

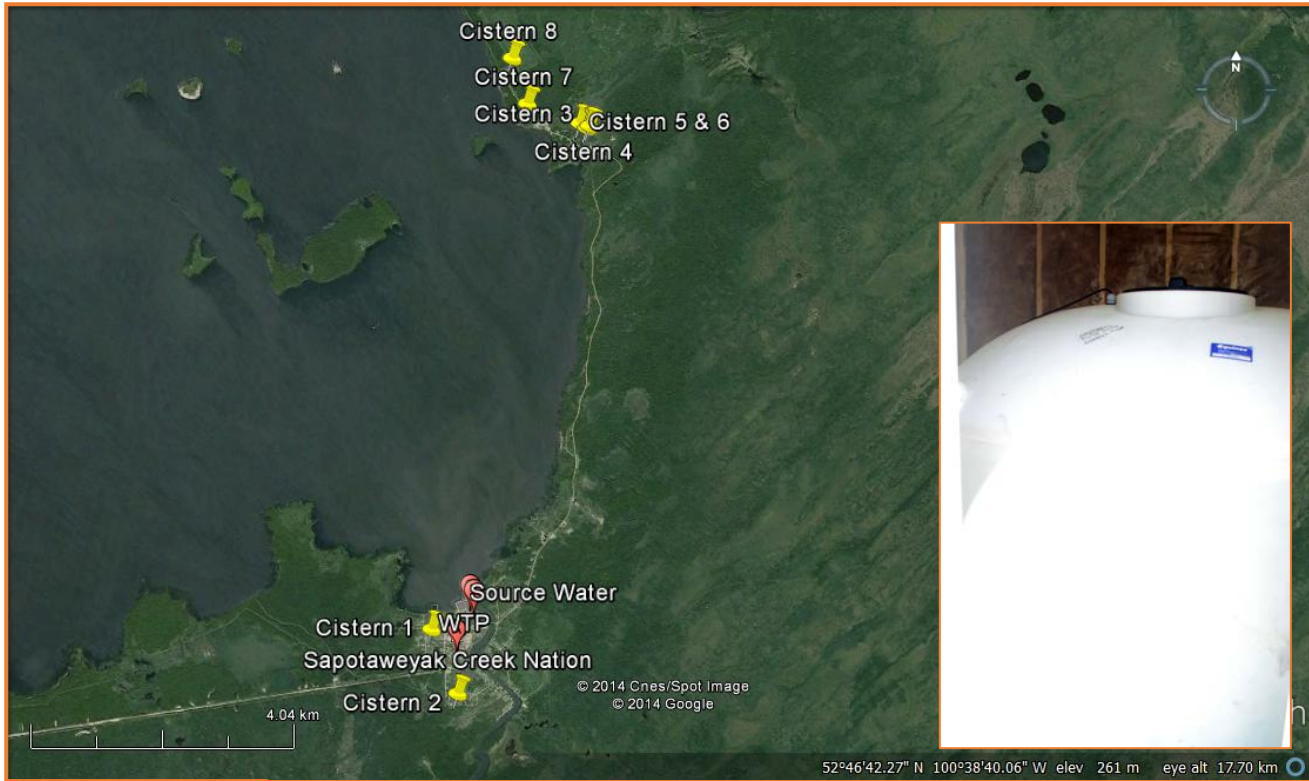
Comparison of drinking water quality in two water distribution systems common to First Nation communities in Manitoba

Sapotaweyak Cree First Nation community

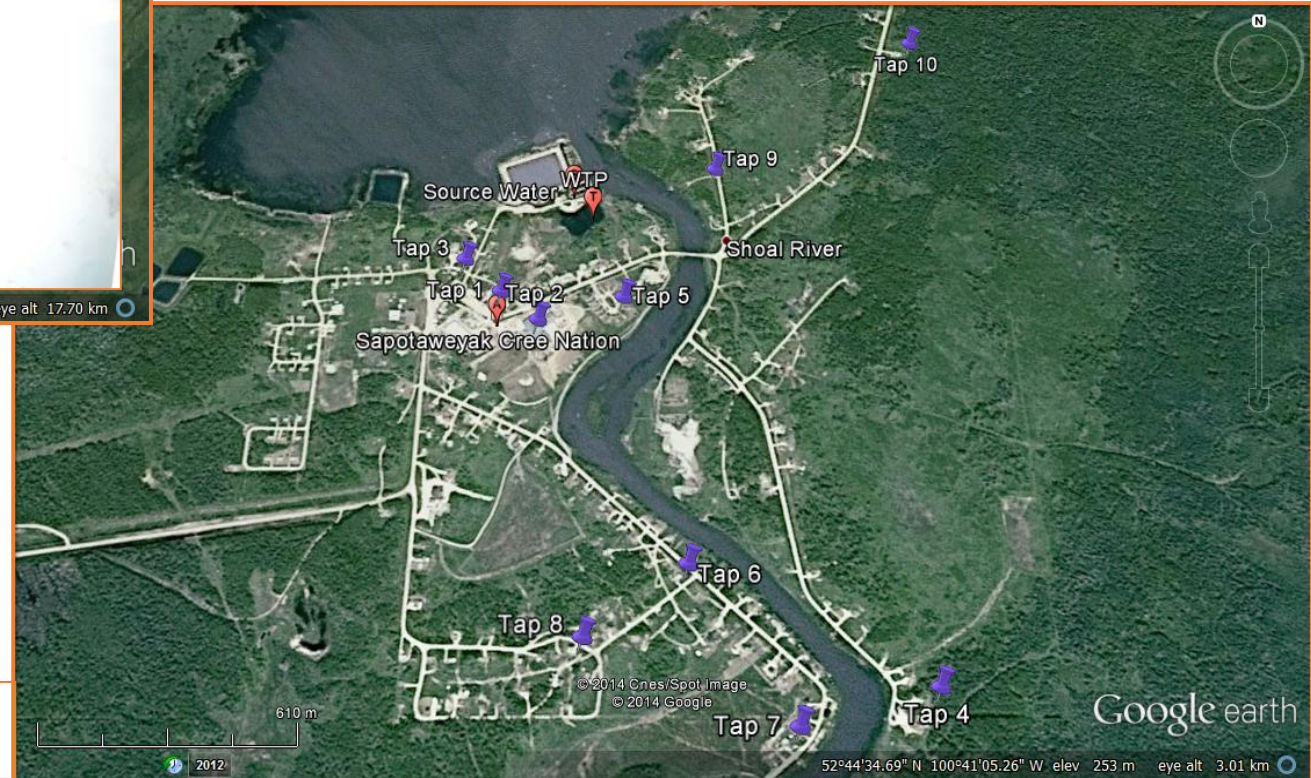
GEETHANI ERAGODA

FRANK COOK

Distribution of cisterns & taps in the community



Cisterns



Main line - Taps

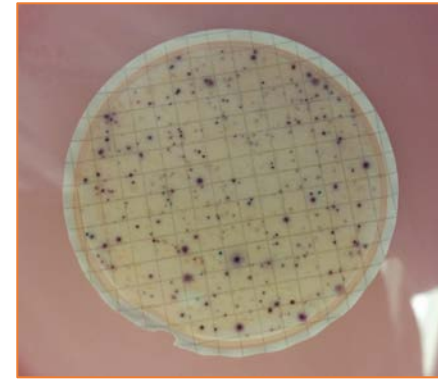
Sample collection

- Around 10 homes from each distribution system to represent the whole community
- Same house to check the temporal variability
- On-site measurements:
 - Free and total chlorine
 - Turbidity
 - Dissolved oxygen
 - pH



Sample analysis

- E.coli/ coliform and Heterotrophic plate count (HPC)- within 48 hrs
 - Filtration method – 100 mL of water sample was filtered through 0.45 μm disposable filter units
 - Place the filter paper on petri dishes with selective media

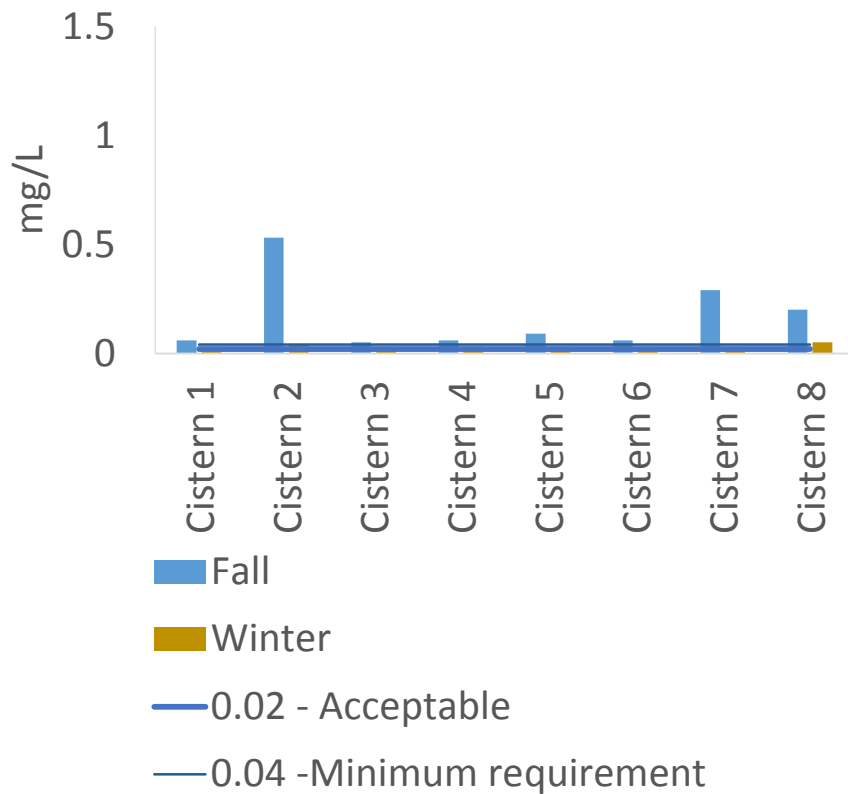


- Disinfection by-products (Trihalomethanes – THM4) by Modified EPA 551 method GC/ECD

Free Chlorine

Cisterns

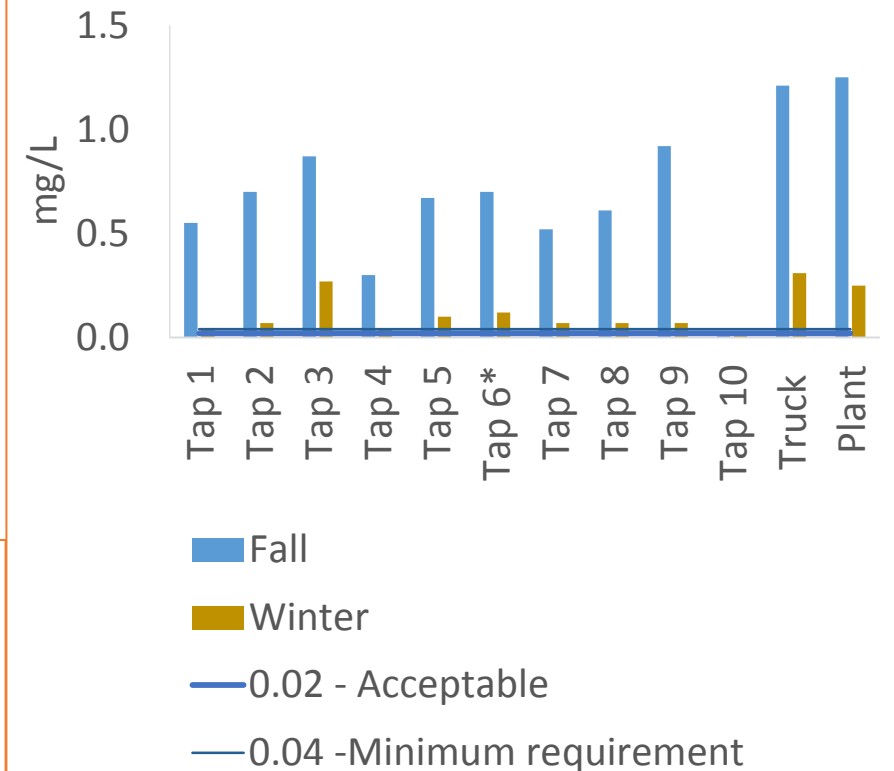
Average = Fall 0.17; Winter 0.03



LOW free chlorine in cisterns

Taps

Average = Fall 0.59; Winter 0.09



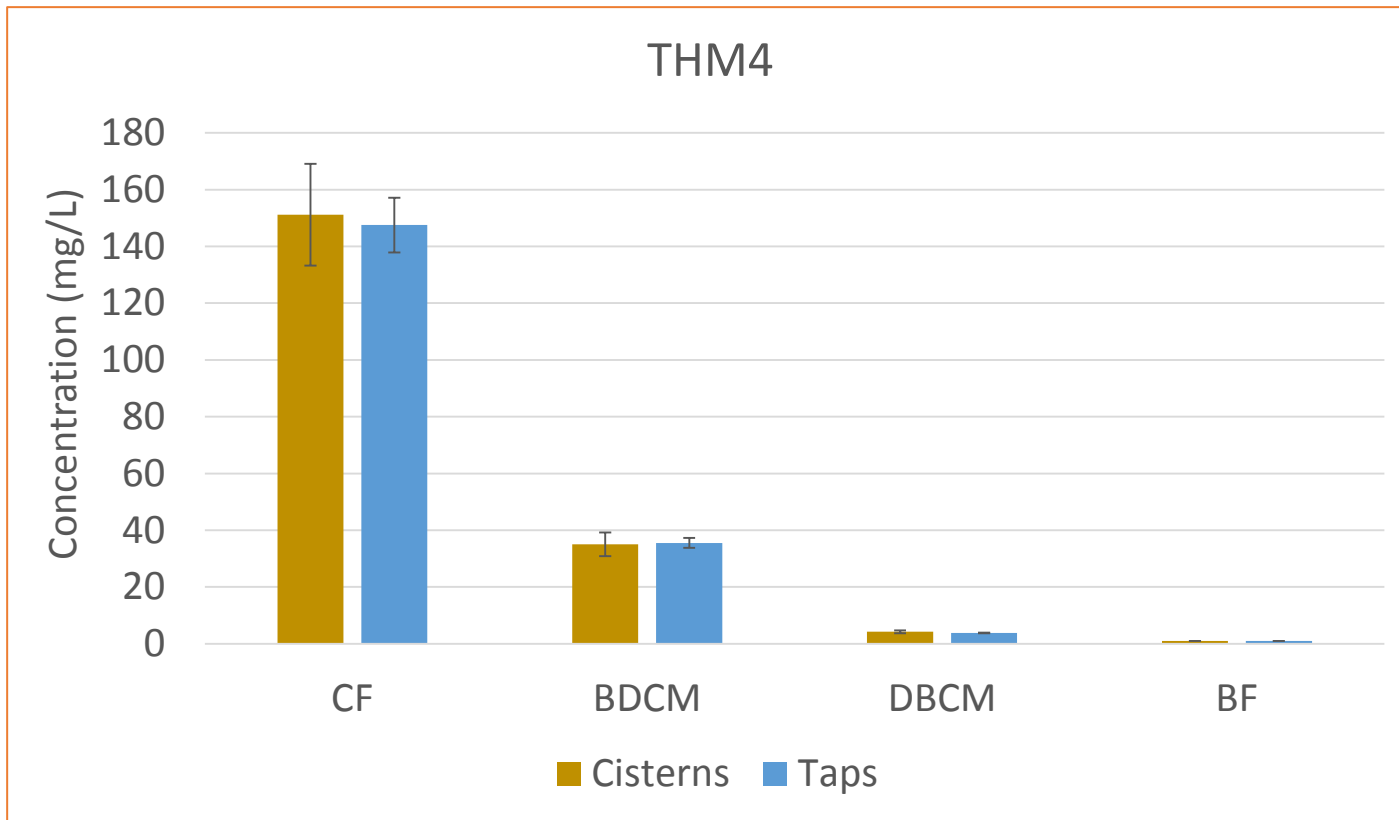
HIGH free chlorine in taps

Microbiology CFU/100 ml

Cistern #	Fall 2014			Winter 2015		
	E.coli	Coliform	HPC	E.coli	Coliform	HPC
1	12	12		0	0	6
2	0	2		0	0	2
3	0	12		1	1	8
4	9	11		0	0	17
5	0	0		0	0	2
6	17	17		0	0	2
7	11	11		6	6	6
8	0	0		0	0	13

Tap#	Fall 2014			Winter 2015		
	E.coli	Coliform	HPC	E.coli	Coliform	HPC
1	0	0		0	0	0
2	0	0		0	0	0
3	0	0		0	0	0
4	0	0		0	0	0
5	0	0		0	0	0
7	0	0		0	0	10
8	0	0		0	0	0
9	0	0		0	0	0
10	0	0		0	0	0

THM4



- No significant difference between cisterns and main line
- High chloroform concentration in all the samples
- Health Canada guideline – 100 mg/L
- THM4 in Cisterns = 191 mg/L & in Taps = 188 mg/L

Conclusions

- Free chlorine concentration was lower in cisterns compared to taps
- Microbial regrowth was observed in six homes with cisterns out of eight cisterns samples in the Fall and only two homes were positive in the winter.
- There was no significant difference in THM concentration in cisterns and taps

Acknowledgement

- Chief, council, and residents of the Sapotaweyak Cree First Nation community
- My supervisors and committee members
- Create H2O
- NSERC Postgraduate Scholarships - Doctoral (PGS D)



Thank you