

Water quality considerations; South Indian Lake Manitoba

O-Pipon-Na-Piwin Cree Nation

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Photo credit google earth

Pollutants

- Flooding of South Indian Lake: The Churchill River Diversion (CRD)
- 1976 was turned into a hydroelectric reservoir supplying water to hydro-electric dams on the Burntwood and Nelson rivers.
- Community had to burn down their houses and move to higher ground as they had their homes all along the narrows.
- Recovery of SIL was predicted 40-50 years.
- Created a new shoreline, still eroding in 2017.
- Increase in sediment supply due to erosion; high levels of mercury.

(Halket, 2018)

Prior to CRD

- Productive riverine system with clear waters, sand and rock beaches.
- Vibrant and healthy shore, composed of many different habitats.
- Healthy and productive fishery.

(Halket, 2018)



Photo credit: Bill Gowans Collection, HBC Corporate Collection



Post CRD

- Sand and rock beaches virtually disappeared, eroding shorelines choked with woody debris
- Poor water quality, cloudy and sometimes reddish plumes from creeks flow into lake
- Disappearance of many plants, animals and insects
- Reduced numbers, poor conditions, size and quality of lake Whitefish and other fish species

(Halket, 2018)

Statistics

- South Indian Lake Manitoba (SIL)
- O-Pipon-Na-Piwin Cree Nation (OPCN)
 - Reserve status 2005
<https://web.archive.org/web/20060621045235/http://www.ncncree.com/opcnrelease.pdf>
- Population (Manitoba Government, 2013)
 - 1452 registered
 - 1052 on reserve
- Resources
 - School K-10
 - Health Complex
 - Northern Store
 - Arena
 - OPCN band office



Water treatment

- Water source: surface water
- Community Water System (CWS)
- Trucked Water System (TWS)
- Waste water: hauled by utility truck to lagoon (pictured)



Photo credit google earth



Photos credit Donald Dysart



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Turbidity NTU		Chlorine mg/L		LITRES
RAW	TREATED	FREE	TOTAL	Distribution
2.91	0.19	2.20	2.20	1052094
2.92	0.18	2.20	2.20	1052199
2.85	0.19	0.79	0.94	1052504
2.92	0.20	0.84	0.93	1052802
2.84	0.82	0.90	1.12	1053091
2.94	0.31	0.93	1.17	1053337
2.75	0.26	0.69	0.90	1053564

Sample monthly flow sheet

Handwritten monthly flow sheet for April 2018. The sheet is titled "April 2018" and "Flow Sheet". It contains columns for Turbidity (RAW and TREATED), Chlorine (FREE and TOTAL), and Litres. The data is written in cursive and matches the table above.

Turbidity		Chlorine		LITRES
RAW	TREATED	FREE	TOTAL	
2.91	0.19	2.20	2.20	1052094
2.92	0.18	2.20	2.20	1052199
2.85	0.19	0.79	0.94	1052504
2.92	0.20	0.84	0.93	1052802
2.84	0.82	0.90	1.12	1053091
2.94	0.31	0.93	1.17	1053337
2.75	0.26	0.69	0.90	1053564

Sample reports

Community Based Water Results Fax Reports to: (204) 983 - 3579

Community: South Indian Lake (318) Name of CBWM: Lloyd A. Mason

DATE: May 3 2012

SPL Number	Sampling Location	Type of Sample	Flow	Chlorine		Residual Chlorine		pH	Quality Test				Comments
				Free (mg/L)	Total (mg/L)	Free Chlorine (ppm)	Total Chlorine (ppm)		Total Solids		Total Phosphorus		
				Free (mg/L)	Total (mg/L)	Free (mg/L)	Total (mg/L)		Free (mg/L)	Total (mg/L)	Free (mg/L)	Total (mg/L)	
12023	WTP - Inlet	WTP	1024	0.51	1.37	A	A	0.08	-	-	-	-	
12024	WTP - Out	WTP	1024	-	-	P	A	2.70	-	1.0	-	-	
12025	Head Office	PHS	1024	1.08	1.36	A	A	1.10					
12026	Head Office	PHS											
12027	Fluorinator In	PHS	1024	0.39	1.05	A	A	1.22					
12028	Fluorinator Out	PHS											
12029	Fluorinator Inlet	PHS	1024	0.12	0.28	A	A	0.74					
12030	Fluorinator Outlet	PHS	1024	0.63	0.72	A	A	1.55					

Temp	Temp	Temp
35°	35°	35°

Operator	Inspector
Lloyd A. Mason	
Signature	Signature
Date	Date
May 3 2012	

Temp	Temp	Temp	Temp	Temp

Provide a copy to CHD weekly. Provide a copy to Chief & Council, Health Director and Water Plant Operator.
 Any violations due to Pathogens or Total Chlorine or T, and must be immediately corrected using Green Tag and Health Canada Form should be attached.

Work to be done

- Investigate: source water, processes at WTP and the supply of treated water to community members
- Attention will be made to the cistern (water tanks) in the homes of community members
- Water quality will be tested before and after creating a carbon filter cartridge that fit the taps (in home) tested in South Indian Lake
- Quantitative and qualitative data collection

References

Google. (2018, May 08). *Google*. Retrieved from Google Maps: <https://www.google.ca/>

Government of Canada. (2018, May 08). *Manitoba*. Retrieved from A History of Mine Site Rehabilitation in Manitoba: https://www.manitoba.ca/iem/mines/oa_rehab_history.html

Halket. (2018, April). Review of Scientific Studies on Southern Indian Lake. Manitoba, Canada: Halket Environmental Consultants.

Manitoba Government. (2013, 02 06). *O-Pipon-Na-Piwin Cree Nation - Connectivity Profile*. Retrieved from Government of Canada: <http://www.aadnc-aandc.gc.ca/eng/1357840941905/1360161876656>