



**THOMPSON
RIVERS
UNIVERSITY**

Water Management Plan

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Introduction

Thompson Rivers University is committed to minimizing water consumption by implementing best practices in the University's operations. Water management is a continuous process involving managing behavioural, organizational, and technical change to improve a building's water performance.

In 2018, SES Consulting conducted a Level 1 Water Audit at TRU. According to the associated report, a total of 150,301 m³ of water was used in 2017, costing approximately \$180,000. Reducing water consumption at TRU can be achieved by using low-flow fixtures, replacing grass with drought resistant landscaping, and installing efficient irrigation systems.

This document has been created as an implementation plan for the Water Conservation Measures (WCM) identified in TRU's 2018 Water Audit Report. Presented on a campus-wide basis, as well as for each of TRU's 23 buildings, water use targets have been set based on the potential savings achieved by implementing all of the associated WCMs. Total annual savings, should all actions be completed, would be approximately 42,866 m³, or \$43,295, a 29% reduction over 2017.

Each WCM lists the capital costs for completing the action, the simple payback period, and annual savings in cost, m³ of water, and in some cases GJ's of natural gas (a result of reduced water heating). Should the WCM be approved, a person(s) of interest (POI) will be listed, as well as anticipated timelines for project initiation, installation, commissioning, etc.

Notes:

- To meet BOMA requirements, a water assessment must be conducted on the building every five (5) years, and the Water Management Plan must be reviewed and updated every three (3) years to capture the most up to date data, evaluate progress, and reassess WCMs.
- In the case of BOMA Recertification, building managers are expected to demonstrate which WCMs listed in the previous Water Management Plan have been implemented since certification.

Campus-Wide

Description	The following measures were deemed to be best implemented campus-wide, as they apply to a subset of buildings or the building stock in general.
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Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals* Installing waterless urinals will significantly reduce consumption across campus	\$45,000 (89 units)	3.6	\$12,370	12,296		See individual building information		
Low Flow Toilets* Replacing large tank toilets with low-flow units will significantly reduce consumption across campus	\$89,000 (178 units)	6.6	\$13,531	13,399		See individual building information		
Irrigation Control Upgrade Install a 'smart' irrigation system to avoid unnecessary or ineffective operation	\$50,000	6.9	\$7,210	7,170		6 months	Warren Auschak	Y
Drought Resistant Landscaping Replace grassed areas with drought resistant plants to minimize irrigation water consumption	\$100,000	11.5	\$8,720	8,668		2 Years	Cameron Lindsay	Pending
Science Lab Water Conservation Install tap-flow aerators for all taps, Carry out autoclave water conservation	\$10,000 (342 sinks)	7.5	\$1,340	1,334	10	3 Years	Ben Wiebe	Pending
Faucet Aerators Test aerators to determine accurate flow-rates. Replace aerators as needed (see 'Fixture Specifications' tab for more details).	\$3 each (units TBD)	N/A	N/A	N/A	N/A	1 year	Ben Wiebe	Y

*Note: This report further details these WCMs in each relevant building page. Water savings for these WCMs have been calculated on a per-building basis and will not match the overall campus savings identified in the Water Audit Report.

Campus-Wide

Description	The following measures were found to be in place or deemed not effective from a cost perspective according to the 2018 Water Audit Report.
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Action

Reasoning

Action	Reasoning
Kitchen and Refrigeration Equipment	Low use fixtures and refrigeration equipment is predominantly in use in commercial kitchens on site.
Rainwater Capture	Rainwater capture was evaluated as a potential conservation measure, and while it did not present a good economic opportunity, there is significant opportunity to capture water for on-site irrigation. As a sustainability initiative, it is recommended that this opportunity be evaluated in additional detail.
Laundry Equipment	No commercial laundry equipment was observed on site. The culinary arts kitchen and daycare have residential type washers, but it is not recommended to replace these for water conservation.

Fixture Specifications

Description	This page is intended as a reference for choosing low-flow fixtures for upgrading. They can be employed across campus and are readily available from many manufacturers.
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Fixture	Specifications	Approx. Cost	Notes
Aerator- Handwashing Sink	1.9 LPM (0.5 GPM) or 3.8 LPM (1.0 GPM)	\$3 ea.	Bulk purchasing may reduce costs
Aerator- Kitchen Sink	5.7 LPM (1.5 GPM)	\$3 ea.	Bulk purchasing may reduce costs
Toilets- Retrofit	Retrofit large tanks w/ pressurized insert (ex Eco-Flush)	\$150 ea.	https://wdiecoflush.com/
Toilets- Replacement	4.8 LPF (1.28 GPF) single/ auto- flush or 6.0/ 2.3 LPF (1.6/0.6 GPF) dual- flush	\$500 ea.	Look for EPA WaterSense label
Showerheads	Max 7.6 LPM (2.0 GPM)	\$60 ea.	Look for EPA WaterSense label
Pre-Rinse Spray Valve (Kitchen dishwashing)	5.7 LPM (1.5 GPM) w/ an angular blade	\$60-\$100 ea.	Look for EPA WaterSense label
Dishwashers (Industrial hood-type)	2.5 L/rack	\$2,000-\$5,000 ea.	Look for EnergyStar Label
Dishwashers (Domestic)	3.5 L/cycle	\$500-\$800 ea.	Look for EnergyStar Label
Waterless Urinals	0 LPF	\$500 ea.	

Arts & Education

Building Description	The building is home to many Faculty of Arts classes and labs, as well as being home to teaching options like Early Childhood Education and Bachelor of Education (Elementary). There is a language lab, two computer labs, faculty and administrative offices.				
Built In	1991	Number of Storeys	3	Sq ft	60,924

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
36	38	12	0	0	1



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units.	\$6,067	6.9	\$882	874		Complete	Ben Wiebe	Y
Upgrade Toilets* Replace 36 large tank toilets with low-flow units.	\$18,000	15.8	\$1,142	1131		Complete	Ben Wiebe	Y
								Y/N
								Y/N

*Note: This action was not identified in the 2018 Water Assessment Report

Culinary Arts

Building Description	This building is home to the culinary arts program, as well as administration areas, the Scratch Café and Market, kitchens, and dining areas.				
Built In	1970/ 1983	Number of Storeys	2	Sqft	20,010

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
11	14	4	1	1	14



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units.	\$2,022	2.8	\$717	710		Building to be replaced	Bryce Parks	N
Upgrade Toilets* Replace 11 large tank toilets with low-flow units.	\$5,500	4.5	\$1,229	1217		Building to be replaced	Bryce Parks	N
								Y/N
								Y/N

**Note: This action was not identified in the 2018 Water Assessment Report*

Gymnasium

Building Description	The Gymnasium has a multi-use gym, change rooms, an exercise area, squash and handball courts (now used as storage), and offices. Following the opening of the Tournament Capital Centre in 2007, the Gymnasium now sees very little use. Facilities staff predict the building will be torn down within 10 years.				
Built In	1976	Number of Storeys		Sqft	39,837

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
8	8	2	18	0	0



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units.	\$1,011	14.7	\$69	68		1 year	Ben Wiebe	Y
Upgrade Toilets* Replace 8 large tank toilets with low-flow units.	\$4,000	40.6	\$98	98		1 year	Ben Wiebe	Y
								Y/N
								Y/N

*Note: This action was not identified in the 2018 Water Assessment Report

House 1- Faculty Association*

Building Description	The Faculty Association contains a board room, offices, and a small kitchen.				
Built In	1945	Number of Storeys	2	Sqft	1,367

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
2	2	0	0	0	1

Water Target (m³/ yr)

Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

**Note: Water usage potential savings were not identified in the 2018 Water Assessment*

House 10- Horticulture

Building Description	The Horticulture center consists of two buildings connected on the ground floor. On the main level there is a classroom and lunchroom with a kitchen. There are offices on the second floor. There are three greenhouses, two of which are heated.				
Built In	1945	Number of Storeys	2	Sqft	8,117

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
3	3	0	1	0	1

325

Water Target (m³/ yr)

Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

House 5- Aboriginal Cultural Center

Building Description	Also known as the Gathering House, this building houses offices, a small kitchen, computer labs, a common area, and a gathering area.				
Built In	1945/ 2009	Number of Storeys	2	Sqft	2,777

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
3	3	0	0	1	1



Action

Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Upgrade Toilets* Replace 3 large tank toilets with low-flow units.	\$1,500	10.2	\$147	146		Building to be replaced	Bryce Park	N
								Y/N
								Y/N
								Y/N

**Note: This action was not identified in the 2018 Water Assessment Report*

House 6&7- Research Center

Building Description	The 2nd floor of the East and West sections of this building contain offices, and either a kitchen or washroom. The 1st floors contain offices, lab rooms, a meeting room, and a central workspace. The basements each contain mechanical rooms, lab spaces, and offices. There is a new annex with has offices, a kitchen, meeting room, washrooms, and mechanical room.				
Built In	1945	Number of Storeys	2	Sqft	6,886

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
4	4	0	0	1	1



Action

Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Upgrade Toilets* Replace 4 large tank toilets with low-flow units.	\$2,000	10.9	\$184	182		3 years	Ben Wiebe	Pending
								Y/N
								Y/N
								Y/N

**Note: This action was not identified in the 2018 Water Assessment Report*

House 9- Welcome Center*

Building Description	The Welcome Center contains an open seating area, meeting room, computer room, offices, and a small kitchen.				
Built In	1945	Number of Storeys	2	Sqft	2,937

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks

Water Target (m³/ yr)

Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
No actions recommended								Y/N
								Y/N
								Y/N
								Y/N

**Note: Waste usage potential savings were not identified in the 2018 Water Assessment*

Old Main

Building Description	The building is divided into three blocks. Block A houses the law department, classrooms and offices. Block B houses classrooms and offices. Block C houses art classrooms, food court, and a theatre.				
Built In	1970/ 2014	Number of Storeys	4/2/1	Sqft	270,948

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
65	60	19	1	8	7



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units..	\$9,607	2.3	\$4,133	4092		3 years	Ben Wiebe	Y
Upgrade Toilets* Replace 65 large tank toilets with low-flow units.	\$32,500	5.5	\$5,905	5846		3 years	Ben Wiebe	Y
								Y/N
								Y/N

*Note: This action was not identified in the 2018 Water Assessment Report

Sciences & Health Sciences

Building Description	The building incorporates two computer labs, study spaces, lecture and lab classrooms, lecture halls, faculty offices, research labs, and a coffee/ snack shop.				
Built In	1980	Number of Storeys	3	Sqft	111,137

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
28	22	8	0	0	1



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units.	\$4,045	1.8	\$2,198	2176		3 years	Ben Wiebe	Y
Aerators Install tap-flow aerators on all 342 taps in the science labs.	\$10,000	7.5	\$1,340	1334	10	3 years	Ben Wiebe	Y
Upgrade Toilets* Replace 28 large tank toilets with low-flow units.	\$14,000	4.5	\$3,139	3108		3 years	Ben Wiebe	Y
								Y/N

**Note: This action was not identified in the 2018 Water Assessment Report*

Trades & Technology Center

Building Description	This building houses workshops, various trades classrooms, common rooms, a café, and offices. Workshops include automotive, carpentry, electrical, and welding.				
Built In	1997	Number of Storeys	2	Sqft	109,878

# Toilets	# Handwashing Sinks	# Urinals	# Showers	# Dishwashers	# Kitchen Sinks
23	20	4	2	0	0



Action	Cost	Simple Return	Annual Savings			Timeline	POI	Status
			\$	m ³	GJ			
Waterless Urinals Replace urinals with waterless units.	\$2,022	2.1	\$984	975		5 years	Ben Wiebe	Pending
Upgrade Toilets* Replace 23 large tank toilets with low-flow units.	\$11,500	6.8	\$1,687	1671		5 years	Ben Wiebe	Pending
								Y/N
								Y/N

**Note: This action was not identified in the 2018 Water Assessment Report*