VEOLIA
WATER

February 22, 2010

**The Whitechurch Water System – 2009 Compliance Summary**

## System Description

The Whitechurch water system is characterized as a "secure ground water" system and is classified as a small municipally owned water system.

### Capacity/Flows

The new plant and its equipment, in service September 2007, currently have a daily maximum capacity to deliver 260 cubic metres of potable water per day to the Whitechurch community.
The Whitechurch water system has 1 permit to take water # 1286-6M7PPP which allows 260 cubic metres per day from the combined wells. This limit was not exceeded in 2009. A full summary of the 2009 flows is attached.
The Whitechurch treatment system has a maximum flow as specified in C of A # 3835-6XTKGA of 260 cubic meters per day .
The limiting factor regarding flow is chlorine contact time in the chlorine contact mains. In order to meet the regulatory CT requirements increased flows beyond 3.28 litres per second must have an increased free chlorine residual to counter the decreased retention time in the chlorine contact main. The records do not indicate flows exceeded 3.28 l/sec in 2009.
In 2009 the system averaged a daily total flow of 84 cubic metres or 32 % of its rated capacity.
The maximum daily flow was 136 cubic meters or 52 % of the rated capacity.

### Source

The current water source is a secure deep bed rock well. Production well # 1 is located approximately 10 metres west of the well house. Production well # 2 is located approximately 30 M due south of well #1.
Well # 1 and #2 were drilled in 2003. The well pump and associated piping in well #1 were installed in August of 2007. The well pump for # 2 well was installed in 2008.

### Well House Equipment

The new well house was equipped with a well pump, backup diesel generator set, chlorinators, a chlorine contact main and online monitoring. The system is controlled and monitored by the Huron Kinloss water systems SCADA system PC in Ripley.

### Distribution System

The attached distribution system is a combination of PVC and polyethylene piping.
There is no elevated storage to maintain pressure and the system pressure is maintained using pressure tanks and the well pump.
The system has no hydrants and lacks the capacity to provide fire flows.

## Chemicals Fed

### Disinfectant

Disinfection was achieved on the Whitechurch well supply through the use of 12% sodium hypochlorite.
In the new well house the chemical was added prior to the water entering the chlorine contact chambers at dosages high enough to achieve both primary and secondary disinfection objectives.

Veolia Water Canada
Goderich Water Treatment Plant

A full summary of dosages and residuals can be found in the attached tables.The free chlorine residual was monitored at the point of entry to the distribution system with a target residual of > 1.00 mg/l and < 1.30 mg/l.

**Iron Sequestering**

The well water at Whitechurch has iron levels higher than what is considered aesthetically acceptable. The new well house provides chemically assisted iron sequestering. The chemical used in 2009 was sodium silicate. This chemical was fed just prior to the point of entry into the distribution system on the old system and is fed prior to the chlorine contact main on the new.
A full summary of dosages and chemical used can be found in the attached tables.

**Precautionary Boil Water Notices**

Precautionary boil water notices were issued on 6 occasions.
These are listed and detailed on the attached tables.
In all cases the notices were put in place by the operating authority due to problems with the chlorination system.
Microbiology analysis of all samples collected during these events showed the water to be free of any bacterial contamination.

**Boil Water Advisory**

There were no Boil Water Advisories issued by the Grey Bruce MOH on the Ripley water system in 2009.

**Annual Ontario Ministry of the Environment Inspection**

Shayne Finlay, MOE Drinking Water Inspector, inspected the water system and examined the water quality and operational records on February 18, 2009. He issued a report of his findings in April of 2009. He outlined a number of non compliant issues.
A complete copy of the non- compliant issues and the owner/ operating authority's response is attached.

**Exceedences**

**Barium**

O. Reg. 169/03 ( the Ontario Drinking Water Standard) has a MAC (maximum allowable concentration) of 1.0 mg/l for barium.
The water from the Whitechurch wells is monitored quarterly for barium. They have naturally occurring levels that can exceed 1.0 mg/l. C of A 3835-6XTKGA section 9.1 provides relief from the regulatory requirement to maintain levels of barium of less than 1.0 mg/l subject to providing an annual report to the Grey Bruce Health unit regarding any exceedence.
The results reported on 2009 analysis ranged from 0.970 mg/l to 1.180 mg/l
A complete listing of the chemical analysis done on the Whitechurch is attached.

Laurie Cox – Project Manager VWC

**Whitechurch Well Supply**

Chemical Usage

2009

| | Sodium Hypochlorite | | | Sodium Silicate | |
|---|---|---|---|---|---|
| Month | Usage kg. | Dosage mg/L | | Usage Kg. | Dosage mg/L |
| Jan '09 | 10.43 | 4.45 | | 28.23 | 12.03 |
| Feb '09 | 66.24 | 28.80 | | 156.83 | 68.18 |
| Mar '09 | 8.96 | 3.57 | | 166.58 | 66.37 |
| Apr '09 | 10.10 | 4.18 | | 24.67 | 10.21 |
| May '09 | 10.06 | 4.03 | | 25.30 | 10.14 |
| Jun '09 | 10.47 | 4.23 | | 27.85 | 11.24 |
| Jul '09 | 12.72 | 4.45 | | 35.65 | 12.49 |
| Aug '09 | 11.88 | 4.29 | | 35.86 | 12.95 |
| Sep '09 | 11.45 | 4.40 | | 32.41 | 12.47 |
| Oct '09 | 11.76 | 4.24 | | 34.50 | 12.43 |
| Nov '09 | 10.08 | 4.09 | | 28.86 | 11.70 |
| Dec '09 | 10.62 | 4.22 | | 28.74 | 11.43 |
| Total | 184.77 | 6.05 | | 625.47 | 20.49 |

Notes:

1) The sodium hypochlorite is used as a source of chlorine (Density: 1.15 at 12%)

2) The sodium silicate is used as a treatment for iron.

All quantities of chemicals are listed as the available chemical in the solutions and not the total physical quantities.

| | |
|---|---|
| Water Works Name: | **Whitechurch Well Supply** |
| Well No. (if applicable): | Well # 1 |
| Year: | 2009 |
| Serviced Population | 93 |
| Laboratories Which Performed Analyses: | SGS Lakefield Research |
| Water Works Number | 220008863 |

**Raw Water**

| Month | Total Coliform | | | | Fecal Coliform / Escherichia Coli | | | |
|---|---|---|---|---|---|---|---|---|
| | No. of Samples Collected | No. of Samples 0-100 | No. of Samples 101-9000 | No. of Samples >9000 | No. of Samples Collected | No. of Samples 0-10 | No. of Samples 11-900 | No. of Samples >900 |
| Jan '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| Feb '09 | 6 | 6 | 0 | 0 | 6 | 6 | 0 | 0 |
| Mar '09 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 |
| Apr '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| May '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| Jun '09 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 |
| Jul '09 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 |
| Aug '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| Sep '09 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 |
| Oct '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| Nov '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 |
| Dec '09 | 6 | 6 | 0 | 0 | 6 | 6 | 0 | 0 |
| Total | 56 | 56 | 0 | 0 | 56 | 56 | 0 | 0 |

Water Works Name: **Whitechurch Well Suplly**
Year: 2009
Serviced Population: 93
Laboratories which Performed Analyses: SGS Lakefield Research

**Distribution System**

| Month | Total Coliform | | | | Fecal Coliform / Escherichia Coli | | | HPC or MF | | | BKG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Samples Collected | No. of Samples "Safe" | No. of Samples "Unsafe" | No. of Samples Deteriorating | No. of Samples Collected | No. of Samples "Safe" | No. of Samples "Unsafe" | No. of Samples Collected | No. of Samples "Safe" | No. of Samples Deteriorating | No. of Samples Collected | No. of Samples "Safe" | No. of Samples Deteriorating" |
| Jan '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| Feb '09 | 6 | 6 | 0 | 0 | 6 | 6 | 0 | 6 | 6 | 0 | | | |
| Mar '09 | 8 | 8 | 0 | 0 | 8 | 8 | 0 | 7 | 7 | 0 | | | |
| Apr '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| May '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| Jun '09 | 9 | 9 | 0 | 0 | 9 | 9 | 0 | 7 | 7 | 0 | | | |
| Jul '09 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 5 | 5 | 0 | | | |
| Aug '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| Sep '09 | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 8 | 8 | 0 | | | |
| Oct '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| Nov '09 | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 0 | | | |
| Dec '09 | 6 | 6 | 0 | 0 | 6 | 6 | 0 | 5 | 5 | 0 | | | |
| Total | 68 | 68 | 0 | 0 | 68 | 68 | 0 | 62 | 62 | 0 | | | |

INDICATORS OF UNSAFE DRINKING WATER QUALITY:
If any of the following conditions exist, the drinking water is judged unsafe:

1. Eschericia coli and/or fecal coliforms are detected in any distribution sample by any analytical method;
2. Total coliforms are detected in consecutive samples from the same site or in multiple samples taken as a single submission from a distribution system.

If the water contains any indicators of unsafe water quality for any of the reasons outlined above, the laboratory will immediately notify the MOEE District Officer who will immediately notify the Medical Officer of Health and the operating authority to initiate collection of special samples and/or take corrective action.

INDICATORS OF DETERIORATING DRINKING WATER QUALITY

Any of the following conditions indicate a deterioration in drinking water quality:
a) total coliforms detected as a single occurrence (but not Escherichia coli or other fecal coliforms);

b) samples contain more than 500 colonies per ml on a heterotrophic plate count analysis;

c) samples contain more than 200 background colonies on a total coliform membrane filter analysis;

d) Aeromonas spp., Pseudomonas aeruginosa, Staphylococcus aureus, Clostridium spp. Or members of the Fecal Streptococcus (Enterococcus) group are detected.

If these conditions occur, the MOEE Dist. Mang. Should be notified.

Water Works Name: **Whitechurch Well Supply**
Well No. (if applicable): N/A
Year: 2009
Serviced Population 93
Laboratories Which Performed Analyses: Veolia Water Canada
Water Works Number 220008863

| Month | Treated Water Flow | | | Process | Treated Water Turbidity | | | Treated Disinfectant | | Treated Disinfectant-SCADA | | Dist. System Disinfectant | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Average Daily (1000 m3) | Maximum Daily (1000 m3) | Monthly Total (1000 m3) | Wastewater Monthly Tota (1000 m3) | No. of Samples Collected | No. of Samples > 1NTU | Average Turbidity NTU | No. of eated Sampl Collected | Average Residual (mg/L) | Minimum Online Residual (mg/L) | Maximum Online Residual (mg/L) | No. of Dist.Samp. Collected | No. of Samples < 0.05 |
| Jan '09 | 0.076 | 0.112 | 2.346 | | 31 | 0 | 0.178 | 31 | 1.61 | 1.13 | 2.05 | 30 | 0 |
| Feb '09 | 0.082 | 0.102 | 2.300 | | 28 | 0 | 0.198 | 28 | 1.61 | 0.00 | 4.99 | 28 | 0 |
| Mar '09 | 0.081 | 0.119 | 2.510 | | 31 | 0 | 0.164 | 31 | 1.19 | 0.01 | 1.99 | 31 | 0 |
| Apr '09 | 0.081 | 0.117 | 2.416 | | 30 | 0 | 0.218 | 30 | 1.40 | 0.67 | 2.01 | 30 | 0 |
| May '09 | 0.080 | 0.107 | 2.495 | | 31 | 0 | 0.195 | 31 | 1.39 | 0.39 | 2.03 | 31 | 0 |
| Jun '09 | 0.083 | 0.101 | 2.477 | | 30 | 0 | 0.217 | 30 | 1.32 | 0.03 | 2.01 | 30 | 0 |
| Jul '09 | 0.092 | 0.136 | 2.855 | | 31 | 0 | 0.197 | 31 | 1.33 | 0.02 | 2.42 | 31 | 0 |
| Aug '09 | 0.089 | 0.116 | 2.770 | | 31 | 0 | 0.200 | 31 | 1.38 | 0.99 | 1.84 | 31 | 0 |
| Sep '09 | 0.087 | 0.118 | 2.599 | | 30 | 0 | 0.220 | 30 | 1.44 | 0.00 | 4.50 | 30 | 0 |
| Oct '09 | 0.090 | 0.110 | 2.775 | | 31 | 0 | 0.283 | 31 | 1.46 | 0.47 | 2.47 | 31 | 0 |
| Nov '09 | 0.082 | 0.099 | 2.466 | | 30 | 0 | 0.295 | 30 | 1.41 | 1.15 | 1.92 | 30 | 0 |
| Dec '09 | 0.081 | 0.111 | 2.514 | | 31 | 0 | 0.256 | 31 | 1.43 | 0.00 | 1.98 | 31 | 0 |
| Total | | | 30.523 | | 365 | 0 | | 365 | | | | 364 | 0 |
| Average | 0.084 | | | | | | 0.218 | | 1.41 | | | | |
| Maximum | | 0.136 | | | | | | | | | | | |

Disnifectant Compound Used (EG. Chlorine Gas, NaOCl, etc.): Sodium Hypochlorite

Form of Residual Displayed on above table: (EG. Free, Combined, or Total): Free

Quantity of Disinfectant used during the year (kg): 184.77

Distribution system target residual (mg/L): > 0.20

| | |
|---|---|
| Water Works Name: | **Whitechurch Well Supply** |
| Well No. (if applicable): | N/A |
| Year: | 2009 |
| Serviced Population: | 93 |
| Laboratories which Performed Analyses: | SGS Lakefield Research |

**Treated Water**

| Month | Total Coliform | | | | Fecal Coliform / Escherichia Coli | | | HPC or MF | | | BKG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Samples Collected | No. of Samples "Safe" | No. of Samples "Unsafe" | No. of Samples Deteriorating | No. of Samples Collected | No. of Samples "Safe" | No. of Samples "Unsafe" | No. of Samples Collected | No. of Samples "Safe" | No. of Samples Deteriorating | No. of Samples Collected | No. of Samples "Safe" | No. of Samples Deteriorating" |
| Jan '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| Feb '09 | 6 | 6 | 0 | | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 0 | 0 |
| Mar '09 | 6 | 6 | 0 | | 6 | 6 | 0 | 6 | 6 | 0 | 0 | 0 | 0 |
| Apr '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| May '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| Jun '09 | 7 | 7 | 0 | | 7 | 7 | 0 | 7 | 7 | 0 | 0 | 0 | 0 |
| Jul '09 | 5 | 5 | 0 | | 5 | 5 | 0 | 5 | 5 | 0 | 0 | 0 | 0 |
| Aug '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| Sep '09 | 8 | 8 | 0 | | 8 | 8 | 0 | 6 | 6 | 0 | 0 | 0 | 0 |
| Oct '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| Nov '09 | 4 | 4 | 0 | | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 0 | 0 |
| Dec '09 | 6 | 6 | 0 | | 6 | 6 | 0 | 5 | 5 | 0 | 0 | 0 | 0 |
| Total | 62 | 62 | 0 | | 62 | 62 | 0 | 59 | 59 | 0 | 0 | 0 | 0 |

INDICATORS OF UNSAFE DRINKING WATER QUALITY:
If any of the following conditions exist, the drinking water is judged unsafe:

1. Eschericia coli and/or fecal coliforms are detected in any distribution sample by any analytical method;
2. Total coliforms are detected in consecutive samples from the same site or in multiple samples taken as a single submission from a distribution system.

If the water contains any indicators of unsafe water quality for any of the reasons outlined above, the laboratory will immediately notify the MOEE District Officer who will immediately notify the Medical Officer of Health and the operating authority to initiate collection of special samples and/or take corrective action.

INDICATORS OF DETERIORATING DRINKING WATER QUALITY

Any of the following conditions indicate a deterioration in drinking water quality:
a) total coliforms detected as a single occurrence (but not Escherichia coli or other fecal coliforms);

b) samples contain more than 500 colonies per ml on a heterotrophic plate count analysis;

c) samples contain more than 200 background colonies on a total coliform membranie filter analysis;

d) Aeromonas spp., Pseudomonas aeruginosa, Staphylococcus aureus, Clostridium spp. Or members of the Fecal Streptococcus (Enterococcus) group are detected.

If these conditions occur, the MOEE Dist. Mang. Should be notified.

Annual Summary - Fluoride, Nitrite, Nitrate, and Colour
(Complete a separate sheet for each imput into the Distribution System)

**Water Works Name:** Whitechurch Well Supply
**Well No. (if applicable):**
**Year:** 2009
**Serviced Population** 93
**Laboratories Which Performed Analyses:** SGS Lakefield Research
**Water Works** 220008863

| Month | Barium | | | Treated Water Nitrite | | | Treated Water Nitrate | | | THM's | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Samples Collected | Average Residual mg/L | Maximum Residual mg/L | No. of Samples Collected | Average Nitrite mg/L | Maximum Nitrite mg/L | No. of Treated Samples Collected | Average Nitrate (mg/L) | Maximum Nitrate mg/L | No of Samples | Result ug/l |
| Jan. | | | | | | | | | | | |
| Feb. | 1 | 970 | 970 | 1 | <0.005 | <0.005 | 1 | <0.013 | <0.013 | 1 | 13 |
| Mar. | | | | | | | | | | | |
| Apr. | | | | | | | | | | | |
| May | 1 | 1090 | 1090 | 1 | <0.005 | <0.005 | 1 | 0.110 | 0.110 | 1 | 11 |
| June | | | | | | | | | | | |
| July | | | | | | | | | | | |
| August | 1 | 1180 | 1180 | 1 | <0.005 | <0.005 | 1 | <0.013 | <0.013 | 1 | 16 |
| Sept | | | | | | | | | | | |
| Oct. New Well | | | | | | | | | | | |
| Nov | 1 | 1080 | 1080 | 1 | <0.005 | <0.005 | 1 | 0.024 | 0.024 | 1 | 13 |
| Dec | | | | | | | | | | | |
| Total | 4 | | | 4 | | | 4 | | | | |
| Average | | | | | #DIV/0! | | | | | | |
| Maximum | | | 1180 | | | 0 | | | 0.11 | | |
| ODWQS | | | | | | | | | | | |

Where nitrate and nitrite are present, the total of the two should not exceed 10 mg/L
THM levels should not exceed 100 ug/L
Fluoride levels above 1.5 mg/L must be reported to the Medical Officer of Health
Barium levels should not exceed 1000 ug/L

Annual Data Summary - Treated Water Volatile Organic and Inorganic Data
(Complete a separate sheet for each input into the Distribution System)

**Water Works Name:** Whitechurch Well Supply
**Well No. (if applicable):** Well # 1 and Well # 2
**Year:** 2009
**Serviced Population** 93
**Laboratories Which Performer Analyses:** SGS Lakefield Research
**Water Works #** 220008863

| Parameter | Analysis Date (MM/DD/YY) | Analysis Result (ug/L) | Maximum Allowable Level (ug/L) | Analysis Result mg/L | Maximum Allowable Level mg/L |
|---|---|---|---|---|---|
| **Schedule 23 & 24** | | | | | |
| Antimony | 10/11/2007 | <0.2 | 6 | | |
| Arsenic | 12/125/2009 | 0.5 | 25 | | |
| Boron | 10/11/2007 | 15 | 5000 | | |
| Cadmium | " | <0.003 | 5 | | |
| Chromium | " | 0.5 | 50 | | |
| Mercury | " | <0.02 | 1 | | |
| Sodium | 11/26/2007 | | | 17.1 | 20 |
| Fluoride | 12/1/2009 | | | 1.02 | 1.5 |
| Selenium | 12/15/2009 | <1 | 10 | | |
| Uranium | 10/11/2007 | 0.161 | 20 | | |
| Benzene | " | <0.37 | 5 | | |
| Carbon Tetrachloride | " | <0.41 | 5 | | |
| 1,2-Dichlorobenzene | " | <0.50 | 200 | | |
| 1,4-Dichlorobenzene | " | <0.21 | 5 | | |
| 1,1-Dichloroethylene | " | <0.41 | 14 | | |
| 1,2-Dichloroethane | " | <0.43 | 5 | | |
| Dichloromethane | " | <0.34 | 50 | | |
| Monochlorobenzene | " | <0.58 | 80 | | |
| Tetrachloroethylene | " | <0.45 | 30 | | |
| Trichloroethylene | " | <0.38 | 50 | | |
| Vinyl Chloride | " | <0.17 | 2 | | |
| Diquat | " | <1 | 70 | | |
| Paraquat | " | <1 | 10 | | |
| Glyphosate | " | <6 | 280 | | |
| Polychlorinated Biphenyls | " | <0.04 | 3 | | |
| Benzo(a)pyrene | " | <0.004 | 0.01 | | |
| 2,4-dichlorophenol | " | <0.15 | 900 | | |
| 2,4,6-trichlorophenol | " | <0.25 | 5 | | |
| 2,3,4,5-tetrachlorophenol | " | <0.14 | 100 | | |
| Pentachlorophenol | " | <0.15 | 60 | | |

| | | | |
|---|---|---|---|
| Alachlor | " | <0.11 | 5 |
| Aldicarb | " | <0.30 | 9 |
| Aldrin+Dieldrin | " | <0.067 | 0.7 |
| Aldrin | " | <0.060 | |
| Dieldrin | " | <0.067 | |
| Atrazine+N-dealkylated metabolites | " | <0.12 | 5 |
| Atrazine | " | <0.11 | |
| De-ethylated atrazine | " | <0.12 | |
| Azinphos-methyl | " | <0.21 | 20 |
| Bendiocarb | " | <0.13 | 40 |
| Carbaryl | " | <0.16 | 90 |
| Carbofuran | " | <0.37 | 90 |
| Chlordane | " | <0.11 | 7 |
| a-chlordane | " | <0.069 | |
| g-chlordane | " | <0.063 | |
| Oxychlordane | " | <0.11 | |
| Chlorpyrifos | " | <0.18 | 90 |
| Cyanazine | " | <0.18 | 10 |
| Diazinon | " | <0.081 | 20 |
| (DDT)+Metabolites | " | <0.14 | 30 |
| op-DDT | " | <0.095 | |
| pp-DDD | " | <0.098 | |
| pp-DDE | " | <0.075 | |
| pp-DDT | " | <0.14 | |
| Dimethoate | " | <0.12 | 20 |
| Diuron | " | <0.087 | 150 |
| Heptachlor-Heptachlor Epoxide | " | <0.11 | 3 |
| Heptachlor | " | <0.061 | |
| Heptachlor epoxide | " | <0.11 | |
| Lindane | " | <0.056 | 4 |
| Malathion | " | <0.091 | 190 |
| Methoxychlor | " | <0.14 | 900 |
| Metolachlor | " | <0.092 | 50 |
| Metribuzin | " | <0.12 | 80 |
| Parathion | " | <0.18 | 50 |
| Phorate | " | <0.11 | 2 |
| Prometryne | " | <0.23 | 1 |
| Simazine | " | <0.15 | 10 |
| Temephos | " | <0.31 | 280 |
| Terbufos | " | <0.12 | 1 |

| | | | |
|---|---|---|---|
| Triallate | " | <0.10 | 230 |
| Trifluralin | " | <0.12 | 45 |
| 2,4-dichlorophenoxyacetic acid | " | <0.19 | 100 |
| 2,4,5-trichlorophenoxyacetic acid | " | <0.22 | 280 |
| Bromoxynil | " | <0.33 | 5 |
| Dicamba | " | <0.20 | 120 |
| Diclofop-methyl | " | <0.40 | 9 |
| Dinoseb | " | <0.36 | 10 |
| Picloram | " | <0.25 | 190 |

## NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

**This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.**

1. **Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

   The inspection of Whitechurch Well Supply chlorine trends indicated that on numerous occasions water was directed to the distribution system that was improperly disinfected. This occurred on June 8, 2008, August 21, 2008 and November 7, 2008. None of these adverse water quality incidents were reported to Ministry of the Environment. There were two (2) other occasions when improperly treated water was directed to the distribution system (on April 8, 2008 and again on May 20, 2008) however both of these incidents were captured in an AWQI. At the time of inspection the ORO did not have a copy of the CT calculation reflecting the upgrades to the pumphouse, however was able to supply the engineer's CT calculation on March 17, 2009.

   **Action(s) Required:**
   The owner/operating authority shall comply with Ontario Regulation 170 schedule 1-2(2). The Owner of a drinking water system and the operating authority for the system shall ensure the following: 3. The water treatment equipment required by section 1-3 or 1-4 is operated in a manner that achieves the design capabilities it required to have under that section. This instance and following failure to report AWQIs and logbook keeping have been referred to Investigations and Enforcement Branch of the MOE.

2. **The Operator-in-Charge had not ensured that all equipment used in the processes was monitored, inspected, and evaluated.**

   Lack of proper calibration records for both handheld chlorine analyzers and the online chlorine analyzer as well as the online and handheld turbidity meters indicate that the equipment used to monitor the process was not inspected or evaluated. There were numerous instances where the difference between the online chlorine analyzer and the handheld chlorine analyzer was more than 5% out, and no record of correction or recalibration exist.

   **Action(s) Required:**
   The OIC doesn't follow SOP, maintenance and recording procedures for online analyzers and hand held chlorine and turbidity analyzers. The Operator-in-Charge shall immediately comply with regulation 128/04 26. (1)(d). and ensure that all equipment used in the processes is monitored, inspected, tested and evaluated. The OIC shall make sure that records of equipment operating status are prepared and available at the end of every operating shift.

3. **Operators and maintenance personnel did not have ready access to operations and maintenance manuals.**

   The owner or operating authority has not ensured that operators and maintenance personnel have ready access to the comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system. The OPS manual is not up to date and lacks a new SCADA system SOP which should include a complete list of alarms with set points/testing frequencies, data review/record keeping procedures and alarm response procedures. The operations manual lacked a CT calculation. The operations manuals should have a valid C of A and PTTW.

   **Action(s) Required:**
   As per Certificate of Approval # 0618-7BDRVG, the owner/ operating authority is required to update old versions and develop site specific Standard Operating Procedures (SOP's) for all key pieces of equipment

including analyzers, disinfection equipment, SCADA system, static well depths, daily distribution residuals, logbook entries, lead sampling, alarms testing, daily checks, flow meter and modules, AWQI procedures with corrective actions and emergency procedures. The SOP's shall include maintenance frequencies, record keeping, alarm testing frequencies including roles and responsibilities of the owner, operating authority, ORO, OIC and operators. The owner/ operating authority shall submit the SOP's for review to Provincial Officer Shayne Finlay by no later than April 30, 2009.

4. **The operations and maintenance manuals did not contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

   The operations and maintenance manual did not contain the CT calculation; however the ORO supplied a copy of the engineer's CT calculation to the MOE on March 17, 2009.

   **Action(s) Required:**
   See required action # 3

5. **The operations and maintenance manuals did not meet the requirements of the Permit, Licence or Approval issued under Part V of the SDWA.**

   The operations manual do not comply with condition 6.5 (iii) of the Certificate of Approval; procedures for the monitoring and recording of in process parameters necessary for the control of the treatment systems and assess the performance of the drinking-water system.

   **Action(s) Required:**
   See required action # 3.

6. **Logs for the treatment subsystem(s) of the drinking water system did not contain the required information.**

   The logbooks did not contain required information. The logbooks did not include the minimum, maximum and mean results for every parameter that was tested by online analyzers for the entire inspection period. During the inspection of the logbooks it was noted that on July 17, 2008, an addition was made to the record of July 15, 2008 indicating that the low chlorine alarm was monitored remotely, however an operator was not dispatched. The record of the test that caused the alarm was not recorded. As well, on January 6, 2008, there was a low chlorine event and the ORO instructed the operator not to call it in as an adverse water quality incident, the reasoning behind why this was not necessary was not included in the logbook.

   **Action(s) Required:**
   The owner/operating authority shall comply with O. Reg. 128/04 and immediately begin recording:

   - The date, the time period the shift covered and the number or designation of the shift,

   - The names of all operators on duty during each shift,

   - Details of departures from normal operating procedures that occurred during the shift, the time they occurred and the name of the person, who gave the instructions for the departure,

   - Logbook entries are made in chronological order.

   - Abnormal and unusual observations and related conclusions and/or actions taken,

   - A record of equipment taken out of service or ceased to operate, maintenance or repair carried out on the equipment, including the date and time when equipment was repaired and returned to service.

   Provincial Officer Shayne Finlay will request, at random, copies of logs at some time in the next three (3) months to confirm this requirement has been met.

7. **Logs or other record keeping mechanisms were not available for at least five (5) years.**

Up until the installation of the new SCADA system a record of the minimum, maximum and mean results of tests for every parameter using continuous monitoring equipment were not recorded.

**Action(s) Required:**
The owner or operating authority shall ensure that logs and other record-keeping mechanisms are accessible at the subsystem, (a) for at least five years after the last entry in it was made, in the case of a log or record-keeping mechanism that is kept in a book or document form or kept on a similarly fixed basis; or (b) for at least five years after each entry in it was made, in the case of a log or record-keeping mechanism that is kept on a loose-leaf or electronic basis or kept on a similarly continuous basis. (O. Reg. 128/04, s. 27 (6).)

8. **All continuous analysers were not calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

The continuous chlorine analyzer is compared daily to the handheld analyzer. On many occasions the difference between the two analyses was greater than 5%. The continuous analyzer requires recalibrating when the difference is greater than 5%. The manufacture recalibration procedure must be followed using known and traceable standards. There were no records to indicate the handheld analyzers were calibrated with known and traceable standards.

**Action(s) Required:**
The owner/operating authority shall follow the instrumentation calibration SOP and follow maintenance procedures for online analyzers and hand held chlorine and turbidity analyzers as detailed in the maintenance manual. Records of the calibrations shall be documented in the maintenance log. The owner/operating authority is required to calibrate online and handheld chlorine and turbidity meters and shall forward the records to Provincial Officer Shayne Finlay by April 30, 2009.

9. **All continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not recording data with the prescribed format.**

As required, the minimum, maximum and mean test results for each parameter measured by continuous monitoring equipment was not recorded prior to the installation of the new SCADA system. Operators were able to get this information from the actual instrumentation, however failed to record it in the daily log.

**Action(s) Required:**
The owner/operating authority shall ensure that the minimum, maximum and mean results for every online analyzer are recorded daily and available for review during the inspection process, as per O.Reg.170/03 6-5 (1) 2.i. and ii. Provincial Office Shayne Finlay will request at random copies of the logs at some time in the next three (3) months to confirm this requirement has been met.

The owner/operating authority shall ascertain the required experts to ensure the SCADA system reflects the true representation of the water treatment plant system, including the correct flows and chlorine analysis. The SCADA system shall time stamp all records and maintain the time stamp throughout the lifespan of the record, including time changes due to daylight savings time.

10 **The owner did not indicate that the required records are kept and will be kept for the required time period.**

The owner of the system has installed a new SCADA system that will facilitate record keeping requirements; however records before this installation are not complete.

**Action(s) Required:**
The owner or operating authority shall ensure that logs and other record-keeping mechanisms are accessible at the subsystem, (a) for at least five years after the last entry in it was made, in the case of a log or record-keeping mechanism that is kept in a book or document form or kept on a similarly fixed basis; or (b) for at least five years after each entry in it was made, in the case of a log or record-keeping mechanism that is kept on a loose-leaf or electronic basis or kept on a similarly continuous basis. (O. Reg. 128/04, s. 27 (6).)

**11. Corrective actions (as per Schedule 18) had not been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

No corrective actions were taken for four (4) low chlorine events, see below.

**Action(s) Required:**
See actions required # 12.

**12 All required notifications of adverse water quality incidents were not immediately provided as per O.Reg. 170/03 16-6.**

Low chlorine events were not reported as AWQIs, specifically, January 6, 2008, June 8, 2008, August 21, 2008 and November 7, 2008. At the time of inspection and during the document review, the ORO was requested to supply a CT calculation for the upgraded pumphouse. Originally the ORO stated that the free chlorine residual needed to be above 0.50 mg/L, however did not have the calculation to verify this. On March 5, 2009 a calculation prepared by the ORO was supplied indicating that a free chlorine residual required was 0.32 mg/L. On March 17, 2009 the CT calculation from their engineer was supplied to Shayne Finlay and Allison Kershaw indicating that 0.32 mg/L of free chlorine was required, however the contact time was shorter than indicated by the ORO. On the dates listed above the free chlorine values were not met, they ranged between 0 mg/L to 0.27 mg/L, as well the flow during these incidents ranged from 2.0 L/s to 3.6 L/s.

**Action(s) Required:**
The owner/operating authority shall comply with Ontario Regulation 170 schedule 16-6 (Manner of making immediate report).

**13 All required notifications of adverse water quality incidents were not provided as per O.Reg. 170/03 16-7.**

No required notifications of adverse water quality incidents were provided for the four (4) low chlorine events of January 6, 2008, June 8, 2008, August 21, 2008 and November 7, 2008.

**Action(s) Required:**
The owner/operating authority shall comply with Ontario Regulation 170 schedule 16-7 (Manner of making a written report within 24 hours of incident).

**14 In instances where written notice of issue resolution was required by regulation, the notice was not provided as per O.Reg. 170/03 16-9.**

No written notice of issue resolutions were provided for the low chlorine events of January 6, 2008, June 8, 2008, August 21, 2008 and November 7, 2008.

**Action(s) Required:**
The owner/operating authority shall comply with Ontario Regulation 170 schedule 16-9 (Manner of making a report within seven days after the issue is resolved).

**15 Where required continuous monitoring equipment, used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person did not respond in a timely manner and/or did not take appropriate actions.**

During the inspection of the logbooks it was noted that on July 17, 2008, an addition was made to the record of July 15, 2008 indicating that the low chlorine alarm was monitored remotely, however an operator was not dispatched. The record of the test that caused the alarm was not recorded. There was no remote monitoring log for this date.

**Action(s) Required:**
The owner/operating authority is required to dispatch a qualified person to examine test results to the location of the alarm, as per O.Reg 170/03 6-5 (10) 3 i, ii, iii.

**16 Annual Reports did not include the required information.**

The annual reports have utilized the chlorine and turbidity grab sample data, and should have used the continuous monitoring data.

**Action(s) Required:**
In accordance with Section 11 of O. Reg. 170/03, the Owner of a drinking-water system must prepare an annual report that summarizes the results of tests by continuous analyzers required under the regulation during the reporting period. Operational testing performed under Schedule 7 of O. Reg. 170/03 for the Whitechurch drinking-water system includes the treated water chlorine residuals measured by the continuous monitoring equipment, distribution chlorine residuals measured by hand-held analyzers, and turbidity values measured by continuous monitoring equipment. The results of these operational checks must be summarized in the annual report with the minimum and maximum values indicated. The operating authority will redo and submit 2008 Annual report to Provincial Officer Shayne Finlay by April 30, 2009.

**17 Summary Reports for municipal council were not completed on time, did not include the required content, and/or were not distributed in accordance with the regulatory requirements.**

The summary report did not include the minimum, maximum and mean test results for every parameter tested by online analyzers, specifically turbidity and free chlorine residuals. In 2008 new SCADA system was installed and the chlorine data was captured, however not the turbidity. In 2007 neither of these parameters were captured.

**Action(s) Required:**
The owner/operating authority shall redo and resubmit the 2008 Summary Report in accordance with Schedule 22 of Ontario Regulation 170/03 to both township council and Provincial Officer Shayne Finlay by April 30, 2009.

**18 The following instances of non-compliances were also noted during the inspection:**

It was noted during the inspection that flows from flow meter and flows recorded by the SCADA system do not correlate. The owner/operating authority are required to ensure the data collection system (SCADA) adequately reflects the status of the water treatment system.

**Action(s) Required:**
In accordance with Section 6 of O. Reg 170/03, the continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions. The owner/operator shall have the SCADA system calibrated so that it accurately reflects the status of the system. The owner/operator shall provide Provincial Officer Shayne Finlay with a copy of the verification of the SCADA system by April 30, 2009.

Veolia Water Canada
Goderich

May 6, 2009

Shayne Finlay
Municipal Drinking Water Inspector
Ministry of the Environment
Owen Sound District Office
1580 20th Street East
Owen Sound, Ont. N4K 6H6

Shayne,
On behalf of the Township of Huron-Kinloss we are responding to your request for an action plan regarding the "Actions Required" and "Actions Recommended" as listed in your inspection report on the Whitechurch Well Supply dated April 14, 2009.

Under the heading of "Actions Required" you list 18 items and the following is the time line and manner Huron Kinloss plans to resolve these:

1) The report is accurate in stating that the operating authority was not able to provide the required CT value for the Whitechurch well supply. None was provided to the owner by the design engineer of the facility. The design engineer left the employ of the owner's consulting engineers during the construction of the facility in 2008. The required CT value was provided by the owner's consulting engineers on March 17, 2009 along with some sample calculations. This information has been added to the Whitechurch well house operations manual and the operators have been made aware of the value and calculations.
   The inspection report is in error in its statement that improperly disinfected water was directed to the distribution system without notification of the events to the MOE SAC or the Grey Bruce Health Unit . The report ignores the actual flow rates through the chlorine contact chamber during the periods noted. Calculations based on the CT information provided on March and the actual flows through the chlorine contact main verify adequate CT values were maintained
   The operators responsible for Whitechurch have been instructed on the requirements of O. Reg. 170/03 schedule 1-2(2) and the need to report water quality as adverse if these are not met.
   .
2) The report is inaccurate when it states that the hand held chlorine analyzers and hand held turbidity analyzers were not inspected or monitored. All of the hand held instruments used by the operating authority are checked against known standards at frequencies exceeding those indicated by the manufacturer. Documentation of these checks and any resultant calibrations are kept by the operating authority and were available to the inspector had they been requested.
   The report is accurate in stating that the records of adjustments made to the on line instrument were inadequate during the inspection period. The need to record all such

adjustments has been the topic at two recent training sessions attended by the operators of the Whitechurch well supply.

3) The current operations manual was submitted to the attention of Matt Shannon for approval in January of 2008.
   This manual, equipment manuals and an emergency plan were on site on the date of the inspection. Unfortunately the inspector attended the well house without an operator familiar with the site present.
   The operating authority's electrician was on site and provided access to the well house. The electrician/operator does not operate the Whitechurch facility and was unfamiliar with the location of the listed documents. The ORO was available in Ripley and contacted the inspector to advise that he could come over. The inspector indicated he had located everything required and there was no need for the ORO to drive over from Ripley.
   An electronic copy of the operations manual on site at the time of the inspection was provided to the inspector during the preparation of the inspection report.
   The operating authority on behalf of the owner will re-examine the operations manuals and update were necessary. The April 30 time line has not been met. The operations manuals will be updated by the operators of the system and the task will be completed as operator time is available.
4) No action required. See item # 1
5) See item #3.
6) - The operating authority cannot comply with "shift" related information as this is a small system and does not involve "shifts" of operators. The OIC listed in the daily log is the operator for the entire 24 period covered by each day's entry unless otherwise noted.
   – The OIC is normally the only operator on duty. The operators have been reminded of the need to document when other operators are in attendance at the well house.
   – The operators have received additional instructions on the need for complete documentation of events at the well house
   - The log book entries have historically been done in chronological order. This practice will continue.
   - The operators have received additional instruction on the need for complete documentation of events at the well house.
7) The system had no method of recording data from the on line instrumentation prior to the installation of the SCADA system in March of 2008. Compliance with this requirement was not possible. Going forward the recorded data will be archived as required.
8) The report is not accurate regarding the lack of documentation regarding the checking and any resultant calibrations of the hand held instruments. The documentation requested will be forwarded to the attention of the author of the report.
9) The inspection report is inaccurate in stating that the minimum , maximum and mean results were available prior to the installation of the SCADA system in March of 2008. Values were available on the PLC interface but were of limited use. Without corresponding trend charts there was no way of interpreting the accuracy of the values presented.
   The owners IT supplier, Emerson Controls has advised compliance with

improvements to the SCADA requested in this item are not possible.
Victor Spinney of Emerson stated that the SCADA program cannot be enabled to maintain time stamps through a transition to daylight savings time. The times on the archived trends will advance one hour or go back one hour with each time change. Mr. Spinney advised us to remain on standard time throughout the year for data recording purposes to avoid time shifts on the archived trends. The operating authority believes this would result in further confusion.
The software and program used on the Huron Kinloss SCADA was current March 2008.
The trends with accurate times are printed out daily. In addition, the operators have been instructed to "expand" any unusual events and print them on the date of the occurrence to expedite future inspections.

10) See item # 7
11) See item # 1.
12) The low chlorine values listed were not below those required to meet CT requirements and did not require reporting as adverse water quality indicators.
The error in the report is based on a misinterpretation of the flows as seen on the SCADA trending. The values listed in this item represent intermittent well pump flows and not the continuous flow through the chlorine contact main during the time intervals referred to.
The operators have been instructed on the requirements of O. Reg. 170/03 s. 16-6 and further instructed to consider a minimum free chlorine residual of $< 0.35$ mg/l at the point of entry as an adverse to avoid confusion in future inspections.
Please note that in this item the inspection report quotes a statement by the ORO regarding required chlorine minimums without including the context within which this statement was made.
The owner had included the design documents for the 2007 Whitechurch upgrades with the package of information provided to the inspector. These were given a cursory examination at the municipal office by the inspectors on the date of the inspection.
When shown the design criteria for the chlorine contact main during the inspection the ORO noted that it appeared that 0.50 mg/l was the minimum.. This was the first time the operating authority was made aware of the contents of the design document. Prior to viewing the design document the ORO had stated in error that the design was for a minimum of 0.20 mg/l.
13) No action required see items #1 & #12.
14) No action required see item # 13.
15) The incident on July 15 involved an alarm that did not require attendance at the well house. Although the residual dropped below the alarm point it remained well above the minimum chlorine residual required. The incident was traced on the remote trending.
The inspection report is correct in indicating a remote actions report of this event should have been filed. The operator who answered the alarm through remote access to the Huron Kinloss SCADA system on July 15 has been advised of this error and the need to not repeat it.

16) The 2008 annual summary was prepared using the data that was available. The report as filed contains summaries of the chlorine residuals taken on the distribution system, minimum and maximum chlorine residuals as measured by the online chlorine analyzer for much of the year. Continuous trending of the chlorine residuals that allowed the operating authority to select daily minimums and maximums presented in much of the 2008 report, was not available for the entire year in 2008.
The turbidity readings were not recorded on the trending.
The report cannot be altered in the manner indicated in this item. The original was submitted to your office earlier this year.

17) The inspection report is correct is stating the turbidity was not recorded on the trending.
The owner does not intend to add turbidity trending to the capabilities of the SCADA system.
The turbidity analyzer is currently listed as being for "monitoring purposes only" in the Whitechurch C of A. The intention is to have this analyzer removed from the system description in the June 2009 license application for this facility.

18) Emerson Controls, the owner's IT provider advises that SCADA systems cannot be "calibrated". They advised that comparisons to data being logged with actual readings from the instruments providing the data should be done periodically.
A visual comparison of the on site readouts with the information being presented on the SCADA was done at Whitechurch on March 19, 2009. The chlorine residual was accurately being represented as were the system's pressure . The flows were being shown on the SCADA screen as higher than actual.
On April 1, 2009 the owner's IT provider, Emerson Controls, adjusted the Whitechurch flow input range to 0 – 5 l/sec from 0 – 5.6 l/sec. The flows shown on the SCADA screen now accurately reflect the flows shown on the actual flow meter readout. The operating authority has asked for written confirmation from Emersons of the change made and will forward a copy when available.

Under the heading "Actions Recommended" you list 7 items. Huron Kinloss is dealing with these in the following manner:

1) A copy of the required CT values and some sample calculations has been added to the Whitechurch well house operations manual. The operators have been instructed on the use of this and to consider all incidents where the free chlorine residual drops below 0.35 mg/l as being below the minimum required.
2) The township passed by-law 2006-109 which addresses their prohibition of cross connections but does not have any regulations pertaining to backflow prevention. No plans are in place to draft such regulations at this time but the Township will continue to consider the matter.
3) In order to be cost effective the Township schedules watermain upgrades in conjunction with capital road reconstruction projects. Exceptions are made if the watermain has become a source of concern.
4) There are no distribution system valves on the Whitechurch system, thus no program for valve turning.

5) Huron Kinloss has no plans to fully meter its water systems at this time but continue to examine the benefits of this practice.
6) See item # 1.
7) The operator has been instructed to ensure the fuel tank is kept at >60 of full at all times. This requirement will be included in the planned additions to the operations manual.

Although it is not anticipated, Huron Kinloss will advise your office if any difficulties are encountered fulfilling the planned actions.

Please feel free to contact myself if this requires clarification or further detail.

We would request acknowledgement of this response. Further we would request that should the recipient find our responses to the individual items inadequate that this be identified.

Laurie Cox - Project Manager VWC