Gull Bay First Nation (Band No. 188)

Date of Visit: February 22, 2001
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Tribal Council Affiliation: Thunder Bay Services Centre - Unaffiliated First Nations (North)
Operator: Barry Poile
Location: The Gull Bay First Nation community is located approximately 180 km north of Thunder Bay
Population: 441 people in the community (November 2000 - INAC)
No. of Units: 100 housing units (CAIS)

1.0 Description of Community Water Supply

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

- 353 people use piped water
- 13 people use individual wells
- 75 people have no service

- 80 houses are serviced by a communal water distribution system;
- 3 houses are serviced by individual water wells; and
- 17 houses have no service.

2.0 Description of Community Sewage Facilities

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

- 146 people use piped sewage
- 295 people use septic tanks

- 33 houses are serviced by a communal sewage system; and
- 67 houses are serviced by individual sewage septic tanks.

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	0	
Physical	0	
Overall Ranking for Water Source	0	No lab data available
B. Design		
Biological	4	8 exceedances out of 137 available samples
Chemical	10	Turbidity exceedance
Physical	6	Color, dissolved organic carbon, hardness exceedances
Risk to Public Health	10	Turbidity, 10 boil water advisories
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	8	
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	7	No plan
Overall Ranking for Operations	9	No chlorine residual analyzer, no turbidity monitoring, no filtration
D. Reporting		
Ranking for Laboratories and Testing	7	Weekly by Health nurse Monthly by Health Canada Results not properly recorded
Ranking for Boil Water Advisories	10	10 boil water advisories

SECTION Water	SECTION RANKING Water	RISK Water
Overall Ranking for Reporting	9	
E. Operators		
Overall Ranking for Operators	7	Limited training and no confidence
F. Statistical Data		
Overall Ranking for Individual Wells	0	
Overall Ranking for the System	10	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	1	No water intake from river
B. Design		
Quality of Treated Effluent	0	
Ranking of Design of Sewage Plant	0	
Ranking of Concerns and Hazards within the Plant	7	No confined space entry equipment, no backup power
Condition of Laboratory Equipment	0	
Overall Ranking for Design	7	
C. Operations		
Ranking for Emergency Plan	0	
Overall Ranking for Operations	7	No cleaning or maintenance, no operation manuals or as-built drawings
D. Reporting		
Overall Ranking for Reporting	7	No regular testing
E. Operators		
Overall Ranking for Operators	7	Limited training and not confident, no backup
F. Statistical Data		
Overall Ranking for Individual Septic Tanks	0	
Overall Ranking for the Systems	7	Medium Risk

5.0 Communal Water Treatment Supply (80 houses)

5.1 Water Source

The raw water is surface water drawn from Lake Nipigon.

5.2 Design

The community is serviced with a water treatment plant that was constructed in the mid 70's. The rated design capacity of the plant is unknown. The treatment plant consists of chlorination only. There is a water reservoir on-site, but the capacity is not known. The water system cannot maintain sufficient pressure during peak demand periods.

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

Date	Location	Exceedances	Result	GCDWQ limit
Nov. 9, 2000	Treated Water	Turbidity	1.71 NTU	1 NTU (HL)
		Colour	34 TCU	15 TCU (AO)
		Dissolved Organic Carbon	7 mg/L	5 mg/L (AO)
		Hardness	63 mg/L	80 to 100 mg/L (OG)

AO = aesthetic objective; OG - operational guideline HL = health limit

There is a diesel operated back up power generator for the water treatment plant. A diesel driven fire pump is not available. Safety hazards include lack of safety equipment and procedures. There is adequate ventilation for the plant and chemical storage. However, laboratory, office/filing and workshop areas are not available.

There is no annual hydrant flushing or main valve operating/maintenance program. There is also no hydrant maintenance program and repairs are performed only as required. In the last two years a service disruption has been experienced due to malfunctioning of the electrical transformer and the standby generator.

A re-occurring operational problem is the high turbidity in the source water in the spring, and consumer complaints of chlorine odour in water.

5.3 Operations

Sodium hypochlorite is used for disinfection. The disinfection equipment is functional with sufficient sodium hypochlorite on site. There is no on-line chlorine residual analyzer and no colilert unit. A manual analysis is used to determine chlorine residual daily. The chemicals are stored in accordance with the MOE guidelines with sufficient test reagents available.

There are no operation and maintenance manuals for plant equipment on site and no as-built drawings. Emergency spare parts are available and there is a contact listing of technicians/trades people available. The response for such personnel is dependent on the situation.

5.4 Reporting

Health Canada conducts bacteriological testing monthly. The results and analysis are not recorded.

There have been approximately ten (10) Boil Water Advisories issued on the community. The turbidity of treated water is not recorded but there have been exceedances in turbidity readings.

The following table summarizes the bacteriological data available from Health Canada:

Period	Frequency	Regularity	Exceedances
99/10/12 to 01/10/30	3 to 18 times per month from different locations	▪ 0 months missing in 1999 ▪ 3 months missing in 2000 ▪ 3 months missing in 2001	▪ Total coliform exceedances in distribution system were recorded on 99/12/13, 99/12/20, 2000/01/25, 2000/06/05, and 2000/06/08.

A chemical analysis of treated water was conducted in November 2000 and there were chemical parameters that exceeded the GCDWQ.

5.5 Operators

Barry Poile is the operator at the water and sewage treatment plants. s.19(1)

The operator position is not a full-time job and there may have been periods of time that the band did not have an operator for the water system.

6.0 Deficiencies in the Community Water Supply

1. The system cannot maintain sufficient pressure during peak demand periods.
2. The treatment plant consists of chlorination only.
3. Lack of safety equipment on-site.
4. There are no operation and maintenance manuals and no as-built drawings for the plant.
5. The operator does not perform a hydrant maintenance, flushing or valve operation and maintenance program.
6. Service disruptions were caused by an electrical transformer and standby generator failures.
7. There is no written contingency plan available.
8. Record keeping needs improvement.
9. There are no online chlorine residual analyzer and turbidity meters.
10. There have been approximately ten boil water advisory issued on the communal water system in the last year.

11. The operator is not certified and has received minimal training to operate and maintain the facility.

12. Reoccurring problems include high turbidity in the raw water in spring, chlorine odour and non-proportional dosage of chlorine addition.

7.0 Communal Sewage Facilities (33 houses)

7.1 Effluent Receiver

The effluent is discharged annually into the Gull River.

7.2 Design

The community is serviced with a sewage treatment facility with one sewage pumping station as part of the collection system. The rated design capacity is unknown.

The treatment facility is a lagoon system with no disinfection. Reoccurring operational problems include problems with pumping station switchboards and safety hazards include limited training for the operators.

There is no backup power in case of an electrical power loss and there are no designated laboratory, office, and maintenance area.

7.3 Operations

There are no as-built drawings and no operation and maintenance manuals on-site or readily available. Emergency spare parts are not available; but there is also contact listing of technicians/trades people available with a response time as required by band.

The sewage pumping station wet well is not being cleaned and the pumps are not regularly maintained. It is unknown whether rather there have been raw sewage bypasses from the sewage pumping station.

It is unknown whether the sewage lagoon is being discharged on a regular basis. There is no excessive reed growth and the berms appear to be in good condition.

7.4 Reporting

Effluent tests are not conducted.

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

7.5 Operators

s.19(1)

Barry Poile is the operator at the water and sewage treatment plants.

Additional training on daily operational tasks and responsibilities, basic electrical instrumentation, maintenance, and disinfection is recommended.

8.0 Deficiencies in the Community Sewage Facilities

1. No safety equipment is available on site.
2. There are no maintenance/operation manuals and no as-built drawings at the plant.
3. There is no backup diesel operated power generator in case of power loss.
4. The operator is not certified and has received minimal training to operate and maintain the facility.
5. No effluent samples are taken and analyzed.

9.0 Recommendations

- Investigate previous boil water advisories and chemical analyses exceeding GCDWQ to ensure the source of the contamination has been addressed adequately.
- Install filtration system.
- Investigate system pressure difficulties during peak hours.
- Review chlorine addition requirements.
- Improve record keeping.
- Establish and implement a protocol for taking water samples at the water treatment plant, including raw water samples.
- Develop a comprehensive operations and maintenance program on the water distribution system to address valve and hydrant maintenance.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and illnesses, main breaks and boil water advisories.
- Obtain operations and maintenance manuals and as-built drawings.
- Implement a training program for the operators that can lead to certification.
- Obtain necessary safety equipment.
- Clean and maintain equipment at the pumping station.
- Initiate a sampling program indicating number of samples, location and parameters to be analyzed.
- Provide emergency back up power for pumping stations.
- Implement a sewage septic tank inspection program to inspect all septic tanks in the community for proper operations and meeting the required standards.

10.0 Plant Classification

Based upon the Terms of Reference – Appendix I – Plant Classification Guideline developed by Public Works 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 I
Sewage Treatment Facility – Class I

11.0 Overall Community Risk Assessment

Water Category - High Risk

High Risk because of the following:

- No filtration; and
- Boil water advisories issued by Health Canada

Sewage Category – Medium Risk

Medium Risk because of the following:

- No regular testing of effluent; and
- No operation and maintenance manuals.

Note: Information within this report is based upon discussions with the plant operator and a quick visual walk through of the facilities. No detailed review was undertaken by OCWA.