

Water Use Reporting Case Studies

*Researched and Prepared by Jacqueline Belzile
for the Okanagan Basin Water Board*

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Executive Summary

To further explore how the online BC Water Use Reporting Centre system developed by the Okanagan Basin Water Board could be expanded to meet new water use reporting requirements across British Columbia, this project looked to other regions to see how their experiences of online water use reporting can inform BC's approach.

Online research and case study interviews were conducted with experts in Alberta, Ontario, Washington, and Michigan in January and February of 2014.

Key findings include:

- Online reporting system features and descriptions
- Linkages between system function and effectiveness and the legislative and historical contexts in which it was created
- The difference between self-reporting models and government or contracted reporting models
- The importance of alignment between system design and organizational structure
- Evaluations of system effectiveness, benefits and weaknesses, and areas of improvement
- Advice from representatives on the importance of: clarity of purpose and audience, simplicity, unique identifiers, system testing, statutory authority and flexibility, user support, and iterative system and process improvements



Project Background

The objective of the BC Water Use Reporting Centre (BCWURC) Case Studies Project is to explore how other jurisdictions have designed, implemented and utilized online water use reporting systems. The intent is to learn lessons from the experiences of others to develop a business case for how to scale up the Okanagan Basin Water Board's (OBWB) existing BCWURC system to assist the Provincial government in implementing new legislative reporting requirements in BC.

BCWURC is an IT system comprised of a database, data reporting software (including analytical tools), and an online interface. The system allows license-holders to report water usage on a monthly basis and currently supports data gathering for: water usage, snow course depth, reservoir/lake levels, and return flows. It has been successfully piloted across the Okanagan basin and a second pilot has recently been launched in Nanaimo.

As BC is currently in the final drafting stages of a new *Water Sustainability Act*, this study examines how online reporting could be integrated into the Act's implementation.

Key research questions include:

- System Design:
 - What kinds of data are being collected, how frequently and from whom?
 - Who has access to the data and what do they use it for?
- Policy and Administrative Context:
 - What, if any, enabling legislation or policies support online water use reporting?
 - How have online systems been integrated into and/or impacted water management and regulation operations?
- System Evaluation:
 - How do representatives of the organizations who own these systems evaluate their performance?
 - What are the benefits and weaknesses of the system in their view?
 - Do they see any areas for system or system usage improvement?
 - What advice do they have for others looking to implement online water reporting systems?

Research Methodology

To answer these questions Jacqueline Belzile, a social scientist with a water resources management background, first conducted preliminary research to identify online water use reporting systems of interest and any existing systems in Canada. Based on the results of this online search, four systems were then selected for more in-depth expert interviews. Five expert interviews were conducted in January and February of 2014 with representatives from Alberta, Washington state, Ontario and Michigan. Case study regions were chosen based on the availability of information on their systems, contextual similarity with BC, and features of interest. Interview notes were vetted by participants to ensure accuracy. The interview questionnaire has been included in Appendix A, along with excerpts from relevant legislation and regulations for each case study in Appendices B through E.

Project Findings

Canadian Context

As water management falls primarily under the jurisdiction of Provincial governments in Canada, water withdrawal and use reporting varies widely. A cross-country search of government agency websites identified three online water use reporting systems: Alberta's Water Use Reporting System (WURS), Ontario's Water Taking Reporting System (WTRS) and Québec's Gestion Des Prélèvements D'Eau (GPE) system. Both Ontario and Québec created their systems in part to meet the reporting requirements of the Great Lakes Charter.

Case Study Selection

To provide a broader range of system experiences, two of the three Canadian systems were selected and two American systems. One criterion for selection was availability of information. Each of the case study systems is well documented and has user guidance materials available online. Other selection criteria included geographic and water rights similarity. Both Alberta and Washington share similar water management issues with BC due to their geography and prior appropriation water rights systems (i.e. First in Time, First in Right). The two eastern cases also share similarities, including involvement in the Great Lakes Charter or Compact, and riparian water rights systems. Ontario was selected based on their dedicated water reporting Permit to Take Water regulation (387/04) and as a second Canadian example. Michigan was selected based on its unique features: a common system shared between the Department of Agricultural and Rural Development and the Department of Environmental Quality with distinct user interfaces for each, and companion Water Withdrawal Assessment Tool for water permitting.

Key Takeaways

Notable results that emerged from a comparison of the different systems include:

- **Online reporting system features and descriptions.** Table 1 compares the four cases on a variety of system design and administration features (see page 3).
- **Linkages between system function and effectiveness and its historical and legislative context.** Three of the systems explored (ON, MI, WA) were developed to meet legislative requirements. However, interestingly the two Canadian systems appear to be used for a wider array of water management purposes, whereas the American systems are used mainly for compliance. For example, the effectiveness of Washington's system is constrained in part by a lack of consistent statewide water user reporting and a 1999 court decision that requires them to focus monitoring and compliance efforts on 16 Fish Critical Basins.

Clearly, the relationship between a system's design purpose and use is important. Both Alberta and Michigan respondents commented that clarity of purpose and organizational support structures are critical to system success. What is unclear is whether it is the structures of the systems, their maturity, or the legal and organizational contexts surrounding them (or some combination of the above) that enhances the diversity of ways they are used.

Table 1. Online Reporting System Comparison Table

Case Study	Alberta	Ontario	Washington	Michigan	
				Agricultural	Non-Agricultural
System Name	Water Use Reporting System (WURS)	Water Taking Reporting System (WTRS)	Online Reporting System (ORS)	Michigan Online Water Use Reporting System (MOWURS)	
System Owner	Alberta Environment and Sustainable Resource Development	Ministry of Environment	Department of Ecology	Department of Agriculture & Rural Development	Department of Environmental Quality
Reporters	Water license holders	Permit to take water holders (i.e. $\geq 50,000$ lpd)	Water rights holders who meet criteria	Agricultural users with pumping capacity ≥ 70 gpm	Property owners with capacity to pump 100,000 gpd; report at 1.5M g/year
Data Collected	Water diversion & use data	Volumes of water taken daily	Volume of water withdrawn or diverted from source	Water use data	Water withdrawal and discharge data
Frequency of Data Collection & Reporting	Depend on license conditions (daily, weekly, monthly or annually)	Report on daily water takings, on an annual basis	Depend on location and quantity being diverted (e.g. higher volume, higher frequency)	Monthly data reported annually	
Measurement Method(s)	Metering preferred, other methods specified in Water Measurement Guidebook	Flow or volumetric meter, or alternative methods can be specified in permits	Method specified in regulation - meters or weirs, unless petition is approved for alternate method	No specified method. Until 2009 water users reported capacities, as of 2009 all new systems have to use the Water Withdrawal Tool for permit approval, and have to report usage.	
Enforcement	Water audits and automatic compliance function to be enabled in future for high risk areas	-	1999 court ruling mandates that Ecology must achieve 80% metering compliance in 16 Fish Critical Basins	No enforcement, because no way to do it without metering.	
Mandatory/Voluntary Online Reporting	Mandatory	Voluntary	Voluntary, but encouraged	Mandatory	Voluntary
Data Uses	Licensing, monitoring, water management, planning & policy development	Water budgeting, reporting for Great Lakes Charter, policy & program development	Compliance only because water users reporting are a small proportion of total water users.	To fulfill Great Lakes Compact reporting obligations. Water Advisory Council is looking at potential for other uses	
Access to Data	License holders, internal, FOI	Internal, partners, FOI	Internal	Reporters can access own, internal	

- ***The difference between self-reporting models and government or contracted reporting models.*** All of the systems researched fell into the self-reporting category, meaning they rely on users to install monitoring equipment or utilize some other approved method to track and report their water use. Jeff Marti of Washington called this a ‘self-reporting model’ and contrasted it to government or contract reporting models, like those in Colorado or Australia, where a government agent or contracted technician is responsible for recording water withdrawal or use data and maintaining equipment. Another version of the government model is North Dakota’s telemetered monitoring of water depots, whereby data gathering is automated and uploaded via satellite to the state’s database. In his opinion, self-reporting models cost less, but generate concerns with data quality, regularity, and dependability. This was supported by concerns over data quality reported by representatives in Michigan. While Alberta uses a self-reporting model, they are currently piloting a telemetering project in a small basin in the water-stressed south.
- ***The importance of alignment between system design and organizational structure.*** This point was raised by Stephen Yeung of Alberta, who explained that to make their system effective they had to create a governance model for it that supported their existing regional model for water approvals. Careful thought has to be put into designing the organizational structures and processes around a system, as well as into the system itself, to ensure that it can achieve its objectives within any existing framework of responsibilities and water management workflow. The state of Michigan’s system, which was developed in two parallel pieces to meet the differing requirements and legislative responsibilities surrounding agricultural and non-agricultural water use, is an example of how a system can be shared to meet differing needs.
- ***Evaluations of system effectiveness, benefits and weaknesses, and areas of improvement.*** Common themes in the case study system evaluations included:
 - Benefits: increased efficiency, data access, and ease of reporting
 - Weaknesses: IT challenges (e.g. compatibility with Macs or data loggers, limited internet connections in remote areas, age related system limitations, etc.), users who are not comfortable with technology, data quality issues with self-reporting
 - Areas of improvement: integration with other systems and tools, new functionalities (e.g. GIS, analytical or export tools, improved user prompts)
- ***Advice from representatives.*** Discussed in depth in the case studies. Common themes included: testing with target audience, and the importance of simplicity and user support.

Other Systems of Interest

Interviews revealed other water reporting systems that may be of interest for further research:

- California’s Electronic Water Rights Management System Report Management System (eWRIMS RMS) – Users report usage into a centralized system that is tied to water license management, allocations and GIS. The system is also used for fee determination and to assess fines for non-compliance.
- Other systems in Kansas, North Dakota, Colorado, and Indiana may merit further investigation.

Case Study 1: Alberta's Water Use Reporting System (WURS)

"Water use data is the basis for all kinds of water management and policy development. We need to know how much we have, how much we use, and how much we can allow people to use in the future."

~ Interview with Stephen Yeung, Acting Approvals Manager for the Lower Athabasca Region

System Description

Alberta Environment and Sustainable Resource Development's Water Use Reporting System is an online water use reporting system that collects data on water diversion and use from water license holders across the Province. Of the cases reviewed in this study, Alberta appears to be the most proactive in continually evolving their system and finding new ways to use it. WURS is currently being used to support water licensing and monitoring, planning, and policy development.

Data collected includes: volumetric data, diversion rate for surface water, groundwater levels and water chemistry data. Frequency of data collection and reporting are set on a case-by-case basis in the conditions of each water license, depending on the anticipated impact of each project. High impact projects are required to report daily or weekly, whereas lower impact projects may report monthly or annually. Initially, online reporting was voluntary; however, a couple of years ago Alberta Environment went through and amended all of the major water licenses (including all oil and gas licenses) to make reporting through WURS mandatory. The preferred method of data collection is water metering; however, alternate approved methods are specified in Alberta's Water Measurement Guidebook. License holders can access their own data in the system, internal staff have access to the entire database, and the public can access the data through the Freedom of Information process. Alberta Environment is working on a project to provide public access in the future, the theory being that greater accessibility of data will increase accountability of water users.

Enforcement of water reporting requirements is also changing as a result of WURS. In the past, when the system was paper-based, routine water audits were conducted to ensure compliance. The new system has an automatic compliance function that emails non-compliant license holders a warning and copies it to compliance staff. The function has yet to be enabled because of staffing limitations. It is being redesigned to target high risk areas without overwhelming staff. Under the *Water Act* (2000) there is an administrative penalty that requires users to pay a fine if there is a contravention of the *Water (Ministerial) Regulation* (1998). In the case of an individual, the fine is limited to not more than \$50,000; for corporations, the fine is limited to not more than \$500,000 on each contravention. Fines are assessed on a case-by-case basis by compliance staff, and additional fines may be levied if there is an environmental impact. If a license holder does not report on water use, their license is not in good standing, and compliance staff can revoke it, rendering it non-renewable or transferable.

Policy Context

Incorporating water use monitoring and reporting into the licensing terms puts it under the statutory authority of Directors, also known as Approvals Managers. Stephen Yeung, Acting Approvals Manager for the Lower Athabasca Region and leader of the development and implementation of WURS, describes how the system fits under existing legislation as follows:

There is no explicit directive about water use reporting in the *Water Act*. The requirements of reporting are indirectly indicated in the following sections under the *Water Act*:

Section 51(3) specifies the Director may issue a license subject to any terms and conditions that the Director considers appropriate.

Section 54(1) (a) (iii) allows the Director to amend a term or condition that relates to a monitoring, reporting or inspection requirement.

Section 55(1) (f) subject to the regulations, the Director may cancel or suspend a license if it has been proven that there was no use of water over a period of 3 years.

In the *Water (Ministerial) Regulation*, Section 15(1) (a) (iii) specifies what information, including 'monitoring data,' can be accessed by the public. (Email correspondence, 18 February 2014)

This discretionary approach provides flexibility to adapt data collection and reporting requirements to suit the needs of particular projects and the changing nature of water resources. The flexibility enabled by Alberta's governance model appears to foster an environment conducive to innovation and system improvement.

Representative's Evaluation of System and Advice

In his interview Stephen Yeung shared the following views on WURS:

- **Evaluation of system effectiveness:** The system is working well. It has gone through many upgrades in terms of functionality since it was created in 2005, though the age of the system platform limits the possibilities for integrating newer GIS and smart functions.
- **His views on the benefits and weaknesses of the system:**
 - Benefits include more real data to inform decision-making and make accurate water use assessments. Data transfer from paper forms to the old system was inefficient. With WURS "staff are focusing more on actual science and analysis". It has helped to identify high and low risk water use projects and to optimize use of internal resources.
 - Weaknesses are those associated with having an Information Technology (IT) system. Some of those who report daily have encountered issues of compatibility when uploading data from their data loggers. When the system was new it was not compatible with Apple computers; this was resolved by converting it to a Firefox base. Internet connections in remote regions have been problematic. Staff have to manually set up reporting requirements for licenses in the system which takes time.
- **Areas for system or system usage improvement:** Adding a GIS map interface. There is a pilot project in the south with automatic reading devices on water intake sites, uploading to the system automatically via satellite. It is cost intensive, but provides real time high quality data.
- **Advice for others:** Test the system, identify limitations and take the time to address them. Be sure to align system design and organizational structures. For example, Alberta's approval model is regional; therefore, they have to support a centralized system from a regional model. To do so they have a Business Committee with regional staff participation. The system itself is supported by a central group that maintains it and works with regional staff. The Business Committee sets the direction, while a wider IT Committee works on enhancements.

Case 2: Ontario's Water Taking Reporting System (WTRS)

"In general the use of an online interface to collect data is more efficient and makes the user more accountable for their data."

~ Representative, Ontario Ministry of Environment

System Description

Ontario Ministry of Environment's Water Taking Reporting System (WTRS) collects data on volumes of water taken daily by Permit to Take Water Holders. The primary role of the system is to collect water taking volumes. It was brought in to eliminate the old paper system and reduce the need for data entry. It is linked to active permits in a separate permitting system. Data from the system is used in a number of different ways. Within the Ministry data is used for water budgets, reports for the Great Lakes Charter, policy and program development. The system has enabled Ontario to provide actual instead of predicted water use in their Great Lakes Charter reports, to improve policy development and support the work of other Ministries and Conservation Authorities. Partners use the data for water budgeting, low water response, and agricultural work.

"Permit holders are legally required to record how much water they take each day. Data includes: purpose, location, water source (e.g. ground or surface), maximum amount allowed per day, permit number and the expiry date of the permit" (MOE 2010). Permit to Take Water Holders are those who take more than 50,000 litres of water per day. Daily data collection is required and reported on an annual basis, on or before March 31st of the following year. Water takings are to be measured by a flow or volumetric meter on each source, or, if that is unfeasible, by one of the approved calculation methods specified in MOE's Technical Bulletin (MOE 2010). Calculated volumes are required to be within 20% accuracy or better, and it is recommended that a meter be used at least once a year to cross-check calculated daily volumes. Online reporting is voluntary and users can input data directly into WTRS or fill out a data template and email it in to be entered. The decision to keep online reporting voluntary was made to achieve the highest possible compliance rate, and to support users with limited internet access or who are unfamiliar with computers. The public can access to data through the Freedom of Information Office.

Policy Context

"In Ontario, water takings are governed by the Ontario Water Resources Act (OWRA) and the Water Takings Regulation. Section 34 of the OWRA requires anyone taking more than 50,000 litres of water a day, with some limited exceptions, to obtain a Permit to Take Water from the Ministry of Environment" (MOE 2010). The Water Takings Regulation (Reg. 387/04) came into to effect on January 1, 2005. Section 9 of the regulation requires all permit holders to collect, record and report data on daily volumes of water withdrawals. Data collection was phased in over three years (2005-2008)¹.

¹ Ministry of Environment. 2010. Technical Bulletin: Permit to Take Water Program – Monitoring and Reporting of Water Takings.
http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079790.pdf

Representative's Evaluation of System and Advice

The Ontario Ministry of Environment representative interviewed provided the following system evaluation and advice:

- **Evaluation of system effectiveness:** The system is more efficient, makes the user more accountable for their data, and is working well.
- **Views on the benefits and weaknesses of the system:**
 - Benefits: "The efficiency of it all."
 - Weaknesses: The user interface could be improved for users with multiple permits. Currently, data has to be extracted for staff or partner use, as there is no process in place for them to easily access the database. Another weakness of IT systems generally is that there will be some who refuse to adopt it (e.g. some farmers in their experience), and will require an alternate way to report.
- **Areas for system or system usage improvement:** Improved access tools for internal users could be created. An improved way to collect and maintain contact information would be useful, as the current linkage to the permitting system often means this information is out of date, complicating outreach and support activities of the unit in charge of the system.
- **Advice for others:** "Know your audience. If you need to, find a couple of ways to get compliance. Be willing to work with your reporters to help them understand how to use the interface." Provide a help desk and supporting documentation. Recognize that support tools may need to be refined over time to address emerging issues. In more complex systems, it is important to do stakeholder testing. Remember that a help desk can be used as a good source of feedback for how to improve a system in the future.

Ontario's system is a good example of a simple system that is managed by its own IT unit and working well. They are able to extract data for analysis by staff, partners and the public and thereby support a variety of water management functions in addition to fulfilling their reporting requirements under the Great Lakes Charter.

Case 3: Michigan's Online Water Use Reporting System

"The primary reason for the online system is to streamline the process and make it easier for us and users."

~ Representative, Michigan Department of Environmental Quality

System Description

Michigan Online Water Use Reporting System (MOWURS) is unique in that it was developed jointly by the Department of Environmental Quality (DEQ) and the Department of Agriculture and Rural Development² (DARD). The system was developed in collaboration with Michigan State University's Institute for Water Resources along with a surface Water Withdrawal Assessment Tool (WWAT). Its main purpose is to fulfill Michigan's obligations under the Great Lakes Compact to better understand and track their baseline water use and report on water usage. DARD is also using the system to help identify areas of increased water use and potential water stress. Other uses and better integration with WWAT are currently being explored by the Water Use Advisory Council which drove MOWURS' development.

Initial attempts to co-develop the user interface failed due to different departmental preferences and data requirements for agricultural versus non-agricultural water users. To resolve these issues the system developer worked with each department in tandem to build a custom user interface, which reports into the same underlying database. Non-agricultural users have been reporting through the DEQ interface since 2011 and agricultural users through the DARD interface since 2013.

All system users report monthly water use data on an annual basis. Non-agricultural users report on: location of groundwater withdrawals, discharge volume (used to determine consumption), and total withdrawal volume. Agricultural users report on: purpose of water use, number of acres under irrigation, volume of use, and the location of water withdrawals. Reporting is required based on capacity to withdraw water and annual thresholds of use. On the DEQ side, any property owner with the capacity to withdraw 100,000 gpd must be registered and report if their water use in any given year is greater than 1.5 million gallons. On the DARD side, agricultural producers with a pumping capacity of 70 gpm or more are required to report if they take more than 200 gpd for more than 90 days a year. There is no required measurement method at present, which is problematic. As the DEQ representative put it:

Because there is no standard, any wild guides or estimate at water use is acceptable. It gets even worse because that 1.5 million gallon threshold is also the cut off for the annual fee – anyone under it is exempt from the \$200 annual fee – which means we probably get underestimates to get out of paying it.

While farm lobbying resulted in a lack of annual fee on the agricultural side, Eaton cited similar concerns about the lack of consistent methods: "There is no enforcement because there is no way to do it without metering." Due to the lack of agricultural fees, this relatively simple IT system was paid for by DEQ. This income disparity has also led to differences in system administration: online reporting is voluntary for DEQ users and mandatory for agricultural users. A DEQ survey found a significant number of their users were not interested in changing how they report, and they chose to keep online reporting

² To better understand the twinned system, two interviews were conducted for this case: one with Abigail Eaton, Manager of the program for agricultural water use reporting, Department of Agriculture and Rural Development, and another with the chief administrator for water reporting, Department of Environmental Quality.

voluntary to “make it as easy on our users as possible.” In contrast, Eaton used her discretionary authority to make online reporting mandatory for agricultural users to deal with staffing shortages. Agricultural users who are unfamiliar with computers can go into the Conservation District office in their county for help inputting data into the system. Users can see their own data and internal staff can access the entire database.

Policy Context

As with all other states and provinces in the Great Lakes Basin, Michigan is a party to the Great Lakes Charter (1985/2001) and the 2005 Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement (or the Agreement). The Great Lakes–St. Lawrence River Basin Water Resources Compact, or Great Lakes Compact, is an interstate compact through which states meet their commitments under the Agreement. Under the Compact, Michigan is legally required to track and keep a database of water use data and report annually to the Office of Great Lakes and the International Joint Commission. The Compact’s aim is to “create a baseline inventory of water uses in the Great Lakes Basin in order to get a prohibition on transferring water out of the Basin”(DEQ).

In 2006 the Natural Resources and Environmental Protection Act (1994) was amended to include Part 317, Section 32707 on Great Lakes Preservation. Water monitoring of large withdrawals is required under this amendment; however, the method of reporting is not specified. Online reporting was brought in to streamline data gathering and the pre-existing water database was upgraded at the same time.

Representative’s Evaluation of System and Advice

The two Michigan representatives interviewed offered the following system evaluations and advice:

- **Evaluation of system effectiveness:** (DEQ): The system fairly simple and working well. (DARD): The system is coming along, though they encountered challenges with software setup and administration in the beginning. The systems is more efficient than paper filings and allows them to follow-up and achieve more complete fillings, due to reporting stop-gaps (e.g. entering lat-long for groundwater is required to complete an online submission).
- **Views on the benefits and weaknesses of the system:**
 - Benefits: (DEQ): Increased efficiency of data entry and well received by some users. (DARD): “More benefits than weaknesses.” They have had problems with a lack of unique system identifiers; one benefit of the system is it puts the onus on users to state when they have transferred ownership or management of a pump. It’s more efficient and fixes the problem of users losing paper filings. Large-users especially appreciate the system.
 - Weaknesses: (DEQ): Lack of scrutiny before data goes into database. (DARD): “People get frustrated with technology, and you can’t anticipate everything.” Computer types and internet connections to remote areas can be problematic.
- **Areas for system or system usage improvement:** (DEQ): Improve user help prompts and add a supervisory approvals option. (DARD): Integrate with surface water tool and permitting process.
- **Advice for others:** (DEQ): Test with the system’s target audience. (DARD): “Be careful with giving too much flexibility early. Be clear in what you want.” Use unique IDs to avoid duplication.

Case 4: Washington's Online Reporting System

"We have spent the past 10 years building a water reporting system and getting compliance from users. It's a lot of hand-holding because people have to spend thousands of dollars. I think BC should look at it carefully in terms of bang for the buck, at what's most effective. Having users pay for installation and working for compliance, or the state managing that or contracting it out?"

~ Jeff Marti, State of Washington's Department of Ecology

System Description

The State of Washington's Department of Ecology uses its Online Reporting System (ORS) to track the volumes of withdrawals or diversions from water rights holders who meet one of three criteria:

1. Surface water diversions greater than one cubic feet of water per second
2. Diversions and withdrawals from surface and groundwater sources that support fish stocks classified as critical or depressed by the Washington Department of Fish and Wildlife
3. Have had a water permitting decision since 2002 (DOE website)

The system is used to achieve compliance with the state's water right measurement rule (Rule 173-173 in Washington's Administrative Code (WAC)).

Water withdrawal or diversion data collection and reporting requirements depend on the location and quantity that is being diverted; generally, the more water, the more frequently reporting is required (e.g. daily or weekly for large users). Measurement devices are specified in the regulation: meters or weirs unless the user successfully petitions for an alternate method. Online reporting is voluntary, but encouraged. Department of Ecology staff are the only ones who can access the data. The system is integrated with a separate water licensing and water rights database, as meter rights and water rights share a common ID.

Policy Context

Washington's experience with water measurement and reporting illustrate the importance of the legal and political structures within which reporting systems function. In his interview, Jeff Marti, an environmental planner who was involved in drafting the 2001 water right measurement rule (173-173 WAC), described several challenges Ecology has faced due to their history of water rights management and reporting. The online system's use is limited to compliance and documentation of users' water rights due to: a complicated compliance process, hundreds of thousands of historical water claims that have yet to be adjudicated and who are not required to report, and a 1999 court ruling against Ecology that requires them to achieve 80% metering compliance in 16 Fish Critical Basins across the state.

Marti compares their 'self-reporting model', which is costly to users yet brings them little in the way of benefits and produces a fragmented view of the state's water use, to government or contracted models in other states like Colorado, where the state owns and maintains metering equipment and has Water Commissioners gathering data on water use. While these systems may cost more, he has seen examples of how these systems allow much more sophisticated water use tracking and management.

Representative's Evaluation of System and Advice

In his interview Jeff Marti provided the following evaluation and recommendations to others considering online reporting:

- **Evaluation of system effectiveness:** “In terms of self-reporting, the system works well for big users (e.g. utilities, water systems). For smaller users, the administrative and logistical workload makes the value questionable. In terms of looking at aggregate use, it would be worthwhile to consider other methods (e.g. statistical or remote sensing).”
- **Views on the benefits and weaknesses of the system:**
 - Benefits: From a state perspective, the program is low cost as users are paying for infrastructure, and maintaining the data system and working with users to get them reporting requires minimal staff (one person for each of the four major areas). Another advantage to users of the system is that it allows them to continually document their water right and keep it valid, thus firming up their property right. It is also useful to be able to look at the database and see water use on a watershed level.
 - Weaknesses: There is a high cost burden to users for measurement equipment, and they have little incentive to read or maintain them properly. “We don’t charge people for the water; we don’t have any leverage over them except with a convoluted compliance process.” The value of the system is limited because a lot of effort is invested, yet only a small fraction of water users are reporting. Reliance on self-reported data also creates risks in terms of data quality and consistency.
- **Areas for system or system usage improvement:** If the resources were available, Marti would prefer a system similar to Colorado’s with contracted meter readers, as it allows better reporting discipline and meter maintenance. Would also like to have better incentives to make people want to meter and track their own water use.
- **Advice for others:** “Keep it simple. When I look at our metering rule, we made it so that the frequency of reporting was set depending on how much water was diverted or withdrawn, and the gradation is too fine (i.e. <10 gpm, 10-49 gpm, >50 gpm) – it just makes it too complicated. Use a basic number that makes measuring and recording easier for users.”

4.3. *Do you see any areas for system or system usage improvement?*

4.4. *Please rank your system on a scale of one to five, with 1 meaning 'poor' and 5 meaning 'excellent' for the following indicators:*

4.4.1. **Efficiency:** 1 2 3 4 5

4.4.2. **Usability:** 1 2 3 4 5

4.5. *Is there anything more you would like to add or advice you would give others looking to implement a new online water use reporting system?*

Thank you for your time and sharing your views with me today.

Appendix B: Alberta – Water Act, Revised Statutes of Alberta 2000, Chapter W-3

Note: There is no explicit directive about water reporting in the Water Act; however, the requirements of reporting are indirectly indicated in the highlighted sections of the Act and Water (Ministerial) Regulation (205/1998) – Stephen Yeung, Alberta Environment

Province of Alberta

WATER ACT

Revised Statutes of Alberta 2000

Chapter W-3

Current as of December 11, 2013

Issuance of licences, preliminary certificates

51(1) On application for a licence by a person in accordance with this Act, the Director may, subject to subsection (2) and sections 34, 46 and 47, issue or refuse to issue

- (a) a preliminary certificate to that person, or
- (b) a licence to that person for
 - (i) the diversion of water, or
 - (ii) the operation of a works,

for any purpose specified in the regulations.

(2) On application by the Government in accordance with this Act, the Director may issue a licence to the Government but to no other person, or may refuse to issue a licence, for

- (a) the diversion of water,
- (b) the operation of a works, or
- (c) providing or maintaining a rate of flow of water or water level requirements

for the purpose of implementing a water conservation objective.

(3) Subject to section 68, the Director may issue a licence under this section subject to any terms and conditions that the Director considers appropriate. [...]

Amendments

54(1) If an amendment of a licence does not increase the volume of the diversion of water specified in the licence, the Director may, subject to the regulations and subsection (3), amend a licence

- (a) on the Director's own initiative, without the consent of the licensee,

(iii) to amend a term or condition that relates to a monitoring, reporting or inspection requirement, [...]

Suspension, cancellation

55(1) The Director may suspend or cancel a licence

- (a) on the request of the licensee,
- (b) if a licence has been issued in error,
- (c) if there is an emergency or if in the Director's opinion it is necessary for public safety purposes,
- (d) if the licensee is indebted to the Government,
- (e) if there is non-performance of or in the opinion of the Director there is a serious breach of any term or condition of the licence,

(f) if, subject to the regulations, the Director is of the opinion that

(i) there has been no diversion of any of the water allocated in the licence, or there has been a failure or ceasing to exercise the rights granted under the licence, over a period of 3 years, and

(ii) there is no reasonable prospect that the licensee will resume diversion of all or part of the water specified in the licence or resume the exercise of the rights granted under the licence, [...]

Province of Alberta

WATER ACT

WATER (MINISTERIAL) REGULATION

Alberta Regulation 205/1998

With amendments up to and including Alberta Regulation 62/2013

Part 4

Access to Information

Disclosure of information

15(1) Subject to this section,

(a) the following documents and information in the possession of the Department that are provided to the Department in the administration of the Act **must be disclosed to the public** in the form and manner provided for in this Regulation:

(i) documents and information in a registry established by the Department for that purpose;

(ii) information, applications, plans and specifications that are provided to the Department as part of an application

(A) by an applicant for an approval, licence or registration,

(B) by the holder of an approval, in respect of an application to amend a term or condition of the approval,

(C) by the holder of a preliminary certificate, in respect of an application to amend a term or condition of the preliminary certificate,

(D) by the licensee, in respect of an application to amend a term or condition of the licence, and

(E) for a transfer of an allocation of water under a licence;

(iii) verified monitoring data and the processing information that is necessary to interpret that data, that is provided by an approval holder or licensee in accordance with a term or condition of the approval or licence, or the Act or this Regulation;

Additional Wording from Water Act that may be relevant

Providing information

167(1) An approval holder, preliminary certificate holder, licensee or traditional agriculture user or the holder's, licensee's or user's administrator, receiver, receiver-manager or trustee shall, to the Director on the request of the Director, forthwith submit information, data, records, reports and documents with respect to the approval, preliminary certificate, licence or registration or a related matter, as required by the Director.

(2) Subsection (1) applies whether or not there are terms and conditions in the approval, preliminary certificate, licence or registration with respect to submitting information, data, records, reports and documents.

1996 cW-3.5 s167

Sources:

Province of Alberta. 2013. *Water Act: Revised Statutes of Alberta 2000, Chapter W-3.*

http://www.qp.alberta.ca/1266.cfm?page=w03.cfm&leg_type=Acts&isbncln=9780779733651 (accessed 17 February 2014)

Province of Alberta. 2013. *Water (Ministerial) Regulation, Alberta Regulation 205/1998.*

http://www.qp.alberta.ca/documents/Regs/1998_205.pdf (accessed 17 February 2014)

Appendix C: Ontario Water Resources Act, Ontario Regulation 387/04, Section 9 – Data and Reporting

Ontario Water Resources Act
Loi sur les ressources en eau de l'Ontario

ONTARIO REGULATION 387/04

WATER TAKING

Consolidation Period: From August 10, 2007 to the [e-Laws currency date](#).

Last amendment: O. Reg. 451/07.

-----Section 9-----

Data and Reporting

Duties of permit holders

9. (1) Every person to whom a permit has been issued under section 34 of the Act shall collect and record data on the volume of water taken daily. O. Reg. 387/04, s. 9 (1).

(2) The data collected under subsection (1) shall be measured by a flow meter or calculated using a method acceptable to a Director. O. Reg. 387/04, s. 9 (2).

(3) On or before March 31 in every year, every person to whom subsection (1) applies shall submit to a Director, in the form and manner approved by the Director, the data collected and recorded under subsection (1) for the previous year. O. Reg. 387/04, s. 9 (3).

(4) Subsections (1), (2) and (3) do not affect a Director's discretion, under subsection 34 (6) of the Act, to impose terms and conditions in issuing a permit and to alter the terms and conditions of a permit after it is issued. O. Reg. 387/04, s. 9 (4).

(5) Subsections (1) and (3) are phased in as follows:

1. Persons described in subsection (6) are governed by subsection (1) on and after July 1, 2005 and by subsection (3) in and after the year 2006.

2. Persons described in subsection (7) are governed by subsection (1) on and after January 1, 2006 and by subsection (3) in and after the year 2007.

3. Persons described in subsection (8) are governed by subsection (1) on and after January 1, 2007 and by subsection (3) in and after the year 2008. O. Reg. 387/04, s. 9 (5).

(6) Paragraph 1 of subsection (5) applies to every person to whom a permit has been issued under section 34 of the Act for taking water for any of the following purposes:

1. Large municipal residential systems and small municipal residential systems, both as defined in Drinking Water Systems,
2. The purposes listed in subsection 5 (5), subject to subsections 5 (6) to (9).
3. The operation of a plant governed by any of the following regulations, made under the *Environmental Protection Act*:
 - i. Ontario Regulation 560/94 (Effluent Monitoring and Effluent Limits — Metal Mining Sector).
 - ii. Ontario Regulation 215/95 (Effluent Monitoring and Effluent Limits — Electric Power Generation Sector).
 - iii. Ontario Regulation 561/94 (Effluent Monitoring and Effluent Limits — Industrial Minerals Sector).
 - iv. Ontario Regulation 64/95 (Effluent Monitoring and Effluent Limits — Inorganic Chemical Sector).
 - v. Ontario Regulation 214/95 (Effluent Monitoring and Effluent Limits — Iron and Steel Manufacturing Sector).
 - vi. Ontario Regulation 562/94 (Effluent Monitoring and Effluent Limits — Metal Casting Sector).
 - vii. Ontario Regulation 63/95 (Effluent Monitoring and Effluent Limits — Organic Chemical Manufacturing Sector).
 - viii. Ontario Regulation 537/93 (Effluent Monitoring and Effluent Limits — Petroleum Sector).
 - ix. Ontario Regulation 760/93 (Effluent Monitoring and Effluent Limits — Pulp and Paper Sector). O. Reg. 387/04, s. 9 (6).

(7) Paragraph 2 of subsection (5) applies to every person to whom a permit has been issued under section 34 of the Act for taking water for any of the following purposes:

1. Any industrial or commercial purpose not described in subsection (6).
2. Wildlife and conservation purposes. O. Reg. 387/04, s. 9 (7).

(8) Paragraph 3 of subsection (5) applies to every person to whom a permit has been issued under section 34 of the Act for taking water for any of the following purposes:

1. Any of the following, as defined in subsection 1 (1) of Drinking Water Systems:

i. A small municipal non-residential system.

ii. A large municipal non-residential system.

iii. A small non-municipal non-residential system.

iv. A large non-municipal non-residential system.

v. A non-municipal seasonal residential system.

vi. A non-municipal year-round residential system.

2. Agriculture.

3. Any purpose not described in subsection (6) or (7). O. Reg. 387/04, s. 9 (8)

Source: Service Ontario e-Laws. http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_040387_e.htm
(accessed 17 February 2014)

Appendix D: Excerpt of Michigan's NREPA Part 327, Section 32707 – Great Lakes Preservation

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT (EXCERPT) Act 451 of 1994

324.32707 Reporting requirements; forms; water use reporting fees.

Sec. 32707.

(1) Except as provided in subsections (2) and (3), a person who is required to register under section 32705 or holds a permit under section 32723 shall file a report annually with the department on a form provided by the department. Reports shall be submitted by April 1 of each year. Except as provided in subsection (8), reports shall include the following information:

- (a) The amount and rate of water withdrawn on an annual and monthly basis.
- (b) The source or sources of the water supply.
- (c) The use or uses of the water withdrawn.
- (d) The amount of consumptive use of water withdrawn.
- (e) If the source of the water withdrawn is groundwater, the location of the well or wells in latitude and longitude, with the accuracy of the reported location data to within 25 feet.
- (f) If the source of water withdrawn is groundwater, the static water level of the aquifer or aquifers, if practicable.
- (g) Other information specified by rule of the department.
- (h) At the discretion of the registrant or permit holder, the baseline capacity of the withdrawal and, if applicable, a description of the system capacity.
- (i) At the discretion of the registrant or permit holder, the amount of water returned to the source watershed.
- (j) Beginning in 2010, an acknowledgment that the registrant has reviewed applicable environmentally sound and economically feasible water conservation measures prepared under section 32708a.

(2) If a person reports the information required by this section to the department in conjunction with a permit or for any other purpose, that reporting, upon approval of the department, satisfies the reporting requirements of this section.

(3) The owner of a farm who reports water use under section 32708 is not required to report under subsection (1).

(4) The department may, upon request from a person required to report under this section, accept a formula or model that provides to the department's satisfaction the information required in subsection (1).

(5) The department shall develop forms for reporting under this section that minimize paperwork and allow for a notification to the department instead of a report if the annual amount of water withdrawn by a person required to report under this section is within 4% of the amount last reported and the other information required in subsection (1) has not changed since the last year in which a report was filed.

(6) Information described in section 32701(d)(i)(B) that is provided to the department under subsection (1)(h) is exempt from disclosure under the freedom of information act, 1976 PA 442, MCL 15.231 to 15.246, and shall not be disclosed unless the department determines that the withdrawal is causing an adverse resource impact.

(7) Except as otherwise provided in this subsection, a person who files an annual report or notification under this section shall annually remit a water use reporting fee of \$200.00 to the department. Water use reporting fees shall be remitted to the department in conjunction with the annual report or notification submitted under this section. The department shall transmit water use reporting fees collected under this section to the state treasurer to be credited to the water use protection fund created in section 32714. A water use reporting fee is not required for a report or notification related to a farm that reports withdrawals under section 32708 or for a report under subsection (8).

(8) A person who withdraws less than 1,500,000 gallons of water in any year shall indicate this fact on the reporting form and is not required to provide information under subsection (1)(a) or (d). A person who withdraws less than 1,500,000 gallons of water in any year is not required to pay the water use reporting fee under subsection (7).

History: Add. 1995, Act 59, Imd. Eff. May 24, 1995 ;-- Am. 1996, Act 434, Imd. Eff. Dec. 2, 1996 ;-- Am. 2003, Act 148, Imd. Eff. Aug. 8, 2003 ;-- Am. 2006, Act 33, Imd. Eff. Feb. 28, 2006 ;-- Am. 2008, Act 182, Imd. Eff. July 9, 2008

Popular Name: Act 451

Popular Name: NREPA

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(<http://www.legislature.mi.gov/%28S%28rs2wrl3tm1ger355gxptmfy1%29%29/mileg.aspx?page=getObject&objectName=mcl-324-32707>) (accessed 17 Feb 2014)

Appendix E: Legislation and Statutes relating to Washington's Water Measurement Rule

For more information on Washington State's laws and rules governing water use measurement, see their Measuring Water Use website at:

<http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html>

RCW 90.03.360

Controlling works and measuring devices — Metering of diversions — Impact on fish stock.

(1) The owner or owners of any water diversion shall maintain, to the satisfaction of the department of ecology, substantial controlling works and a measuring device constructed and maintained to permit accurate measurement and practical regulation of the flow of water diverted. Every owner or manager of a reservoir for the storage of water shall construct and maintain, when required by the department, any measuring device necessary to ascertain the natural flow into and out of said reservoir.

Metering of diversions or measurement by other approved methods shall be required as a condition for all new surface water right permits, and except as provided in subsection (2) of this section, may be required as a condition for all previously existing surface water rights. The department may also require, as a condition for all water rights, metering of diversions, and reports regarding such metered diversions as to the amount of water being diverted. Such reports shall be in a form prescribed by the department.

(2) Where water diversions are from waters in which the salmonid stock status is depressed or critical, as determined by the department of fish and wildlife, or where the volume of water being diverted exceeds one cubic foot per second, the department shall require metering or measurement by other approved methods as a condition for all new and previously existing water rights or claims. The department shall attempt to integrate the requirements of this subsection into its existing compliance workload priorities, but shall prioritize the requirements of this subsection ahead of the existing compliance workload where a delay may cause the decline of wild salmonids. The department shall notify the department of fish and wildlife of the status of fish screens associated with these diversions.

This subsection (2) shall not apply to diversions for public or private hatcheries or fish rearing facilities if the diverted water is returned directly to the waters from which it was diverted.

[1994 c 264 § 85; 1993 sp.s. c 4 § 12; 1989 c 348 § 6; 1987 c 109 § 92; 1917 c 117 § 37; RRS § 7389. Formerly RCW [90.28.070](#).]

Notes:

Findings -- Grazing lands -- 1993 sp.s. c 4: See RCW [79.13.600](#).

Severability -- 1989 c 348: See note following RCW [90.54.020](#).

Rights not impaired -- 1989 c 348: See RCW [90.54.920](#).

Purpose -- Short title -- Construction -- Rules -- Severability -- Captions -- 1987 c 109:

See notes following RCW [43.21B.001](#).

Instream flows: RCW [90.22.060](#).

Source: Washington State Legislature. <http://apps.leg.wa.gov/rcw/default.aspx?cite=90.03.360>
(accessed 18 February 2014)

Washington Administrative Code

Chapter 173-173 WAC

Last Update: 12/21/01

REQUIREMENTS FOR MEASURING AND REPORTING WATER USE

Chapter listing

WAC Sections

- [173-173-010](#) What is the purpose of this rule?
- [173-173-015](#) What are the goals of this rule?
- [173-173-020](#) What is the authority for this rule?
- [173-173-040](#) To whom does this rule apply?
- [173-173-045](#) Definitions.
- [173-173-050](#) What water use information may the department require regarding my water use?
- [173-173-060](#) If I must report data regarding my water use, how shall I report it?
- [173-173-080](#) Can the department modify the reporting requirements on a case-by-case basis?
- [173-173-090](#) What are the general requirements for measuring devices?
- [173-173-100](#) What are the specific requirements for meters for pressure systems?
- [173-173-110](#) What are the installation requirements for meters on pressure systems?

- [173-173-120](#) What are the operation and maintenance requirements for meters on pressure systems?
- [173-173-130](#) What are the specific requirements for measuring systems on open channels?
- [173-173-140](#) What are the installation requirements for open channel measuring systems?
- [173-173-150](#) What are the operation and maintenance requirements for open channel measuring facilities?
- [173-173-160](#) Under what conditions is the use of power consumption data acceptable to the department?
- [173-173-170](#) What alternative water measuring devices and methods can I use?
- [173-173-175](#) May I request a variance from the technical and reporting requirements contained in this chapter?
- [173-173-180](#) What recordkeeping responsibilities do I have?
- [173-173-190](#) Will the department notify the Washington department of fish and wildlife about the status of my fish screens?
- [173-173-200](#) Does the department have authority to enforce this rule?
- [173-173-210](#) Can I appeal the department's order to measure my water use?
- [173-173-220](#) Will the department review this rule in the future to determine if changes are necessary?

173-173-010

What is the purpose of this rule?

(1) This rule establishes standards of acceptability for measuring devices and methods, and requirements for recording and reporting water use data.

(2) All measuring devices or measuring methods required to be installed under this chapter must conform to requirements for measuring devices and methods described in this chapter, or other method(s) approved by the department.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-010, filed 12/21/01, effective 1/21/02.]

173-173-015

What are the goals of this rule?

(1) The department seeks to ensure the reliable, accurate measurement of state water that is diverted, withdrawn, stored and used so that sound decisions may be made in administering state water laws and regulations.

(2) The department has the following specific goals for the enforcement of water measurement and the reporting of measurement data:

- (a) Determining whether water is available for appropriation;
- (b) Assessing and enforcing water rights compliance;
- (c) Understanding the hydrology of surface and groundwaters;
- (d) Protecting instream resources;
- (e) Managing and planning the state's watersheds;
- (f) Informing water users about how much and when water is used.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-015, filed 12/21/01, effective 1/21/02.]

173-173-020

What is the authority for this rule?

(1) RCW [90.03.360](#) directs the department of ecology to require that diversions allowed by all new surface water permits be either metered or measured by other approved methods.

(2) RCW [90.03.360](#) also directs the department to require metering or measurement by other approved methods as a condition for all previously existing water rights or claims if:

- (a) The diversion or withdrawal is from waters in which the salmonid stock status is depressed or critical, as determined by the Washington department of fish and wildlife; or
- (b) The flow rate of the surface water diversion exceeds one cubic foot per second.

(3) RCW [90.44.050](#), 90.44.250 and 90.44.450 give the department authority to require that groundwater withdrawals are measured, and to require that information about the amount of water being withdrawn be reported to the department.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-020, filed 12/21/01, effective 1/21/02.]

173-173-040

To whom does this rule apply?

The requirements of this chapter apply to the owner or owners of any source water diversion or source withdrawal and to the department.

(1) Any owner or owners of any surface water diversion are required by state law (RCW [90.03.360](#)) to measure and regulate their water use.

(2) The department must enforce the requirement to measure water use for the following types of water use:

(a) All new surface water permits;

(b) New and existing surface water rights where the diversion of any volume of water is from waters containing depressed or critical salmonid stock;

(c) New and existing groundwater rights where the department concludes that the withdrawal of any volume of water may affect surface waters containing depressed or critical salmonid stock;

(d) Existing surface water rights where the diversion volume exceeds one cubic foot per second.

(3) This chapter only applies to source diversions and withdrawals and is not intended to apply to customers of a municipality or public water supply system or members of an irrigation district or similar secondary users.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-040, filed 12/21/01, effective 1/21/02.]

173-173-045

Definitions.

(1) "Approved measuring device" means an instrument or facility constructed and operated in conformance with the requirements of this chapter and that measures the volume or flow rate of water which is diverted, withdrawn, stored, or used.

(2) "Approved measuring method" means a procedure approved by the department, which, when used with an approved measuring device (if applicable), will allow for an accurate computation of flow rate.

(3) "Control" means a feature that determines the stage-discharge relation. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

(4) "Cfs" means cubic feet per second.

(5) "Controlling work" means a device or structure used for diverting, withdrawing, pumping, impounding, storing, measuring, piping, conserving, conveying, confining or using water.

(6) "Department" means the department of ecology.

(7) "Diversion" means to divert water from one course to another. Diversion, when used without qualification, includes the diversion of surface water and the withdrawal of groundwater.

(8) "Flow rate" means the volume of water that passes through a specific cross section of a pipe or open channel in a specified period of time.

(9) "Gpm" means gallons per minute.

(10) "Open channel flow" means water moving through a canal, flume, ditch, or other unenclosed conduit, and may include flow in a pipe if the pipe is not full and is not under pressure.

(11) "Pipeflow" means water moving through a closed conduit under pressure.

(12) "Rated section" means a cross-section of a stream, river or ditch where a unique relationship between the stage and flow rate has been determined.

(13) "Rating curve" means the relationship between stage and flow rate in a rated stream section.

(14) "Responsible party" means an owner, owners, manager, or appropriator required by RCW [90.03.360](#), 90.44.050, 90.44.250 and 90.44.450, or by a permit, rule, or order issued pursuant to these laws, to use a measuring device or method approved by the department.

(15) "Stage" means the elevation of a water surface in relation to a datum or reference point.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-045, filed 12/21/01, effective 1/21/02.]

173-173-050

What water use information may the department require regarding my water use?

(1) The department may require any responsible party to report data describing the volume of water diverted, withdrawn, used or stored, and other related information.

(2) If a responsible party is required to report information regarding water use, the report must be submitted on a form or in a format prescribed by the department and must include such information as requested by the department. The department may require that the information be submitted in writing or electronically. This information may include, but is not limited to, the following:

(a) The name, address and telephone number of the responsible party;

(b) The location of the point(s) of diversion or withdrawal, the place(s) of use and metering site(s);

(c) The county parcel identification number for the point(s) of diversion or withdrawal, and place(s) of use or area served by the diversion or withdrawal, except that municipalities, public water supply systems and irrigation districts shall not be required to provide parcel identification numbers for their customers, members and secondary users.

(d) The water right number(s) or claim number(s) or other information that indicates the legal basis for the diversion or withdrawal;

(e) The volume and/or flow rate of water diverted or withdrawn;

(f) The make, model and serial number of the measuring device(s) and any separable counting units;

(g) The date the device was last calibrated;

(h) Any date(s) during which the meter or measuring device was not functioning properly;

(i) For flow rate data based upon power consumption, electrical records, pump test data, or other data necessary to verify flow rate estimates;

(j) Whether the intake structure for the diversion has a screen or screens installed to prevent the entry of fish into the diversion works or pump facilities;

(k) The water source name;

(l) For public water systems, the public water system identification number and source number assigned by the department of health.

(3) All responsible parties must attest that the information provided is true and correct to the best of their knowledge.

(4) The department may accept water use information from a stream patrolman on behalf of a responsible party.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-050, filed 12/21/01, effective 1/21/02.]

173-173-060

If I must report data regarding my water use, how shall I report it?

(1) The following requirements to measure and report water use, when the department so requires, shall apply to responsible parties who divert or withdraw water.

Recording and Reporting Requirements			
Average diversion rate in gallons per minute	<10 gpm	10-49 gpm	>50 gpm
Recording frequency	Monthly	Biweekly	Weekly
Volume or rate to report	Maximum rate of diversion	Maximum rate of diversion	Maximum rate of diversion
	Annual total volume	Annual total volume	Annual total volume
Date data must be reported to department	By Jan. 31 of the following calendar year	By Jan. 31 of the following calendar year	By Jan. 31 of the following calendar year
Monthly means calendar month			
Weekly means Monday 12:01 a.m. to Sunday 12:00 p.m.			
Biweekly means once every two weeks			
Daily means 12:01 a.m. to 12:00 p.m.			
1 gallon per minute is equivalent to .002 cubic feet per second			

(2) Where a device capable of indicating flow rate is not installed, a responsible party may determine the maximum flow rate by measuring the volume of water that is diverted over a brief time period when the system is operating under maximum demand.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-060, filed 12/21/01, effective 1/21/02.]

173-173-080

Can the department modify the reporting requirements on a case-by-case basis?

(1) Yes. The department may modify the reporting requirements in WAC [173-173-060](#) of this chapter if it concludes that different reporting requirements are necessary to meet the water measurement and reporting goals described in WAC [173-173-015](#).

(2) The department will provide a written justification and notification to the responsible party.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-080, filed 12/21/01, effective 1/21/02.]

173-173-090

What are the general requirements for measuring devices?

(1) No withdrawal or diversion of water shall be made unless the measuring devices and facilities are in proper operating condition, except when:

(a) A measuring device or facility is being repaired according to the requirements of subsection (2) or (3) of this section; and

(b) The responsible party uses a substitute measuring device or other method to measure the diversion or withdrawal or to provide a reasonable estimate thereof.

(2) Upon discovery of a malfunctioning measuring device or facility, the responsible party shall repair the device or facility and make them operable as soon as possible.

(3) If a responsible party does not comply with WAC 173-173-090(2), the department may order that a measuring device or facility be repaired or replaced within a specified time period.

(4) Measuring devices and facilities must register and be calibrated for the full range of discharge from the diversion or withdrawal for which they are to be used.

(5) On an open channel diversion, all flow diverted shall be measured as close to the point of diversion as possible.

(6) There shall be no turnouts or diversions between the source of water and the measuring devices and facilities, except for faucets or other small outlets that have a *de minimis* effect on the diversion or withdrawal.

(7) In those cases where wells are authorized for the purpose of supplementing surface waters with water from combined sources, both sources of water shall be metered.

(8) In the case of intermittent artesian wells, the meter shall be installed in a manner that will measure both pumped and flowing discharge.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-090, filed 12/21/01, effective 1/21/02.]

173-173-100

What are the specific requirements for meters for pressure systems?

(1) At any flow rate measured by the meter, the meter itself shall be rated by the manufacturer to register not less than ninety-five percent, nor more than one hundred five percent, of the water actually passing through the meter.

(2) At any flow rate measured by the measuring system; i.e., meter plus any secondary equipment such as data recorders; the system shall register not less than ninety percent, nor more than one hundred ten percent, of the water actually passing through the system.

(3) The meter shall have a visual totalizer or the facility shall be capable of totalizing the flow. The totalizer shall contain sufficient recording digits to ensure that "roll over" to zero does not occur before the next recording period.

(4) The department may require that the measuring device be capable of indicating flow rate as well as totalized flow.

(5) For other conditions necessary to ensure accurate and precise measurement data, the selection, installation and maintenance of measuring devices by water users shall be guided by generally accepted industry standards, such as the American Water Works Association standards and information from the manufacturer. These standards also shall be used by the department in making decisions as to the appropriate selection, installation, operation and maintenance of measuring devices acceptable under this rule.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-100, filed 12/21/01, effective 1/21/02.]

173-173-110

What are the installation requirements for meters on pressure systems?

Meters required under this rule shall meet the following installation requirements:

(1) The meter shall be installed in accordance with manufacturer specifications.

(2) There shall be a full pipe of water at all times when water is being withdrawn.

(3) The meter shall not be installed in a manner that creates an uneven velocity profile. Straight sections of pipe before and after the meter, straightening vanes or other flow conditioning devices shall be used to provide even flow through the meter as necessary.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-110, filed 12/21/01, effective 1/21/02.]

173-173-120

What are the operation and maintenance requirements for meters on pressure systems?

(1) Meters shall be inspected and maintained as specified by the manufacturer.

(2) Meters shall be field or shop calibrated, as specified by the manufacturer. Meters also shall be field or shop calibrated and/or repaired if they are over or under registering. System diagnostics may substitute for physical calibration of nonmechanical meters.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-120, filed 12/21/01, effective 1/21/02.]

173-173-130

What are the specific requirements for measuring systems on open channels?

The following requirements apply to weirs, flumes, ramps and orifices. For other devices, the department will determine specific requirements on a case-by-case basis.

(1) At any flow rate measured by the measuring system, i.e., the measuring device plus any secondary equipment such as data recorders, the system shall register not less than ninety percent, nor more than one hundred ten percent, of the water actually passing through the system.

(2) In determining a stage-discharge relation for these devices, the distribution of open channel flow measurements shall be sufficient to establish a full range of values for the entire stage-discharge relation.

(3) For other conditions necessary to ensure accurate and precise data, generally accepted industry standards, such as those in the U.S. Bureau of Reclamation "*Water Measurement Manual, Third Edition*" and information from the manufacturer or designer, shall guide the selection, installation, and maintenance of measuring devices and facilities by water users. The department also shall use these standards in evaluating the selection, installation, operation and maintenance of the measuring system.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-130, filed 12/21/01, effective 1/21/02.]

173-173-140

What are the installation requirements for open channel measuring systems?

The measuring facility shall be installed or constructed in accordance with the manufacturer's and/or designer's specifications.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-140, filed 12/21/01, effective 1/21/02.]

173-173-150

What are the operation and maintenance requirements for open channel measuring facilities?

(1) Rating curves shall be recalculated when there is a change in channel conditions that significantly alters flow across the control or once a year, whichever is more frequent.

(2) If the measuring system has no continuous stage recorder, an observer shall read the staff gage and record the reading as close in time as is practical before and after changes in regulation of flow occur.

(3) Measuring facilities shall be operated and maintained to ensure that discharge can be measured accurately.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-150, filed 12/21/01, effective 1/21/02.]

173-173-160

Under what conditions is the use of power consumption data acceptable to the department?

(1) Use of power consumption data may be substituted for more direct flow measurement methods, provided:

- (a) Use of the method is approved in writing by the department;
- (b) Installation of a water meter would be unduly burdensome to the water user;
- (c) The water system maintains a constant or near constant pumping or diversion rate;
- (d) The power meter is dedicated to one diversion or withdrawal;

(e) A pump test is conducted for a minimum duration of two hours and is conducted under normal operating conditions;

(f) The diversion or withdrawal is not a flowing artesian well.

(2) The equation below shall be used when relying upon electrical power consumption to estimate volume or flow rate. This equation also may be used to estimate flow during short periods of meter repair or maintenance if the department finds that reasonable estimates of pump and motor efficiency are available:

$$V = \frac{318,600(kWh)(P_{eff})(M_{eff})}{TDH}$$

Where: V = volume of water pumped in gallons;

318,600 = conversion factor;

kWh = number of kilowatt-hours for the time period in question; e.g., irrigation season, year or minutes;

Peff = pump efficiency as a decimal;

Meff = motor efficiency as a decimal; and

TDH = total dynamic head of the system in feet.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-160, filed 12/21/01, effective 1/21/02.]

173-173-170

What alternative water measuring devices and methods can I use?

Any responsible party may use an alternative water measuring device or method that differs from those described in this chapter, if:

(1) The method is approved in writing in advance by the department; and

(2) The device(s) and installation are certified by a registered professional engineer or other qualified person acceptable to the department to:

(a) Measure all flow diverted or withdrawn in accordance with the pipeflow or open channel accuracy requirements in WAC [173-173-100](#)(2) and [173-173-130](#)(1);

(b) Measure the appropriate volumes and flow rates in WAC [173-173-060](#);

(c) Be installed and operated according to the manufacturer's and/or designer's instructions, and other such conditions as the department may find necessary.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-170, filed 12/21/01, effective 1/21/02.]

173-173-175

May I request a variance from the technical and reporting requirements contained in this chapter?

(1) Yes. Any responsible party may request in writing to the department a variance from the requirements of this chapter pertaining to the:

(a) Acceptable accuracies of measuring devices and methods;

(b) Reporting of water use data;

(c) Calculation of rating curves;

(d) Other provisions as the department may find acceptable.

(2) Provided, the department may not grant a variance from the requirements of WAC [173-173-040](#) or exempt a responsible party of its obligation to comply with RCW [90.03.360](#).

(3) No variance request shall be considered granted until the department has approved it in writing.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-175, filed 12/21/01, effective 1/21/02.]

173-173-180

What recordkeeping responsibilities do I have?

All measurement notes, rating curves, calculations, and data logs should be retained as long as practicable, and copies made available to the department when requested.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-180, filed 12/21/01, effective 1/21/02.]

173-173-190

Will the department notify the Washington department of fish and wildlife about the status of my fish screens?

Yes. The department will notify the department of fish and wildlife regarding the status of fish screens associated with diversions and withdrawal facilities subject to this rule.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-190, filed 12/21/01, effective 1/21/02.]

173-173-200

Does the department have authority to enforce this rule?

Yes. In enforcing this chapter the department can impose such sanctions as are appropriate under the authorities vested in it, including, but not limited to, issuing regulatory orders under RCW [43.27A.190](#) and civil penalties under RCW [90.03.600](#).

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-200, filed 12/21/01, effective 1/21/02.]

173-173-210

Can I appeal the department's order to measure my water use?

Yes. Appeals may be filed with the pollution control hearings board in accordance with RCW [43.21B.230](#), except that appeals of orders to measure water use issued by a court conducting a general adjudication of water rights pursuant to RCW [90.03.110](#) through 90.03.245 shall be filed in accordance with the applicable Washington court rules.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-210, filed 12/21/01, effective 1/21/02.]

173-173-220

Will the department review this rule in the future to determine if changes are necessary?

Yes. The department will initiate a review of the rules established in this chapter if new information, changing conditions, or statutory modifications make it prudent or necessary to consider revisions to the chapter.

[Statutory Authority: RCW [90.03.360](#), 90.44.050, [90.44.]250, [90.44.]450 and chapter [43.21A](#) RCW. WSR 02-02-017 (Order 00-01), § 173-173-220, filed 12/21/01, effective 1/21/02.]

Source: Washington State Legislature. Chapter 173-173 Washington Administrative Code: Requirements for Measuring and Reporting Water Use. <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-173&full=true> (accessed 18 February 2014)