CAMP

Coordinated Aquatic Monitoring Program

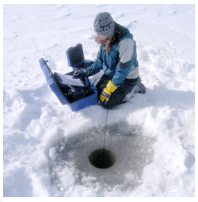
Annual Activity Report

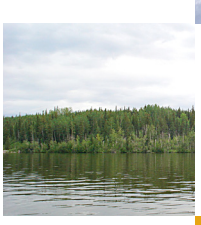
2013/2014

Submitted to:
Minister of Conservation and Water Stewardship

President/CEO Manitoba Hydro

Submitted by:
MOU Working Group





June 2014

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1.0 Summary

The 2013/14 Coordinated Aquatic Monitoring Program (CAMP) marks the sixth year of monitoring since implementation in 2008/09. The program was initiated to address the need for system-wide monitoring to better understand the potential effects of hydroelectric operations on the aquatic environment. CAMP was designed using an ecosystem-based approach using key biological/chemical parameters and hydrometric data to describe the ecological condition and status of aquatic ecosystem health of the waterways in which MB Hydro operates. The parameters selected are scientifically based and were developed from "best advice" obtained from workshops held each year since November 2007 that includes representation from Manitoba Conservation and Water Stewardship, Manitoba Hydro, Fisheries and Oceans Canada, University of Manitoba, Environment Canada and North/South Consultants Inc.

To date, the program has been assessed annually and adjusted accordingly to ensure it maintains scientific credibility and is on scope for meeting objectives of the Memorandum of Understanding. Recent developments to the program include completion of the first three year report describing results from the pilot phase (2008-2010), creation of a data presentation section on the program's website, development of preliminary aquatic ecosystem health indicators, and implementation of a pilot sediment monitoring program on Playgreen Lake. Additional items to be developed over the next few years include implementation of ecosystem health indicators, implementation of the preferred data management option, selection of an appropriate erosion monitoring methodology and broader implementation of the sediment monitoring component.

2.0 Background

The purpose of this report is to provide the signatories of the "Memorandum of Understanding about the Program of LWR/CRD Monitoring Activities (MOU)" with a summary of the 2013/14 Coordinated Aquatic Monitoring Program. The MOU, signed in 2006 by the Province of Manitoba and Manitoba Hydro (Attachment 1), outlines the need to develop a system-wide aquatic monitoring program to address concerns related to potential effects associated with Manitoba Hydro operations. The Coordinated Aquatic Monitoring Pilot Program (CAMPP) was developed and implemented in 2008/09 and operated for the first three years to test sampling methodologies. This 2013/14 annual activity report represents the third year of a fully implemented, post-pilot phase Coordinated Aquatic Monitoring Program (CAMP).

3.0 Meetings

3.1 Working Group

On March 21, 2013, a draft workplan for 2013/14 program was presented to the MOU Working Group which is the oversight committee identified in the MOU (see Attachment 2). Items that were presented and discussed included: 1) review of the 2012/13 CAMP; 2) update on CAMP reporting and data management; 3) presentation and discussion of proposed 2013/14 CAMP workplan; and 4) update on community dialogue efforts. No significant concerns or issues were raised by the Working Group members during the meeting or the two week review period and the 2013/14 workplan was subsequently accepted as presented.

3.2 Subcommittee

The Subcommittee met on April 19, 2013 to discuss a number of technical items as described in Attachment 2.

3.3 Annual Workshop

The annual CAMP Workshop was held on March 7, 2013 and was attended by approximately 30 people representing federal and provincial agencies, private consultants and Manitoba Hydro staff. The main agenda items included presentation and discussion of options for a proposed erosion and sedimentation component for CAMP, an update on the CAMP data management strategy, an overview presentation of the pilot summary report and recommendations, an update on phase 2 of the CAMP website, a discussion on how to utilize CAMP for describing ecosystem health and a number of technical program items (see Attachment 2).

4.0 Summary of Activities

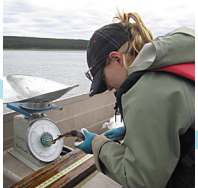
The following summary documents the major activities undertaken by CAMP in 2013/14.

4.1 Field Program

A total of 32 sites (21 on-system and 11 off-system) were sampled for water quality, benthic invertebrates, and fish community during the 2013/14 CAMP. Tissue samples collected during fish community monitoring at 15 sites was submitted for mercury content analysis and water quality samples from four waterbodies were analyzed for phytoplankton community composition and biomass. A list of sample sites and associated field parameters is included in Attachment 3 and a map showing the waterbodies sampled is included in Attachment 4.

4.1.1 Hydrometrics

Hydrometric information associated with hydro developments on Manitoba's waterways is captured in an annual report prepared by Manitoba Hydro, entitled: "Water Power Act Licences Annual Water Levels and Flows Report 2013 Calendar Year", (In Prep). Copies of this report will be forwarded to the Department of Conservation and Water Stewardship once completed.



4.1.2 Aquatic Habitat

An aquatic habitat (bathymetry and substrate) survey was completed at Southern Indian Lake (Area 4) in summer 2013.

4.1.3 Water Quality

Water quality sampling was completed at all sites in the open-water season as planned. Sampling could not be completed at the site located on the lower Churchill River near the Little Churchill River in winter as sufficient water could not be located.

4.1.4 Benthic Invertebrates

All scheduled benthic invertebrate sampling was completed in 2013/14

4.1.5 Phytoplankton

Samples for phytoplankton analysis (i.e., community composition and biomass) were collected from four (Cross, Setting, Split and Assean lakes) annual monitoring sites in the open water sampling period.

4.1.6 Fish Community

All scheduled fish community sampling was completed in 2013/14.

4.1.7 Mercury in Fish

Fish tissue samples collected from 15 waterbodies were submitted for analysis of mercury in 2013/14.

4.1.8 Sediment Monitoring

A sediment monitoring plan was initiated as a pilot program at Playgreen Lake in 2013/14. This monitoring included collection of:

- continuous turbidity data at six locations during open water and winter seasons;
- water samples for total suspended solids (TSS) analysis during open water (n = 632) and winter (n = 124) seasons;
- 40 bed material samples (bedload sampler) during open water; and
- 15 sediment deposition samples (sediment traps) during open water and winter seasons.

4.2 Community Meetings

Manitoba Conservation and Water Stewardship presented and discussed CAMP at a variety of community meetings in 2013/14. A list of these community meetings is provided in Attachment 5.

4.3 Reporting Framework

The first three-year report, documenting results of the pilot program (2008-10) was completed in 2013/14. The CAMP website (www.campmb.com) was upgraded to include a data presentation section.

5.0 Emerging Items

5.1 Indicators of Aquatic Ecosystem Health

A preliminary set of aquatic ecosystem health indicators were selected during the annual CAMP workshop held in March 2014. Use of these indicators will be tested by analyzing all years of available CAMP data from one region. The results of this pilot will be shared with CAMP sub-committee members and scientific advisors at a workshop scheduled for fall 2014. Pending this review, select indicators will be used to analyze data from all remaining CAMP regions and serve as the basis for the next three-year synthesis report (2008-13).

5.2 Annual Reporting via CAMP Website

The CAMP website will continue to be updated with data as it is collected and made available. The first three-year synthesis report (2008-10) will be posted on the website once a final pdf version is completed.

5.3 Sediment and Erosion Monitoring

Sediment monitoring is proposed for Southern Indian Lake (Area 4) in 2014/15. This will be a similar program that was delivered on Playgreen Lake in 2013/14. An erosion monitoring methodology is still being considered, but a decision is expected to be made in fall 2014. One methodology that is being examined is the use of close range photogrammetry. A pilot study using this technique is being conducted by Hydraulic Operations Department on Wuskwatim Lake in summer 2014. The outcome of this study will dictate which erosion method is selected for CAMP. The use of remote sensing to monitor surface water quality, including TSS and turbidity, is being evaluated by MB Hydro R&D staff. Early indications show this technology could be a valuable and affordable tool for assessing surface water quality on a system-wide scale which would be beneficial to CAMP.

Attachment 1

Memorandum of Understanding

Memorandum of Understanding about Program of LWR/CRD Monitoring Activities, dated October 16, 2006.

The Government of Manitoba and Manitoba Hydro are committed to work together on matters relating to monitoring of hydrometric (water level and stream flow) and environmental data in certain areas in the Lake Winnipeg Regulation and Churchill River Diversion system.

Manitoba and Manitoba Hydro have the common objective of developing a program of activities ("the activities"), building on the existing monitoring program of Manitoba Hydro, that would provide objective information about hydrometric and environmental effects of hydro-electric development on agreed rivers and lakes comprising the Lake Winnipeg Regulation and Churchill River Diversion systems ("the system"). The information from the activities could be of benefit to Manitoba, Manitoba Hydro and other interested parties, including communities in the area of the Lake Winnipeg Regulation/Churchill River Diversion project. Objectives of the program of activities would include:

(a) assisting in evaluating whether and to what extent the water regime in areas of the system is or will be affected by the addition of additional hydro-electric facilities;

(b) assisting in identifying adverse effects and positive effects resulting from effects on the water regime; and

(c) assisting in considering measures that may be undertaken to address any identified adverse effects.

Manitoba and Manitoba Hydro may establish additional objectives of the activities.

Manitoba and Manitoba Hydro recognize that Manitoba Hydro has made commitments to monitoring and follow up programs as part of the environmental licensing process for the Wuskwatim Generating Station. These commitments will be considered in developing the activities.

The program of activities will be reviewed each year and annual workplans will developed by Manitoba and Manitoba Hydro to assist in achieving the program of activities. The agreed workplan for the fiscal year ending March 31, 2007 is attached as Appendix A to this Memorandum.

Manitoba and Manitoba Hydro will consider methods of making information from the activities available to interested parties.

It is intended that the nature and scope of activities will be developed starting in Fiscal Year 2006-07 (starting April 1, 2006) and will continue until Manitoba and Manitoba Hydro agree to no longer proceed with a program of activities.

As part of the development of the annual program of activities, Manitoba and Manitoba Hydro will consider the resources each will provide in order to carry out the activities

It is intended that Manitoba and Manitoba Hydro personnel will prepare an Annual Report to be delivered to the Minister of Water Stewardship and the Minister of Conservation, on behalf of Manitoba and to the President and CEO of Manitoba Hydro. Additional reports may be prepared as Manitoba and Manitoba Hydro determine to be appropriate. The Annual Report may include:

- a description of the activities for that year;
- a description of any information determined as a result of the activities;
- information about any circumstances where water levels or flows were outside of ranges provided for in licences;
- methods of making the information available to interested parties and to the public;
- any other matters that are considered appropriate. It is expected that Manitoba and Manitoba Hydro will make the Annual Reports available to the public.

Manitoba and Manitoba Hydro may amend this Memorandum from time to time by further Memorandum.

for Manitoba

Oct. 16, 2006
Date

for Manitoba Hydro

06 09 06
Date

Attachment 2

Summary of 2012/13 CAMP Meetings

MOU Working Group Meeting – March 21, 2013

AGENDA

- Welcome and review of 2013/14 agenda
- Review of 2012/13 Working Group meeting summary / action items
- Review of the 2012/13 CAMP
- Reporting and data management update:
  - CAMP website
  - Pilot program summary report
  - Data management strategy
- Discussion of proposed 2013/14 CAMP work plan
- Update on the system-wide community dialogue effort
- Update on annual activity report

Subcommittee Meeting – April 19, 2013

AGENDA

- Light extinction monitoring
- Lake Winnipegosis water quality sampling
- Phytoplankton taxonomy and biomass
- Lake Winnipeg water quality and benthic invertebrate sampling

Workshop – March 7, 2013

AGENDA

- Presentation and discussion of draft erosion & sedimentation plan
- Update on CAMP data management strategy
- Pilot program summary report overview and recommendations
- Miscellaneous technical items
  - Phytoplankton QA/QC
  - Hg in fish field protocol and QA/QC
  - Lake Winnipeg data sharing
  - Lower Churchill River site relocation
- Ecosystem health discussion

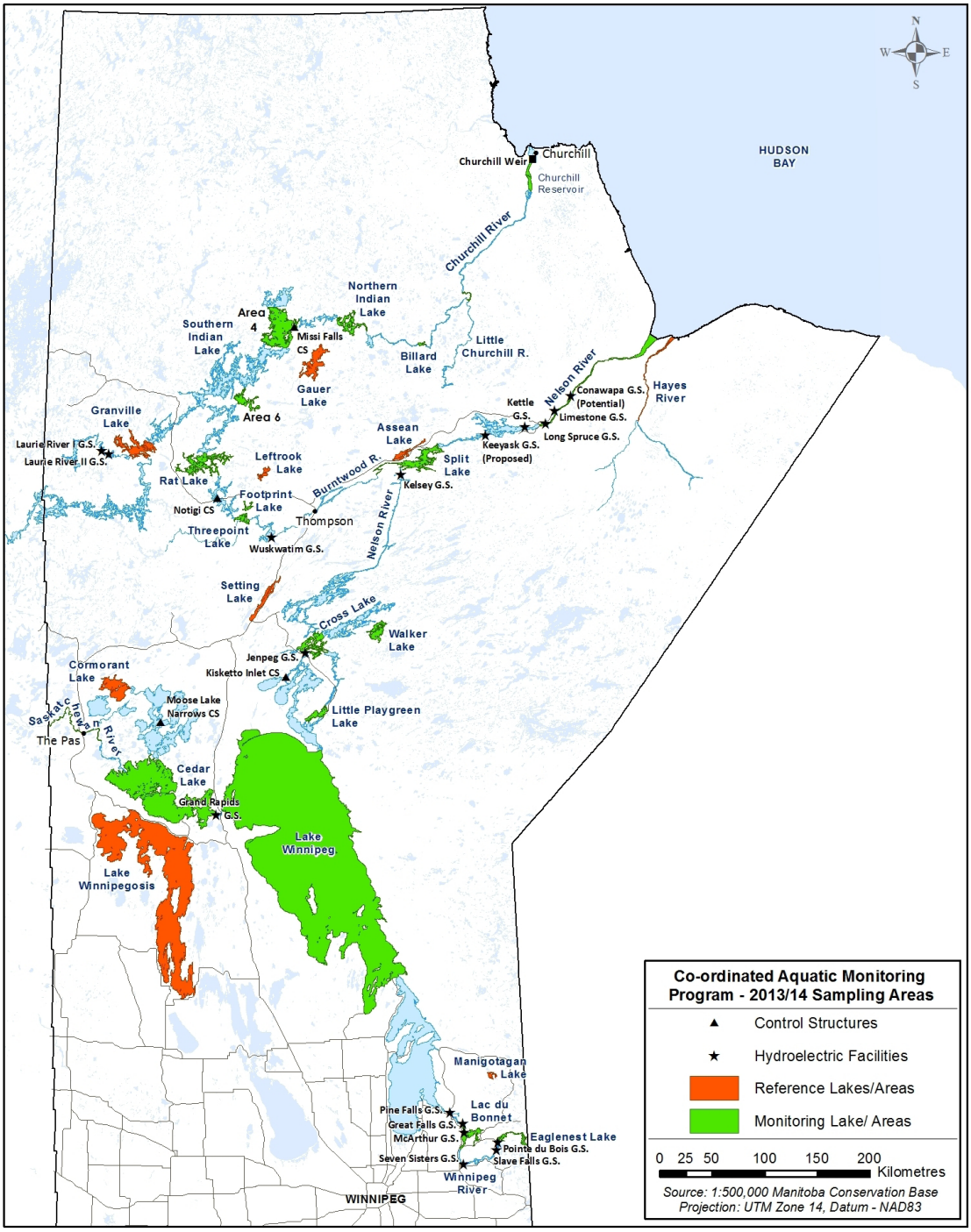
Attachment 3 2013/14 Sampling Parameters and Waterbodies

Region	Site	Fish Community	Water Quality	Benthic Invertebrate	Hg in Fish	Phytoplankton
Upper Churchill River	Southern Indian Lake (Area 4)					
	Granville Lake					
	Southern Indian Lake (Area 1)					
Churchill River Diversion	Rat Lake					
	Threepoint Lake					
	Leftrook Lake					
	Footprint Lake					
Lower Churchill River	Northern Indian Lake					
	Churchill R. at Little Churchill R.					
	Gauer Lake					
	Billard Lake					
Winnipeg River	U/S of Pointe du Bois					
	Lac du Bonnet					
	Manigotagan Lake					
	Eaglenest Lake					
Saskatchewan River	Cedar Lake (Area 1)					
	Cormorant Lake					
	Saskatchewan River					
Upper Nelson River	Cross Lake - West basin					
	Setting Lake					
	Little Playgreen Lake					
	Walker Lake					
Lower Nelson River	Split Lake					
	Assean Lake					
	Nelson R. d/s Limestone					
	Hayes River					
	Limestone Forebay					
	Burntwood R. @ Split Lake					
Lake Winnipeg	Lake Winnipeg					
	Lake Winnipegosis					

MB - Water Quality Section	
MB - Fisheries Branch	
Consultants	

Attachment 4

Map of Waterbodies Sampled in 2013/14



Attachment 5

Listing of CAMP Community Discussions/Presentations 2013/14

Community/Resource Management Board (RMB) meetings where CAMP was discussed attended by Don Macdonald (Regional Fisheries Manager, Manitoba Fisheries Branch):

June 18, 2013. Southern Indian Lake Technical Committee.

July 9, 2013. Norway House Resource Management Board.

July 16, 2013. Southern Indian Lake Environmental Monitoring Committee.

September 18, 2013. Moose Lake Resource Management Board.

November 13, 2013. Cedar Lake Resource Management Board.

January 15, 2014. Cedar Lake Resource Management Board.

February 28, 2014. Norway House Commercial Fisherman's Association.

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www.campmb.com