Correctional Service Canada
Service correctionnel Canada

Environmental Guidelines

318-9

Water Measurement and Conservation

Issued under the authority of the Assistant Commissioner, Corporate Services

2003-06-11

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ENVIRONMENTAL GUIDELINES (EG) – WATER MEASUREMENT AND CONSERVATION

PRIMARY GOALS

To reduce the harmful environmental impacts of withdrawing and using groundwater and surface water and of treating water.

To contribute, through water conservation initiatives, to the preservation of this natural resource.

SPECIFIC OBJECTIVES

To promote effective, responsible management of water in the Correctional Service of Canada's (CSC's) institutions by confirming practical alternatives for reducing water consumption, identifying instances where water may be wasted, and by installing water-saving devices based on priorities of volume.

To implement a system for the measurement and monitoring of potable water consumed in institutions. The system will make it possible to:

- gather, record and save reliable and auditable data on water;
- formally manage this environmental aspect of CSC's Sustainable Development Strategy; and
- monitor on an ongoing basis the results and hence environmental performance.

AUTHORITIES

Correctional Service of Canada Commissioner's Directive 318 – Environmental Programs.

Sustainable Development Strategy (SDS) of the Correctional Service of Canada.

Guidelines for Water Efficiency in Publicly Funded Buildings and Properties, Canadian Council of Ministers of the Environment (CCME) Water Use Efficiency Task Group, July 1995.

Provincial laws and regulations on water usages.

Regional municipality and city handling requirements, by-laws and regulations on water usages.

SECTION 1 – DEFINITIONS, RESPONSIBILITIES AND SCOPE

DEFINITIONS

For the purpose of these Environmental Guidelines:

CPM – Chief of Plant Maintenance or Chief of Works.

Potable water – Water used for a utility purpose (common to most CSC institutions), such as water for showering, toilet flushing, ordinary laundry, cleaning up in Food Services or Institutional Services, and cosmetic landscaping. However, the large amount of potable water that may be used for a utility purpose in only a few institutions is not included. Examples are water used for: farm irrigation, composting, a water-intensive metal finishing in a Corcan shop, a multi-institution or commercial laundry, etc.

RESPONSIBILITIES

The Institutional Head, his or her assistants and the Corcan Operations Managers are accountable to ensure compliance with these Environmental Guidelines.

The Chief, Plant Maintenance (CPM) will normally be the person responsible for managing and monitoring the implementation of these Environmental Guidelines so that water consumption management activities may be conducted and maintained from a central point in the institution.

SCOPE

All the institutional sectors that consume water are subject to these Environmental Guidelines.

SECTION 2 – GENERAL REQUIREMENTS

1. The CPM will put in place mechanisms and procedures that will allow the measurement and conservation of water.

SECTION 3 – SPECIFIC REQUIREMENTS

WATER AUDIT AND CUSTODY

1. The CPM will identify the institution's utility water systems and subsystems that use relatively large quantities of potable water for utility purposes. In general, this requirement will call for an audit of the institutional water system.

2. The CPM will clarify and formalize the institution's custody for all utility water systems, and systems that use relatively large quantities of potable water. Custody arrangements are normally as follows:

   a. The CPM has custody of an institution's principal potable water supply and distribution system.

   b. Corcan managers have custody of specialized utility water supply and distribution systems, and many of the systems that use potable water for utility purposes.

   c. Institutional Services managers have custody of multi-institution or quasi-commercial laundries.

WATER MEASUREMENT AND MONITORING

3. The CPM will operate a system for measuring (in terms of litres/occupant/day), recording, and managing potable water use from the main supply system. This requires:

   a. recording once a month the institutional water use from the water bills or the main water meter (and/or the water meters at selected points) using the Water Consumption Monitoring Protocol [refer to Annex A];

   b. analyzing every month the water consumption data in the CSC Water Consumption Monitoring Protocol and comparing the institution's total water use for the current year with that for the comparable period of the previous year;

   c. setting targets for or forecasts of water use at each measurement point; and

   d. comparing actual water use with that targeted or forecasted at each measurement point, investigating significant over-consumption (possibly caused by water leaks, taps habitually left on in the kitchen and washrooms, etc.), and making repairs or promoting changes in water use practices.

Note: The Water Consumption Monitoring Protocol tracks the total amount of water that is purchased by each institution or complex. Where two or more institutions use water reported on one bill, metered data should be used to prorate the relative portions of the total water purchased that is used by each institution. The timing of the meter readings used for prorating should correspond with the timings reported on the utility bills.

WATER LEAKS

4. Detectable leaks in the institution's potable water distribution system shall be repaired as soon as possible.

5. When required, and in accordance with the frequency determined by the CPM, checks of the institution's accessible water distribution system should be conducted. If leaks are suspected in inaccessible areas, more sophisticated measures should be taken (e.g., investigations conducted by specialized firms using acoustic or video detection systems).

WATER CONSERVATION PLAN

6. The CPM should once yearly or on a continuous improvement basis review all potable water use practices at the institution, and plan and implement improvements, such as replacing heat exchangers in refrigeration apparatus and other devices that use potable water for cooling, installing low-flow toilets and faucets, placing timers on kitchen and lawn irrigation faucets, etc. [refer to Annex B].

7. Custodians of utility water systems and operations that use potable water for utility purposes must follow practices similar to those in paragraph 3 above for measuring and managing its use.

8. All new systems, devices and equipment that require a cooling medium in order to operate shall, to the extent possible, use air for that purpose as opposed to non-recirculated potable water.

SECTION 4 – DATA MANAGEMENT AND REPORTING

RECORDS

1. On-site records must be kept using the Water Consumption Monitoring Protocol that will show the monthly quantities (litres or m^3) of water consumed. Since the water consumption measurement/audit process is a repetitive one, tasks related to data collection could be integrated into the institution's Maintenance Management System (MMS), using a sequence predetermined by the CPM.

2. All the documents required in these Environmental Guidelines (audits, measurement data, records) must be kept on site for at least five years following the date of issue.

REPORT

3. The CPM will periodically provide a report to the Environmental Management Committee (EMC) on the results of the local water measurement and conservation program.

4. The CPM should establish a program whereby progress results are regularly posted, mainly for the benefit of those who participate in the water consumption reduction program. Reports could take the form of a chart showing progress over time by sector or by building [refer to Annex C].

SECTION 5 – TRAINING / REFERENCES

TRAINING

1. The person responsible for water management at the institutional level must coordinate the measures necessary for ensuring ongoing training and coaching sessions for institutional personnel in water conservation techniques as well as awareness activities for inmates.

REFERENCES

2. Environment Canada infonet site on water (home page) at:
   http://www.ec.gc.ca/water/e_main.html.

3. Environment Canada infonet site on water efficiency/conservation at:
   http://www.ec.gc.ca/water/en/manage/effic/e_weff.htm.

4. Environment Canada infonet site on water efficiency/conservation –
   Guidelines for Water Efficiency in Publicly Funded Buildings and Properties at:
   http://www.ec.gc.ca/water/en/info/pubs/arwcp/e_pubbld.htm.

5. Environment Canada infonet site on water efficiency/conservation –
   A Water Conservation Plan for Federal Government Facilities at:
   http://www.ec.gc.ca/water/en/info/pubs/arwcp/e_plan.htm.

6. Environment Canada infonet site on water efficiency/conservation – Publications at:
   http://www.ec.gc.ca/water/en/info/pubs/e_pubs.htm.

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ANNEX A

Water Consumption Monitoring Protocol: Sample Institutional Results for One Quarter

FY 2001-2002 Institution X			Water Usage			
			April	May	June	Q1
No. of people	Number of inmates (total)		568	568	568	568
	Number of staff (total)		394	394	394	394
	Number for per person calculation		699	699	699	699
Water use per person	Municipal	L/person	5 277,1	9 518,0	8 871,1	23 666,2
	Well	L/person	-	-	-	-
	Surface	L/person	-	-	-	-
	Total for FY 2001-2002	Litres	3 690 476,2	6 656 255,8	6 203 823,5	16 550 555,6
		L/person	**5 277,1**	**9 518,0**	**8 871,1**	**23 666,2**
		L/pers/day	**175,9**	**307,0**	**295,7**	**260,1**
	Previous year	Litres	**6 191 610,3**	**4 496 024,0**	**7 786 235,3**	**18 473 869,6**
		L/person	**8 853,6**	**6 429,0**	**11 133,8**	**26 416,4**
		L/pers/day	**295,1**	**207,4**	**371,1**	**290,3**
	Difference from previous year	Litres	(2 501 134,1)	2 160 231,9	(1 582 411,8)	(1 923 314,0)
		L/person	(3 576,5)	3 089,0	(2 262,7)	(2 750,2)
		L/pers/day	(119,2)	99,6	(75,4)	(30,2)
		%	-40,4%	48,0%	-20,3%	-10,4%
	PRIMARY INDICATOR: Ratio to previous year	%	**59,6%**	**148,0%**	**79,7%**	**89,6%**
	Running total, this year	L/person	5 277,1	14 795,1	23 666,2	23 666,2
		L/pers/day	175,9	482,9	778,6	260,1
	Running previous year	L/person	8 853,6	15 282,6	26 416,4	26 416,4
		L/pers/day	295,1	502,5	873,6	290,3
	Difference from previous year (running)	L/person	(3 576,5)	(487,5)	(2 750,2)	(2 750,2)
		L/pers/day	(119,2)	(19,6)	(95,0)	(30,2)
		%	-40,4%	-3,2%	-10,4%	-10,4%
	Ratio to previous year (running)	%	59,6%	96,8%	89,6%	89,6%
Water costs (if applicable)	Municipal	$	$ 9 909,71	$ 10 434,11	$ 5 403,16	$ 25 746,99
	Well	$	$ -	$ -	$ -	$ -
	Surface	$	$ -	$ -	$ -	$ -
	Total for FY 2001-2002	$	$ 9 909,71	$ 10 434,11	$ 5 403,16	**$ 25 746,99**
		$/person	$ 14,17	$ 14,92	$ 7,73	**$ 36,82**
		$/pers/day	$ 0,16	$ 0,16	$ 0,08	**$ 0,40**

ANNEX B

Water Conservation Plan – Effective Water Management Suggestions

Categories of Operations Comprising Water Use

In order to determine ways of reducing water use, you must first divide it into separate categories. This will make your task easier. Water use in any industrial, commercial, or institutional operation may be divided as follows:

- **domestic water use**
- **industrial water use**
- **external/outdoor water use.**

Water Management Options

Water management options may be divided into various groups that will make it possible to pinpoint reduction possibilities.

- **Network monitoring** – Regularly measure and record data on water consumption, analyze trends to quickly detect major leaks, and repair damage as soon as possible.
- **System optimization** – See that equipment, devices or systems that use water are running smoothly and ensure that they do not use too much water (regular, preventative maintenance).
- **System replacement** – Replace or make changes to existing equipment through more effective devices or technologies for water use.
- **Reuse and recycling** – Replace drinking water from municipal or local system used by current equipment with water that has already been used once (grey water) in your facility.
- **Changes in procedures and operations** – Make changes to procedures that use water in your facility so that the same work can be performed with less or no water.
- **Water conservation awareness** – Reduce water consumption by making people more aware of water conservation. This may mean persuading them to get rid of water-wasting habits.

ANNEX C

Example – Water Consumption Measurement Performance Report

Month (2001)	Average (litres/occupant/day)	Total Water Consumption (litres)
January	525	7 893 375
February	610	8 283 800
March	495	7 288 875
April	465	6 765 750
May	680	10 308 120
June	820	12 054 000
July	1 055	16 188 975
August	975	14 961 375
September	845	12 421 500
October	515	7 743 025
November	360	5 238 000
December	435	6 472 800