

Bkwejwanoong Territory (Walpole Island) First Nation (Band No. 170)

Date of Visit: March 29, 2001

By Mike Newland (OCWA).

Site Address: Walpole Island First Nation

R.R. #3

Wallaceburg, ON, N8A 4K9

Phone No.: 519-627-1481

Fax No.: 519-627-0440

Tribal Council Affiliation: Unaffiliated First Nations (South)

Operators: Brian Johnson and Stacey Kicknosway (water), Brian Ermatinger and Dale Sands (sewage)

Location: The Bkwejwanoong Territory (Walpole Island) First Nation community is located approximately 35 km south of Sarnia on Hwy. 40

Population: 2,062 people in the community (November 2000 - INAC)

No. of Units: 672 housing units (CAIS)

1.0 Description of Community Water Supply

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

- 1985 people use piped water
- 15 people have other services
- 46 people have no service
- 16 people have no information in CAIS

- 647 houses are serviced by a communal water system;
- 5 houses have other service;
- 15 houses have no service; and
- 5 houses have no information in CAIS.

2.0 Description of Community Sewage Facilities (2 Communal Systems)

Based on the CAIS report, sewage from the houses within the Bkwejwanoong Territory community is treated as follows:

- 43 people use piped sewage
- a sports center and a strip mall use piped sewage
- 61 people have other services
- 46 people have no service
- 1898 people have no information in CAIS

- 14 houses are serviced by a communal sewage system;
- a sports centre and a strip mall are serviced by a communal sewage system;
- 20 houses have other service;
- 15 houses have no service; and
- 619 houses have no information in CAIS.

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 data available
Chemical	9	No exceedances Two boil water advisories due to upstream chemical spill
Physical	6	Hardness and aluminum exceedance
Overall Ranking for Water Source	4	
B. Design		
Biological	1	1 total coliform exceedances in the distribution system; retest was in compliance
Chemical	0	Aluminum
Physical	0	No lab data available
Risk to Public Health	1	
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	4	
C. Operations		
Reservoir Cleanliness	0	Not inspected
Emergency Plan	10	No plan
Overall Ranking for Operations	7	Chlorine residual analyzer not calibrated, chemicals not properly stored
D. Reporting		
Ranking for Laboratories and Testing	2	Weekly by operator

SECTION Water	SECTION RANKING Water	RISK Water
Ranking for Boil Water Advisories	9	Two boil water advisories
Overall Ranking for Reporting	6	
E. Operators		
Overall Ranking for Operators	2	Training and confident
F. Statistical Data		
Overall Ranking for Individual Wells	0	No data
Overall Ranking for the System	5	Medium 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 available
B. Design		
Quality of Treated Effluent	0	No data available
Ranking of Design of Sewage Plant	4	No flow meter
Ranking of Concerns and Hazards within the Plant	7	No ventilation, backup power, confined space entry equipment
Condition of Laboratory Equipment	0	Not inspected
Overall Ranking for Design	6	
C. Operations		
Ranking for Emergency Plan	0	No data available
Overall Ranking for Operations	10	Malfunctioning equipment, burnt out UV bulb, no treatment
D. Reporting		
Overall Ranking for Reporting	8	No regular sampling, odour complaints
E. Operators		
Overall Ranking for Operators	7	Some training
F. Statistical Data		
Overall Ranking for Individual Septic Tanks	0	Not inspected
Overall Ranking for the Systems	8	High Risk

5.0 Communal Water Treatment Plant (647 houses)

5.1 Water Source

The raw water is drawn from the St. Clair River.

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

Sample Date	Date Received	Exceedance	Result	GCDWQ Limit
May 30, 2000	May 31, 2000	Hardness	102 mg/L	80-100 mg/L (OG)
		Aluminum	0.128 mg/L	0.10 mg/L (AO)

AO = aesthetic objective, OG = operational guideline

5.2 Design

The community is serviced with a Class III water treatment plant constructed in 1979 and expanded in 1994. The rated design capacity of the treatment plant is 2288 m³/d. The operator reports that the demand is well below the design capacity of the plant. The water treatment plant consists of conventional sand filtration and activated carbon, with alum and polymer addition and calcium hypochlorite for disinfection. There is an off-site reservoir with a capacity of 794 m³.

There is no backup power generator for the water treatment plant, but there is a diesel operated pump for fire protection. Safety equipment at the plant is not adequate; for example, the operator has no face shield for chemical handling. There is a safety concern that mixing calcium hypochlorite from granular generates a large amount of chlorine gas.

There is an annual hydrant flushing and maintenance program but there is no main valve operating and maintenance program in place. Breakdown maintenance is the only other maintenance performed and no records are kept.

5.3 Operations

Calcium hypochlorite is used for disinfection. The disinfection equipment is functional and there is sufficient disinfectant available on-site. The calcium hypochlorite tanks are located in the main plant area, which is not well ventilated and the fumes are causing severe rusting problems. The tanks need to be moved to a separate chemical room. There is an on-line chlorine residual analyzer that checks the residual daily. The chlorine residual analyzer has never been calibrated.

There are operation and maintenance manuals for plant equipment on site as well as the as-built drawings. Emergency spare parts are available. There is a contact listing of technicians/trades people available with a response time of two hours.

In the last two years, service disruptions have been experienced due to chemical spills from industry located upstream of the treatment plant.

5.4 Reporting

The operator uses a colilert unit to complete bacteriological analyses on the treated water and a number of hydrants every other week. The results are kept at the water treatment plant. The operator takes bacteriological samples to the Sarnia Health Laboratory, and Health Canada takes samples to the London

Health Laboratory. Fire hydrants are also sampled. The Health Services Department takes samples from the houses, but the operators never see the results.

There has been two boil water advisories issued on the communal water system by the Health Unit, which were caused by industrial chemical spills upstream of the plant.

The turbidity of the treated water is recorded twice per year. A chemical analysis of the treated water is conducted by the DWISP program. The operator indicated that aluminum has exceeded the GCDWQ.

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

Period	Frequency	Exceedances
00/05/29 – 01/10/15	Once a week from different locations	<ul style="list-style-type: none"> 1 total coliform exceedances in the distribution system; retest was in compliance.

Raw water bacteriological tests indicate that there is a consistent total coliform and E.Coli presence in the water. Total coliform in the raw water ranges from 10->200 #/100mL and for E.Coli 1-920 #/100mL.

5.5 Operators

The operators of the water treatment plant are Brian Johnson and Stacey Kicknosway. Both operators have been grandfathered in with a Class I certification. The operators have had minimal training and both would like to be trained to complete their Class III certification. The operators are not familiar with calibrating and maintaining the disinfection equipment but both appear to have confidence in their operational techniques.

6.0 Deficiencies in the Communal Water Supply

1. The rated capacity of the treatment plant is 2,288 m³/d and the operator reports that the demand is well below the capacity of the treatment plant. OCWA understands that the plant intake is being reviewed for capacity and zebra mussel issues.
2. The calcium hypochlorite is stored in the main plant area, causing a severe rusting problem from the fumes. These tanks need to be moved to a separate chemical room with proper ventilation.
3. The plant has no backup power generator but there is a diesel operated fire pump.
4. Safety equipment is not adequate. The operator has no face shield for chemical handling and there is a safety concern over mixing calcium hypochlorite from granular because it generates a large amount of chlorine gas.
5. There is no main valve operating/maintenance program in place.
6. Service disruptions have been experienced due to chemical spills from industry located upstream of the treatment plant.
7. There is no written contingency plan available.
8. Breakdown maintenance is the only maintenance performed but no records are kept.

9. The chlorine equipment was working and a free chlorine test is done once a day. There is a chlorine residual analyzer, but it has never been calibrated.
10. A chemical analysis of the treated water is conducted once per year and aluminum has exceeded the GCDWQ.
11. The Health Services Department conducts bacteriological analyses on samples from the houses; however, the operators do not see these results.
12. There have been two boil water advisories issued on this system by the Health Unit caused by chemical spills upstream.
13. The operators of the treatment plant have been grandfathered in as Class I certification, but would like to receive training for their Class III certification.

7.0 Communal Sewage Facility (Residential System - 14 houses)

7.1 Effluent Receiver

The effluent receiver is a wetland next to the plant.

7.2 Design

The treatment system was constructed in 1993. This treatment system treats the sewage from 14 homes in the community. There is a sewage pump in each house. The treatment facility consist of extended aeration with tertiary treatment, alum addition, and UV disinfection.

The plant has no ventilation and no backup power in case of hydro loss. The plant has no laboratory or office areas, but a workshop area is available off site for maintenance. Safety equipment is inadequate.

7.3 Operations

A UV unit is used to disinfect the treated effluent, however, there was no indicator to tell whether the equipment is functional.

The plant has operating and maintenance manuals for the plant equipment, as well as-built drawings are readily available. There is no operating manual for the treatment plant.

The sewage pumping stations are cleaned once per year, but the pumps are not routinely maintained. Emergency spare parts are not readily available. There is a contact listing of technicians/trades people available with an average response time of one hour.

There have been no raw sewage bypasses from any of the sewage pumping stations. However, the pumping station pumps, at each house, have failed causing basement flooding.

7.4 Reporting

Sludge is hauled once per year when the aeration tank is emptied completely. The tank is re-seeded with sludge from another location. No samples are taken for analysis.

There are no regular effluent tests conducted on the sewage facilities. There have been no disease or health related outbreaks in the last two years. There have been odour complaints, and basements have flooded when the pumps at the houses fail.

7.5 Operators

s.19(1)

The operator of the residential sewage facility is Dale Sands – [REDACTED]
[REDACTED] The operator is familiar with calibrating and maintaining the equipment [REDACTED] He needs hands on training at the treatment plant to understand the process better. Dale Sands does not have a backup operator to cover for vacation or sickness.

8.0 Communal Sewage Facility – Commercial System

8.1 Effluent Receiver

The treated effluent is discharged to a ditch beside the plant, which is located in a developed area.

8.2 Design

The commercial sewage from the sports centre and the strip mall is treated by an extended aeration system with a tertiary treatment facility alum addition and UV disinfection. The collection system consists of two pumping stations. The system was constructed in 1988 and upgraded in 1997.

The plant has no backup power in case of hydro loss. Safety equipment is not adequate for alum addition and confined space entry. The operator also has concerns with the handling of the silica sand and alum. The UV disinfection unit is not functional because the bulbs burnt. There are no laboratory or office areas, but there is a workshop area.

8.3 Operations

The pumping stations are cleaned on a yearly basis but the pumps are not routinely maintained. There is no contact listing of technicians/trades people available, but response time for such personnel is two hours. There are no operations and maintenance manuals, or as-built drawings on site. There are no emergency spare parts.

The facilities experience re-occurring operational problems, which include the freezing of alum lines and continuous plugging of the tertiary treatment filters. At the time of the OCWA visit, the plant was not operating and raw sewage was being discharged into the ditch without treatment. There was no activated sludge in the aeration tank and no alum was being fed. The tertiary treatment module was out of service and the UV system was disconnected from power.

8.4 Reporting

There are no regular effluent tests conducted on the sewage facilities. There have been no disease or health related outbreaks in the last two years. There have been odour complaints, and basements have flooded when the pumps at the houses fail.

8.5 Operators

s.19(1)

The operator of the commercial sewage facility is Brian Ermatinger. [REDACTED]

[REDACTED] Brian does not have backup personnel to cover for vacation or illness.

9.0 Deficiencies in the Community Sewage Facilities

1. The plant has no ventilation.
2. There is no backup power in case of hydro loss at plants.
3. There are no laboratory or office areas, but a workshop area is available off site for maintenance.
4. Confined space entry equipment and face shield for chemical handling is required to complete the safety equipment on site.
5. The UV unit does not have an indicator light to show whether the equipment is functional and dismantling is required to determine if UV lamps are operational.
6. The sewage pumping stations are cleaned once per year. Pumps are not routinely maintained.
7. Emergency spare parts are not readily available.
8. The pumps located in each house have failed, causing basement flooding.
9. Sludge is hauled once per year when the aeration tank is emptied. The tank is re-seeded with sludge from another location. Samples are not taken for analysis.
10. Dissolved oxygen is checked on a daily basis. No other regular effluent testing is conducted.
11. The UV disinfection unit is not functional due to burned out bulbs at the commercial facility.
12. Re-occurring operational problems include freezing of the alum lines and continuous plugging of the tertiary treatment filters at the commercial facility.
13. At the time of the OCWA visit, the commercial facility was not operating and raw sewage was being discharged to the ditch. There was no activated sludge in the aeration tank and no alum was being fed. The tertiary treatment module was out of service and the UV disinfection system was disconnected from the power.

14. Regular effluent tests are not conducted on the treated effluent.

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15. [REDACTED]

16. The operator does not have backup personnel to cover for vacation.

10.0 Recommendations - Action Required

- Relocate calcium hypochlorite tanks to chemical room and ensure proper ventilation to stop severe rusting problem in the main water treatment plant area.
- Consider backup power for the water and sewage treatment plants.
- Purchase safety equipment.
- Re-evaluate use of granular calcium hypochlorite because of a safety concern over chlorine gas generation when being mixed.
- Train operators in calibrating the chlorine residual analyzer.
- Investigate chemicals spills from industry upstream that have caused service disruptions and boil water advisories.
- Implement a training program that can lead to Class III certification of the operators.
- Establish and implement a protocol for taking water samples at the water treatment plant, including raw water samples.
- Develop a comprehensive operation and maintenance program on the water distribution system to address valve maintenance.
- Develop a comprehensive contingency plan to address operational problems, breakdowns, vacations and sickness, main breaks and boil water advisories.
- Monitor previous boil water advisories and chemical analyses exceeding Health Canada guidelines (i.e. aluminum) to ensure the source of the contamination has been addressed adequately.
- Obtain operating manual for the sewage treatment plants.
- Implement a pump maintenance program for the pumping station pumps.
- Obtain spare parts for emergency repairs.
- Investigate cause of periodic failure of individual house pumps on residential system.
- Sludge hauling and seeding method should be evaluated.
- Implement a regular effluent-testing program to include all required parameters.
- Obtain professional evaluation for out-of-service tertiary treatment system, UV and alum at the commercial sewage facility.
- Replace bulbs in UV disinfection unit and install indicator to show if UV lamp is operational.
- Consider installing heat tracing for alum feed lines that freeze in the winter at the commercial sewage facility.
- Implement a routine pump maintenance program.
- Consider purchasing process control equipment such as dissolved oxygen meter, graduated cylinder, thermometer, pH meter and suspended solids testing equipment.

11.0 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 III
Sewage Treatment Facility(Residential)	-	Class II
Sewage Treatment Facility(Commercial)	-	Class II

12.0 Overall Community Risk Assessment

Water Category - Medium Risk

Medium Risk because of the following:

- Upstream chemical spills resulting in two boil water advisories;
- Improper storage of chemicals; and
- Poor ventilation.

Residential Sewage Category – High Risk

High Risk because of the following:

- Operator inadequately trained;
- Inadequate effluent sampling; and
- Equipment problems (pump failure, no UV lamp indicator).

Commercial Sewage Category - High Risk

High Risk because of the following:

- No treatment for sewage;
- Equipment malfunctioning; and
- Operator inadequately trained.

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