

is risk to human health, and this program has been paid for by funding from the Province, administered through the Union of BC Municipalities (UBCM).

There are essentially three basic methods for controlling mosquito populations: larviciding, adulticiding, and source control. Larval mosquito control, or larviciding, targets immature mosquitoes in their aquatic habitat before they become flying, biting adults. In general, larval control is the most effective method of controlling mosquito populations, has the least effect on non-target species, and has the smallest “footprint” in terms of environmental impacts. Adult mosquito control targets adult mosquitoes using insecticides that are applied using “foggers” that produce clouds of tiny droplets that kill mosquitoes upon contact. Adulticiding is relatively ineffective, non-selective (kills other insects including mosquitoes) and can create other problems. Source control consists of modifying potential mosquito breeding habitat so that it no longer functions as breeding habitat. Examples include agitation of stagnant water bodies (e.g., golf course water features) and elimination of areas of pooled water on private properties (e.g., birdbaths, ornamental ponds, old tires, etc.).

WNV Strategy

In 2003, the Provincial Government announced a comprehensive Provincial strategy to address WNV. As part of the Province’s coordinated WNV strategy, the Minister of Health Services obtained a Pesticide Use Permit under the *Pesticide Control Act* to control mosquitoes should they pose a public health risk due to their ability to spread WNV. The permit ensures health officials can respond quickly to protect residents of B.C. It provides a legal mechanism to allow pesticide application if health officials determine the virus poses a public health threat.

WNV Response Plan

With the expected arrival of WNV in British Columbia this year, the Fraser Health Authority (FHA) has asked municipalities within its region to prepare a WNV response plan that addresses public communication, surveillance, and control relating to mosquitoes and WNV. The FHA has requested that the plan include the following items:

- Staff and Council education regarding WNV;
- Public education regarding ways to reduce mosquito breeding and recommended ways to protect against mosquito bites;
- Identification and mapping of mosquito producing areas/breeding sites;
- Source reduction of mosquito breeding and nesting sites;
- Mosquito larvae speciation to determine the abundance and distribution of species that are potential WNV vectors;
- Preparedness for control of mosquito larvae, including preparedness for use of larvicidal agents;
- Monitoring of adult mosquito populations – speciation and abundance throughout each season;
- Appointment or confirmation of members for the WNV Adult Mosquito Control Local Advisory Committee;

- A public communication strategy for the WNV response plan;
- A public communication strategy to be implemented in association with Fraser Health if mosquito control measures (larval and/or adult mosquito control) are determined to be necessary to protect human health;
- A process for the rapid identification of areas that would be considered sensitive if adult mosquito control activities are deemed to be necessary; and
- A process for monitoring and evaluation of the WNV response plan.

Regional Policy for a Standardized Preparedness and Management Approach for West Nile Virus for Health Purposes: Mosquito Surveillance, Education and Larval Control

To aid municipalities in preparing their WNV response plans, and to ensure a coordinated regional approach is adopted for WNV preparation, the Regional Engineers' Advisory Committee (REAC) of the GVRD set up a Mosquito Technical Work Group in January 2004. This Working Group developed a policy for both the preparedness and management of mosquitoes for health purposes. The GVRD Board of Directors passed this policy on March 26, 2004. The policy is based on the local governments assuming responsibility for the management of mosquitoes on their lands. Mosquito management on private lands is the property owner's responsibility and will be managed by the Regional Health Authorities under the provision of the *Health Act*.

Staff is proposing that Council adopt the attached City of Surrey 2007 West Nile Virus Response Plan (Appendix 1), which has been created following the GVRD approved policy. Essentially the 2007 Response Plan is the same as for 2006 with some minor enhancements and is similar to plans used by other municipalities.

Adult Mosquito Control

Adult control should be considered only when there is a significant human health risk and only implemented when ordered by a Regional Health Authority. The Regional Health Authorities will lead planning for adult mosquito control. Local governments may assist in the planning process but have deferred most adulticiding activities to their respective Health Authorities due to the controversial nature of the activity. Should the Regional Health Authority feel that adult mosquito control is necessary, a Local Advisory Committee would be formed to provide input.

Local Advisory Committee

The Fraser Health WNV Adult Mosquito Control Local Advisory Committee has been established to provide consultation for the Medical Health Officer (MHO) regarding the advisability and feasibility of adult mosquito control in a specific situation or situations in order to mitigate a human health hazard. The members of the committee are:

- Two to three regional health staff including the Manager, Health Protection (Communicable Disease) or designate and an MHO;
- Two or more local/regional government representatives including an Engineering Department representative, a Mosquito Control Contractor representative, and an elected municipal and/or regional district official;

- A MWLAP Pesticide Officer; and
- A BC Centre for Disease Control representative.

SCOPE OF WORK

Contract M.S. 4807-913 involves monitoring and preventative control measures to deal with WNV vector mosquitoes on public properties. Preventative measures include cleaning and/or treating catchbasins, filling in small areas of standing water, mapping and monitoring key breeding areas, and treating mosquitoes when still in larval stage of life. The plan also includes some public awareness and communication initiatives in conjunction with the Province and regional authority.

REQUEST FOR PROPOSAL RESULTS

Proposals for the above contract were received on May 11, 2007, with the results as follows:

Contractor	Proposal Amount with GST	Adjusted Amount
Culex Environmental Ltd.	\$194,801	\$337,901
Morrow Bioscience Ltd.	\$202,513	\$374,763
D.G. Regan and Associates Ltd.	Did not submit	N/A

The three contractors invited to bid are the only companies available to provide these specialized services. The corrected values of their bids are significantly greater than the dollar figures provided in their respective proposals since the adjusted figures include a second round of treatments on public property catchbasins. This additional treatment has not been done in the past, but it may be necessary should WNV arrive in BC this year. WNV has currently reached as close to B.C. as Everett, Washington.

EVALUATION

Staff reviewed the submissions for accuracy and completeness. All submissions demonstrated sufficient understanding and capabilities to undertake the project.

The low bidder, Culex Environmental Ltd., is currently conducting the City's nuisance mosquito program and has performed well. Therefore, it is recommended that Culex Environmental Ltd. be awarded the contract, M.S. 4807-913.

FUNDING

The Province has mandated the need for municipalities to develop and implement WNV Risk Reduction Programs and, to date, the Provincial Government has provided the necessary funding. For 2007, the City has been informed that our funding application to the Province, which is administered through the UBCM, for WNV risk reduction programs has been accepted. The funding will total \$376,605 and will be provided before June 1, 2007.

Paul Ham, P.Eng.
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LWE/brb

Appendix 1 – Draft City of Surrey 2007 West Nile Virus Response Plan

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City of Surrey 2007 West Nile Virus Response Plan

The 2007 West Nile Virus (WNV) Response Plan is an update of the 2006 WNV Response Plan developed by the City of Surrey at the request of the Fraser Health Authority. The Plan follows the “Regional Policy for a Standardized Preparedness and Management Approach for West Nile Virus for Health Purposes: Mosquito Surveillance, Education and Larval Control for Surface Waters on Public Lands” and the “Regional Policy for a Standardized Preparedness and Management Approach for West Nile Virus for Health Purposes: Mosquito Surveillance, Education and Larval Control in Catchbasins on Public Lands” that were developed by the Mosquito Technical Work Group chaired by the GVRD. In addition, the Plan follows current program development regarding Provincial and regional communications for WNV response. Where municipalities were identified as the lead responsibility, the method by which Surrey plans on carrying out the task is described. For tasks that had other jurisdictions identified as the lead responsibility, the support role that Surrey will fulfill for the task is identified, if applicable.

A. Sustainable Response Planning

1. *Each jurisdiction should prepare a sustainable WNV response plan for their surface waters and CBs based on this policy.*

This document serves as Surrey’s WNV response plan for surface waters and CBs that fall under the City’s jurisdiction.

2. *Each jurisdiction should regularly monitor and evaluate its response plan.*

Surrey will undertake to evaluate its response plan on a yearly basis. This plan is the result of an evolving response plan that has been updated each year since 2004, the year it was first created.

3. *The Provincial Government should be encouraged to provide ongoing financial assistance to local governments in implementing sustainable WNV response plans.*

Surrey will support the GVRD and Regional Health Authorities in their ongoing efforts to secure long term funding for the implementation of WNV response plans from the Provincial Government.

In 2007, the Provincial Government has committed funding to local governments to ensure a proactive approach to mosquito control through the “2007 West Nile Virus Risk Reduction Initiative” administered by UBCM.

4. *Each jurisdiction should estimate its annual WNV management costs in a general framework to contribute to an annual regional roll-up.*

Surrey manages the WNV portion of its mosquito control operations as a separate project from nuisance mosquito control, so costs are easy to track and document.

Surrey is willing to provide these costs to the GVRD as part of an annual regional roll-up.

B. Mapping and Inventory

1. *All WNV-vector mosquito habitat (surface water and CBs) in the jurisdiction should be digitally mapped and incorporated into the jurisdiction's WNV database.*

Similar to the 2006 program, the 2007 program will ensure that all mapping is coordinated with the regional database maintained by the GVRD. Surrey will supply data on mosquito surveillance, monitoring and treatment activities to the regional mapping initiative. As a partner in the process, Surrey will be able to compare its activities with those of others in the region to better coordinate programs.

Larval monitoring for all surface water mosquito development sites will be performed on a weekly basis and will consist of site exploration, dip sampling, species identification, and mapping of results. A representative sample of CBs within Surrey (to account for variations in aspect, vegetation cover, etc.) will also be monitored on a weekly basis.

2. *WNV-vector mosquito related data should be made available to participating jurisdictions to assist in providing a larger sub-regional or regional context.*

Surrey provides the GVRD with all of the mapping completed annually to contribute to the regional information resource. In 2007, Surrey will provide the regional database with regular updates of the program including catchbasin cleaning locations, monitoring results and treatment areas (for both surface waters and CBs).

3. *Each jurisdiction should classify their identified WNV-vector mosquito habitats according to the risk they pose for breeding WNV-vector mosquitoes.*

Surface water mosquito development sites will be classified according to "Mosquito Municipal Control Guidelines" (Ellis, 2001) as high, medium and low risk sites.

In 2005-2006, the regional working group initiated a project entitled "Pre-emptive West Nile Virus Mosquito Control in Catch Basins: Identification of Triggers and Priority Areas for Larval Treatment" ("Triggers Study") to look at identifying potential high priority areas more likely to provide WNV-vector breeding habitat in CBs. The City will take the results of this study, with the assistance of the contractor, and rate different geographical areas of Surrey according to risk.

4. *Each jurisdiction should compile locations of areas of environmental sensitivity, and monitoring and surveillance results by individual jurisdictions.*

Areas that are sensitive to management measures (e.g. fish bearing watercourses, schools, hospitals, etc.) will be assembled by City staff and this information provided to the contractor for incorporation into the GIS database. Compilation of both data sets (i.e. mosquito breeding habitats and sensitive areas) in the database will allow City staff and the contractor to prioritize sites for treatment and evaluate proposed management measures based on proximity of sensitive areas.

Monitoring and surveillance results of the 2007 WNV-vector management program undertaken by the City will be compiled and provided to the GVRD for incorporation into the regional database.

C. Surveillance

1. *In sampled surface waters and CBs, each jurisdiction should record attributes and the data be maintained in its WNV database.*

Surrey will undertake to record data for its WNV database in such a way that it is compatible with the regional database (managed by the GVRD).

D. Integrated Management for Larval Control

1. *Each jurisdiction should make adequate preparations for larval control of vector mosquitoes, including a CB treatment program for managing WNV-vector mosquitoes for health purposes.*

Surrey will be fully prepared to undertake larval control of vector mosquitoes in both surface waters and CBs through a mosquito control contractor. CB cleaning is coordinated with the larval control program to ensure that treatment is as effective as possible.

2. *If it is not feasible to clean and treat all identified areas of concern, each jurisdiction should determine its treatment regime for its mosquito vector habitat as resources allow.*

As discussed above (B3) Surrey will utilize the results from the recently completed “Triggers Study” to rate the risk levels for CBs throughout the City and prioritize areas for treatment. This rating scheme will then be used to identify areas for pre-emptive larval treatment of CBs and also to prioritize areas for widespread larval treatment in the event that WNV arrives in BC.

Surface water mosquito development sites will be prioritized and treated according to their assessed level of risk (as per Ellis, 2001).

3. *Each jurisdiction should monitor and evaluate the results of treatments, if any, as resources allow.*

The City's mosquito contractor as part of the 2007 program will conduct post-treatment monitoring.

4. *The REAC WNV Mosquito Work Group should continue to investigate viable alternatives to the application of pesticide in surface waters and CBs for control of mosquitoes.*

Surrey has had a staff member sitting on the Work Group since its inception, and will continue to actively participate in the group. Surrey supports research and investigation into methods of mosquito control other than pesticide application.

5. *Each jurisdiction should, over time, consider modification of potential vector mosquito habitat by physical or mechanical means to reduce their viability as mosquito breeding habitat (with caution to avoid disruption of sensitive habitats).*

As part of the 2007 mosquito control program, the City's contractor will be asked to outline prescriptive measures for areas conducive to physical modification, which may include, but are not necessarily limited to, the following:

- Continued disturbance of water surfaces
 - Ideal for man-made structures and other water features,
 - Not practical or desirable for natural watercourses or ditches.
- Introduction of predators
 - Install swallow or bat boxes in key locations.
- Habitat alteration
 - Remove or add vegetation,
 - Adjust water level,
 - Adjust water flow,
 - Remove water (if possible).
- Application of physical barriers
 - Remove debris in catch basins.

Operations staff will also commit to reducing standing water in upland ditch systems when identified and if feasible. Parks Operations will endeavor to have all CBs that were not cleaned in 2006 cleaned this year to reduce possible breeding areas.

6. *The Regional Health Authorities should ensure that there are appropriate protocols in place to facilitate access for inspection, surveillance, monitoring and control of mosquitoes for health purposes, including private lands.*

Surrey has several by-laws already in place that could be utilized to facilitate access for inspection, monitoring and control of mosquitoes on private lands. These include the “Surrey Sanitation Bylaw, 1969, No. 3052”, “Surrey Community Improvement and Unsightly Property Bylaw, 1997, No. 13150”, and “Surrey Community Improvement and Noxious or Offensive Trade Bylaw, 2003, No. 15144”.

In 2005, The Ministry of Health completed a project looking at crown lands, school properties and private lands. The City will look at initiatives involving integration between the various parties where applicable.

E. Communications

1. *The Regional Health Authorities/Province should prepare public messages on:*

- *Private land owners’ responsibilities and general WNV information;*
- *Surveillance results;*
- *Treatment including personal protection, source reduction and adaptive management.*

Surrey will act in a supporting role in this task (e.g. aid in the distribution of brochures prepared by the FHA). In 2005, local government staff was added to the provincial communications working group. Surrey staff will continue to participate in this working group to ensure the needs of local governments are recognized in the provincial planning initiatives.

2. *The GVRD should utilize its communication and education channels to assist the Regional Health Authorities to deliver the public messages across the Lower Mainland.*

The GVRD has developed a WNV communications initiative to coordinate communications needs of the province and local governments in the region. Under this initiative, media coordination in the event of a WNV outbreak will occur as well as information dissemination. Surrey is a member of the GVRD communications group developing standard information and responses for the region as well as establishing defined lines of communication for each local government.

3. *Each jurisdiction may supplement the general regional and provincial communication messages with messaging specific to their needs including, where applicable, private landowners.*

Surrey's contractor will develop education programming for youth, which can be taken out to schools if necessary. The City is also planning to host several open houses that would be conducted to coincide with WNV activity. In addition, the City's mosquito control contractor will provide educational presentations to staff and Council. The City's "Nature Matters" program plays a key education role at public events in this regard. Information is also handed out through the program to farmers, industry, and residents. This public education initiative is coordinated with Fraser Health Authority staff.

In 2006 the Fraser Health Authority (FHA) updated their 2004 WNV brochure and specifically customized a number of versions for different audiences. The City will liaise with the Fraser Health Authority to distribute to the community these and any other education materials that are developed.

Information on WNV and key telephone numbers will be posted on the City of Surrey website. In addition, an automated telephone tree will be setup to better manage directing the public to information on WNV and the appropriate authorities for corvid reporting, etc.

4. *Messages concerning WNV mosquito management in surface waters and CBs should be disseminated to the public in a timely and consistent manner.*

The City will ensure that its mosquito contractor makes the public aware of larvicide applications in surface waters and CBs by posting notices of the intent to treat in local newspapers and providing a 24-hour telephone information hotline.

5. *The REAC WNV Mosquito Work Group should continue to act as a focus for information sharing and regional policy review on catch basin management for WNV management purposes.*

As demonstrated by its initiative in undertaking the "Triggers Study", the Work Group is committed to a regional, coordinated approach to CB management for WNV. Surrey will continue to work with the Working Group to facilitate information sharing and regional policy review for WNV catch basin treatment.

6. *Each jurisdiction should share a summary of its experiences in surface water and CB management for WNV prevention with other jurisdictions in the REAC WNV Mosquito Work Group to ensure that we are managing from a regional perspective.*

Surrey will continue to share this information with the Work Group members.

F. Data Management

1. *All jurisdictions should ensure that WNV data is collected or processed so that it can be made available in a common format compatible for regional use.*

Surrey's mosquito control contractor will collect and format data into a GIS database that is standardized to the GVRD database format. The City will continue to participate in the Regional WNV data model being hosted by the GVRD.

G. Training and Technology

- 1. Each jurisdiction should ensure that appropriate personnel are trained in the basics of responding to public inquiries related to the WNV response plan of their jurisdiction.*

Surrey plans to provide all staff with information regarding WNV and personal protection measures. In addition, key clerical staff will be provided with answer keys to general information on WNV in order to facilitate public inquiries. All departments are given critical information on WNV to deliver to the public. This is conducted through the City's call centers, building permits, recreation centers, fire department staff and all City Hall counters.

H. Research

- 1. Each jurisdiction should support the development of a predictive model that will facilitate the efficient management of mosquitoes for WNV.*

Surrey supports the development of a predictive model and will provide assistance to the GVRD and Health Authorities to complete this task.