Eagle Lake First Nation (Band No. 148)

Date of Visit: April 2, 2001
by Peter Fox (OCWA) and Jody Knibbs (Bimose)
Site Address: Box #10
Eagle River, ON P0V 1S0
Phone No.: 807-755-5526 **Fax No.:** 807-755-5696
Tribal Council Affiliation: Bimose Tribal Council
Operators: William Sky, Johnson Bruyere, Claude Bighetty
Location: The Eagle Lake First Nation community is located on the shores of Eagle Lake, 15 km to the west of Dryden and south of the Trans Canada Highway - about 6 km via Hwy. 594
Population: 223 people in the community (November 2000 – INAC)
No. of Units: 76 housing units (CAIS)

1.0 <u>Description of Community Water Supply</u>

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

- 208 people use piped water
- 15 people have other services

- 71 houses are serviced by a communal water supply; and
- 5 houses have other services.

2.0 <u>Description of Community Sewage Facilities</u>

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

- 220 people use septic tanks
- 3 people have no service

- 75 houses are serviced by septic tanks; and
- 1 house has other 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	No lab
Chemical	8	Slightly high aluminum and turbidity
Physical	6	High color, total organic carbon, hardness, pH and alkalinity out of range
Overall Ranking for Water Source	7	
B. Design		
Biological	1	No exceedances
Chemical	6	Aluminum exceedance
Physical	6	Cloudy, color, hardness, alkalinity out of range, high total organic carbon exceedances
Risk to Public Health	1	No risk
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	7	No safety equipment
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	0	Unknown
Overall Ranking for Operations	6	No chlorine residual analyzer or main valve maintenance
D. Reporting		
Ranking for Laboratories and Testing	1	Envirotest lab, monthly

SECTION Water	SECTION RANKING Water	RISK Water
Ranking for Boil Water Advisories	1	No boil water advisory
Overall Ranking for Reporting	1	
E. Operators		
Overall Ranking for Operators	2	Not certified, but trained and has confidence
F. Statistical Data		
Overall Ranking for Individual Wells	0	No individual well data
Overall Ranking for the System	4	Low Risk

4.0 Communal Water Supply (71 houses)

4.1 Water Source

The raw water source is drawn from Eagle Lake.

The following table summarizes the treated water data available from Health Canada, which does not meet GCDWQ:

Sample	Exceedances	Result	GCDWQ Limit
Oct. 16, 2000	Aluminum	0.11 mg/L	0.10 mg/L (OG)
	Colour	27 TCU	15 TCU (AO)
	Turbidity	2.77 NTU	1.0 NTU
	TOC	8.0 mg/L	5.0 mg/L
Apr. 18, 2001	Color	74 TCU	15 TCU (AO)
	Appearance	Pale Yellow	-
	pH	5.06	6.5 – 8.5 (OG)
	Turbidity	6.4 NTU	1.0 NTU
	Aluminum	0.47 mg/L	0.10 mg/L (OG)
	Hardness	25 mg/L	80 to 100 mg/L (OG)

AO = aesthetic objective, OG = operational guideline

4.2 Design

The water treatment plant is a Zenon (ZeeWeed) facility that started operating in April 2000. The plant can produce up to 395,000 L/day with an average daily demand being 100,000-150,000 litres.

Potable water is pumped by high lift pumps to an elevated water standpipe (450,000 L) where the water is circulated to prevent freezing. An additional chlorination system is available at the water standpipe, if required. There is a minimal amount of potable water storage at the plant in a ground level enclosed large steel tank. The water distribution system is gravity fed from the elevated water standpipe.

The following table summarizes the treated water data available from Health Canada, which does not meet GCDWQ:

Sample Date	Sample Received	Location	Exceedances	Result	GCDWQ Limit
Oct. 16, 2000	-	Treated	Aluminium	0.15 mg/L	0.10 mg/L (OG)
Nov. 15, 2000	Nov. 17, 2000	Water Treatment Plant	TOC	4.8 mg/L	5.0 mg/L
			Hardness	22 mg/L	80 to 100 mg/L (OG)
Apr. 18, 2001	Apr. 18, 2001	Water Treatment Plant	Appearance	Cloudy	-
			TOC	5.5 mg/L	5.0 mg/L
			Hardness	30 mg/L	80 to 100 mg/L (OG)

AO = aesthetic objective, OG = operational guideline

The plant does not have backup power but the elevated standpipe will continue to supply water so long as the power outage is not extreme.

There is an excellent laboratory/office/ maintenance area and there are sufficient tools available. Ventilation is adequate. An eyewash is available but there is no confined space entry equipment. The only safety hazards are confined spaces.

4.3 Operations

Sodium hypochlorite (12%) is used as a disinfectant. Chemicals are stored properly but buffer reagents for process control were past their expiry date.

The plant process chemicals include alum as a coagulant aid, soda ash for pH adjustment, and sodium bisulphate for neutralizing chlorine in the backwash tank.

Backwash wastewater is stored in a below ground reject tank with supernatant discharge back to the lake. The sodium bisulphate is used to control chlorine levels in the supernatant prior to release to the environment. The Zenon system requires the raw water to be chlorinated for effective operation.

The plant has on-line continuous turbidity monitoring. Operation and maintenance manuals and as-built drawings are available.

Few spare parts are available. There is not a list of local technicians but the facility is still under warranty and they do have a list of subcontractors. Computer modem hookup to Zenon is available for troubleshooting with plant operations staff.

On the water distribution system the operators are planning for an annual flushing and fire hydrant maintenance program. Circuit Rider Training Program has recently commenced and plans to deal with fire hydrant maintenance.

4.4 Reporting

The operators of the water treatment plant take chlorine residual samples every day and once per week at the tower. The turbidity results are recorded every day. Plant staff take regular bacteriological tests once per month and submit them to the Thunder Bay Envirotest laboratory.

The following table summarizes all the bacteriological results available from Health Canada:

Date	Location	Exceedances
Oct. 16, 2000	Raw	3 Total coliform/100 mL
	Treated	None
	School	None
	Residence	None
Jul. 3, 2001	Distribution system (4 different sample)	None

A colilert kit and incubator is on site and the operators report the information when the unit is used. Test reagents were within acceptable shelf life. Operators had just returned from a Health Canada- Sioux Lookout training session for use of the incubator, chlorine residuals and turbidity.

Sample results are kept at the plant and the Administration Office. Sampling for chemical analyses is conducted in the fall and spring by Health Canada. Total organic carbon (TOC) levels were elevated. No boil water advisories have been issued since the new water treatment plant came on line.

4.5 Operators

The operators at the water treatment plant are William Sky and Johnson Bruyere. They alternate on a rotating six-month basis as the operator; Claude Bighetty has just started a familiarization program with the plant.

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[redacted] Each acts as the others backup when either is on vacation or sick.

5.0 Deficiencies in the Communal Water Supply

1. Turbidity meters are still on warranty and have not been calibrated by plant staff although they are confident they can do so.

2. Alum and soda ash are stored off site at a warehouse.

3. Chemical buffer reagents for process control were past the expiry date.

4. Aluminum, total organic carbon and color have been exceeded in treated water samples.

5. Adequate safety equipment for confined space entry is not available on site for entry to low lift pump chamber, elevated water tower, and reject tank.

6. Plant does not have a diesel backup but there have been few power failures.

7. The water distribution system has an elevated standpipe that will supply water to the distribution system by gravity during power failures. During prolonged power failures, the elevated water standpipe could run dry.

8. Few spare parts are available on site.

9. Local technicians and tradesmen were not listed, but the facility is still under warranty so contractor's subs were listed. The Consulting Engineer has been contacted to remedy any deficiencies to date.

10. Flushing, hydrant and valve maintenance have not been undertaken in the past, but a program is planned for the future.

11. The operators have received training but a program of additional training, leading to certification, would be beneficial.

6.0 Recommendations

- Implement training program for operators leading to certification.
- Implement a contingency plan for emergencies for the water supply system.
- Investigate the elevated TOC levels to determine whether they present any hazard and whether further treatment is needed.
- Consider addressing aluminum and color appearance problems in treated water
- Review the use of sodium bisulphate in the reject water tank process for neutralizing chlorine and provide the operators with guidance.
- Implement a distribution system flushing program, a fire hydrant maintenance program and an annual valve-testing program.
- Review the frequency that operators use the colilert equipment for bacteriological testing.

7.0 Plant Classification

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

Water Treatment Facility - Class II

8.0 Overall Community Risk Assessment

Water Category – Low Risk

Note: **Information within this report is based on discussions with the plant operators and a quick visual walkthrough of the facilities. No detailed review was undertaken by OCWA.**