

AGENDA
CASCADE CHARTER TOWNSHIP
REGULAR BOARD MEETING

Wednesday, March 25, 2015
7:00 P.M.

Cascade Branch of the Kent District Library, Wisner Center
2870 Jacksmith, S.E.

Expected Meeting Procedures

1. During public comments you may speak on any item not noted on the agenda for a public hearing.
2. Please limit comments to 3 minutes per person and the Board may or may not choose to respond.
3. Please limit your comments to a specific issue.
4. Please turn OFF cellular phones.

Article 1. Call to Order, Roll Call

Article 2. Pledge of Allegiance to the Flag

Article 3. Approval of Agenda

Article 4. Presentations/Public Comments (limit comments to 3 minutes)

Article 5. Approval of Consent Agenda

- a. Receive and File Various Meeting Minutes
 1. Regular Board Meeting Minutes for 3/11/15.
 2. Zoning Board of Appeals Meeting Minutes for 12/09/2014.
- b. Receive and File Various Reports
 1. Fire Department Monthly Report for February, 2015.
- c. Education Requests
 1. Debbie Amos – MMTA Basic Institute – April 19-24th – Mt. Pleasant, MI
 2. Oxana Sourine – Association of Public Treasurers of US and Canada 50th Annual Conference – August 16-18th – Chicago, IL.
 3. Ken Peirce – MMTA Advanced Institute – April 29- May 1st - Mt. Pleasant, MI.
 4. Michael Bolt/Todd Stevenson – Fire Department Instructors Conference – April 20-25th – Indianapolis, IN
 5. Robert Norris/Doug Poolman – Michigan Arson School – May 18-22nd – Bay City, MI

Article 6. Financial Actions

Article 7. Unfinished Business

Article 8. New Business

021-2015 Consider Approval of Contract with Hamilton Helicopter Inc. for Gypsy Moth Suppression Services.

Article 9. Public Comments on any other matters. (limit comments to 3 minutes)

Article 10. Manager Comments

Article 11. Board Member Comments

Article 12. Adjournment

**MINUTES OF THE
CASCADE CHARTER TOWNSHIP
REGULAR BOARD MEETING**

Wednesday, March 11, 2015
7:00 P.M.

- Article 1.** Supervisor Beahan called the meeting to order at 7:00 p.m.
Present: Supervisor Beahan, Clerk Goodyke, Treasurer Peirce, Trustee McDonald, Koessel, Lewis and Goldberg (arrived at 7:10 p.m.)
Absent: None
Also Present: Manger Swayze, Fire Chief Sigg and those listed on Supplement #1.
- Article 2.** Supervisor Beahan led the Pledge of Allegiance to the Flag.
- Article 3.** Motion was made by Trustee Koessel and supported by Trustee Lewis to approve the Agenda as presented. Motion carried unanimously.
- Article 4.** **Presentations/Public Comments (limit comments to 3 minutes)**
- Article 5.** **Approval of Consent Agenda**
a. Receive and File Various Meeting Minutes
1. Regular Board Meeting Minutes for 2/25/15.
2. Planning Commission Meeting Minutes for 2/2/2015.
b. Receive and File Various Reports
1. Building Department Monthly Report for February, 2015.
2. Treasurer's Department Monthly Report for December, 2014.
c. Education Requests
1. Bill Benoit – Code Officials Conference of Michigan – May 4-5, 2015 – Bay City, MI.
Motion was made by Clerk Goodyke and supported by Trustee Lewis to approve the Consent Agenda. Motion carried unanimously.
- Article 6.** **Financial Actions (None)**
- Article 7.** **Unfinished Business**
- Article 8.** **New Business**
016-2015 Consider Approval of July 4th, 2015 Celebration Contract for Funny Business.
Fire Chief Sigg addressed the Board regarding the Contract with Funny Business. Motion was made by Trustee Koessel and supported by Clerk Goodyke to approve the contract with Funny Business in the amount of \$41,375. Motion carried unanimously.
- 017-2015 Consider Approval of Road Closures for July 4, 2015.**
Motion was made by Trustee Koessel and supported by Trustee McDonald to approve the road closures for July 4th, 2015 Celebration. Motion carried unanimously by roll call vote.

- 018-2015 Consider Approval of Purchase of New Air Packs for Fire Department.**
Chief Sigg reviewed the request for the purchase of new Air packs. Motion was made by Clerk Goodyke and supported by Trustee Koessel to approve the purchase of the MSA air packs in the amount of \$149,628.75. Motion carried unanimously.
- 019-2015 Consider Approval of HOPE Network Cost Increase.**
Manager Swayze reviewed the cost increase with the Board. Motion was made by Trustee Koessel and supported by Trustee Goldberg. Discussion followed. Motion carried unanimously.
- 020-2015 Consider Approval of the Proposed Fixed Asset Capitalization and Depreciation Policy.**
Manager Swayze reviewed the proposed Fixed Asset Policy. Discussion followed. Motion was made by Trustee Goldberg and supported by Trustee McDonald to approve the Fixed Asset Capitalization and Depreciation Policy as presented. Motion carried unanimously by roll call vote.

Article 9. Public Comments on any other matters. (limit comments to 3 minutes)

Article 10. Manager Comments

Manager Swayze offered the following comments:

- We had the resident meeting for the Schoolhouse Creek stormwater project that we are working on. I thought there were some great comments. The next step is to wait until next week to see if we receive any additional comments from the residents. After that, we will meet with the engineers to put together a final project. We will then meet with the infrastructure committee to talk about next steps...eventually talking about the financing of the project.
- A couple of other meetings coming up:
 - Stormwater education meeting coming up March 20th here at the Wisner Center
 - March 24th at 5:00 p.m. here in the Wisner Center we are having the first of two meetings to talk about the downtown construction activities. This meeting is geared towards the business community. As we get closer to April, we will have a public meeting as well.

Article 11. Board Member Comments

Trustee Koessel offered the following comments:

- Just a question...how are we dealing with our potholes.
 - Manager Swayze stated the road commission has been out...I have seen them a couple of times on Thornhills. They do

encourage us to report any potholes that we see that needs to be addressed right away.

Treasurer Peirce offered the following comments:

- Latest percentage of tax collection for March was up to 97.73%.
- I thought the Monday night meeting was well done. It showed the Township is concerned and was doing its best to arrive at some kind solution.

Trustee McDonald offered the following comments:

- I think Ben did a nice job on Monday's meeting...staying logical and focused.

Trustee Goldberg offered the following comments:

- Comments made regarding the Schoolhouse Creek Project.

Supervisor Beahan offered the following comment:

- The Board of Review met Tues/Wed. The biggest source of adjustment were the Veterans Exemptions.

Article 12. Adjournment

Motion was made by Treasurer Peirce and supported by Clerk Goodyke to adjourn. Motion carried unanimously.

Meeting adjourned at 7:33 p.m.

Respectfully submitted,

Denise M. Biegalle
Deputy Clerk

Approved by:

Ron Goodyke, Clerk

Robert S. Beahan, Supervisor

ZONING MINUTES
Cascade Charter Township
Zoning Board of Appeals
Tuesday, December 09, 2014
7:00 P.M.
Cascade Library Wisner Center
2870 Jackson Avenue SE

ARTICLE 1. **Chairman Casey called the meeting to order at 7:00 P.M.**
Members Present: Berra, Casey, Hammond, McDonald, Neal
Members Absent: Cousins (Excused)
Others Present: Community Development Director Steve Peterson and those listed on the sign in sheet.

ARTICLE 2. **Chairman Casey led the Pledge of Allegiance to the flag.**

ARTICLE 3. **Approve the Agenda.**

Motion made to approve the Agenda as printed by Member McDonald. Support by Member Berra. Motion carried 5-0.

ARTICLE 4. **Approve the Minutes of the November 11, 2014 Meeting.**

Motion made by Member McDonald to approve the Minutes of the November 11, 2014 Meeting as written. Support by Member Berra. Motion carried 5-0.

ARTICLE 5. **Acknowledge visitors and those wishing to speak to non-agenda items.**

No visitors present wished to speak to non-agenda items.

ARTICLE 6. **Case #14:3223 Darlee LLC**

Public Hearing

Property Address: 5380 52nd Street

Requested Action: The Applicant is requesting a variance to allow a new driveway off from 52nd Street that does not meet our spacing standards.

Community Development Director Peterson introduced the case by reviewing the map. The property is located on the south side of 52nd Street between Kraft and Patterson. They have two curb cuts but would like to close their western curb cut and put in a second curb cut further to the west to allow access to an undeveloped property to the rear of the site. The spacing we require for a street with traffic over 45mph is 300 feet. It does not meet the spacing requirement for driveways on the same side of the road to the next parcel to the west. By moving the curb cuts there would only be 251 feet of separation between the two driveways. The drawing shows the variance request is 251 feet so it does meet that requirement. The original Site Plan that the Township approved shows the two current curb cuts and it also shows this exact driveway as a future proposed driveway to the West. They are coordinating with the Road Commission's plans to reconstruct 52nd Street next year. We have granted some exceptions to our spacing requirements in the past. They were typically for right in/right

out entrances. Meijer and Centennial Park are the most recent cases. The regulations for spacing standards that we have on the books were developed after the original Site Plans were approved. We did allow DJ's Landscaping to keep their curb cuts that are spaced closer together with the understanding that when the parcel next door is developed they will close curb cuts and utilize a shared driveway. The curb cuts were existing. I am recommending approval of their variance but I would like to see if the driveway could be moved further to the east to increase the amount of spacing between the two curb cuts. A variance is warranted in this case, as the original plan showed this proposal and the coordination of their project with the Road Commission. It is a small variation in our spacing standards.

Chairman Casey asked the Applicant to come forward with any comments.

Zach Vogt, Moore & Bruggink Engineering and Eric DeRuge of Darlee LLC came forward as the Applicants to answer any questions.

Member McDonald made a motion to open the Public Hearing. Support from Member Hammond. Motion passed 5-0.

No one wished to speak on the case.

Member McDonald made a motion to close the Public Hearing. Support from Member Hammond. Motion passed 5-0.

Member McDonald made a motion for Case #14-3223 Darlee LLC, that the Applicant's request for a variance be approved to allow a new driveway off from 52nd street that does not meet our spacing standards per Staff's Finding of Fact and on the basis that this was part of the original Site Plan. Support by Member Hammond. Motion passed 5-0.

**ARTICLE 7. Case #14:3224 Meidema Metal Building System
Public Hearing
Property Address 3801 Kraft**

Requested Action: The Applicant is requesting a variance to allow a new parking area to be installed one (1) foot from the north property line.

Community Development Director Peterson introduced the case by reviewing the map. This is an industrial piece of property on Kraft Avenue south of 36th Street that dead ends at the airport. Lakeland Pallets operates out of this location. The exception that they are requesting is to extend their current parking lot on the north side to within one (1) foot of the property line. Normally we would have a buffer yard or a green space between a property line and a building. They are requesting to pave the buffer yard area. The Zoning Ordinance requires a 20 foot buffer yard so the variance is requesting a 19 foot exception. The site is surrounded by the airport, railroad tracks and the old gravel pit which is in operation. The site looks full and I am not recommending approval. Typically the variances that we have approved have been for a reduction in the buffer yard that still had room for plantings. When we have granted a variance we

have been able to get the required landscaping and in this case this is not possible. I did not find anything unique in this situation that would allow approval.

Chairman Casey asked the Applicant to come forward with any comments.

Dennis Buist, Meidema Metal Building Systems and Dan Bodbyl, Lakeland Pallets, came forward as the Applicant. There is going to be an addition added to the building and this will take away even more of the existing property. There is limited space now for the employee parking, pallets and trucks that enter the site.

Member McDonald asked if the property line extended to Kraft Avenue on the North side. The Applicant stated the property line extends to the fence.

Member McDonald asked if they could purchase some of the vacant property. The Applicant stated they had requested to purchase land from the neighboring property in the past and were turned down.

Member McDonald stated that if they did not receive the variance they would lose parking spaces along Kraft. The Applicant stated the current parking would be lost to truck traffic with the addition, so most of the employee parking would be lost.

Member Hammond asked if the Applicant had talked to the property owner about the parking addition. The Applicant stated they had not talked to the neighbor.

Member McDonald stated the issue is setting a precedent if we allow a variance without unique circumstances. There are not really any exceptional or unique circumstances in this case. We do recognize that you are land locked by the airport and the railroad tracks.

Chairman Casey stated that for clarification, if the gravel pit was redeveloped, they would be required to have a buffer yard. Director Peterson stated that this was correct.

The Applicant asked if it was possible to work with the gravel pit to work out an easement of 20 feet to allow for the buffer yard. Director Peterson stated this can be done but it is sometimes very hard to keep track of and can create an issue on future projects. We prefer this method is not used.

Member McDonald asked what amount of property would be needed to meet all the requirements. Director Peterson stated they would technically need only the 20 feet.

Member McDonald asked if it was possible to grant a partial variance if they could have a smaller buffer yard. Director Peterson stated it is up to the Board to decide if they would allow a smaller variance.

Chairman Casey stated that currently the Applicant is asking for the maximum variance. Given the guidelines that we have, it has to be demonstratable to be the minimal variance that makes sense to conditions that are beyond Applicants control.

Joel Bodbyl, Lakeland Pallets, asked if it was possible to receive a conditional variance stating they could put in the parking lot, but if the property to the north was ever sold, they would be required to remove the parking and put in the buffer yard at that time. Director Peterson stated he would not want to put something into a variance that is contingent on someone else's property or that was difficult to track or enforce.

Director Peterson stated the case could be tabled to give the Applicant time to ask the adjacent property owner if they were willing to sell the footage that is necessary to either be compliant or to know the minimum variance needed.

Member Hammond made a motion to open the Public Hearing. Support from Member Berra. Motion passed 5-0.

No one wished to speak on the case.

Member McDonald made a motion to close the Public Hearing. Support from Member Hammond. Motion passed 5-0.

Member McDonald made a motion to Table Case #14:3224, Meidema Metal Building Systems, to allow the Applicant time to pursue purchasing property from the adjacent property owner and/or redo the property with less of a variance request. Support by Member Berra. Motion passed. 5-0.

ARTICLE 8. Any other business.

There was no new business.

ARTICLE 9. Adjournment

Motion by Member McDonald to adjourn the meeting. Support by Member Berra. Motion Passed 5-0. Meeting adjourned at 7:45 PM.

Respectfully submitted,
Bill Cousins, Secretary

Ann Seykora/Debra Groendyk
Planning Administrative Assistant



Cascade Charter Township Fire Department Month End Report
February 2015

Site Plan Review:

We had no site plan reviews this month.

Public Relations:

We participated in two (2) public relation programs this month.

- CPR/AED class
- Employee Safety Training at Sentinel Pointe

Meeting attendance:

- MABAS meeting
- KCEMS Agency meeting
- KCEMS Governing Board meeting
- Kent County Fire Chiefs meeting
- CERT meeting
- Department Officer meeting
- Northern Exposure Exercise meeting
- FDAC meeting
- KCEMS Protocol Review meeting
- Department Head meeting
- Preparing on Children meeting – Red Cross
- Meeting with Township Manager
- Meeting at Life EMS
- July 4th committee meeting
- Tri-Corn Haz Mat meeting with Kentwood Fire

On Site Program:

We performed no on-sites this month.

Fires and Fire Investigations:

We had one reported fire this month.

- Vehicle Fire which turned out to be an overheated vehicle. No fire.

New Hires:

We had no new hires this month.

Items Completed by Staff:

- Locking and unlocking township properties
- General repairs to apparatus and equipment
- Monthly trainings – Department and Shift
- Physical fitness

- Cleaned both stations
- Shift Trainings
- Maintenance of buildings
- CPR Classes
- Equipment Maintenance
- Snow removal /Salting

Training:

This month's training covered the following topics.

- Department training:
 - SCBA/SCBA Emergencies/PPE
 - Right to know/IMS/Hazard Communication
- Shift Trainings:
 - Air management
 - Stress management

Types of Alarms:

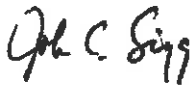
➤ Fire Alarms	9
➤ Automatic Aid	1
➤ Aircraft Alerts	1
➤ Bomb Threat	0
➤ CO Alarm	3
➤ Dumpster Fire	0
➤ Check Welfare	0
➤ Service Calls	0
➤ Fires	0
➤ Hazardous Incident	0
➤ Grass Fires	0
➤ Illegal Burn	0
➤ Lock Out	1
➤ Lift Assist	0
➤ Lightning Strike (no fire)	0
➤ Med 1	32
➤ Med 2	8
➤ Med 3	21
➤ Medical Alarm	1
➤ Mechanical Failure	0
➤ Mutual Aid	4
➤ Gas Leak	0
➤ Odor of Smoke	1
➤ Personal Injury Accidents	9
➤ Property Damage Accidents	6
➤ Stand By	1
➤ Search	0
➤ Technical Rescue	0
➤ Tree Down	0
➤ Vehicle Fire	1
➤ Wires Down	0
➤ Wash Downs	0
➤ Water Leak	2
TOTAL	101

Mutual/Automatic Aid responses:

- Alto Fire assisted us on an accident on the highway.
- We assisted Caledonia covering their township while they were on fires. We also responded with Engine and Tender to a house fire in Caledonia.

Summary:

We responded to 101 calls for assistance this month with an average turnout per incident of four (4) personnel. As of February 28, 2015, we responded to 248 calls for the year compared to 270 as of February 28, 2014. This is a decrease of 22 responses from last year. We had 5 calls that overlapped during the month.



John C. Sigg
Fire Chief

Life EMS Ambulance February 2015 Report

Cascade Twp

Total Responses: 66

Total Transports: 51

% Transports: 77%

Suburban Response Interval

Priority 1 12:00

Priority 2 20:00

Priority 3 20:00

Rural Response Interval

Priority 1 15:00

Priority 2 20:00

Priority 3 20:00

Fractile Response Interval

Cascade Twp Suburban Priority 1

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
1	2	2	7	5	4	2	0	2	0	0	1	0	0	26	81%	0:08:02

Cascade Twp Suburban Priority 2

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
0	1	0	3	1	2	2	0	0	3	1	0	0	1	14	93%	0:13:45

Cascade Twp Suburban Priority 3

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
1	0	0	0	1	5	6	1	1	3	1	0	0	2	22	95%	0:12:12

Cascade Twp Rural Priority 1

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	100%	0:11:21

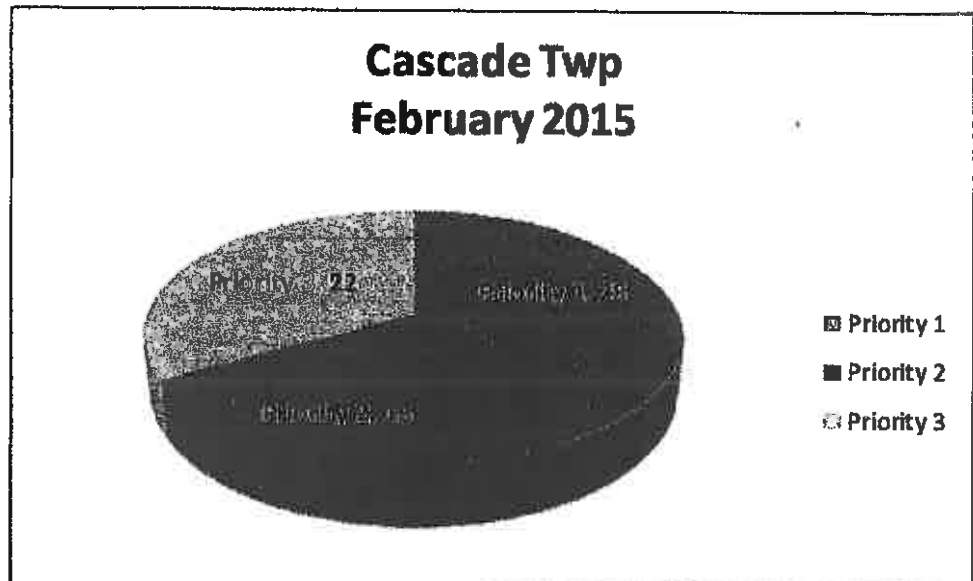
Cascade Twp Rural Priority 2

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	100%	0:17:16

Cascade Twp Rural Priority 3

0-2 Min	2-4 Min	4-6 Min	6-8 Min	8-10 Min	10-12 Min	12-14 Min	14-16 Min	16-18 Min	18-20 Min	20-22 Min	22-24 Min	>24 Min	Requested Exceptions	TOTAL	Compliant	Average
0	0	0	0	0	0	0	1	1	0	0	0	1	1	4	75%	0:21:32

Response Priority	Total
Priority 1	28
Priority 2	16
Priority 3	22
Grand Total	66





**Cascade Charter Township
Seminar Reimbursement Request**

Conditions for Reimbursement:

- Cascade Charter Township will reimburse employees for approved registration for work related seminars. Individual seminars must be related to the employee's current job duties or a foreseeable future position in the organization in order to be eligible for educational assistance.
- Some seminars that an employee may attend may be unrelated to their particular job or government in general, and are therefore not cover by this assistance policy.
- Any education request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the course is taken.

This form must be completed by the employee and approved by the Township Board before the course is taken in order to qualify for reimbursement.

Name: Debbie Amos

Application Date: 3-11-2015

Location of Seminar: Mount Pleasant Michigan

Name of Proposed Seminar: MMTA Basic Institute

Description of Seminar: (may also be attached) _____

Attached

Cost of Seminar: \$ 550.00

Your Signature: Debbie Amos

Approvals:

Department Head: Ken Pewie Date: 3/12/2015

Township Manager: BS Date: _____

Clerk's Signature: _____ Date: _____

(Showing Township Board approval)

Original to personnel file
1 copy to applicant
1 copy to Accounting

**2015**

Michigan Municipal Treasurers Association

INSTITUTE**MMTA BASIC INSTITUTE**

April 19 - 24, 2015

MMTA ADVANCED INSTITUTE

April 29 - May 1, 2015

**2015 REGISTRATION**

First Name: Debbie Last Name: Amos
 Title: Account Clerk II Organization: Cascade Charter Township
 Address: 2865 Thornhills SE City: Grand Rapids MI
 State: Michigan Zip Code: 49546 Phone: 616-949-6944
 Email: damos@cascaadetwp.com Is this your first MMTA Event? Yes ☐ No ☒

SIGN UP FOR BASIC**BASIC INSTITUTE - \$550.00**

April 19 - 24, 2015

Basic Institute

 Year 1: ☐ Year 2: ☐ Year 3: ☒
(Please indicate first, second, or third year.)

Available only to MMTA members. Membership forms are available at <http://mmta.publishpath.com/membership>. Basic registration deadline is April 3, 2015.

Basic Institute
\$550.00

Includes classes and materials

All break snacks and beverages

Lunch Monday, Tuesday and Thursday

Dinner Sunday, Tuesday and Thursday

April 19 - 24, 2015

Attendance is required at all sessions

MMTA membership is required

Registration deadline is April 3, 2015

SIGN UP FOR ADVANCED**ADVANCED INSTITUTE - \$325.00**

April 29 - May 1, 2015

(Year completed Basic Institute)

Available only to MMTA members who have completed the Basic Institute. Advanced registration deadline is April 14, 2015.

Advanced Institute
\$325.00

Includes all classes and materials

All break snacks and beverages

Lunch on Wednesday and Thursday

Registration deadline is April 14, 2015

April 29 - May 1, 2015

Advanced Institute is only offered to those members who have completed the three year Basic Institute

PAYMENT INFORMATION*(Name as it appears on card)*
 Credit Card #: _____
(Visa or Master Card only)

Expiration Date: _____

Zip Code: _____

3 Digit Code: _____

PLEASE MAKE CHECKS PAYABLE TO:
Michigan Municipal Treasurers Association
C/O Bruce Malinczak
P.O. Box 87156 | Canton, MI 48187



MMTA TAX
ID NUMBER IS
38-3023792

- Please note that a \$50 late charge is added for registrations postmarked after the deadline.
- Please do not fax registration materials.
- Scanned registration forms will be accepted if accompanied by credit card information.
- Email to Bruce Malinczak: bmalinczak@canton-mi.org

Cancellations must be in writing and emailed or postmarked before April 3rd for Basic and April 14th for Advanced.
 No refunds will be given for cancellations made after the deadline.
 If you have any questions regarding either Institute, contact Mary Bender at mbender102@aol.com.



2015

Michigan Municipal Treasurers Association

INSTITUTE

MMTA BASIC INSTITUTE

April 19 - 24, 2015



MMTA

2015 BASIC INSTITUTE

SUNDAY 04/19/15	MONDAY 04/20/15	TUESDAY 04/21/15	WEDNESDAY 04/22/15	THURSDAY 04/23/15	FRIDAY 04/24/15
<i>Hotel Check In Time is 4:00 PM</i> REGISTRATION FOR BASIC INSTITUTE 3:30 p.m. - 5:00 p.m. Comfort Inn Lobby <i>Returning participants should remember to bring their notebooks from last year.</i> 5:00 p.m. - 7:30 p.m. Orientation Session <i>Includes Class Assignment</i> <i>Dinner served at 6:30 p.m. Required Session Don't Miss It!</i> REMINDERS! • As a courtesy to others, no cell phones, no texting or laptops in class. • Limit side conversations during class. • Classrooms are cold! MMTI is about YOU! Have fun!	8:30 a.m. - 9:45 a.m. Trends and Implications <i>Facilitated discussion focused on debt management.</i> Lewis Bender, Ph.D. and MMTA Board Members 10:00 a.m. - Noon Debt Management Tom Colis Miller, Canfield, Paddock and Stone PLC Tom Traciak, HJ Umbaugh & Associates Noon - 1:00 p.m. LUNCH 1:00 p.m. - 4:30 p.m. Governmental Accounting Peter Haefner Vredevelde Haefner LLC www.vh-cpas.com 4:30 p.m. - 5:00 p.m. HEARTY SNACK 5:00 p.m. - 8:30 p.m. Creative Problem Solving, Conflict Management and How They Can Work Together in Building a Successful Team Lewis Bender, Ph.D. MMTA Facilitator <i>On your own for dinner.</i>	8:30 a.m. - 11:30 a.m. Cash Management • <i>Balancing strong internal controls with limited resources.</i> • <i>Handling misapplied payments, and tracking</i> John Globensky, MICPT, CPFIM City Treasurer City of Grand Rapids Mike Pettigrew, CTP, CPFA, CPFIM, MICPT Deputy Treasurer City of Ann Arbor Noon - 1:00 p.m. LUNCH 1:00 p.m. - 4:30 p.m. Counterfeit Currency Brian S. Lambert Resident Agent in Charge Saginaw, MI Resident Office 5:00 p.m. - 6:30 p.m. Networking Opportunity <i>Dinner provided.</i>	8:30 a.m. - Noon Principles of Public Finance • <i>Sources & Uses of Public Funds</i> • <i>Costing Governmental Services</i> • <i>Using Graphs</i> Keith Sawdon Director of Finance City of Rochester Hills Lunch on Your Own Wednesday afternoon is free time. <i>This time off makes up for classes on Sunday and Monday evenings. You earned this free time and you deserve it, so enjoy it!</i>	8:30 a.m. - 11:30 a.m. Written Communication in the Treasurer's Office <i>In this session you will learn new ways to improve written communication.</i> Jan Roncelli, Ph.D. Clerk Bloomfield Township 11:30 a.m. - 1:00 p.m. WORKING LUNCH Team Building 1:30 p.m. - 4:30 p.m. Disaster Preparedness <i>You will receive training to prepare you for minimizing the impact a potential disaster could have on your community as well as your department.</i> Presenter TBD 5:30 p.m. - 6:30 p.m. RECEPTION 6:30 p.m. - 7:30 p.m. DINNER 7:30 p.m. - 8:30 p.m. AWARDS FOR MMTI CLASS OF 2015 <i>Congratulations!</i>	8:30 a.m. - 11:00 a.m. Investing Public Funds Rich Garay Regional Marketing Director Cutwater Holdings LLC Bruce Malinczak Deputy Treasurer Charter Township of Canton 11:00 a.m. - Noon Eureka to Action! Lewis Bender, Ph.D. MMTA Facilitator CERTIFICATES <i>At the conclusion of the last session, certificates will be awarded to everyone including the third year graduates.</i> <i>Please keep a copy of your certificate for your records and certification applications.</i>

NOTE: EVERYONE IS ON THEIR OWN FOR DINNER ON MONDAY AND WEDNESDAY EVENINGS.



mmta-mi.org



**Cascade Charter Township
Seminar/Conference Attendance Request Form**

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
2. Some seminars/conferences that an employee may attend may be unrelated to their particular job or government in general, and are therefore not covered by this assistance policy.
3. Any request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the seminar/conference is attended.
4. Under extenuating circumstances, the Township Manager may approve an overnight stay or expenditure over \$200 for a conference or seminar prior to Township Board approval. The request must be made before attendance to a seminar/conference. The Township Board will be informed of request at their next scheduled meeting.

This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar/conference is attended.

Name: Oxana Sourine

Application Date: 3/17/15

Location of Seminar/Conference Chicago

Name of Proposed Seminar/Conference: Association of Public Treasurers of US and Canada 50th Annual Conference

Description of Seminar/Conference: (may also be attached) _____

The topics include investment management, cash management, banking, debt management, technology, etc.

(over)

How will the Seminar/Conference benefit the employee and the township? I am
planning to attend training session for
CPFIM accreditation. Continuing education
points

Cost of the Seminar/Conference: (Registration) \$ 395-Conference + 175-Training
(Lodging) \$ 190 x 3 = 570 (Travel) \$ 200

Account #: 101-253-724-000

Your Signature: Q. Sourine

Approvals:

Department Head: Ken Poirer Date: 3/18/2015

Township Manager: DS Date: 3/19/15

Clerk's Signature: _____ Date: _____

(Showing Township Board approval)

Original to personnel file

1 copy to applicant

1 copy to Accounting

Oxana Sourine

From: info@aptusc.org
Sent: Monday, March 16, 2015 2:47 PM
To: Oxana Sourine
Subject: APT US&C 2015 Conference Register Now



Registration is now open!

Register today for the Association of Public Treasurers of the US and Canada's 50th Annual Conference in Chicago on August 16-18, 2015, at the Hilton Chicago. Register now and get the early registration discount!

Join APT US&C for the premier professional development conference for public treasury management professionals in the Windy City: *Celebrating 50 Years of Keeping Public Treasurers in the Loop*, and our 2015 conference offers outstanding educational opportunities, certifying treasury skills, networking, and professional education opportunities and CPFA points.

The 2015 conference will include general sessions, breakouts and workshops focusing on topics that include banking, debt management, technology and up to date information on economic trends, agency oversight, and representatives of the Federal Reserve Bank and the FBI. In addition, Certified Public Funds Investment Manager (ACPFIM) training and testing will be offered.

For more information about the conference, visit our [2015 APT US&C Conference website](#).

How to register:

If you are an APT-USC member, please enter your existing userID and password to log in. When you log in, you will be able to register for the conference. If you need to renew your membership or would like to join to receive the member discount, please contact our customer care center at n.cheever@aptusc.org or 414-908-4947 x. 116. Nicole can also assist you with your registration.

If you are **not** an APT-USC member, you may continue on to our [Non-Members registration page](#).

Registration Type	Early Registration (register by April 1)	Regular Registration (register by June 1)	Late Registration (Register after 6/1)
APT US&C Member	\$395	\$495	\$545
Non-member	\$495	\$595	\$645

Registration includes conference general sessions and breakouts. Additional training programs and workshops are available for an additional fee.

Additional Training Program Registration

Additional training program fees are separate from the Annual Conference registration.

Certified Public Funds Investment Manager (CPFIM) Accreditation

Training on Sunday, August 16, 2015; Testing on Monday, August 17 and Tuesday, August 18

APT US&C Members: \$175

Non-members: \$260

Advanced Certified Public Funds Investment Manager (ACPFIM) Accreditation

Wednesday, August 19, 2015, Training 8:00 am – 12:00 pm; Testing 1:00 pm – 3:00 pm

APT US&C Members: \$175

Non-members: \$260



**Cascade Charter Township
Seminar/Conference Attendance Request Form**

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
2. Some seminars/conferences that an employee may attend may be unrelated to their particular job or government in general, and are therefore not covered by this assistance policy.
3. Any request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the seminar/conference is attended.
4. Under extenuating circumstances, the Township Manager may approve an overnight stay or expenditure over \$200 for a conference or seminar prior to Township Board approval. The request must be made before attendance to a seminar/conference. The Township Board will be informed of request at their next scheduled meeting.

This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar/conference is attended.

Name: Ken Peirce

Application Date: 03/18/2015

Location of Seminar/Conference MT. Pleasant, MI

Name of Proposed Seminar/Conference: MMTA 2015 Advanced Institute

Description of Seminar/Conference: (may also be attached) see attached

(over)

How will the Seminar/Conference benefit the employee and the township? _____

Improve function of Treasurer's office

Cost of the Seminar/Conference: (Registration) \$ 325.00

(Lodging) \$ 230.00 (Travel) \$ 150.00

Account #: 101-253-724-000

Your Signature: Ken Peirce 3/18/2015

Approvals:

Department Head: Ken Peirce Date: 3/18/2015

Township Manager: [Signature] Date: 3/19/15

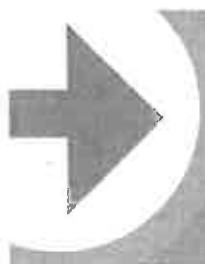
Clerk's Signature: _____ Date: _____

(Showing Township Board approval)

Original to personnel file

1 copy to applicant

1 copy to Accounting



MMTA 2015 ADVANCED INSTITUTE

WEDNESDAY April 29, 2015	THURSDAY April 30, 2015	FRIDAY May 1, 2015
8:30 a.m. - 11:30 a.m. Financial Reporting to the Board or Council Jamie Carruthers, CPA, MBA, Senior Auditor Stephenson, Gracik & Co., P.C. 11:30 a.m. - 1:30 p.m. WORKING LUNCH Business Etiquette Pattie McNeil, Founder and CEO First Impressions Training 1:00 p.m. - 5:00 p.m. Update from Michigan State Tax Commission • EVIP • Exemptions Presenter TBD 5:30 p.m. - 7:30 p.m. When Things Go Wrong ... <i>We live in a changing world and regrettably when "stuff" happens we are often left holding the bag. This working session will delve into some best practices in terms of getting out of unfortunate situations.</i> Includes Dinner (Required for certification and recertification points.) Lewis Bender, Ph.D. MMTA Facilitator	8:30 a.m. - Noon Breakout Sessions (Choose two of three.) The Rapidly Changing Landscape of Banking and How it Impacts You Todd Alton, Vice President of Credit Research All About Grants <i>In this session you will learn:</i> • How to find grant opportunities • Standard documentation needed for all grants • What can be considered when matching funds are required Meredith Johnson Contracts and Grants Manager Kuntzsch Business Services, Inc. Professionalism and Civility <i>How one's image is perceived and why it is important for you and your staff.</i> Pattie McNeil, Founder and CEO First Impressions Training Noon - 1:00 p.m. LUNCH 1:00 p.m. - 4:30 p.m. Disaster Preparedness <i>You will receive training to prepare you for minimizing the impact a potential disaster could have on your community as well as your department.</i> Presenter TBD 5:30 p.m. - 7:30 p.m. Networking Opportunity <i>Includes Casual Dinner</i> (Not required for certification and recertification points.)	8:30 a.m. - Noon Conflict Resolution and Employee Motivation <i>This session will provide ideas about how to resolve conflicts caused by behavior and attitude differences that create discord in the workplace. In addition, you will be learning how to successfully motivate employees.</i> Lewis Bender, Ph.D. MMTA Facilitator <i>Certificates will be distributed at the close of the last session. You must attend all sessions in order to receive a certificate of completion.</i>  LINKS - Michigan Municipal Treasurers Association mmta-mi.org - MiCPT Information mmta.publishpath.com/Websites/mmmta/images/MiCPT%20guidelines.pdf - CPFA Information http://aptusc.org/accreditations/cpfa - MMTA Membership Information mmta.publishpath.com/membership - Comfort Inn & Suites Hotel www.mtcomfortinn.com - Fairfield Inn & Suites www.marriott.com/hotels/travel/mbsmp-fairfield-inn-and-suites-mt-pleasant/

MMTA 2015 REGISTRATION



First Name: Kenneth Last Name: Peirce

Title: Treasurer Organization: Cascade Charter Township

Address: 2865 Thornhills SE City: Grand Rapids

State: MI Zip Code: 49546 Phone: 616-989-6844

Email: kpeirce@cascadechrtwp.com Is this your first MMTA Event? Yes ☐ No ☒

SIGN UP FOR BASIC

BASIC INSTITUTE - \$550.00

April 19 - 24, 2015

Basic Institute

Year 1: _____ Year 2: _____ Year 3: _____
(Please indicate first, second, or third year)

Available only to MMTA members. Membership forms are available at <http://mmta.publishpath.com/membership>. Basic registration deadline is April 3, 2015.

Basic Institute \$550.00

Includes classes and materials
All break snacks and beverages
Lunch Monday, Tuesday and Thursday
Dinner Sunday, Tuesday and Thursday

April 19 - 24, 2015

Attendance is required at all sessions
MMTA membership is required
Registration deadline is April 3, 2015

SIGN UP FOR ADVANCED

ADVANCED INSTITUTE - \$325.00

April 29 - May 1, 2015

2012
(Year completed Basic Institute)

Available only to MMTA members who have completed the Basic Institute. Advanced registration deadline is April 14, 2015.

Advanced Institute \$325.00

Includes all classes and materials
All break snacks and beverages
Lunch on Wednesday and Thursday
Registration deadline is April 14, 2015

April 29 - May 1, 2015

Advanced Institute is only offered to those members who have completed the three year Basic Institute

PAYMENT INFORMATION

(Name as it appears on card)

Credit Card #: _____
(Visa or Master Card only)

Expiration Date: _____

Zip Code: _____

3 Digit Code: _____

PLEASE MAKE CHECKS PAYABLE TO:
Michigan Municipal Treasurers Association
C/O Bruce Malinczak
P.O. Box 87156 | Canton, MI 48187



**MMTA TAX
ID NUMBER IS
38-3023792**

- Please note that a \$50 late charge is added for registrations postmarked after the deadline.
- Please do not fax registration materials.
- Scanned registration forms will be accepted if accompanied by credit card information.
- Email to Bruce Malinczak: bmalinczak@canton-mi.org

*Cancellations must be in writing and emailed or postmarked before April 3rd for Basic and April 14th for Advanced.
No refunds will be given for cancellations made after the deadline.
If you have any questions regarding either Institute, contact Mary Bender at mbender102@aol.com.*

FIRE DEPARTMENT MEMORANDUM



TO: BENJAMIN SWAYZE – TOWNSHIP MANAGER
FROM: JOHN SIGG – FIRE CHIEF *John*
SUBJECT: FDIC (FIRE DEPARTMENT INSTRUCTORS CONFERENCE) INTERNATIONAL –
FIREFIGHTER MICHAEL BOLT AND LIEUTENANT TODD STEVENSON
DATE: MARCH 18, 2015
CC: TOWNSHIP BOARD

Attached is a request for Firefighter Michael Bolt and Lieutenant Todd Stevenson to attend FDIC (Fire Department Instructor Conference) International. This is a large convention in Indianapolis, IN. This is geared toward fire instructors which they would be able to gain information for trainings and new techniques for our department. Firefighter Bolt and Lieutenant Stevenson are both fire instructors for our department. They are also planning on meeting with a representative from Fire Facilities who we are looking at to possibly build our training facility.

This is a very large convention and has an abundance of vendors, programs and manufacturers of different fire related topics and trainings. This is a good place to gain information from many different sources.

The cost of the convention is \$100 for each of them and an overnight stay of one evening. They will be sharing a room to keep costs down.

We have funds available for this in our education line item.

I ask you approve this request for Firefighter Michael Bolt and Lieutenant Todd Stevenson.



**Cascade Charter Township
Seminar/Conference Attendance Request Form**

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
2. Some seminars/conferences that an employee may attend may be unrelated to their particular job or government in general, and are therefore not covered by this assistance policy.
3. Any request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the seminar/conference is attended.
4. Under extenuating circumstances, the Township Manager may approve an overnight stay or expenditure over \$200 for a conference or seminar prior to Township Board approval. The request must be made before attendance to a seminar/conference. The Township Board will be informed of request at their next scheduled meeting.

This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar/conference is attended.

Name: TODD STEVENSON

Application Date: 3-13-15

Location of Seminar/Conference Indianapolis, IN

Name of Proposed Seminar/Conference: FDIC (FIRE
DEPARTMENT INSTRUCTOR CONFERENCE)

Description of Seminar/Conference: (may also be attached) Large show with
various training topics and classes along with
vendors.

(over)

How will the Seminar/Conference benefit the employee and the township? Ideas for
training, Meeting with company that builds training
towers (Please see attached)

Cost of the Seminar/Conference: (Registration) \$ \$ 100.00

(Lodging) \$ Sharing a Room (Travel) \$ 528 miles x 57.5 = \$303.60

Account #: 206-336-724

Your Signature: [Signature]

Approvals:

Department Head: [Signature] Date: 3-19-15

Township Manager: _____ Date: _____

Clerk's Signature: _____ Date: _____

(Showing Township Board approval)

Original to personnel file

1 copy to applicant

1 copy to Accounting

1

FDIC 2015 EVENT REGISTRATION

Attendee Name: _____

Phone: _____

Badge ID: _____

ATTENDEE INFORMATION (Enter this information as you would like it to appear on your badge)



April 20-25, 2015

**Indiana Convention Center & Lucas Oil Stadium
Indianapolis, Indiana**

Registration Sponsor:



ATHLETIC GEAR FOR FIREFIGHTERS.™

REGISTRATION

- Fully complete the registration form. Incomplete registration forms will be returned for complete information.
- Placement in Hands-On Training (H.O.T.) classes is not reserved until registration form is fully completed and payment is received.
- Registration and payment received after March 5, 2015 is subject to full registration fees.
- Each attendee must be individually registered. Single registrations may not be separated or shared among multiple attendees.
- There is no refund for partial-day attendance.

IF PAYING WITH PURCHASE ORDER (PO) - Purchase order must have a credit card guarantee or the registration will be forfeited. A PO is not considered a payment. Payments must be received prior to the event or upon arrival to receive your badge.

STEP BY STEP HANDS-ON TRAINING INSTRUCTIONS

1. Fully complete the registration form.
2. Select Hands-On Training Premium Package or Hands-On Training and Pre-Conference Workshops Only on page 5.
3. Choose your classes on pages 3 & 4.
4. Total the registration fees and the class fees on the bottom of page 5.
5. Payment is required to reserve H.O.T. classes.

HANDS-ON TRAINING INFORMATION

- Register early. Hands-On training class sizes are limited.
- Hands-On training participants must register and report to Staging by 6:30 a.m.
- Signed liability waivers are required for all Hands-On training. Visit www.fdic.com to print a liability waiver.
- Full turnout gear and/or technical rescue gear is required for certain Hands-On training. (See "Important Notes for H.O.T. Attendees" at www.fdic.com.)
- Lunch is provided for all Hands-On training attendees
- SCBA will be provided when necessary.
- If selecting 4 hour Hands-On training in the morning, you can only select a Hands-On training for the afternoon. You cannot combine a Hands-On training and a Pre-Conference workshop on the same day.
- H.O.T. Class Pricing: 4-hour are \$150 each and 8-hour are \$250 each in addition to the registration fee.

PRE-CONFERENCE WORKSHOPS INFORMATION

- Morning Pre-Conference workshops begin promptly at 8:00 a.m.
- Afternoon Pre-Conference workshops begin promptly at 1:30 p.m.
- Lunch is *NOT* provided for Pre-Conference workshop attendees.
- If selecting a 4 hour Pre-Conference workshop in the morning, you can only select a Pre-Conference workshop for the afternoon. You cannot combine a Hands-On training and a Pre-Conference workshop on the same day.
- Pre-Conference workshops are \$125 each in addition to the registration fee.

Attendee Name: _____
Phone: _____
Badge ID: _____

2

FDIC 2015
EVENT REGISTRATION

ATTENDEE INFORMATION (Enter this information as you would like it to appear on your badge)

TODD STEVENSON LIEUTENANT
First Name Last Name Title
CASCADE FIRE DEPT
Department/Company (Maximum 30 Characters)
2865 THORN HILL
Address (To mail badge and conference information)
USA
Address 2 (Suite #, etc.) Country
GRAND RAPIDS MI 49546
City State Zip
(616) 949-1320 (616) 285-2330 t.stevenson@cascadefire.com
Phone Fax E-mail (A unique Email is required for processing registration)
(616) _____
Cell (Required for Emergency Response Communication)

Rank/Title

- | | |
|--|---|
| ☐ (01) Chief of Depart. | ☐ (07) Firefighter/Paramedic |
| ☐ (02) Staff Chief | ☐ (08) Firefighter/EMT |
| ☒ (03) Other Officer | ☐ (06) Other |
| ☐ (04) Firefighter | (please specify) _____ |
| ☐ (05) Training Officer | |

Job Function (Check all that apply)

- | | |
|--|---|
| ☐ (01) Management | ☒ (08) Public Education |
| ☒ (02) Training | ☐ (09) EMS |
| ☐ (03) Prevention | ☒ (10) Haz Mat |
| ☒ (04) Suppression | ☐ (11) Rescue |
| ☐ (05) Investigation | ☐ (13) Wildfire |
| ☐ (06) Maintenance | ☐ (12) Other |
| ☐ (07) Communication | (please specify) _____ |

Purchasing Responsibility

- | | |
|--|--|
| ☐ (04) Approve | ☒ (02) Recommend |
| ☐ (01) Purchase | ☐ (03) Specify |

Are you a member of a purchasing committee?

- | | |
|----------------------------------|--|
| ☐ (1) Yes | ☒ (0) No |
|----------------------------------|--|

Type of Department

- | | |
|--|--|
| ☐ (01) Volunteer | ☐ (04) Industrial |
| ☐ (02) Career | ☐ (05) Military |
| ☒ (03) Combination | ☐ (06) Other |
| Career/Vol | (please specify) _____ |

Population Served by Department

- | | |
|--|---|
| ☐ (01) Under 2,500 | ☐ (05) 50,001-100,000 |
| ☐ (02) 2,501-10,000 | ☐ (06) 100,001-500,000 |
| ☒ (03) 10,001-25,000 | ☐ (07) Over 500,000 |
| ☐ (04) 25,001-50,000 | |

Do you read Fire Engineering?

- | | |
|--|----------------------------------|
| ☒ (01) Yes | ☐ (02) No |
|--|----------------------------------|

Do you read Fire Apparatus & Emergency Equipment magazine?

- | | |
|-----------------------------------|---|
| ☐ (01) Yes | ☒ (02) No |
|-----------------------------------|---|

Do you read FireRescue magazine?

- | | |
|--|----------------------------------|
| ☒ (01) Yes | ☐ (02) No |
|--|----------------------------------|

How many years have you attended FDIC? 0

I am visiting the FDIC International 2015 exhibits to obtain information on: (Check all that apply)

- | | |
|--|--|
| ☐ (01) Ambulances | ☐ (13) HazMat Products |
| ☐ (02) Apparatus & Apparatus Accessories | ☐ (14) Incident Management/ Accountability Systems |
| ☐ (03) Badges, Emblems & Accessories | ☐ (15) Insurance / Financial Institutions/Consulting Services |
| ☒ (04) Breathing Apparatus/Air Systems/SCBA & Supplies | ☒ (16) Miscellaneous/Other |
| ☐ (05) Communications/Radios/ Dispatch Equipment | ☐ (17) Monitors & Detectors |
| ☐ (06) Computer Services/Software | ☐ (18) Nozzles, Hoses, Reels & Couplings |
| ☐ (07) Water, Diving & Ice Rescue Equip. & Accessories | ☐ (19) Protective Clothing (PPE) / Apparel |
| ☒ (08) Educational Materials/ Colleges/Training Services & Equipment | ☐ (20) Pumps/Gauges |
| ☐ (09) EMS Equipment & Supplies | ☒ (21) Rescue Tools & Equipment |
| ☐ (10) FOAM, Environmental Products, CAF Units | ☐ (22) Ropes, Chains, Safety Belts & Accessories |
| ☐ (11) Fans/Portable Generators & Accessories | ☐ (23) Sirens, Alarms & Signaling Devices |
| ☒ (12) Hand Tools & Forcible Entry | ☐ (24) Thermal Imaging Cameras |
| | ☐ (25) Wildfire Rescue Equip. & Access. |

Attendee Name: _____

Phone: _____

Badge ID: _____

HANDS-ON TRAINING AND PRE-CONFERENCE WORKSHOPS

Monday, April 20, 2015 Hands-On Training

PLEASE NOTE: IF YOU SELECT A HANDS-ON TRAINING IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A HANDS-ON TRAINING COURSE. HANDS-ON TRAINING COURSES INCLUDE LUNCH.

4-Hour Hands-On Training:

Monday, April 20, 8:00 a.m.-12:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☒ ☒ ☒ ☒ ☒ 01MA Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ ☐ 02MA Aerial Ladder and Tower Ladder Placement and Operations
- ☒ ☒ ☒ ☒ ☒ 03MA Conventional Forcible Entry
- ☒ ☒ ☒ ☒ ☒ 04MA Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ ☐ 05MA Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ ☐ 06MA Firefighter Bailout Techniques
- ☒ ☒ ☒ ☒ ☒ 07MA Heavy Vehicle Extrication
- ☒ ☒ ☒ ☒ ☒ 08MA Man vs. Machinery
- ☒ ☒ ☒ ☒ ☒ 09MA Recognizing Flashover
- ☐ ☐ ☐ ☐ ☐ 10MA Rescue and Squad Company Operations on the Fireground
- ☐ ☐ ☐ ☐ ☐ 11MA Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

4-Hour Hands-On Training:

Monday, April 20, 1:00 p.m.-5:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☒ ☒ ☒ ☒ ☒ 01MP Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ ☐ 02MP Aerial Ladder and Tower Ladder Placement and Operations
- ☐ ☐ ☐ ☐ ☐ 03MP Conventional Forcible Entry
- ☒ ☒ ☒ ☒ ☒ 04MP Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ ☐ 05MP Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ ☐ 06MP Firefighter Bailout Techniques
- ☒ ☒ ☒ ☒ ☒ 07MP Heavy Vehicle Extrication
- ☐ ☐ ☐ ☐ ☐ 08MP Man vs. Machinery
- ☐ ☐ ☐ ☐ ☐ 09MP Recognizing Flashover
- ☐ ☐ ☐ ☐ ☐ 10MP Rescue and Squad Company Operations on the Fireground
- ☒ ☒ ☒ ☒ ☒ 11MP Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

8-Hour Hands-On Training:

Monday, April 20, 8:00 a.m.-5:00 p.m. (\$250)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ ☐ 12M Compliant Live Burn Training in Acquired Structures
- ☒ ☒ ☒ ☒ ☒ 13M Live Fire: First Due Tactics
- ☒ ☒ ☒ ☒ ☒ 14M Nozzle Forward
- ☐ ☐ ☐ ☐ ☐ 15M Rapid Intervention Team Combat Drills
- ☐ ☐ ☐ ☐ ☐ 16M Structural Collapse Rescue
- ☒ ☒ ☒ ☒ ☒ 17M Truck Company: Essentials
- ☐ ☐ ☐ ☐ ☐ 18M UL-NIST Live Fire Dynamics for Fire Officers
- ☐ ☐ ☐ ☐ ☐ 19M Urban Essentials

☐ Three-Day Workshop: Monday, April 20, 8 a.m. to 5 p.m.;
Tuesday, April 21, 8 a.m.-5 p.m.;
Wednesday, April 22, 10:30 a.m.-5 p.m.
FDIC Blue Card Simulation Lab and Conference

Monday, April 20, 2015 Pre-Conference Workshops

PLEASE NOTE: IF YOU SELECT A PRE-CONFERENCE WORKSHOP IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A PRE-CONFERENCE WORKSHOP. PRE-CONFERENCE WORKSHOPS DO NOT INCLUDE LUNCH.

4-Hour Pre-Conference Workshops:

Monday, April 20, 8:00 a.m.-12:00 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ ☐ 20MA Alternative Funding Solutions for Your Emergency Service Organization
- ☐ ☐ ☐ ☐ ☐ 21MA Applying Science without Abandoning Aggressive Tactics
- ☐ ☐ ☐ ☐ ☐ 22MA Blink: Critical Fireground Decision Making
- ☐ ☐ ☐ ☐ ☐ 23MA E-Learning in the Fire Service: Course Development, Creation, and Training
- ☐ ☐ ☐ ☐ ☐ 24MA Fire Chiefing in the Real World
- ☐ ☐ ☐ ☐ ☐ 26MA Firefighting Operations in Mega-Mansions
- ☐ ☐ ☐ ☐ ☐ 28MA Five-Alarm Leadership
- ☐ ☐ ☐ ☐ ☐ 29MA Functional Fitness Programs for Fire Service Athletes
- ☐ ☐ ☐ ☐ ☐ 30MA Inspiring Leaders for Today's Fire Service
- ☐ ☐ ☐ ☐ ☐ 31MA Instructor and Training Officer Bootcamp
- ☐ ☐ ☐ ☐ ☐ 32MA ISFSI Principles of Modern Fire Attack-Train the Trainer
- ☐ ☐ ☐ ☐ ☐ 33MA Pre-Emergency Planning and Inspection of Manufacturing and Industrial Facilities
- ☐ ☐ ☐ ☐ ☐ 34MA Reading the Fire
- ☐ ☐ ☐ ☐ ☐ 35MA Rescuer Near-Misses and Fatalities in Aquatic Environments
- ☐ ☐ ☐ ☐ ☐ 36MA Responding to and Preparing for Acts of Violence
- ☐ ☐ ☐ ☐ ☐ 37MA Saving Those Who Save Others
- ☐ ☐ ☐ ☐ ☐ 25MA Sustainable Green Design and Construction and the Fire Service
- ☐ ☐ ☐ ☐ ☐ 38MA The Seven Deadly Sins of High-Rise Firefighting
- ☐ ☐ ☐ ☐ ☐ 39MA Zero to Hero: Personal Leadership

4-Hour Pre-Conference Workshops:

Monday, April 20, 1:30 p.m.-5:30 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ ☐ 40MP Aggressive Command and Tactics
- ☐ ☐ ☐ ☐ ☐ 41MP Developing a Training Program for Today's Fire Service
- ☐ ☐ ☐ ☐ ☐ 42MP Drill Ground Instructor Academy
- ☐ ☐ ☐ ☐ ☐ 43MP Fireground Control: Managing the Hard Environment
- ☐ ☐ ☐ ☐ ☐ 44MP Fireground Scenario Workshop
- ☐ ☐ ☐ ☐ ☐ 45MP Hazmat: Initial Approach and Actions
- ☐ ☐ ☐ ☐ ☐ 46MP How Firefighters Learn: How Fire Instructors Should Teach Them
- ☐ ☐ ☐ ☐ ☐ 47MP Human Behavior and Positive Psychology: Tools for the Firehouse
- ☐ ☐ ☐ ☐ ☐ 48MP Intelligent Fire Operations: Balancing Safety and Aggression
- ☐ ☐ ☐ ☐ ☐ 49MP Lightweight Construction: Past and Present
- ☐ ☐ ☐ ☐ ☐ 50MP Safety Leadership
- ☐ ☐ ☐ ☐ ☐ 51MP Strategic Decision Making at Commercial Building Fires
- ☐ ☐ ☐ ☐ ☐ 52MP Taking Action Against Cancer in the Fire Service
- ☐ ☐ ☐ ☐ ☐ 53MP The Art of Reading Smoke
- ☐ ☐ ☐ ☐ ☐ 54MP The Courage Within (Stress Inoculation Training)
- ☐ ☐ ☐ ☐ ☐ 55MP The Ultimate Team Sport: What Position Will I Play?
- ☐ ☐ ☐ ☐ ☐ 56MP Think Like an Incident Commander
- ☐ ☐ ☐ ☐ ☐ 57MP Vehicle Rescue: Operational and Technologic Considerations for Today
- ☐ ☐ ☐ ☐ ☐ 58MP Waving Red Flags on the Fireground
- ☐ ☐ ☐ ☐ ☐ 59MP Where Have All the Good Officers Gone?

Attendee Name: _____
Phone: _____
Badge ID: _____

4

FDIC 2015
EVENT REGISTRATION

HANDS-ON TRAINING AND PRE-CONFERENCE WORKSHOPS

Tuesday, April 21, 2015 Hands-On Training

PLEASE NOTE: IF YOU SELECT A HANDS-ON TRAINING IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A HANDS-ON TRAINING COURSE. HANDS-ON TRAINING COURSES INCLUDE LUNCH.

4-Hour Hands-On Training:

Tuesday, April 21, 8:00 a.m.-12:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☒ ☒ ☒ ☒ ☒ 01TA Advanced Extrication: Real-World Challenges
☐ ☐ ☐ ☐ ☐ 02TA Aerial Ladder and Tower Ladder Placement and Operations
☒ ☒ ☒ ☒ ☒ 03TA Conventional Forcible Entry
☒ ☒ ☒ ☒ ☒ 04TA Engine Company Essentials: Getting Water on the Fire
☐ ☐ ☐ ☐ ☐ 05TA Engine Company High-Rise Standpipe Operations
☐ ☐ ☐ ☐ ☐ 06TA Firefighter Bailout Techniques
☒ ☒ ☒ ☒ ☒ 07TA Heavy Vehicle Extrication
☐ ☐ ☐ ☐ ☐ 08TA Man vs. Machinery
☒ ☒ ☒ ☒ ☒ 09TA Recognizing Flashover
☐ ☐ ☐ ☐ ☐ 10TA Rescue and Squad Company Operations on the Fireground
☒ ☒ ☒ ☒ ☒ 11TA Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

4-Hour Hands-On Training:

Tuesday, April 21, 1:00 p.m.-5:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☒ ☒ ☒ ☒ ☒ 01TP Advanced Extrication: Real-World Challenges
☐ ☐ ☐ ☐ ☐ 02TP Aerial Ladder and Tower Ladder Placement and Operations
☐ ☐ ☐ ☐ ☐ 03TP Conventional Forcible Entry
☐ ☐ ☐ ☐ ☐ 04TP Engine Company Essentials: Getting Water on the Fire
☐ ☐ ☐ ☐ ☐ 05TP Engine Company High-Rise Standpipe Operations
☐ ☐ ☐ ☐ ☐ 06TP Firefighter Bailout Techniques
☒ ☒ ☒ ☒ ☒ 07TP Heavy Vehicle Extrication
☐ ☐ ☐ ☐ ☐ 08TP Man vs. Machinery
☐ ☐ ☐ ☐ ☐ 09TP Recognizing Flashover
☐ ☐ ☐ ☐ ☐ 10TA Rescue and Squad Company Operations on the Fireground
☒ ☒ ☒ ☒ ☒ 11TP Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

8-Hour Hands-On Training:

Tuesday, April 21, 8:00 a.m.-5:00 p.m. (\$250)

1st 2nd 3rd 4th 5th

- ☒ ☒ ☒ ☒ ☒ 12T Compliant Live Burn Training in Acquired Structures
☒ ☒ ☒ ☒ ☒ 13T Live Fire: First Due Tactics
☒ ☒ ☒ ☒ ☒ 14T Nozzle Forward
☐ ☐ ☐ ☐ ☐ 15T Rapid Intervention Team Combat Drills
☐ ☐ ☐ ☐ ☐ 16T Structural Collapse Rescue
☒ ☒ ☒ ☒ ☒ 17T Truck Company: Essentials
☐ ☐ ☐ ☐ ☐ 18T UL-NIST Live Fire Dynamics for Fire Officers
☐ ☐ ☐ ☐ ☐ 19T Urban Essentials

Tuesday, April 21, 2015 Pre-Conference Workshops

PLEASE NOTE: IF YOU SELECT A PRE-CONFERENCE WORKSHOP IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A PRE-CONFERENCE WORKSHOP. PRE-CONFERENCE WORKSHOPS DO NOT INCLUDE LUNCH.

4-Hour Pre-Conference Workshops:

Tuesday, April 21, 8:00 a.m.-12:00 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ ☐ 60TA Building the Ladder: Officer Development Programs
☐ ☐ ☐ ☐ ☐ 61TA Combat Ready Firefighting
☐ ☐ ☐ ☐ ☐ 62TA Drills You're Not Going to Find in the Books
☐ ☐ ☐ ☐ ☐ 63TA Fire Academy 101: Building Better Firefighters Through Quality Training
☐ ☐ ☐ ☐ ☐ 64TA Fire Literacy and Applied Fire Dynamics
☐ ☐ ☐ ☐ ☐ 65TA Fireground Decision-Making for Suburban Company Officers
☐ ☐ ☐ ☐ ☐ 66TA Getting the Most from Your Incident Simulation Software
☐ ☐ ☐ ☐ ☐ 67TA Hazardous Materials: Managing the Incident
☐ ☐ ☐ ☐ ☐ 68TA Instructional Craftsmanship: Method and Mastery
☐ ☐ ☐ ☐ ☐ 69TA Leadership in the Real World
☐ ☐ ☐ ☐ ☐ 70TA Modern Buildings: the Recipe for Firefighter Deaths or Injuries
☐ ☐ ☐ ☐ ☐ 71TA Required Training: a Guide for the Training Officer
☐ ☐ ☐ ☐ ☐ 72TA Solar Power Strategy and Tactics: a Renewable Danger for Firefighters
☐ ☐ ☐ ☐ ☐ 73TA Stress First Aid for Fire and EMS Personnel: Train the Trainer
☐ ☐ ☐ ☐ ☐ 74TA Survival: Why Things Went Right and Why They Went Horribly Wrong
☐ ☐ ☐ ☐ ☐ 75TA Tactical and Strategic Perspectives of Residential Fires: Command and Fire Attack
☐ ☐ ☐ ☐ ☐ 76TA The 21st Century Fire Officer: Strategies and Tactics from the Firehouse to the Fireground
☐ ☐ ☐ ☐ ☐ 77TA The Professional Volunteer Fire Department
☐ ☐ ☐ ☐ ☐ 78TA This House Rocks/Firehouse Excellence
☐ ☐ ☐ ☐ ☐ 79TA Transitional Attack and Modern Wood-Frame Construction

4-Hour Pre-Conference Workshops:

Tuesday, April 21, 1:30 p.m.-5:30 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ ☐ 80TP 25 to Survive: Reducing Residential Injuries and LODDs
☐ ☐ ☐ ☐ ☐ 81TP Attack from the Burned Side: New Age Tactics and Tasks
☐ ☐ ☐ ☐ ☐ 82TP Avoiding Career Crushers
☐ ☐ ☐ ☐ ☐ 83TP Drill Development: the Next Level
☐ ☐ ☐ ☐ ☐ 84TP Essentials of Fire Investigation: the Complete Fire Scene Examination
☐ ☐ ☐ ☐ ☐ 85TP Fireground Tactics: Strip Malls and Stores
☐ ☐ ☐ ☐ ☐ 86TP First-Due Tactics Take-Home Package
☐ ☐ ☐ ☐ ☐ 87TP ISFSI Instructor Development Clinic
☐ ☐ ☐ ☐ ☐ 88TP Managing Rescue Operations
☐ ☐ ☐ ☐ ☐ 89TP Mastering the Instructor's Tools of the Trade
☐ ☐ ☐ ☐ ☐ 90TP Modern Training Techniques for Tactical Success
☐ ☐ ☐ ☐ ☐ 91TP No-Brainer Management
☐ ☐ ☐ ☐ ☐ 92TP Officer and Leadership Development Workshop
☐ ☐ ☐ ☐ ☐ 93TP Right-Seat Leadership
☐ ☐ ☐ ☐ ☐ 94TP Tactical and Strategic Perspectives of Residential Fires: Ventilation and Search
☐ ☐ ☐ ☐ ☐ 95TP The Aggressive Interior Attack: Mastering the Modern Residential Firefight
☐ ☐ ☐ ☐ ☐ 96TP The Art of Reading a Building Using the Rapid-Street Read System
☐ ☐ ☐ ☐ ☐ 97TP The Basics of Specifying Fire Apparatus
☐ ☐ ☐ ☐ ☐ 98TP The Fire Department Assessment Center: How to Get Promoted
☐ ☐ ☐ ☐ ☐ 99TP Volunteer and Combination Fire Department Managers Academy
☐ ☐ ☐ ☐ ☐ 100TP Why Fire Prevention Education Isn't Working for Today's Fire Service

FDIC 2015

EVENT REGISTRATION

Badge ID: _____

REGISTRATION FEES *(Please select only one of the following)*

www.fdic.com



**Cascade Charter Township
Seminar/Conference Attendance Request Form**

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
2. Some seminars/conferences that an employee may attend may be unrelated to their particular job or government in general, and are therefore not covered by this assistance policy.
3. Any request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the seminar/conference is attended.
4. Under extenuating circumstances, the Township Manager may approve an overnight stay or expenditure over \$200 for a conference or seminar prior to Township Board approval. The request must be made before attendance to a seminar/conference. The Township Board will be informed of request at their next scheduled meeting.

This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar/conference is attended.

Name: MICHAEL BOLT

Application Date: 3-14-15

Location of Seminar/Conference INDIANAPOLIS, IN

Name of Proposed Seminar/Conference: FDC INTERNATIONAL

Description of Seminar/Conference: (may also be attached) Large Fire Convention
with classes, exhibits, live demos.

(over)



FDIC
INTERNATIONAL

2015 EVENT REGISTRATION

Attendee Name: _____
Phone: _____
Badge ID: _____

REGISTRATION INFORMATION SHEET



APRIL 20-25, 2015
INDIANA CONVENTION CENTER & LUCAS OIL STADIUM
INDIANAPOLIS, INDIANA

Registration Sponsor:



REGISTRATION

- Fully complete the registration form. Incomplete registration forms will be returned for complete information.
- Placement in Hands-On Training (H.O.T.) classes is not reserved until registration form is fully completed and payment is received.
- Each attendee must be individually registered. Single registrations may not be separated or shared among multiple attendees.
- There is no refund for partial-day attendance.

IF PAYING WITH PURCHASE ORDER (PO) - Purchase order must have a credit card guarantee or the registration will be forfeited. A PO is not considered a payment. Payments must be received prior to the event or upon arrival to receive your badge.

STEP BY STEP HANDS-ON TRAINING INSTRUCTIONS

1. Fully complete the registration form.
2. Select **Hands-On Training Premium Package** or **Hands-On Training and Pre-Conference Workshops** Only on page 5.
3. Choose your classes on pages 3 & 4.
4. Total the registration fees and the class fees on the bottom of page 5.
5. Payment is required to reserve H.O.T. classes.

HANDS-ON TRAINING INFORMATION

- Register early. Hands-On Training class sizes are limited.
- Hands-On Training participants must register and report to Staging by 6:30 a.m.
- Signed liability waivers are required for all Hands-On Training. Visit www.fdic.com to print a liability waiver.
- Full turnout gear and/or technical rescue gear is required for certain Hands-On Training. (See "Important Notes for H.O.T. Attendees" at www.fdic.com.)
- Lunch is provided for all Hands-On Training attendees
- SCBA will be provided when necessary.
- If selecting 4-hour Hands-On Training in the morning, you can only select a Hands-On Training for the afternoon. You cannot combine a Hands-On Training and a Pre-Conference Workshop on the same day.
- H.O.T. Class Pricing: 4-hour are \$150 each and 8-hour are \$250 each in addition to the registration fee.

PRE-CONFERENCE WORKSHOPS INFORMATION

- Morning Pre-Conference Workshops begin promptly at 8:00 a.m.
- Afternoon Pre-Conference Workshops begin promptly at 1:30 p.m.
- Lunch is NOT provided for Pre-Conference Workshop attendees.
- If selecting a 4-hour Pre-Conference Workshop in the morning, you can only select a Pre-Conference Workshop for the afternoon. You cannot combine a Hands-On Training and a Pre-Conference Workshop on the same day.
- Pre-Conference Workshops are \$125 each in addition to the registration fee.



FDIC
INTERNATIONAL

2015 EVENT REGISTRATION

Attendee Name: _____
Phone: _____
Badge ID: _____

ATTENDEE INFORMATION

(Enter this information as you would like it to appear on your badge)

MICHAEL BOLT FIREFIGHTER/EMT
First Name Last Name Title
CASCADE TOWNSHIP FIRE DEPT.
Department/Company (Maximum 30 Characters)
2865 THORNHILL
Address (To mail badge and conference information)
Address 2 (Suite #, etc.) USA
Country
GRAND RAPIDS MI 49546
City State Zip
(616) 949-1320 (616) 285-2330 M.BOLT@CASCADETWP.COM
Phone Fax E-mail (A unique Email is required for processing registration)
(616) 862-9188
Cell (Required for Emergency Response Communication)

Rank/Title

- ☐ (01) Chief of Depart.
☐ (02) Staff Chief
☐ (03) Other Officer
☒ (04) Firefighter
☐ (05) Training Officer
☐ (07) Firefighter/Paramedic
☒ (08) Firefighter/EMT
☐ (06) Other
(please specify) _____

Job Function (Check all that apply)

- ☐ (01) Management
☒ (02) Training
☐ (03) Prevention
☒ (04) Suppression
☐ (05) Investigation
☐ (06) Maintenance
☐ (07) Communication
☒ (08) Public Education
☒ (09) EMS
☐ (10) Haz Mat
☐ (11) Rescue
☐ (13) Wildfire
☐ (12) Other
(please specify) _____

Purchasing Responsibility

- ☐ (01) Approve
☐ (02) Purchase
☒ (03) Recommend
☐ (04) Specify
☐ (05) Other

Are you a member of a purchasing committee?

- ☐ (1) Yes ☒ (0) No

Type of Department

- ☐ (01) Volunteer
☐ (02) Career
☒ (03) Combination
Career/Vol
☐ (04) Industrial
☐ (05) Military
☐ (06) Other
(please specify) _____

Population Served by Department

- ☐ (01) Under 2,500
☐ (02) 2,501-10,000
☒ (03) 10,001-25,000
☐ (04) 25,001-50,000
☐ (05) 50,001-100,000
☐ (06) 100,001-500,000
☐ (07) Over 500,000

Do you read Fire Engineering?

- ☒ (01) Yes ☐ (02) No

Do you read Fire Apparatus & Emergency Equipment magazine?

- ☐ (01) Yes ☒ (02) No

Do you read FireRescue magazine?

- ☒ (01) Yes ☐ (02) No

How many years have you attended FDIC? 0

I am visiting the FDIC 2015 exhibits to obtain information on: (Check all that apply)

- ☐ (01) Ambulances
☐ (02) Apparatus & Apparatus Accessories
☐ (03) Badges, Emblems & Accessories
☒ (04) Breathing Apparatus/Air Systems/SCBA & Supplies
☐ (05) Communications/Radios/Dispatch Equipment
☐ (06) Computer Services/Software
☐ (07) Water, Diving & Ice Rescue Equip. & Accessories
☒ (08) Educational Materials/Colleges/Training Services & Equipment
☐ (09) EMS Equipment & Supplies
☐ (10) FOAM, Environmental Products, CAF Units
☐ (11) Fans/Portable Generators & Accessories
☒ (12) Hand Tools & Forcible Entry
☐ (13) HazMat Products
☐ (14) Incident Management/Accountability Systems
☐ (15) Insurance / Financial Institutions/Consulting Services
☒ (16) Miscellaneous/Other
☐ (17) Monitors & Detectors
☐ (18) Nozzles, Hoses, Reels & Couplings
☐ (19) Protective Clothing (PPE) / Apparel
☐ (20) Pumps/Gauges
☒ (21) Rescue Tools & Equipment
☐ (22) Ropes, Chains, Safety Belts & Accessories
☐ (23) Sirens, Alarms & Signaling Devices
☐ (24) Thermal Imaging Cameras
☐ (25) Wildfire Rescue Equip. & Access.



FDIC
INTERNATIONAL

2015 EVENT REGISTRATION

Attendee Name: _____
Phone: _____
Badge ID: _____

HANDS-ON TRAINING AND PRE-CONFERENCE WORKSHOPS

Monday, April 20, 2015 Hands-On Training

PLEASE NOTE: IF YOU SELECT A HANDS-ON TRAINING IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A HANDS-ON TRAINING COURSE. HANDS-ON TRAINING COURSES INCLUDE LUNCH.

4-Hour Hands-On Training:

Monday, April 20, 8:00 a.m.-12:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 01MA Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ 02MA Aerial Ladder and Tower Ladder Placement and Operations
- ☐ ☐ ☐ ☐ 03MA Conventional Forcible Entry
- ☐ ☐ ☐ ☐ 04MA Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ 05MA Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ 06MA Firefighter Bailout Techniques
- ☐ ☐ ☐ ☐ 07MA Heavy Vehicle Extrication
- ☐ ☐ ☐ ☐ 08MA Man vs. Machinery
- ☐ ☐ ☐ ☐ 09MA Recognizing Flashover
- ☐ ☐ ☐ ☐ 10MA Rescue and Squad Company Operations on the Fireground
- ☐ ☐ ☐ ☐ 11MA Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

4-Hour Hands-On Training:

Monday, April 20, 1:00 p.m.-5:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 01MP Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ 02MP Aerial Ladder and Tower Ladder Placement and Operations
- ☐ ☐ ☐ ☐ 03MP Conventional Forcible Entry
- ☐ ☐ ☐ ☐ 04MP Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ 05MP Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ 06MP Firefighter Bailout Techniques
- ☐ ☐ ☐ ☐ 07MP Heavy Vehicle Extrication
- ☐ ☐ ☐ ☐ 08MP Man vs. Machinery
- ☐ ☐ ☐ ☐ 09MP Recognizing Flashover
- ☐ ☐ ☐ ☐ 10MP Rescue and Squad Company Operations on the Fireground
- ☐ ☐ ☐ ☐ 11MP Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

8-Hour Hands-On Training:

Monday, April 20, 8:00 a.m.-5:00 p.m. (\$250)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 12M Compliant Live Burn Training in Acquired Structures
- ☐ ☐ ☐ ☐ 13M Live Fire: First Due
- ☐ ☐ ☐ ☐ 14M Nozzle Forward
- ☐ ☐ ☐ ☐ 15M Rapid Intervention Team Combat Drills
- ☐ ☐ ☐ ☐ 16M Structural Collapse Rescue
- ☐ ☐ ☐ ☐ 17M Truck Company: Essentials
- ☐ ☐ ☐ ☐ 18M UL-NIST Live Fire Dynamics for Fire Officers
- ☐ ☐ ☐ ☐ 19M Urban Essentials

☐ **Three-Day Workshop: Monday, April 7, 8 a.m.-5 p.m.; Tuesday, April 8, 8 a.m.-5 p.m.; Wednesday, April 9, 10:30 a.m.-5 p.m.**
FDIC Blue Card Simulation Lab and Conference

Monday, April 20, 2015 Pre-Conference Workshops

PLEASE NOTE: IF YOU SELECT A PRE-CONFERENCE WORKSHOP IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A PRE-CONFERENCE WORKSHOP. PRE-CONFERENCE WORKSHOPS DO NOT INCLUDE LUNCH.

4-Hour Pre-Conference Workshops:

Monday, April 20, 8:00 a.m.-12:00 p.m. (\$125)

1st 2nd 3rd 4th 5th

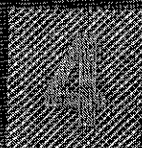
- ☐ ☐ ☐ ☐ 20MA Alternative Funding Solutions for Your Emergency Service Organization
- ☐ ☐ ☐ ☐ 21MA Applying Science without Abandoning Aggressive Tactics
- ☐ ☐ ☐ ☐ 22MA Blink: Critical Fireground Decision Making
- ☐ ☐ ☐ ☐ 23MA E-Learning in the Fire Service: Course Development, Creation, and Training
- ☐ ☐ ☐ ☐ 24MA Fire Chiefing in the Real World
- ☐ ☐ ☐ ☐ 26MA Firefighting Operations in Mega-Mansions
- ☐ ☐ ☐ ☐ 28MA Five-Alarm Leadership
- ☐ ☐ ☐ ☐ 29MA Functional Fitness Programs for Fire Service Athletes
- ☐ ☐ ☐ ☐ 30MA Inspiring Leaders for Today's Fire Service
- ☐ ☐ ☐ ☐ 31MA Instructor and Training Officer Bootcamp
- ☐ ☐ ☐ ☐ 32MA ISFSI Principles of Modern Fire Attack-Train the Trainer
- ☐ ☐ ☐ ☐ 33MA Pre-Emergency Planning and Inspection of Manufacturing and Industrial Facilities
- ☐ ☐ ☐ ☐ 34MA Reading the Fire
- ☐ ☐ ☐ ☐ 35MA Rescuer Near-Misses and Fatalities in Aquatic Environments
- ☐ ☐ ☐ ☐ 36MA Responding to and Preparing for Acts of Violence
- ☐ ☐ ☐ ☐ 37MA Saving Those Who Save Others
- ☐ ☐ ☐ ☐ 25MA Sustainable Green Design and Construction and the Fire Service
- ☐ ☐ ☐ ☐ 38MA The Seven Deadly Sins of High-Rise Firefighting
- ☐ ☐ ☐ ☐ 39MA Zero to Hero: Personal Leadership

4-Hour Pre-Conference Workshops:

Monday, April 20, 1:30 p.m.-5:30 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 40MP Aggressive Command and Tactics
- ☐ ☐ ☐ ☐ 41MP Developing a Training Program for Today's Fire Service
- ☐ ☐ ☐ ☐ 42MP Drill Ground Instructor Academy
- ☐ ☐ ☐ ☐ 43MP Fireground Control: Managing the Hard Environment
- ☐ ☐ ☐ ☐ 44MP Fireground Scenario Workshop
- ☐ ☐ ☐ ☐ 45MP Hazmat: Initial Approach and Actions
- ☐ ☐ ☐ ☐ 46MP How Firefighters Learn: How Fire Instructors Should Teach Them
- ☐ ☐ ☐ ☐ 47MP Human Behavior and Positive Psychology: Tools for the Firehouse
- ☐ ☐ ☐ ☐ 48MP Intelligent Fire Operations: Balancing Safety and Aggression
- ☐ ☐ ☐ ☐ 49MP Lightweight Construction: Past and Present
- ☐ ☐ ☐ ☐ 50MP Safety Leadership
- ☐ ☐ ☐ ☐ 51MP Strategic Decision Making at Commercial Building Fires
- ☐ ☐ ☐ ☐ 52MP Taking Action Against Cancer in the Fire Service
- ☐ ☐ ☐ ☐ 53MP The Art of Reading Smoke
- ☐ ☐ ☐ ☐ 54MP The Courage Within (Stress Inoculation Training)
- ☐ ☐ ☐ ☐ 55MP The Ultimate Team Sport: What Position Will I Play?
- ☐ ☐ ☐ ☐ 56MP Think Like an Incident Commander
- ☐ ☐ ☐ ☐ 57MP Vehicle Rescue: Operational and Technologic Considerations for Today
- ☐ ☐ ☐ ☐ 58MP Waving Red Flags on the Fireground
- ☐ ☐ ☐ ☐ 59MP Where Have All the Good Officers Gone?



INTERNATIONAL

2015 EVENT REGISTRATION

Attendee Name: _____

Phone: _____

Badge ID: _____

HANDS-ON TRAINING AND PRE-CONFERENCE WORKSHOPS

Tuesday, April 21, 2015 Hands-On Training

PLEASE NOTE: IF YOU SELECT A HANDS-ON TRAINING IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A HANDS-ON TRAINING COURSE. HANDS-ON TRAINING COURSES INCLUDE LUNCH.

4-Hour Hands-On Training:

Tuesday, April 21, 8:00 a.m.-12:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 01TA Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ 02TA Aerial Ladder and Tower Ladder Placement and Operations
- ☐ ☐ ☐ ☐ 03TA Conventional Forcible Entry
- ☐ ☐ ☐ ☐ 04TA Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ 05TA Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ 06TA Firefighter Bailout Techniques
- ☐ ☐ ☐ ☐ 07TA Heavy Vehicle Extrication
- ☐ ☐ ☐ ☐ 08TA Man vs. Machinery
- ☐ ☐ ☐ ☐ 09TA Recognizing Flashover
- ☐ ☐ ☐ ☐ 10TA Rescue and Squad Company Operations on the Fireground
- ☐ ☐ ☐ ☐ 11TA Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

4-Hour Hands-On Training:

Tuesday, April 21, 1:00 p.m.-5:00 p.m. (\$150)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 01TP Advanced Extrication: Real-World Challenges
- ☐ ☐ ☐ ☐ 02TP Aerial Ladder and Tower Ladder Placement and Operations
- ☐ ☐ ☐ ☐ 03TP Conventional Forcible Entry
- ☐ ☐ ☐ ☐ 04TP Engine Company Essentials: Getting Water on the Fire
- ☐ ☐ ☐ ☐ 05TP Engine Company High-Rise Standpipe Operations
- ☐ ☐ ☐ ☐ 06TP Firefighter Bailout Techniques
- ☐ ☐ ☐ ☐ 07TP Heavy Vehicle Extrication
- ☐ ☐ ☐ ☐ 08TP Man vs. Machinery
- ☐ ☐ ☐ ☐ 09TP Recognizing Flashover
- ☐ ☐ ☐ ☐ 10TP Rescue and Squad Company Operations on the Fireground
- ☐ ☐ ☐ ☐ 11TP Vent-Enter-Isolate-Search: Addressing Flow Path and Victim Removal

8-Hour Hands-On Training:

Tuesday, April 21, 8:00 a.m.-5:00 p.m. (\$250)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 12T Compliant Live Burn Training in Acquired Structures
- ☐ ☐ ☐ ☐ 13T Live Fire: First Due
- ☐ ☐ ☐ ☐ 14T Nozzle Forward
- ☐ ☐ ☐ ☐ 15T Rapid Intervention Team Combat Drills
- ☐ ☐ ☐ ☐ 16T Structural Collapse Rescue
- ☐ ☐ ☐ ☐ 17T Truck Company: Essentials
- ☐ ☐ ☐ ☐ 18T UL-NIST Live Fire Dynamics for Fire Officers
- ☐ ☐ ☐ ☐ 19T Urban Essentials

Tuesday, April 21, 2015 Pre-Conference Workshops

PLEASE NOTE: IF YOU SELECT A PRE-CONFERENCE WORKSHOP IN THE MORNING, YOUR AFTERNOON SELECTION MUST ALSO BE A PRE-CONFERENCE WORKSHOP. PRE-CONFERENCE WORKSHOPS DO NOT INCLUDE LUNCH.

4-Hour Pre-Conference Workshops:

Tuesday, April 21, 8:00 a.m.-12:00 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 60TA Building the Ladder: Officer Development Programs
- ☐ ☐ ☐ ☐ 61TA Combat Ready Firefighting
- ☐ ☐ ☐ ☐ 62TA Drills You're Not Going to Find in the Books
- ☐ ☐ ☐ ☐ 63TA Fire Academy 101: Building Better Firefighters Through Quality Training
- ☐ ☐ ☐ ☐ 64TA Fire Literacy and Applied Fire Dynamics
- ☐ ☐ ☐ ☐ 65TA Fireground Decision Making for Suburban Company Officers
- ☐ ☐ ☐ ☐ 66TA Getting the Most from Your Incident Simulation Software
- ☐ ☐ ☐ ☐ 67TA Hazardous Materials: Managing the Incident
- ☐ ☐ ☐ ☐ 68TA Instructional Craftsmanship: Method and Mastery
- ☐ ☐ ☐ ☐ 69TA Leadership in the Real World
- ☐ ☐ ☐ ☐ 70TA Modern Buildings: The Recipe for Firefighter Deaths or Injuries
- ☐ ☐ ☐ ☐ 71TA Required Training: a Guide for the Training Officer
- ☐ ☐ ☐ ☐ 72TA Solar Power Strategy and Tactics: a Renewable Danger for Firefighters
- ☐ ☐ ☐ ☐ 73TA Stress First Aid for Fire and EMS Personnel: Train the Trainer
- ☐ ☐ ☐ ☐ 74TA Survival: Why Things Went Right and Why They Went Horribly Wrong
- ☐ ☐ ☐ ☐ 75TA Tactical and Strategic Perspectives of Residential Fires: Command and Fire Attack
- ☐ ☐ ☐ ☐ 76TA The 21st Century Fire Officer: Strategies and Tactics from the Firehouse to the Fireground
- ☐ ☐ ☐ ☐ 77TA The Professional Volunteer Fire Department
- ☐ ☐ ☐ ☐ 78TA This House Rocks/Firehouse Excellence
- ☐ ☐ ☐ ☐ 79TA Transitional Attack and Modern Wood-Frame Construction

4-Hour Pre-Conference Workshops:

Tuesday, April 21, 1:30 p.m.-5:30 p.m. (\$125)

1st 2nd 3rd 4th 5th

- ☐ ☐ ☐ ☐ 80TP 25 to Survive: Reducing Residential Injuries and LODDs
- ☐ ☐ ☐ ☐ 81TP Attack from the Burned Side: New Age Tactics and Tasks
- ☐ ☐ ☐ ☐ 82TP Avoiding Career Crushers
- ☐ ☐ ☐ ☐ 83TP Drill Development: the Next Level
- ☐ ☐ ☐ ☐ 84TP Essentials of Fire Investigation: the Complete Fire Scene Examination
- ☐ ☐ ☐ ☐ 85TP Fireground Tactics: Strip Malls and Stores
- ☐ ☐ ☐ ☐ 87TP ISFSI Instructor Development Clinic
- ☐ ☐ ☐ ☐ 88TP Managing Rescue Operations
- ☐ ☐ ☐ ☐ 89TP Mastering the Instructor's Tools of the Trade
- ☐ ☐ ☐ ☐ 90TP Modern Training Techniques for Tactical Success
- ☐ ☐ ☐ ☐ 91TP No-Brainer Management
- ☐ ☐ ☐ ☐ 92TP Officer and Leadership Development Workshop
- ☐ ☐ ☐ ☐ 93TP Right-Seat Leadership
- ☐ ☐ ☐ ☐ 94TP Tactical and Strategic Perspectives of Residential Fires: Ventilation and Search
- ☐ ☐ ☐ ☐ 95TP The Aggressive Interior Attack: Mastering the Modern Residential Firefight
- ☐ ☐ ☐ ☐ 96TP The Art of Reading a Building Using the Rapid-Street Read System
- ☐ ☐ ☐ ☐ 97TP The Basics of Specifying Fire Apparatus
- ☐ ☐ ☐ ☐ 98TP The Fire Department Assessment Center: How to Get Promoted
- ☐ ☐ ☐ ☐ 99TP Volunteer and Combination Fire Department Managers Academy
- ☐ ☐ ☐ ☐ 100TP Why Fire Prevention Education Isn't Working for Today's Fire Service



FDIC
INTERNATIONAL

2015 EVENT REGISTRATION

Attendee Name: _____

Phone: _____

Badge ID: _____

CONFERENCES & EXHIBITS REGISTRATION FORM

REGISTRATION FEES

(Please select only one of the following)

Fire Engineering Training Network SUBSCRIBER RATE

By renewing or becoming an annual subscriber to the Fire Engineering Training Network, you are automatically eligible to receive a significant discount on your 2015 FDIC International registration fee. See additional details at bottom of page.

FETN Subscriber Fee	Non- Subscriber Fee
---------------------------	---------------------------

☐ Hands-On Training Premium Package

\$595*

\$700*

*Includes all general sessions, classrooms & exhibits.
May register separately for up to 16 hours of Hands-On
Training and/or Pre-Conference Workshops.*

Additional per-class costs listed on Registration pp 3 & 4.

☐ Two-Day Hands-On Training & Pre-Conference Workshops Only

\$230*

\$300*

Includes all general sessions.

(DOES NOT INCLUDE CLASSROOMS OR EXHIBITS.)

*May register separately for up to 16 hours of Hands-On Training
and/or Pre-Conference Workshops.*

Additional per-class costs listed on Registration pp 3 & 4.

☐ FDIC Blue Card Simulation Lab and Conference

\$1,000

\$1,000

*Includes 3-day workshop, Monday – Wednesday, all general
sessions, classrooms, & exhibits. Limited space available.*

☐ Individual Full Conference

\$595

\$700

Includes all general sessions, classrooms & exhibits

☐ One-Day Conference

\$360

\$400

*Includes general session and classrooms on selected day only
& all three days of exhibits*

☐ Wed., April 22 ☐ Thurs., April 23 OR ☐ Fri., April 24

☒ Exhibit Package

\$85

\$100

Includes exhibition only all exhibit days, Thurs. – Sat., April 23 – 25

☐ One-Day Exhibits Only

\$50

\$70

Includes exhibits on selected day only.

☐ Thurs., April 23 ☐ Fri., April 24 OR ☐ Sat., April 25

☐ Spouse Exhibits Only

\$25

\$25

Includes exhibition only all exhibit days, Thurs. – Sat., April 23 – 25

Name for Badge: _____

☐ Fire Engineering Training Network Discount

*Check if you do not wish to receive a 1-year membership to the
Fire Engineering Training Network (includes annual print/digital
magazine subscription (\$25 value), as well as access to exclusive
membership-only content on FireEngineering.com
(effective Jan. 1, 2015).*

GROUP PLANS

Registration Fee

☐ Group Plan 10 (up to 10 members/employees)

\$4,950

(10% off the price of 10 individual full conference attendees)

☐ Group Plan 20 (11 to 20 members/employees)

\$9,350

(15% off the price of 20 individual full conference attendees)

Larger Group Plans are Available (Contact Registration for Details)

*** PRICE DOES NOT INCLUDE THE COST OF INDIVIDUAL HANDS-ON
TRAINING CLASSES/PRE-CONFERENCE WORKSHOPS CLASSES.**

Registration Fee \$ 100.00

Hands-On Training Class Price from Registration Pages 3 & 4 \$ _____

Total Due \$ 100.00

PAYMENT

All Registration Fees must be paid in full prior to event for admittance.

☐ Check payable to PennWell/FDIC15.

☐ Signed purchase order with credit card guarantee.
Please include credit card details below.

☐ Charge my credit card: ☐ MasterCard ☐ Visa
☐ American Express ☐ Discover

Card number _____

Exp. date _____

Name on card _____

Signature _____

4 WAYS TO REGISTER

1. Online: www.fdic.com

2. Fax to: +1-888-299-8057
or +1-918-831-9161

3. Email: registration@pennwell.com

4. Mail to: PennWell/FDIC15

Registration Department
P.O. Box 973059,
Dallas, TX 75397-3059

Questions? Please call: +1-888-299-8016 or +1-918-831-9160

CANCELLATION POLICY

Cancellations must be received in writing before March 12, 2015, in order to receive a refund, minus a \$115 administrative charge. After March 12, 2015, refunds are not available. Substitutions may be made at any time by notifying the registration office in writing.

STEP BY STEP HANDS-ON TRAINING INSTRUCTIONS

1. Fully complete the registration form.
2. Select Hands-On Training Premium Package or Hands-On Training and Pre-Conference Workshops Only on page 5.
3. Choose your classes on pages 3 & 4.
4. Total the registration fees and the class fees on the bottom of page 5.
5. Payment is required to reserve H.O.T. classes.

FIRE DEPARTMENT MEMORANDUM



TO: BENJAMIN SWAYZE - TOWNSHIP MANAGER
FROM: JOHN SIGG - FIRE CHIEF *JS*
SUBJECT: EDUCATION REQUEST FIREFIGHTER/ FIRE INVESTIGATOR ROBERT NORRIS -
MICHIGAN ARSON SCHOOL - MAY 18-22, 2015
DATE: MARCH 17, 2015
CC: TOWNSHIP BOARD

Attached is an education request for Firefighter/Fire Investigator Robert Norris to attend the Annual Michigan Fire School Conference sponsored by the Michigan Chapter of the International Association of Arson Investigators. This annual conference provides training on fire cause and origin investigation practices and procedures. It will also provide training and updates on arson and insurance fraud claims that are actively happening around the state. By attending this conference Firefighter Norris will gain continuing education credits toward his license as a fire investigator.

Firefighter Norris and Inspector Poolman will be sharing a room to cut down on the cost of lodging. Firefighter Norris has submitted for mileage as Inspector Poolman will be traveling to the conference early for other meetings.

We have monies available for this conference in our education line item.

I ask that you please approve this education request for Firefighter Robert Norris.



CASCADE
CHARTER
TOWNSHIP

Cascade Charter Township
Seminar / Conference Attendance Request Form

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
2. Some seminars / conferences that an employee may attend may be unrelated to their particular job or government in general, and are therefore not covered by this assistance policy.
3. Any request that requires an overnight stay or expenditure over \$200 requires Township Board approval before the seminar / conference is attended.
4. Under extenuating circumstances, the Township Manager may approve an overnight stay or expenditure over \$200 for a conference or seminar prior to Township Board approval. The request must be made before attendance to a seminar / conference. The Township Board will be informed of request at their next scheduled meeting.

This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar / conference is attended.

Name: Robert Norris

Application Date: 1-22-15

Location of Seminar / Conference: Bay city MI.

Name of Proposed Seminar / Conference: Michigan Alson School

Description of Seminar / Conference: (may also be attached) _____

Fire Investigation, search warrants
hands on Investigation of Burned Fire cells

(Over)

How will the Seminar / Conference Benefit the Employee and the Township?

This will be continuing education credits
For my certified Investigator credential

Cost of Seminar / Conference: (Registration) \$ 17500

(Lodging) \$ Will be rooming w/ Doug Poolman (Travel) \$ 95.00

Your Signature: [Signature]

Acc # : 206-336-724

Approvals:

Department Head: [Signature]

Date: 3-17-15

Township Manager: _____

Date: _____

Clerk's Signature: _____

Date: _____

(Showing Township Board approval)

Original to personnel file
1 copy to applicant
1 copy to Accounting

after class I will submit for reimbursement



2015

MICHIGAN ARSON SCHOOL

May 19 - 22, 2015

Bay City, Michigan

This year's topics will include:

Fire investigation of hazardous material sites, search warrants, origin investigations, hands on investigation of pre-burned fire cells and round table discussions of findings. We are working hard to finalize this year's schedule.

Double Tree Hotel

Wenonah Park Place

Bay City, MI 48708

989.891.6000

Registration before April 29, 2014

Member (weekly)	\$175.00
Non-Member (weekly)	\$200.00
Member (daily / day)	\$ 50.00
Non-Member (daily / day)	\$ 65.00
Additional Banquet Ticket	\$ 35.00

A block of rooms has been reserved. The room rate is \$75.00 / night.

After May 10, 2015, rates will return to normal.

Registration after April 29, 2014

Member (weekly)	\$200.00
Non-Member (weekly)	\$240.00
Member (daily / day)	\$ 60.00
Non-Member (daily / day)	\$ 75.00
Additional Banquet Ticket	\$ 40.00



Name: Robert Norris

Email: robertjnorris@hotmail.com

Address: 7777 Thornapple River Dr

Telephone: 616-460-1683

City: Caledonia

Department: Cascade FD

State: MI Zip: 49316

MI-IAAI Membership Number: ? ~~XXXXXXXXXX~~

Note: There will be NO refunds after May 1, 2015

I am a member

Mail to: Michigan IAAI - PO Box 187 - Dimondale - Michigan - 48821

FIRE DEPARTMENT MEMORANDUM



TO: BENJAMIN SWAYZE - TOWNSHIP MANAGER
FROM: JOHN SIGG - FIRE CHIEF *JS*
SUBJECT: EDUCATION REQUEST FIRE INSPECTOR/ FIRE INVESTIGATOR DOUGLAS POOLMAN -
MICHIGAN ARSON SCHOOL - MAY 18-22, 2015
DATE: MARCH 17, 2015
CC: TOWNSHIP BOARD

Attached is an education request for Fire Inspector/Fire Investigator Douglas Poolman to attend the Annual Michigan Fire School Conference sponsored by the Michigan Chapter of the International Association of Arson Investigators. This annual conference provides training on fire cause and origin investigation practices and procedures. It will also provide training and updates on arson and insurance fraud claims that are actively happening around the state. By attending this conference Fire Inspector Poolman will gain continuing education credits toward his license as a Fire Investigator and Fire Inspector.

Fire Inspector Poolman and Firefighter Norris will be sharing a room to cut down on the cost of lodging. Fire Inspector Poolman has submitted for mileage as he will be traveling to the conference early for other meetings.

We have monies available for this conference in our education line item.

I ask that you please approve this education request for Fire Inspector Douglas Poolman.



**Cascade Charter Township
Seminar/Conference Attendance Request Form**

This form must be filled out if the employee is requesting Township payment or reimbursement for the employee's attendance to a seminar or conference.

Conditions:

1. Cascade Charter Township will reimburse employees for approved registration for work related seminars and conferences. Individual seminars and conferences must be related to the employee's current job duties or a foreseeable-future position in the organization in order to be eligible for educational assistance.
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This form must be completed by the employee and approved by the Township Manager and/or Township Board before the seminar/conference is attended.

Name: DOUGLAS P. POOLMAN

Application Date: 2/22/15

Location of Seminar/Conference BAY CITY, MICHIGAN - MAY 18-22, 2015

Name of Proposed Seminar/Conference: MICHIGAN CHAPTER - IAAI (INTERNATIONAL ASSOCIATION OF ARSON INVESTIGATORS) AKA. "MICHIGAN ARSON SCHOOL"

Description of Seminar/Conference: (may also be attached) "MICHIGAN ARSON SCHOOL"

IS AN ANNUAL SCHOOL/CONFERENCE HOSTED BY THE MICHIGAN CHAPTER OF THE IAAI. THE CONFERENCE PROVIDES EDUCATION & TRAINING ON PRACTICES & PROCEDURES OF FIRE CAUSE & ORIGIN INVESTIGATION, PROVIDES INFORMATION ON THE LATEST TRENDS IN ARSON CASES IN MICHIGAN, THIS SEMINAR ALSO PROVIDES FOR REQUIRED CONTINUING EDUCATION (over) POINTS TO MAINTAIN BOTH MY INVESTIGATOR LICENSE AS WELL AS MY FIRE INSPECTOR LICENSE THROUGHOUT THE STATE OF MICHIGAN. I ALSO SIT AS A DIRECTOR OF THE BOARD AND NEED TO ATTEND TO FULFILL MY OBLIGATIONS.

How will the Seminar/Conference benefit the employee and the township? PROVIDES BOTH
CLASSROOM AND HANDS ON TRAINING providing continuing education credits
Required to keep my licensures current & up to date.

Cost of the Seminar/Conference: (Registration) \$ 175⁰⁰

(Lodging) \$ 375 + LOCAL TAXES/FEES (Travel) \$ (350 MILES) 201.²⁵

Account #: 206-336-724

Your Signature: [Signature] 2/22/15

Approvals:

Department Head: [Signature] Date: 3-17-15

Township Manager: _____ Date: _____

Clerk's Signature: _____ Date: _____

(Showing Township Board approval)

Original to personnel file

1 copy to applicant

1 copy to Accounting



2015

MICHIGAN ARSON SCHOOL

Bay City, Michigan

This year's topics will include:

Fire investigation of hazardous material sites, search warrants, origin investigations, hands on investigation of pre-burned fire cells and round table discussions of findings. We are working hard to finalize this year's schedule.

Double Tree Hotel

Wenonah Park Place

Bay City, MI 48708

989.891.6000

Registration before April 29

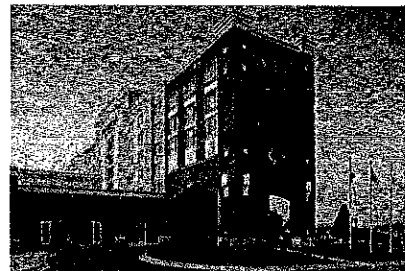
Member (weekly)	\$175.00
Non-Member (weekly)	\$200.00
Member (daily / day)	\$ 50.00
Non-Member (daily / day)	\$ 65.00
Additional Banquet Ticket	\$ 35.00

A block of rooms has been reserved. The room rate is \$75.00 / night.

After May 10, 2015, rates will return to normal.

Registration after April 29

Member (weekly)	\$200.00
Non-Member (weekly)	\$240.00
Member (daily / day)	\$ 60.00
Non-Member (daily / day)	\$ 75.00
Additional Banquet Ticket	\$ 40.00



Name: Doug Poolman

Email: geofire891@gmail.com

Address: 4250 BLAIR ST.

Telephone: 416 325-6283

City: HUDSONVILLE

Department: CASCADE TWP. F.D.

State: MI Zip: 49424

MI-IAAI Membership Number: # 497

Note: There will be NO refunds after May 1, 2015

Mail To: Michigan IAAI - 46036 Michigan Ave - Suite 105 - Canton, MI 48188



CASCADE CHARTER TOWNSHIP

2865 Thornhills SE Grand Rapids, Michigan 49546-7140

Date: March 20th, 2015
To: Supervisor Beahan and Township Board Members
From: Ben Swayze, Township Manager
Subject: Contract with Hamilton Helicopter Inc. for Gypsy Moth Suppression Services

FACTS:

In the fall of 2014 Cascade Township contracted with Aquatic Consulting Services LLC to conduct gypsy moth egg mass surveys to determine areas that require aerial spraying for 2015. As a result of that survey, it has been recommended that approximately 687 acres of the Township be sprayed for gypsy moth suppression. For budgetary reasons, it was requested that the consultant divide the areas proposed for spray into two priority areas so that the Township would be able to allocate their available resources efficiently if we are not able (or willing) to spray the entire recommended areas. The priority "A" area consists of 417 acres, while the priority "B" area consists of 270 acres.

The Township has utilized Mid-Michigan Helicopter Inc. for Gypsy Moth Suppression services since the onset of our program. However, this year Mid-Michigan Helicopter has been bought by Hamilton Helicopter. Jim Barenese, owner of Mid-Michigan Helicopter, is continuing to help with the spray program during this transition year. The Township last sprayed for gypsy moths in spring of 2014, when we sprayed 372 acres. The follow up report from Aquatic Consulting Services in summer of 2014 indicated the spray program was successful in suppressing the gypsy moth population in the indicated spray areas.

The proposed contract would provide for gypsy moth suppression services for the Township at a cost of \$60.00 per acre. The cost to spray the priority "A" area would be \$25,020, and the cost to spray the entire recommended area would be \$40,320. The program will take place in the time period between May 1st and June 15th, with a more specific date to be available when the weather breaks. The Township is required to notify all residences in the spray block areas of the program. Any objectors to the spray program are eligible to be removed from the spray block at the discretion of the Township.

Attached for your review are:

- Proposed agreement with Hamilton Helicopter Inc. for Gypsy Moth Suppression Services.
- Map of the proposed spray blocks for 2015
- Gypsy Moth information brochure published by the MSU Extension
- Information regarding *Bacillus Thuringiensis* pesticide.

ANALYSIS & CONCLUSIONS:

The Township has participated in the gypsy moth spray program in conjunction with Mid-Michigan Helicopter Inc. and Aquatic Consulting Services going on 17 years. The Township has

participated in the program because of the acknowledgement of the devastating effect the gypsy moth population could have on the canopy cover of the Township.

The partnership with both Aquatic Consulting Resources and Mid-Michigan Helicopter Inc. has allowed us to efficiently allocate our financial resources to this program. The survey ensures that the aerial spray program effectively targets areas of infestation above the set thresholds, and on several occasions has saved us from unnecessarily spraying, as was the case in 2013 and 2010-11

FINANCIAL CONSIDERATIONS:

The proposed agreement with Hamilton Helicopter Inc. is for a rate of \$60.00 per acre, which is the same cost as 2014 with Mid-Michigan Helicopter. If the Township chooses only to spray the priority "A" area, the cost of the program will come to \$25,020. If the Township chooses to spray the entire recommended area, the cost of the program would come to \$40,320. The Township has budgeted \$25,000 for this program in 2015, so if the Township chooses to spray the full area then a budget adjustment will be needed.

RECOMMENDED ACTION:

Approve the agreement with Hamilton Helicopter Inc. for Gypsy Moth Suppression Services to spray 417 acres at a cost of \$25,020

Or

Approve the agreement with Hamilton Helicopter Inc. for Gypsy Moth Suppression Services to spray 687 acres at a cost of \$40,320



Hamilton Helicopters Inc.

P.O. Box 264
4488 134th Ave
Hamilton, MI 49419
616-291-5808
khomkes@gmail.com

February 5, 2015

Hi Benjamin

It's my understanding you have heard about the transfer of the Mid Michigan and Hamilton Helicopters as far as Jim's Gypsy Moth Application business. I am excited to be able to work with you and your Townships needs in this area. I you have any questions or need any information please feel free to contact me in anyway. I have enclosed a contract basically the same as Mid Michigan has used in the past. Hope this is satisfactory. And again contact me with any questions!

Thanks

A handwritten signature in black ink, appearing to read 'Kurt Homkes'. The signature is fluid and cursive, with the first name 'Kurt' being more prominent.

Kurt Homkes
Hamilton Helicopters

GYPSY MOTH SUPPRESSION SERVICES AGREEMENT

This agreement is made as of _____. 2015, between Cascade Charter Township, a Michigan municipal corporation at 2865 Thornhills Ave. SE, Grand Rapids Michigan. 49546. (Hereafter referred to as the Township), and Hamilton Helicopter Inc. (hereafter referred to as Hamilton Helicopters).

Whereas the Township desires to control the gypsy moth population within its boundaries, and Hamilton Helicopters is interested in and capable of participating in a Gypsy moth suppression program with the Township.

NOW, therefore, the parties agree as follows.

- A With regard to the gypsy moth suppression program, the Township shall provide or arrange for the following to be performed.
 - (1) Determination of spray blocks.
 - (2) Provide homeowner notification of the spraying program, and make all public notices required, and make sure there are no objectors in the spray blocks.
 - (3) Provide location of all objectors in and outside the spray blocks, and exclude and defend Hamilton Helicopters from any action ,legal or otherwise, that should arise from the "no exclusion policy".
 - (4) Provide digitized maps of the spray blocks.
 - (5) Provide traffic and crowd control at the time of spraying, in the spray blocks and at the load site if deemed necessary by the parties.
 - (6) Provide a central loading site.
- B With regard to the gypsy moth suppression program, Hamilton Helicopters shall.
 - (1) Have and maintain insurance coverage during the term of this agreement in the amount of \$2,000,000.00 single limit bodily injury and property damage. The Township and its employees shall be named as "additional insured". All liability for Hamilton Helicopters and its employees will be limited to the insurance policy provided.
 - (2) Will apply to the F.A.A. for a (workable) congested area spray plan for the time period from May 1, 2015 to June 15, 2015.
 - (3) Provide Bacillus Thuringiensis 'BT' at the rate of 19 B.I.U. per acre to cover _____ acres for the Township.
 - (4) Coordinate the spray timing with Aquatic Consulting Services.
- C In addition to providing the services in paragraph A above, the City shall pay Hamilton Helicopters a fee of \$60.00 per acre for providing the services listed in paragraph B. This shall be paid within 30 days of billing.
- D In the event Hamilton Helicopters is prevented from spraying as a result of legal action, court injunction, terrorist related problems or any problems beyond the control of Hamilton Helicopters, the Township will pay \$15.00 per acre to cover some of the costs incurred.

E For the purposes of this contract, the contractor and its employees shall be considered Independent contractors.

F Either party upon Thirty (30) days' notice may terminate this agreement, in addition, this agreement may be amended by mutual consent of the parties.

IN WITNESS THERE OF, the parties here have executed this agreement by and through their authorized representatives as of the date written above.

Cascade Charter Township

Hamilton Helicopters Inc.

DATE _____

Kurt Homber DATE 2/5/15
Its Pres.



Aquatic Consulting Services LLC

P.O. Box 530, Sanford, MI 48657 989-687-5198

Lake and Pond Improvement
Water Quality Investigation
Environmental Assessments
Wetland Use Evaluations

October 31, 2014

Mr. Ben Swayze,
Township Manager
Cascade Charter Township
2865 Thornhills, S.E.
Grand Rapids, MI 49546

Dear Mr. Swayze:

I have completed the gypsy moth surveys for the 2015 season in Cascade Charter Township. I have enclosed smaller sized maps of the results in this package along with a short report on the conditions in each recommended spray block. Also included in this package is a CD-ROM disk of the electronic version of the spray block map in JPG format for use on your web site and a printable PDF version. One 18 x 24 inch display map is being sent in a separate package.

As you can see from the map, the gypsy moth populations in the township have grown somewhat relative to previous years. When gypsy moth populations are on the rise, they tend to be quite resilient. Fortunately, annual surveying has been shown to be the best means of control. Also, gypsy moth population expansions are generally localized and grow from an "epicenter." Our survey and spray techniques are designed to contain expansion and suppress population growth. It appears that populations are on the rise in a few areas that we will continue to monitor to suppress population growth. We achieved good results in areas sprayed last year but some areas will need a smaller application to control a remnant population. We have their limits well identified, and the spray should be very effective at keeping the overall population in check. Egg mass densities are still quite low overall, so good spray results are expected.

I will hold off for a few of months on digitizing the spray blocks for the pilot's use until you have had a chance to review the map. If it meets with your approval, I will put a final package together for Jim Barensen of MidMichigan Helicopters, Inc. I am told that the cost per acre should stay the same as last year with any increases solely due to the cost of the B.t. product. Jim will contact you to discuss this season's spray contract.

Thank you again for the opportunity to work for Cascade Township. Please let me know if there is anything further you need. (989) 687-5198 or gypsymoth@aquaticremedies.com.

Sincerely,

Neal Swanson
Owner/Biologist

Enclosures

Cascade Charter Township
Recommended Gypsy Moth Spray Areas 2015

By
Aquatic Consulting Services LLC
October 2014

PRIORITY A		
Block #	Acres	Reason for Spray
Cas1	142	A rising population in prime habitat, spray to contain and prevent nuisance.
Cas2	231	Prime habitat with a history of infestation, spray to prevent nuisance.
Cas3	44	A rising population taking advantage of a new housing development, spray to prevent buildup and nuisance.

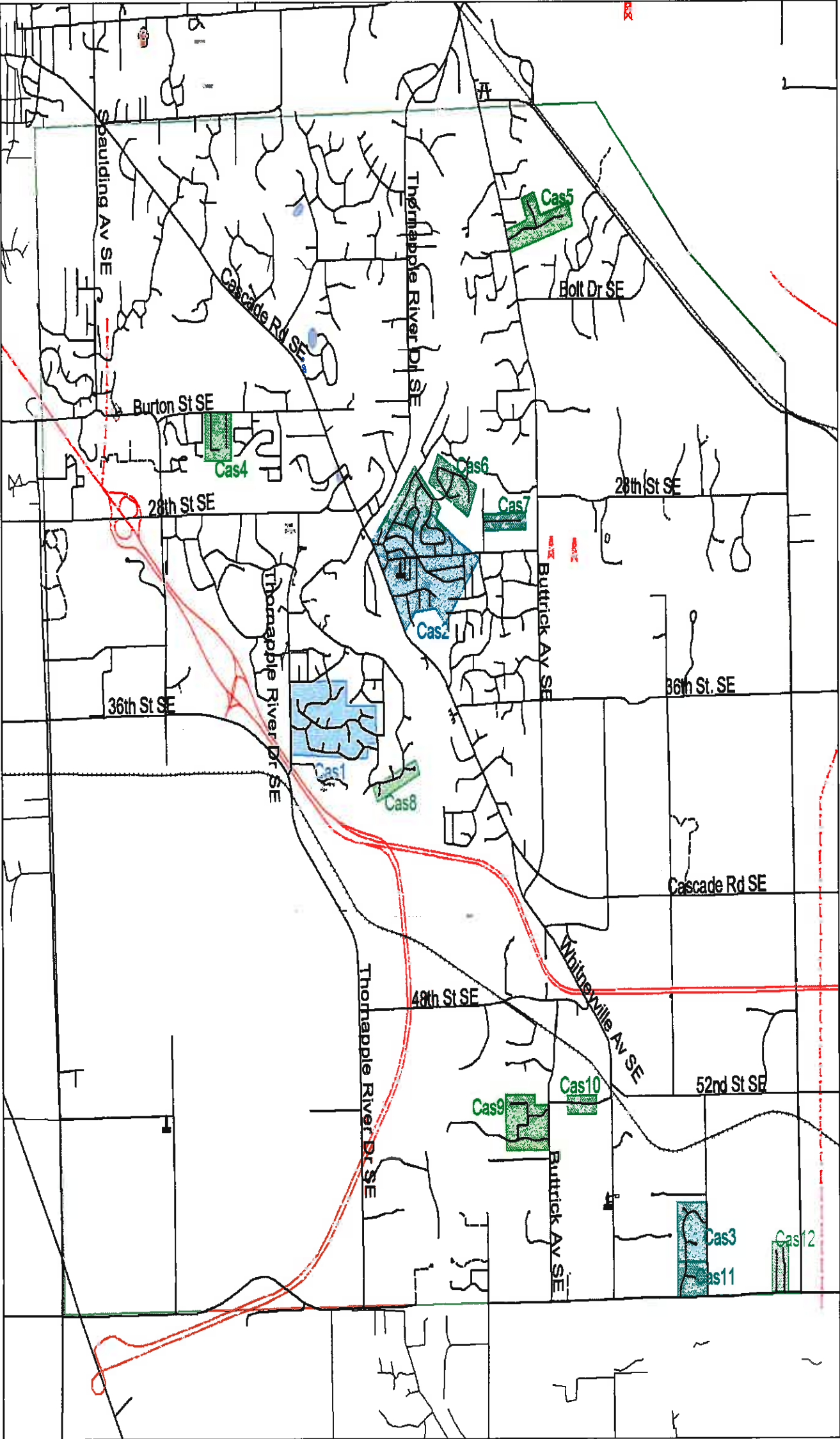
Total Priority A acres = 417 acres

PRIORITY B		
Block #	Acres	Reason for Spray
Cas4	32	An isolated population beginning to multiply, spray to contain and prevent buildup.
Cas5	47	An isolated population in marginal habitat, spray to contain.
Cas6	37	A rising population in prime habitat, spray to prevent buildup.
Cas7	17	An isolated population in marginal habitat, spray to contain.
Cas8	19	A rising population in prime habitat, spray to prevent buildup.
Cas9	57	A remnant population in a new housing development, spray to prevent buildup.
Cas10	14	An isolated population in rural habitat, spray to prevent nuisance.
Cas11	26	A rising population in a new housing development, spray to prevent buildup.
Cas12	21	An isolated population in marginal habitat, spray to contain and prevent nuisance.

Total Priority B acres = 270 acres

TOTAL OVERALL acres = 687 acres

Report for 2015 Season



Shaded Areas Proposed for
Aerial Spray in Spring 2015

Priority A areas
Priority B areas



Township Border

2014 Aquatic Consulting Services LLC

Gypsy Moth in Michigan

Michigan State University Extension & Michigan State University Department of Entomology
& the Michigan Department of Agriculture

The following information was taken from the
Gypsy Moth in Michigan Homeowner's Guide

**MICHIGAN STATE
UNIVERSITY
EXTENSION**



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Gypsy Moth Management Starts At Home

You are the first line of defense for protecting your trees and shrubs from damage by gypsy moth, other insects, nematodes and diseases. Being knowledgeable about the life cycle of the gypsy moth will pay off in money saved, labor expended and peace of mind.

Depending upon where you live in Michigan, gypsy moth outbreaks may last from two to several years or may never occur. Why gypsy moth populations explode from time to time is not entirely clear. Outbreaks will eventually collapse, usually from natural causes.

Until a local gypsy moth population crashes, however, there are several techniques that homeowners can employ to keep damage and nuisance to an affordable minimum.

Monitoring

Hopefully, the mind set of dragging the sprayer out of the garage and spraying insecticide on trees and shrubs just because something might be out there lurking is no longer a part of the Michigander mentality. Years ago this was called "insurance spraying" when everybody was spraying chlorinated hydrocarbon insecticides (e.g., DDT) on everything that moved. We all know where that got us!

Take time to inspect your trees and shrubs periodically for the various life forms of gypsy moth. Especially look for the caterpillars when they begin to hatch, usually in early May.

Contrary to popular belief, population explosions in a locality do not happen suddenly! An area will undergo a gradual population buildup for a time before the population goes into a phase of rapid release. This gives vigilant homeowners, neighborhoods and communities time to assess local conditions and take appropriate action.

The gypsy moth is in the egg mass form for nearly nine months, plenty of time to find and destroy them before they hatch in the spring. While it may not be possible to find and destroy all of the egg masses in and around your backyard, this activity will complement management activity taken in the spring.

Management Non-Pesticide Techniques:

Water and Fertilize

We often take trees and shrubs for granted, figuring that they are indestructible and meant to last forever. Trees and shrubs have specific nutrient and water requirements. Take the time to determine what they need, and water and fertilize properly. There are bulletins available at all county extension offices and garden centers. Most insects and diseases select trees and shrubs that are being stressed. Keeping your trees and shrubs healthy will reduce the pests and diseases attracted to your foliage and lessen the damage done if they are attacked.

Sanitation

Keep your yard as clean as possible. Remove discarded items, dead branches (from the ground and out of the trees), stumps, etc., where the adult female moth is likely to lay egg masses. It is very important that homeowners be watchful when obtaining firewood from areas infested by the gypsy moth. A good rule of thumb is to never get more firewood in the summer or fall than you can burn by spring.

Each fall, check recreation vehicles (boats, trailers, campers, etc.) for gypsy moth egg masses. Vehicular movement is how gypsy moth came to Michigan.

Destroy Egg Masses

As mentioned, gypsy moth egg masses are around for nearly nine months before they hatch. Homeowners can help reduce gypsy moth population on their property and in their neighborhood by seeking out and destroying egg masses each year.

When a gypsy moth caterpillar is about to pupate, it will look for a protected area such as a loose flap of bark, something flat nailed to a tree, woodpile of the underside of branches, etc. Once a suitable location is found, it weaves a loose net of silk around itself and

transforms into a pupa. This is the resting state where the caterpillar undergoes the miracle transformation from caterpillar to moth. This takes about two weeks.

Upon emergence, the female gypsy moth is creamy white and has a wingspan of about two inches. The male moth is smaller in size and camouflage brown with black mottling. Both have a distinguishing mark on their forewings: an inverted black V often referred to as a chevron marking.

The female generally deposits egg masses from early July to mid-August depending upon local weather conditions. The female cannot fly, so she will lay egg masses near where she was in the pupal (cocoon) stage.

The adult female lives about a week. Her only purpose in life is to breed as quickly as possible and lay her eggs. She cannot fly, so she emits a chemical odor to attract the nearest male for mating, the male flies off to mate several more times before dying. After mating, the female spends about a day depositing her egg mass, falls to the ground and dies. Neither the male or female moth feed.

Each egg mass can contain from 50-1,000 eggs. The eggs are intertwined in a matting of hair from the body of the female. The hair is a tan-buff color and helps insulate eggs.

The egg masses begin hatching the following May. Hatching coincides with the bud break of aspen and the flowering of serviceberry.

Homeowners are encouraged to search out and destroy egg masses. This is accomplished by scraping them from the surface to which they are attached into a coffee can or similar receptacle. They can be buried or burned. Remember that each egg mass destroyed probably eliminated 400-500 caterpillars. Destroying egg masses is not a cure all. Many times egg masses are overlooked or inaccessible. However, it is a very good and certainly very cheap way to significantly impact the gypsy moth population in your yard and neighborhood.

Continued on page 3

Barrier Bands

Sticky, or slippery bands can be placed around tree trunks to help curtail, though not necessarily prevent, the caterpillars movement into and out of the tree canopy.

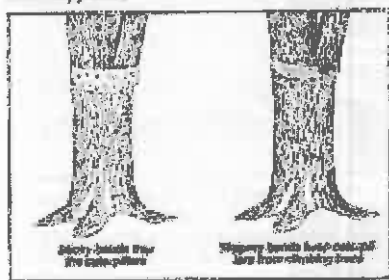
Sticky bands can be purchased or made using a nonporous material that can be wrapped around a tree trunk, then coated with a commercially made, vegetable-based sticky material. **Never put sticky material directly on the tree trunk.** This will permanently stain the bark and may harm the tree.

Sticky bands should not be put on the tree until the caterpillars are about an inch long. Smaller caterpillars usually stay in the tree canopy. Sticky bands eventually lose their effectiveness due to rain and other weather factors, the sticky material has to be reapplied periodically. Bands covered completely with caterpillars need to be cleaned or replaced.

Slippery bands are also intended to interrupt the daily migration of the caterpillar. They prevent the caterpillar from climbing up into the canopy.



Gypsy moth caterpillars use cloth bands to hide during daylight hours. Scrape the caterpillars into a bucket of soapy water.



Hiding Bands

Cloth, or hiding bands, can be homemade from medium weight dark cloth about 12 to 18 inches wide and long enough to completely wrap

around the tree. Fasten each band at chest height around the tree with twine, cord or wire about midway from the bottom of the cloth. Then fold the top part of the cloth down over the bottom half.

Caterpillars descending the tree in the morning in search of a secluded daytime resting spot will hide under the flap of the band. Remove and destroy caterpillars each day by scraping them into a bucket of soapy water.

Pesticide Techniques

Biological Pesticide

Many pesticides are registered for use against gypsy moth in Michigan. A biological pesticide commonly used on gypsy moth is *Bacillus thuringiensis* var. *kurstaki*. B.t. is a common soil bacteria. It is commercially formulated and sold under various labels (e.g., Dipel, Foray, Thuricide and Bactur to name a few). B.t. can be applied from the ground or by aerial spraying.

B.t. formulations are quite safe to humans. There is no apparent human toxicity, although there have been rare cases of allergic reaction by humans to certain formulations of B.t. In fact, B.t. is only known to be toxic to the caterpillars of moths and butterflies. While there are many species of caterpillars affected by B.t., this pesticide is the most "selective" product available.

To be effective in minimizing defoliation, B.t. must be applied when caterpillars are less than one inch long. As caterpillars get larger, the efficacy of B.t. diminishes. B.t. has a reported residual activity (i.e. how long it remains potent) of about a week. It is broken down by sunlight. In instances where there are very high gypsy moth populations, two applications five days apart might be needed.

Most chemical pesticides are 95% - 99% effective. B.t.k. is probably is 80% - 85% efficient in field applications. This is a desirable attribute of B.t.k.. That may sound like a contradiction, but it isn't. pesticides that are highly efficient will eventually work against the pest manager. Insects, through natural selection, will develop resistance to the pesticide. By

leaving 15% of the population intact, selection for resistance is slowed.

B.t.k. has been used against gypsy moth for over twenty-five years and no resistance has been discovered. There is, quite naturally, a trade off. When B.t.k. is applied there are still some caterpillars crawling around. However, nuisance is reduced to a minimum, defoliation lowered below damaging levels.

Soap and Water

In addition to destroying egg masses, homeowners can use other non-pesticide methods to reduce defoliation of their yard trees.

Watch for the appearance of the small caterpillars in the spring. A garden hose has sufficient water pressure to knock them off the foliage. Spraying them with water under pressure kills many of them.

Garden centers carry various brands of "insecticidal soap." An insecticidal soap is not a soap with a synthetic insecticide but instead refers to the ability of the soap to kill certain insects. Spraying gypsy moth caterpillars with a hose with an attachment to dispense soap can be effective. Always follow label directions on the insecticidal soap container. Small and large caterpillars can be drowned when submerged into a bucket of soapy water.

Chemical Insecticides

A number of chemical pesticides are registered against gypsy moth in Michigan. Many are available at your local garden center or nursery. Some of the most common are formulations of acephate, carbaryl, and malathion.

If you choose to use chemical insecticides, apply them judiciously and wisely. Besides gypsy moth they can have a potential impact on a variety of beneficial insects, including valuable predators, parasites and honeybees.

Regardless of what insecticide you choose, read the label instructions and follow them exactly. If you have any potential personal health concerns regarding pesticides, discuss them with a physician or contact your local health department.

Trees and shrubs defoliated by gypsy moth

Although gypsy moth caterpillars feed primarily on deciduous tree species such as oak or aspen, this insect is known for its wide-ranging appetite. When populations of gypsy moth are very high, the caterpillars quickly devour the leaves of their preferred host tree species. Once their favored food source disappears, the hungry caterpillars do not hesitate to seek out new sources of food. When this occurs, almost any deciduous or conifer tree, shrub or other landscape plant may be at risk of suffering some amount of defoliation.

Consequently, it is difficult to state exactly how susceptible a tree or shrub species is to defoliation by gypsy moth caterpillars. Therefore, the following list is offered only as a guide to homeowners. This list does not guarantee that any species listed as minimally at risk will never be defoliated by the gypsy moth.

More importantly, homeowners need to recognize that gypsy moth caterpillars do have preferences for certain types of trees and thrive best on those species. Typically these favored food sources are usually the first ones attacked in a homeowner's yard, especially tall, large crowned trees. These are the trees most likely at risk to defoliation.

Generally speaking, when gypsy moth caterpillars move into less preferable food sources, the caterpillars do not thrive as well and often only cause minor damage.

However, regardless of this insect's food preferences, close inspection of yard trees and outdoor fixtures and prompt action by the homeowner to destroy egg masses and small caterpillars is crucial. This is the real key to minimizing the discomfort and, to some degree, the defoliation caused by large numbers of gypsy moth caterpillars.

If a homeowner is able to minimize the amount of defoliation from the gypsy moth, it will lessen the overall impact on tree health. When a hardwood tree is heavily defoliated, the needed energy to regrow a new set of leaves causes stress. This stress often weakens a tree which may lead

to additional tree health problems. Moreover, conifer species, such as spruce or pine, are at greater risk than hardwoods because conifers are not able to regrow needles lost to defoliation. Thus complete defoliation of conifers by gypsy moth is usually fatal.

Trees and Shrubs Most at Risk to Defoliation

All Oak (*Quercus*).
All aspen and poplar (*Populus*).
Gray, paper (white), and river birch (*Betula*).
All willow (*Salix*).
All apple and crabapple (*Malus*).
All thornapple and hawthorne (*Craetagus*).
White pine (*Pinus*).
Blue spruce (*Picea*).
American beech (*Fagus*).
Basswood (*Tilia*).
Sweetgum (*Liquidambar*).
Juneberry or serviceberry (*Amelanchier*).
Witch hazel (*Hamamelis*).
Hazelnut (*Corlus*).
Mountain ash (*Sorbus*).

Trees and Shrubs Somewhat at Risk to Defoliation

Black walnut and butternut (*Juglans*).
All cherry and plum (*Prunus*).
Norway, red and sugar maple (*Acer*).
Hophornbeam or ironwood (*Ostrya*).
Alder (*Alnus*).
Elm (*Ulmus*).
Hickory (*Carya*).
Eastern redbud (*Cercis*).
Sassafras (*Sassafras*).
Paw paw (*Asimina*).
White and Norway spruce (*Picea*).
Balsam fir (*Abies*).
Eastern hemlock (*Tsuga*).
Red, jack, scotch and Austrian Pine (*Pinus*).

Trees and Shrubs at Minimal Risk to Defoliation

Ash (*Fraxinus*).
Tulip tree or yellow poplar (*Liriodendron*).
Sycamore and London plane tree (*Plantanus*).
Northern catalpa (*Catalpa*).
Honey locust (*Gleditsia*).
Black locust (*Robinia*).
Horsechestnut (*Aesculus*).
Dogwood (*Cornus*).



Gypsy moth caterpillars prefer to eat leaves of certain tree species, including poplar.

Eastern redcedar (*Juniperus*).
Juniper (*Juniperus*).
Yew (*Taxus*).
Lilac (*Syringa*).
Azalea (*Azalea*).
Rhododendron (*Rhododendron*).
Arborvitae (*Thuja*).
Viburnum (*Viburnum*).

Homeowners considering planting trees or shrubs in areas prone to high gypsy moth population build-ups should choose species that are at minimal risk to defoliation. Contact your local MSU Extension office for bulletins and information on tree selection, planting and care.



Be careful about quick fixes for your gypsy moth problem

Struggling with the effects of the gypsy moth can be frustrating enough without unscrupulous people trying to take advantage of the homeowner by offering quick fixes.

There are no quick fixes, declares Russell Kidd, MSU Extension district forestry agent in Roscommon County.

He advises homeowners to be wary of products or services that promise or imply they can end gypsy moth problems in the backyard or woodlot.

Be careful of salespeople who want to spray your trees with chemicals that are "guaranteed" to control the gypsy moth. In some cases, these may be worthless or even dangerous.

Homeowners should ask what chemical is to be used, its hazard, what its effect will be and what precautions will be taken to minimize spray drift to nearby objects.

Homeowners should also ask to see proof that the company and the individual are certified and licensed to

apply such a material. Michigan law requires that commercial pesticide spraying companies be certified and licensed by the Michigan Department of Agriculture.

Remember that chemical sprays are effective only during the caterpillar stage of the gypsy moth. Spraying trees before the eggs hatch or after the caterpillars have pupated or emerged as adults moths is worthless. (See the gypsy moth life cycle chart).

Be wary of unrealistic claims about products or techniques to rid your property of the gypsy moth by themselves.

Some products, such as sticky bands, are indeed useful, but they will not control the gypsy moth completely, especially when used alone. Only a combination of control treatments, used diligently by the homeowner, will achieve satisfactory control of the gypsy moth.

Other products may not do what their names imply. Take, for instance, the gypsy moth trap. The

purpose of the trap is to attract and capture the adult gypsy moth.

Traps are used to monitor gypsy moth populations. They will not control or eliminate next year's gypsy moth problem in your yard because one adult male moth can mate with many female moths and one or two traps will not capture enough males to interfere with mating or cause the population to decline significantly next year.

Be very careful about timber buyers who offer to buy standing trees that have been defoliated. Unscrupulous timber buyers may use gypsy moth infestations in an area as a scare tactic to persuade people to sell valuable timber at low prices before the tree die.

Timber owners should always consult with professional foresters before they decide to sell any standing timber.

Your county MSU Extension office can provide the names of professional foresters in your area.



Be careful with pesticides!



Use proper recycling procedures for disposing of pesticide containers.

This publication contains pesticide recommendations based on research and pesticide regulations. However, changes in pesticide regulations occur constantly. Some pesticides mentioned may no longer be available, and some may no longer be legal. If you have questions about the legality and/or registration status for using pesticides, contact your MSU Extension county office.

To protect yourself and others and the environment, always read the label before applying any pesticide. For information about pesticide labels see Extension Bulletin E-2182 *Reading a Pesticide Product Label*.

For more information about pesticide safety, see Extension Bulletin E-2215, *Using Pesticides Safely: A Guide for the Applicator*; Extension Bulletin E-1546 *Take Cover! Protect Yourself from Exposure (Pesticides)*.

For more information about safe disposal of pesticide containers see Extension Bulletin AM-95 *Rinsing and Recycling Pesticide Containers*.

Dozens of other Extension bulletins on safe application of pesticides are also available.

Gypsy Moth Life Cycle

1) Small Larvae. This stage lasts for 7-10 days after eggs hatch in early May (or sooner in warmer weather). Larvae are less than 1/2 inch long and usually black. They linger around the egg cluster for several days if the weather is cool or rainy, then climb trees or other objects, trailing silken threads as they move. When the larvae reach the top of the tree, they do not feed but drop on silken threads and are dispersed by the wind.

2) Large Larvae. Feeding at night for 4 to 6 weeks, large larvae generally rest during the day unless populations are very large, then they wander constantly. They grow until they are about 2 inches long.



1. Small Larvae—May



2. Large Larva—June



3. Pupae—July



4. Adults—August

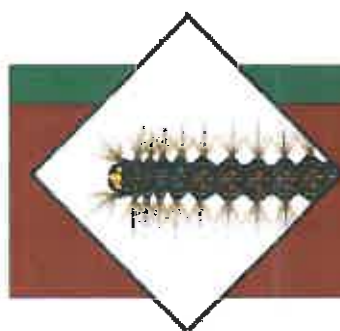


5. Egg masses—August

3) Pupae. During this stationary stage the larvae are changing into moths. This generally occurs from the end of July until early August. After about 10 days in the dark colored pupal cases, the adult moths emerge, leaving the pupal cases behind.

4) Adults. The female moth is creamy white and does not fly but emits a chemical called a pheromone to attract a male moth. The male is brownish and flies in a zigzag pattern looking for the female. A single male can mate with many females. Both sexes have chevron markings (V or notch-shaped marking) on each forewing.

5) Egg masses. The buff-colored egg masses contain between 50 and 1,500 eggs. The female deposits the eggs on any convenient surface. The masses are usually covered with hairs from the female's abdomen. The egg masses are quite cold resistant and can survive temperatures as low as -20 degrees F. Egg masses hatch during May.



Extension Bulletin B-2199, Reprinted from 2002

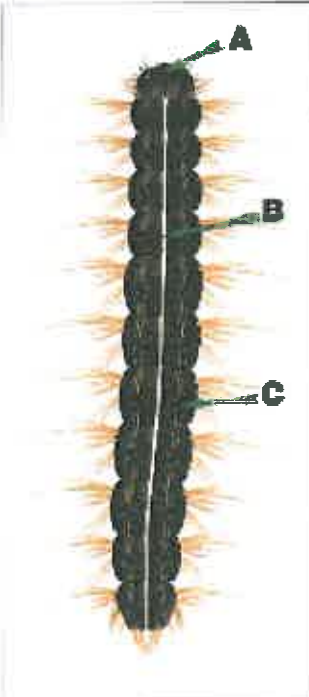
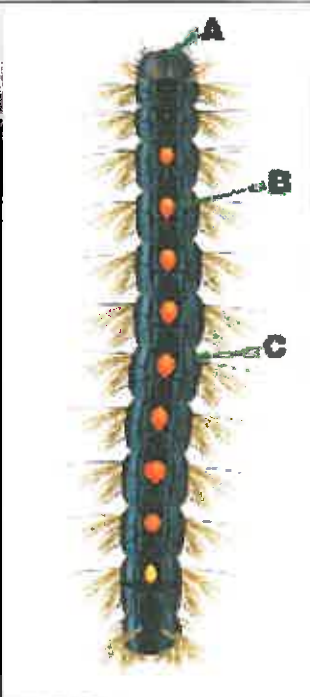
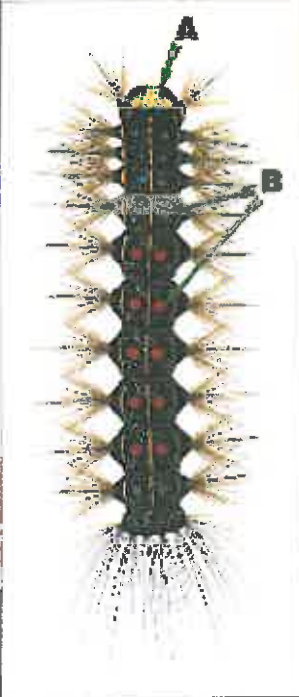
Comparison of the Eastern Tent Caterpillar, Forest Tent Caterpillar and Gypsy Moth

Michigan State University Extension

These three insects are often found feeding on the leaves of hardwood trees early in the summer. They can be easily confused with one another. The illustrations and information here will help you to identify which caterpillar is feed-

ing on your trees. Contact your local MSU Extension office or regional Dept. of Natural Resources office for more information on the biology and management of these insects.

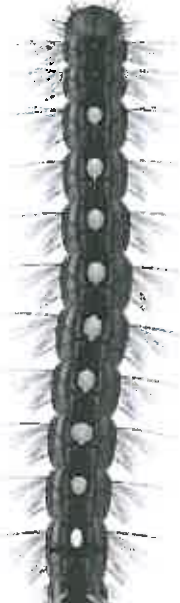
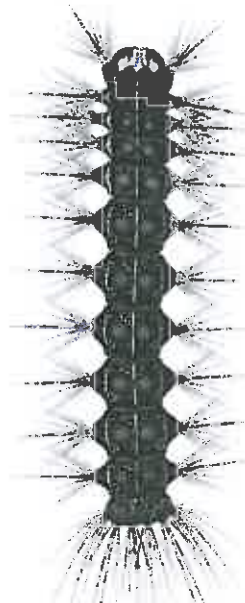
Illustrations by: Peter Combs/MSU

			
	Eastern Tent Caterpillar <i>(Malacosoma americanum)</i>	Forest Tent Caterpillar <i>(Malacosoma disstria)</i>	Gypsy Moth Caterpillar <i>(Lymantria dispar)</i>
Markings	A) Dark head; B) prominent white or yellow stripe down the center of the body; C) small blue spots to the side.	A) Blue head; B) prominent central row of white or yellow markings in keyhole or footprint shape; C) bluish on sides of body.	A) Yellow head with black markings; B) prominent blue and red spots.
Tents	Prominent silk tents at branch junctions.	They do not spin silk tents; resting sites on leaves may have small silk layer.	No silk tents.

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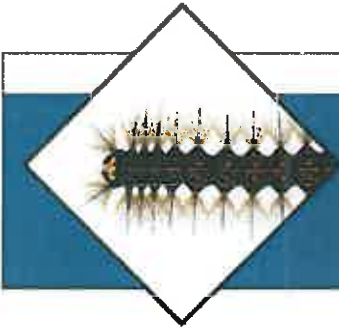
Comparison of the Eastern Tent Caterpillar, Forest Tent Caterpillar and Gypsy Moth

			
	Eastern Tent Caterpillar (<i>Malacosoma americanum</i>)	Forest Tent Caterpillar (<i>Malacosoma disstria</i>)	Gypsy Moth Caterpillar (<i>Lymantria dispar</i>)
Egg Mass	Dark, spindle-shaped mass wrapped around twigs; rough varnished texture. 	Similar to eastern tent caterpillar. 	Tan color; covered with fine hairs; 1 to 3 inches long; usually on tree bark. 
Preferred Host Trees	Black cherry, apple, crabapple.	Aspen, sugar maple, oaks, birch, black gum.	Oaks, aspen, birch, willow and more than 250 other species.
Populations	Native insect; silk tent is unattractive, but feeding rarely harms trees; common pest of ornamental trees in urban settings.	Native insect; outbreaks occur at roughly 10-year intervals and usually last 2 to 4 years; most common in forests, especially where aspen is abundant.	Exotic pest; severe defoliation during outbreaks can occur for 2 to 3 years in urban and forested areas, especially where oaks are abundant.

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Entomophaga maimaiga - A Natural Enemy of Gypsy Moth

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The gypsy moth (*Lymantria dispar* L.) is an exotic pest of urban and forest trees. Gypsy moth caterpillars feed on the leaves of oaks, aspens, and many other hardwood and conifer trees. During gypsy moth outbreaks, trees may be completely stripped of leaves. Although gypsy moth caterpillars rarely kill trees by themselves, trees weakened by heavy defoliation may become more susceptible to drought, disease or other insect pests. In addition, the large hairy caterpillars annoy people living or recreating in outbreak areas.

Managing gypsy moth requires the integration of a variety of control tactics. Biological control, the use of natural enemies to control a pest, can be an important part of an integrated pest management program for gypsy moth. One biocontrol agent that has recently shown much promise is a fungal pathogen, *Entomophaga maimaiga*.

Origin of *Entomophaga maimaiga*

Entomophaga maimaiga is a common disease in gypsy moth populations in its native country of Japan. The fungus was first released into the United States near Boston in 1910 as part of a program to introduce natural enemies of gypsy moth. Scientists could find no evidence that the fungus had become established and the project was abandoned a few years later. However, the fungus appeared unexpectedly in several northeastern states in 1989 and caused high mortality in many gypsy moth populations. Although scientists have several theories, the strange reappearance of the fungus is still a mystery.

Entomophaga maimaiga was first brought into Michigan in 1991 by scientists at Michigan State University and the USDA Forest Service. It was released in three sites in northern lower Michigan and monitored closely.

Additional introductions have since occurred and the fungus also is spreading naturally. *Entomophaga maimaiga* has now been found throughout most of Lower Michigan.

Life history of *Entomophaga maimaiga*

Entomophaga maimaiga passes the winter as a tough, thick-walled "resting spore" in the soil and on tree bark. In May and June, resting spores germinate and produce sticky spores at the end of a stalk that grows just above the soil surface. Gypsy moth caterpillars come into contact with these spores in the spring as they search for suitable leaves to feed on. The fungus digests its way through the exoskeleton of the caterpillar and grows inside the body of the caterpillar. Infected caterpillars may die within one week.

When young caterpillars are affected early in the summer, the fungus will produce a second type of spore called conidia. These microscopic spores are spread by the wind and can infect other caterpillars. The cycle of conidia production and infection may occur four to nine times during the summer. When the fungus develops in large caterpillars, it produces the overwintering resting spores.

Weather plays an important role in determining how effective *Entomophaga maimaiga* will be. Like most fungi, its spores need moisture and high humidity to germinate. Frequent rainfall during May and June contributes to the start and spread of *Entomophaga maimaiga* through a gypsy moth population. Temperatures of 50 to 80 degrees F enhance fungal growth.



Entomophaga maimaiga – A Natural Enemy of Gypsy Moth



Figure 1. Gypsy moth larva killed by NPV hanging in an inverted "V" position.



Figure 2. Dead larva covered with conidia of *Entomophaga maimaiga*.



Figure 3. Larvae killed by *Entomophaga maimaiga* often remain attached to trees.

Distinguishing *Entomophaga maimaiga* from NPV

Another disease is common in outbreak populations of gypsy moth. NPV (nuclearpolyhedrosis virus) is a virus disease that often causes gypsy moth outbreak populations to collapse. One important difference between the two diseases is that NPV is seldom prevalent until gypsy moth populations reach very high levels. In contrast, *Entomophaga maimaiga* may be found even when gypsy moth populations are low.

Caterpillars killed by NPV often remain attached to the stem or branches of trees. The bodies of the dead caterpillars are soft, filled with a brown liquid and disintegrate rapidly. Usually they hang limply in an upside-down "V" position (Fig. 1).

Caterpillars killed by *Entomophaga maimaiga* will also remain attached to tree stems or branches. However, the bodies tend to be stiff and straight, and the legs extend stiffly from the body. Some of the dead caterpillars may have tiny white conidia attached to the hairs on the body (Fig. 2). The cadavers may remain on the stem well into autumn (Fig. 3).

The future of *Entomophaga maimaiga*

Entomophaga maimaiga may become an important biological control of gypsy moth in both low and high populations. Infections may be more common in years with rainy spring weather than in years with dry spring weather. Scientists have found that the fungus is established in a number of areas in Michigan. Laboratory and field studies have shown that *Entomophaga maimaiga* is host specific and poses little risk to other insect populations. It will not affect other animals or humans. Introductions and evaluation will continue. Although there is not likely to be any "silver bullet" for gypsy moth, *Entomophaga maimaiga* should improve our ability to manage this pest in Michigan.

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Gypsy Moth Populations Growing

Robert Bricault, MSU Horticulture Educator

One of the hardest lessons I learned over the years is that information taught in the past may not be remembered tomorrow. Gypsy Moth management was the central focus of my career from 1985 through 1999. I worked in landscaping in Midland and Isabella Counties when Gypsy Moths caused the first defoliation in Michigan in 1985. During the 1990's the insect moved into Southeast Michigan where it continued its destructive pattern of ravenous eating, stripping thousands of trees of their leaves.



By 1994, Extension worked with the Michigan Department of Agriculture mapping out areas with large Gypsy Moth egg mass counts for aerial spraying with the bacteria, Bt (*Bacillus thuringiensis*). Bt did not kill the caterpillars quickly, but made them sick by changing the pH in their stomachs. Eventually they stopped eating and starved to death.

Bt helped to reduce the population not eliminate it, giving parasites, predators and pathogens a chance to develop. A pathogen called NPV, nucleopolyhedrosis virus, began killing large number of caterpillars leaving them hanging in an upside down V on tree trunks. Unfortunately, NPV only worked well when populations of the insect were very high. A real break came when a soil borne fungus, *Entomophaga maimaiga* started to kill off large numbers of caterpillars in midsummer leaving them hanging straight down on tree trunks. The fungus was effective even in sites with low numbers of Gypsy Moths present. The fungus spreads during periods of consistent rainfall in late spring and early summer. Gypsy Moth populations have been at very low numbers for the past eight years in Washtenaw County mostly due to the *Entomophaga* fungus.

The drought of 2007 reduced the development of the fungus allowing more caterpillars to survive, change into moths and lay eggs. The increasing population of caterpillars led to localized defoliation of trees. The worst damage was on Blue Spruces. Fortunately, we did experience good rainfall in June 2008, allowing the *Entomophaga* fungus to spread and kill many caterpillars. Enough Gypsy Moth did survive in 2008 to produce larger numbers of egg masses than we have seen in over six years. This may cause some localized defoliation of trees again this coming summer, increasing the need to educate residents on managing this pest.

Gypsy moth eggs hatch in mid spring usually about the time serviceberry is in bloom. People often confuse Gypsy Moth with other caterpillars that make tents or webs in trees. Gypsy Moth can hang from silk like strands from a branch but do not make webbed tents. They can spread by wind while hanging from this thread. At this early stage they are susceptible to Bt. Bt works well on young caterpillars, but is ineffective once they get beyond an inch long. Trees can be banded with burlap to trap caterpillars that seek shelter under the burlap during the day. Unfortunately, in blue spruces it is

hard to manage them through banding. Once in the moth stage Gypsy Moth does not feed. The brown male moths can be seen flying around searching for the white female moths that do not fly. The female leaves behind buff colored egg masses that are easy to see.



Fall and winter are great times to go hunting for the buff colored egg masses in trees. If you have spruces check under the branches for the egg masses. If you find egg masses on structures, outdoor furniture or trees, knock them off into soapy water. This sanitation practice greatly reduces the number of caterpillars the following year. Some of their favorite trees include oak, birch, apple, willow, hawthorn, white pine, blue spruce, serviceberry and poplars, but they will eat leaves from maples and other trees that are not their



most preferred species. If large populations are found damaging trees it may become necessary to treat the trees with an insecticide. The greatest risk is to evergreens like blue spruces and white pines that do not come back from defoliation as well as deciduous trees will. If using a pesticide make sure it is labeled for control of Gypsy Moth.

We are often asked why the county is not still part of the state's suppression program. The need for the program in Washtenaw and across Michigan declined as Gypsy Moth levels dropped very low across the state. The State's Suppression program actually ended in 2006 and also the availability of federal dollars to assist communities in aerial spray programs. The suppression program did what it was supposed to do, reducing the insects population long enough for other forces that help control Gypsy Moth to develop in our ecosystem.

Through careful monitoring, sanitation practices, banding as well as localized pesticide treatment, you can help to keep Gypsy Moth in check while allowing natural pathogens, predators and parasites to gain back a balance of control. Our hope is that nature will continue to keep Gypsy Moth populations at low levels in most years and eliminate the need for large scale spray programs. If you find large local Gypsy Moth infestations please share this information with the Horticulture staff at the MSU Extension office: 734 997-1678 or contact the Master Gardener Hotline from mid April through October at 734 997-1819.

Gypsy moth and gardening questions phone:
Washtenaw County, MSU Extension
Master Gardening Hotline at: 734 997-1819

Master Gardener Volunteers are available:
mid April through October
Monday through Thursday
9:00 a.m. – 12:00 noon
1:00 p.m. – 4:00 p.m.

At other times phone the MSU Extension office at 734 997-1678

Bacillus thuringiensis

Fact Sheet No. 5.556

Insect Series | Home and Garden

by W.S. Cranshaw*

Bacillus thuringiensis (Bt) is an insecticide with unusual properties that make it useful for pest control in certain situations. Bt is a naturally occurring bacterium common in soils throughout the world. Several strains can infect and kill insects. Because of this property, Bt has been developed for insect control. At present, Bt is the only "microbial insecticide" in widespread use.

The insecticidal activity of Bt was first discovered in 1911. However, it was not commercially available until the 1950s. In recent years, there has been tremendous renewed interest in Bt. Several new products have been developed, largely because of the safety associated with Bt-based insecticides.

Properties

Unlike typical nerve-poison insecticides, Bt acts by producing proteins (delta-endotoxin, the "toxic crystal") that reacts with the cells of the gut lining of susceptible insects. These Bt proteins paralyze the digestive system, and the infected insect stops feeding within hours. Bt-affected insects generally die from starvation, which can take several days.

Occasionally, the bacteria enter the insect's blood and reproduce within the insect. However, in most insects it is the reaction of the protein crystal that is lethal to the insect. Even dead bacteria containing the proteins are effective insecticides.

The most commonly used strain of Bt (*kurstaki* strain) will kill only leaf- and needle-feeding caterpillars. In the past decade, Bt strains have been developed that control certain types of fly larvae (*israelensis* strain, or Bti). These are widely used against larvae of mosquitoes, black flies and fungus gnats.

More recently, strains have been developed with activity against some

leaf beetles, such as the Colorado potato beetle and elm leaf beetle (*san diego* strain, *tenebrionis* strain). Among the various Bt strains, insecticidal activity is specific. That is, Bt strains developed for mosquito larvae do not affect caterpillars. Development of Bt products is currently an active area and many manufacturers produce a variety of products. Effectiveness of the various formulations may differ.

Disadvantages

Bt is susceptible to degradation by sunlight. Most formulations persist on foliage less than a week following application. Some of the newer strains developed for leaf beetle control become ineffective in about 24 hours.

Manufacturers are experimenting with several techniques to increase its persistence. One involves inserting Bt toxic crystal genes into other species of bacteria that can better survive on leaf surfaces (e.g., the M-Trak formulation of *san diego* strain).

The highly specific activity of Bt insecticides might limit their use on crops where problems with several pests occur, including nonsusceptible insects (aphids, grasshoppers, etc.). As strictly a stomach poison insecticide, Bt must be eaten to be effective, and application coverage must be thorough. This further limits its usefulness against pests that are susceptible to Bt but rarely have an opportunity to eat it in field use, such as codling moth or corn earworm that tunnel into plants. Additives (sticking or wetting agents) often are useful in a Bt application to improve performance, allowing it to cover and resist washing.

Since Bt does not kill rapidly, users may incorrectly assume that it is ineffective a day or two after treatment. This, however, is merely a perceptual problem, because Bt-affected insects eat little or nothing before they die.

Bt-based products tend to have a shorter shelf life than other insecticides.



Quick Facts

- *Bacillus thuringiensis* (Bt) is a naturally occurring bacterial disease of insects. These bacteria are the active ingredient in some insecticides.
- Bt insecticides are most commonly used against some leaf- and needle-feeding caterpillars. Recently, strains have been produced that affect certain fly larvae, such as mosquitoes, and larvae of leaf beetles.
- Bt is considered safe to people and nontarget species, such as wildlife. Some formulations can be used on essentially all food crops.
- Bt is used in agriculture as a liquid applied through overhead irrigation systems or in a granular form for control of European corn borer.

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*Colorado State University Extension entomologist and professor, bioagricultural sciences and pest management. 12/2008



Figure 1: Alfalfa webworms killed by *Bacillus thuringiensis*.

Manufacturers generally indicate reduced effectiveness after two to three years of storage. Liquid formulations are more perishable than dry formulations. Shelf life is greatest when storage conditions are cool, dry and out of direct sunlight.

Advantages

The specific activity of Bt generally is considered highly beneficial. Unlike most insecticides, Bt insecticides do not have a broad spectrum of activity, so they do not kill beneficial insects. This includes the natural enemies of insects (predators and parasites), as well as beneficial pollinators, such as honeybees. Therefore, Bt integrates well with other natural controls. For example, in Colorado, Bt to control corn borers in field corn has been stimulated by its ability to often avoid later spider mite problems. Mite outbreaks commonly result following destruction of their natural enemies by less selective treatments.

Perhaps the major advantage is that Bt is essentially nontoxic to people, pets and wildlife. This high margin of safety recommends its use on food crops or in other sensitive sites where pesticide use can cause adverse effects.

Bt-based products tend to have a shorter shelf life than other insecticides

Unlike most insecticides, Bt insecticides do not have a broad spectrum of activity, so they do not kill beneficial insects.

Perhaps the major advantage is that Bt is essentially nontoxic to people, pets and wildlife.

Table 1. Primary strains of *Bacillus thuringiensis* used in managing insects.

<i>Bacillus thuringiensis</i> strain (Common name)	Susceptible Insects
<i>aizawi</i>	Many Lepidoptera larvae
<i>kurstaki</i>	Many Lepidoptera larvae
<i>israelensis</i>	Larvae of mosquitoes, black flies, fungus gnats
<i>japonensis</i>	Larvae of scarab beetles (Coleoptera: Scarabaeidae)
<i>tenebrionis</i> (sandiego)	Larvae of leaf beetles (Coleoptera: Chrysomelidae)
<i>CryIAb delta-endotoxin</i> ¹	Many Lepidoptera larvae
<i>Cry3Bb1 variant</i> ¹	Corn rootworm larvae (Coleoptera: Chrysomelidae)

¹Only used in production of genetically modified crops

Insects Controlled by Bt

Kurstaki strain (Biobit, Dipel, MVP, Steward, Thuricide, etc.):

Vegetable insects

- Cabbage worm (cabbage looper, imported cabbageworm, diamondback moth, etc.).
- Tomato and tobacco hornworm.

Field and forage crop insects

- European corn borer (granular formulations have given good control of first generation corn borers).
- Alfalfa caterpillar, alfalfa webworm.
- Fruit crop insects
- Leafroller.
- Acheon sphinx.

Tree and shrub insects

- Tent caterpillar.
- Fall webworm.
- Leafroller.
- Redhumped caterpillar.
- Spiny elm caterpillar.
- Western spruce budworm.
- Pine budworm.
- Pine butterfly.

Israelensis strains (Vectobac, Mosquito Dunks, Gnatrol, Bactimos, etc.)

- Mosquito.
- Black fly.
- Fungus gnat.

San diego/tenebrionis strains (Trident, M-One, M-Trak, Foil, Novodor, etc.)

- Colorado potato beetle.
- Elm leaf beetle.
- Cottonwood leaf beetle.

Application

The greatest use of Bt involves the *kurstaki* strain used as a spray to control caterpillars on vegetable crops. In addition, Bt is used in agriculture as a liquid applied through overhead irrigation systems or in a granular form for control of European corn

borer. The treatments funnel down the corn whorl to where the feeding larvae occur.

Many formulations (but not all) are exempt from pesticide tolerance restrictions and may be used up to harvest on a wide variety of crops. This also makes Bt useful in applications where pesticide drift onto gardens is likely to occur, such as treating trees and shrubs. The exceptional safety of Bt products also makes them useful where exposure to pesticides is likely during mixing and application.

To control mosquito larvae, formulations containing the *israelensis* strain are placed into the standing water of mosquito breeding sites. For these applications, Bt usually is formulated as granules or solid, slow-release rings or brickettes to increase persistence. Rates of use are determined by the size of the water body. Make applications shortly after insect eggs are expected to hatch, such as after flooding due to rain or irrigation. Bt persistence in water is longer than on sun-exposed leaf surfaces, but reapply if favorable mosquito breeding conditions last for several weeks. Although the *israelensis* strain is quite specific in its activity, some types of nonbiting midges, which serve as food for fish and wildlife, also are susceptible and may be affected. For information on mosquito control, see fact sheet 5.526, *Mosquito Management*.

Use of Bt (*israelensis*) for control of fungus gnat larvae involves drenching the soil. Bt applied for control of elm leaf beetle or Colorado potato beetle (san diego/tenebrionis strain) is sprayed onto leaves in a manner similar to the formulations used for caterpillars. Bt does **not** control shore flies, another common fly found in greenhouses.

Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating. CSU Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.