

**CITY OF HAMILTON**

**PUBLIC HEALTH SERVICES**  
**Health Protection Division**

<b>TO:</b> Mayor and Members Board of Health	<b>WARD(S) AFFECTED:</b> CITY WIDE
<b>COMMITTEE DATE:</b> July 11, 2012	
<b>SUBJECT/REPORT NO:</b> Bed Bugs Actions Update - BOH11010(a) (City Wide)	
<b>SUBMITTED BY:</b> Elizabeth Richardson, MD, MHSc, FRCPC Medical Officer of Health Public Health Services Department	<b>PREPARED BY:</b> Sally Radisic 905-546-2424 Ext. 5549
<b>SIGNATURE:</b>	Marie McKeary 905-546-2424 Ext. 1308  Matt Lawson 905-546-2424 Ext. 5823

**RECOMMENDATION:**

That the Board of Health write a letter to the Honourable Deb Mathews, Ontario Minister of Health, to request that continuous, annual funding be provided to Hamilton Public Health Services for the purpose of supporting community outreach actions to prevent and/or eliminate bed bug infestations.

**EXECUTIVE SUMMARY**

At the April, 2011 BOH meeting, Public Health Services (PHS) staff presented information on actions taken to control and prevent bed bugs in Hamilton (BOH11010). The report included details of the PHS application for part of the \$5 million dollars in provincial funding to prevent and control bed bug infestations.

This report provides information about the use of the \$234,254 in one-time funding awarded to PHS by the province. As outlined in the application, this funding was used to create awareness and educate the public about bed bugs; and support vulnerable populations with the control and/or prevention of bed bugs in their places of residence.

**FINANCIAL / STAFFING / LEGAL IMPLICATIONS** (for Recommendation(s) only)

**Financial:** None

**Staffing:** None

**Legal:** None

**HISTORICAL BACKGROUND** (Chronology of events)

On January 10, 2011, the Ontario Ministry of Health and Long-Term Care (MOHLTC) announced \$5 million in one-time funding for Ontario health units to access for the purposes of providing education and outreach activities about bed bugs within communities, and providing support to vulnerable populations affected by bed bugs. On June 9, 2011, PHS officially received \$234,254 in one-time funding for these purposes. The information provided below describes the activities which have been pursued over the past year. Further details can also be found in the report to the Province which is attached as Appendix A.

**1. Education and Outreach**

Education and outreach activities to the public and stakeholders were used to enhance awareness and knowledge in the identification, prevention and control of bed bug infestations. Services and activities included:

- Provision of information, advice and guidance on identifying, preventing and controlling infestations
- Development and enhancement of community partnerships
- Education and information sessions with the public and community partners
- Education and outreach targeted to specific high-risk setting and/or populations

PHS has continued to work with community partnerships through the Bed Bug Action Group (BBAG), which has the following members: Housing Help Centre, Good Shepherd Works, Victoria Park Community Homes, Hamilton Community Legal Clinic, City Housing Hamilton and representatives from various City Departments (Public Health Services, Emergency Services, Community Services, City Manager's Office and Police Services).

The Hamilton BBAG facilitates a coordinated, community-wide effort to control and prevent bed bugs based upon currently available information and best practices. The key objectives of the BBAG are to: facilitate a coordinated, efficient approach to respond to the issue of bed bugs; and create a forum for acquiring and sharing available information and resources.

PHS has continued to present bed bug information at landlord association meetings and other community group centres which service new residents to the City of Hamilton of various cultural backgrounds. In addition, PHS has continued to work with Hamilton Housing Help Centre to support a post for a Community Development Worker- Bedbug Awareness. This position acts as a link between the community and PHS, as well as other municipal departments. This post focuses on work with landlords, tenants, tenant associations, tenant support groups and community groups in order to facilitate a community wide response to improve bed bug control through public education and awareness.

PHS has worked also to promote bed bug awareness via a promotional campaign that has utilized bus and bus shelter ads, mall posters, community newspaper ads and distribution of educational brochures via tax bills. The funding provided by the province for education and outreach activities totalled \$74,254.

## **2. Supports to Vulnerable Populations**

Supports to vulnerable populations impacted most negatively by bed bug infestations included:

- Inspection and assessment services
- Assistance with, and coordination of, extreme cleaning services and unit preparation
- Bed bug identification services
- Referral to appropriate social and community-based services to address the specific needs of particular vulnerable populations
- Collaboration and engagement with municipal and other local partners in addressing specific needs of these populations
- Provision of specific front-line supports and services to vulnerable populations dealing with bed bug infestations

PHS has continued to record bed bug complaints and follow through with bed bug inspection, identification and assessment by Public Health Inspectors (PHIs) throughout the City of Hamilton and in the CODE RED identified vulnerable population areas of the City.

PHIs continued to identify complaints involving hoarding cases and have worked collaboratively with social workers to provide the most effective approach to bed bug infestations in this type of specialized setting.

PHS worked with Hamilton Housing Help Centre to develop an Eligibility Screening Tool for a Unit Preparation Assistance Subsidy so that vulnerable populations are given priority for such services. Moreover, PHS has continued to work with Hamilton Housing Help Centre to promote the Unit Preparation Assistance Subsidy opportunity for vulnerable populations and support the service.

Good Shepherd Works (GSW) is a community stakeholder organization that provides the service of unit preparation to those vulnerable populations eligible for the subsidy, as well as, the provision of bed bug prevention kits (ie. mattress covers, bed bug traps, bed post sleeves, etc.). In addition, PHS has met and collaborated with the local offices of Ontario Works and the Ontario Disability Support Program to provide awareness regarding unit preparation availability for vulnerable populations. The funding provided by the province for supports to vulnerable populations totalled \$160,000.

Once the procurement approvals were granted, the subsidy program for unit preparation was promoted in Hamilton beginning in September 2011, and the program began to build momentum over time such that approximately \$43,268 (before tax) was spent on preparing 45 residential units for treatment for bed bugs. One limitation of the project being executed as planned was the timing with which the \$100,000 budgeted for unit preparation could be spent. The support work to prepare units for treatment performed by GSW was in high demand during the allowable funding period. This high demand for services often resulted in a waiting period of up to 3 weeks until unit preparation services could be performed, which meant that eligibility for the subsidy needed to be closed approximately 3 weeks prior to the provincial deadline for using the granted funds.

The remaining \$56,732 (before tax) was used to purchase materials (ie., bed bug prevention kits) for preventing bed bug infestations within the residences of vulnerable populations. A total of 111 bed bug prevention kits for tenants, and 10 deluxe bed bug prevention kits for tenant associations were purchased for distribution to vulnerable clients identified through participating community partners. A tenant prevention kit contains items such as mattress and box spring covers and bed bug monitors and traps, while the deluxe tenant association kit contains such items as a hepa-filter vacuum cleaner, a steam cleaner, and bed bug monitors and traps. Both the unit preparation services and the bed bug prevention kits were well-received by the populations that they were intended to assist.

## **POLICY IMPLICATIONS**

All reports of bed bug infestations in rental housing made to the Health Protection Division of PHS are investigated by PHIs to determine compliance with section 26 (Pests) of the Hamilton Property Standards By-Law 10-221, and take enforcement action when necessary.

Continuous, annual funding to PHS would allow for enhanced outreach activities in the community about bed bug awareness, as well as providing additional services to control and prevent bed bug infestations among vulnerable populations within the community.

**RELEVANT CONSULTATION**

Through BBAG, PHS has met with community stakeholders and City of Hamilton departments on a regular basis since October 2010. There is a consensus among members of BBAG that a lack of financial resources is a limiting factor toward success in the fight against bed bugs. Additional funding to fight bed bugs would allow the continuation of activities such as creating awareness and educating the public about how to identify and manage bed bug infestations when they are encountered. BBAG supports the recommendation being brought forward in this report.

**ANALYSIS / RATIONALE FOR RECOMMENDATION**

(include Performance Measurement/Benchmarking Data, if applicable)

**Data Collection**

Three projects were created by PHS in order to track and evaluate the degree of bed bug infestation, requests for services, as well as, measure local awareness and concern around this topic. For all three projects the research findings were analyzed and presented in an inclusive manner covering the complete Ministry funding timeline of May 2011 to March 2012 (see Appendix B for MIEH report). Each of the three projects satisfies public health values of capacity building and knowledge translation by involving other public health programs and municipal departments.

**Project 1** - *Complaint Data Base Surveillance* utilized the current PHS data base to focus specifically on complaints and inquiries regarding bed bugs addressed by PHIs within the Health Protection Division. Staff performed a combined total of 583 on-site housing inspections for bed bug infestations and/or responded to public enquires about bed bugs from May 2011 to March 2012. This is a reduction from the 661 inspections and/or consultations for the same period one year prior (May 2010 to March 2011). One possible explanation for this slight reduction is that awareness and education efforts that were afforded by the one-time provincial funding helped inform and empower members of the public to be able to deal with bed bug infestations without the assistance of site inspections from PHS staff.

**Project 2** – *Website Data Analysis* for designated bed bug web site and URL contained within PHS web pages. The PHS website for bed bugs ([www.hamilton.ca/bedbugs](http://www.hamilton.ca/bedbugs)) had 9,961 viewings between May 2011 and March 2012. The web site ranked in the top 300 pages of the City's approximately 6,700 available web pages over the specified time period. The website was advertised through media outlets such as HSR and bus shelter ads, newspapers, and facebook using provincial one-time funding.

**Project 3** – *Customer Contact Centre (CCC) Surveillance* where calls from the general public are interviewed and coded into a specific data template designed by MIEH and the results are monitored and analyzed on a weekly basis. Between the period of May 2011 to March 2012, a total of 334 enquires about bed bug related issues were made to the CCC. This volume of calls to the CCC further demonstrates the likely influence of the bed bug advertising that was afforded by the one-time funding, as the ads promoted contact phone numbers for the public to call if they required information about bed bug issues.

### **Successes and Impacts of Implemented Activities and Supports**

Engagement and collaboration with community partners has provided a coordinated, community-wide approach to control bed bugs based upon currently available information and best practices. In addition, this approach has created a forum for acquiring and sharing available information and resources.

Working collaboratively with Hamilton Housing Help Centre and implementing the Eligibility Screening Tool for Unit Preparation ensured that vulnerable populations were provided with assistance. The Unit Preparation Assistance Subsidy has been well adopted by landlords who have tenants belonging to the vulnerable population. Landlords were able to get assistance for tenants who had infested units within a multi-level building who would otherwise not have been able to prep their units for treatment and may have been the source of reoccurring bed bug infestations within their unit and other units within the same building. Both proper unit preparation and treatment are required for an effective pest control program. Continued funding for these supports would allow PHS and community partners within BBAG to build on the momentum that was created by the provincial one-time funding.

### **Concluding Comments**

The scope of the bed bug problem is large and complex. The provincial one-time funding has provided an opportunity to begin to address the problem in the City. It is apparent that addressing the problem and assisting vulnerable populations is dependent on continuous resources over time which in turn is dependent on on-going funding over time.

The data collected thus far, generally shows a decrease in bed bug related complaints from the initial provincial reporting period (April 1, 2011 to December 31, 2011) to the final reporting period (January 1, 2012 to March 31, 2012). The data gathered has not taken into account confounding variables which may be influencing results and therefore no conclusions can be definite in regard to the level of bed bug infestations within the City of Hamilton. In order to be able to draw conclusions with respect to the level of bed bug infestations in the City of Hamilton, data must be recorded over a longer time period taking into consideration any seasonal effects that may be influencing levels.

Staff recognize the importance of the collaborative efforts implemented as a result of the provincial funding to address the bed bug issue within the City of Hamilton. In order to determine effectiveness and efficiency of the current strategy implemented, evaluation must be done in a manner that is both reliable and valid. On-going data collection that is both reliable and valid will guide and inform appropriate action to be taken to address the bed bug issue. This evidence-based approach is dependent on sustainable funding. In other words, examining levels of bed bug infestations within the same months over a 4 to 5 year time period would be optimal for a comparison from which a more accurate conclusion could be drawn.

**ALTERNATIVES FOR CONSIDERATION:**

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Below are alternatives to the suggested recommendations which have been considered:

- A) The BOH could choose not to request additional funding from the Ontario provincial government for the purpose of the prevention and control of bed bug infestations in Hamilton.

**Financial Implications:** This would result in no opportunity to request and possibly receive provincial funding.

**Staffing Implications:** No City staff were hired with the provincial grant funding. PHI staff will continue to respond to all bed bug complaints regardless of new or continued funding.

**Legal Implications:** None

**Policy Implications:** None

**Pros:** None

**Cons:** By not requesting funding from the Ontario provincial government, there would be less likelihood of receiving any additional funding for the purpose of prevention and control of bed bug infestations in Hamilton.

- B) The Board of Health could choose to fund an ongoing Bed Bug initiative through 100% levy funding.

**Financial Implications:** This would result in a pressure on the tax levy of the same amount as would be dedicated to enhance bed bug prevention and control initiatives.

**Staffing Implications:** None

**Legal Implications:** None

**Policy Implications:** None

**Pros:** Additional funding would allow enhanced education, awareness, and support activities to be provided to the vulnerable groups that are affected by bed bug infestations.

**Cons:** Funding an ongoing bed bug initiative using 100% tax levy funding would result in a pressure on the tax levy of the same amount as would be dedicated to enhance bed bug prevention and control initiatives.

### **CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)**

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

#### ***Skilled, Innovative & Respectful Organization***

- ◆ More innovation, greater teamwork, better client focus
- ◆ This report highlights the work accomplished to address the problem of bed bugs through collaboration between provincial, municipal, and community partnerships

#### ***Financial Sustainability***

- ◆ Financially Sustainable City by 2020

#### ***Intergovernmental Relationships***

- ◆ Influence federal and provincial policy development to benefit Hamilton
- ◆ Acquire greater share of Provincial and Federal grants (including those that meet specific needs)
- ◆ Maintain effective relationships with other public agencies
- ◆ Recommending that the Provincial Government provide sustainable, continuous funding to PHS for the purposes of assisting populations within the community that are vulnerable to bed bug infestations

#### ***Social Development***

- ◆ Residents in need have access to adequate support services
- ◆ People participate in all aspects of community life without barriers or stigma

### **APPENDICES / SCHEDULES**

Appendix A - Public Health Unit Bed Bug Support Fund

Appendix B - Health Hazard Bed Bug Research & Evaluation





# Public Health Unit Bed Bug Support Fund

## Final Project Report Template

<b>Board of Health:</b> City of Hamilton	<b>Address:</b> 1 Hughson St. N. 3 <sup>rd</sup> Floor Hamilton ON L8R 3L5
<b>Contact Name / Position Title:</b> Matthew Lawson Manager, Environmental Health	<b>Telephone Number:</b> 905-546-2424 ext. 5823
<b>Date submitted:</b> April 30, 2012	

## **Overview**

The following Final Project Report Template is being provided to public health units that received funding under the Bed Bug Support Fund.

As stated in the administrative letter dated April 28, 2011 from the Assistant Deputy Minister, Public Health Division, the one-time funding to support bed bug related activities is subject to specific terms and conditions, which includes specific reporting requirements.

## **Scope**

The details provided by public health units to the province in the Project Reports will allow for assessment of the scope of the bed bug issue in the province and the effectiveness of implemented activities.

As per the administrative letter dated April 28, 2011, the Initial/Final Project Reports should include the following details:

- Description of activities implemented and delivered under the one-time funding including the streams under which activities were identified (i.e. education and outreach, and/or supports to vulnerable populations).
- Description of successes of activities.
- Impact of activities on decreasing bed bug infestations in the public health unit area.

## **Timelines for Reporting**

Required Reports:

<b>Name of Report</b>	<b>For the Period Of</b>	<b>Due Date</b>
Initial Project Report	April 1, 2011 to June 30, 2011	July 31, 2011 (Complete)
Initial Surveillance and Evaluation Report	April 1, 2011 to December 31, 2011	January 31, 2012
Final Surveillance and Evaluation Report	January 1, 2012 to March 31, 2012	April 30, 2012
Final Project Report	July 1, 2011 to March 31, 2012	April 30, 2012

**This template is to be used for the Final Project Report due on April 30, 2012.**

Please submit electronic copies of this report to Nancy Sullivan, Public Health Practice Advisor, System Capacity and Practice Unit, Public Health Standards, Practice and Accountability Branch at [Nancy.Sullivan@ontario.ca](mailto:Nancy.Sullivan@ontario.ca) by April 30, 2012.

The original report can be forwarded to:

Attention: Nancy Sullivan

Public Health Standards, Practice and Accountability Branch

Public Health Division

393 University Avenue, Suite 2100, 21<sup>st</sup> floor

Toronto ON M7A 2S1

If you have any questions about this template or the reporting requirements please contact Nancy Sullivan by email at [Nancy.Sullivan@ontario.ca](mailto:Nancy.Sullivan@ontario.ca) or phone at 416-325-2168.

## **Final Project Report**

### **Part 1 – Description of Activities**

#### ***Stream 1 – Education and Outreach***

Stream 1 activities relate to education and outreach to the public and stakeholders to enhance awareness and knowledge in the identification, prevention and control of bed bug infestations. Services and/or activities could include, but are not limited to:

- Provision of information, advice and guidance on identifying, preventing and controlling infestations
  - Development or enhancement of community partnerships
  - Education and information sessions with the public and community partners
  - Education and outreach targeted to specific high-risk setting and/or populations
1. If you have implemented and delivered activities within Stream 1, please describe the activities you have undertaken for the reporting period. Were activities implemented as planned and in accordance with your application? If not, why not?

PHS has continued to work with community partnerships via the Bed Bug Action Group (BBAG) consisting of the following key community members: City of Hamilton (Public Health Services, Emergency Services, Community Services, City Manager's Office and Police Services) along with representatives from community stakeholder organizations (Good Shepherd, Housing Help Centre, and Victoria Park Community Homes). Hamilton Bed Bug Action Group (BBAG) facilitates a coordinated, community-wide effort to control and prevent bed bugs based upon currently available information and best practices. The key objectives of the BBAG are to: 1) facilitate a coordinated, efficient approach to respond to the issue of bed bugs, and 2) create a forum for acquiring and sharing available information and resources. PHS has continued to present bed bug information at landlord association meetings and other community group centres which service new residents to the City of Hamilton of various cultural backgrounds.

In addition, PHS has continued to work with Hamilton Housing Help Centre to support a post for a Community Development Worker- Bedbug Awareness. This position acts as a link between the community and Public Health Department as well as other Municipal Departments. This post focuses on work with landlords, tenants, tenant associations, tenant support groups and community groups in order to facilitate a community wide response to improve bed bug control through public education and awareness.

Also, PHS has worked to promote bed bug awareness via a promotional campaign outlined below:

<b>BedBug Campaign</b>	<b>Budget</b>	<b>Quantity</b>
Text Box	\$226.00	1 design
Brochures	\$4,322.76	100 000 copies
Fact Sheets	\$3,767.48	100 000 copies
		3-week launch, bi-monthly reminder, 3-week close
Hamilton Community Newspaper (6)	\$22,218.06	
Transit Shelter	\$30,133.20	20 shelter for 6 months
Mall Poster	\$5,424.00	6 months, 2 malls
Internal Bus Ads	\$1,872.98	200
Bus Backs	\$498.61	10/month
Posters (11x17)	\$433.92	1000
Magnets	\$232.78	300 quantity
Buck Insert	\$2,185.42	200,000
DVD	\$0.00	25 -30 from Ministry
Hamilton Visitors Distribution (Tourism Ad)	\$1,299.50	spent
<b>Ministry Allocated Funds</b>	<b>\$73,000.00</b>	
<b>SPENT Funds</b>	<b>\$72,614.71</b>	
<b>Balance (allocated - spent)</b>	<b>\$385.29</b>	

### ***Stream 2 – Supports to Vulnerable Populations***

Stream 2 relates to the provision of supports to vulnerable populations impacted most negatively by bed bug infestations.

Supports and services could include, but are not limited to:

- Inspection and assessment services

- Assistance with, and coordination of, extreme cleaning services and unit preparation
  - Bed bug identification services
  - Referral to appropriate social and community-based services to address the specific needs of particular vulnerable populations
  - Collaboration and engagement with municipal and other local partners in addressing specific needs of these populations
  - Provision of specific front-line supports and services to vulnerable populations dealing with bed bug infestations
2. If you have implemented and delivered services and supports within Stream 2, please describe the activities you have undertaken for the reporting period. Were activities implemented as planned and in accordance with your application? If not, why not?

PHS has continued to record bed bug complaints and follow through with bed bug inspection, identification and assessment by Public Health Inspectors (PHIs) throughout the City of Hamilton and in the "CODE RED" identified vulnerable population areas of the City. PHIs have continued to identify complaints involving hoarding cases and have worked collaboratively with social workers to provide the most effective approach to bed bug infestations in this type of specialized setting. PHS has worked with Hamilton Housing Help Centre to develop an Eligibility Screening Tool for a Unit Preparation Assistance Subsidy such that vulnerable populations are given priority for such services (see Appendix A). Moreover, PHS has continued to work with Hamilton Housing Help Centre to promote the Unit Prep Assistance Subsidy opportunity for vulnerable populations and support the service. Good Shepherd Works is a community stakeholder organization that provides the service of unit preparation to those vulnerable populations eligible for the subsidy, as well as the provision of bed bug prevention kits (ie., mattress covers, bed bug traps, bed post sleeves, etc.). In addition, PHS has met and collaborated with the local offices of Ontario Works and the Ontario Disability Support Program to provide awareness regarding unit prep availability for vulnerable populations.

One limitation of the project being executed as planned was due to the timing with which the \$100,000 budgeted for supports to vulnerable populations could be spent. Once the procurement approvals were granted, the subsidy program for unit preparation was promoted in Hamilton beginning in September/2011, and the program began to build momentum over time such that approximately \$43,268 (before tax) was spent on preparing 45 residential units for treatment for bed bugs. The remaining \$56,732 (before tax) was used to purchase materials (ie., bed bug prevention kits) for preventing bed bug infestations within the residences of vulnerable populations. A total of 111 bed bug prevention kits for tenants, and 10 deluxe bed bug prevention kits for tenant associations were purchased for distribution to vulnerable clients identified through participating community partners. Both the unit preparation services and the bed bug prevention kits were well-received by the populations that they were intended to assist, meaning, PHS received positive feedback from the vulnerable clients who benefitted from these initiatives.

A total of \$60,000 was used to fund the full-time position of a Community Development Worker- Bedbug Awareness. The funding of this position was integral to the ongoing efforts to educate the community about the issue of bed bugs and to help promote the available assistance regarding unit preparation services and prevention kits to vulnerable populations.

## **Part 2 – Successes and Impacts of Implemented Activities and Supports**

3. Please describe the successes of the delivered activities under both Streams. Were particular activities more effective than others? If available, please share examples of specific success stories in your health unit.

Engagement and collaboration with community partners provides a coordinated, community-wide approach to control bed bugs based upon currently available information and best practices. In addition, this approach creates a forum for acquiring and sharing available information and resources (data to be provided in Surveillance and Evaluation Report).

Working collaboratively with Hamilton Housing Help Centre and implementing the Eligibility Screening Tool for Unit Prep ensures that vulnerable populations are provided with assistance. The Unit Prep Assistance Subsidy has been well adopted by landlords who have tenants belonging to the vulnerable population. Landlords are able to get assistance for tenants who have infested units within a multi-level building who would otherwise not be able to prep their units for treatment and may be the source of reoccurring bed bug infestations within their unit and other units within the same building; both proper unit prep and treatment are required for an effective pest control program. PHS works with internal departments such as Public Health Nurses from Healthy Living Division to deliver bed bug awareness to a local Elementary School Program found within a low socio-economic neighbourhood.

4. Please describe the impact of the activities on decreasing bed bug infestations in the public health unit area and impacts on vulnerable populations. Have these impacts been measurable and if so, please provide any data to demonstrate the impact.

Available data will be provided in the Surveillance and Evaluation Report which is forthcoming.

5. Any additional comments? Lessons learned?

The scope of the bed bug problem in Hamilton is large and complex. This initial funding has provided an opportunity to begin to address the problem in the City. It is apparent that addressing the problem and assisting vulnerable populations is dependent on continuous resources over time which are dependent on continuous funding over time. Continuous funding for the promotion of bed bug awareness and supports provided to vulnerable populations will be key to getting control over the problem of bed bugs in communities within Hamilton.

# HEALTH HAZARD 'BED BUGS' RESEARCH & EVALUATION



Project Reporting Period May 2011 to March 2012

K. Bruce Newbold ([newbold@mcmaster.ca](mailto:newbold@mcmaster.ca)) & Marie McKeary ([mmckeary@hamilton.ca](mailto:mmckeary@hamilton.ca))  
McMaster Institute of Environment and Health (MIEH)

On behalf of

Matt Lawson, Manger of Health Hazard Program, Health Protection Division  
Hamilton Public Health Services

Funded by Ministry of Health and Long Term Care  
April 2012

## Hamilton Public Health Services(HPHS) & McMaster Institute of Environment and Health (MIEH)

### Bed Bug Strategy “Snapshot”

<p><b><u>Customer Contact Centre Project ‘A’</u></b></p>	<p>* <b>252</b> calls from August 25<sup>th</sup> – December 31, 2011</p> <p>* <b>82</b> calls from January 3 – March 31, 2012</p> <p>Customer Contact Centre public inquiries during Ministry reporting period totaled <b>334 (May 2011 –March 2012)</b></p> <p><b>(Average per month = 30 approx.)</b></p>
<p><b><u>Electronic Complaint Data Base Project ‘B’</u></b></p>	<p>*Hamilton PHS assessed (on site inspections) <b>465 units for Bed bugs infestations</b> during the Ministry reporting period of <b>May 2011 – March 2012.</b></p> <p>* Hamilton PHS responded to <b>118 public inquiries</b> by phone/e-mail regarding Bed bugs for the Ministry reporting period of <b>May 2011 - March 2012.</b></p> <p>**Overall, the total number of Bed bug requests for service, via Hamilton PHS complaint data base <b>totalled 583</b>, during the <b>Ministry reporting period of May 2011 to March 2012.</b></p> <p><b>(Average per month = 53 approx. requests for service)</b></p>
<p><b><u>Website Data Analysis Project ‘C’</u></b> (# of visits to dedicated Bed Bug Web Page)</p>	<p>* Total number of pages viewed during the <b>Ministry timeline of May 2011 to March 2012</b> equaled <b>nine thousand, nine hundred and sixty-one, 9,961.</b></p> <p><b>(Average number of pages viewed per month = 906 approx.)</b></p> <p>The PHS bed bug page consistently ranked in the <b>top 300</b> within the City of Hamilton’s <b>6,700 available web pages</b> over the specified time period.</p>

\*Total number of requests includes “Other” category



Ministry of Health and Long Term Care  
Final Report: Cimex lectularius ‘Bed Bug’ Strategy  
Hamilton Public Health Services & McMaster Institute of Environment and Health  
April 2012

On January 10, 2011, the Ontario Ministry of Health and Long-Term Care (M.O.H.L.T.C.) announced \$5 million in one-time funding for Ontario health units to access for the purposes of 1) providing education and outreach activities about bed bugs within communities, and 2) providing support to vulnerable populations affected by bed bugs. The application for funding was successfully awarded to Hamilton PHS on January 27, 2011. Hamilton Public Health Services (H.P.H.S.) leveraging an existing consulting relationship with the McMaster Institute of Environment and Health (M.I.E.H.) (contracted for research development and evaluation services) collaborated on the funding application drawing on previous programming developed in partnership to service the Hamilton Community. H.P.H.S. had also taken a leadership role in the formation of the community collaboration, the ‘Bed Bug Action Group’ (B.B.A.G.).

Thus, once funding was successfully awarded, H.P.H.S. and M.I.E.H developed a two-tiered strategy. The two tiered strategy allowed H.P.H.S. to fulfill its legislated population health mandate to offer services to the general public while simultaneously developing specific programming supports for ‘vulnerable’ populations. MIEH would develop and/or evaluate public health projects focused primarily on the general public. Community Partners and members of B.B.A.G .would focus specifically on targeted ‘vulnerable’ populations, as defined and specified by the Ministry. The activities of the community partners are outlined in a separate report utilizing the Ministry template.

It is important to note that although M.I.E.H. fulfilled the existing mandate of Hamilton Public Health Services by focusing project funding on the development and/or evaluation of services to the wider population of the City of Hamilton the social demographic profile of the City of Hamilton meant that any surveillance projects would automatically include members from designated ‘vulnerable’ groups. A quick snapshot of the socio-demographic profile for Hamilton illustrates the extent of ‘vulnerability’ to be found within the wider population:

- ☞ ***Income Disparity*** - the lowest quintile shared five percent (5%) of the Total Income and the highest quintile shared forty-one percent (41%) of the total income (2009)
- ☞ ***Children Living in Poverty*** – twenty six percent (26%) of children lived in families that earned below the low income measure (2009)
- ☞ ***New Permanent Residents*** – among the four thousand and three (4,003) permanent residents who arrived in Hamilton, there was a poverty rate of over 50% higher than in any other Ontario city(2010)
- ☞ ***Youth Unemployment*** – the unemployment rate for youth during the first half of 2011 was 13.4 a number more than double that of the general population.
- ☞ ***Unemployment Rate***- the adult unemployment rate for 2011 averaged approximately 6.3%.
- ☞ ***Average Earnings*** – the average earnings for men was 46,400 and for women was 29,800 (2009)<sup>1</sup>

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<sup>1</sup> City of Hamilton Web Page “Hamilton Community Wellness Indicators” retrieved January 20, 2012

<http://www.hamilton.ca/CityDepartments/CorporateServices/FinanceBudgetTaxes/CommunityWellness.htm>

The remainder of this report will scope the three projects created by H.P.H.S./M.I.E.H. in order to track and evaluate the degree of Bed Bug infestation as recorded by Hamilton Public Health Services' Health Hazard Program, as well as, probe the Hamilton population in terms of their awareness and concern around this topic. The Ministry funded reporting period extended from May 2011 to March 2012. The report will detail the planning phase of the projects including the creation of partnerships, the implementation of the projects as well as the data findings and analysis. The research findings are analyzed and presented in an inclusive manner, covering the complete Ministry funding timeline of May 2011 to March 2012. Each of the three projects fulfills the public health values of capacity building and knowledge translation by involving other public health programs and municipal departments (internal partners) , for example the Municipal Customer Contact Service and City Managers Office and Planning and Business Improvement – Strategic Services.<sup>2</sup> The projects originating with BBAG focus on developing community capacity and the creation of external partnerships.

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<sup>2</sup> M.I.E.H. would like to acknowledge the invaluable assistance of Ramsin Kamos and Jay Adams, Electronic Data Analysts for PHS and the City of Hamilton, respectively and Verna Radford, Victor Paola, Irene Stuckey, Thomas Chan and all of the operators of the Hamilton Customer Contact Centre.

Analysis developed by B. Newbold and M. McKeary of the McMaster Institute of Environment and Health (MIEH) under a consultancy agreement with Health Protection Division, Hamilton Public Health Services.

## Project A: Customer Contact Centre Surveillance and Evaluation (CCC)

Hamilton has the eighth largest population of all Canadian cities (504,550) and remains the fourth largest of all Ontario cities, preceded by Toronto, Ottawa, and Mississauga. There are nine thousand and four hundred (9,400) people employed by the City of Hamilton. The Customer Contact Centre is a centralized customer service, employing approximately thirty-five employees, to assist in both telephone and e-mail public enquiries for all services offered by the City of Hamilton. Translation is available in one hundred and seventy (170) languages. The City of Hamilton Customer Contact Centre (H.C.C.C.) is the front line response centre for the municipal government offices, providing service to the citizens and businesses of Hamilton. In 2011, the Customer Contact Centre 'abandoned' over 480,000 calls for the municipality. The range of calls handled for the municipality include inbound inquiries regarding city services such as taxes, waste management, health, special events, and public transportation. Hours of operation are from 8:30 am to 4:30 pm EST Monday to Friday. All other times are handled by after hour's service. Customer communication mediums include: phone, fax, email, web and post mail.

In the role of project lead MIEH, developed a surveillance project, on behalf of public health in collaboration with the C.C.C., to monitor both the quality and quantity of 'Bed Bug' inquiries received from the general public. Once funding was confirmed and received, meetings began with Management at the Contact Centre in June of 2011. By late August, MIEH had developed background information for usage by call centre operators, a survey tool to gather information from the public and, two internal templates for tracking data. C.C.C.- IT departments electronically retrieved and forwarded data weekly for review and analysis by M.I.E.H. staff. All Customer Contact Centre operators received orientation on Bed Bugs, data gathering tools and interview techniques in facilitated sessions conducted by M.I.E.H. staff. Thus, the collaboration increased capacity and knowledge transfer for all parties concerned. By mid August 2011, the CCC/BB project was implemented. On-going research support was made available for the customer contact employees through the M.I.E.H. liaison. The survey tool was intended to profile the concerns of the general public, the social identity of callers, their level of awareness not only of BB's but of the availability of community services included H.P.H.S., and through the collection of caller postal codes M.I.E.H./H.P.H.S. will eventually be able to develop a service map of **BB public inquiries** for the City of Hamilton. The chart below reveals the number and dissemination of calls over the reporting time period for the CCC surveillance project (A).

BB/CCC	2011-2012
August (19 <sup>th</sup> )2011	24
September 2011	76
October 2011	65
November 2011	63
December(excludes calls during City Shutdown) 2011	24
January 2012	24
February 2012	27
March 2012	31
<b>Total</b>	<b>334</b>
<b>Monthly Average</b>	<b>Approx. = 30</b>

**Research findings** based on analysis of the survey tool data illustrates the richness of the results for future program decision making by H.P.H.S.. The following will allow for evidence based decision-making regarding allocation of program resources and development of policies and procedures.

- ☐ Overall, the Customer Contact Centre (CCC) received and **processed three hundred and thirty four (334) BB calls** on behalf of the City of Hamilton from **August 19, 2011 to March 31, 2012**.
- ☐ A **Social or Community agency (20%)** followed by the categories of **Friend (13%), Family Member (12%) , Media (11%) and Self (10%)** included the most **common referral sources** to the contact centre regarding BB's inquiries. .
- ☐ Most often, **sixty-four (64%)** of the time individuals were **calling on their own behalf**. The second highest category included individuals calling on behalf of **a family member (15%)**.
- ☐ When operators inquired, regarding the **reason for the call** there was a response rate of ninety-four percent (94%), with the two largest categories identified as **information on treatment of BB infestations (50%)** and **requests for general information (35%)** on the subject.
- ☐ The majority of callers sixty-six percent **(66%) were renters**. Callers were invited to give further details regarding their accommodation as to whether it was a **market or subsidized** rental. **Seventeen per cent (17%) lived in subsidized** dwellings and **thirty-two percent (32%)** were living in market priced rental units. In addition to the above profile **twenty-three (23%)** of callers lived in **multi-unit buildings**.
- ☐ As mentioned earlier in the report the City of Hamilton is unique with regards to control and management of BB's since there exists a pest By-Law (which applies to rental properties only) and HPHS are the lead enforcement agency responsible for its implementation. In order to investigate the knowledge of callers with regards to a possible avenue for assistance, operators inquired of callers whether they were aware of the City By-Law and its requirements. The results illustrate **a need for more public education** since approximately, **twenty-nine percent (29%)** chose **'YES'** and **thirty-two percent (32%)** chose **'NO'** while thirty-nine percent (39%) of callers chose not to answer the question.
- ☐ The findings above regarding awareness of the unique "Pest" By-Law for the municipality are echoed by another research project conducted by H.P.H.S./M.I.E.H. prior to the Ministry Timeframe (early 2011). H.P.H.S. facilitated a **'Landlord Information Session'**, subsequently evaluated by M.I.E.H., in partnership with Off-campus Housing at McMaster University. The majority of respondents were landlords/owners of single dwelling structures utilized as rental/income properties. The participants included a diverse group who owned/managed a range of rental properties including a small number of units to upwards of eighty units in the City of Hamilton. Sixty-three percent **(63%)** were unaware of the pest By-Law and their mandated responsibilities. However, eighty-four percent **(84%)** requested more education/information on BB's from Public Health and sixty-eight percent **(68%)** believed bed bug infestations were on the rise in the City of Hamilton.<sup>3</sup>
- ☐ The number of callers who contacted the Customer Contact Centre (C.C.C.) and stated they **currently had an issue** with BB's totaled **seventy-seven percent (77%)**.
- ☐ Callers who stated this was their **first time experiencing** issues with BB's totaled **forty-one percent (41%)**.

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<sup>3</sup> B. Newbold and M. McKeary, (2011) "Landlord Survey. McMaster Off Campus Housing Association". McMaster Institute of Environment and Health (MIEH) on behalf of Hamilton Public Health Services.  
Analysis developed by B. Newbold and M. McKeary of the McMaster Institute of Environment and Health (MIEH) under a consultancy agreement with Health Protection Division, Hamilton Public Health Services.

- ☐ When asked to elaborate on their experience(s) with BB infestations in the recent past, **eighty six percent (86%) had not previously** had an issue, with **three percent (3%)** having at least one experience, while for **six percent (6%)** this was their second infestation, and **four percent (4%)** had experienced **between 3 and 6 infestations**.
- ☐ Considering the above results it was surprising to discover **only ten percent (10%)** of the callers had previously contacted Hamilton Public Health Services. Thus, we would recommend the need **for H.P.H.S. to conduct more education with the public on the role of PHS regarding this issue and the programs/services the organization offers**.
- ☐ Only **fifteen percent (15%)** of callers had contacted any community/social agency who may have acted as a potential source of information and assistance. The most popular local agencies exempting H.P.H.S. included **Housing Help Centre (3%)** and **Good Shepherd (Works) (6%)**.
- ☐ Customer Contact Centre operators referred **twenty-seven percent (27%)** of callers to H.P.H.S.. They also redirected another **thirteen percent (13%)** to either **Good Shepherd (5%)** or **Housing Help Centre (8%)**.
- ☐ **Seven percent (7%)** of callers requested a **BB brochure**, developed by the Province, and distributed by HPHS, to be mailed to their home.
- ☐ **Twenty-five percent (25%)** of callers **requested the designated 'Bed Bug' website URL**(see **Project C**), developed and maintained by H.P.H.S..
- ☐ As part of the project, Customer Contact Centre operators collected postal codes from the public. Approximately **forty-two percent (42%)** of callers shared their postal code information thus offering a large enough sample to develop GIS mapping and gain information with regards to the high call volume areas of the City. The data however must be used appropriately with regards to any conclusions regarding BB infestations within the City of Hamilton versus simply identification of source areas for callers. Common postal codes areas (L8H, L8K, L8L, L8N, L8P and L8R) trace the origin of a majority of the inquiries to the downtown core of the City, primarily the North to North East region.

## Project B: Electronic Health Protection Complaint Data Base

In 2011, M.I.E.H. initiated an on-going analysis of data sourced from the electronic Health Protection Complaint Data Base. Hamilton Public Health Services (HPHS) has electronically collected data on Bed Bug calls (and other Health Hazards) since (2004) until present day (2012). Data is retrieved and analyzed by M.I.E.H., on an annual basis, with the goal of revealing patterns/trends in the inquiries over time and for annual comparison purposes. It is important to note the ***data is not a reflection of bed bug infestation levels in Hamilton but a reflection of complaints/inquiries registered by the general public*** to the Hamilton Public Health Services Complaint line, although a relationship does exist between the two findings. The research goal is to conduct surveillance/evaluation activities in order to assist H.P.H.S. with evidence based decision making regarding allocation of program resources, program planning and the development of policies and procedures.

Hamilton Public Health Services (HPHS) determines if a 'Health Hazard' exists, a mandatory public health program, and responds to complaints and enquiries from the public by conducting on site inspections or providing advice through phone contact, email or letters. Most of the investigations arise from complaints received from individual members of the public. In addition, PHS staff is often involved in investigations led by other agencies (e.g. Ministry of Environment) or the Infectious Disease team within PHS. ***'Total Health Hazard'*** complaints refer to the following hazards; asbestos, bed bugs, cockroaches, Diogenes, general sanitation, housing, insects (not covered by Property Standards By-law #10-221), marijuana 'Grow' operations, mice, mould, odour, rats, sewage, and Sharps collection.

The following project examines Bed Bug complaints both as a percentage of all Health Hazard complaints, as well as tracking the increase/decrease of the individual category. However, a comparative examination of the two sets of data illustrates the level of public concern/anxiety generated by the bed bugs within the general public. It also reveals the subsequent impact on the resources of the Health Hazard program of Public Health Services.

***Complaints*** are defined as those contacts requiring an on-site visit by a PHI to the premises. In the case of BB's the visit is often for the purposes of identification and assessment. Once an investigation has occurred and a paper report compiled, the data is not longer in an accessible format since HPHS does not currently have access to an electronic data base for tracking the positive or negative outcome of the investigation. ***Inquiries*** are defined as those contacts addressed by a PHI primarily through e-mail or telephone and thus those that do not require a site visit.

Over the last nine years, data analysis reveals a substantial increase in Health Hazard complaints and investigations, which includes the subset of 'Bed Bug' complaints. Overall, ***relative to all 'Health Hazard' complaints***, bed bug complaints increased from three percent (3 %) in 2005-6, to eight percent (8%) in 2007 and to **sixteen percent (16%)** in 2008. Through the years the increase has been consistent and at times substantial ranging from twenty-two percent (22%) in 2009, to **thirty-seven (37%)** in 2010 and finally, BB's accounted for approximately twenty-three (23%) of ***all 'Health Hazard' complaints*** in 2011.<sup>4</sup> Thus, continuing to burden the existing program resources of the Health Hazard program of Public Health Services (see chart below).

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<sup>4</sup> Although 2012 numbers are not yet available, the first quarter of the year reflects a steady stream of requests from the public. A comparison of the first quarter (Jan-Mar) for previous years reveals that with the exception of 2011, 2012 numbers have increased over other years.

Analysis developed by B. Newbold and M. McKeary of the McMaster Institute of Environment and Health (MIEH) under a consultancy agreement with Health Protection Division, Hamilton Public Health Services.

**Project B: Electronic Health Protection Complaint Data Base (continued)**

	Complaints & Inquiries	% Increase Bed Bug calls	Bed Bug calls as % of Total Health Hazard
2004	7		1.5
2005	46	557	3.1
2006	38	21 (-)	3.1
2007	124	226	8.3
2008	267	115	15.8
2009	370	39	22.4
2010	603	63	36.5
2011	659	9	22.8
2012 1 <sup>st</sup> Quarter only (Jan-Mar)	133	N/A	40.2

\*\* See appendices for a comprehensive set of data findings including both complaints and inquiries over the nine year time period.

As mentioned previously, unique to the City of Hamilton, Public Health Services is the lead enforcement agency for municipal By Law 10-221 “Property Standards By Law” which contains a section on ‘pests’. Thus, the documented increase in complaints was accompanied by a corresponding increased demand on limited program resources within the Health Hazard Program. The greatest increases (see chart above) were recorded **from 2004 to 2005 (557% increase)** and **2006-2007 (226% increase)**. However, there has been an annual increase in each subsequent year. In **2008(115%), 2009 (39%), 2010 (63%)** and finally, in **2011 the increase was nine per cent (9%)**.

**Summary of Bed Bug complaints and inquiries during the Ministry reporting period of May 2011 to March 2012 (see Project B appendices on pp. 10-11 of this document for full details).**

- ☞ In 2011, there were four hundred and eighty-one (**481 complaints**) and one hundred and sixty-five (**165 inquiries**) for a **total** of six hundred and fifty-nine (**659 calls**), including an ‘other’ category.
- ☞ In 2011, Hamilton Public Health services assessed four hundred and eighty-one (481) units and specifically, **three hundred and sixty-four (364) units over the Ministry reporting period of May-December 2011.**
- ☞ In 2012, Hamilton Public Health Services **assessed one hundred and one (101) units** during the **Ministry reporting period of January-March (1<sup>st</sup> quarter)**
- ☞ **Overall, the number of site inspections conducted by PHI’s with regards to Bedbug identification/verification totaled four hundred and sixty-five (465) over the Ministry reporting period of May 2011 to March 2012.**

**Summary of Bed Bug complaints and inquiries during the Ministry reporting period of May 2011 to March 2012 (see Project B appendices on pp. 10-11 of this document for full details). (continued)**

- ☞ In 2011, Hamilton Public Health Services *responded to one hundred and sixty-five (165) public inquiries by telephone and e-mail specifically, eighty-five (85) public inquiries during the reporting period of May-December 2011.*
- ☞ In 2012, *during the Ministry reporting period of January-March (1<sup>st</sup> quarter) Hamilton Public Health Services responded to thirty-two (32) public inquiries by telephone and e-mail.*
- ☞ *Overall, the total number of public inquiries attended to by Public Health Inspectors for the Ministry Time Period of May 2011 to March 2012 totaled one hundred and seventeen (118).*
- ☞ *Thus, the total number of public inquiries received to the HPHS complaint data base, which necessitated either a site visit or response from a PHI via phone/e-mail totaled, five hundred and eighty three (583).*



### PROJECT C: Website Surveillance Data

Hamilton Public Health Services developed/maintained a ***dedicated web site URL on Bed Bugs*** for public usage, <http://www.hamilton.ca/HealthandSocialServices/PublicHealth/BedBugs.htm>. The web page contains background information on the entomology of bed bugs, prevention, identification, eradication, diagnosis and management of BB bites, finally, suggested links to authoritative sources including the provincial government website.<sup>5</sup>

Month	# Pages Viewed	Rank Order
May 2011	771	235
June 2011	721	246
July 2011	1181	165
August 2011	890	179
September 2011	996	169
October 2011	1012	147
November 2011	1163	140
December 2011	764	184
January 2012	731	256
February 2012	744	246
March 2012	988	189
<b>TOTAL</b>	<b>9,961</b>	

Total number of visits to the Bed Bug web site for the ***Ministry reporting period (May 2011-March 2012)*** was nine thousand, nine hundred and sixty one (***9,961***). There are approximately ***6,700 web pages for potential viewing in the City of Hamilton*** and the designated Bed Bug URL has consistently ***ranked no lower than 256*** and as ***high as 140 in popularity*** illustrating a ***strong interest/need on the part of the general public*** for information on this issue. There has been a steady increase in the number of pages viewed since the inception of the website, as evidenced over the Ministry reporting period. Surveillance findings can only preliminary due to not only the limited but the choice of allotted time period. The data for 2012 would also appear to be increasing over the first quarter. The increases could potentially be correlated with the launch of a Media Campaign sponsored by the Health Hazard Program. ***Overall, the dedicated webpage received almost 10,000*** visits over the Ministry reporting period ranking the page ‘high’ compared to other City of Hamilton electronic information pages.

***In conclusion, the above findings combined with the results from the other two projects (A and B), all continue to show a demand for information/services with regards to Bedbugs generally, as well as, treatment methods for Bedbug eradication both originating from the general public and drawing on the limited resources of Hamilton Public Health Services.***

<sup>5</sup> **Pages viewed** = number of times the page was viewed by visitors.

**Pages viewed rank order** = ranking of webpage contextualized to number of web pages for potential viewing throughout the City of Hamilton portal (totaling approximately 6,700).

## PROJECT B: APPENDICES

### HPHS Electronic Complaint Data Base<sup>6</sup>

	2005 Complaints	2006 Complaints	2007 Complaints	2008 Complaints	2009 Complaints	2010 Complaints	2011 Complaints	2012 Complaints 1 <sup>st</sup> quarter	Total
January	0	7	7	14	29	15	29	53	154
February	1	0	6	7	19	16	21	26	96
March	1	2	5	14	13	17	28	22	102
April	1	0	4	16	5	17	39	N/A	82
May	2	1	3	17	14	22	30	N/A	89
June	2	3	2	18	25	39	37	N/A	126
July	2	6	8	33	32	45	43	N/A	169
August	1	3	17	11	46	62	62	N/A	202
September	3	2	13	18	28	71	45	N/A	180
October	6	2	11	20	29	50	62	N/A	180
November	4	3	7	22	36	49	50	N/A	171
December	0	2	4	11	13	16	35	N/A	81
<b>TOTAL</b>	<b>23</b>	<b>31</b>	<b>87</b>	<b>201</b>	<b>289</b>	<b>419</b>	<b>481</b>	<b>101</b>	<b>1632</b>

	2005 Inquiries	2006 Inquiries	2007 Inquiries	2008 Inquiries	2009 Inquiries	2010 Inquiries	2011 Inquiries	2012 Inquiries 1 <sup>st</sup> quarter	Total
January	0	0	4	2	6	7	19	13	51
February	0	1	0	1	4	4	19	6	35
March	3	1	1	0	9	7	32	13	66
April	3	0	0	4	1	10	9	N/A	27
May	3	1	1	5	5	12	11	N/A	38
June	1	1	4	8	2	12	6	N/A	34
July	3	1	3	2	8	2	5	N/A	24
August	2	0	9	0	5	24	13	N/A	53
September	3	0	0	9	8	31	8	N/A	59
October	1	0	8	9	9	28	18	N/A	73
November	1	0	1	8	9	16	20	N/A	55
December	1	1	0	7	3	2	5	N/A	19
<b>TOTAL</b>	<b>21</b>	<b>6</b>	<b>31</b>	<b>55</b>	<b>69</b>	<b>155</b>	<b>165</b>	<b>32</b>	<b>534</b>

<sup>6</sup> Data retrieved and analyzed by McMaster Institute of Environment and Health (MIEH), 2012  
Analysis developed by B. Newbold and M. McKeary of the McMaster Institute of Environment and Health (MIEH) under a consultancy agreement with Health Protection Division, Hamilton Public Health Services.

## APPENDICES

### Electronic Complaint Data Base

	2005 Total	2006 Total	2007 Total	2008 Total	2009 Total	2010 Total	2011 Total	2012 Total	Total
January	0	7	11	17	35	23	48	66	207
February	1	1	6	8	23	21	42	32	134
March	6	3	6	14	23	24	61	35	172
April	4	0	4	20	6	28	49	N/A	111
May	5	2	4	23	19	36	41	N/A	130
June	3	4	6	27	29	55	43	N/A	167
July	5	8	14	38	44	56	49	N/A	214
August	3	3	28	11	51	92	76	N/A	264
September	6	2	14	27	37	105	57	N/A	248
October	7	2	19	30	38	79	81	N/A	256
November	5	3	8	32	49	65	72	N/A	234
December	1	3	4	20	16	19	40	N/A	103
<b>TOTAL</b>	<b>46</b>	<b>38</b>	<b>124</b>	<b>267</b>	<b>370</b>	<b>603</b>	<b>659</b>	<b>133</b>	<b>2240</b>

\* Number do not total with other tables since 'other' category is included (Other = Councilor complaints and Repeat calls)