
Kingfisher Lake First Nation (Band No. 212)

Date of Visit: March 14, 2001

By R. Beauvais (OCWA)

Site Address: Kingfisher Lake, ON P0V 1Z0

Phone No.: 807-532-2067 **Fax No.:** 807-532-2063

Tribal Council Affiliation: Shibogama First Nations Council

Operators: Thomas Winter, Zeb Bighead

Location: The Kingfisher Lake First Nations community is approximately 360 km northeast of Sioux Lookout.

Population: 395 people in the community

No. of Units: 96 houses in community

1.0 Description of the Community Water Supply

Based on the CAIS report, water to the houses in the Kingfisher Lake community is treated as follows:

- 202 people use piped water
- 189 people have trucked water
- 4 people have no service

- 49 houses are serviced by a communal water distribution system;
- 46 houses have individual water holding tanks with trucked water; and
- 1 house has no water service.

2.0 Description of the Community Sewage Treatment

Based on the CAIS report, sewage from the houses in the Kingfisher Lake community is treated as follows:

- 200 people use piped sewage
- 189 people have septic tanks
- 4 people have no service

- 49 houses are serviced by a communal sewage system;
- 46 houses have individual septic tanks; and
- 1 house has no water service.

3.0 Overall Assessment for Communal Water Treatment Supply

The questionnaire developed by PWGSC required OCWA to undertake a risk assessment of the Water Source, Design, Operation, Reporting, and Operators. To properly assess these areas, a revisit to the water treatment facilities would be required.

OCWA was requested to undertake the evaluation without a visit to the site. With the available information, OCWA has undertaken the requested assessment of the facilities.

The ranking system used is as follows:

- 0 = Not enough information to assess
- 1-4 = Low Risk
- 5-7 = Medium Risk
- 8-10 = High Risk

For more detailed information on the Risk Assessment used see the Terms of Reference, Appendix B.

SECTION Water	SECTION RANKING Water	RISK Water
A. Water Source		
Biological	0	
Chemical	6	Sodium
Physical	6	Colour
Overall Ranking for Water Source	6	
B. Design		
Biological	1	No exceedances
Chemical	10	THMs
Physical	6	Colour, total organic carbon
Risk to Public Health	10	THMs, 3 boil water advisories
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	8	
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	10	No plan
Overall Ranking for Operations	7	Chlorine residual analyzer not calibrated properly, service disruptions due to power failures
D. Reporting		
Ranking for Laboratories and Testing	3	Twice per month by operator
Ranking for Boil Water Advisories	10	3 in last year
Overall Ranking for Reporting	7	

SECTION Water	SECTION RANKING Water	RISK Water
E. Operators		
Overall Ranking for Operators	4	Some training and confidence but unfamiliar with calibrating and maintaining disinfection equipment
F. Statistical Data		
Overall Ranking for Individual Wells	0	No data
Overall Ranking for the System	8	High Risk

4.0 Overall Assessment for Communal Sewage Treatment Facilities

The questionnaire developed by PWGSC required OCWA to undertake a risk assessment of the Effluent Receiver, Design, Operation, Reporting, and Operators. To properly assess these areas, a revisit to the sewage treatment facility would be required.

OCWA was requested to undertake the evaluation without a visit to the site. With the available information, OCWA has undertaken the requested assessment of the facilities.

The ranking system used is as follows:

- 0 = Not enough information to assess
- 1-4 = Low Risk
- 5-7 = Medium Risk
- 8-10 = High Risk

For more detailed information on the Risk Assessment used see the Terms of Reference, Appendix B.

SECTION Sewage	SECTION RANKING Sewage	RISK Sewage
A. Effluent Receiver		
Overall Ranking for Effluent Receiver	0	No data
B. Design		
Quality of Treated Effluent	7	BOD, SS, TP, Fecal Coliform exceedances
Ranking of Design of Sewage Plant	7	Leaking cell No safety equipment
Ranking of Concerns and Hazards within the Plant	2	No concerns
Condition of Laboratory Equipment	0	
Overall Ranking for Design	5	
C. Operations		
Ranking for Emergency Plan	0	
Overall Ranking for Operations	7	No as-builts, no spare parts, pumping station not cleaned
D. Reporting		
Overall Ranking for Reporting	2	
E. Operators		
Overall Ranking for Operators	4	No training but confident
F. Statistical Data		
Overall Ranking for Individual Septic Tanks	0	Not inspected
Overall Ranking for the Systems	5	Medium Risk

5.0 Communal Water Treatment Supply (49 houses)

5.1 Water Source

The raw water is drawn from Kingfisher Lake.

Two raw water samples were available from Health Canada in Sioux Lookout:

Date	Exceedances	Result	GCDWQ Limit	Notes
Nov. 16,	No Exceedances			Sample met all criteria
Feb. 7, 2001	Colour	14 TCU	15 TCU	Sample appeared pale yellow and contained flaky and fibrous particulate
	Sodium	98.9 mg/L	20 mg/L	
	Hardness	58 mg/L	80 to 100 mg/L (OG)	

AO = aesthetic objective, OG = operational guideline

5.2 Design

The Kingfisher Lake communal water supply consists of a lake intake, a Napier-Ried packaged filtration treatment system with chlorination, an on-site water reservoir, and a water distribution system.

The community is serviced by a water treatment plant constructed in 1994. The rated design capacity of the plant is believed to be 360 m³/d or 4.2 L/s and the demand requirement is met.

Two treated water samples were available from Health Canada in Sioux Lookout:

Date	Exceedances	Result	GCDWQ Limit	Notes
Nov. 16,	No Exceedances			Sample met all criteria
Feb. 7, 2001	Colour	14 TCU	15 TCU	Sample appeared slight yellow
	THM	0.141 mg/L	0.10 mg/L	
	Hardness	79 mg/L	80 to 100 mg/L (OG)	

AO = aesthetic objective, OG = operational guideline

There is an on-site water reservoir but the capacity is unknown.

There is a diesel operated pump for fire protection, which is tested on a regular basis. There is no backup power supply for the water treatment plant during blackouts. There is sufficient safety equipment at the plant and no safety hazards were observed. There is no office and laboratory area or workshop area for maintenance. Ventilation for the plant and chemical storage is satisfactory.

5.3 Operations

Sodium hypochlorite is used for disinfection. The disinfection equipment is functional with sufficient sodium hypochlorite on-site. There is an on-line chlorine residual analyzer, but it has not been calibrated. Chlorine residual in the treated water is also manually checked every day. The chemicals are stored in accordance with the MOE guidelines. Chemicals are effective but a February 7, 2001 sample indicated excessive chlorine may be used, causing THMs to exceed GCDWQ. The operator does use a colilert unit, which has sufficient test reagents available.

There are operations and maintenance manuals for plant equipment, but no as-built drawings on-site. Emergency spare parts are not available. There is a contact listing of technicians/trades people available. The response for such personnel is about 3-5 days.

There is an annual hydrant-flushing program and the fire hydrants and main valve are maintained as required. In the last two years, service disruptions have been experienced due to power failures. There are no re-occurring operational problems.

5.4 Reporting

The plant operator conducts bacteriological testing every two weeks using the colilert equipment plus the on-line chlorinator. The results and analyses are kept at the plant. Samples should be sent to an accredited laboratory.

There have been no disease or health related outbreaks in the last two years. Health Canada has issued the following boil water advisories:

- November 3, 2000 on the plant and November 22, 2000 on the watermain. No reason was given.
- February 3, 2001 and removed on February 15, 2001. No reason was given;
- July 16, 2001 because there was a fire in the community and the community fire system draws untreated water during fire situations. The waterlines need to be superchlorinated and flushed, and samples taken with negative results. As of December 3, 2001 the boil water advisory was still in effect.

The turbidity of the treated water is recorded daily and there have been no exceedances in turbidity readings. Chemical analysis of the treated water is conducted by Health Canada semi-annually.

The following colilert results were available from Health Canada:

Date	Result
Feb. 7, 2001	4 Satisfactory samples
Feb. 7, 2001	No testing since February 7, 2001

The following chlorine residual data were available from Health Canada:

Date	Result
Feb. 7, 2001	2 satisfactory results 2 low results
Feb. 7, 2001	No testing since February 7, 2001

5.5 Operators

Thomas Winter and Zeb Bighead are the operators of the water and wastewater treatment plants.

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The operators have received some training and are currently receiving hands on training from Northern Waterworks. Additional training on basic sewage and lagoon operation, basic water treatment and maintenance is recommended.

The facility is generally well kept and clean.

6.0 Deficiencies in the Communal Water Supply

1. Investigate the possibility of chlorination for water entering the water distribution system via the diesel operated fire pump. Presently, this pump puts untreated water directly into the water distribution system, when the fire pump is operated.
2. The water treatment plant does not have a backup power supply and there have been service disruptions due to power failures.
3. There are no as-built drawings on-site.
4. There is no written contingency plan available.
5. Online chlorine residual analyzer needs calibrating.
6. There have been three boil water advisories issued on the communal water system in the last year, confirmed by Health Canada.
7. **s.19(1)**
[REDACTED]
8. THMs have exceeded the GCDWQ.
9. Chemical analysis sampling takes three working days to get to a certified laboratory.
10. Based on one sample result, it appears that the water treatment does not remove colour in the raw water.

7.0 Communal Sewage Treatment Facilities (49 houses)

7.1 Effluent Receiver

The effluent is discharged annually into a marshy area.

7.2 Design

The facility is a lagoon system with no disinfection, and one pumping station as part of the collection system constructed in 1994. The rated design capacity is unknown. There are no reoccurring operational problems and no safety hazards or safety concerns with the facility.

7.3 Operation

There are no as-built drawings on-site or readily available. Emergency spare parts are not available, but there is a contact listing of technicians/trades people available with a three to four day response time. The sewage pumping station wet well is not being cleaned regularly, and the pumps are not regularly maintained. There have been no raw sewage bypasses from the sewage pumping station.

The sewage lagoon is being discharged annually. There is no excessive reed growth and the berms are in good condition.

7.4 Reporting

Effluent tests are conducted yearly by Health Canada. The results are recorded and kept with Health Canada.

The following test results were available from Health Canada.

Date	Location	Exceedances	Result	Ministry of Environment Effluent Guidelines
Nov. 16, 2000	Cell #1	Total Phosphorus	1.33 mg/L	1.0 mg/L
		Suspended Solids	25 mg/L	25 mg/L
		Fecal Coliforms	840/100 mL	400/100 mL
Jul. 24, 2001	Cell #1	Biochemical Oxygen Demand	36 mg/L	20 mg/L
		Total Phosphorus	1.56 mg/L	1.0 mg/L*
		Suspended Solids	37 mg/L	25 mg/L

*TP = 1.0 mg/L is desirable but not required since discharge is not to Great Lakes basin.

Health Canada notes that there may be a possible leak from cell #2 of the lagoon. Based on the exceedances reported, Health Canada recommends that professional assistance is required to evaluate these problems with treatment.

There have been no sewage collection backups, no improper sewage discharge, no complaints of odour and no basement flooding.

7.5 Operators

Thomas Winter and Zeb Bighead are the operators at the water and wastewater treatment plants. [REDACTED]

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The operators have received some training and are currently receiving hands on training from Northern Waterworks. Additional training on basic sewage and lagoon operation, basic water treatment and maintenance is recommended.

8.0 Deficiencies in the Communal Sewage Treatment Facilities

1. There are no operation, maintenance or as-built drawings available.

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[REDACTED] have received minimal training to operate and maintain the facility.

3. An inventory of spare parts is not available.

4. There is no safety equipment on-site, but there were no safety hazards noted.

5. There may be a leak in cell #2 of the lagoon.

6. Effluent samples indicate exceedances Health Canada recommends obtaining professional assistance to evaluate the lagoon's treatment.

9.0 Recommendations

- Implement a training program that can lead to operator certification.
- Correct causes for boil water advisory.
- Investigate exceedance of THMs in treated water.
- Calibrate online chlorine residual analyzer.
- Consider addition of a diesel backup generator in case of power failure.
- Establish and implement a protocol for taking water samples at the water treatment plants, including raw water samples.
- Obtain an inventory of spare parts.
- Consider upgrading the office, laboratory and workshop areas.
- Consider modifying the fire pump, to pump chlorinated water into the water distribution system rather than unchlorinated water.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, main breaks and boil water advisories.
- Obtain as-built drawings on the water and sewage facilities.
- Develop a contingency plan for emergency situations at the sewage treatment plant.
- The pumping station wet well should be regularly cleaned out and the pumps should be regularly maintained.
- Obtain professional assistance to evaluate lagoons.

10.0 Plant Classifications

Based upon the Terms of Reference – Appendix I – Plant Classification Guideline developed by Public Works and Government services and Government Services Canada and with discussions with the Ontario Ministry of the Environment Classification Group, OCWA, classified these plants as follows:

Water Treatment Facility - Class II
Sewage Treatment Facility - Class I

11.0 Overall Community Risk Assessment

Water Category – High Risk

- **High Risk because of the following:**
 - Investigate removing water boil advisory.

Sewage Category – Low Risk

Sewage Category – Medium risk

- **Medium Risk because of the following:**
 - No operating, maintenance manuals or as-build drawings available
 - No safety equipment in the plant
 - Operators are not certified and have minimal training
 - Leaking from lagoon cell and effluent exceedances.

Note: Information within this report is based on discussions with the plant operators, sample results supplied by Health Canada and a quick visual walk through of the facilities. No detailed review was undertaken by OCWA.