

MANITOBA HEALTH AND HEALTHY LIVING

WEST NILE VIRUS PROGRAM 2009:

Planning Document for Municipalities

June 2009



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PART I: WEST NILE VIRUS PROGRAM INFORMATION

1.0 – OVERVIEW – WEST NILE VIRUS

What is West Nile virus?

West Nile virus (WNV) is transmitted by mosquitoes. Most people who are bitten by an infected mosquito do not become ill and for those who do, the symptoms are usually mild. In some cases, the virus causes serious illness and sometimes death. Human cases of WNV were first detected in (southern) Manitoba in the summer of 2003. Information on human cases is posted on the WNV website at: <http://www.gov.mb.ca/health/wnv/>.

In Manitoba, the main carrier of the virus is the *Culex tarsalis* mosquito. The risk of WNV varies from year to year and is influenced by temperature, precipitation, amount of virus in birds, etc. Manitobans are at highest risk of being bitten by a WNV infected mosquito during late June, July, August and early September. The greatest risk occurs in July and August.

What are the Symptoms?

WNV can cause severe illness (West Nile virus neurological syndrome) including encephalitis, an inflammation of the brain. The severe illness can be life-threatening and may result in long-term disability. Since 2003, the annual number of severe cases of WNV in Manitoba has ranged from one to 72; WNV-related deaths have ranged from none to four per year. More people develop a milder illness (West Nile virus Non-neurological Syndrome) with symptoms such as fever, headache, fatigue, body aches and rash. Most people infected with WNV have no symptoms and do not become ill. There is no vaccine or specific treatment for WNV. People with pre-existing medical conditions, transplant recipients and older adults are at greater risk for developing severe illness. However, severe illness has occurred in all age groups and in otherwise healthy individuals.

How is West Nile virus spread?

People can become infected with WNV when they are bitten by an infected mosquito.

There are also other less common ways that WNV may be spread. Cases from blood transfusions and tissue transplants have been identified but are rare. All donated blood is tested for the presence of WNV. There is evidence that pregnant women can pass the virus to their unborn babies and that the virus may be passed through breast milk. There is also some evidence that poultry workers in Wisconsin exposed to a WNV outbreak among turkeys may have become infected with WNV.

2.0 – MANITOBA HEALTH AND HEALTHY LIVING PLANNING

ASSUMPTIONS

GOAL: To assess and take appropriate measures to limit the adverse impact to human health of West Nile virus (WNV) in Manitoba

- WNV is endemic in southern Manitoba and is expected to appear annually;
- The number and severity of human WNV cases is difficult to predict in advance of each season. Weather patterns and surveillance indicators will help predict the risk during the course of the season;
- Increases in the trap counts of adult *Culex tarsalis* mosquitoes and mosquito infection rates will correspond to the time period of human case exposure to WNV;
- The greatest risk for human exposure to WNV typically occurs in July and August. Exposure risk can exist in June and September;
- Based on studies of the biting habits of the *Culex tarsalis* mosquito, the greatest risk for exposure is between dusk and dawn. In the fall, mosquitoes may begin to bite earlier in the afternoon;
- Personal protection measures, such as applying an appropriate insect repellent according to Health Canada guidelines and label instructions, reducing time spent outdoors between dusk and dawn, and wearing light colored, loose-fitting, long-sleeved clothing can be effective ways to minimize exposure to mosquito bites;
- *Culex tarsalis* mosquitoes lay their eggs on standing water. Reducing the presence of even small amounts of standing water around the home can reduce *Culex tarsalis* numbers;
- Larviciding prevents the development of the *Culex tarsalis* mosquitoes. Control is more effective where the size of the treatment area is large and the percentage of sites containing larvae treated within that area is high;
- To be effective, larviciding for *Culex tarsalis* mosquitoes should begin early to mid June, (depending on weather conditions and the initial early season identification of *Culex tarsalis* larvae). Larviciding should occur in sites where larval sampling has identified larvae;
- Current information indicates that adult mosquito control using Malathion can be effective at reducing mosquito numbers when utilized according to Health Canada guidelines and label instructions and will not pose a health concern;
- The number of infected mosquitoes in an area as measured by weekly trap information has a relationship to the risk of human illness in that area;
- The risk area for WNV in Manitoba is southern Manitoba. It is unlikely that the accumulation of warm days would be sufficient to produce a risk for WNV exposure in northern Manitoba;

- Public communication is an effective mechanism to inform Manitobans about WNV.

3.0 –PROVINCIAL WEST NILE VIRUS PROGRAM

The West Nile virus (WNV) strategy includes surveillance, risk assessment, public education and mosquito control. The program is reviewed annually and adjusted to reflect and incorporate experiences from previous years, feedback received and emerging information.

The success of a program aimed at protecting citizens from WNV requires strong partnerships between the municipal, provincial and federal governments, as well as the public. Municipalities play a key role in supporting the planning and implementation of these activities.

Regional Teams (RTs) disseminate and communicate WNV-related information between government, Regional Health Authorities (RHA), municipalities and other involved partners. Manitoba Health and Healthy Living Regional Coordinators lead the teams and act as primary contacts for region-specific WNV issues. RTs will also have representation from RHAs, the departments of Manitoba Agriculture, Food & Rural Initiatives, Manitoba Conservation and Manitoba Intergovernmental Affairs & Trade. Municipalities and First Nations communities are also welcome to participate. Please see *Appendix A* (page 12) for a map of the Regional Team areas.

Regional Coordinators for the team areas are as follows:

Winnipeg Region (Winnipeg RHA area)	Western Region (Brandon, Westman, & Parkland RHA areas)	Central Region (Central & Interlake RHA areas)	Eastern Region (North Eastman & South Eastman RHA areas)	Northern Region (Burntwood, Churchill, & Norman RHA areas)
<u>Regional Coordinator</u> Audra Kolesar Ph: 788-6795	<u>Regional Coordinator</u> Richard Baydack Ph: 788- 6715	<u>Regional Coordinator(s)</u> Richard Baydack (Central) Audra Kolesar (Interlake)	<u>Regional Coordinator</u> Audra Kolesar	<u>Regional Coordinator</u> Richard Baydack

PROVINCIAL SURVEILLANCE/MONITORING ACTIVITIES:

The province conducts a number of surveillance and monitoring activities that are designed to assess the risk to human health posed by WNV and assure appropriate delivery of the WNV program. Mosquito surveillance and monitoring activities include larval sampling and adult mosquito trapping. Surveillance systems are also in place to detect the presence of WNV in horses and in humans. A *Field Surveillance Coordinator* oversees *Field Surveillance Teams* who are responsible for the operational aspects of mosquito surveillance and monitoring activities in rural areas of the province throughout the season. Field Surveillance Teams work closely with municipal staff. City of Winnipeg personnel undertake surveillance activities within the City of Winnipeg area.

A central coordination unit in the Public Health Division, Manitoba Health and Healthy Living, is managed by the *Coordinator of the Environmental Infectious Disease Unit* and supported by *Consulting Entomologists* and others.

a) Corvid (bird) Surveillance

Since 2006, corvid surveillance has **not been a part of** surveillance for WNV in Manitoba. Other surveillance indicators, such as mosquito surveillance, provide more direct information on the risk to human health. Therefore, dead birds are not picked up as part of the WNV program.

Should individuals wish to remove a dead bird, they should refer to the following guidelines:

- Do not touch the dead bird with bare hands;
- Take care not to scratch or puncture skin while handling the bird;
- Use a shovel or a plastic bag to pick up the dead bird;
- Dispose of the bird with regular household trash; and
- Promptly wash hands well with soap and water.

For further detail on how to dispose of dead birds and small animals, please refer to our website at: <http://www.gov.mb.ca/health/wnv> . Health Links/Info Santé at 788-8200 or 1-800-315-9257 will also provide information to the public on how to dispose of dead birds.

b) Mapping:

Not all standing water is used by mosquitoes. Studies from Winnipeg have shown that in many years only 20-25% of the available water is actually used by mosquitoes as larval habitat. Furthermore, many of the sites that do produce mosquitoes are used year after year. This is why it is important to identify and map the sites that actually produce mosquitoes.

Mapping is important in identifying, describing, and maintaining an inventory of potential *Culex tarsalis* and other mosquito larval habitats for planning and response purposes. An inventory of data collected from 2003 to 2006 was used to create “master maps” of communities in southern Manitoba in which adult mosquito traps are situated. The master maps assist in prioritizing sites for sampling and potential larviciding.

Municipalities are asked to participate in mapping activities in the following ways:

- Ensure that larviciding logs are completed accurately and consistently by applicators and are submitted to Manitoba Health and Healthy Living at the end of each season.
**In addition, these records must be kept as a requirement of the Pesticide Applicators Licence issued by Manitoba Agriculture Food and Rural Initiatives; a final Post Seasonal Report is also a requirement of the Pesticide Use Permits issued by Manitoba Conservation. Pesticide Use Permit Post Seasonal reports, which are submitted to Manitoba Conservation require applicants to calculate the total amount of pesticides used (by product in litres) and identify the area treated (in hectares), together with a map of the treated areas.*
- Keep a record of any major changes in the community that may increase or eliminate larval development sites; and
- Identify areas of concern with regard to mosquito control.

Municipalities that are represented by a Water Planning Authority, as outlined in *The Water Protection Act*, are encouraged to consider their WNV mapping data in the development of their Integrated Watershed Management Plans. Similarly, those municipalities that are not represented by a Water Planning Authority are encouraged to consider their WNV mapping data in the development of regional watershed management plans.

c) Larval Sampling

Larval sampling involves sampling of mosquito larvae from temporary, permanent or semi-permanent water found in habitat conducive to *Culex tarsalis* development.

Field Surveillance Teams begin larval sampling in early to mid June, dependent on temperatures. Larval sampling to identify *Culex tarsalis* larvae occurs in public areas of the municipalities where adult mosquito surveillance is undertaken. The purpose of early season larval sampling is to identify the initial presence of *Culex tarsalis* larvae in communities in southern Manitoba. ***Once the presence of Culex tarsalis larvae is confirmed, municipalities that have been approved for cost-shared funding will be advised by the Regional Coordinators to begin their larviciding programs.***

Larval sampling always precedes larviciding for the following reasons:

- It provides information on where to target larvicide activities in current and future years;
- It establishes best times for application of larval control measures; and
- It helps to evaluate the effectiveness of control measures.

d) Adult Mosquito Surveillance

Permanent traps are set in 37 southern Manitoba communities. Information gathered from adult mosquito trap surveillance (i.e. numbers of infected *Culex tarsalis* mosquitoes) will help to estimate the risk of human infection.

Factors considered in selecting communities for adult mosquito surveillance include:

- Population density;
- Historical/current evidence of WNV activity; and
- Distribution of traps throughout southern Manitoba.

If adult mosquito surveillance is undertaken in an area, local assistance will be needed to find or re-confirm appropriate sites for traps. Ideal locations are:

- Within a fairly open space with some bushes and trees; however, not densely treed. Preferably at the edge or interface between shrubs/trees and open areas;
- Secure from interference by the public either in a fenced (short) enclosure, (e.g. a back yard), or out of public view and at least 30 feet away from buildings;
- Away from competing light sources such as yard lights;
- A sheltered location out of wind and free from dust or other pollutants; and
- Accessible to Field Surveillance Teams.

e) Equine Surveillance

Manitoba Health and Healthy Living continue to receive information related to equine testing from the Veterinary Services Laboratory, Manitoba Agriculture, Food and Rural Initiatives. If a citizen has concerns regarding WNV and horses, they should contact their local veterinarian.

f) Human Surveillance

Cadham Provincial Laboratory analyzes specimens received on human cases and tests organ and tissue donations. The Canadian Science Centre for Human and Animal Health (National Microbiology Laboratory) will do confirmatory testing as necessary. Canadian Blood Services screens donated blood for West Nile virus. As in previous years, the number of WNV human cases will be posted on the Manitoba Health and Healthy Living WNV website.

g) Risk Assessment

The WNV Scientific Advisory Committee reviews surveillance information throughout the summer, in order to provide recommendations concerning risk to human health from WNV to the Minister of Health.

4.0 – MOSQUITO CONTROL STRATEGY

a) Source Reduction

Mosquito larvae need standing water to develop. Reducing standing water will decrease the numbers of *Culex tarsalis* mosquitoes. There are numerous sites where water may collect, e.g. equipment, containers, old tires etc. For more information visit the Manitoba government web site at: www.gov.mb.ca/health/wnv.

b) **Larviciding**

As in previous years, a 75 percent provincial and 25 percent municipal cost-shared program is in place for 2009. ***Municipalities that were approved for cost-shared funding in 2008, will be pre-approved to participate in 2009. Following a review of cost-shared funding for larviciding, those municipalities that have participated in the program for three (3) or more years have had their pre-approved funding levels adjusted to more accurately reflect claimed amounts by each respective municipality during that time. Funding approval to spend up to the preapproved amount is obtained by advising the applicable Regional Coordinator in writing of the intent to larvicide. Municipalities that anticipate requiring a higher amount of funding than already approved in 2009, will be required to submit an updated application clearly identifying the rationale for the proposed increase. Municipalities that did not apply for funding in 2008, but wish to apply in 2009 will be required to submit an application.*** Applications will be assessed and if appropriate, funding will be approved for larviciding activities. An application package and guidelines appears in PART II of this document.

Larviciding may not be feasible or effective in all communities/municipalities. There is some evidence that suggests that larviciding in small communities is less effective at reducing mosquito numbers than in larger communities Your Regional Coordinator in consultation with the WNV Consulting Entomologist will be able to assist in determining this. Tips for mosquito control in small communities can be viewed in *Appendix C*.

Mosquito larvicides kill mosquitoes during the larval stage of a mosquito's life cycle. *Bacillus thuringiensis israelensis (Bti)*, (Aquabac® and Vectobac®), a bacterium found naturally in soils, is the recommended larvicide in Manitoba. *Bti* is registered under the federal *Pest Control Products Act* and is administered by the Pest Management Regulatory Agency (PMRA). It has minimal impact on the environment and other insect and animal species. *Bacillus sphaericus* (Vectolex®) is another biological control product that has recently been registered for use in Canada. It is used in wastewater systems (sewage lagoons, septic ditches, animal waste lagoons) and storm water/drainage systems (storm sewers, catch basins, drainage ditches, retention, detention and seepage ponds). It is also used in recycled/waste tires stockpiled in collection depots, landfills, and recycling plants. Other larvicides are also available for specific mosquito control situations. For further information on *Bti* and other registered larviciding products, visit the PMRA website at: www.hc-sc.gc.ca/pmra-arla.

In 2009, the Municipalities Trading Company of Manitoba Ltd. (MTCML) will continue to offer larvicide products for purchase. The MTCML allows members of the Association of Manitoba Municipalities (AMM) to purchase products and services at reduced prices through bulk buying. Additional information on this offer is available on the AMM website at: http://www.amm.mb.ca/trade_mtcml.html.

Larvicide may be applied by hand held equipment, backpack blowers, truck mounted or aerial sprayers depending on the geographic characteristics of the area being sprayed. The main considerations for larviciding include:

- Proximity of appropriate, accessible standing water within **3 km** of residential areas in a community;

- Specific characteristics of standing water (stagnant, still pools high in organic material, open sun-lit pools, etc.) which determine the probability of *Culex tarsalis* mosquitoes being present;
- Time of year and expected life cycle of *Culex tarsalis* mosquitoes (usually not before mid June);
- Presence of *Culex tarsalis* larvae in the water (larval sampling results);
- Past evidence of *Culex tarsalis* in the area; and
- Estimated risk of human infection.

Municipalities are encouraged to gain permission to access private lands with standing water sites for larviciding purposes.

c) Adult Mosquito Control

Adult mosquito control involves the application of pesticide to kill adult mosquitoes. The main considerations for adulticiding related to WNV include:

- Estimated human risk of exposure to WNV based on surveillance and other data;
- Human population density;
- Weather conditions, including temperature, rain and wind;
- Time of year, and
- Life cycle of *Culex tarsalis* mosquitoes.

In a situation where a significant risk to human health due to WNV appears imminent, a municipality may be ordered to undertake adult mosquito control pursuant to *The Environment Act*. Communication will occur between Regional Coordinators and municipalities as soon as possible, if an Order is being considered.

Mosquito adulticide is applied by ground-based equipment. Mosquito adulticides are applied as an Ultra-Low-Volume (ULV) spray where small amounts of pesticide are dispersed into the air when mosquitoes are active and flying. At this time, the only registered product for adulticiding that has undergone a recent evaluation by the PMRA is Malathion. For further information on Malathion, visit the PMRA website at: www.hc-sc.gc.ca/pmra-arla.

In the event of adult mosquito control measures under an Order, notification to the public in the area must occur at least 24 hours in advance of the program. Municipalities are encouraged to notify residents of each subsequent spray event, if applicable.

As well, municipalities should have a plan to keep track of all residents who have made concerns regarding pesticide use known to the municipality. Efforts should be made to individually notify these residents in the event of an Order.

For more detailed information on adult mosquito control under an Order, please refer to PART II of this document.

Pesticide Incident Reporting:

As of 2007, Manitoba Conservation requires all Pesticide Use Permit holders to report every suspected pesticide incident to the Pesticide/Fertilizer Section. Municipalities should refer to their Pesticide Use Permits for further details on the reporting process and/or contact Krystal MacDougall at Manitoba Conservation's Pesticide/Fertilizer Section at 1-204-945-2819 or Krystal.Macdougall@gov.mb.ca.

As well, individuals may report incidents related to pesticides to the Pest Management Regulatory Agency (PMRA). Further information on this process is available on the PMRA website at: <http://www.pmra-arla.gc.ca/english/legis/aer-e.html>.

5.0 – PUBLIC EDUCATION AND COMMUNICATION

The key messages in the communication and public education strategy include the following:

a) Source Reduction:

The public education and communication campaign encourages Manitobans to keep their private property as free as possible of habitat for *Culex tarsalis* mosquitoes. Citizens are advised on how to reduce standing water that may collect in backyards, including pools from over-irrigation, old tires, children's toys, pet bowls, wading pools, stagnant ponds, birdbaths and flowerpots.

Reducing sources of standing water on municipal sites will also reduce mosquito numbers. Large piles of tires may need to be moved and/or covered or larvicided. Equipment or machinery may collect water. Manitoba Conservation should be consulted if changes to drainage are contemplated. *Appendix C* outlines mosquito control tips for small communities.

For more information, visit the Manitoba government website at: www.gov.mb.ca/health/wnv.

b) Personal Protection:

The public education and communication campaign provides information about ways people can protect themselves. Communications material advises Manitobans to undertake the following activities in order to reduce their exposure to mosquitoes that carry WNV virus:

- Apply an appropriate mosquito repellent;
- Reduce the amount of time spent outdoors between dusk and dawn (the peak mosquito hours are around dusk and dawn but *Culex tarsalis* mosquitoes will also bite during the night, or on cloudy, overcast days);
- Wear light coloured, loose fitting clothing with long sleeves and pant legs when outdoors; and
- Make sure that door and window screens fit tightly and are free of holes.

Workplace Safety and Health has information for workers regarding WNV that can be viewed at: <http://safemanitoba.com/uploads/bulletins/bltn224.pdf>

Public education tools, such as fact sheets, brochures, media bulletins, news releases, WNV surveillance statistics, WNV protection tips and links to other WNV related websites will

continue to be posted on the Manitoba Health and Healthy Living West Nile virus website at: www.gov.mb.ca/health/wnv. Public inquiries can be directed to Health Links/Info Santé at 788-8200 in Winnipeg, or 1-888-315-9257 outside Winnipeg.

The website is updated regularly with the latest information on WNV. WNV media bulletins will be distributed as required.

c) Communication with Municipalities:

The 2009 WNV communication and public education campaign will continue to utilize several communication vehicles, including brochures, posters, on-line fact sheets, a website, regular media bulletins, print and radio ads, and community outreach activities. Municipalities are encouraged to provide information on West Nile virus to their residents via municipal newsletters or other means. Brochures and posters will be distributed to municipalities.

Public outreach has also been included in the public communication strategy. Partnerships with the Canadian Red Cross Society and provincial parks program have created opportunities for staff and volunteers to interact with the public, distribute information about WNV and provide the opportunity to answer any appropriate questions. Public outreach was done in many different municipalities throughout southern Manitoba in 2008, mostly at festivals and fairs. More public outreach activities are planned for 2009.

Regional Coordinators are available to provide information to municipalities and answer any WNV related questions. Field Surveillance Teams will work with municipal staff to increase knowledge and enhance skills. Further information on this is provided in the Cost-Shared Funding Application component of this package.

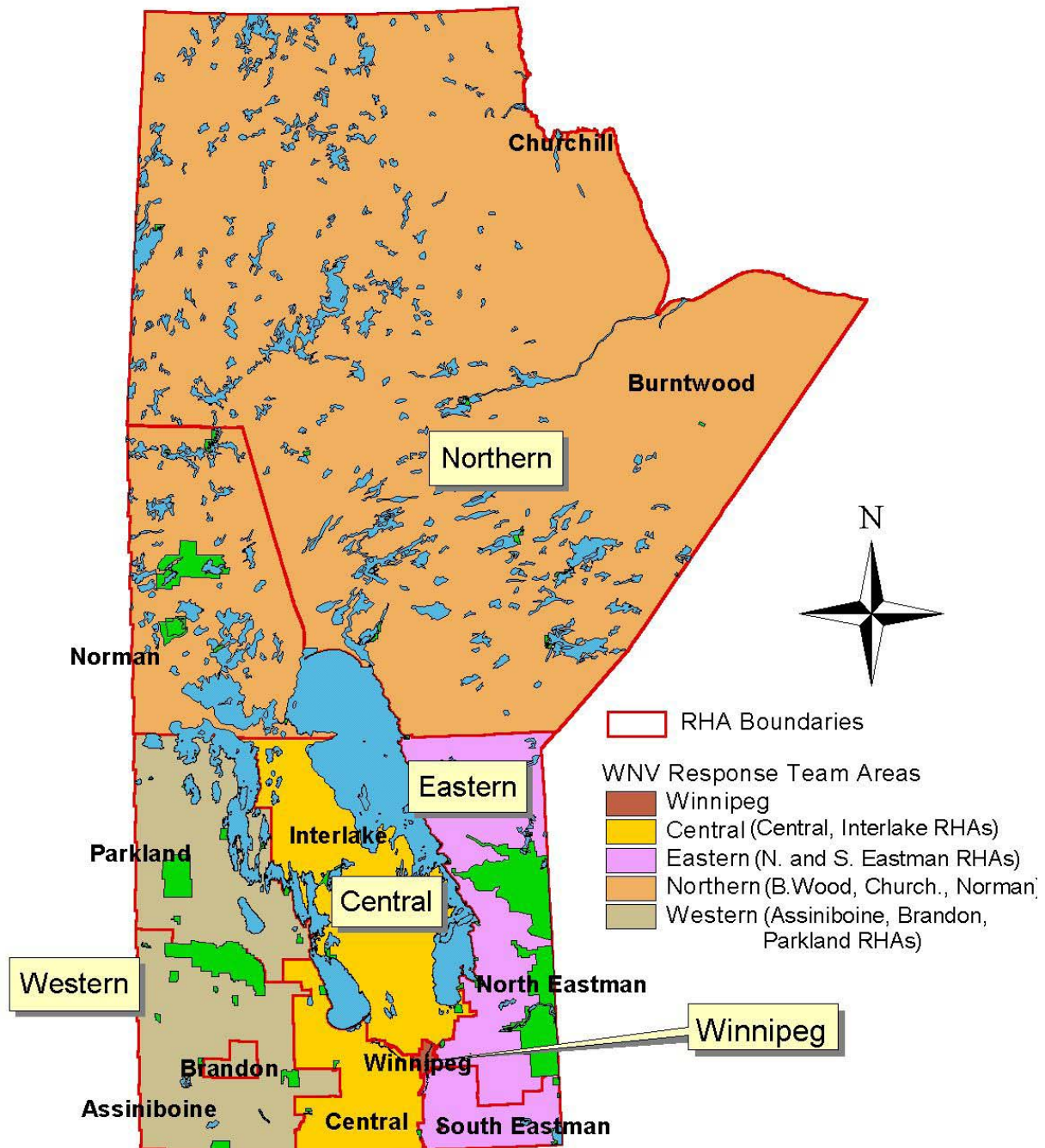
d) Sharing of Surveillance Information:

Manitoba Health and Healthy Living shares provincial surveillance information with municipalities for planning and response purposes. Mapping, larval sampling, adult mosquito, and equine information will be shared with municipalities by their Regional Coordinator in as timely a manner as possible. ***Municipalities are encouraged to share surveillance information with their larvicide applicators.***

Human case information by Regional Health Authority location will be reported to the media and will be available to the public on the Manitoba Health and Healthy Living website. Where feasible, municipalities will be informed if there are human cases that were likely *exposed* to the virus in their municipality. Determining the most likely place of exposure may take several weeks to investigate thoroughly, therefore there may be some delay in providing this information to municipalities.

APPENDIX A

West Nile Virus Regional Response Team Areas



Prepared by Chris Green, Public Health Branch, May, 2003

APPENDIX B

KEY CONTACT INFORMATION

➤ **HEALTH LINKS/INFO SANTÉ**

In Winnipeg: (204) 788-8200
Outside Winnipeg: 1-888-315-9257

➤ **AGRICULTURE: PROVINCIAL VETERINARY SERVICES AND LIVESTOCK ISSUES**

Dr. Tim Pasma (204) 945-5169

➤ **AGRICULTURE: COMMERCIAL BEEKEEPING INDUSTRY**

David Ostermann, Pollination Apiarist (204) 945-3861

➤ **COORDINATOR, ENVIRONMENTAL INFECTIOUS DISEASE (EID) UNIT**

A/Coordinator, Rob Diakiw (204) 788-6779

➤ **REGIONAL COORDINATORS, EID UNIT**

Audra Kolesar (204) 788-6795 Richard Baydack (204) 788-6715

➤ **FIELD SURVEILLANCE TEAM COORDINATOR, WEST NILE VIRUS PROGRAM (EID UNIT)**

Scott Graham-Derham (204) 788-6742

➤ **CONSERVATION: PESTICIDE PERMITS**

Krystal MacDougall, Pesticide Approvals (204) 945-2819

➤ **REGIONAL MEDICAL OFFICERS OF HEALTH**

WRHA, MOH	Dr. Pierre Plourde	(204) 926-8083
N. Eastman MOH	Dr. Bumni Fatoye	(204) 268-7419
S. Eastman MOH	Dr. Jan Roberts	(204) 346-6140
Assiniboine/Brandon MOH	Dr. Elise Weiss	(204) 571-8395
Parkland MOH	Dr. Anna Johnston	(204) 638-2124
Central MOH	Dr. Shelly Buchan	(204) 428-2018
Interlake MOH	Dr. Tim Hilderman	(204) 467-4410
NorMan MOH	Dr. Lawrence Elliot	(204) 272-3118
Burntwood/Churchill MOH	Dr. Lisa Richards	(204) 788-6375

➤ **MANITOBA HEALTH WEBSITE**

<http://www.gov.mb.ca/health/>

APPENDIX C

Mosquito Control Tips for Small Communities

It may be difficult and costly for smaller communities to maintain a comprehensive mosquito control program in town or in a three-kilometre treatment area adjacent to the community. However, some effective treatment options are available that can reduce mosquito numbers in and near where people live.

1. Not all sites with standing water produce mosquitoes. It is important to identify the sites that have larvae in them in most years, particularly those that are close to town. Pay special attention to shallow, sunlit water that collects along roadside ditches, railway and power transmission rights-of-way. These areas can be treated with larvicides containing *Bacillus thuringiensis israelensis* (*Bti*) (i.e. Aquabac® and Vectobac®) or can be regularly maintained to improve drainage.
2. In dry years, stagnant water lying in culverts along roads can produce significant numbers of *Culex tarsalis* mosquitoes. These sites should be checked regularly for larvae and treated with *Bti* if necessary. Blocked or poorly draining culverts should be cleaned periodically.
3. Small amounts of water that are allowed to stand for a week may produce mosquitoes. Have clean-up days around your community to encourage residents to clear yards of debris and clean and empty eaves troughs, tires, pool covers and other items that collect water. Encourage homeowners to cut the grass around their homes; trim hedges and trees around doorways and seating areas.
4. Use newsletters to advise residents to reduce standing water around the home. For example, cover rain barrels with tight lids or screens and tightly seal around the downspouts, look for and reduce objects that collect water, install aeration pumps on ornamental ponds and water gardens and empty and clean birdbaths weekly.
5. Mosquitoes will readily enter a building so encourage residents to check screens on windows and doors, gazebos or decks. Screens are an effective barrier, but only if they are properly maintained. They should be checked for holes or tears and should fit snugly into their frames. Screen doors should always open toward the outdoors.
6. Have copies of all WNV fact sheets and other information on hand at the municipal office. Some municipalities also provide small shaker cans of *Bti* (i.e. Aquabac®) at cost to their ratepayers. These are available at most hardware or building supply stores and can be used by residents on their own property.

PART II: MOSQUITO CONTROL INFORMATION/COST-SHARED FUNDING PACKAGE

MANITOBA HEALTH AND HEALTHY LIVING WEST NILE VIRUS PROGRAM COST-SHARED FUNDING APPLICATION FOR LARVICIDING

1.0 – INTRODUCTION TO APPLICATION PACKAGE

Municipalities can be approved for provincial funding that will cover 75 percent of specified costs associated with larviciding activities to reduce the risk of human exposure to WNV. Municipalities are expected to cover 25 percent of costs.

In an attempt to simplify the application process:

- *Municipalities that were approved for cost-shared funding in 2008, will be pre-approved to participate in 2009;*
- *Following a review of cost-shared funding for larviciding, those municipalities that have participated in the program for three (3) or more years will have their pre-approved funding levels adjusted to more accurately reflect claimed amounts by each respective municipality during that time. Funding approval to spend up to this amount can be obtained by advising the applicable Regional Coordinator in writing of the intent to larvicide;*
- *Municipalities that anticipate that they will require a higher amount of funding than already approved, will be required to submit an updated application clearly identifying the rationale for the proposed increase, before the additional funding can be considered.*
- *Municipalities that did not apply for funding in 2008 but wish to apply in 2009 will be required to submit an application. Applications submitted will be assessed and if appropriate, funding approved for larviciding activities.*

Typically, the period from about **mid June to late August** is the most effective time for controlling *Culex tarsalis* larvae. **Municipalities will be advised by the WNV Program as to when to commence and when to discontinue WNV related larviciding activities.** These decisions will be made based on larval sampling/identification undertaken by the province, as well as other scientific considerations.

Any new cost estimates in applications for 2009 cost-shared funding should be based on an average of five (5) rounds of larviciding (assuming an average of 7-10 days between each round), including up to a **3 km extended treatment area** around the targeted community. *Bacillus thuringiensis israelensis (Bti)* is the recommended larvicide in Manitoba. (More information on *Bti* can be found on page 18 of this document.) Smaller amounts of the bacterium *Bacillus sphaericus (Bsph)* may be used in limited site-specific situations, such as treating tires. New applicants should contact their respective Regional Coordinator for assistance in completing their cost-shared applications.

Municipalities that are applying for cost-shared funding for larviciding for the first time will need to describe their plan on the attached application form and submit it to Manitoba Health and Healthy Living for approval (a sample plan and budget can be found on pages 24 and 25 of this document). Applications will be reviewed by the WNV Program, which will provide

recommendations to Manitoba Health and Healthy Living. An application checklist outlining activities to be completed as part of the application process can be found on page 26.

2.0 – LARVICIDING: FREQUENTLY ASKED QUESTIONS

What does a larviciding program involve?

A larviciding program involves using current maps of standing water to identify suitable sites for *Culex tarsalis* to lay their eggs. Municipalities are expected to sample (i.e. dip) the sites of standing water to confirm the presence of larvae before treating those sites and evaluate effectiveness by sampling after larviciding applications. Guidelines for larval sampling and larviciding, as well as a log for tracking larval sampling and larviciding activities can be found on pages 28-31 of this document.

How does a municipality know whether to undertake larviciding?

Larviciding may not be feasible or effective in all communities/municipalities. **There is evidence that suggests that larviciding in small communities is less effective at reducing mosquito numbers than in larger communities since a smaller area is covered and mosquitoes migrate in from surrounding areas.** Your Regional Coordinator, in consultation with the WNV Consulting Entomologist will be able to assist in determining this.

Do I need to submit larval sampling and larviciding data to Manitoba Health and Healthy Living? How do I use the larviciding log?

Service providers (e.g. municipal staff, weed control personnel, third party providers) are required to complete larval sampling/larviciding logs during the season and submit them along with their invoices at the end of the season. A template of the larval sampling/larviciding log and instructions on how to use the log appears on pages 28-31 of this document. Logs must be completed accurately and reflect sites that are consistent with numbered sites mapped by the field teams (if applicable). Field teams will communicate with service providers to ensure that logs are completed as required by Manitoba Health and Healthy Living. These logs support municipal claims. They also fulfill provincial pesticide permit requirements and provide Manitoba Health and Healthy Living with information for the purposes of broad analysis.

Why do I have to indicate my intent to larvicide or apply for larviciding cost-shared funding now?

Municipalities are encouraged to indicate their intent to larvicide or apply for cost-shared funding prior to the WNV season so that they are prepared to respond as soon as *Culex tarsalis* larvae are identified in southern Manitoba. Prevention of mosquito larvae development is important to the success of a larviciding program.

Can northern communities apply for cost-shared funding?

Shorter summers and habitats that are less conducive to *Culex tarsalis* development make the risk of WNV in the north extremely low, if present at all. It is therefore not considered necessary for communities within the NorMan, Burntwood and Churchill Regional Health Authorities to undertake larviciding for WNV risk reduction.

Who can perform WNV-related larviciding within our municipality?

Personnel who are certified and licensed to apply pesticides can perform WNV-related larviciding in your municipality. This may be municipal staff, weed control personnel or a third party service provider. Pesticide Certification and Licensing is a two-part process: Certification through Assiniboine Community College (ACC), and Licensing through Manitoba Agriculture, Food, and Rural Initiatives (MAFRI). MAFRI requires re-certification every five years. For information on licensing, contact Tracey Cummer at 204-745-5660 or Tracey.Cummer@gov.mb.ca. All Pesticide Applicator/Dispenser Certification candidates must pass a Pesticide Core certification exam and a category certification exam (customized specifically for mosquito control). For more information on the certification process, please contact Mr. Trent Nowosad, Program Coordinator at ACC at 1-800-862-6307 ext 7116 or 1-204-725-8700 ext 7116.

What costs are eligible for Provincial Cost-Shared Funded Larviciding?

Provincial cost-sharing assistance to municipalities is only available for costs associated with WNV related larviciding activities undertaken in accordance with a plan approved by Manitoba Health and Healthy Living. The following will be eligible for cost-shared funding:

- Employee wages for time spent larviciding (this includes larval sampling) during the WNV season (as per direction provided by Manitoba Health and Healthy Living);
- Cost of insecticides that have NOT been claimed in previous years (invoices must be provided in order to claim the cost of insecticide);
- Rental of ATV/truck during the WNV larviciding period;
- Purchase of equipment such as a backpack or handheld granular shakers;
- Fuel for vehicle(s) used during larviciding rounds;
- Costs incurred by a municipality to contract an independent third party to conduct the larviciding;
- Pesticide permits, licensing, and insurance costs that are purchased specifically for the purpose of WNV-related mosquito control; and
- Administration costs (**to a maximum of 15%**) – keeping in mind that cost-shared funding is expected to be revenue neutral.

What costs are NOT eligible for Provincial Cost-Shared Funded Larviciding?

The following items are not eligible for cost-shared funding reimbursement:

- Insurance and liability coverage purchased/required for other purposes;
- Pesticide permit and/or licensing costs that are purchased/required for other purposes;
- The **purchase** of an ATV or any other vehicle;
- Any equipment or insecticide cost that was previously cost-shared with Manitoba Health and Healthy Living in previous years or purchased from another municipality under the cost-shared program;
- Any larviciding costs incurred outside of the specified WNV larviciding dates directed by Manitoba Health and Healthy Living; and
- **GST.**

What is Bti? How is it stored and what is its shelf life?

Bacillus thuringiensis israelensis (*Bti*), also known commercially as AquaBac® and VectoBac®, is a biological larvicide used to kill mosquitoes in the larval stage of their life-cycle. The active ingredients in *Bti* occur naturally in the environment and therefore have very minimal adverse effects to mammals, fish or other wildlife at recommended field rates. *Bti* is applied, either in granular or liquid form, to standing water sites where larvae are present. *Bti* should be reapplied every 7-10 days, depending on the post larval sampling results. It should be stored in containers in a cool, dry place at temperatures between 0° to 25° C. *Bti* should be used within **24 months** of date of manufacture, as its effectiveness diminishes after this time period. Application rates differ between AquaBac® and VectoBac®. Information on application rates is available from the supplier or on product labels.

Can municipalities use liquid Bti instead of granular Bti?

In most situations, particularly in later summer, granular *Bti* may be more effective than liquid *Bti* due to its direct contact with the water surface. The liquid works in the spring before much vegetation is growing in the water. However, as cattails, grasses and other vegetation grow in the water, liquid *Bti* gets “hung-up” in the vegetation. Granular products are able to descend between the vegetation, reaching the water’s surface providing a visual indication of the coverage. *Bti* only activates if it actually comes into contact with the surface of the water.

Can municipalities use B.Sph.(Vectolex®), as well as Bti products such as AquaBac® or VectoBac®?

Bacillus sphaericus (Vectolex®) is another biological control product that has recently been registered for use in Canada. It is used in wastewater systems (sewage lagoons, septic ditches, animal waste lagoons) and storm water/drainage systems (storm sewers, catch basins, drainage ditches, retention, detention and seepage ponds). It is also used in recycled/waste tires stockpiled in collection depots, landfills, and recycling plants. Some of these habitats, such as storm sewers and catch basins are not typical *Culex tarsalis* habitats. Therefore, the use of Vectolex® may not be approved under the cost-shared funding program except in situations where it is clearly targeting *Culex tarsalis* habitats.

Where can I purchase larvicide product?

The Municipalities Trading Company of Manitoba Ltd. (MTCML) offers larvicide products for purchase through its trading company. The MTCML allows members of the Association of Manitoba Municipalities (AMM) to purchase products and services at low prices through bulk buying. Additional information on this offer is available on the AMM website at: http://www.amm.mb.ca/trade_mtcml.html. Other pesticide suppliers in Manitoba may also carry *Bti* products.

Can municipalities larvicide on private property?

Ideally, a comprehensive mosquito control program would include access to private property for surveillance and response purposes. Focusing only on public property potentially leaves large areas of untreated standing water and larval habitats. Municipalities may gain access to private property by receiving permission from the property owner. Alternatively, municipalities may develop a mosquito control by-law, which would include authorization for designated staff to have access to private property for inspection purposes. In particular, communities may want to consider access to properties that are known to have standing water and potential larval habitats, (e.g. tire disposal collection and recycling sites).

What are the considerations for approval of cost-shared funding applications for larviciding?

Typically, decisions will not be based on any one factor alone, but instead will be based upon available information and evidence in a particular set of circumstances, including:

- Population density/size of community;
- Previous and/or current detection of WNV in an area, including presence and number of positive; surveillance indicators, (e.g. *Culex tarsalis* larvae, numbers/infection rates of adult mosquitoes, human cases, etc.); and
- Accessibility of the standing water.

What about costs incurred before the plan is approved?

Municipalities concerned about cost-sharing may want to wait for approval of their plan prior to incurring costs.

What if the costs incurred by the municipality during the larviciding season are more than what was cost-shared approved?

If during the season it becomes evident to the municipality that the cost of larviciding may exceed the amount approved, the municipality must submit a supplementary application outlining the need for additional cost-shared funding. Costs exceeding the amount of the initially approved application may not be supported by the provincial program.

When is the provincial share of the costs going to be paid?

If an application for cost-shared funding is approved, the municipality will be responsible for undertaking the action in their municipality as described in their plan, and to incur the costs, for later reimbursement. An itemized claim for reimbursement of 75 percent of the actual total costs incurred must be submitted to Manitoba Health and Healthy Living, once all activity is complete, no later than **October 30, 2009**.

What supporting documents will be required by the Province for the costs to be paid?

The municipality will need to submit a **reconciliation invoicing form** (included on page 33 of this document) to Manitoba Health and Healthy Living, for payment of 75 percent of eligible, approved expenses. **This reconciliation information is required from all municipalities, including those using third party service providers.** A summary of details of the mosquito control action, including dates of mosquito control, pesticide use, records of staff salaries, etc. must accompany the invoice. Municipalities will also be **required to submit invoices for all expenditures including purchases such as insecticide or equipment, payroll records and other relevant documentation to support costs. Larval sampling/larviciding logs should be submitted with invoices, to Manitoba Health and Healthy Living no later than October 30, 2009.** Municipalities will be subject to a random audit of cost-shared funding expenditures.

3.0 – LARVICIDING COST-SHARED FUNDING APPLICATION FORM

This application should be used by municipalities that did not apply/receive approval in 2008, or did apply but anticipate additional funding requirements for 2009. Each section of the application should be completed thoroughly in order to be considered for cost-shared funding.

Municipalities are to consult with their Regional Coordinator as necessary to complete this application. Name and contact information of Regional Coordinators can be found on page 4 of this document. Municipalities may fax the completed application to (204) 948-2190. In addition, the original application, along with all supporting documentation, should be mailed directly to:

**Manitoba Health and Healthy Living – WNV Program
4049-300 Carlton Street
Winnipeg, MB, R3B 3M9**

NAME OF REGIONAL COORDINATOR: _____

NAME OF REGIONAL TEAM: _____

NAME OF MUNICIPALITY: _____

CAO: _____

PHONE NO: _____

ADDRESS: _____

LEAD CONTACT PERSON (if different from above):

NAME: _____

PHONE NUMBER: _____

AFTER HOURS CONTACT: _____

EMAIL: _____

FAX: _____

2009 Estimated Total Larviciding Budget (based on an average of five rounds)

	Estimated Budget
<u>Personnel Cost</u> Identify service provider and average cost per hour. Identify what the hourly wage includes (ex. in some instances, such as Weed Control Supervisors, cost will include truck rental, gas, etc.).	
<u>Insecticide Cost</u> Identify type of insecticide and amount being purchased. Costs should be per kilogram or per 18.1 kg bag.	
<u>Purchase/Rental of Equipment</u> Identify type of equipment being purchased/rented and associated costs.	
<u>Other costs</u> Identify other costs related to larviciding activities, such as gas (if not claimed as part of personnel cost), administration costs (up to 15%), etc.	
Total	
25% Municipal Share	
75% Provincial Share	

Your Regional Team Coordinator will advise you verbally if your application is approved. An acceptance letter will follow shortly after. If you have any questions regarding the status of your application, please contact your Regional Team Coordinator.

Date Submitted: _____

Prepared by (include title): _____

Signature of Preparer: _____

Name of Authorized Officer: _____

Signature of Authorized Officer: _____

For Use by Manitoba Health and Healthy Living

Date Application Received: _____

Date Reviewed: _____

Decision: _____

Comments:

4.0 – SAMPLE LARVICIDING PLAN AND BUDGET

Community X proposes to undertake a larviciding program within the community and within a 3 km extended treatment area of Community X.

Geographic Area – The Community is 3200 acres. The 3 km extended treatment area is 5400 acres. (A map of the area is enclosed) It is proposed to larvicide standing water in ponds and ditches within the city limits and within a 3 km radius of the community with specific priority to:

- X creek, cemetery, bypass drain;
- Golf course water hazards, ponds, and streams;
- Ditches surrounding public playgrounds and parks;
- Ditches in residential zones as well as commercial and industrial areas; and
- Watercourse, streams and agricultural irrigation holding ponds.

Estimated population: Population of Community X is approximately 2340; population within the 3 km extended treatment area of the community is approximately 250.

Proposed dates and times: As defined in the municipal planning document, the public works staff, (*or third party service provider*) will commence larviciding at the direction of Manitoba Health and Healthy Living, i.e. early to mid June, and will cease larviciding at the direction of Manitoba Health and Healthy Living, i.e. approximately in late August. The public works staff (*or third party service provider*), will dip water to confirm the presence of larvae and will apply *Bti* to those sites where larvae are present approximately every 7-10 days based on post sampling information. The public works staff (*or third party service provider*), will keep a log of all sites and dates of larval sampling/larviciding throughout the season.

Resources: Application will be done by public works staff, (*or third party service provider*) (i.e. one permanent staff and one seasonal). Pesticide permits are in place, and staff are licensed. Previous maps provided by Manitoba Health and Healthy Living will be used to identify locations of standing water. Public works staff (*or third party service provider*), will work with the Field Surveillance Team to identify any new sites of standing water in the community.

Equipment: Motorized backpack sprayers, pick up truck, Gator,

Product: insecticides (VectoBac®)

Plan for Evaluation: Evaluation of the larviciding program will consist of post sampling of larvicided sites. Applicators will use the larval sampling/larviciding data collected to assess effectiveness of the larviciding.

2009 Estimated Total Larviciding Budget (based on an average of five rounds)*

	Estimated Budget
<p><u>Personnel Cost</u> (Identify service provider and average cost per hour. Identify what the hourly wage includes, (ex. In some instances such as Weed Control Supervisors, cost will include truck rental, gas, etc.)</p> <p>1 staff : 96 hours @\$17.30 Assistant: 150 hours @ \$10.28 Administration: 15%</p>	<p>\$1660.80 \$1542.00 \$ 480.42</p>
<p><u>Insecticide Cost</u> (Identify type of insecticide and amount being purchased.)</p> <p>VectoBac 200G (905 kg @ \$6.65/kg)</p>	<p>\$6,018.25</p>
<p><u>Purchase/Rental of Equipment</u> (Identify type of equipment being purchased/rented and associated costs.)</p> <p>We have a motorized back pack that was purchased last year and we will use our own truck and ATV – no rentals required.</p>	
<p><u>Other costs</u> (Identify other costs related to larviciding activities, such as gas, etc.)</p> <p>Miscellaneous supplies – gas, protective gear, signs</p>	<p>\$1050</p>
Total	\$10,751.47
25% Municipal Share	\$2687.87
75% Provincial Share	\$8063.61

5.0 – COST-SHARED FUNDING APPLICATION CHECKLIST:

- Read the *West Nile Virus Program 2009: Planning Document for Municipalities*.
- Identify a West Nile virus (WNV) lead contact person(s), as well as a back-up contact and inform your Regional Coordinator.
- Advise Regional Coordinator of intent to larvicide in 2009 via email.
- Provide all requested information in the proposed larviciding plan if funding requirements are anticipated to exceed 2009 approved levels, or if making a new application.
- Discuss proposed plan with Regional Coordinator.
- Receive authorization to enter private property (if necessary).
- Review required laws related to pesticide use and ensure required permits and licenses are in place.
- Read the Guidelines for Larval Sampling and Larviciding provided on pages 28-31 of this document and review the template for tracking these activities.
- Ensure process is in place for tracking expenditures.

MUNICIPAL RESPONSIBILITIES DURING LARVICIDING SEASON

1.0 MUNICIPALITY CHECKLIST DURING LARVICIDING SEASON

- Review maps (if applicable) to become familiar with areas of high, medium and low probability of developing standing water and/or mosquito larvae in the community. Assess whether there are any new areas of potential standing water in the municipality.
- Sample larvae (i.e. “dip” for larvae) and confirm the presence of larvae prior to applying larvicide as well as after applying larvicide to evaluate the effectiveness of the larvicide.
- Place a Public Larviciding Notice and/or signs to inform the public as to where larviciding is being conducted.
- Keep an ongoing log of larval sampling and larviciding activities (use log sheet on page 31) and submit to Manitoba Health and Healthy Living at the end of the season.
- Reduce standing water on municipal property, where feasible.
- Remind residents and businesses within the municipality of their role in effective mosquito control (ex. eliminating mosquito larval habitats, usage of mosquito repellent, etc.)
- Liaise with the applicable Regional Coordinator regarding questions/concerns about West Nile virus and the West Nile Virus Program.
- Refer all media calls related to WNV health issues within the municipality to the Regional Medical Officer of Health. Calls regarding local response issues can be handled by the municipality. (See contact list on page 13)

2.0 - LARVAL SAMPLING/LARVICIDING GUIDELINES/LOG

***Culex tarsalis* larval habitat**

Culex tarsalis has a wide range of habitats in grassland and open woodland areas, usually in warmer water areas exposed to the sun. In the spring, small numbers of *Culex tarsalis* larvae usually can be found in shallow, semi-permanent ponds, irrigated areas and weedy roadside ditches. However, as populations build during the summer, larvae may be found in temporary water bodies, including artificial containers, water-filled hoof prints near livestock watering sites, bird baths, used tires and foul water in corrals and around feedlots.

Monitoring for Mosquito Larvae

Testing or monitoring for the presence of mosquito larvae in standing water is a critical “first step” in any mosquito control program. Biological larvicides such as VectoBac® or AquaBac® will not work unless mosquito larvae at a certain stage of development are present. Testing for mosquito larvae is usually done with a dipper which has a handle about 3’ long with a cup or dipper attached to the end. Commercially made dippers are available, but one can be made by using a 3’ long dowel with a plastic container (500 g yogurt containers work well) attached to the end. The old white enamel dippers that were used on the farm in the past are excellent – but are hard to find.

Performing a Dip

When searching for mosquito larvae it is important to not disturb the larvae that may be on the water surface. Mosquito larvae will quickly swim to the bottom of the water body or hide under vegetation or other debris if disturbed.

- When approaching a water body, move slowly and carefully. Vibrations from footsteps, disturbing the vegetation or casting a shadow over the water can be enough to cause larvae to dive to the bottom;
- Mosquito larvae of the *Culex tarsalis* genera are typically found on the surface of the water and usually next to vegetation or surface debris. In larger bodies of water, they are found in more shallow water areas with vegetation, such as grasses and sedges present. These are along the edge of larger water bodies. Mosquito larvae are not typically found in the more open deeper water areas where there is excessive wind and wave action;
- Dipping should be concentrated in areas where there is vegetation or floating debris;
- If there is a strong wind, dipping should be done on the downwind side of the water body where the larvae and pupae may be concentrated; and
- Dipping for mosquito larvae is not effective if it is raining.

Dipping Techniques¹

Complete Submersion and Simple Scoop Method

- A “dip” is made by quickly scooping a dipperful of water. Mosquito larvae such as *Culex tarsalis* are frightened easily and will try to avoid the dipper, if the dip is taken too slowly; therefore it is important that a dip be done quickly.
- Quickly plunge the dipper below the surface of the water, and then bring back a “scoop-full” of water; avoid over-filling as the larvae may be lost in the overflow.
- This is the most common way of performing a dip.

Partial Submersion and Flow-In Method

- This method is used when you need to test for larvae at the edges of vegetation in shallow water.
- Push the dipper, tilted at approximately 45°, straight down into the mud and beside clumps of grasses or sedges. This causes the water around the vegetation to flow into the dipper, carrying the larvae with the flow. There is no need to move the dipper. Ensure to pull the dipper up before it is full.

Scraping Method

- Used to collect larvae that are hiding under floating or other vegetation, such as cattails.
- Dip from the water towards the vegetation and then use the dipper to scrape up against the base or underside of the vegetation to dislodge the larvae.
- This method can be more effective if the bottom of the dipper is screened.

Treating Larvae

Once the presence of mosquito larvae are detected in a water body, treatment of that area with the biological control agent, *Bacillus thuringiensis var. israeliensis* or *Bti* for short (VectoBac® or AquaBac®) can be utilized². These products come in either a liquid or granular form. The liquid can be applied with conventional spray equipment and is suitable for open water bodies, such as roadside ditches in the spring. However, when there is thick vegetation present by late spring or summer, the granule form is preferred as it falls through the vegetation to the water surface. *Bti* granules can be applied by hand using a pail and a scoop or by small hand-held grass seed or fertilizer spreaders if the water body is small. If a water body is too large to be treated by hand, then a backpack blower can be used.

- *Bti* is most effective when the larvae are in the 2nd and 3rd instar of their development stage. It does not work on pupae.

¹ C. O'Malley, *Wingbeats*, Winter 1995, p.24

² Other products are registered in Manitoba for specialized uses. *Bacillus sphaericus* (VectoLex®) for control of larvae in tires, catch basins or polluted water. Methoprene (Altosid®, Pre-Strike®), a juvenile growth regulator, can provide long lasting control in inaccessible or hard to treat areas. However, at this time, these products are not cost-share funded.

- Apply at rates recommended on label. The application rate for all methods averages 5 – 10 kg/ha. (approx. 4.5 – 9 lbs/ac.) or .5 to 1g/m² but can be up to 20 kg/ha (18 lbs/ac) for AquaBac. In the case AquaBac, higher rates may be needed to achieve effective control in more polluted or colder water. Note: There is a tendency by some operators to over-apply the granular product. It is a good idea to treat a number of large test strips (i.e. a section of roadside ditch) and then measure out how much product was used. The output can then be adjusted up or down to obtain the desired rate. A test strip that is 8 feet wide by 1 mile long = 1 acre.
- Use in temporary pools in pastures and woodlots, irrigation or roadside ditches, natural marshes, catch basins and sewage lagoons.
- Use higher rates in deep, very cold water, and/or polluted water, and when late 3rd or 4th instar larvae predominate.

When to treat

The following table gives an estimate of larval density and can be used as a guide for treating or not treating a water body³. The counts are based on 10 dips taken around and close to the vegetation edge of the water body. At each “dip”, the mosquito larvae are counted.

Density	Low	Medium	High
No. larvae in 10 dips	1-4	5-60	>60
Treatment required	No *	Yes	Yes

*Treating a site with low numbers depends on size. If small, then treat it. If the water body is large, then treatment is not cost-effective.

Larval sampling of sites should be completed each week. Typically, larval treatment at any given site using *Bti* will need to be undertaken on average every 7-10 days.

³ Based on guidelines from the City of Winnipeg, Insect Control Branch

3.0 – SAMPLE PUBLIC NOTIFICATION (LARVICIDING)

The following is a sample format, which may be used to provide notice to the community/municipality regarding the intention to conduct West Nile virus (WNV)-related larviciding:

Important Mosquito Larviciding Control Public Notice

Notice is hereby given that _____ (municipality name) _____ intends to conduct West Nile virus related larviciding in 2009,

1. Control of mosquito larvae in stagnant water will involve the identification of standing water bodies within the boundaries of (community/municipality name) _____ and the surrounding area up to 3 km outside the municipality's boundaries.
2. Where mosquito larvae are identified one or more of the following products will be applied: AquaBac® and VectoBac® (Bacillus thuringiensis var. isaelensis – *Bti*).

The projected dates of application will be from (insert start date) to (insert end date). The duration of the program may vary, depending upon weather conditions and insect population levels.

All pesticides used and procedures applied will be in accordance with federally approved label recommendations from the Pest Management Regulatory Agency, Health Canada and the recommendations set by Manitoba Conservation.

If you have any questions regarding this mosquito larviciding program please contact the municipal office at _____ (location of municipal office and phone number or by email at _____ (email address) _____).

Notice Issued By _____
(CAO Name)

Municipality Name: _____

Date: _____

END OF SEASON RECONCILIATION

1.0 WEST NILE VIRUS COST-SHARED LARVICIDING RECONCILIATION FORM

(Attach larval sampling log/larviciding log to support claim)

	Approved Budget	Actual Costs																
<p><input type="checkbox"/> Personnel Cost:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;"><u>(No. of Hours)</u></th> <th style="width: 10%; text-align: center;">x</th> <th style="width: 10%; text-align: center;"><u>Rate/Hr.)</u></th> </tr> </thead> <tbody> <tr> <td>a) _____</td> <td style="text-align: center;">_____</td> <td></td> <td style="text-align: center;">_____</td> </tr> <tr> <td>b) _____</td> <td style="text-align: center;">_____</td> <td></td> <td style="text-align: center;">_____</td> </tr> <tr> <td>c) _____</td> <td style="text-align: center;">_____</td> <td></td> <td style="text-align: center;">_____</td> </tr> </tbody> </table> <p>Please state what the cost per hour includes (ex. labour, truck rental, gas, etc.)</p>		<u>(No. of Hours)</u>	x	<u>Rate/Hr.)</u>	a) _____	_____		_____	b) _____	_____		_____	c) _____	_____		_____		
	<u>(No. of Hours)</u>	x	<u>Rate/Hr.)</u>															
a) _____	_____		_____															
b) _____	_____		_____															
c) _____	_____		_____															
<p><input type="checkbox"/> Insecticide Cost:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;"></th> <th style="width: 20%; text-align: center;"><u>Bag size/weight (kg)</u></th> <th style="width: 20%; text-align: center;"><u>No. of Bags</u></th> <th style="width: 20%; text-align: center;"><u>Cost/bag</u></th> </tr> </thead> <tbody> <tr> <td>a) _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>b) _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		<u>Bag size/weight (kg)</u>	<u>No. of Bags</u>	<u>Cost/bag</u>	a) _____	_____	_____	_____	b) _____	_____	_____	_____						
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a) _____	_____	_____	_____															
b) _____	_____	_____	_____															
<p><input type="checkbox"/> Purchase/Rental of Equipment (ex. backpacks, ATV rental, etc.):</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%; text-align: center;"><u>Type</u></th> <th style="width: 30%; text-align: center;"><u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>a) _____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>b) _____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>c) _____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>d) _____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>	<u>Type</u>	<u>Cost</u>	a) _____	_____	b) _____	_____	c) _____	_____	d) _____	_____								
<u>Type</u>	<u>Cost</u>																	
a) _____	_____																	
b) _____	_____																	
c) _____	_____																	
d) _____	_____																	
<p><input type="checkbox"/> Other Costs (Please list):</p> <p>a) _____</p> <p>b) _____</p> <p>c) _____</p>																		
Subtotal																		
25% Municipal Share																		
75% Provincial Share																		
Total 75 % Provincial Share																		

All invoices and records for all costs must accompany the reconciliation form.
2.0 COST-SHARED FUNDING RECONCILIATION CHECKLIST

- All fields of reconciliation form are complete, including budgeted amounts and actuals.
- Larval sampling and larviciding log record is complete and submitted with reconciliation form.
- Copies of **all** receipts, invoices, pay roll records, etc. that are claimable for the larviciding period are submitted with reconciliation form.
- Copies of expense records are kept on file.

MOSQUITO ADULTICIDING UNDER AN ORDER

1.0 FREQUENTLY ASKED QUESTIONS:

What is the difference between adulticiding and larviciding?

Adulticiding is the application of pesticide to kill adult mosquitoes and may be applied either by ground based or aerial equipment. In Manitoba, mosquito adulticides are applied as an Ultra-Low-Volume (ULV) spray where small amounts of insecticide are dispersed by truck-mounted equipment. Larviciding is the application of pesticide to kill mosquito larvae before they become adult mosquitoes.

What is the difference between nuisance mosquito control and mosquito control under an Order?

In situations where a public health threat is considered imminent, adult mosquito control under an Order may be directed. The primary mosquito of concern in the transmission of WNV to humans in Manitoba is the *Culex tarsalis* mosquito; therefore adult mosquito control under an Order targets this species of mosquito. Most other mosquito species in Manitoba do not carry the virus. Municipalities may choose to control any mosquito species at any time in accordance with their Pesticide Permit.

How is the decision made to issue an Order for adult mosquito control in a municipality?

The Chief Provincial Public Health Officer or designate may advise the Minister of Health of the presence of an 'imminent' or existing health emergency. The main considerations for adulticiding under an Order include:

- Imminence of significant human risk based on surveillance and other data;
- Human population density;
- Weather conditions, including temperature, rain, and wind;
- Time of year; and
- Life-cycle of *Culex tarsalis* mosquitoes.

Subsequently, the Minister of Health may initiate a Declaration of a Health Emergency. Upon the Minister of Health's Declaration of an existing or imminent health emergency, the Minister of Conservation may issue an Order for adult mosquito control to a municipality(ies) outlining its terms.

What are the responsibilities of the municipality under an Order?

A municipality is required to carry out all requirements identified in the Order. The Province will work with municipalities on the requirements of the Order. Teleconferences between Manitoba Health and Healthy Living, the Consulting WNV Entomologist, the municipality(ies) under an Order, and other relevant parties will be scheduled as soon as an Order is issued so that issues related to the implementation of an Order can be communicated and clarified.

One of the primary requirements for municipalities under an Order is to provide advance notice to the public at least 24 hours prior to the commencement of mosquito adulticiding. The public notice must identify the pesticide products to be used in the program and when the program will begin. Sample notices (for print/posting/television/radio) appear on pages 39-41 of this

document, as well as a notice for campgrounds. Municipalities are encouraged to notify residents of each subsequent spray event, if applicable.

Who will perform adulticiding under an Order within our municipality?

Municipalities may have licensed and experienced staff to undertake adult mosquito control. In situations where a municipality is not able to undertake adult mosquito control on its own, Manitoba Health and Healthy Living has contracts with the City of Winnipeg and the City of Brandon to provide contingency mosquito control under an Order in southern Manitoba. In the event of an Order, Manitoba Health and Healthy Living will work with each municipality to ensure plans are in place to meet the conditions set forth in the Order.

Does the municipality require permission to access private property under an Order?

Permission is not required to access private property under an Order for adult mosquito control.

Will adulticiding equipment be available for municipalities to use during an Order?

Municipalities that are placed under an Order to undertake adult mosquito control may gain access to certain types of equipment (ULVs for adult mosquito control) from one of the Mosquito Control Centres in Winkler or Brandon. There is also some equipment located in Winnipeg that is available for use by municipalities. The community will require trained staff with pesticide applicators licenses and the required permits to access this equipment. Availability of the equipment will depend on scheduling needs.

What products are available for adult mosquito control under an Order?

At this time the only registered product for ULV adulticiding that has undergone a recent evaluation by the Pest Management Regulatory Association is Malathion. For further information on Malathion, see the PMRA web site at: www.hc-sc.gc.ca/pmra-arla.

What if there are some individuals who are concerned about or oppose mosquito adulticiding under an Order?

Municipalities should keep an updated list of residents who may oppose the use of pesticides in the event that adult mosquito control is ordered. Prior to adulticiding under an Order, municipalities should provide individual notification to these residents at least 24 hours in advance of any spray operation.

Where can the public get information on adult mosquito control activities under an Order in Manitoba?

In the event of adult mosquito control under an Order, notification to the public in the area must occur at least 24 hours in advance of the program. This notification may occur by newspaper, radio, television and/or other public notification means. **Municipalities are encouraged to notify residents of each subsequent spray event, if applicable.** Once an Order is issued, the public can obtain information on the schedule of mosquito control activities by:

- Contacting their municipality;
- Contacting Health Links/Info Santé at (204) 788-8200 or outside Winnipeg at 1-888-315-9257; or
- Visiting the Manitoba Health and Healthy Living website at: www.gov.mb.ca.

Under what conditions does adult mosquito control occur?

The general guidelines are as follows:

- ULV treatment does not start any earlier than 9:30 p.m. and is not done after 8:00 a.m.;
- ULV treatment does not occur if the temperature falls below 13 degrees Celsius. *Culex* species and many other species are not active at temperatures lower than this. During a ULV operation, temperatures are typically recorded at regular intervals;⁴
- ULV treatment ceases or does not occur if wind speeds are too high and not conducive for effective adult mosquito control; and
- ULV treatment does not occur if there are or have been significant amounts of precipitation. However, treatment may resume a half hour to one hour after a short thunderstorm and light rainfall if there is no evidence of additional precipitation events occurring.

Is there a cost-shared funding arrangement for adulticiding under an Order?

The 75 percent provincial/25 percent municipal cost-shared funding formula applies to adult control activities undertaken under an Order. As with WNV-related larviciding, reconciliation occurs at the end of the season. In situations where a municipality's employees undertake the adult mosquito control under an Order, the reconciliation form used for cost-shared larviciding can be used to claim associated costs; however, a separate form is required for each of larviciding and adulticiding costs. In situations where adult mosquito control under an Order is conducted in a municipality by the City of Winnipeg or the City of Brandon, Manitoba Health and Healthy Living will invoice the municipality for 25 percent of the costs.

2.0 MUNICIPALITY 'TO DO' LIST:

- ❑ Maintain a list of individuals who have identified themselves to the municipality as being concerned about or opposed to pesticide use. Municipalities should individually notify these residents prior to undertaking adult mosquito control.
- ❑ Implement a mosquito adulticiding program following the direction of an Entomologist designated by Manitoba Health and Healthy Living and consistent with the conditions set forth in the Order.
- ❑ Participate in scheduled teleconferences with Manitoba Health and Healthy Living so that issues related to implementation of an Order can be communicated and clarified between all relevant parties. Provide advance notice to the public, in the print media, radio or on television, at least 24 hours prior to the commencement of the spraying program. Ensure the notice includes a statement as to why an Order is in place, the description of the area required to be adulticided, the product to be used, the time and date that adulticiding will occur, the buffer zone distance to be sprayed, general precautions citizens should take during adulticiding, and a contact number should citizens have any questions.

⁴ ULV trucks have thermometers and wind metres to measure local conditions. Therefore, these measurements may vary from information available from weather stations.

- ❑ Notify the public of each spray event, as is feasible.
- ❑ Maintain an aduaticiding log report if municipal staff are undertaking aduaticiding under an Order. The log report shall include date and time of application, amount and type of product used, weather conditions at time of spraying (including temperature, wind speeds, and precipitation), and a map of treated and untreated areas.

3.0 SAMPLE NOTIFICATIONS (ADULTICIDING UNDER AN ORDER)

MEDIA NOTICE (*ENTER DATE*)

Subject:(*Enter name of City, Rural Municipality, or Town*).....Mosquito Spraying Program

The Manitoba Government has issued an Order to begin adult mosquito control (Mosquito Spraying) within the.....(*Enter name of City, Rural Municipality, or Town*).....and portions of the municipality(*ies*) of(*Enter name of Rural Municipality(ies)*).....due to the high numbers of adult *Culex tarsalis* mosquitoes, some of which are infected with West Nile virus, that have been found in.....(*Enter name of City, Rural Municipality, or Town*).....

Presuming weather conditions are conducive, the spraying will occur during the late evening and early morning starting no earlier than (*enter date*). **The spray treatment may occur twice in seven days.** If spraying is cancelled due to weather conditions, it will be carried out as soon as weather permits spraying to be continued.

Spraying may include private roadways and field roads leading to dwellings that are set back further into larger agriculture fields.

The area targeted for spraying is outlined in a map attached to the notification.

For further information about the spraying schedule or West Nile virus, contact Health Links/Info Santé at 788-8200 or 1-888-315-9257 or visit the Manitoba Health and Healthy Living website at: www.manitoba.ca and click the West Nile virus link. You can also contact your municipal office.

Respectfully,

PUBLIC NOTICE

RESIDENTS OF

**THE(Enter name of City, Rural Municipality, or Town).....AND PORTIONS OF
THE MUNICIPALITY(ies) OF(Enter name of Rural Municipality(ies) that fall
within the 3 km extended treatment area).....**

The Manitoba Government has issued an Order, under *The Environment Act* to begin adult mosquito control (Ground-based ultra-low volume spraying) in the.....(Enter name of City, Rural Municipality, or Town).....and parts of the RM('s) of.....(Enter name of Rural Municipality(ies)).....within a 3 km treatment area of the.....(Enter name of City, Rural Municipality, or Town)....., because of high numbers of adult *Culex tarsalis* mosquitoes, some of which are infected with West Nile virus, that have been found in.....(Enter name of City, Rural Municipality, or Town).....

Presuming weather conditions are conducive, the ground based spraying will occur during the late evening and night starting no earlier than (*Insert day, month and year*). **Spraying may occur twice in seven days.** If spraying is cancelled due to weather conditions, adult mosquito control will be carried out as soon as weather permits. For information on mosquito control including planned mosquito control times, please contact your municipal office or call Health Links/Info Santé at 788-8200 or 1-888-315-9257 or visit the Manitoba Health and Healthy Living website at: www.manitoba.ca.

The pesticide product to be used for ground based spraying is Malathion dispersed by an ultra-low volume cold aerosol sprayer.

Activities to reduce exposure to Malathion:

- Close all windows and doors.
- Stay away from working trucks while spraying is underway.
- Fans and air conditioners can be turned off or set at exhaust.
- Wash fruits and vegetables.
- Remove clothes and children's toys from outdoor areas.
- Wash any household items or toys left outside before use.
- For information on Malathion, please see the PMRA website at: www.hc-sc.gc.ca/pmra-arla.

Activities to reduce exposure to mosquitoes:

- Use appropriate mosquito repellent, reduce time spent outdoors when mosquitoes are active, especially between dusk and dawn, wear light colored, long sleeves loose fitting clothing; fix screens.
- Reduce standing water.

(Enter date)

NOTICE TO ALL CAMPERS

SPRAYING FOR MOSQUITOES TO REDUCE THE RISK OF WEST NILE VIRUS

Spraying to control mosquitoes to reduce the risk of West Nile virus will take place in this campground this evening (*Enter date*), weather permitting. Spraying with truck-mounted ultra-low volume units will take place between the hours of 10:00 p.m. and 11:00 p.m. in the campground area.

People who wish to reduce their exposure to Malathion can take precautions including:

- Staying inside your camper or tent, or leaving the campground between 10:00 p.m. and 11:00 p.m.;
- Closing all doors and windows on trailers, and making sure all tent doors are zipped and flaps closed on all screened doors and windows;
- Turning off fans and air conditioners;
- Removing clothes, food, camping/storage equipment and toys from the campsite and putting them in the tent, camper trailer or vehicle; and
- Rinsing off any outdoor furniture or play equipment left outside before using them.

Campers can reduce their risk of mosquito bites by:

- Using an appropriate insect repellent;
- Wearing long pants, long-sleeved shirts, socks, shoes and a hat, particularly during the peak mosquito hours between dusk and dawn; and
- Maintaining door and window screens so they fit tightly and are free of holes.

More information about West Nile virus is available on the Manitoba Health and Healthy Living website at: <http://www.gov.mb.ca/health/wnv> or from Health Links/Info Santé at (204)788-8200 or 1-888-315-9257, or by calling your municipal office.