New Brunswick	x	172.2 ^D	33.1 ^E	F	x	211.9 ^C	4.3
Quebec	152.2 ^D	1,009.2 ^D	x	F	18.3 ^E	1,293.8 ^C	26.5
Ontario	161.4 ^C	1,856.7 ^D	F	x	x	2,033.5 ^D	41.7
Manitoba	19.5 ^E	x	0.0	6.7 ^E	x	81.1 ^B	1.7
Saskatchewan	8.5 ^E	x	0.0	F	x	9.8 ^E	0.2
Alberta	15.9 ^D	183.2 ^D	0.0	0.2 ^E	15.6 ^E	214.9 ^C	4.4
British Columbia	x	467.5 ^E	248.6 ^E	F	x	748.3 ^D	15.3
Yukon, Northwest Territories and Nunavut	x	0.0	0.0	x	x	0.0 ^A	0.0
	percent						
Percentage of total water discharge	8.4	76.8	11.2	1.7	1.9	100.0	..

1. For 2005, tidewater is included in surface water bodies and other points of discharge. As of 2007, it appears separately.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0070 and 153-0071.

Table 10-2
Water discharge in manufacturing industries, by point of discharge, 2009 — Drainage regions

	Public and municipal utilities	Surface water bodies	Tidewater ¹	Groundwater	Other	Total water discharge	Percentage of total water discharge
	millions of cubic metres						%
Canada	410.1^B	3,746.6^C	547.8^D	82.3^E	93.2^E	4,879.9^B	100.0
Pacific Coastal	8.7 ^D	F	247.4 ^E	x	F	349.6 ^E	7.2
Fraser - Lower Mainland	13.8 ^E	176.9 ^D	F	F	x	199.8 ^D	4.1
Okanagan - Similkameen	F	0.0	0.0	0.0	0.0	F	F
Columbia	0.7 ^E	F	0.0	F	1.1 ^A	F	F
Yukon	x	0.0	0.0	x	x	0.0 ^B	0.0
Peace - Athabasca	0.1 ^C	178.8 ^D	0.0	F	F	179.4 ^D	3.7
Lower Mackenzie	0.0 ^A	0.0	0.0	0.0	0.0	0.0 ^A	0.0
Arctic Coast - Islands	..	..	..	..	..	..	..
Missouri	x	0.0	0.0	0.0	x	0.0 ^A	0.0
North Saskatchewan	11.4 ^E	4.7 ^A	0.0	F	x	16.7 ^E	0.3
South Saskatchewan	10.7 ^E	7.8 ^B	0.0	0.1 ^E	15.0 ^E	33.6 ^D	0.7
Assiniboine - Red	21.3 ^E	x	0.0	F	0.5 ^D	26.1 ^E	0.5
Winnipeg	x	96.1 ^A	0.0	F	0.0 ^A	98.8 ^A	2.0
Lower Saskatchewan - Nelson	x	x	0.0	1.2 ^C	x	50.8 ^A	1.0
Churchill	0.0 ^C	x	0.0	0.0	0.0	x	x
Keewatin - Southern Baffin Island	x	0.0	0.0	0.0	0.0	x	x
Northern Ontario	x	x	0.0	0.0 ^D	x	79.3 ^A	1.6
Northern Quebec	0.2 ^D	x	0.0	0.0 ^B	0.0	x	x
Great Lakes ²	304.6 ^B	2,613.3 ^C	F	F	31.6 ^D	2,959.8 ^C	60.7
Ottawa ²	..	..	..	..	..	..	..
St. Lawrence ²	..	..	..	..	..	..	..
North Shore - Gaspé	x	76.4 ^E	49.6 ^E	F	F	130.6 ^C	2.7
Saint John - St. Croix	x	144.0 ^D	x	0.1 ^A	x	173.7 ^C	3.6
Maritime Coastal	16.0 ^E	F	198.4 ^E	F	F	347.1 ^D	7.1
Newfoundland - Labrador	8.7 ^E	F	F	0.1 ^A	0.0 ^C	F	F
	percent						
Percentage of total water discharge	8.4	76.8	11.2	1.7	1.9	100.0	..

1. For 2005, tidewater is included in surface water bodies and other points of discharge. As of 2007, it appears separately.

2. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0070 and 153-0071.

Table 11**Water discharge in manufacturing industries, by type of final treatment and industry group, 2009**

	Water not treated before discharge	Primary or mechanical	Secondary or biological	Tertiary or advanced
millions of cubic metres				
Total	1,674.3^C	869.9^D	1,889.9^C	445.8^E
Food	210.0 ^D	121.9 ^E	35.8 ^D	23.2 ^E
Beverage and tobacco	38.9 ^E	3.3 ^E	x	x
Textile mills	x	x	0.0	0.0
Textile products	4.4 ^E	0.8 ^B	0.0	0.0
Wood	14.0 ^E	F	F	F
Paper	378.4 ^C	x	1,692.5 ^C	x
Petroleum and coal	80.1 ^C	282.6 ^E	29.1 ^A	F
Chemicals	181.6 ^B	40.1 ^E	12.3 ^C	12.5 ^E
Plastics and rubber	30.5 ^D	0.3 ^D	F	F
Non-metallic minerals	17.0 ^E	32.6 ^E	F	x
Primary metals	651.8 ^E	232.1 ^E	F	F
Fabricated metals	15.9 ^E	F	F	F
Machinery	2.7 ^E	F	F	F
Computers and electronics ¹	F	0.1 ^E	F	F
Electrical products ¹	x	F	F	0.0
Transportation equipment	25.4 ^E	1.4 ^E	F	5.2 ^E
Miscellaneous	5.4 ^E	F	0.0 ^E	0.0
Other ²	13.9 ^D	F	0.0	0.0
percent				
Percentage of total water discharge	34.3	17.8	38.7	9.1

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.

2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0070 and 153-0072.

Table 12-1**Water discharge in manufacturing industries, by type of final treatment, 2009 — Provinces and territories**

	Water not treated before discharge	Primary or mechanical	Secondary or biological	Tertiary or advanced
millions of cubic metres				
Canada	1,674.3^C	869.9^D	1,889.9^C	445.8^E
Newfoundland and Labrador	F	x	x	0.0
Prince Edward Island	F	F	F	F
Nova Scotia	29.5 ^E	159.5 ^E	x	x
New Brunswick	57.0 ^E	x	141.4 ^D	x
Quebec	440.4 ^D	214.5 ^E	637.5 ^D	1.5 ^E
Ontario	823.3 ^D	397.8 ^E	430.1 ^E	F
Manitoba	F	9.0 ^D	32.3 ^A	x
Saskatchewan	x	F	x	F
Alberta	35.4 ^D	31.2 ^E	142.8 ^D	5.5 ^E
British Columbia	242.3 ^E	36.5 ^D	445.4 ^D	24.1 ^D
Yukon, Northwest Territories and Nunavut	x	0.0	F	0.0
percent				
Percentage of total water discharge	34.3	17.8	38.7	9.1

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0070, 153-0072 and 153-0073.

Table 12-2
Water discharge in manufacturing industries, by type of final treatment, 2009 — Drainage regions

	Water not treated before discharge	Primary or mechanical	Secondary or biological	Tertiary or advanced
millions of cubic metres				
Canada	1,674.3^C	869.9^D	1,889.9^C	445.8^E
Pacific Coastal	31.8 ^D	F	302.0 ^E	x
Fraser - Lower Mainland	36.0 ^D	x	129.3 ^E	x
Okanagan - Similkameen	F	0.0	0.0	0.0
Columbia	F	F	x	x
Yukon	x	0.0	F	0.0
Peace - Athabasca	x	F	135.8 ^D	0.0
Lower Mackenzie	0.0 ^A	0.0	0.0	0.0
Arctic Coast - Islands	..	..	..	..
Missouri	0.0 ^A	0.0	0.0	0.0
North Saskatchewan	6.3 ^E	9.9 ^E	x	x
South Saskatchewan	10.5 ^D	F	15.0 ^E	5.8 ^E
Assiniboine - Red	F	7.3 ^C	3.8 ^A	F
Winnipeg	x	F	x	0.0
Lower Saskatchewan - Nelson	1.0 ^D	F	x	x
Churchill	0.0 ^C	0.0	x	0.0
Keewatin - Southern Baffin Island	x	0.0	0.0	0.0
Northern Ontario	x	F	x	F
Northern Quebec	2.8 ^E	x	x	0.0
Great Lakes ¹	1,073.3 ^C	578.8 ^E	923.8 ^D	F
Ottawa ¹	..	..	..	..
St. Lawrence ¹	..	..	..	..
North Shore - Gaspé	x	x	74.1 ^E	F
Saint John - St. Croix	50.4 ^E	x	111.4 ^D	x
Maritime Coastal	96.0 ^E	162.1 ^E	x	F
Newfoundland - Labrador	F	2.8 ^B	x	0.0
percent				
Percentage of total water discharge	34.3	17.8	38.7	9.1

1. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0070, 153-0072 and 153-0073.

Table 13
Water acquisition costs in manufacturing industries, by industry group, 2009

	Public utilities	Operation and maintenance costs (excluding treatment)	Licence fees	Total water acquisition costs
thousands of dollars				
Total	355,980^B	118,495^C	3,900^D	478,375^B
Food	128,115 ^C	15,469 ^D	236 ^E	143,820 ^C
Beverage and tobacco	17,515 ^D	4,514 ^E	77 ^E	22,107 ^D
Textile mills	202 ^E	F	x	213 ^E
Textile products	4,670 ^E	F	F	4,957 ^E
Wood	5,404 ^E	F	F	9,949 ^E
Paper	36,633 ^D	35,081 ^D	2,119 ^E	73,833 ^D
Petroleum and coal	9,120 ^A	3,224 ^E	283 ^D	12,627 ^B
Chemicals	28,194 ^D	11,840 ^B	F	40,658 ^C
Plastics and rubber	16,444 ^C	1,311 ^D	F	17,781 ^C
Non-metallic minerals	7,561 ^E	x	F	9,117 ^D
Primary metals	38,127 ^D	33,481 ^E	196 ^E	71,804 ^D
Fabricated metals	12,475 ^D	F	0	13,334 ^D
Machinery	4,800 ^D	F	0	5,721 ^D
Computers and electronics ¹	F	x	0	F
Electrical products ¹	x	x	x	x
Transportation equipment	24,081 ^D	F	F	29,731 ^E
Miscellaneous	6,463 ^E	F	F	6,528 ^E
Other ²	6,895 ^E	0	0	6,895 ^E
percent				
Percentage of total water acquisition costs	74.4	24.8	0.8	100.0

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.
2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0074.

Table 14-1
Water acquisition costs in manufacturing industries, 2009 — Provinces and territories

	Public utilities	Operation and maintenance costs (excluding treatment)	Licence fees	Total water acquisition costs
thousands of dollars				
Canada	355,980^B	118,495^C	3,900^D	478,375^B
Newfoundland and Labrador	x	2,460 ^C	x	x
Prince Edward Island	F	F	0	F
Nova Scotia	x	4,392 ^E	F	10,682 ^E
New Brunswick	8,661 ^C	2,826 ^D	138 ^C	11,626 ^C
Quebec	46,761 ^C	19,797 ^D	F	66,907 ^C
Ontario	215,101 ^B	49,251 ^D	F	265,214 ^B
Manitoba	19,303 ^E	x	F	30,700 ^E
Saskatchewan	8,021 ^D	x	x	12,742 ^C
Alberta	16,418 ^D	9,900 ^D	227 ^A	26,546 ^C
British Columbia	28,582 ^D	14,015 ^E	1,899 ^E	44,496 ^D
Yukon, Northwest Territories and Nunavut	14 ^B	x	x	17 ^B
percent				
Percentage of total water acquisition costs	74.4	24.8	0.8	100.0

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0074 and 153-0075.

Table 14-2
Water acquisition costs in manufacturing industries, 2009 — Drainage regions

	Public utilities	Operation and maintenance costs (excluding treatment)	Licence fees	Total water acquisition costs
thousands of dollars				
Canada	355,980^B	118,495^C	3,900^D	478,375^B
Pacific Coastal	7,126 ^D	7,146 ^E	1,611 ^E	15,882 ^D
Fraser - Lower Mainland	20,657 ^E	F	169 ^D	25,503 ^D
Okanagan - Similkameen	x	0	0	x
Columbia	718 ^D	F	F	3,028 ^E
Yukon	x	F	x	9 ^C
Peace - Athabasca	x	2,102 ^C	x	3,741 ^D
Lower Mackenzie	3 ^A	x	0	x
Arctic Coast - Islands	..	..	..	..
Missouri	4 ^A	x	0	x
North Saskatchewan	8,123 ^D	x	x	11,630 ^C
South Saskatchewan	12,110 ^D	5,034 ^E	F	17,156 ^D
Assiniboine - Red	21,389 ^E	F	F	29,035 ^E
Winnipeg	762 ^A	x	0	x
Lower Saskatchewan - Nelson	x	4,263 ^D	x	4,860 ^C
Churchill	x	x	x	x
Keewatin - Southern Baffin Island	x	0	0	x
Northern Ontario	x	877 ^C	F	993 ^C
Northern Quebec	321 ^B	x	0	x
Great Lakes ¹	258,687 ^B	65,651 ^D	1,195 ^E	325,533 ^B
Ottawa ¹	..	..	..	..
St. Lawrence ¹	..	..	..	..
North Shore - Gaspé	2,000 ^D	x	F	3,451 ^C
Saint John - St. Croix	6,967 ^C	1,681 ^D	97 ^D	8,745 ^B
Maritime Coastal	8,404 ^E	6,278 ^D	124 ^E	14,805 ^D
Newfoundland - Labrador	6,401 ^E	x	x	8,862 ^E
percent				
Percentage of total water acquisition costs	74.4	24.8	0.8	100.0

1. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0074 and 153-0075.

Table 15**Total water costs in manufacturing industries, by water cost component and industry group, 2009**

	Acquisition	Intake treatment	Recirculation	Discharge treatment	Total water costs
thousands of dollars					
Total	478,375^B	205,232^B	120,998^D	575,668^B	1,380,273^B
Food	143,820 ^C	17,447 ^D	8,835 ^D	99,957 ^D	270,059 ^C
Beverage and tobacco	22,107 ^D	5,460 ^D	619 ^E	3,702 ^E	31,888 ^D
Textile mills	213 ^E	x	F	x	330 ^D
Textile products	4,957 ^E	F	0	F	6,191 ^E
Wood	9,949 ^E	3,800 ^E	2,327 ^E	F	21,261 ^E
Paper	73,833 ^D	76,550 ^C	41,196 ^E	274,099 ^C	465,677 ^B
Petroleum and coal	12,627 ^B	10,195 ^A	786 ^E	13,888 ^D	37,497 ^C
Chemicals	40,658 ^C	60,911 ^D	4,336 ^C	77,714 ^E	183,619 ^D
Plastics and rubber	17,781 ^C	8,810 ^E	5,314 ^E	3,550 ^E	35,455 ^D
Non-metallic minerals	9,117 ^D	F	F	1,110 ^C	13,208 ^D
Primary metals	71,804 ^D	13,680 ^E	53,367 ^E	61,759 ^D	200,609 ^D
Fabricated metals	13,334 ^D	F	F	5,872 ^E	21,257 ^D
Machinery	5,721 ^D	F	F	F	11,152 ^E
Computers and electronics ¹	F	F	0	F	F
Electrical products ¹	x	F	0	0	x
Transportation equipment	29,731 ^E	2,454 ^E	F	17,731 ^E	51,681 ^E
Miscellaneous	6,528 ^E	F	F	F	11,732 ^E
Other ²	6,895 ^E	F	0	F	7,376 ^E
percent					
Percentage of total water costs	34.7	14.9	8.8	41.7	100.0

1. For 2005, computer and electronic product manufacturing and electrical equipment, appliance and component manufacturing are included in the other manufacturing industries category. As of 2007, they appear separately.
2. Other manufacturing industries combines the following industry groups 3-digit North American Industry Classification System (NAICS): clothing manufacturing (315), leather and allied product manufacturing (316), printing and related support activities (323) and furniture and related product manufacturing (337). The industry groups included in other manufacturing industries may vary from year to year.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0076.

Table 16-1**Total water costs in manufacturing industries, by water cost component, 2009 — Provinces and territories**

	Acquisition	Intake treatment	Recirculation	Discharge treatment	Total water costs
thousands of dollars					
Canada	478,375^B	205,232^B	120,998^D	575,668^B	1,380,273^B
Newfoundland and Labrador	x	x	102 ^E	x	x
Prince Edward Island	F	F	F	F	F
Nova Scotia	10,682 ^E	8,716 ^E	F	x	33,889 ^D
New Brunswick	11,626 ^C	9,462 ^D	2,273 ^E	28,352 ^D	51,713 ^C
Quebec	66,907 ^C	55,186 ^D	43,165 ^E	181,764 ^D	347,022 ^C
Ontario	265,214 ^B	59,845 ^D	61,037 ^E	193,094 ^D	579,190 ^C
Manitoba	30,700 ^E	8,382 ^C	F	36,592 ^E	78,045 ^E
Saskatchewan	12,742 ^C	5,360 ^B	471 ^D	4,520 ^C	23,094 ^B
Alberta	26,546 ^C	44,187 ^C	6,364 ^C	52,960 ^C	130,057 ^B
British Columbia	44,496 ^D	13,066 ^D	2,144 ^E	59,812 ^D	119,519 ^C
Yukon, Northwest Territories and Nunavut	17 ^B	0	x	F	18 ^B
percent					
Percentage of total water costs	34.7	14.9	8.8	41.7	100.0

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0076 and 153-0077.

Table 16-2
Total water costs in manufacturing industries, by water cost component, 2009 — Drainage regions

	Acquisition	Intake treatment	Recirculation	Discharge treatment	Total water costs
thousands of dollars					
Canada	478,375^B	205,232^B	120,998^D	575,668^B	1,380,273^B
Pacific Coastal	15,882 ^D	5,174 ^D	1,606 ^E	26,974 ^D	49,636 ^C
Fraser - Lower Mainland	25,503 ^D	6,753 ^E	386 ^E	28,590 ^E	61,232 ^D
Okanagan - Similkameen	x	F	x	0	26 ^B
Columbia	3,028 ^E	x	x	3,490 ^E	7,085 ^E
Yukon	9 ^C	0	0	F	x
Peace - Athabasca	3,741 ^D	13,440 ^D	2,029 ^D	25,341 ^D	44,551 ^C
Lower Mackenzie	x	0	x	0	6 ^A
Arctic Coast - Islands	..	..	..	..	..
Missouri	x	0	0	0	x
North Saskatchewan	11,630 ^C	11,877 ^A	2,931 ^B	8,458 ^E	34,896 ^B
South Saskatchewan	17,156 ^D	20,051 ^D	1,650 ^E	20,970 ^E	59,827 ^C
Assiniboine - Red	29,035 ^E	8,320 ^C	2,626 ^E	F	60,858 ^E
Winnipeg	x	796 ^A	72 ^A	x	4,735 ^A
Lower Saskatchewan - Nelson	4,860 ^C	x	F	x	27,201 ^A
Churchill	x	x	0	x	x
Keewatin - Southern Baffin Island	x	0	0	0	x
Northern Ontario	993 ^C	746 ^B	x	x	x
Northern Quebec	x	206 ^E	22 ^D	x	1,340 ^B
Great Lakes ¹	325,533 ^B	104,387 ^C	100,599 ^D	337,545 ^C	868,063 ^B
Ottawa ¹	..	..	..	..	..
St. Lawrence ¹	..	..	..	..	..
North Shore - Gaspé	3,451 ^C	3,609 ^E	3,202 ^E	20,870 ^D	31,132 ^D
Saint John - St. Croix	8,745 ^B	6,191 ^D	2,122 ^E	28,138 ^D	45,197 ^C
Maritime Coastal	14,805 ^D	17,339 ^E	F	14,958 ^D	50,423 ^D
Newfoundland - Labrador	8,862 ^E	x	102 ^E	x	15,637 ^D
percent					
Percentage of total water costs	34.7	14.9	8.8	41.7	100.0

1. As of 2007, data for the Great Lakes drainage region, the Ottawa drainage region and the St. Lawrence drainage region are combined under the Great Lakes drainage region.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0076 and 153-0077.

Table 17
Water use parameters in mineral extraction industries, by industry group and region, 2009

	Intake		Recirculation		Recirculation rate ¹	Gross water use ²		Discharge		Mine water
	millions of cubic metres	%	millions of cubic metres	%		millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres
Industry group										
Coal mines	22.0 ^E	4.4	9.2 ^E	0.6	41.8	31.2	1.5	29.8 ^E	4.8	22.5 ^E
Metal mines	372.2 ^D	74.8	1,475.2 ^B	95.3	396.3	1,847.4	90.3	426.5 ^C	68.7	90.6 ^D
Non-metal mines ³	103.1 ^D	20.7	63.2 ^C	4.1	61.3	166.3	8.1	164.1 ^D	26.5	122.7 ^D
Total	497.2^C	100.0	1,547.7^B	100.0	311.3	2,044.9	100.0	620.4^C	100.0	235.8^C
Region										
Atlantic ⁴	271.1 ^D	54.5	106.1 ^D	6.9	39.1	377.2	18.4	247.1 ^D	39.8	49.1 ^E
Quebec	55.7 ^D	11.2	289.1 ^D	18.7	519.0	344.8	16.9	151.4 ^C	24.4	62.1 ^D
Ontario	42.4 ^D	8.5	x	x	x	x	x	62.7 ^D	10.1	36.2 ^D
Prairies ⁵	53.9 ^C	10.8	x	x	x	x	x	43.1 ^D	6.9	24.3 ^D
British Columbia and territories ⁶	74.0 ^E	14.9	194.4 ^E	12.6	262.7	268.4	13.1	116.1 ^D	18.7	64.1 ^D
Canada	497.2^C	100.0	1,547.7^B	100.0	311.3	2,044.9	100.0	620.4^C	100.0	235.8^C

1. Recirculation rate = Amount of recirculated water as a percent of intake. The same water can leave a sub-system and re-enter it or is used in another sub-system many times, resulting in a recirculation rate > 100%.

2. Gross water use = Intake + Recirculation.

3. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

4. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

5. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

6. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0078 and 153-0079.

Table 18
Water intake in mineral extraction industries, by month and region, 2009

	Atlantic ¹		Quebec		Ontario		Prairies ²		British Columbia and territories ³		Canada	
	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%
Total	271.1^D	100.0	55.7^D	100.0	42.4^D	100.0	53.9^C	100.0	74.0^E	100.0	497.2^C	100.0
January	18.2 ^D	6.7	3.9 ^D	7.0	3.2 ^D	7.5	4.9 ^C	9.1	5.2 ^E	7.0	35.4 ^C	7.1
February	17.1 ^D	6.3	3.9 ^D	7.0	3.3 ^D	7.8	4.3 ^C	8.0	4.9 ^E	6.6	33.6 ^C	6.8
March	19.7 ^D	7.3	4.3 ^D	7.7	4.0 ^D	9.4	4.5 ^C	8.3	5.2 ^E	7.0	37.7 ^C	7.6
April	20.7 ^D	7.6	4.5 ^D	8.1	4.1 ^D	9.6	4.5 ^C	8.3	5.5 ^E	7.4	39.3 ^C	7.9
May	26.8 ^D	9.9	4.5 ^D	8.1	3.6 ^D	8.5	4.4 ^C	8.2	6.9 ^E	9.3	46.2 ^D	9.3
June	26.5 ^D	9.8	4.3 ^D	7.7	3.5 ^D	8.2	4.6 ^C	8.5	7.1 ^E	9.6	46.0 ^D	9.3
July	27.6 ^E	10.2	5.0 ^D	9.0	3.6 ^D	8.5	4.6 ^C	8.5	7.7 ^D	10.4	48.4 ^D	9.7
August	28.1 ^E	10.4	4.9 ^D	8.8	3.7 ^D	8.7	4.5 ^C	8.3	7.7 ^D	10.4	49.0 ^D	9.9
September	27.8 ^D	10.3	5.2 ^D	9.3	3.2 ^D	7.5	4.6 ^C	8.5	7.5 ^D	10.1	48.2 ^D	9.7
October	20.5 ^D	7.6	5.2 ^D	9.3	3.7 ^D	8.7	4.3 ^C	8.0	5.9 ^E	8.0	39.6 ^C	8.0
November	18.3 ^D	6.8	5.2 ^D	9.3	3.7 ^D	8.7	4.5 ^C	8.3	5.2 ^E	7.0	36.8 ^C	7.4
December	19.8 ^D	7.3	4.9 ^D	8.8	2.9 ^D	6.8	4.2 ^C	7.8	5.2 ^E	7.0	37.0 ^C	7.4

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079 and 153-0080.

Table 19
Water intake in mineral extraction industries, by source, industry group and region, 2009

	Freshwater source				Saline water source			Total water intake
	Municipal	Self-supplied			Self-supplied			
		Surface water bodies	Groundwater	Other	Groundwater	Tidewater	Other	
millions of cubic metres								
Industry group								
Coal mines	F	14.2 ^E	x	x	0.0	0.0	0.0	22.0 ^E
Metal mines	F	300.9 ^D	28.6 ^D	25.7 ^E	0.0	0.0	0.0	372.2 ^D
Non-metal mines ¹	x	68.9 ^E	x	x	x	F	x	103.1 ^D
Total	F	384.0 ^D	44.0 ^D	38.4 ^D	x	F	x	497.2 ^C
percent								
Percentage of total water intake	F	77.2	8.8	7.7	x	F	x	100.0
millions of cubic metres								
Region								
Atlantic ²	x	260.3 ^E	F	x	0.0	F	0.0	271.1 ^D
Quebec	F	21.1 ^D	9.6 ^E	x	F	0.0	0.0	55.7 ^D
Ontario	F	29.5 ^D	4.1 ^E	8.4 ^D	0.0	0.0	0.0	42.4 ^D
Prairies ³	4.8 ^D	29.1 ^C	F	x	x	0.0	x	53.9 ^C
British Columbia and territories ⁴	0.0	44.0 ^E	17.7 ^B	F	0.0	0.0	0.0	74.0 ^E
Canada	F	384.0 ^D	44.0 ^D	38.4 ^D	x	F	x	497.2 ^C
percent								
Percentage of total water intake	F	77.2	8.8	7.7	x	F	x	100.0

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0078, 153-0079, 153-0081 and 153-0082.

Table 20

Intake water treatment in mineral extraction industries, by type of treatment, industry group and region, 2009

	Screening	Filtration	Chlorination and disinfection	Corrosion and slime control	Alkalinity control	Hardness	Coagulation and flocculation	Other treatments
	millions of cubic metres							
Industry group								
Coal mines	0.0	x	x	0.0	0.0	x	F	F
Metal mines	27.6 ^E	8.9 ^B	3.3 ^D	x	x	F	F	F
Non-metal mines ¹	23.7 ^A	x	x	x	x	0.2 ^D	0.2 ^E	x
Total	51.4^D	10.1^B	8.2^D	10.6^A	0.9^D	0.3^D	0.3^E	F
Region								
Atlantic ²	x	0.0	x	0.0	0.0	F	F	0.0
Quebec	F	x	x	x	x	x	0.0	F
Ontario	x	0.7 ^B	x	0.0	0.0	0.0	0.0	0.0
Prairies ³	13.6 ^D	x	4.9 ^E	x	F	0.3 ^D	0.2 ^E	x
British Columbia and territories ⁴	x	5.6 ^C	1.9 ^E	0.0	0.0	F	0.0 ^A	F
Canada	51.4^D	10.1^B	8.2^D	10.6^A	0.9^D	0.3^D	0.3^E	F

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0083 and 153-0084.

Table 21

Water intake in mineral extraction industries, by purpose of initial use, industry group and region, 2009

	Process water	Cooling, condensing and steam	Sanitary service and domestic use	Other	Total water intake
	millions of cubic metres				
Industry group					
Coal mines	14.5 ^E	x	x	F	22.0 ^E
Metal mines	280.1 ^D	67.2 ^D	24.8 ^E	F	372.2 ^D
Non-metal mines ¹	66.0 ^E	x	x	x	103.1 ^D
Total	360.5^D	83.8^D	31.3^D	21.7^D	497.2^C
	percent				
Percentage of total water intake	72.5	16.9	6.3	4.4	100.0
	millions of cubic metres				
Region					
Atlantic ²	x	x	x	0.0	271.1 ^D
Quebec	27.1 ^D	x	x	x	55.7 ^D
Ontario	x	x	F	15.5 ^E	42.4 ^D
Prairies ³	36.0 ^C	8.1 ^A	x	F	53.9 ^C
British Columbia and territories ⁴	62.8 ^D	F	F	F	74.0 ^E
Canada	360.5^D	83.8^D	31.3^D	21.7^D	497.2^C
	percent				
Percentage of total water intake	72.5	16.9	6.3	4.4	100.0

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0078, 153-0079, 153-0085 and 153-0086.

Table 22
Water recirculation in mineral extraction industries, by purpose, industry group and region, 2009

	Process water	Cooling, condensing and steam	Other	Total water recirculation
	millions of cubic metres			
Industry group				
Coal mines	9.2 ^E	0.0	F	9.2 ^E
Metal mines	1,451.5 ^B	x	F	1,475.2 ^B
Non-metal mines ¹	58.1 ^C	x	x	63.2 ^C
Total	1,518.8^B	28.1^E	F	1,547.7^B
	percent			
Percentage of total water recirculation	98.1	1.8	F	100.0
	millions of cubic metres			
Region				
Atlantic ²	105.7 ^D	F	F	106.1 ^D
Quebec	x	x	F	289.1 ^D
Ontario	x	F	F	x
Prairies ³	x	x	0.0	x
British Columbia and territories ⁴	191.7 ^E	F	0.0	194.4 ^E
Canada	1,518.8^B	28.1^E	F	1,547.7^B
	percent			
Percentage of total water recirculation	98.1	1.8	F	100.0

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0078, 153-0079, 153-0087 and 153-0088.

Table 23**Water discharge in mineral extraction industries, by point of discharge, industry group, region and type of final treatment, 2009**

	Public and municipal utilities	Surface water bodies	Tidewater ¹	Groundwater	Tailing ponds	Other	Total water discharge
millions of cubic metres							
Industry group							
Coal mines	F	22.0 ^E	0.0	x	0.0	x	29.8 ^E
Metal mines	F	336.9 ^D	F	22.6 ^D	54.5 ^D	x	426.5 ^C
Non-metal mines ²	0.1 ^E	92.9 ^D	F	F	12.5 ^C	15.5 ^D	164.1 ^D
Total	F	451.9^C	F	55.7^E	66.9^C	22.9^C	620.4^C
Region							
Atlantic ³	F	x	F	F	14.1 ^B	x	247.1 ^D
Quebec	F	124.5 ^C	F	1.0 ^E	x	x	151.4 ^C
Ontario	F	56.6 ^D	0.0	F	x	x	62.7 ^D
Prairies ⁴	0.1 ^E	x	0.0	F	x	x	43.1 ^D
British Columbia and territories ⁵	0.0	68.7 ^E	0.0	x	x	F	116.1 ^D
Canada	F	451.9^C	F	55.7^E	66.9^C	22.9^C	620.4^C
Treatment							
Water not treated before discharge	F	255.7 ^D	F	F	44.1 ^D	x	371.8 ^D
Primary or mechanical	F	156.0 ^C	0.0	F	x	F	193.3 ^C
Secondary or biological	F	F	F	0.1 ^E	0.0	F	1.0 ^E
Tertiary or advanced	0.0	39.3 ^E	0.0	x	x	0.0	54.4 ^D
Total	F	451.9^C	F	55.7^E	66.9^C	22.9^C	620.4^C

1. For 2005, tidewater is included in surface water bodies and other points of discharge. As of 2007, it appears separately.

2. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

3. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

4. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

5. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.**Source(s):** Statistics Canada, CANSIM tables 153-0078, 153-0079, 153-0089, 153-0090 and 153-0091.**Table 24****Water discharge in mineral extraction industries, by type of final treatment, industry group and region, 2009**

	Water not treated before discharge	Primary or mechanical	Secondary or biological	Tertiary or advanced
millions of cubic metres				
Industry group				
Coal mines	x	x	x	0.0
Metal mines	263.8 ^D	119.6 ^D	F	x
Non-metal mines ¹	x	x	F	x
Total	371.8^D	193.3^C	1.0^E	54.4^D
Region				
Atlantic ²	225.1 ^D	x	0.0	x
Quebec	29.1 ^D	108.3 ^D	0.1 ^E	13.9 ^E
Ontario	28.6 ^D	x	F	17.6 ^E
Prairies ³	20.0 ^C	x	F	F
British Columbia and territories ⁴	68.9 ^D	40.9 ^E	F	x
Canada	371.8^D	193.3^C	1.0^E	54.4^D

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.**Source(s):** Statistics Canada, CANSIM tables 153-0092 and 153-0093.

Table 25
Water acquisition costs in mineral extraction industries, by industry group and region, 2009

	Public utilities	Operation and maintenance costs (excluding treatment)	Licence fees	Total water acquisition costs
thousands of dollars				
Industry group				
Coal mines	F	1,378 ^E	x	1,388 ^E
Metal mines	F	11,895 ^D	x	14,122 ^D
Non-metal mines ¹	4,405 ^D	7,323 ^D	658 ^E	12,386 ^C
Total	6,449^D	20,596^C	851^E	27,897^C
percent				
Percentage of total water acquisition costs	23.1	73.8	3.1	100.0
thousands of dollars				
Region				
Atlantic ²	x	1,936 ^E	x	2,191 ^E
Quebec	F	2,837 ^C	F	4,470 ^E
Ontario	F	4,024 ^E	x	4,991 ^E
Prairies ³	x	3,015 ^D	x	7,326 ^C
British Columbia and territories ⁴	0	8,784 ^E	135 ^D	8,919 ^E
Canada	6,449^D	20,596^C	851^E	27,897^C
percent				
Percentage of total water acquisition costs	23.1	73.8	3.1	100.0

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0094, 153-0095, 153-0096 and 153-0097.

Table 26

Total water costs in mineral extraction industries, by water cost component, industry group and region, 2009

	Acquisition	Intake treatment	Recirculation	Discharge treatment	Total water costs
thousands of dollars					
Industry group					
Coal mines	1,388 ^E	245 ^E	487 ^E	1,532 ^E	3,652 ^E
Metal mines	14,122 ^D	12,713 ^E	32,660 ^E	56,701 ^E	116,197 ^D
Non-metal mines ¹	12,386 ^C	5,728 ^A	F	12,350 ^C	45,847 ^D
Total	27,897^C	18,686^E	48,529^E	70,584^D	165,695^C
percent					
Percentage of total water costs	16.8	11.3	29.3	42.6	100.0
thousands of dollars					
Region					
Atlantic ²	2,191 ^E	F	F	5,976 ^C	19,185 ^E
Quebec	4,470 ^E	F	x	29,552 ^E	47,227 ^E
Ontario	4,991 ^E	x	x	F	14,094 ^E
Prairies ³	7,326 ^C	6,756 ^E	3,602 ^B	12,173 ^E	29,856 ^D
British Columbia and territories ⁴	8,919 ^E	4,044 ^B	26,796 ^E	15,575 ^E	55,334 ^E
Canada	27,897^C	18,686^E	48,529^E	70,584^D	165,695^C
percent					
Percentage of total water costs	16.8	11.3	29.3	42.6	100.0

1. Excluding sand, gravel, clay, and ceramic and refractory minerals mining and quarrying (North American Industry Classification System, code 21232).

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0096 and 153-0097.

Table 27

Water use parameters in thermal-electric power generation industries, by region, 2009

	Intake		Recirculation		Recirculation rate ¹	Gross water use ²		Discharge		Consumption ³		Consumption rate ⁴
	millions of cubic metres	%	millions of cubic metres	%		millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	
Region												
Atlantic ⁵	1,726.1 ^C	6.6	x	x	x	x	x	1,355.5 ^C	5.2	370.6	73.1	21.5
Quebec	x	x	x	x	x	x	x	x	x	x	x	x
Ontario	x	x	x	x	x	x	x	x	x	x	x	x
Prairies ⁶	1,853.9 ^A	7.0	3,775.3 ^E	89.5	203.6	5,629.2	18.4	1,769.1 ^A	6.8	84.8	16.7	4.6
British Columbia and territories ⁷	109.0 ^D	0.4	x	x	x	x	x	106.4 ^D	0.4	2.6	0.5	2.4
Canada	26,345.5^A	100.0	4,220.0^E	100.0	16.0	30,565.5	100.0	25,838.4^A	100.0	507.1	100.0	1.9

1. Recirculation rate = Amount of recirculated water as a percent of intake. The same water can leave a sub-system and re-enter it or is used in another sub-system many times, resulting in a recirculation rate > 100%.

2. Gross water use = Intake + Recirculation.

3. Consumption = Intake - Discharge.

4. Consumption rate = Consumption as a percentage of Intake.

5. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

6. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

7. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0079.

Table 28
Water intake in thermal-electric power generation industries, by month and region, 2009

	Atlantic ¹		Quebec		Ontario		Prairies ²		British Columbia and territories ³		Canada	
	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%	millions of cubic metres	%
Total	1,726.1^C	100.0	x	100.0	x	100.0	1,853.9^A	100.0	109.0^D	100.0	26,345.5^A	100.0
January	128.8 ^C	7.5	x	x	x	x	147.0 ^B	7.9	9.5 ^D	8.7	2,385.1 ^A	9.1
February	x	x	x	x	x	x	134.7 ^A	7.3	5.6 ^E	5.1	2,048.3 ^A	7.8
March	122.0 ^C	7.1	x	x	x	x	149.9 ^A	8.1	6.1 ^E	5.6	2,106.6 ^A	8.0
April	123.7 ^C	7.2	x	x	x	x	153.4 ^A	8.3	9.7 ^D	8.9	2,102.3 ^A	8.0
May	148.1 ^D	8.6	x	x	x	x	159.9 ^A	8.6	8.2 ^D	7.5	1,982.4 ^A	7.5
June	178.5 ^C	10.3	x	x	x	x	148.8 ^A	8.0	x	x	2,137.0 ^A	8.1
July	171.4 ^C	9.9	x	x	x	x	169.1 ^B	9.1	7.8 ^D	7.2	2,383.4 ^A	9.0
August	170.0 ^C	9.8	x	x	x	x	171.2 ^B	9.2	9.8 ^D	9.0	2,537.5 ^A	9.6
September	178.8 ^C	10.4	x	x	x	x	162.8 ^B	8.8	x	x	2,276.5 ^A	8.6
October	133.2 ^C	7.7	x	x	x	x	160.4 ^B	8.7	4.8 ^E	4.4	2,092.5 ^A	7.9
November	128.5 ^C	7.4	x	x	x	x	143.6 ^A	7.7	11.8 ^C	10.8	2,042.3 ^A	7.8
December	x	x	x	x	1,882.2 ^A	x	153.2 ^A	8.3	x	x	2,251.7 ^A	8.5

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079 and 153-0080.

Table 29
Water intake in thermal-electric power generation industries, by source and region, 2009

	Freshwater source				Saline water source			Total water intake
	Municipal	Self-supplied			Self-supplied			
		Surface water bodies	Groundwater	Other	Groundwater	Tidewater	Other	
millions of cubic metres								
Region								
Atlantic ¹	x	x	x	x	0.0	x	0.0	1,726.1 ^C
Quebec	F	x	F	0.0	0.0	0.0	0.0	x
Ontario	x	x	x	x	0.0	0.0	0.0	x
Prairies ²	2.7 ^E	x	x	4.3 ^E	F	0.0	x	1,853.9 ^A
British Columbia and territories ³	x	x	0.0	x	0.0	x	0.0	109.0 ^D
Canada	x	24,009.6 ^A	x	x	F	1,719.9 ^C	x	26,345.5 ^A
percent								
Percentage of total water intake	x	91.1	x	x	F	6.5	x	100.0

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079 and 153-0082.

Table 30
Intake water treatment in thermal-electric power generation industries, by type of treatment and region, 2009

	Screening	Filtration	Chlorination and disinfection	Corrosion and slime control	Alkalinity control	Hardness	Coagulation and flocculation	Other treatments
	millions of cubic metres							
Region								
Atlantic ¹	x	5.0 ^E	3.8 ^E	x	1.1 ^E	x	x	1.7 ^D
Quebec	x	x	x	F	0.4 ^E	0.4 ^E	x	F
Ontario	x	201.5 ^C	919.9 ^A	x	9.4 ^B	x	x	188.9 ^B
Prairies ²	1,262.0 ^A	5.5 ^D	15.2 ^E	7.4 ^E	x	6.8 ^D	2.7 ^D	10.8 ^E
British Columbia and territories ³	x	x	x	x	1.8 ^A	0.6 ^A	x	x
Canada	25,211.0^A	213.0^C	995.4^A	109.8^C	x	167.3^D	160.8^D	202.7^B

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0084.

Table 31
Water intake in thermal-electric power generation industries, by purpose of initial use and region, 2009

	Cooling, condensing and steam	Pollution control	Sanitary service and domestic use	Other	Total water intake
	millions of cubic metres				
Region					
Atlantic ¹	1,710.5 ^C	x	x	11.6 ^E	1,726.1 ^C
Quebec	x	0.0	x	x	x
Ontario	x	0.9 ^C	x	x	x
Prairies ²	1,845.3 ^A	F	x	0.5 ^E	1,853.9 ^A
British Columbia and territories ³	x	x	x	x	109.0 ^D
Canada	26,164.3^A	x	x	x	26,345.5^A
	percent				
Percentage of total water intake	99.3	x	x	x	100.0

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079 and 153-0086.

Table 32
Water recirculation in thermal-electric power generation industries, by purpose and region, 2009

	Cooling, condensing and steam	Pollution control	Other	Total water recirculation
millions of cubic metres				
Region				
Atlantic ¹	x	x	x	x
Quebec	x	0.0	0.0	x
Ontario	15.1 ^C	x	x	x
Prairies ²	x	F	x	3,775.3 ^E
British Columbia and territories ³	x	0.0	0.0	x
Canada	3,783.5 ^E	x	x	4,220.0 ^E
percent				
Percentage of total water recirculation	89.7	x	x	100.0

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079 and 153-0088.

Table 33
Water discharge in thermal-electric power generation industries, by point of discharge, region and type of final treatment, 2009

	Public and municipal utilities	Surface water bodies	Tidewater ¹	Groundwater	Other	Total water discharge
millions of cubic metres						
Region						
Atlantic ²	0.3 ^D	x	x	x	x	1,355.5 ^C
Quebec	F	x	0.0	F	F	x
Ontario	2.1 ^A	x	0.0	x	0.0	x
Prairies ³	x	1,765.4 ^A	0.0	F	1.9 ^E	1,769.1 ^A
British Columbia and territories ⁴	x	x	x	0.0	x	106.4 ^D
Canada	4.1 ^C	24,435.1 ^A	1,396.0 ^C	F	x	25,838.4 ^A
Treatment						
Water not treated before discharge	x	x	x	x	2.3 ^E	15,219.3 ^A
Primary or mechanical	x	x	x	F	x	x
Secondary or biological	0.1 ^E	x	x	F	x	x
Tertiary or advanced	x	x	x	F	x	x
Total	4.1 ^C	24,435.1 ^A	1,396.0 ^C	F	x	25,838.4 ^A

1. For 2005, tidewater is included in surface water bodies and other points of discharge. As of 2007, it appears separately.

2. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

3. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

4. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0079, 153-0090 and 153-0091.

Table 34
Water discharge in thermal-electric power generation industries, by type of final treatment and region, 2009

	Water not treated before discharge	Primary or mechanical	Secondary or biological	Tertiary or advanced
	millions of cubic metres			
Region				
Atlantic ¹	x	x	1.6 ^E	x
Quebec	x	x	x	x
Ontario	x	x	x	x
Prairies ²	x	x	F	F
British Columbia and territories ³	x	x	x	0.0
Canada	15,219.3 ^A	x	x	x

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0093.

Table 35
Water acquisition costs in thermal-electric power generation industries, by region, 2009

	Public utilities	Operation and maintenance costs (excluding treatment)	Licence fees	Total water acquisition costs
	thousands of dollars			
Region				
Atlantic ¹	x	8,331 ^C	x	10,762 ^B
Quebec	F	x	0	x
Ontario	5,656 ^B	49,704 ^A	38 ^C	55,398 ^A
Prairies ²	x	8,111 ^E	x	10,392 ^D
British Columbia and territories ³	x	x	x	x
Canada	10,832 ^B	67,858 ^A	317 ^A	79,007 ^A
	percent			
Percentage of total water acquisition costs	13.7	85.9	0.4	100.0

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM tables 153-0095 and 153-0097.

Table 36**Total water costs in thermal-electric power generation industries, by water cost component and region, 2009**

	Acquisition	Intake treatment	Recirculation	Discharge treatment	Total water costs
thousands of dollars					
Region					
Atlantic ¹	10,762 ^B	4,003 ^C	x	x	18,274 ^B
Quebec	x	x	x	x	2,390 ^D
Ontario	55,398 ^A	34,636 ^A	4,853 ^C	5,729 ^A	100,617 ^A
Prairies ²	10,392 ^D	16,327 ^D	8,589 ^E	612 ^D	35,920 ^D
British Columbia and territories ³	x	x	x	x	3,776 ^A
Canada	79,007 ^A	58,425 ^B	14,049 ^D	9,495 ^A	160,977 ^A
percent					
Percentage of total water costs	49.1	36.3	8.7	5.9	100.0

1. Atlantic provinces include: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

2. Prairie provinces include: Manitoba, Saskatchewan and Alberta.

3. British Columbia and territories include: British Columbia, Yukon, Northwest Territories and Nunavut.

Note(s): Thermal-electric power generation is defined as fossil-fuel electric power generation (North American Industry Classification System, code 221112) and nuclear electric power generation (North American Industry Classification System, code 221113). Figures may not add up to totals due to rounding.

Source(s): Statistics Canada, CANSIM table 153-0097.

Data sources and methodology

Reference period

The information contained in this report reflects volumes of water intake and discharge and some associated costs by industrial users for the calendar year 2009. The **Industrial Water Survey** is a biennial survey.

Survey frame

The frame used for sampling purposes was the Statistics Canada Business Register with the observed population of all manufacturing, selected mining and all thermal-electric locations as defined by the North American Industry Classification System (NAICS) 2007. The statistical unit was the location. The location, as a statistical unit, is defined as a producing unit at a single geographical location at which or from which economic activity is conducted and for which, at a minimum, employment data are available. Locations may also be referred to as cost centres or as revenue centres, based on the availability of accounting information about them.

The target population consisted of locations primarily engaged in manufacturing, coal mining, metal ore mining, non-metallic mineral mining (excluding sand and gravel quarrying), nuclear electric power generation and fossil-fuel electric power generation. The population size was 31,301 manufacturing locations (NAICS 31 – 33), 696 mines (NAICS 2121, 2122, 2123, excl. 21232) and 112 thermal-electric power generating plants (NAICS 221112, 221113).

Coverage and sample selection

There was an independent sampling strategy for each of the three sectors.

A census was taken of the thermal-electric power generating stations component of the survey.

A stratified simple random design was used for sample selection in the manufacturing and mineral extraction sectors.

In the mining sector, mines were stratified by province and by 4-digit NAICS industry. All multi-locations (more than one location for one establishment) and all locations identified as employers of 50 persons or more were selected as “must-take” units and the rest of the population was sampled with varying sampling fractions, depending on the industry.

In the manufacturing sector, locations were stratified by industry (3 and 5 digit NAICS) and by geography (drainage region – see map 1 in the Analysis section). A size measure (shipments or revenues) was used as an auxiliary variable. To reduce response burden on small units, the smallest units of the industries of interest are excluded from the population. In each combination of industries, locations that make up the bottom 5% of the size measure by drainage region were excluded.

The manufacturing component of the survey was divided into four sampling groups:

1. Must-take industries (all locations in this group were selected to receive a questionnaire);
2. Heavy-rate industries (sampled at a relatively high rate);
3. General industries (sampled at a lower rate than the “heavy-rate” industries) and;
4. Negligible industries (sampled lightly, just enough to permit an estimation of the coverage).

A list of industries in each of the sampling groups follows:

Must-take industries:

- 322111 Mechanical Pulp Mills
- 322112 Chemical Pulp Mills
- 322121 Paper (except Newsprint) Mills
- 322122 Newsprint Mills
- 324110 Petroleum Refineries
- 325110 Petrochemical Manufacturing
- 331110 Iron and Steel Mills and Ferro-Alloy Manufacturing
- 331410 Non-Ferrous Metal (except Aluminum) Smelting and Refining

Heavy rate industries:

- 311224 Oilseed Processing
- 3114 Fruit and Vegetable Preserving and Specialty Food Manufacturing
- 31151 Dairy Product (except Frozen) Manufacturing
- 31161 Animal Slaughtering and Processing
- 31171 Seafood Product Preparation and Packaging
- 31199 All Other Food Manufacturing
- 31211 Soft Drink and Ice Manufacturing
- 31212 Breweries
- 31214 Distilleries
- 322130 Paperboard Mills
- 32518 Other Basic Inorganic Chemical Manufacturing
- 32519 Other Basic Organic Chemical Manufacturing
- 32521 Resin and Synthetic Rubber Manufacturing
- 325313 Chemical Fertilizer (except Potash) Manufacturing
- 327310 Cement Manufacturing
- 331313 Primary Production of Alumina and Aluminum
- 334410 Computer and Peripheral Equipment Manufacturing

General industries:

- All other industries not stated in 1, 2 or 4

Negligible industries:

- 315 Clothing Manufacturing
- 316 Leather and Allied Product Manufacturing
- 323 Printing and Related Support Activities
- 337 Furniture and Related Product Manufacturing

Data collection and processing

Responding to this survey is mandatory. Data were collected directly from survey respondents using mail out/mail back questionnaires.

Mail out occurred in June of the year following the reference year and was directed to an “environment manager or coordinator”. Respondents were asked to return the completed questionnaires within 30 days of receipt. Upon receipt, the collected questionnaires were scanned and the data from these questionnaires were captured using “key from image” technology. Preliminary editing was also performed to ensure the validity of the collected data. Follow-up for non response and for data validation was conducted by telephone or fax. Fax reminders were sent to respondents whose questionnaires were outstanding 45 days after the mail out. Collection activities for the 2009 survey were completed in February 2011.

Data quality

All data, from whatever source, are subject to error. The **Industrial Water Survey** is no exception. There are two general categories of error in surveys. The first is sampling error which arises from the fact that a sample or subset of the target population is used to represent the population. The size of sampling error is quantifiable. The second category is referred to as non-sampling error and is not as easily quantified. Non-sampling error refers to all the other kinds of error that arise in surveys. For example, incomplete or inaccurate lists of the general population, respondent misinterpretation of questions, provision of erroneous information, failure to respond, information processing errors, etc.

Typically the sampling error is measured by the expected variability of the estimate from the true value, expressed as a percentage of the estimate. This measure is referred to as the coefficient of variation (CV) or the standard deviation. Coefficients of variation of the final estimates were computed for the **Industrial Water Survey** and are indicated on the statistical tables. The quality of the estimates was classified as follows:

A. Excellent	CV is 0.01% to 4.99%
B. Very good	CV is 5.00% to 9.99%
C. Good	CV is 10.00% to 14.99%
D. Acceptable	CV is 15.00% to 24.99%
E. Use caution	CV is 25.00% to 49.99%
F. Unreliable	CV is > 49.99% (data is suppressed)

As mentioned in the previous section on “data collection and processing”, every attempt was made to eliminate the non-sampling error through collection and data validation techniques.

Response rates

The 2009 response rate for the manufacturing component of the **Industrial Water Survey** was 70%. For the mining component of the survey, it was 79%. The response rate was 84% for the thermal-electric component. The total water intake variable and the total water discharge variable were considered mandatory. Without these two variables, a record was considered to be a “total non-response” to the survey. At the end of the collection cycle, the sample was re-weighted to account for the “total non-response” units.

Error detection

Many factors affect the accuracy of data produced in a survey. For example, respondents may have made errors in interpreting questions, answers may have been incorrectly entered on the questionnaires, and errors may have been introduced during the data capture or tabulation process. Every effort was made to reduce the occurrence of such errors in the survey.

Returned data were first checked using an automated edit-check program (BLAISE) immediately after capture. This first procedure verifies that all mandatory cells have been filled in, that certain values lie within acceptable ranges, that questionnaire flow patterns have been respected, and that totals equal the sum of their components. Collection officers evaluate the edit failures and concentrate follow-up efforts accordingly.

Further data checking is performed by subject matter officers who compare historical data (if available) with returned data to determine if differences between survey cycles are reasonable. If not, collection officers are asked to confirm with respondents their responses. Subject matter officers also research companies (annual reports, web sites, etc.) in an effort to verify information submitted by respondents.

Imputation

Statistical imputation was used for partial-response records. Five methods of imputations were used for the **Industrial Water Survey**: Deterministic imputation (only one possible value for the field to impute), historical imputation, imputation by ratio, donor imputation (using a "nearest neighbour" approach to find a valid record that is most similar to the record requiring imputation) and manual imputation. Ratios were calculated and donors were selected for imputation purposes based on the same or closest industry group within specified geographic areas.

Estimation

The response values for sampled units were multiplied by a sampling weight in order to estimate for the entire population. The sampling weight was calculated using a number of factors, including the probability of the unit being selected in the sample. Raising the factor (weight) adjustment was used in the estimation process to account for the uncovered portion and for respondents who could not be contacted or who refused to complete the survey.

Quality evaluation

Data evaluation and error detection during data collection is an important way to ensure that the final estimates that are produced are of good quality. However, the survey results are evaluated after data collection is over and the estimates have been produced. One way to assess data quality is to compare it to the trends of other data collected. For the **Industrial Water Survey**, estimates of 2009 were compared with the estimates of the 2007 and 2005 editions. This historical comparison was made to make sure that the estimates were coherent.

Variables measured

The survey questionnaires (one for each of the three components) were designed in consultation with specialists in Statistics Canada and Environment Canada.

The information collected included the sources of water used, what purposes industry used the water for, whether or not water was recirculated or re-used, where the water was discharged and what treatments were used for water brought into the facility and discharged from the facility. Also, water acquisition costs and operating and maintenance expenses related to water intake and discharge were collected.

Basic definitions

Total water intake refers to the total amount of water added to the water system of the facility to replace water discharged or consumed during production. It may be broken down into the amounts withdrawn from various sources (for example, surface water, groundwater, etc.) and the amounts used for various purposes, or end uses. The latter refers to the initial use of water in these purposes – cooling, processing, condensing, and steam generation, and sanitary and other purposes. Cooling and condensing water refers to water used for the production of steam or the dissipation of waste heat. Processing water refers to water that comes in contact with an intermediate or final product of the manufacturing or mining operation. Sanitary water use serves basic human sanitary requirements at industrial facilities.

Recirculated water (recirculation or recycling) refers to water used more than once in an industrial facility, and in Canada applies mainly to cooling and processing activities. Recirculation does not refer to water used a number of times within a particular process subsystem of a facility but only to water that leaves a particular process subsystem and re-enters it or is used in another process. Recirculation and water intake combine to form the water input system of a facility.

Gross water use refers to the total amount of water used in the production of the product. It is the sum of total water intake and water recirculation.

Water consumption refers to water that is lost in the production process. In other words, consumed water is not returned to its original source. The two major portions of consumed water are escaped steam and the incorporation of water into a product, as for example in the production of soft drinks. Water consumption is a strictly local concept for the purposes of this report, and refers to water not returned to the source of abstraction in the vicinity of the facility in question. In the broader context, because of the earth's water cycle, water is never really consumed. For example, evaporated water falls back to the earth in the form of precipitation, and is not lost to the environment as a whole. In this report, consumption is an accounting concept used to describe the water balances at single facilities only.

Wastewater discharge refers to water that is returned to the environment in the form of water usually close to the facility. Discharged water may be treated or untreated. Together, water discharge and water consumption form the effluent subsystem of the facility. The sum of these two parameters is approximately equal to the total water intake of the facility.

Questionnaires

Questionnaire(s) and reporting guide(s) – Industrial Water Survey

- Industrial Water Survey: Fossil-Fuel and Nuclear Electric Power Generating Plants, 2009
- Industrial Water Survey: Manufacturing Industries, 2009
- Industrial Water Survey: Mineral Extraction Industries, 2009

Copies of the questionnaires and reporting guides can be seen at the end of this report (or IMDB record number 5120).

Industrial Water Survey: Manufacturing Industries, 2009

Collected under the authority of the *Statistics Act*,
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This document is confidential when completed.

Version française disponible

Correct pre-printed information, if necessary,
using the corresponding boxes below:

0001	Legal name		
0002	Business name		
0021	C/O		
0028	Last name of contact		
0008	First name of contact		
0004	Address		
0005	City	0006	Province/Territory or State
0053	Country	0007	Postal code/Zip code

Please read before completing

Survey Purpose

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Person primarily responsible for completing this questionnaire, if different from above:

0026	1 <input type="radio"/> Mr.	2 <input type="radio"/> Mrs.	3 <input type="radio"/> Miss	4 <input type="radio"/> Ms	5 <input type="radio"/> Dr.	0017	Telephone number	extension
0054	Last name					0027	() -	
0013	First name					0016	() -	
0014	Title					0020	Website address	
						0018	E-mail address	

For Statistics Canada use only

Rec.	Ed.	Kyd.	Bat.	Coll.	FSC
Y M D	Y M D	Y M D			



REPORTING YEAR: JANUARY 1, 2009 TO DECEMBER 31, 2009

NOTE i) Water volumes are to be reported in the units in use at this facility; please **mark only one selection** and use this unit of measure throughout the questionnaire.

Line
1

C0101

1 ☐ cubic metres

2 ☐ other – specify

C0102

IMPORTANT

If reporting in multiples of a unit of measure, please take care to enter the correct decimal values or number of zeros. (i.e., if *other*, above, is specified as *thousands* of litres, note that a reported quantity of 3 = 3,000 (*3 thousand*) litres, whereas a reported quantity of 3,000 = 3,000,000 (*3 million*) litres).

If reporting in gallons, please specify Imperial or U.S. gallons.

ii) **Where data are not available, please estimate.**

SECTION 1: MONTHLY AND ANNUAL TOTAL WATER INTAKE AND DISCHARGE

INSTRUCTIONS

- (i) In this section, under intake, please report by month the quantity of “new water” brought into your operation. For the purpose of this questionnaire “new water” is defined as water introduced for the first time into this establishment **regardless of source or quality** (including sanitary/domestic water intake).
- (ii) Where you supply water to adjacent or tenant industry(ies) or municipality(ies), please report estimated water intake for your establishment only.
- (iii) Under discharge, please report the quantity of water routed to its ultimate point of discharge (including sanitary/domestic discharge).
- (iv) Under discharge **do not report** the volume of water released to ponds, lagoons or basins and intended for recirculation or reuse until such water is actually discharged to a location beyond the control of the establishment.
- (v) Under discharge **do not include** any water lost in production through evaporation, permanently held in open or closed storage, or otherwise consumed (e.g. included in a final product).

Month	Volume per month	
	Intake	Discharge
2 January	C1001	C1101
3 February	C1002	C1102
4 March	C1003	C1103
5 April	C1004	C1104
6 May	C1005	C1105
7 June	C1006	C1106
8 July	C1007	C1107
9 August	C1008	C1108
10 September ..	C1009	C1109
11 October	C1010	C1110
12 November ..	C1011	C1111
13 December ..	C1012	C1112
14 ANNUAL TOTAL	C1013	C1113

15 If total discharge volume (C1113) is greater than total intake volume (C1013), please indicate reason:

C1201

SECTION 2: WATER INTAKE BY SOURCE AND KIND

INSTRUCTIONS

- (i) Please report your volumes of intake water by source and its usual characteristic.
- (ii) Freshwater is defined as water containing 900 parts per million, or less, of total dissolved solids.
- (iii) Saline / brackish water is defined as water containing more than 900 parts per million of total dissolved solids.

Where data are not available, please estimate.

Source	Volume per year	
	Freshwater	Saline / Brackish
16 Public water utility system	C2401	XXXX
17 Self-supplied surface water system (lake, river, etc.)	C2402	XXXX
18 Self-supplied groundwater system (well, spring, etc.)	C2403	C2203
19 Self-supplied tide water (salt water) body (estuary, bay, ocean, etc.)	XXXX	C2204
20 Other sources (<i>specify</i>) C2000	C2405	C2205
21 TOTAL	C2406	C2206

NOTE: The sum of C2406 and C2206 (line 21, above) should equal C1013 at line 14 on previous page.

Estimated annual cost of water acquisition:

22	Payment to public utility (for water volume at line 16, above).....	C2301 \$	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	.00
			Millions	Thousands	Hundreds		
23	Estimated annual operating and maintenance costs of intake water acquisition (excluding water treatment costs which are covered on the next page). Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain your systems that bring water into your facility.....	C2302 \$	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	.00
			Millions	Thousands	Hundreds		
24	Cost of your annual intake licence (estimate if permit not purchased annually).....	C2303 \$	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	.00
			Millions	Thousands	Hundreds		
25	Payment for purchase of water from another operator / industrial supplier.....	C2304 \$	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div>	.00
			Millions	Thousands	Hundreds		

SECTION 3: INTAKE WATER - TREATMENT

26 Did this establishment treat any **intake** water?

C3001 1 ☐ Yes

3 ☐ No → *If no, go to Section 4*

INSTRUCTIONS

- (i) Indicate the volume of intake **water treated** within your establishment prior to initial use. Do not include treatment of water for re-use.

Where data are not available, please estimate.

Category of treatment	Volume per year
27 Screening	C3201
28 Filtration	C3202
29 Chlorination - disinfection (includes for process and for biological control)	C3203
30 Corrosion and slime control	C3204
31 Alkalinity control	C3205
32 Hardness (or water softening)	C3206
33 Coagulation / flocculation	C3207
34 Other (specify) C3213	C3210
Other (specify) C3214	C3211
Other (specify) C3215	C3212

35 Estimated annual operating and maintenance cost of your intake water treatment. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water brought into your facility.....

C3101

\$, , , .00
 Millions Thousands Hundreds

SECTION 4: WATER INTAKE BY PURPOSE

INSTRUCTIONS

- (i) Report the amount of water within your establishment by **initial** use. This section should not include recirculated water except as stated in Line 36 (for a definition of "recirculated water", see section 5).
- (ii) In Line 39 "Other uses" should not include water pumped by the establishment, and intended for initial use outside the establishment.

Where data are not available, please estimate.

Purpose	Volume per year
36 Process water - This is water that serves in any level of the manufacturing process. It includes all water which comes in direct contact with products and/or materials. It also includes water which is used in the sanitation of process equipment, water which is consumed in milling and special processes, water which is included in final output or water which has been used for another purpose, and is undergoing its final use as process water	C4101
37 Cooling, condensing and steam - This is water which does not come in direct contact with the products, materials or by-products of the processing operation. It includes pass-through water used in the operation of cooling or process equipment (including air conditioning) and water introduced into boilers for the production of steam for either process operations or electric power.	C4102
38 Sanitary service/Domestic use - This is water used for toilets, janitorial services, lawn watering, washing of vehicles, etc.	C4103
39 Other uses (specify) C4000	C4104
40 Total (Lines 36 to 39 should equal sum of figures reported in Line 14, C1013)	C4105

SECTION 5: WATER RECIRCULATED OR REUSED BY PURPOSE

Recirculated water refers to water used at least twice in an industrial establishment. It is water that **leaves** a particular subsystem and **re-enters** it or is **used in another** subsystem. It does not refer to water that circulates many times within the same sub-system (i.e. it excludes closed-loop systems).

- 41 Did this establishment recirculate or reuse water? C5001 1 ☐ Yes
 3 ☐ No → **If no, go to Section 6**

INSTRUCTIONS

- (i) Please report the volume of water recirculated or reused.

Where data are not available, please estimate.

Purpose	Volume per year
42 Process	C5101
43 Cooling, condensing and steam	C5102
44 Other uses (specify) C5000	C5103
45 Total (Lines 42 to 44)	C5104

46 Estimated annual operating and maintenance cost of water recirculation. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to recirculate water in your facility

C5201 \$, Millions , Thousands , Hundreds .00

SECTION 6: TREATMENT AND DISCHARGE OF WATER

INSTRUCTIONS

- (i) Please report the volume of all water routed by this facility to its ultimate point of discharge by the most advanced treatment process used.
- (ii) Do not report the volume of water released and intended for re-use or recirculation until it is actually discharged to a location beyond the control of the facility.
- (iii) Do not include the volume of water lost in production through evaporation, permanently held in open or closed storage or otherwise consumed and not brought to the ultimate point of discharge.

47 Is discharge volume metered or otherwise measured?

C6001 1 ☐ Yes

3 ☐ No (If no, please provide your best estimate below)

INSTRUCTIONS

The sum of all amounts entered below should equal C1113 from Section 1 (page 2).

Type of treatment	Point of discharge				
	Public utilities	Surface Freshwater bodies	Tide water (Ocean)	Ground water	Other
	Annual volume				
48 Water not treated at this facility before discharge	C6101	C6102	C6106	C6103	C6104
49 Primary or mechanical (the physical removal of large solids using grates, screens and settling tanks) ...	C6201	C6202	C6206	C6203	C6204
50 Secondary or biological (the promotion of bacterial growth and other microbes that break down the organic wastes)	C6301	C6302	C6306	C6303	C6304
51 Tertiary or advanced (the reduction of concentrations of phosphorus or nitrogen through biological or chemical processes) ..	C6401	C6402	C6406	C6403	C6404

52 Estimated annual operating and maintenance cost for treatment of water discharge. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water discharged by your facility

C6501

\$, Millions , Thousands , Hundreds .00

53 Please indicate if your facility's final effluent (industrial waste discharged) is monitored for:

Biochemical Oxygen Demand

C6601 1 ☐ Yes 3 ☐ No

Chemical Oxygen Demand

C6602 1 ☐ Yes 3 ☐ No

Suspended Solids

C6603 1 ☐ Yes 3 ☐ No

Phenols

C6604 1 ☐ Yes 3 ☐ No

Toxicity

C6605 1 ☐ Yes 3 ☐ No

pH

C6606 1 ☐ Yes 3 ☐ No

Oil & Grease

C6607 1 ☐ Yes 3 ☐ No

Temperature

C6608 1 ☐ Yes 3 ☐ No

Colour

C6609 1 ☐ Yes 3 ☐ No

Acute lethality

C6610 1 ☐ Yes 3 ☐ No

Other (specify)

C6801

C6611 1 ☐ Yes 3 ☐ No

Other (specify)

C6802

C6612 1 ☐ Yes 3 ☐ No

Other (specify)

C6803

C6613 1 ☐ Yes 3 ☐ No

Frequency

C6701
C6702
C6703
C6704
C6705
C6706
C6707
C6708
C6709
C6710
C6711
C6712
C6713

SECTION 7: OTHER DETAILS

54 Capital expenditures on water intake, discharge or treatment facilities made at this establishment for 2009. Include all relevant outlays for machinery and equipment purchases, and their installation, as well as for construction related to water intake, discharge and treatment.....

C7010

\$, , , .00
Millions Thousands Hundreds

Comments

Approximately how long did it take to collect the data and complete this survey?

C9910

Hour(s)

C9909

Minutes

We invite your comments or suggestions on the following or any other topic related to the *Industrial Water Survey*. We appreciate your assistance.

- Questionnaire content
- New questions of interest to your industry
- Clarity of questions
- Order and flow of questions
- Timing of receipt of questionnaire and the period given for response
- Alternative sources of information to further reduce response burden

C9920

C9913

C9914

If you have questions, please contact us.
Telephone (toll free): 1 866 855-8594
Fax: 1 800 755-5514 (within Canada)

Please return this questionnaire in the envelope provided.
THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY!

Industrial Water Survey: Mineral Extraction Industries, 2009

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0053	Country	0007	Postal code/Zip code

Please read before completing

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Planned Data Linkage

In order to enhance the analytic possibilities of this survey, Statistics Canada intends to combine the information from the Industrial Water Survey with the information your company/business provided on the Annual Census of Mines.

Person primarily responsible for completing this questionnaire, if different from above:

0026	1 <input type="radio"/> Mr.	2 <input type="radio"/> Mrs.	3 <input type="radio"/> Miss	4 <input type="radio"/> Ms	5 <input type="radio"/> Dr.	0017	Telephone number	extension
0054	Last name					0027	() -	
0013	First name					0016	Fax number	
0014	Title					0020	() -	
						0018	Website address	
							E-mail address	

For Statistics Canada use only

Rec.	Ed.	Kyd.	Bat.	Coll.	FSC
Y M D	Y M D	Y M D			



REPORTING YEAR: JANUARY 1, 2009 TO DECEMBER 31, 2009

NOTE i) Water volumes are to be reported in the units in use at this facility; please **mark only one selection** and use this unit of measure throughout the questionnaire.

Line
1

C0101

1 ☐ cubic metres

2 ☐ other – specify

C0102

IMPORTANT

If reporting in multiples of a unit of measure, please take care to enter the correct decimal values or number of zeros. (i.e., if *other*, above, is specified as *thousands* of litres, note that a reported quantity of 3 = 3,000 (3 *thousand*) litres, whereas a reported quantity of 3,000 = 3,000,000 (3 *million*) litres).

If reporting in gallons, please specify Imperial or U.S. gallons.

ii) Where data are not available, please estimate.

SECTION 1: MONTHLY AND ANNUAL TOTAL WATER INTAKE AND DISCHARGE

INSTRUCTIONS

- (i) In this section, under intake, please report by month the quantity of “new water” brought into your operation. For the purpose of this questionnaire “new water” is defined as water introduced for the first time into this mine **regardless of source or quality** (including sanitary/domestic water intake).
- (ii) Where you supply water to adjacent or tenant industry(ies) or municipality(ies), please report estimated water intake for your mine only.
- (iii) Under discharge, please report the quantity of water routed to its ultimate point of discharge (including sanitary/domestic discharge). In mining operations please include waste water pumped from the mine and not used for any other purpose, as discharge water only.
- (iv) Under discharge **do not report** the volume of water released to ponds, lagoons or basins and intended for recirculation or reuse until such water is actually discharged to a location beyond the control of the mine or plant.
- (v) Under discharge **do not include** any water lost in production through evaporation, permanently held in open or closed storage, or otherwise consumed (e.g. included in a final product or slurry), include such water only as intake.
- (vi) Annual total discharge may be greater than annual total intake as explained above in item (iii).

Month	Volume per month	
	Intake	Discharge
2 January	C1001	C1101
3 February	C1002	C1102
4 March	C1003	C1103
5 April	C1004	C1104
6 May	C1005	C1105
7 June	C1006	C1106
8 July	C1007	C1107
9 August	C1008	C1108
10 September ..	C1009	C1109
11 October	C1010	C1110
12 November ..	C1011	C1111
13 December ..	C1012	C1112
14 ANNUAL TOTAL	C1013	C1113

15 Of the annual volume of discharge water at Line 14, C1113, what volume originated as mine water (drainage of ground water) pumped from the mine?

C1301

SECTION 2: WATER INTAKE BY SOURCE AND KIND

INSTRUCTIONS

- (i) Please report your volumes of intake water by source and its usual characteristic.
- (ii) Freshwater is defined as water containing 900 parts per million, or less, of total dissolved solids.
- (iii) Saline / brackish water is defined as water containing more than 900 parts per million of total dissolved solids.

Where data are not available, please estimate.

Source	Volume per year	
	Freshwater	Saline / Brackish
16 Public water utility system	C2401	XXXX
17 Self-supplied surface water system (lake, river, etc.)	C2402	XXXX
18 Self-supplied groundwater system (well, spring, etc.)	C2403	C2203
19 Self-supplied tide water (salt water) body (estuary, bay, ocean, etc.)	XXXX	C2204
20 Other sources (<i>specify</i>) C2000	C2405	C2205
21 TOTAL	C2406	C2206

NOTE: The sum of C2406 and C2206 (line 21, above) should equal C1013 at line 14 on previous page.

Estimated annual cost of water acquisition:

22	Payment to public utility (for water volume at line 16, above).....	C2301 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Millions Thousands Hundreds </div>	.00
23	Estimated annual operating and maintenance costs of intake water acquisition (excluding water treatment costs which are covered on the next page). Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain your systems that bring water into your facility.....	C2302 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Millions Thousands Hundreds </div>	.00
24	Cost of your annual intake licence (estimate if permit not purchased annually).....	C2303 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Millions Thousands Hundreds </div>	.00
25	Payment for purchase of water from another operator / industrial supplier.....	C2304 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Millions Thousands Hundreds </div>	.00

SECTION 3: INTAKE WATER - TREATMENT

26 Did this establishment treat any **intake** water?

C3001 1 ☐ Yes

3 ☐ No → *If no, go to Section 4*

INSTRUCTIONS

- (i) Indicate the volume of intake **water treated** within your establishment prior to initial use. Do not include treatment of water for re-use.

Where data are not available, please estimate.

Category of treatment	Volume per year
27 Screening	C3201
28 Filtration	C3202
29 Chlorination - disinfection (includes for process and for biological control)	C3203
30 Corrosion and slime control	C3204
31 Alkalinity control	C3205
32 Hardness (or water softening)	C3206
33 Coagulation / flocculation	C3207
34 Other (specify) C3213	C3210
Other (specify) C3214	C3211
Other (specify) C3215	C3212

35 Estimated annual operating and maintenance cost of your intake water treatment. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water brought into your facility.....

C3101

\$, , , .00
 Millions Thousands Hundreds

SECTION 4: WATER INTAKE BY PURPOSE

INSTRUCTIONS

- (i) Report the amount of water within your establishment by **initial** use. This section should not include recirculated water except as stated in Line 36 (for a definition of "recirculated water", see section 5).
- (ii) In Line 39 "Other uses" should not include water pumped by the establishment, and intended for initial use outside the establishment.

Where data are not available, please estimate.

Purpose	Volume per year
36 Process water - This is water that serves in any level of the mining process. It includes all water which comes in direct contact with products and/or materials. It also includes water which is used in the sanitation of process equipment, water which is consumed in milling and special processes, water which is included in final output or water which has been used for another purpose, and is undergoing its final use as process water	C4101
37 Cooling, condensing and steam - This is water which does not come in direct contact with the products, materials or by-products of the processing operation. It includes pass-through water used in the operation of cooling or process equipment (including air conditioning) and water introduced into boilers for the production of steam for either process operations or electric power.	C4102
38 Sanitary service/Domestic use - This is water used for toilets, janitorial services, lawn watering, washing of vehicles, etc.	C4103
39 Other uses (<i>specify</i>) C4000	C4104
40 Total (Lines 36 to 39 should equal sum of figures reported in Line 14, C1013)	C4105
41 Of the annual volume of intake water for process reported in Line 36, what volume of water was consumed or lost (i.e. not returned to original source)?	C4301
42 Of the annual volume of intake water for cooling, condensing or steam production reported in Line 37, what volume of water was consumed or lost (i.e. not returned to original source)?	C4302
43 What volume of intake water was used as injected water or steam in the secondary recovery of oil or natural gas?	C4303

SECTION 5: WATER RECIRCULATED OR REUSED BY PURPOSE

Recirculated water refers to water used at least twice in an industrial facility. It is water that **leaves** a particular subsystem and **re-enters** it or is **used in another** subsystem. It does not refer to water that circulates many times within the same sub-system (i.e. it excludes closed-loop systems).

- 44 Did this mine recirculate or reuse water? C5001 1 ☐ Yes
3 ☐ No → If no, go to Section 6

INSTRUCTIONS

(i) Please report the volume of water recirculated or reused.

Where data are not available, please estimate.

Purpose	Volume per year
	C5101
45 Process	C5102
46 Cooling, condensing and steam	C5103
47 Other uses (specify) C5000	C5104
48 Total (Lines 45 to 47)	

- 49 Does this operation have a tailings pond(s)? C5301 1 ☐ Yes 3 ☐ No



- 50 If yes, indicate the volume of water recirculated or re-used from the tailings pond(s).....

Volume per year
C5302

- 51 Does this operation inject water into an oil bearing formation? C5303 1 ☐ Yes 3 ☐ No



- 52 If yes, indicate the volume of water injected.....

Volume per year
C5304

- 53 Estimated annual operating and maintenance cost of water recirculation. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to recirculate water in your facility

C5201

\$, , , .00
Millions Thousands Hundreds

SECTION 6: TREATMENT AND DISCHARGE OF WATER

INSTRUCTIONS

- (i) Please report the volume of all water routed by this facility to its ultimate point of discharge by the most advanced treatment process used.
- (ii) Do not report the volume of water released and intended for re-use or recirculation until it is actually discharged to a location beyond the control of the facility.
- (iii) Do not include the volume of water lost in production through evaporation, permanently held in open or closed storage or otherwise consumed and not brought to the ultimate point of discharge.

54 Is discharge volume metered or otherwise measured? C6001 1 ☐ Yes

3 ☐ No (If no, please provide your best estimate below)

Where data are not available, please estimate.

INSTRUCTIONS

The sum of all amounts entered below should equal C1113 from Section 1 (page 2).

Type of treatment	Point of discharge					
	Public utilities	Surface freshwater bodies	Tide water (Ocean)	Ground water	Tailing Ponds or Injected to Producing Formations	Other
Annual Volume						
55 Water not treated at this facility before discharge	C6101	C6102	C6106	C6103	C6105	C6104
56 Primary or mechanical (the physical removal of large solids using grates, screens and settling tanks) ...	C6201	C6202	C6206	C6203	C6205	C6204
57 Secondary or biological (the promotion of bacterial growth and other microbes that break down the organic wastes)	C6301	C6302	C6306	C6303	C6305	C6304
58 Tertiary or advanced (the reduction of concentrations of phosphorus or nitrogen through biological or chemical processes) ..	C6401	C6402	C6406	C6403	C6405	C6404

59 Estimated annual operating and maintenance cost for treatment of water discharge. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water discharged by your facility.

C6501 \$, , , .00
Millions Thousands Hundreds

60 Please indicate if your facility's final effluent (industrial waste discharged) is monitored for:

Biochemical Oxygen Demand

C6601 1 ☐ Yes 3 ☐ No

Frequency

C6701

Chemical Oxygen Demand

C6602 1 ☐ Yes 3 ☐ No

C6702

Suspended Solids

C6603 1 ☐ Yes 3 ☐ No

C6703

Phenols

C6604 1 ☐ Yes 3 ☐ No

C6704

Toxicity

C6605 1 ☐ Yes 3 ☐ No

C6705

pH

C6606 1 ☐ Yes 3 ☐ No

C6706

Oil & Grease

C6607 1 ☐ Yes 3 ☐ No

C6707

Temperature

C6608 1 ☐ Yes 3 ☐ No

C6708

Colour

C6609 1 ☐ Yes 3 ☐ No

C6709

Acute lethality

C6610 1 ☐ Yes 3 ☐ No

C6710

Other (specify) C6801

C6611 1 ☐ Yes 3 ☐ No

C6711

Other (specify) C6802

C6612 1 ☐ Yes 3 ☐ No

C6712

Other (specify) C6803

C6613 1 ☐ Yes 3 ☐ No

C6713

SECTION 7: OTHER DETAILS

61 Capital expenditures on water intake, discharge or treatment facilities made at this establishment for 2009. Include all relevant outlays for machinery and equipment purchases, and their installation, as well as for construction related to water intake, discharge and treatment

C7010

\$

.00

Millions

Thousands

Hundreds

Comments

Approximately how long did it take to collect the data and complete this survey?

C9910

Hour(s)

C9909

Minutes

We invite your comments or suggestions on the following or any other topic related to the *Industrial Water Survey*. We appreciate your assistance.

- Questionnaire content
- New questions of interest to your industry
- Clarity of questions
- Order and flow of questions
- Timing of receipt of questionnaire and the period given for response
- Alternative sources of information to further reduce response burden

C9920

C9913

C9914

If you have questions, please contact us.

Telephone (toll free): 1 866 855-8594

Fax: 1 800 755-5514 (within Canada)

Please return this questionnaire in the envelope provided.
THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY!

Industrial Water Survey: Fossil-Fuel and Nuclear Electric Power Generating Plants, 2009

Collected under the authority of the *Statistics Act*, Revised Statutes of Canada, 1985, Chapter S19.

This document is confidential when completed.

Français au verso

Correct pre-printed information, if necessary, using the corresponding boxes below:

0001	Legal name		
0002	Business name		
0021	C/O		
0028	Last name of contact		
0008	First name of contact		
0004	Address		
0005	City	0006	Province/Territory or State
0053	Country	0007	Postal code/Zip code

Please read before completing

Survey Purpose

This survey collects detailed information on water use in Canada by the manufacturing, mining and electrical power generating industries. The survey asks information on who uses water, how much, where and at what cost. This data will be used to track the state of stocks of water on a regional basis in Canada and will also be used in the development of environmental accounts and indicators.

Return of Questionnaire(s)

Please return the completed questionnaire(s) to Statistics Canada within 30 days of receipt by mail, using the enclosed envelope. **If you are unable to do so, call 1 866 855-8594** to inform us of the expected completion date. You can also fax it to 877 256-2370. Lost the return envelope, need help to complete your questionnaire(s)? Call us at 1 866 855-8594.

Fax or Other Electronic Transmission Disclosure

Statistics Canada advises you that there could be a risk of disclosure during the facsimile or other electronic transmission. However, upon receipt, Statistics Canada will provide the guaranteed level of protection afforded to all information collected under the authority of the *Statistics Act*.

Authority

This survey is conducted under the authority of the *Statistics Act*, Revised Statutes of Canada, 1985, Chapter S19.

COMPLETION OF THIS QUESTIONNAIRE IS A LEGAL REQUIREMENT UNDER THE STATISTICS ACT.

Confidentiality

Statistics Canada is prohibited by law from publishing any statistics which would divulge information obtained from this survey that relates to any identifiable business. The data reported on this questionnaire will be treated in strict confidence.

Data-sharing Agreements

In an effort to reduce respondent burden, Statistics Canada has entered into an agreement with Environment Canada under **Section 12 of the *Statistics Act*** for sharing of data herein. Environment Canada has undertaken to keep the information confidential and to use it for statistical purposes only. This Section 12 agreement shall not apply if an authorized officer or person of your company objects **in writing to the Chief Statistician and mails that letter to the Operations and Integration Division of Statistics Canada** with the completed questionnaire.

Planned Data Linkage

In order to enhance the analytic possibilities of this survey, Statistics Canada intends to combine the information from the Industrial Water Survey with the information your company/business provided on the Monthly Electricity Survey, the Annual Electricity Survey and the Electricity Supply Disposition Annual Survey.

Person primarily responsible for completing this questionnaire, if different from above:

0026	1 <input type="radio"/> Mr.	2 <input type="radio"/> Mrs.	3 <input type="radio"/> Miss	4 <input type="radio"/> Ms	5 <input type="radio"/> Dr.	0017	Telephone number	extension
0054	Last name					0027	() -	
0013	First name					0016	() -	
0014	Title					0020	Website address	
						0018	E-mail address	

For Statistics Canada use only

Rec.	Ed.	Kyd.	Bat.	Coll.	FSC
Y M D	Y M D	Y M D			

4-2300-12: 2010-02-18 STC/ESP-291-75412



Statistics Canada
Statistique Canada

Canada

REPORTING YEAR: JANUARY 1, 2009 TO DECEMBER 31, 2009

NOTE i) Water volumes are to be reported in the units in use at this facility; please **mark only one selection** and use this unit of measure throughout the questionnaire.

Line
1

C0101

1 ☐ cubic metres

2 ☐ other – specify

C0102

IMPORTANT

If reporting in multiples of a unit of measure, please take care to enter the correct decimal values or number of zeros. (i.e., if *other*, above, is specified as *thousands* of litres, note that a reported quantity of 3 = 3,000 (*3 thousand*) litres, whereas a reported quantity of 3,000 = 3,000,000 (*3 million*) litres).

If reporting in gallons, please specify Imperial or U.S. gallons.

ii) **Where data are not available, please estimate.**

SECTION 1: MONTHLY AND ANNUAL TOTAL WATER INTAKE AND DISCHARGE

INSTRUCTIONS

- (i) In this section, under intake, please report by month the quantity of “new water” brought into your operation for **all** power plant uses. For the purpose of this questionnaire “new water” is defined as water introduced for the first time into this facility **regardless of source or quality** (including sanitary/domestic water intake). It also includes water diverted from a natural resource into storage ponds or outside holding facilities for later use.
- (ii) Where you supply water to adjacent or tenant industry(ies) or municipality(ies), please report estimated water intake for your establishment only.
- (iii) Under discharge, please report the quantity of water routed to its ultimate point of discharge (including sanitary/domestic discharge).
- (iv) Under discharge **do not report** the volume of water released to ponds, lagoons or basins and intended for recirculation or reuse until such water is actually discharged to a location beyond the control of the facility.
- (v) Under discharge **do not include** any water lost in production through evaporation, permanently held in open or closed storage, or otherwise consumed (e.g. included in a final product).

Month	Volume per month	
	Intake	Discharge
2 January	C1001	C1101
3 February	C1002	C1102
4 March	C1003	C1103
5 April	C1004	C1104
6 May	C1005	C1105
7 June	C1006	C1106
8 July	C1007	C1107
9 August	C1008	C1108
10 September ..	C1009	C1109
11 October	C1010	C1110
12 November ..	C1011	C1111
13 December ..	C1012	C1112
14 ANNUAL TOTAL	C1013	C1113

15 If total discharge volume (C1113) is greater than total intake volume (C1013), please indicate reason:

C1201

SECTION 2: WATER INTAKE BY SOURCE AND KIND

INSTRUCTIONS

- (i) Please report your volumes of intake water by source and its usual characteristic.
- (ii) Freshwater is defined as water containing 900 parts per million, or less, of total dissolved solids.
- (iii) Saline / brackish water is defined as water containing more than 900 parts per million of total dissolved solids.

Where data are not available, please estimate.

Source	Volume per year	
	Freshwater	Saline / Brackish
16 Public water utility system	C2401	XXXX
17 Self-supplied surface water system (lake, river, etc.)	C2402	XXXX
18 Self-supplied groundwater system (well, spring, etc.)	C2403	C2203
19 Self-supplied tide water (salt water) body (estuary, bay, ocean, etc.)	XXXX	C2204
20 Other sources (<i>specify</i>) C2000	C2405	C2205
21 TOTAL	C2406	C2206

NOTE: The sum of C2406 and C2206 (line 21, above) should equal C1013 at line 14 on previous page.

Estimated annual cost of water acquisition:

22	Payment to public utility (for water volume at line 16, above).....	C2301 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Millions</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Thousands</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Hundreds</div> </div>	.00
23	Estimated annual operating and maintenance costs of intake water acquisition (excluding water treatment costs which are covered on the next page). Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain your systems that bring water into your facility.....	C2302 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Millions</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Thousands</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Hundreds</div> </div>	.00
24	Cost of your annual intake licence (estimate if permit not purchased annually).....	C2303 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Millions</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Thousands</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Hundreds</div> </div>	.00
25	Payment for purchase of water from another operator / industrial supplier.....	C2304 \$	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Millions</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Thousands</div> </div>	<div style="display: flex; justify-content: space-between;"> <div><div></div><div></div><div></div><div></div></div> <div>Hundreds</div> </div>	.00

SECTION 3: INTAKE WATER - TREATMENT

26 Did this establishment treat any **intake** water?

C3001 1 ☐ Yes

3 ☐ No → *If no, go to Section 4*

INSTRUCTIONS

- (i) Indicate the volume of intake **water treated** within your establishment prior to initial use. Do not include treatment of water for re-use.

Where data are not available, please estimate.

Category of treatment		Volume per year
27 Screening		C3201
28 Filtration		C3202
29 Chlorination - disinfection (includes for process and for biological control)		C3203
30 Corrosion and slime control		C3204
31 Alkalinity control		C3205
32 Hardness (or water softening)		C3206
33 Coagulation / flocculation		C3207
34 Other (specify) C3213		C3210
Other (specify) C3214		C3211
Other (specify) C3215		C3212

35 Estimated annual operating and maintenance cost of your intake water treatment. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water brought into your facility.....

C3101

\$, , , .00
 Millions Thousands Hundreds

SECTION 4: WATER INTAKE BY PURPOSE

INSTRUCTIONS

- (i) Report the amount of water within your facility by **initial** use. This section should not include recirculated water (for a definition of "recirculated water", see section 5).
- (ii) In Line 39 "Other uses" should not include water pumped by the facility, and intended for initial use outside the facility.

Where data are not available, please estimate.

	Purpose	Volume per year
36	Cooling, condensing and steam - defined as water which does not come in direct contact with the products, materials or by-products of the processing operation. It includes pass-through water used in the operation of cooling or process equipment (including air conditioning) and water introduced into boilers for the production of steam for either process operations or electric power.	C4102
37	Pollution control (e.g. wet flue gas desulphurization, etc.)	C4106
38	Sanitary service/Domestic use - This is water used for toilets, janitorial services, lawn watering, washing of vehicles, etc.	C4103
	C4000	C4104
39	Other uses (<i>specify</i>)	C4105
40	Total (Lines 36 to 39 should equal sum of figures reported in Line 14, C1013)	
41	What were the estimated water losses (including evaporation and seepage):	C4201
	(i) in cooling cycle?	C4202
	(ii) pollution control (e.g. wet flue gas desulphurization, etc.)?	C4203
	(iii) in ash control system (include evaporation losses from ponds)?	
42	What was the amount of boiler make-up water required for power generation purpose (excluding production for steam sales or transfer)?	C4204
43	Is there a water-cooled condenser in your plant? C4205 1 <input type="radio"/> Yes 3 <input type="radio"/> No	
	↓	
44	If yes, what was the actual temperature rise of the cooling water in your condenser cooling cycle?	
	Minimum	Temperature C4206 °C
	Maximum	C4207 °C
45	Please indicate the type of cooling system employed in your establishment:	C4208
	(i) Once-through	1 <input type="radio"/> Yes 3 <input type="radio"/> No
	(ii) Cooling ponds	C4213 1 <input type="radio"/> Yes 3 <input type="radio"/> No
	(iii) Cooling tower	C4214 1 <input type="radio"/> Yes 3 <input type="radio"/> No
	(iv) Other methods	C4211 1 <input type="radio"/> Yes 3 <input type="radio"/> No
46	Did this plant produce steam for purposes other than electric power generation (i.e. heating, process or for sale)?	C4212 1 <input type="radio"/> Yes 3 <input type="radio"/> No

SECTION 5: WATER RECIRCULATED OR REUSED BY PURPOSE

Recirculated water refers to water used at least twice in an industrial establishment. It is water that **leaves** a particular subsystem and **re-enters** it or is **used in another** subsystem. It does not refer to water that circulates many times within the same sub-system (i.e. it excludes closed-loop systems).

- 47 Did this facility recirculate or reuse water? C5001 1 ☐ Yes
3 ☐ No → *If no, go to Section 6*

INSTRUCTIONS

- (i) Please report the volume of water recirculated or reused.

Where data are not available, please estimate.

Purpose	Volume per year
48 Cooling, condensing and steam	C5102
49 Pollution control (e.g.wet flue gas desulphurization, etc.)	C5105
50 Other uses (specify) C5000	C5103
51 Total (Lines 48 to 50)	C5104

- 52 Estimated annual operating and maintenance cost of water recirculation. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to recirculate water in your facility C5201
- \$, Millions , Thousands , Hundreds .00

SECTION 6: WATER DISCHARGE AND ITS TREATMENT

INSTRUCTIONS

- (i) Please report the volume of all water routed by this facility to its ultimate point of discharge by the most advanced treatment process used.
- (ii) Do not report the volume of water released and intended for re-use or recirculation until it is actually discharged to a location beyond the control of the facility.
- (iii) Do not include the volume of water lost in production through evaporation, permanently held in open or closed storage or otherwise consumed and not brought to the ultimate point of discharge.

53 Is discharge volume metered or otherwise measured?

C6001 1 ☐ Yes

3 ☐ No (If no, please provide your best estimate below.)

INSTRUCTIONS

The sum of all amounts entered below should equal C1113 from Section 1 (page 2).

Type of treatment	Point of discharge				
	Public utilities	Surface Freshwater bodies	Tide water (Ocean)	Ground water	Other
	Annual volume				
54 Water not treated at this facility before discharge	C6101	C6102	C6106	C6103	C6104
55 Primary or mechanical (the physical removal of large solids using grates, screens and settling tanks) ...	C6201	C6202	C6206	C6203	C6204
56 Secondary or biological (the promotion of bacterial growth and other microbes that break down the organic wastes)	C6301	C6302	C6306	C6303	C6304
57 Tertiary or advanced (the reduction of concentrations of phosphorus or nitrogen through biological or chemical processes) ..	C6401	C6402	C6406	C6403	C6404

58 Estimated annual operating and maintenance cost for treatment of water discharge. Operating and maintenance costs should only include your material, labour and energy costs incurred to operate and maintain systems to treat water discharged by your facility

C6501

\$, , , .00
 Millions Thousands Hundreds

SECTION 7: OTHER DETAILS

- 59 Capital expenditures on water intake, discharge or treatment facilities made at this establishment for 2009. Include all relevant outlays for machinery and equipment purchases, and their installation, as well as for construction related to water intake, discharge and treatment.....

C7010

\$, Millions , Thousands , Hundreds .00

- 60 Indicate the average number of employees (including administrative staff)

- 61 Indicate the number of days of operation of the facility during the reporting period.....

- 62 Indicate the average number of hours this facility operates in an average day

- 63 Indicate the amount of electrical power produced at this facility:

(i) net generation.....

(ii) station service.....

- 64 Indicate the average heat rate of the facility.....

- 65 Indicate the electrical generation capacity of this facility.....

- 66 Indicate the total capacity of water intake pumps (*specify unit of measure*).....

- 67 (i) Does your facility provide water for uses other than in the power plant.....

C7009

1 ☐ Yes 3 ☐ No



(ii) If yes, please explain:

C7011

C7012

Number
C7001
C7002
C7003

C7004	MWh
C7005	MWh

C7006	BTU/KWh
-------	---------

C7007	MW
-------	----

C7008

Comments

Approximately how long did it take to
collect the data and complete this survey?

C9910

Hour(s)

C9909

Minutes

We invite your comments or suggestions on the following or any other topic related to the *Industrial Water Survey*. We appreciate your assistance.

- Questionnaire content
- New questions of interest to your industry
- Clarity of questions
- Order and flow of questions
- Timing of receipt of questionnaire and the period given for response
- Alternative sources of information to further reduce response burden

C9920

C9913

C9914

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Fax: 1 800 755-5514 (within Canada)

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THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY!