



Algoma
PUBLIC HEALTH
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Benzene Project

Benzene Water Sampling Project:
Point Des Chenes Area, Sault Ste. Marie West

October 24, 2008

Algoma Public Health Benzene Water Sampling Project

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Scope of the Project

Benzene was detected in a well water sample at a level that exceeds the Ontario Drinking Water Standard (ODWS). Algoma Public Health (APH) planned to sample residential wells in the surrounding area to determine if benzene is a concern in the groundwater for properties beyond the property of concern.

Introduction

Successive samples of the water supply of Point Des Chenes Campground Park (PDC) have exceeded the ODWS in 2008 for benzene.

In the fall of 2007, Ministry of the Environment (MOE), Cliff Graham, notified APH that benzene levels were elevated in PDC Campground Park. At the time, the park was closed for the season. APH planned further investigation in the spring 2008.

The Sault Ste. Marie Airport had historically conducted fire suppression exercises on its property across from the Park by burning fuel. The airport has been monitoring benzene on the property since 1999. A copy of the monitoring report was obtained. The report concluded that contaminant levels had declined and had not left the property.

Chemical analysis of the drinking water at the park was required under Ont. Reg. 170/03 until 2006. The authority for water quality has since changed to Ont. Reg. 252/05 that no longer requires chemical sampling. However, sampling was continued (see Table).

Samples taken 2002 to 2006 were consistently below the maximum acceptable concentration of 5ug/L (see Pointe Des Chenes Benzene Results from PUC). Samples taken at the beginning of the season exceed the ODWS and appear to have increased.

May 21	5.8ug/L
May 29	6.4ug/L raw, 6.6ug/L treated

On May 29, 2008 APH received notification from the contracted operator of the water system, PUC, of the adverse result. PUC indicated that corrective action to be taken was resample and test. On June 3, 2008, APH was notified that subsequent samples again exceeded Ontario Drinking Water Standards. The Park was immediately contacted and advised to notify all consumers not to drink the water, to post access points, and to supply safe drinking water.

The PUC followed up and posted signage at access points and arranged for the delivery of bottled water to the park. The municipality, the owner of the Park, will propose to City Council the addition of a treatment system to reduce benzene levels.

After successive samples showed benzene levels in the Park's water had dropped below 5ug/L, the drinking water advisory was lifted on the condition that sampling continue weekly and if the levels rose above the limit, the drinking water advisory would be reinstated for the duration of the season.

Benzene is a known carcinogen. The benzene levels in the groundwater at the park prompted investigation of levels of benzene in the surrounding residential wells.

Method

APH proposed to sample surrounding residential wells to determine if the contaminant was detected in other ground water sources.

MOE was consulted (April 29, 2008) and agreed to have samples processed through the MOE laboratory. It was recommended to sample every third well.

Wells were chosen from residences surrounding the Park: Nokomis Beach Road, Des Chenes Drive, Point Des Chenes Crescent in Sault Ste. Marie. A list of 66 possible residential addresses was created.

A package was assembled and mailed to residents that included an introductory letter advising them of the survey and precautions/actions they may consider implementing, a benzene information sheet, and a list of accredited laboratories for private testing. In addition, APH took the opportunity to encourage area residents to sample their well for bacteriological water quality and provided instructions and a water sample bottle. Packages were hand delivered to each residence during the week of June 12. If the mailing address of owners of the property differed from the area of interest, the package was mailed to the owners.

Some residents were contacted and a list of preferred sampling sites was created. A sanitary survey was also conducted at the time of the sampling.

The local MOE office arranged to have water samples processed at its laboratory. Their recommended choice of sample is the Volatile Organic Compounds (VOCs) sample (see MOE publication, Practices for the Collection and Handling of Drinking-Water Samples, July 2003). Sampling began the week of July 7, 2008.

MOE preferred all samples delivered to them for shipment to the lab on the same day. The lab processes samples within 14 days. The MOE sampling procedure is attached to the report.

APH was advised that the results may not be sent for months. Because of this, two samples were sent to a private accredited laboratory to hopefully get results faster and for comparison to the MOE results. If there was a benzene problem in the water in the area, faster results may speed up priority processing and knowing of a potential problem in the area sooner provides opportunity to decrease potential exposure risk. These samples met the ODWS.

Results

Twelve samples were initially collected (July 8 and 9, 2008) and sent to the MOE laboratory. The results indicated that all levels were within the acceptable parameters of the ODWS.

Two samples showed the presence of other chemicals however levels were below the Standard. The two water supplies were re-sampled along with four more wells in the area (August 13, 2008).

All results were within the ODWS. The second sample results of the two previously sampled wells did not indicate any detected levels.

One sample had a sodium level above the level for notification from public health in the event of sodium restricted consumption and the well owner was notified by letter.

Thank you letters were sent (August 8, 2008) to all participants reporting their results. All but one (0.2mg/L) of the twelve samples were below the Method Detection Limit.

Conclusion

The survey results indicate that benzene levels in the wells in the area is not a public health concern.

The elevated benzene levels in the samples from the campground seem to be only affecting that water supply. PUC will continue to monitor benzene levels in the future.

APH requested MOE to consider identifying the source of the contamination.

TABLE : PUC Sample Results for Benzene, Point Des Chenes Campground

Pointe des Chenes WTP - Benzene Analysis Results			
Date	Raw Water (ug/L)	Treated Water (ug/L)	MAC (ug/L)
1	June 24, 2002	3.2	5.0
2	May 27, 2003	3.4	5.0
3	May 31, 2004	4.2	5.0
4	June 8, 2005	3.7	5.0
5	May 1, 2006	< 0.5	5.0
6	May 23, 2006	3.1	5.0
7	June 5, 2006	3.3	5.0
8	June 20, 2006	2.9	5.0
9	July 4, 2006	1.3	5.0
10	July 18, 2006	2.8	5.0
11	August 1, 2006	< 0.5	5.0
12	August 15, 2006	2.7	5.0
13	August 29, 2006	< 0.5	5.0
14	September 12, 2006	0.5	5.0
15	September 26, 2006	1.0	5.0
16	May 21, 2008	5.8	5.0
17	May 29, 2008	6.4	5.0
18	June 5, 2008		5.0
19	June 16, 2008	6.4	5.0
20	June 23, 2008	4.9	5.0
21	June 30, 2008	2.8	5.0
22	July 7, 2008	4.0	5.0
23	July 14, 2008	4.8	5.0
24	July 21, 2008	4.5	5.0
25	July 28, 2008	4.5	5.0
26	August 5, 2008	4.5	5.0

MOE Sampling Procedure:

1. Fill first 40ml bottle half full with sample water.
2. Add two (2) drops of hydrochloric acid (preservative, MSDS provided, personal precautions required)
3. Fill top half of bottle with sample water, ensuring meniscus
4. Cap bottle, ensuring no air bubbles and pressure on membrane cap
5. Label with first of two labels for site.
6. Repeat steps 1 to 4 for second 40ml bottle.
7. Label second bottle with second of two labels for site.
8. Wrap each bottle in bubble wrap
9. Place both bottles from the site in a large standard 1 L plastic sample bottle
10. Complete form
11. Complete sanitary survey form

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