



# REPORT

## ENGINEERING DEPARTMENT

**To:** Mayor Wright and Members of Council  
Committee of the Whole

**Date:** May 28, 2007

**From:** Steven Lan  
Acting Director of Engineering Services

**File:** 0187-20

**Subject:** West Nile Virus Control Program - Update #1  
2007 New Westminster West Nile Virus Response Plan

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### RECOMMENDATION

**THAT** the report entitled "West Nile Virus Control Program - Update #1-2007 New Westminster West Nile Virus Response Plan" be accepted for information purposes;

**THAT** the attached report entitled "2007 New Westminster West Nile Virus Response Plan" be accepted and the recommendations contained therein be implemented;

**THAT** Option 1 be adopted as the appropriate level of pre-emptive larviciding control for the City of New Westminster.

**THAT** a Councillor be appointed to sit on the Local Advisory Committee for adulticiding should the Health Authority deem it necessary to implement this as a control measure.

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### ORIGIN/PURPOSE

The three primary objectives of this report are as follows:

- To update Council on the status of West Nile Virus planning in New Westminster and the Lower Mainland;
- To present and request agreement from Council on the proposed New Westminster West Nile Response Plan developed for implementation during 2007, and
- To establish the level of pre-emptive larviciding control acceptable to Council.

### BACKGROUND

Last year North America received what would be considered typical West Nile Virus activity with the exception of Idaho which had a significant outbreak year. No cases or documented evidence of the virus originating in British Columbia were reported in 2006. With WNV cases documented in Washington, Idaho, and Alberta the disease is now present on the southern and eastern borders further suggesting that it is only a matter of time before it ultimately enters British Columbia.

The 2007 West Nile Virus Response Plan is very similar to the 2006 version as no significant modifications were necessary. It is expected that implementation of the plan will proceed smoothly, however, there is a potential for alteration of the plan based on guidance from Fraser Health Authority during the course of the season. The Plan's components are similar to those previously proposed and include communications, monitoring, habitat control, pre-emptive larviciding, and if necessary adulticiding. A brief summary is provided below (refer to the attached report for additional details).

**Communications Plans** were developed at both the senior and local level agencies in 2005. These plans were used in 2006 and are expected to be implemented in 2007 as required. In summary, the Senior Level Agencies including the Provincial Ministries, Health Authorities, and the BC Centre for Disease Control (BCCDC) will be distributing basic information related to the ongoing status of WNV in BC as well as general protection measures. The Local Level Agencies including Lower Mainland Municipalities, Greater Vancouver Regional District (GVRD) and the Health Authorities will be distributing information related to the specific activities and measures relevant at a local scale.

**Monitoring** in British Columbia to be completed as part of the response to the risk of West Nile Virus will consist of numerous elements completed by a variety of agencies. The various elements include monitoring of dead birds, adult / larval mosquitoes, habitat status, human cases, and meteorological conditions. The primary components for which the City of New Westminster will be wholly or partly responsible include assessing habitat status, aiding in the collection of dead birds, and testing of adult / larval mosquitoes for population, speciation and larvicide efficacy. A summary of the findings from the monitoring programs in previous years can be found in the 2007 West Nile Response Plan.

**Habitat Control** refers to physical measures that can be implemented to reduce potential mosquito breeding habitat. This includes cleaning of catchbasins, reducing the amount of stagnant water in ditches where possible and modifying small sheltered sites that can retain water (i.e., old tires, small containers, tarps, etc).

**Pre-Emptive Larviciding** has been recommended by the Health Authority to help reduce the mosquito population both early in the year before the arrival of WNV as well as after its arrival. It is not feasible to eliminate all mosquitoes; however, reductions in the population will reduce the rate and extent of the spread of WNV. Two options are available related to pre-emptive larviciding which are presented in the Options Section below. All proposed larviciding to be completed in New Westminster will utilize either *Bacillus sphaericus* products (Bsp) otherwise known as Vectolex, or *Bacillus thuringiensis israelensis* (Bti) otherwise known as Vectobac. Both of these larvicides are biological in nature and are reported to be the most benign to the environment, while maintaining a high level of effectiveness.

**Adulticiding** for the purposes of West Nile Virus control is not currently expected to be necessary during 2007. However, should conditions change such that the Health Authority deem the use of adulticiding to be necessary, they have assumed responsibility for the organizing and implementation of the program. A local advisory committee will be established consisting of an elected council member, relevant staff, and any third party contractors as required.

**OPTIONS**

Fraser Health Authority provided a letter identifying recommendations for developing a West Nile Response Plan for 2007 (see attached letter). Based on the recommendations in the letter, two options for a pre-emptive larviciding program have been developed for 2007.

Option 1: Larvicide Surface Water Sites and All Catchbasins

There are approximately 4,000 catchbasins distributed throughout the city, and the majority of surface water sites are associated with the ditch system located throughout Queensborough. This option provides the most complete coverage of potential mosquito control habitat. This option also abides by the 2007 recommendations put forth by Fraser Health. However, inherent with this option is the increased manpower and larviciding costs required to provide coverage.

Two mosquito species have been identified as vectors of increased concern in the lower mainland due to prevalence and competence for transmitting West Nile virus. These two species consist of *Culex tarsalis* (+++ competence) and *Culex pipiens* (++ competence). Competencies are organized in a graduated scale ranging from (0), lowest ability for transmission of WNV, to (+++) species which have the greatest ability for transmission of WNV. Previous monitoring indicated the higher competency *tarsalis* mosquitoes were observed at open water sites in Queensborough. *Pipiens* were identified in both open water sites and within catchbasins throughout the Mainland as well as Queensborough.

Option 2: Wait for an Order from Fraser Health Authority to Initiate a Larvicide Program

All elements of the Response Plan will be completed except larviciding of potential habitat. The program identified in Option 1 would only be implemented upon receipt of an "Order" from the Fraser Health Authority. This option provides the highest risk of infection should West Nile Virus arrive in the lower mainland. Implementation of a larviciding program later in the summer upon confirmation of the arrival of WNV, will not be very effective as the mosquito population will have become well established. **This option is not recommended by the local Health Authority.**

Review of Surrounding Municipalities

At this time, a variety of larviciding programs are being developed for adjacent municipalities. Most include some form of pre-emptive treatment but range between treating no catchbasins to treating all catchbasins.

**FINANCIAL IMPACT**

The province has provided funding of \$5 million dollars to be distributed throughout the province and administered by the Union of B.C. Municipalities. The funding allocated to New Westminster is \$57,606. This funding is currently being secured and will be available for implementation of the response plan. Additional city based funding allocated in previous years but not fully expended is also available in the order of approximately \$25,000.

It is not possible to provide fixed estimates for the cost to implement the two versions of the Response Plan due to the inherent uncertainty. As the season proceeds, additional control measures or more significant communication efforts may be deemed necessary. A request for proposal has been distributed to contractors to complete the 2007 program. However, to provide a basis for comparison when assessing the relative benefits and risks of each option, approximate costs have been estimated and are presented in the table below.

Option	Cost
1: Larvicide Surface Water Sites and All Catchbasins	\$ 58,000
2: Wait for an Order from Fraser Health Authority to Initiate a Larvicide Program	\$ 30,000


The funding provided by the Province is expected to satisfy the resource requirements for either option. This assumes significant additional funds will not be required to address unforeseen circumstances upon the possible arrival of WNV.

**INTERDEPARTMENTAL LIAISON**

An internal City of New Westminster working group was formed during 2005 with representatives providing input from various departments including Engineering, Parks, Risk Management, Building Management, Strategic Services, Communications, and Human Resources. Much of the 2007 WNV Response Plan is similar to the previous plans and as such, limited circulation has occurred prior to submission of this report.

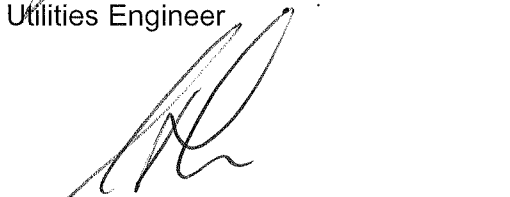
**CONCLUSION**

Two options related to the level of pre-emptive larvicide have been developed for consideration with varying levels of risk, cost, and manpower resources required. To provide the highest level of control and hence the lowest associated risk within the available funding limits, staff recommend that Council follow the Fraser Health Authority recommendation and select Option 1 as the basis for pre-emptive larviciding control for the City of New Westminster.




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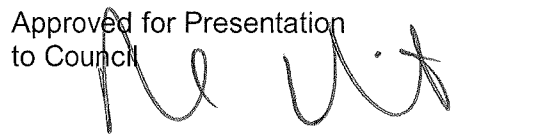
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Approved for Presentation  
to Council




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Paul Daminato  
City Administrator

# City of New Westminster

2007

## West Nile Virus Response Plan





## 1 INTRODUCTION

While its arrival has been expected for the past couple years, British Columbia made it through the 2006 West Nile season without evidence of the disease, and much of North America received what would be considered average activity. The one exception to that was the State of Idaho which experienced an outbreak year. At the end of the 2006 season one case of WNV was detected in a horse within the Prince George vicinity which was attributed to travel in Colorado. As was the case last year, each local municipality is responsible for the development of their own WNV Response Plan in advance of the coming season.

During the 2006 season, the City of New Westminster completed treatments on catchbasins beginning July 2<sup>nd</sup> and completed in the week of July 11<sup>th</sup>.

In 2006 the City engaged the services of Morrow Bioscience Ltd. (MBL) to complete a surveillance and control program to address West Nile Virus concerns. The surveillance control program consisted of two sections:

- Catchbasin treatment and monitoring;
- Open water treatment and monitoring; and

MBL treated 3676 catchbasins (cb's) with Vectolex (Bsp) and a variety of open water sites with Vectobac (bti). Monitoring of 95 cb's grouped into 24 clusters with between 3 and 4 CB's in each cluster was completed on a bi-weekly basis. The open water habitats were monitored on a weekly basis. The following recommendations were provided by MBL:

- Develop an FTP site for data transfer and continue to utilize GVRD Data Model.
- Catchbasin monitoring to begin in May and treatments to commence as soon as presence of vector species is detected.
- Alternate larvicide products at least every 6<sup>th</sup> treatment, therefore the city should consider using an alternate product in the 2009 or 2010 season.
- The open water habitat monitoring program (predominately ditches) should be continued in the Queensborough for the period between May and September.
- Alteration of habitat is not a viable solution to vector control and sites should be left to natural vices. Treatments should only be conducted in the presence of larvae or other vector species.

As per the Provincial Pesticide Use Permit, no pesticide application for the purposes of West Nile virus mosquito control can occur without an order or a recommendation from the appropriate Health Authority. The Fraser Health Authority has provided a letter for the coming 2007 season. The recommendations and requirements contained in the letter consist of the following:



- *Submission of the proposed 2007 West Nile Response Plan;*
- *Recommendation to initiate strategic pre-emptive larval control for vector mosquito breeding sites. This includes a recommendation to treat all identified surface water WNV vector breeding habitat starting between June 1<sup>st</sup> and June 15<sup>th</sup>. It also includes a recommendation to treat all catchbasins starting between June 15<sup>th</sup> and July 6<sup>th</sup>. Start dates and locations for both habitat types can be modified if specific evidence is provided to demonstrate appropriateness.*
- *Request for council representation on the Local Advisory Committee (LAC) related to potential adult mosquito control.*

To provide a measure of standardization with respect to the implementation approach, planning has been ongoing via an interagency working group consisting of local municipalities, GVRD, the Health Authorities, the Province and the BC Centre for Disease Control (BCCDC), known as the Regional WNV Mosquito Working Group. This cooperative approach has resulted in the development of a voluntary common framework for addressing catchbasins, surface water sites, and communications components within each municipal WNV Response Plans. A study was commissioned during the winter season to identify a common methodology for implementing pre-emptive larval control. The draft conclusions of the study indicate that a common trigger is not feasible. Therefore, as each municipality is still responsible for its own plan, the level of acceptable risk relative to the program developed must be determined by the elected council. The elements of the Response Plan for the City of New Westminster are provided in the section below.

## **2 RESPONSE PLAN ELEMENTS**

The local risk posed by WNV vector mosquitoes to residents and visitors of the City of New Westminster varies with mosquito species, proximity to larval development sites, and individual health factors. The primary components of the WNV Response Plan include communications, monitoring, habitat control, pre-emptive larviciding, and if necessary adulticiding. The details of each element are presented below and are similar to the program developed for the 2006 season.

### **2.1 Communications:**

Both before and after the arrival of West Nile Virus, there will be a need to provide multiple and varied messages to relevant stakeholders. Various levels of government will be responsible for providing the various messages.



## **2.1.1 Senior Level Agencies**

The Provincial Ministries, Health Authorities, and the BC Centre for Disease Control (BCCDC) will be distributing basic information related to the ongoing status of WNV in BC as well as general protection measures. The proposed communications plan consists of a series of press releases and informational support material distributed throughout the summer, websites at the respective agencies, weekly conference calls between MHO's, BCCDC, and other relevant professionals, as well as coordination of public information and education between various provinces and states. The mechanisms of distributing information may include general radio/tv/print ad's or public service announcements, as well as to targeted sectors (e.g., gardening, camping, fishing, golf courses, birding, etc).

## **2.1.2 Local Level Agencies**

As response plans will vary throughout the province, activities and measures being implemented at the local level also need to be communicated. This information would not be covered by the senior level agencies due to the potential variation in different areas of the province. Staff from many lower mainland municipalities as well as the Greater Vancouver Regional District (GVRD) and the Health Authorities have been working together to develop a local communication plan to address these issues. The proposed plan utilizes local/regional municipal websites including links to senior agency websites, education and materials for front line and field staff to prepare for interaction with the public, dissemination of local control and monitoring measures, and regular interaction between local, regional, and senior level agencies. A common list of contacts and information sources will be circulated and advertised at all municipalities such that the similar messages are conveyed across the lower mainland, with the exception of specific control measures implemented.

The primary stakeholders for the City of New Westminster communication program consist of the general public, elected members of council, front line employees that will be addressing public inquiries, and staff that are at greater potential risk due to the nature of their work responsibilities. As noted above, front line staff will require a more extensive level of training in preparation for inquiries from the public. These messages and the associated materials have previously been prepared and will be reviewed for additional 2007 content. Similarly, staff that is potentially at greater risk will require additional preparatory training. This was completed during 2005 and 2006, however, refresher training will be completed in 2007 as required.





## 2.2 *Monitoring:*

Monitoring in British Columbia completed as part of the response to the risk of West Nile virus will consist of numerous elements completed by a variety of agencies. The various elements include monitoring of dead birds, adult / larval mosquitoes, habitat status, human cases, and meteorological conditions. The primary components for which the City of New Westminster will be wholly or partly responsible include assessing habitat status, collection of dead birds, and testing of adult / larval mosquitoes for population, speciation and larvicide efficacy. The tasks related to these elements are provided below:

**Adult / Larval Mosquitoes** – As part of the response plan, approximately 2.5% of the 4000 catchbasins in the City will be monitored on a regular basis to help determine the presence and concentration of mosquito larvae and the effectiveness of larval control as appropriate. Cluster sampling will be used with 4 catchbasins monitored at approximately 25 locations distributed throughout the city. Open water systems (ditches) in Queensborough will be monitored and the effectiveness of larval treatment assessed. Samples will also be analyzed to identify the species of larvae present.

**Habitat Status** – As part of the overall monitoring/treatment program, the existence and status of potential habitat will be recorded throughout the season. This will primarily consist of whether an area is wet or dry, and cataloguing of potential sites in the city's GIS system.

**Dead Birds** – Animal services staff will aid in the collection of dead birds reported as needed. These birds will then be forwarded to BCCDC/Fraser Health Authority for testing. This procedure and limitations on the frequency will be modified throughout 2006 depending on the status of WNV in BC and the volume of dead birds.

The data collected during 2007 will be added to the database created from the previous monitoring programs. This data will be shared with other agencies to aid in the future development of WNV response plans and control measures. All data pertaining to mosquito, bird and human health surveillance will be forwarded to the BCCDC which is developing a provincial database containing surveillance information as it relates to WNV.

## 2.3 *Habitat control:*

Approximately, two thirds of the city's catchbasins are cleaned annually with selected sites historically known to have high organic loadings cleaned annually.



To help reduce the suitability of catchbasins to act as mosquito breeding habitat, the 2007 cleaning program is currently underway.

Additional drainage pumping infrastructure has been commissioned that will permit a reduction in the ditch water levels within Queensborough in some areas. The extent of the change in water levels is under examination at this time, but is expected to reduce the area that experiences stagnant water during the summer months.

All employees, particularly outside staff, can provide assistance in the identification and control of potential habitat sites. The primary mosquito species of concern are known as container breeders. As such, small sheltered areas that remain wet for extended periods of time are primary breeding sites. Examples include old tires, small containers, deep ruts in roads, tarps that hold water, etc. Attention paid to either emptying or permanently modifying a potential site to prevent ponding of water will help to reduce the mosquito population. **Care should be taken that natural environmental areas (i.e., wetlands, woodlot pools, etc), or stormwater management measures (i.e., infiltration facilities, treatment ponds, etc) should not be altered.**

## ***2.4 Pre-emptive larviciding:***

The purpose of completing a pre-emptive larviciding program is to reduce the number of mosquitoes present in New Westminster. It is not feasible to eliminate all mosquitoes, however, reductions in the mosquito population will reduce the rate and extent of the spread of West Nile Virus. Due to the dynamics of mosquito growth rates, it is not as effective to wait until after WNV is detected before commencing a larviciding program, as the base mosquito population will already have become established. It is commonly accepted by professionals across North America that the best method to reduce the mosquito population is to reduce the growth rates early in the season. This serves to limit both the spread of the virus between birds and mosquitoes, but also reduces the number of adult mosquitoes capable of reproducing later in the season when the human population will be more at risk.

The Fraser Health Authority has provided a letter to each municipality recommending pre-emptive larviciding of WNV mosquito surface water and catchbasin habitat sites.

All larviciding completed in New Westminster will utilize either *Bacillus sphaericus* products (Bsp) otherwise known as Vectolex, or *Bacillus thuringiensis israelensis* (Bti) otherwise known as Vectobac. Both of these larvicides are biological in nature and are reported to be the most benign to the environment, while maintaining a high level of effectiveness.



Based on recommendations from the Fraser Health Authority and BCCDC as well as discussions with other municipalities it is anticipated that monitoring and treatment will commence during the month of June. Surface water habitat is expected to commence in early June while catchbasin habitat will commence in late June or early July.

## **Option 1: Larvicide Surface Water Sites and All Catchbasins**

There are approximately 4,000 catchbasins distributed throughout the city, and the majority of surface water sites are associated with the ditch system located throughout Queensborough. This option provides the most complete coverage of potential mosquito control habitat. However, inherent with this option is the increased manpower and larviciding costs required to provide coverage.

Two mosquito species have been identified as vectors of increased concern in the lower mainland due to prevalence and competence for transmitting West Nile virus. These two species consist of *Culex tarsalis* (+++ competence) and *Culex pipiens* (++ competence). Previous monitoring has indicated the higher competency *tarsalis* mosquitoes were observed at open water sites in Queensborough. *Pipiens* were identified in both open water sites and within catchbasins.

## **Option 2: Wait for an Order from Fraser Health Authority to Initiate a Larvicide Program**

All elements of the Response Plan will be completed except larviciding. This will only be implemented if ordered by the Fraser Health Authority. This option provides the highest risk of infection should West Nile Virus arrive in the lower mainland. Implementation of a larviciding program later in the summer upon confirmation of the arrival of WNV, will not be very effective as the mosquito population will have become well established.

### ***2.5 Adulticiding:***

The majority of Local Government representatives participating in planning for WNV surveillance and management in the Fraser and Vancouver-Coastal Health areas have recommended that there should be a provincial or regional capacity for WNV-vector adult mosquito control response where deemed necessary for health purposes.

The Fraser and Vancouver Coastal Health Authorities have jointly agreed to assume full management responsibilities for the implementation of adult WNV-vector mosquito control for human health purposes. "For 2007 Fraser and Vancouver Coastal Health will continue to administer a contract or contracts to implement spray events if required."



In the event that adult mosquito control is indicated for human health purposes, and recommended or ordered by the Medical Health Officer, the necessary work can be done by the mosquito control contractor(s) on contract with the Health Authorities OR by the local government through its mosquito control contractor if preferred by the local government. Either way, there will be consultation with the local government. (Excerpt from Health Authority Letter)

Further to the above noted direction proposed for addressing potential adulticiding, the Fraser Health Authority has expressed a need for representation from New Westminster on a Local Advisory Committee for the purposes of consultation. Representation will include New Westminster staff, the City's third party WNV contractor, and an elected council member.

## **2.6 Cost Estimates:**

It is not possible to provide fixed estimates for the cost to implement each version of the Response Plan due to the inherent uncertainty. As the season proceeds, additional control measures or more significant communication efforts may be deemed necessary. However, to provide a basis for comparison when assessing the relative benefits and risks of each option, approximate costs have been estimated and are presented in the table below.

<b>Option</b>	<b>Cost</b>
1 : Larvicide Surface Water Sites and All Catchbasins	\$ 58,000
2 : Wait for an Order from Fraser Health Authority to Initiate a Larvicide Program	\$ 30,000

The amount of 2007 funding New Westminster has been allocated by the Province is \$57,606. Review of the above noted table indicates that implementing Option 1 will utilize the available third party funding. Implementing Option 2 will result in unused funding. As noted above, unforeseen circumstances may develop during the season that could result in additional funding requirements. Approximately \$25,000 is also available through funds budgeted in years prior to provincial funding that were not fully expended. These funds would be preferentially used before allocating new funding.

## **2.7 Risk Analysis of Options**

With each reduction in the level of larviciding control, there is inherently a graduated risk of a more significant outbreak of West Nile Virus. It is not possible to attach a fixed number to the level of risk due to the large number of variables that could impact the spread of the virus. As mentioned in Section 1.0 each municipality has been given the responsibility of developing individual response plans with the inherent choice of an acceptable level of risk for the resources expended.



Option 1 provides the lowest level of risk with the commensurate higher cost. Option 2 provides a higher level of risk with limited control activities and primarily focuses on communication, monitoring, and program management.

### **3 CONCLUSIONS AND RECOMMENDATIONS**

Last year North America received what would be considered typical West Nile Virus activity with the exception of Idaho which had a significant outbreak year. No cases or documented evidence of the virus originating in British Columbia were reported in 2006. With WNV cases documented in Washington, Idaho, and Alberta the disease is now present on the southern and eastern borders further suggesting that it is only a matter of time before it ultimately enters British Columbia.

Two options have been provided for consideration with varying levels of risk, cost, and manpower resources required. The option that provides the most active control feasible by a municipality is Option 1, while Option 2 provides limited control measures. Fraser Health Authority recommends Option 1 as a preferred course of action over Option 2. Recall that Option 1 includes pre-emptive larviciding of all catchbasins and surface water sites.

At this time, a variety of larviciding programs are being developed for adjacent municipalities. Most include some form of pre-emptive treatment but range between treating no catchbasins to treating all catchbasins.

To provide the highest level of control and hence the lowest associated risk within the available funding limits, staff recommend that Council follow the Fraser Health Authority recommendation and select Option 1 as the basis for pre-emptive larviciding control for the City of New Westminster.