WATER TESTING ON THIRTY-ONE MILE LAKE AND LAKE PEMICHANGAN

RESULTS TO 2015

2015 Final Testing Results

Table 1 provides the annual average water transparency results for the four sites on Thirty-one Mile Lake for the years 2009-2015 and for the two Lake Pemichangan sites for 2012, 2013 and 2015. The results are in metres. For those who measure using the imperial system, one metre is about 3.3 feet. Some of the main takeaways from the results include:

- There is considerable variation across the sites. The readings for the Pemichangan site 689B are noticeably deeper. By contrast, the results for Baie Davis (site 464A) are typically 1.5 to 2 metres shallower than for other sites on the lake.
- There does not appear to be much of a trend either way in the Thirty-one Mile Lake results. The 2014 results for the south end (site 464D) were a bit lower than normal but have recovered in 2015. The Pemichangan results also appear fairly stable although, with only three observations, one cannot be definitive about this.
- Overall, RVSL ranks the water transparency in the two lakes as very clear. Essentially any reading over 4 metres is considered as clear and all our results greatly exceed that minimum.

TABLE 1: THIRTY-ONE MILE LAKE AND LAKE PEMICHANGAN
WATER TRANSPARENCY RESULTS
2009-2015

SITE	2009	2010	2011	2012	2013	2014	2015
	Annual Average of bi-monthly observations in metres						
Thirty-one Mile Lake							
464A: Baie Davis	5.1	4.5	5.9	5.6	5.3	5.3	5.6
464B- Trois Doigts/off Petit Loge	7.2	7.0	7.5	6.8	7.5	7.6	7.6
464C- MacKenzie Bay	7.7	7.2	7.6	7.1	7.6	7.7	7.7
464D- South of Poplar Island	7.6	6.8	7.2	6.6	7.1	6.0	7.1
Lake Pemichangan							
689A- west of Ile Chantigny	x	x	X	7.2	7.4	x	7.8
689B-east of Ile Chantigny	x	x	X	9.0	8.7	x	9.0

Table 2A and 2B provide the chemical test results covering phosphorus, chlorophyll and organic carbon for Pemichangan and Thirty-one Mile Lake respectively. Also provided in the first three rows are values used by RSVL to determine the trophic state of a lake. There are no classification ranges for organic carbon. High levels of organic carbon lend a tea-like colour to water which makes it less transparent than it otherwise would be.

Reviewing the results in Tables 2A and 2B, it is clear that both lakes are classified as oligotrophic. For both phosphorus and chlorophyll, all readings are in the oligotrophic range. Only at one site –Baie Davis on Thirty-one Mile Lake in 2010 – do the numbers even approach the boundary between oligotrophic and mesotrophic. On organic carbon, the RSVL commentary indicates that the Pemichangan and Thirty-one results are quite low. Further, the 2015 results for Thirty-one Mile Lake suggest an improvement in water quality with the numbers for phosphorus and organic carbon all being lower than the corresponding 2009 and 2010 readings.

TABLE 2A: LAKE PEMICHANGAN - CHEMICAL TESTING RESULTS

	Phosphorus		**Chlorophyll**		**Organic Carbon**	
	Micrograms/litre		**Micrograms/litre**		**Milligrams/litre**	
Oligotrophic Range	**<10**		**< 3**		**na**	
Mesotrophic Range	**10 to 30**		**3 to 8**		**na**	
Eutrophic Range	**>30**		**>8**		**na**	
	2012	**2013**	**2012**	**2013**	**2012**	**2013**
	Average of three samples					
689A- west of Ile Chantigny	3.3	4.6	1.1	1.1	2.9	3.0
689B-east of Ile Chantigny	2.5	2.6	0.9	0.8	2.8	3.6

TABLE 2B: THIRTY-ONE MILE LAKE –CHEMICAL TESTING RESULTS

	Phosphorus			**Chlorophyll**			**Organic Carbon**		
	Micrograms/litre			**Micrograms/litre**			**Milligrams/litre**		
Oligotrophic Range	**<10**			**< 3**			**na**		
Mesotrophic Range	**10 to 30**			**3 to 8**			**na**		
Eutrophic Range	**>30**			**>8**			**na**		
	2009	**2010**	**2015**	**2009**	**2010**	**2015**	**2009**	**2010**	**2015**
	Average of three samples								
464A: Baie Davis	5.4	6.9	4.1	1.8	2.7	1.4	5.2	4.4	4.3
464B- Trois	3.0	3.0	2.0	1.5	1.0	1.0	4.0	3.4	2.8

Doigts/off Petit Loge									
464C- MacKenzie Bay	3.9	3.4	2.8	1.4	0.8	0.8	3.5	4.0	3.0
464D- South of Poplar Island	3.4	6.0	2.2	1.2	0.8	1.0	3.2	3.6	3.1

Conclusions and Suggestions

The bottom line is that the water quality of our two lakes is uniformly high. While reassuring, we should probably not be complacent. Both natural and human factors can influence a lake's transparency level and trophic state. Nutrients carried into water bodies from non-point sources such as agricultural runoff, residential fertilisers, phosphate detergents and sewage can all increase the algal biomasss, and can easily cause an oligotrophic lake to become eutrophic over time.

As noted in the background section, the RSVL exercise is very useful in establishing a general baseline for water quality. Over time, that baseline can be used to monitor the effect of major changes in lake use or the surrounding shoreline. But, by design, the survey is extensive rather than intensive. It is limited to certain parameters of water quality namely transparency and biological state. If there are major developments suggested for the lakes –such as the proposed regional park on Thirty-one Mile Lake – or potential major stressors – such as the Pemichangan boat launch site – the Club may wish to consider partnering with the associations to undertake more focussed chemical or biomass testing.

Finally, as also noted earlier, The 2016 transparency testing is ongoing on both lakes. I'll provide an update on the results in early 2017.

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(with information and advice from Kim and Dale Snider, Denis Lacroix and Ed Marga)
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