

**F I N A L   R E P O R T**

## **METLAKATLA BAND**

# **Assessment Studies of Water and Wastewater Systems and Associated Water Management Practices at Selected First Nation Communities**



RESULTS OF ANALYSIS - Water

File No. 11774

Metlak.

98 01 16  
12:30

Physical Tests

|                        |            |      |
|------------------------|------------|------|
| Colour                 | (CU)       | <5   |
| Conductivity           | (umhos/cm) | 146  |
| Total Dissolved Solids |            | 87   |
| Hardness               | CaCO3      | 57.1 |
| pH                     |            | 6.91 |
| Turbidity              | (NTU)      | 0.2  |

Dissolved Anions

|                  |     |       |       |
|------------------|-----|-------|-------|
| Alkalinity-Total |     | CaCO3 | 25    |
| Chloride         | Cl  |       | 4.7   |
| Fluoride         | F   |       | <0.02 |
| Sulphate         | SO4 |       | 30    |

Nutrients

|                  |  |   |        |
|------------------|--|---|--------|
| Nitrate Nitrogen |  | N | 0.088  |
| Nitrite Nitrogen |  | N | <0.001 |

Total Metals

|           |      |          |                            |
|-----------|------|----------|----------------------------|
| Aluminum  | T-Al | <0.2     | <i>- DL not low enough</i> |
| Arsenic   | T-As | <0.0001  |                            |
| Barium    | T-Ba | <0.01    |                            |
| Boron     | T-B  | <0.1     |                            |
| Cadmium   | T-Cd | <0.0002  |                            |
| Calcium   | T-Ca | 22.2     |                            |
| Chromium  | T-Cr | <0.01    |                            |
| Copper    | T-Cu | 0.03     |                            |
| Iron      | T-Fe | <0.03    |                            |
| Lead      | T-Pb | <0.001   |                            |
| Magnesium | T-Mg | 0.42     |                            |
| Manganese | T-Mn | <0.005   |                            |
| Mercury   | T-Hg | <0.00005 |                            |
| Potassium | T-K  | <2       |                            |
| Selenium  | T-Se | <0.0005  |                            |
| Sodium    | T-Na | 4        |                            |
| Zinc      | T-Zn | 0.039    |                            |

Remarks regarding the analyses appear at the beginning of this report.  
 Results are expressed as milligrams per litre except for pH, Colour (CU),  
 Conductivity (umhos/cm), and Turbidity (NTU).  
 < = Less than the detection limit indicated.



## Appendix 1 - REGULATORY CRITERIA

File No. 11774

Health Canada

Guidelines for Canadian Drinking Water Quality, Sixth Ed., 1996.  
 All limits are Maximum Acceptable Concentration (MAC) unless  
 otherwise indicated.  
 Limits expressed as milligrams per litre except pH, Turbidity,  
 Colour, and Coliform Bacteria.

|                         |                   | Lower<br>Limit | Upper<br>Limit |      | Notes |
|-------------------------|-------------------|----------------|----------------|------|-------|
| <b>Physical Tests</b>   |                   |                |                |      |       |
| Colour                  | (CU)              | -              | 15             | CU   | 1     |
| Total Dissolved Solids  |                   | -              | 500            | mg/L | 1     |
| Hardness                | CaCO <sub>3</sub> | -              | -              |      | 2     |
| pH                      |                   | 6.5            | 8.5            |      | 1     |
| Turbidity               | (NTU)             | -              | 5              | NTU  | 3, 4  |
| <b>Dissolved Anions</b> |                   |                |                |      |       |
| Chloride                | Cl                | -              | 250            | mg/L | 1     |
| Fluoride                | F                 | -              | 1.5            | mg/L |       |
| Sulphate                | SO <sub>4</sub>   | -              | 500            | mg/L | 1, 5  |
| <b>Nutrients</b>        |                   |                |                |      |       |
| Nitrate Nitrogen        | N                 | -              | 10.0           | mg/L |       |
| Nitrite Nitrogen        | N                 | -              | 1.0            | mg/L |       |
| <b>Total Metals</b>     |                   |                |                |      |       |
| Arsenic                 | T-As              | -              | 0.025          | mg/L | 6     |
| Barium                  | T-Ba              | -              | 1.0            | mg/L |       |
| Boron                   | T-B               | -              | 5.0            | mg/L | 6     |
| Cadmium                 | T-Cd              | -              | 0.005          | mg/L |       |
| Chromium                | T-Cr              | -              | 0.05           | mg/L |       |
| Copper                  | T-Cu              | -              | 1.0            | mg/L | 1, 3  |
| Iron                    | T-Fe              | -              | 0.3            | mg/L | 1     |
| Lead                    | T-Pb              | -              | 0.01           | mg/L | 3, 7  |
| Manganese               | T-Mn              | -              | 0.05           | mg/L | 1     |
| Mercury                 | T-Hg              | -              | 0.001          | mg/L |       |
| Selenium                | T-Se              | -              | 0.01           | mg/L |       |
| Sodium                  | T-Na              | -              | 200            | mg/L | 1     |
| Zinc                    | T-Zn              | -              | 5.0            | mg/L | 1, 3  |

- 1 Aesthetic Objective (AO) (taste, odour, appearance, etc.)
- 2 Maximum not established, levels > 200 mg/L are considered poor but may be tolerated (AO).
- 3 At point of consumption (AO).
- 4 1 NTU maximum allowed for water entering distribution systems.
- 5 There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
- 6 Interim Maximum Acceptable Concentration (IMAC)
- 7 First drawn water may be high, flush system before sampling(MAC)



LABORATORY REPORT OF WATER FILTER ANALYSIS  
PRINCE GEORGE WATER ASSAY  
PO Box 2832 Station B  
Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services  
Health Canada, Medical Services Branch  
220 - 177 Victoria Street  
Prince George, BC V2S 5R8

Sample Number: 278

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: 07/26/2001

Sample Source: Metlakatla, Tsook Lake

Sample Site: Raw water, Water Treatment Plant

Sample sent by: Lise Fish

Volume Filtered: 292 litres

Date & Time Received: 07/27/2001

Date Processed / Preserved: 07/27/2001

Condition of Filter: Good. It was shipped in 250 ml of residual water.

Filter Type:  Filterite  Cotton

Slides Analysed: 1 = 50 Litres

Temperature on Receipt:  < 5 °C,  5 - 10 °C,  10 - 20 °C,  > 20 °C

Observations:

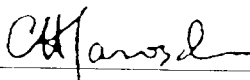
- Debris present: 1.5 ml of dark-brown sediment was obtained from the filter.
- Algae: A large number of species, each quite abundant, was noted.
- Other: Aquatic arthropods, conidia and nematode were observed also.

*Giardia* Result:  Positive  Presumptive  Negative

*Cryptosporidium* Result:  Positive  Presumptive  Negative

Summary and Conclusion: No presumptive or confirmed *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were found.

Results Certified by:

  
C.H. Jarosch  
Prince George Water Assay

Date: August 17, 2001

LABORATORY REPORT OF WATER FILTER ANALYSIS  
PRINCE GEORGE WATER ASSAY  
PO Box 2832 Station B  
Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services  
Health Canada, Medical Services Branch  
220 - 177 Victoria Street  
Prince George, BC V2S 5R8

Sample Number: 274

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: 07/26/2001                      Sample Source: Metlakatla, Tsook Lake

Sample Site: Treated water, Water Treatment Plant

Sample sent by: Ed Robinson                      Volume Filtered: 302 litres

Date & Time Received: 07/27/2001                      Date Processed / Preserved: 07/27/2001

Condition of Filter: Good. It was shipped in 380 ml of residual water.

Filter Type:  Filterite    Cotton                      Slides Analysed: 1 = 100 Litres

Temperature on Receipt:  < 5 °C,    5 - 10 °C,    10 - 20 °C,    > 20 °C

Observations:

- Debris present: 0.5 ml of orange-brown sediment was obtained from the filter.
- Algae: None were found.
- Other: Most of the debris carried over to the filter membrane was amorphous but some intact pollen grains, nematodes, parasite eggs and plant cells were observed.

*Giardia* Result:                       Positive    Presumptive    Negative

*Cryptosporidium* Result:                       Positive    Presumptive    Negative

Summary and Conclusion: No presumptive or confirmed *Giardia* cysts or confirmed or presumptive *Cryptosporidium* oocysts were found.

Results Certified by: C.H. Jarosch  
C.H. Jarosch  
Prince George Water Assay

Date: August 11, 2001

### Metlakatla Water Samples

2000 = 71 Samples  
collected  
15 Labs

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| Date         | Location         | Time       | Results  |          | Sample |
|--------------|------------------|------------|----------|----------|--------|
|              |                  |            | Positive | Negative |        |
| Jan 4/2000   | Health Centre    | 9:45 a.m.  |          | ✓        | 84     |
| Jan 13/2000  | Health Centre    | 9:03 a.m.  |          | ✓        | 84     |
| Jan 27/00    | Health Station   | 9:45 a.m.  |          | ✓        | 84     |
| Feb 7/00     | Health Station   | 11:34 a.m. |          | ✓        | 84     |
| Feb 9/00     |                  | 12         |          | ✓        | 84     |
| Feb 15/00    |                  | 11:45      |          | ✓        | 84     |
| " "          | Band Office      | 11:45      |          | ✓        | 84     |
| Feb 16/00    | band office      | 11:45      |          | ✓        | 84     |
| Feb 21/00    |                  |            |          | ✓        | 84     |
| Feb 21/00    | Health Station   | "          |          | ✓        | 84     |
| Mar 7/00     |                  | 11:40      |          | ✓        | 84     |
| "            |                  | 11:40      |          | ✓        | 84     |
| "            | Health Centre    | 11:43      |          | ✓        | 84     |
| Mar 28/00    | H. Centre        | 10:37      |          | ✓        | 84     |
| Mar 4/00     | Health Centre    | 1:00       |          | ✓        | 84     |
| Mar 5/00     | Band Office      | 10:45      |          | ✓        | 84     |
| "            | Developer office | 10:45      |          | ✓        | 84     |
| "            |                  | 10:45      | ✓        |          | "      |
| "            |                  | 10:45      |          | ✓        | "      |
| May 4/00     |                  | 11:50 a.m. |          | ✓        | "      |
| "            |                  | 11:50 a.m. |          | ✓        | "      |
| "            |                  | 11:50 a.m. |          | ✓        | "      |
| "            |                  | 11:50 a.m. |          | ✓        | "      |
| "            | B. Office        | 11:50 a.m. |          | ✓        | "      |
| June 1/00    | H. Station       | 11:40 a.m. |          | ✓        | "      |
| June 5/2000  | H station        | 11:16 a.m. |          | ✓        | "      |
| "            |                  | 11:14 a.m. |          | ✓        | "      |
| "            |                  | "          | ✓        |          | "      |
| "            |                  | "          |          | ✓        | "      |
| June 6, 2000 |                  | 4 p.m.     |          | ✓        | "      |
| "            |                  | 3:15       | ✓        |          | "      |
| "            | Band Office      | 3:15       |          | ✓        | "      |
| "            |                  | 3:15       |          | ✓        | "      |
| "            |                  | 3:15       |          | ✓        | "      |

### Metlakatla Water Samples

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| Date          | Location         | Time       | Results  |          | Sample |
|---------------|------------------|------------|----------|----------|--------|
|               |                  |            | Positive | Negative |        |
| June 15/00    | Develop Corp.    | 10:55      |          | ✓        | 8.9    |
| "             | Community Hall   | 10:55      |          | ✓        | "      |
| "             | Health Station   | 10:55      |          | ✓        | "      |
| June 26/00    | H Station        | 10:55 a.m. |          | ✓        | "      |
| July 4, 2000  | [Redacted]       | 11:35 a.m. |          | ✓        | "      |
| "             | H.C.             | 11:35 a.m. |          | ✓        | "      |
| "             | B. Office        | "          |          | ✓        | "      |
| "             | Develop. Corp.   | "          |          | ✓        | "      |
| July 10/00    | Health Station   | 9:55       |          |          | "      |
| July 25/00    | H.S.             | 9:59       |          |          | "      |
| Aug 21/00     | [Redacted]       | 11:45 a.m. |          | ✓        | "      |
| "             | Board Office     | "          |          | ✓        | "      |
| "             | [Redacted]       | "          | ✓        |          | "      |
| Aug 22 2000   | [Redacted]       | 11:58      |          |          | "      |
| "             | H Station        | 3:30       |          | ✓        | "      |
| Sept 11, 2000 | H. Station       | 9:30 a.m.  |          |          | "      |
| Sept 19 2000  | [Redacted]       | 12 o'clock |          |          | "      |
| "             | [Redacted]       | 12 "       |          | ✓        | "      |
| "             | Board Office     | 12 "       |          | ✓        | "      |
| "             | [Redacted]       | "          |          | ✓        | "      |
| "             | [Redacted]       | "          |          | ✓        | "      |
| "             | [Redacted]       | "          |          | ✓        | "      |
| Sept 25/00    | [Redacted]       | 3:05 PM    |          |          | "      |
|               | [Redacted]       | 3:05 PM    |          |          | "      |
| Nov 1 2000    | Board Office     | 11:55      |          | ✓        | "      |
| "             | Health Centre    | 11:55      |          | ✓        | "      |
|               | Develop Corp.    | 11:55 a.m. |          | ✓        | "      |
| Nov 23, 2000  | Health Station   | 11:50 a.m. |          | ✓        | "      |
| "             | [Redacted]       | 11:50 a.m. |          | ✓        | "      |
| "             | [Redacted]       | 11:50 a.m. | ✓        |          | "      |
| "             | [Redacted]       | 11:50 a.m. |          | ✓        | "      |
| "             | Met-Develop Corp | 11:50 a.m. |          | ✓        | "      |
| "             | Met Board Office | 11:50 a.m. |          | ✓        | "      |
| "             | [Redacted]       | 11:50 a.m. |          | ✓        | "      |

2001 = 21 samples  
collected  
+ 2 Labs

Metlakatla  
Water Samples

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| Date        | Location                  | Time            | Results  |          | Samplers |
|-------------|---------------------------|-----------------|----------|----------|----------|
|             |                           |                 | Positive | Negative |          |
| Nov 28/00   |                           | 3:50            | ✓        | ✓        | JK       |
| " "         |                           | 3:50            | ✓        |          | JK       |
| " "         | Band Office               | 3:50            | ✓        | ✓        | JK       |
| " "         |                           | 3:50            | ✓        |          | JK       |
| Dec 4 2000  |                           | 11:50 am        |          | ✓        | JK       |
| " "         | Band Office               | "               |          | ✓        | JK       |
| " "         |                           | "               |          | ✓        | "        |
| " "         | Develop. Office           | "               |          | ✓        | "        |
| " "         |                           | "               |          | ✓        | "        |
| Jan 9, 01   | Health Station            | 3:05 p.m.       | ✓        | ✓        | "        |
| " "         | MFCB Office               | 3:05 p.m.       |          | ✓        | "        |
| " "         |                           | 3:25 p.m.       | ✓        |          | "        |
| " "         |                           | "               |          | ✓        | "        |
| " "         |                           | "               | ✓        |          | "        |
| Jan 10 2001 |                           | on 11:10 a.m.   |          | ✓        | "        |
| " "         |                           | "               |          | ✓        | "        |
| " "         | Health Station            | "               |          | ✓        | "        |
| " "         | Band Office               | "               |          | ✓        | "        |
| Feb 14 2001 | Health Station            | 3:57            |          | ✓        | "        |
| Feb 27 2001 | Health Station            | 4:15            |          | ✓        | "        |
| Mar 5 2001  | Health Station            | 2:30            |          | ✓        | JK       |
| " "         | <del>Health Station</del> | <del>2:30</del> |          | ✓        |          |
| " "         |                           | 2:30            |          | ✓        | JK       |
| " "         |                           | 2:30            |          | ✓        | JK       |
| Mar 15/01   | Met. Health Station       | 11:50           |          | ✓        | JK       |
| " "         | Met Develop. Corp         | 11:50           |          | ✓        | JK       |
| " "         | Met Band Office           | 11:50           |          | ✓        | JK       |
| Mar 21 2001 |                           | 2:30            |          | ✓        |          |
| " "         |                           | 2:30            |          | ✓        |          |
| " "         |                           | 2:30            | ✓        |          |          |
| " "         | Health Station            | 2:30            |          | ✓        |          |
| " "         |                           | 2:30            |          | ✓        |          |
| " "         |                           | 2:30            |          | ✓        |          |
| Mar 22 2001 |                           | 11:50 am        |          | ✓        |          |

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### Metlakatla Water Samples

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| Date         | Location       | Time        | RESULTS  |          | Comments |
|--------------|----------------|-------------|----------|----------|----------|
|              |                |             | Positive | Negative |          |
| Apr 18 2001  |                | 11:24       |          | ✓        | 54.      |
| " 18 2001    |                | 11:29       |          | ✓        |          |
| " "          | Health centre  | 11:29       |          | ✓        |          |
| May 9, 2001  |                | 3:15        |          | ✓        |          |
| "            |                | 3:15        |          | ✓        |          |
| "            |                | "           |          | ✓        |          |
| "            |                | "           |          | ✓        |          |
| "            |                | "           | ✓        | 0        | 10       |
| "            |                | "           |          | ✓        |          |
| May 14/2001  |                | 12:00 pm    |          | ✓        |          |
| "            | Health         | 2:00 pm     |          | ✓        |          |
| July 9 2001  | Health station | 11:50 12:00 |          | ✓        |          |
|              | Band Office    | 12 o'clock  |          | ✓        |          |
|              | Develop. Corp. | "           |          | ✓        |          |
| July 19 2001 | Health station | 11 o'clock  |          | ✓        |          |
| "            |                | 11:50 a.m.  |          | ✓        |          |
|              | Band Office    | 11:50 a.m.  |          | ✓        |          |
|              |                | 11:50 a.m.  |          | ✓        |          |
|              |                | " a.m.      |          | ✓        |          |
|              | NIFCS office   | " a.m.      |          | ✓        |          |
|              |                | " a.m.      |          | ✓        |          |
| Aug 7 2001   | Raw water      | 10:45 a.m.  | ✓        | ✓        |          |
| "            | Treated water  | 10:45 a.m.  |          | ✓        |          |
| "            | filter water   | "           |          | ✓        |          |
| "            |                | "           |          | ✓        |          |
| "            | Health station | "           |          | ✓        |          |
| Aug 22 2001  | Health station | 11:35 Am    |          | ✓        |          |
|              |                | "           |          | ✓        |          |
|              | Filter water   | "           |          | ✓        |          |
|              | Raw water      | "           | ✓        |          |          |

s.19(1)





RESULTS OF ANALYSIS

File No. D4489

|                              | Band<br>Office | Blank    |
|------------------------------|----------------|----------|
|                              | 93 09 24       | 93 09 24 |
| <hr/>                        |                |          |
| <u>Halogenated Volatiles</u> |                |          |
| Bromodichloromethane         | 0.0017         | <0.0005  |
| Bromoform                    | <0.0005        | <0.0005  |
| Chloroform                   | 0.0721         | <0.0005  |
| Dibromochloromethane         | <0.0005        | <0.0005  |
| <u>Surrogate Standards</u>   |                |          |
| 4-Bromofluorobenzene (SS)    | % 90           | 91       |
| d5-Chlorobenzene (SS)        | % 104          | 101      |
| Fluorobenzene (SS)           | % 80           | 84       |

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< = Less than the detection limit indicated.  
Results are expressed as milligrams per litre.