

Tweed Drinking Water System Annual Water Report

Reporting period of January 1, 2015 – December 31, 2015

Prepared For: The Corporation of the Municipality of Tweed

Prepared By:



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared to satisfy the annual reporting requirements of the Provincial Regulations and Guidelines established by the Ministry of the Environment in the Province of Ontario including the section 11 and Schedule 22 reports identified in O.Reg 170/03, Drinking Water Systems Regulation and the Permit to Take Water Reports identified in O.Reg 387/04, Water Taking and Transfer Regulation.

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Report Availability

Population Served:	< 10,000
Website where the annual report can be viewed by the public:	www.twp.tweed.on.ca
Alternate location where annual report will be available for inspection and is free of charge:	Municipal Office
How are system users notified that the annual report is available and is free of charge?	Public access/notice via Municipal Website and Bi-weekly Municipal News Column
Number of Designated Facilities served:	None
Has a copy of this report been provided to all Designated Facilities?	N/A
Number of Interested Parties reported to:	N/A
Has a copy of this report been provided to all Interested Parties?	N/A
The following Drinking-Water Systems receive drinking water from this system:	N/A
Has a copy of this report been provided to connected owners?	N/A

Compliance Report Card

Drinking Water System Number:	220001557
System Owner:	The Corporation of the Municipality of Tweed
Operating Authority:	Ontario Clean Water Agency
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2015 – December 31, 2015

Event Summary	# of Events	Date	Details
Ministry of Environment Inspections	1	July 21, 2015	Announced-Focused Drinking Water Inspection – Final Inspection Rating of 100%
Ministry of Labour Inspections	0		
DWQMS Audits	1	Feb 11, 2015	Re-Accreditation Audit performed by SAI Global
AWQI's	2	May 6 & Nov 20, 2015	AWQI# 123484 AWQI# 127459
Non-Compliance	0		
Community Complaints	0		
Spills	0		

Quality Control Measures

The Corporation of the Municipality of Tweed facilities are part of OCWA's operational Trent Valley Hub. The facilities are supported by hub, regional and corporate resources. Operational Services are delivered by OCWA staff that live and work in the surrounding area.

OCWA operates facilities in compliance with applicable regulations. The facility has comprehensive manuals detailing operations, maintenance, instrumentation, and emergency procedures. All procedures are treated as active documents, with annual reviews.

OCWA has additional "Value Added" and operational support services that the Corporation of the Municipality of Tweed benefits from including:

- Access to a network of operational compliance and support experts at the regional and corporate level, as well as affiliated programs that include the following:
 - Quality & Environmental Management System, Occupational Health & Safety System and an internal compliance audit system.
 - Process Data Collection (PDC) and PDM (WISKI) facility operating information repository, which consolidates field data, online instrumentation, and electronic receipt of lab test results for reporting, tracking and analysis.
 - Work Management System (WMS) tracks and reports maintenance activities, and creates predictive and preventative reports.
 - WonderWare wide-area SCADA system allows for process optimization and data logging, process trending, remote alarming and optimization of staff time.
- Client reporting which includes operational data, equipment inventory, financial statements, maintenance work orders, and capital status reports
- Site-Specific Contingency Plans and Standard Operating Procedures
- Use of accredited laboratories
- Access to a network of operational compliance and support experts at the hub, region and corporate level
- Additional support in response to unusual circumstances, and extra support in an emergency.
- Use of sampling schedules for external laboratory sampling

System Process Description

Raw Source

Raw water sources for the Tweed Drinking Water System are from two separate groundwater wells. The main service well is the Crookston Well or Well #3, Well #1 is only utilized as an emergency stand-by well.

Treatment

No treatment exists at the Well #1 pump house. In the event that this standby well is needed to be put into operation, it is designed to pump water to the Well 3 treatment subsystem for further treatment and disinfection. Well #3 subsystem is equipped with submersible pumps ultraviolet light for primary disinfection and sodium hypochlorite for secondary disinfection. Well #3 (Crookston) has a nitrate uranium removal system (ion exchange). The facility is equipped with on-line, alarmed continuous monitoring for treated water free chlorine residual and turbidity and distribution system free chlorine residual. The facility also contains a well pump lock out system in the case of disinfection failure.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Sodium Chloride	Softener	Sifto Canada Corp
Sodium Hypochlorite	Disinfection	Brenntag

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Cause			Corrective Action Taken
		Parameter	Result	Exceedance of	
May 6, 2015	123484	Pressure	Loss of Pressure due to Maintenance		Boil Water Advisory (BWA) issued after initial call to MOH & SAC. Restore Disinfectant, Flush Mains, resample and retest. BWA lifted on May 8, 2015 @ approximately 2030hrs.
Nov 20, 2015	127459	Total Coliform	12.0 cfu/100ml	0 cfu/100ml	Flush, Re-sample and Re-test Hydrant #67. As well sampled Upstream and Downstream hydrants.

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status

Non-Compliance Identified in a Ministry Inspection:

Ministry of Environment Inspection Rating: 100%

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
n/a				

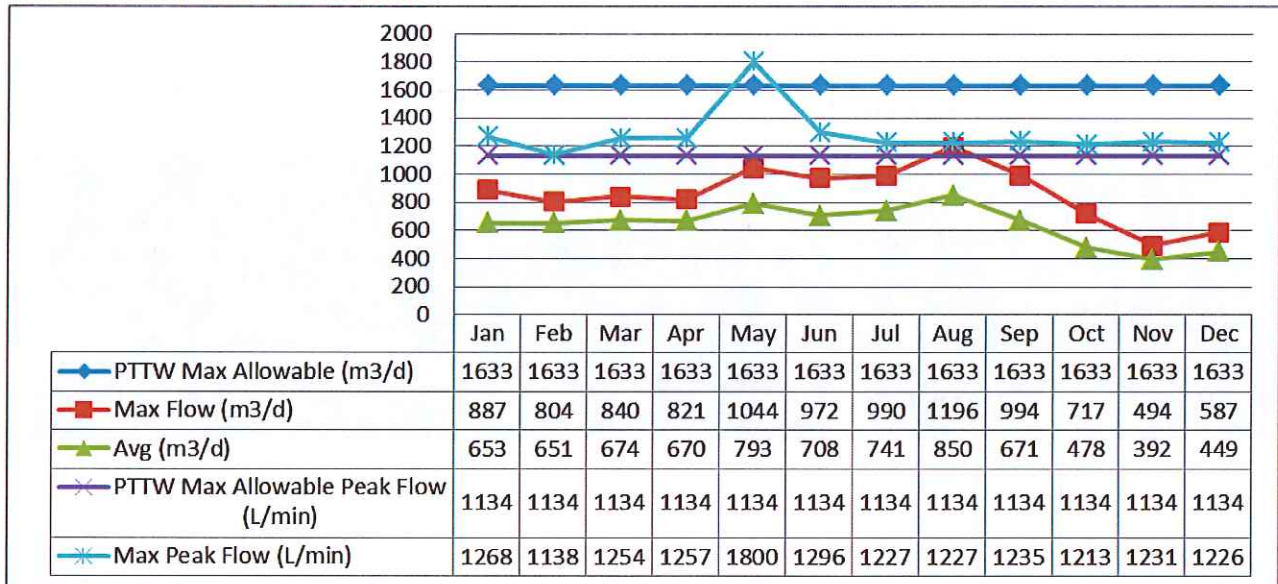
Flows

The Tweed Drinking Water System has a rated capacity of 1633 m³/day.

Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water.

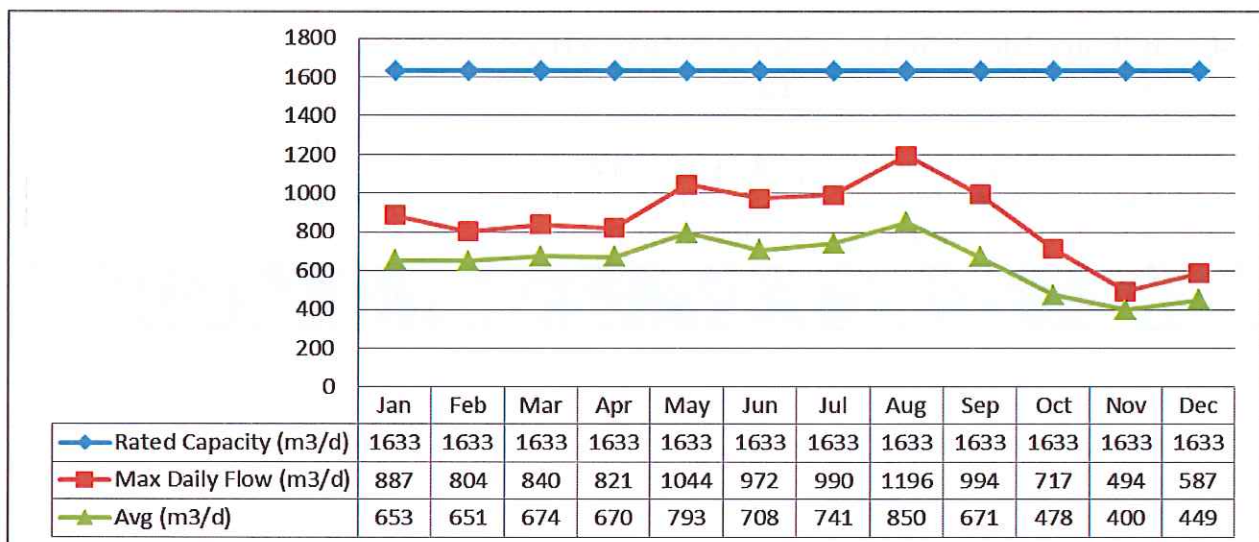
Raw Water Volume Taken: RW3



The above table shows there were exceedances in instantaneous peak flow rate (L/sec) these occurrences were caused during pump start up/pump to waste.

Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.



Regulatory Sample Results Summary

- RW1 =Raw Water Well 1
- RW3 = Raw Water Well 3
- TW=Treated Water
- DW=Distribution Water

Microbiological Testing

Location	Number of Samples	E.coli Results (min) - (max)	Total Coliform Results (min) – (max)	Number of HPC Samples	HPC Results (min) - (max)
Raw Water – RW 1	52	0 - 0	0 - 40	~	~
Raw Water – RW 3	52	0 - 0	0 - 0	~	~
Treated Water - TW	52	0 - 0	0 - 0	52	0 – 28
Distribution - DW	133	0 - 0	0 - 12	133	0 - 65

Operational Testing

On-Line

Parameter	Range of Results (min # - max #)
Treated Free Chlorine	1.07 – 4.25 mg/L
Distribution Free Chlorine	1.15 – 2.79 mg/L
Treated Water Fluoride	Fluoride is not added at this facility

* Instrument spikes and dips recorded by on-line instrumentation were a result of air bubbles and various maintenance and calibration activities. Power interruptions may also cause an instrument reading to drop to zero. All events are reviewed for compliance with O. Reg. 170/03 and if warranted, are reported to the Ministry of Environment as Adverse Water Quality Incidents

In-House

Parameter	# of grab samples taken	Range of Results (min # - max #)
Raw Well 1 Turbidity	12	0.13 – 2.06 NTU
Raw Well 1 UVT	12	92.5 – 98.0 %
Raw Well 3 Turbidity	12	0.10 - 0.38 NTU
Raw Well 3 UVT	12	92.2 – 98.3 %
Treated Free Chlorine	52	1.25 – 2.40
Distribution Free Chlorine	133	0.32 – 2.18

Laboratory - Reg. 170/03

Parameter	# of grab samples taken	Range of Results (min # - max #)
Treated Well 3 Uranium	5	0.03 – 0.42 ug/L
Treated Well 3 Fluoride	4	0.10 – 0.86 mg/L
Distribution Uranium	4	0.09 – 0.14 ug/L

Additional Legislated Samples

Legal Document	Date of Issuance	Parameter	# of grab samples taken	Range of Results (min # - max #)	
PTTW #0687-6K5JCW	March 22, 2006	Raw Well 1	Ammonia	4	0.04 – 0.05 mg/L
			Uranium	4	328 – 387 ug/L
			Nitrate	4	1.14 – 2.50 mg/L
			Nitrite	4	0.14 – 0.19 mg/L
		Raw Well 3	Ammonia	4	0.04 – 0.09 mg/L
			Uranium	4	20.1 – 21.7 ug/L
			Nitrate	4	3.03 – 3.07 mg/L
			Nitrite	4	0.00 – 0.00 mg/L

Lead Sampling

The Lead Sampling Program is required under O.Reg 170/03. This system qualified for the plumbing exemption.

Location	Date	Lead	pH	Alkalinity (mg/L) as CaCO ₃
	<i>Limit/Ranges</i>	10	6.5-8.5	30-500
Hydrant #1	31-Mar-15	0.08	8.04	333
Hydrant #88	31-Mar-15	0.62	8.18	256
Hydrant #15	22-Sep-15	0.01	8.16	248
Hydrant #88	22-Sep-15	0.22	8.27	273

Inorganic Parameters

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level
- Note: Fluoride and Sodium are only required to be tested every 60 months.

TREATED WATER	Sample Date (mm/dd/yyyy)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW3	3/2/2015	0.29	6.0	No	No
Arsenic: As (ug/L) - TW3	3/2/2015	1.4	25.0	No	No
Barium: Ba (ug/L) - TW3	3/2/2015	379	1000.0	No	No
Boron: B (ug/L) - TW3	3/2/2015	26.6	5000.0	No	No
Cadmium: Cd (ug/L) - TW3	3/2/2015	0.007	5.0	No	No
Chromium: Cr (ug/L) - TW3	3/2/2015	0.07	50.0	No	No
Mercury: Hg (ug/L) - TW3	3/2/2015	0.03	1.0	No	No
Selenium: Se (ug/L) - TW3	3/2/2015	<1.0	10.0	No	No
Uranium: U (ug/L) - TW3	10/13/2015	0.036	20.0	No	No
Additional Inorganics					
Uranium: U (ug/L) - TW3	01/05/2015	0.03	20.0	No	No
Uranium: U (ug/L) - TW3	04/13/2015	0.42	20.0	No	No
Uranium: U (ug/L) - TW3	07/13/2015	0.06	20.0	No	No
Uranium: U (ug/L) - TW3	10/13/2015	0.04	20.0	No	No
Fluoride (mg/L) - TW3	01/05/2015	0.83	1.5	No	Yes
Fluoride (mg/L) - TW3	04/13/2015	0.10	1.5	No	No
Fluoride (mg/L) - TW3	07/13/2015	0.86	1.5	No	Yes
Fluoride (mg/L) - TW3	10/13/2015	0.82	1.5	No	Yes
Nitrite (mg/L) - TW3	1/5/2015	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	4/13/2015	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	7/13/2015	<0.003	1.0	No	No
Nitrite (mg/L) - TW3	10/13/2015	<0.003	1.0	No	No
Nitrate (mg/L) - TW3	1/5/2015	2.66	10.0	No	No
Nitrate (mg/L) - TW3	4/13/2015	3.15	10.0	No	No
Nitrate (mg/L) - TW3	7/13/2015	3	10.0	No	No
Nitrate (mg/L) - TW3	10/13/2015	2.58	10.0	No	No

*Uranium and Fluoride typically exceed half of the maximum acceptable concentration (1/2 MAC) as these parameters are considered naturally occurring. To comply with Regulation 170/03 sampling is increased from annually to quarterly. There is no duty to report ½ MAC exceedances; Duty to report only occurs if we exceed the MAC.

Organic Parameters

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Alachlor (ug/L) - TW3	3/2/2015	<0.02	5.00	No	No
Aldicarb (ug/L) - TW3	3/2/2015	<0.01	9.00	No	No
Aldrin+Dieldrin (ug/L) - TW3	3/2/2015	<0.01	0.70	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	3/2/2015	0.040	5.00	No	No
Azinphos-methyl (ug/L) - TW3	3/2/2015	<0.02	20.00	No	No
Bendiocarb (ug/L) - TW3	3/2/2015	< 0.01	40.00	No	No
Benzene (ug/L) - TW3	3/2/2015	<0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW3	3/2/2015	<0.004	0.01	No	No
Bromoxynil (ug/L) - TW3	3/2/2015	<0.33	5.00	No	No
Carbaryl (ug/L) - TW3	3/2/2015	<0.01	90.00	No	No
Carbofuran (ug/L) - TW3	3/2/2015	<0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW3	3/2/2015	<0.16	5.00	No	No
Chlordane: Total (ug/L) - TW3	3/2/2015	<0.01	7.00	No	No
Chlorpyrifos (ug/L) - TW3	3/2/2015	<0.02	90.00	No	No
Cyanazine (ug/L) - TW3	3/2/2015	<0.03	10.00	No	No
Diazinon (ug/L) - TW3	3/2/2015	<0.02	20.00	No	No
Dicamba (ug/L) - TW3	3/2/2015	<0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW3	3/2/2015	<0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW3	3/2/2015	<0.36	5.00	No	No
DDT + metabolites (ug/L) - TW3	3/2/2015	< 0.01	30.00	No	No
1,2-Dichloroethane (ug/L) - TW3	3/2/2015	< 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW3	3/2/2015	<0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	3/2/2015	<0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW3	3/2/2015	< 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	3/2/2015	<0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW3	3/2/2015	<0.4	9.00	No	No
Dimethoate (ug/L) - TW3	3/2/2015	< 0.03	20.00	No	No
Dinoseb (ug/L) - TW3	3/2/2015	<0.36	10.00	No	No
Diquat (ug/L) - TW3	3/2/2015	< 1.0	70.00	No	No
Diuron (ug/L) - TW3	3/2/2015	<0.03	150.00	No	No
Glyphosate (ug/L) - TW3	3/2/2015	<1.0	280.00	No	No
Heptachlor+hepachlor epoxide (ug/L) - TW3	3/2/2015	<0.01	3.00	No	No
Lindane (ug/L) - TW3	3/2/2015	<0.01	4.00	No	No
Malathion (ug/L) - TW3	3/2/2015	< 0.02	190.00	No	No
Methoxychlor (ug/L) - TW3	3/2/2015	< 0.01	900.00	No	No
Metolachlor (ug/L) - TW3	3/2/2015	<0.01	50.00	No	No

Metribuzin (ug/L) - TW3	3/2/2015	<0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	3/2/2015	<0.3	80.00	No	No
Paraquat (ug/L) - TW3	3/2/2015	<1.0	10.00	No	No
Parathion (ug/L) - TW3	3/2/2015	<0.02	50.00	No	No
PCB (ug/L) - TW3	3/2/2015	<0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW3	3/2/2015	<0.15	60.00	No	No
Phorate (ug/L) - TW3	3/2/2015	<0.01	2.00	No	No
Picloram (ug/L) - TW3	3/2/2015	<1.0	190.00	No	No
Prometryne (ug/L) - TW3	3/2/2015	<0.03	1.00	No	No
Simazine (ug/L) - TW3	3/2/2015	<0.01	10.00	No	No
Temephos (ug/L) - TW3	3/2/2015	< 0.01	280.00	No	No
Terbufos (ug/L) - TW3	3/2/2015	< 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW3	3/2/2015	< 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	3/2/2015	< 0.2	100.00	No	No
Triallate (ug/L) - TW3	3/2/2015	< 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW3	3/2/2015	< 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	3/2/2015	<0.25	5.00	No	No
2,4,5-T (ug/L) - TW3	3/2/2015	<0.22	280.00	No	No
Trifluralin (ug/L) - TW3	3/2/2015	< 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW3	3/2/2015	< 0.17	2.00	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2015	13.325	100.00	No	No

Maintenance Summary

OCWA uses a risk-based preventative maintenance framework that ensures assets are maintained to manufacturer's and/or industry standards. Maintenance is completed using various tools and operational supports.

OCWA uses a Workplace Maintenance System (WMS). WMS is a maintenance tracking system that can generate work orders as well as give summaries of completed and scheduled work. During the year, the operating authority at the facility generates scheduled work orders on a weekly, monthly and annual basis. The service work is recorded in the work order history. This ensures routine and preventive maintenance is carried out. Emergency and capital repair maintenance is completed and added to the system.

Capital projects are listed and provided to the The Corporation of the Municipality of Tweed in the form of a "Capital Forecast". This list is developed by facility staff and provides recommendations for facility components requiring upgrading or improvement.

Preventative Maintenance Work Orders Completed	172
Operational Maintenance Work Orders Completed	19
Capital Maintenance Work Orders Completed	1
Weekly Maintenance Work Orders Completed	384

Maintenance Highlights: major expenses incurred to install, repair or replace required equipment

• 2 Preventive Maintenance kits for chlorine pumps	\$675.23
• 2 Chlorine Injector Check Valves	\$185.13
• Injector Wand	\$409.58
• Dehumidifier	\$386.17
• Emergency Repairs Troubleshoot Low Temp Alarm	\$2,429.58
• Emergency Repairs – Failed UV lamp Ignition	\$1,310.62
• Emergency Repairs Diesel Failed to Start, Replaced Fuel Pump	\$1,297.97
• Emergency repairs; replace failed motor contactor on main well pump starter	\$758.98
• Equipment replacement; 1 sensor body UV	\$1,163.45
• Emergency Repairs – Troubleshoot Chart Recorder	\$585.12
• Emergency Repairs – Labour & Parts to repair Pump	\$964.75

QEMS

A Re-Accreditation Audit was conducted by QMI-SAI Canada Limited on February 11, 2015. The Corporation of the Municipality of Tweed’s Quality Management System conforms to the Standard.

Water Taking and Transfer Data

Data for the reporting period of January 1, 2015 - December 31, 2015 was submitted electronically to the Ministry of the Environment on January 27, 2016 under Permit to Take Water #1674-8WAL9T.

The screenshot shows the WTRS web interface. At the top left is the Ontario logo. In the center is the 'environet WTRS' logo. At the top right is the text 'Ministry of the Environment and Climate Change'. Below the logos is a navigation bar with links: WT DATA | REPORTS | SEARCH WT DATA | ADMINISTRATION | USER PROFILE | CONTACT US | HELP | HOME | LOGOUT. Below the navigation bar is a breadcrumb trail: Location: WTRS / WT DATA / Input WT Record. On the right side of the breadcrumb trail is the ID: WTRS-WT-008. A green-bordered box contains the message: 'Water Taking Data submitted successfully.' Below this is a 'Confirmation:' section with the following text: 'Thank you for submitting your water taking data online. Permit Number: 1674-8WAL9T. Permit Holder: THE CORPORATION OF THE MUNICIPALITY OF TWEED. Received on: Jan 27, 2016 7:27 AM. This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.'