

**DELHI CHARTER TOWNSHIP
COMMITTEE OF THE WHOLE MEETING HELD ON APRIL 19, 2016**

The members of the Delhi Charter Township Committee of the Whole met on Tuesday, April 19, 2016 in the Multipurpose Room at the Community Services Center, 2074 Aurelius Road, Holt, MI. Supervisor Davis called the meeting to order at 6:00 p.m.

Members Present: Supervisor C.J. Davis, Clerk Evan Hope, Treasurer Roy Sweet, Trustees Jon Harmon, John Hayhoe, DiAnne Warfield

Members Absent: Trustee Megan Ketchum

BUSINESS

INGHAM COUNTY SHERIFF'S OFFICE/DELHI DIVISION – MARCH ACTIVITY REPORT

The Board reviewed the March Ingham County Sheriff's Office/Delhi Division Activity Report (ATTACHMENT I).

Lt. Elliott stated that the new speed signs have been installed.

Lt. Elliott reported that heroin and opioid drug overdoses continue to be a problem in the Township. It was stated that this problem is not specific to the Township; it is affecting the entire nation.

FIRE DEPARTMENT – MARCH ACTIVITY REPORT

The Board reviewed the March Fire Department Activity Report (ATTACHMENT II).

Fire Chief Brian Ball introduced Jim Procello, Emergency Management/Recruitment & Retention Coordinator.

Chief Ball stated that Matt Bennett was awarded Fire Fighter of the Year and Dustin Dickerson was awarded the Chief's Award at the Fire Department's annual awards banquet.

Chief Ball stated that the Command Team (the Metro Fire Departments and the Battalion Chiefs) are having positive outcomes by erasing jurisdiction lines. Fire trucks from several jurisdictions are arriving on scene and arriving quicker.

COMMUNITY DEVELOPMENT DEPARTMENT – MARCH ACTIVITY REPORT

The Board reviewed the March Community Development Department Activity Report (ATTACHMENT III).

Tracy Miller, Director of Community Development, stated that Jim Borseth has returned to the Community Development Department as a seasonal part-time Code Enforcement Officer.

Ms. Miller reported that the Realize Cedar project concluded their focus group meetings. Meetings were held with the residents, seniors, residents of the corridor areas and

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businesses all with good input. The steering committee is continuing to meet; pop-up meetings will begin addressing base goals.

The site plan for the gas station located at M-99 and Bishop Road will be sent to the Planning Commission on April 25, 2016 for final approval.

Ms. Miller stated that the Prestwick Village construction project is moving along rapidly.

Trustee Harmon asked Ms. Miller if she has any updates from the Wieland-Davco Corporation regarding Willoughby Estates. Ms. Miller stated that the project will be set to public hearing on May 9, 2016.

PERFORMANCE CONTRACTING – HONEYWELL ENERGY SERVICES

Dick Williams and Nelson Brikho, Honeywell Energy Services, gave a presentation on the Energy Saving Performance Contracting.

PUBLIC COMMENT – Mike Hamilton, 4541 Sycamore, questioned if Honeywell would install cost efficient systems in new Township facilities, such as the Kiwanis Park Restroom facilities.

ADJOURNMENT

Meeting adjourned at 7:20 p.m.

Date: May 3, 2016

Evan Hope, Township Clerk

Date: May 3, 2016

C.J. Davis, Supervisor

/af

SUBJECT TO APPROVAL

COUNTY of INGHAM

State of Michigan

SHERIFF'S OFFICE

**Gene L. Wriggelsworth**

Sheriff

Allan C. Spyke
Undersheriff630 North Cedar Street
Mason, Mi 48854
(517) 676-2431
FAX (517) 676-8299Greg S. Harless
Chief DeputySam Davis
MajorJoel Maatman
Major**TO:** Delhi Township Board of Trustee's**FROM:** Lt. Vern Elliott**DATE:** April 14, 2016**RE:** March 2016 Monthly Report**HIGHLIGHTED CASES AND INCIDENTS:**

- 3/9/16 Sgt. Harrison stopped a vehicle for having an unreadable plate. The driver attempted to flee into the nearby woods, but Sgt. Harrison was able to apprehend him. He was found to have a parole violation warrant, and was charged with resisting and obstructing, providing false information to a police officer, no operator's license and open intoxicants.
- 3/13/16 Delhi units assisted Lansing with a double shooting at the Fahrenheit bar. They helped with scene security, protected victims while enroute to the hospital, and helped with traffic.
- 3/18/16 There was a fight at the junior high during a dance. Initial reports were that 20 people were fighting; however, the units responding found only two were fighting and neither one of them were from Holt.
- 3/28/16 A call of a suspicious vehicle at Elliott Elementary netted an intoxicate driver that had damaged the fence in several places. The vehicle was impounded, and due to their levels of intoxication, the driver and his passenger were taken to the hospital for detox.

3/28/16 A victim of a domestic assault came to the office to report it. After taking her statement, when they responded to the residence, they found him hiding in an upstairs closet. Also found were 50 marijuana plants and a handgun. Tri-County Metro responded for the grow operation, and the suspect was charged with aggravated domestic assault, and felon in possession of a firearm.

3/29/16 Deputy Kindervater stopped a vehicle for an equipment violation. The driver was found to be in possession of a stolen handgun. Also found was a quantity of marijuana and \$400 cash. He was charged with the stolen handgun and possession with intent to deliver marijuana and the cash was seized.

STATISTICS:

During the month of March, Deputies responded to 258 calls for service (written and blotter complaints). They made 77 arrests of which 43 were self – initiated, and 4 were for OWI. Deputies responded to 48 traffic crashes. Deputies issued 247 citations. Deputies conducted 283 business/property checks, 49 school contacts, and spent 117.2 hours in Community Policing. Deputies participated in 265.5 hours of training.

Calls for Service

	2014	2015	2016
March	337	422	258
Year to Date	973	1050	887

Total Arrests

	2014	2015	2016
March	115	61	77
Year to Date	368	233	265

Total Self – Initiated Arrests

	2014	2015	2016
March	61	36	43

Year to Date	195	133	124
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Citations Issued

	2014	2015	2016
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March	220	219	247
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Year to Date	532	532	696
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To: Lieutenant Elliott

From: Deputy Rowley 5378

Date: April 8, 2016

Re: March 2016 Monthly Report

Statistics:

- Criminal Complaints: 11**
- Abandoned Vehicle Reports: 10**
- Business Community Policing hours: 24.9 hours**
- Accident Reports: 2**
- Blotter Reports: 8**
- Business Checks: 91**
- Traffic Stops: 4**
- Citations: 2**

I received a request to serve a trespass letter to a male subject as he attempted to appear for medical treatment at Fresenius Medical Center 3960 Patient Care Dr. Suite 112. I was ready to serve the trespass letter at the medical center but the subject was involved in a verbal dispute in Meridian Twp. I went to the scene in Meridian Twp. and served the subject with the letter at that scene.

Throughout the Month of March I continued to focus on the abandoned vehicle process and coordination with the LEIN helpdesk and SOS helpdesk. I received ten abandoned vehicle report in the month of March. The process was complicated by the change made by the State of Michigan on 4/1/2015 to enter vessels as well as vehicles. This entry has to be done in a specific sequence for it to validate.

I received a walk-in complaint at the Delhi Division Office from a young woman regarding

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messages she had been receiving from her former boyfriend. The young woman had a personal protection order entered into LEIN and stated her ex-boyfriend was incarcerated but on work release. The woman did not know where her ex-boyfriend was incarcerated, but I found he was at Shiawassee County Jail. I notified the Shiawassee County Jail staff to review the PPO and have it served. I requested the inmate status be checked as he was out on work release sending messages via phone and Facebook. I followed up with the woman who advised me the messages had stopped. I verified the PPO was now listed as served on 3/25/2016.

I received a larceny of tools report from a local business on N. Cedar St. I interviewed the victim and recorded as much information about the tools as he was able to provide. The victim also was able to give me complete suspect information, as the suspect was a recent employee. I located two of the missing tools at Capitol Discount & Second Hand Store on the corner of Foster St. and E. Michigan Ave. in Lansing from the RPDSS system. I recovered the tools and the receipt full suspect information and thumb print. I entered the property into evidence.

I received assistance from LPD Detective P. Scaccia who told me there were two other stolen tools pawned at Dicker & Deal by the wife of the suspect. I recovered the tools at Dicker & Deal along with the receipt and thumb print from the suspect's wife. I contacted the suspect's wife and interviewed her regarding the tools. After the conversation with the wife I interviewed the suspect who was with her and recorded his statement. I secured the evidence and forwarded the report to the Prosecuting Attorney for the charge of Stolen Property – R&C. I followed up with the business owner and advised him of where the case is.

7-11 reported a retail fraud in progress to which I responded. I interviewed the staff and waited until the parent of the juvenile boy arrived, then after receiving permission, interviewed the juvenile. The 7-11 co-owner advised she did not want to press charges on the juvenile but did not want him back inside the store again. I advised the juvenile and the parent of the order.

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At the corner of W. Holt Rd. and Burton Ave. I received a check welfare call. An infant was found on the corner next to the roadway. The caller reported she had secured the infant in her vehicle but did not know where the infant was supposed to go. I met the caller and took the infant, an 18 month old boy, to 4570 W. Holt Rd. #2 where Deputy Huhn located the child's aunt. I interviewed the child's aunt regarding the welfare and location of the child. The aunt told me she just turned around as she was getting ready and the little boy had just disappeared. The aunt told me the boy was only out of her sight for maybe a minute or two.

I contacted the boy's father and advised him of the situation. The boy's father told me the young one had recently become very mobile and inquisitive. The boy's father told me he wanted the boy to remain with the aunt. I left the boy in the care of his aunt. I forwarded a copy of the report to Child Protective Services for review.

I continue to meet with business owners and employees of the Downtown Development Authority businesses. I have been completing the business contact information forms during my introductions and will compile and new spreadsheet for the Sheriff's Office as well as Central Dispatch. My recent primary focus has been the business corridor located off of Jolly Rd. and Pine Tree Rd.

I was on vacation from March 12th through March 20th and worked a total of 153.6 hours. I also submitted an introduction article to Ginny Perry to be published in the Our Town magazine. I submitted the article to command prior to submission for review and approval.

Respectfully submitted,
Deputy James Rowley 5378

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TO: Lt. Vern Elliott
FROM: Deputy Mary Hull #5353
DATE: Thursday, April 07, 2016
RE: March 2016 Monthly Report

MONTHLY STATISTICS:

Complaints:	16
Community Policing Hours:	38
School Contacts:	48

COMMUNITY POLICING HIGHLIGHTS:

Early in March I received a call from the Principal at Sycamore Elementary about some issues pertaining to parking on Elm St. and a parent driving reckless in the drop off pick up area. A parent living on Elm called the Principal about a parking issue on Elm Street, as cars were parking in an area marked with "no parking" signs. I checked the area to first to make sure that signs were placed by Ingham County Road Commission and not the homeowners in the area. On several occasions, I checked the area, upon approaching the area most cars moved knowing that the no parking signs were posted some drivers had to be reminded of the signs and reminded not to park in the area. The Principal also received a complaint about a parent driving in the drop off pick up lane aggressively. The Principal was able to provide a license plate of the vehicle. I was able to make contact with the registered owner by telephone. The registered owner was advised of the complaint and advised that continued complaints would result in

the complaint being forwarded to Delhi Township Attorney for reckless driving. The registered owner advised that his girlfriend is the person that normally picks the kids up from school but would be more than willing to relay the message.

During March, Chris Billingslea, the Assistant Principal and I worked on rewriting Holt Public Schools Emergency Protocols for all emergency drills including bomb threats and lockdown drills.

On March 14, Sgt. Flint, Deputy Huhn and I conducted a school bus violation sting. Sgt. Flint rode the bus with a driver that experiences numerous violations as Deputy Huhn and I made the stops on the suspect vehicles. Sgt. Flint witnessed three violations in a short time; one driver was cited for failing to stop for a school bus.

On March 24, Maureen Smith from Prevention Network and Mikki Furman from Eaton County RESA, and I met with the Students Against Drunk Driving advisor at Holt High School to discuss this year's Safe Prom Initiative. The theme for this year's Safe Prom Initiative will be Most Teens Don't. In addition to the SADD group it is our hope to get the student's participating in the LINKS program to assist with the events. I created a Safe Prom flyer that will be distributed to all stores, party stores and restaurants reminding minors that they will not be served alcohol or tobacco.

TRAINING:

On March 8 and 9, I attended a Defending Against Lone Wolf Attacks at Ingham County Sheriff's Office. The instructor spoke about the goals of a lone wolf attackers, the types of terrorists, potential terrorists' targets including public, non-military, and infrastructural and the metal cycle of a terrorist.

On March 15, I attended a lunch and learn series at Ingham County Health Department. The presenter of the one hour informational seminar spoke about Marijuana; Use, Abuse and Safety, E-Cigarettes: Data, Intervention and Education, Use patterns and recovery, and Ingham County Health Department Licensure of vaping oil and pens.

COMPLAINTS:

During the month of March I responded to 16 calls for service; 10 of the 16 calls for service involved Holt Public Schools.

On March 1, a written bomb threat was located in a women's restroom at the High School on February 29. The person that wrote the threat was not known at the time; in addition it was not known what time the threat was written. The days following the threat, school was cancelled due to heavy snow fall; however, during that time Chris Billingslea and I had the opportunity to view video from February 29. We were able to narrow the possible suspects down to two students and tracked their movements until through the end of the school day.

Chris Billingslea took papers from the two girl's locker's to compare the handwriting to that on the wall. During this investigation one of the two girls stood out and a potential suspect. On Monday March 7, the potential suspect was interviewed by Detective Brad Delaney. Even after being presented with the evidence Chris and I obtained, and the fact the suspect parent also agreed that writing was the same the suspect would not confess to the writing the threat. Due to the fact that the suspect would not admit to the bomb threat the report was not forwarded to Ingham County Prosecutor's office.

On March 3, I received a dispatch call from a suspicious situation. A teenage female reported that she was walking on Holt Rd near Cedar St when a small vehicle with a young white male passenger and a young black male driver pulled up; the passenger rolled down the window and asked the teen if she wanted a ride then laughed. The driver then sped off west on Holt Rd. The teenaged female was not able to give a description of the vehicle, but believed that the males were of high school age. The area was checked but no suspect vehicle was located. However the teen did admit that she waited more than 15 minutes before she called her parent.

On March 7, while at Holt High School I received information from a school employee that two high school students and two non-Holt students were in the parking lot smoking marijuana. Upon arrival to the parking lot I was directed to the suspect vehicle. Four subjects, two males and two females were asked to exit the vehicle. When the doors to the vehicle opened I smelled a strong odor of fresh marijuana. A small baggie of marijuana was found on one of the males, cigarettes were found on both females. Both females were cited for minor in possession of tobacco; in addition, one of female was also cited for disorderly conduct when she became boisterous using foul language and refused to stop. A warrant request was submitted to Ingham County Prosecutor's Office for the male subject that was in possession of marijuana.

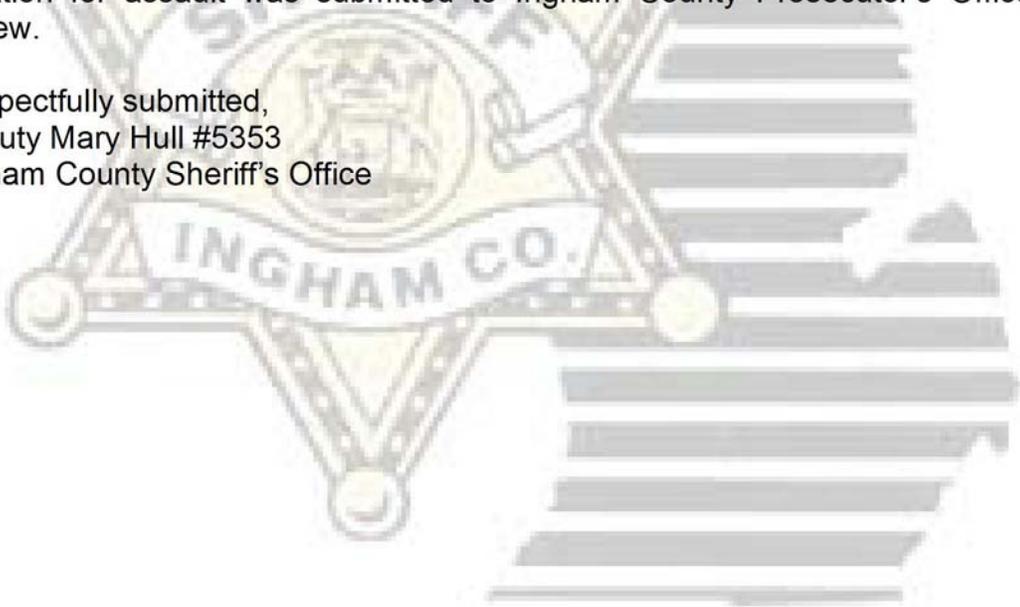
On March 18, I responded to Holt High School for a late domestic assault complaint. A 16 year old victim reported that her on again and off again boyfriend physically assaulted her sometime between January 4 and January 24, during passing time for second hour. The victim advised that she did not report the incident and would not have made a report if not for a friend that reported to school officials on March 18. The 16 year old suspect denied having assaulted the victim or ever doing anything that would constitute an assault. The report was forwarded to Ingham County Prosecutor's Office for review. The victim's parents were given Personal Protection Order information and the school principal was advised of the incident.

On March 18, I received a message from dispatch to call a victim of a fraud. Upon making contact with the victim she reported that she hired U-Save Moving and Storage to move her belongings from a moving truck to a third story apartment in November. The victim reported that she paid the \$300.00 fee using

her debit card at the time of the move. However in February the victim noticed that U-Save debited her account again for the same amount. When the victim called the business to question the charge she was told that this sort of problem happened before and she would be credited the charge. However, more than a month later and two more phone calls to the business the refund had not taken place. The victim was subsequently credited the money by her banking institution, but encouraged to file a police report. I made several attempts to contact the owner of the business both in person and by telephone, but was not successful.

On March 22, I took an assault report that occurred on March 17. The incident occurred at the Jr. High prior to beginning of the school day. The suspect female was videoed yelling at a female victim sitting on a bench in a hallway. The video then went viral on Facebook and other social media sites that afternoon. The day of the incident that victim's mother did not want a police report she only wanted information about Personal Protection Orders. However, after the video was put out on social media the victim was interviewed and a police report was completed. Although there was not a physical battery occurred the report and a petition for assault was submitted to Ingham County Prosecutor's Office for review.

Respectfully submitted,
Deputy Mary Hull #5353
Ingham County Sheriff's Office



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Chief Deputy

Sam Davis
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Joel Maatman
Major

TO: Lt. Vern Elliott
FROM: Deputy Cheryl Huhn #5430
DATE: 4/7/16
RE: March 2016 Monthly

STATISTICS:

Comm. Policing Hours:	15.3
Complaints taken:	22
Training:	26.0
Traffic stops:	10
Citations issued:	4
Arrests:	5
Contacts (school):	12
Contacts (business):	16

COMMUNITY POLICING ACTIVITY:

I attended the monthly Business Alliance meeting at Charlar Place.

I attended weekly sobriety court meetings at 55th District Court with Judge Allen. Each week we would discuss who was in compliance with the probation and who was in violation. If any individual absconded from the probation or was noncompliant then a warrant would be entered for their arrest. I would make arrangements to have those individuals picked up and arrested on the warrants.

During the month of March I assisted with maintaining the Ingham County Sheriff's Office // Delhi Division Facebook webpage.

I went to Tamarack Apartments and made contact with Stephanie Payne. Stephanie is the new manager of the complex. Erin Lyons is no longer working for the company due to medical issues. Stephanie advised that she did not know of any current issues going on in the complex.

I met with Rebecca Cousinaeu, the property manager at South Square Apartments. Rebecca advised that she is no longer living on site but she lives in the vicinity of the complex in case she is ever needed for an emergency situation. Rebecca advised that the complex is in the process of getting lock boxes on the outside of every building. Each lock box would contain a master key for that building so that Police and Fire would be able to gain access inside of the building. Rebecca advised that in the near future, South Square apartments will be transitioning over to Section 8 housing. Rebecca advised that there are a large number of vacant apartments in the complex that should start to fill as soon as they make the switch to Section 8. Rebecca and I were I advised Rebecca that under Federal Law it is illegal to smoke and process marihuana in Section 8 housing.

I went to the Township Offices and made contact with Dennis Lerner about concerns I had about the living conditions in a room at Happy's Inn Motel. I advised Dennis that there was a complaint that night shift dealt with where the person living at Happy's Inn told the Deputy that his room had been infested with bedbugs for the past year. Dennis advised that he would go to Happy's Inn and investigate the allegation.

I met with Ashley Gould the manager at Delhi Manor. Ashley advised that she is in the process of evicting the female that lives in lot #37. Ashley advised that she has court scheduled for 4-14-16. Ashley advised that the police have responded to multiple calls at lot #37. Ashley advised that evicting the female should clear up some of the complaints in the park.

I met with Andrea Powell at Huntly Villa Townhomes. Andrea advised that she was not aware of any issues that were going on right now in the complex.

OTHER MATTERS

During the month of March I responded to 22 calls for service. Some of these calls included a weapon complaint, domestic assault, suspicious situation, larceny, conditional bond violation, welfare check, assist other agency, and sex offender registration violation.

On 3-7-16 I responded to 1463 Clermont Rd to check an address of a registered sex offender. The sex offender was not in compliance and failed to register his address. Contact was made and I am seeking charges from the Ingham County Prosecutor's Office.

On 3-16-16 I responded to 2010 Adelpha Ave for a welfare check. A female did not show up for work and her son did not show up for school. I went to the duplex and no

one answered the door. I made contact with the reporting party via the telephone. The reporting party advised that she was in fear that something bad happened with the female because the female is going through a bad divorce and the husband lives in Bowling Green Ohio. I was able to contact Bowling Green Ohio Police Department and they checked the welfare of the female. Bowling Green reported back that they made contact with the female and everything was ok. The following week I was contacted by the female whose welfare I was checking on. The female advised that she was not okay when Bowling Green Police Department checked her welfare. The female advised that she was held against her will then she was later assaulted by her husband and he held a gun against her head. The female advised that ultimately her husband was arrested and she was able to come back to Michigan with the children.

On 3-16-16 I responded to 3933 Moonlight Lane to conduct address verification on a registered sex offender. Contact was made at the residence and the home owner reported that the sex offender moved out of his residence. The sex offender did not report a change of address. I am seeking charges from the Ingham County Prosecutor's Office.

On 3-24-16 I was dispatched to a PPO violation complaint. The female that I originally dealt with on 3-16-16 for a welfare check reported that her husband posted bond in Ohio and he came to Michigan to find her. The female advised that she was driving south bound on Onondaga Rd when she saw her husband driving her vehicle heading north bound. The female advised that her husband turned around and followed her to her mother's address on Onondaga Rd. The female advised that as she was being followed, she immediately called 911. The male continued south bound and was never located. The male is now wanted out of Ohio on outstanding warrants. I will be seeking a warrant on the male for conditional bond violation.

On 3-24-16 I took two late larceny complaints at the Delhi Township Office. Two males reported that their catalytic converters on their vehicles were stolen sometime during the night at South Square Apartments. There have been other larcenies of catalytic converters in the area but there have not been any leads for possible suspects.

On 3-28-16 I took a domestic assault complaint in Windmill Trailer Park. A male was arrested to assaulting his 8 month pregnant girlfriend.

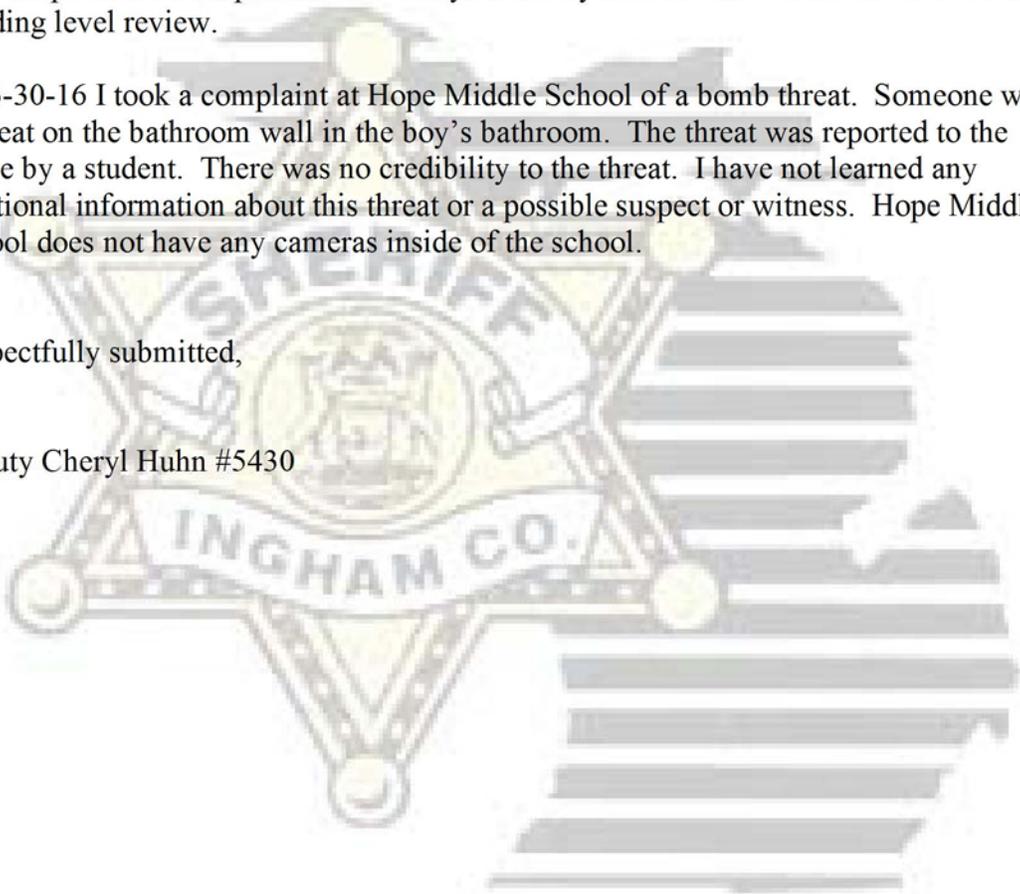
On 3-28-16 I took a domestic assault complaint on Pine Tree Rd. A female was assaulted by her boyfriend at the residence and then she went with him Meijer on Saginaw Street to get bandages to clean up the laceration on her face that she sustained from the assault. The female advised that as soon as she got into the parking lot, she exited the vehicle and the male tried to run her over with the vehicle. The female advised that witnesses called the police. The female reported that she went to the hospital and got medical treatment for the injuries. When we tried to contact the boyfriend at the residence, the boyfriend was hiding in the closet. The boyfriend was arrested and lodged at the Ingham County Jail.

On 3-29-16 I took a late weapons complaint at the Holt Junior High School. A female filled a threats complaint to Lansing Police Department on 3-28-16. The female told the LPD Officer that a boy that rides her bus threatened that he was going to shoot her. The female reported that approximately 1 week prior to the threat, the same boy had a handgun in his backpack on the bus. I followed up with the Holt Transportation Department and with Assistant Principle Mashell Failer. After reviewing the surveillance video the suspect was identified. No gun was seen in the video surveillance. Contact was made at the Holt Junior High with the possible suspect and his father. Through the investigation it was learned the the suspect hand an airsoft gun on the bus in his backpack. The suspect purchased the airsoft gun from another student on the school bus. Both suspects were suspended for 10 days and they cannot return to school without a building level review.

On 3-30-16 I took a complaint at Hope Middle School of a bomb threat. Someone wrote a threat on the bathroom wall in the boy's bathroom. The threat was reported to the office by a student. There was no credibility to the threat. I have not learned any additional information about this threat or a possible suspect or witness. Hope Middle School does not have any cameras inside of the school.

Respectfully submitted,

Deputy Cheryl Huhn #5430



Delhi Township Fire Department Monthly Report

March, 2016

Total Calls

	<i>Delhi</i>	<i>Alaiedon</i>	<i>Total</i>
EMS / Medical	213	0	213
Fire / Rescue	48	0	48
Total Calls	261	0	261
Staff Hours	470.52	0	470.52

Total calls in 2016: 764

Total calls for 2015: 3,342

Inspections

Commercial Fire Inspections – 6
Plan Reviews – 3 (including Alaiedon)

Training

225 Personnel participated in 323.5 Hours of Training

Mutual Aid: Given – 15 Received – 5 Auto Aid- 35
Overlapping Calls - 59

Miscellaneous

- March 4 2500 Blk. Jolly Motor Vehicle Colission
- March 8 2000 Blk. Washington Vehicle Fire
- March 16 Assist Mason Fire on a possible apartment fire
- March 21 3700 Blk. Cornice Falls Grass Fire
- March 26 Assist Mason Fire on a dryer fire in a building

DELHI CHARTER TOWNSHIP
Department of Community Development
March 2016 Activity Report

New Permits:

<u>Category</u>	<u>DDA Area Permits</u>	<u>Total Permits</u>	<u>Total Inspections</u>
Building	6	36	85
Electrical	6	47	60
Mechanical	8	74	139
Plumbing	9	44	95
Fire Inspections	N/A	N/A	N/A
Totals	29	201	379

Soil Erosion Permits & APA Projects:

<u>Category</u>	<u>DDA Area Permits</u>	<u>Total Permits/New Projects</u>	<u>Total Inspections</u>
Soil Erosion	2	9	72
Soil Erosion Waivers	3	3	0
APA Projects	0	0	0
Totals	5	12	72

New Code Enforcement Cases:

<u>Category</u>	<u>DDA Area Cases</u>	<u>Total Cases</u>
Building Maintenance	0	3
Fence Violation	0	0
Junk & Debris	3	7
Junk Vehicles	5	10
Miscellaneous	2	3
Noxious Weeds	0	0
Sidewalk Snow	0	2
Sign	1	1
Site Plan	0	0
Yard Parking	5	6
Improper Zoning Use	0	2
Totals	16	34
Total # of Inspections	23	

Rental Program Information:

Number of New Registered Rental Properties	0
Number of Rental Re-inspections	71
Number of Rental Investigations	1
Number of Rental Cycle Inspections	118

Civil Infraction/Abatement Information:

Abatement/Clean-ups	0
<i>Abatement/Clean-up Fees Issued (Year to date)</i>	\$228.95
Civil Infractions Issued	2
<i>Civil Infraction Fines Issued (Year to date)</i>	\$425.00

DELHI CHARTER TOWNSHIP
Building Permit Details

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 # of
 Permits

Permit No.	Property Address	Permit Applicant	Work Description	Estimated Cost	Permit Fee	DDA?	# of Permits
COMMERCIAL ALTERATION							
PB16-068	2380 CEDAR ST 202	BROOKSIDE INTERIORS	DEMOLITION - 10' X 12' DECK - 20,000 SQ FT.	\$234,000	\$1,801.80	Y	
PB16-077	2495 CEDAR ST A01	KROGER	MINOR INTERIOR RENOVATIONS FOR NEW ONLINE ORDER PROGRAM	\$40,000	\$308.00		
COMMERCIAL ALTERATION				\$274,000	\$2,109.80		Total: 2
DECK							
PB16-074	4404 WILLOUGHBY ROAD	CARPENTER, DEBRA	REPLACING EXISTING CONCRETE PORCH WITH WOOD DECK	\$3,817	\$100.00	Y	
PB16-075	3620 FERNWOOD LANE	BRIAN GUILFORD	10 X 12 (APPROX) DECK - 6' OFF THE GROUND	\$1,496	\$100.00	Y	
DECK				\$5,313	\$200.00		Total: 2
FENCE							
PB16-067	2240 BEECHNUT TRAIL	ARTISTIC POOLS & CONCRETE LLC	INSTALL 48" ALUMINUM POOL CODE FENCE WITH SELF-CLOSING & LATCHING GATES	\$0	\$60.00		
PB16-092	1817 MAPLE STREET	THOMPSON, PATRICK	INSTALL A 4' PRIVACY FENCE ALONG BACK LOT LINE	\$0	\$60.00		
PB16-099	2253 TIFFANY LANE	HOOD, KAREN	INSTALL 4' CHAIN LINK FENCE IN REAR YARD	\$0	\$60.00		
FENCE				\$0	\$180.00		Total: 3
POOL							
PB16-066	2240 BEECHNUT TRAIL	ARTISTIC POOLS & CONCRETE LLC	INSTALL 28' X 18' X 40' INGROUND STEEL WALL, VINYL LINED POOL	\$0	\$60.00		
POOL				\$0	\$60.00		Total: 1
RESIDENTIAL ADDITION							
PB16-080	5239 WITHERSPOON WAY	TRUELOVE HOMES	12' X 16' ADDITION ON EXISTING DECK	\$19,200	\$140.00		
RESIDENTIAL ADDITION				\$19,200	\$140.00		Total: 1

DELHI CHARTER TOWNSHIP

Building Permit Details

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Permits

Permit No.	Property Address	Permit Applicant	Work Description	Estimated Cost	Permit Fee	DDA?	# of Permits
RESIDENTIAL ALTERATION							
PB16-076	2240 MOORWOOD DRIVE	BLH CONSTRUCTION	400 SQ FT BASEMENT FINISH WITH FULL BATH	\$9,600	\$70.00		
PB16-084	1833 HAMILTON STREET	PERDUE, DONALD L	DEMO EXISTING GARAGE & BATHROOM DUE TO FIRE & BUILD NEW GARAGE & NEW BATHROOM	\$30,000	\$210.00		
PB16-085	2096 SUNSHINE PEAK DRIVE	MAYBERRY HOMES, INC.	BASEMENT FINISH	\$0	\$77.00		
PB16-086	2088 SUNSHINE PEAK DRIVE	MAYBERRY HOMES, INC.	BASEMENT FINISH	\$10,320	\$77.00		
PB16-087	2080 SUNSHINE PEAK DRIVE	MAYBERRY HOMES, INC.	BASEMENT FINISH	\$0	\$77.00		
PB16-088	2086 SUNSHINE PEAK DRIVE	MAYBERRY HOMES, INC.	BASEMENT FINISH	\$15,840	\$112.00		
PB16-098	2164 CEDAR BEND DRIVE	G C FRONTIER BUILDERS INC	FINISH BASEMENT (552 SQ FT) WITH EGRESS WINDOW	\$13,248	\$98.00		
PB16-100	2084 SUNSHINE PEAK DRIVE	MAYBERRY HOMES, INC.	BASEMENT FINISH - 430 SQ. FT.	\$10,320	\$0.00		
RESIDENTIAL ALTERATION				\$89,328	\$721.00		Total: 8
RESIDENTIAL DWELLING/GARAGE							
PB16-070	1120 MATTHAEI COURT	ALLEN EDWIN HOMES	CONSTRUCTING SINGLE FAMILY HOME	\$229,137	\$1,610.00		
PB16-071	1117 MATTHAEI COURT	ALLEN EDWIN HOMES	CONSTRUCTING SINGLE FAMILY HOME	\$261,193	\$1,834.00		
PB16-072	1126 MATTHAEI COURT	ALLEN EDWIN HOMES	CONSTRUCTING SINGLE FAMILY HOME	\$157,734	\$1,106.00		
PB16-078	1510 CATALINA DRIVE	COUNTRY VIEW ESTATES LLC	1632 SQ FT SINGLE FAMILY DWELLING	\$192,036	\$1,351.00		
PB16-079	1141 MATTHAEI COURT	MAYBERRY HOMES, INC.	CONSTRUCT A 2,444 SQ FT SINGLE FAMILY DWELLING	\$248,036	\$1,743.00		
PB16-101	1696 JUNIPER PLACE	ALLEN EDWIN HOMES	2088 SQ FT SINGLE FAMILY DWELLING	\$235,120	\$1,652.00		
RESIDENTIAL DWELLING/GARAGE				\$1,323,256	\$9,296.00		Total: 6

DELHI CHARTER TOWNSHIP

Building Permit Details

Permit No.	Property Address	Permit Applicant	Work Description	Estimated Cost	Permit Fee	DDA?	
RESIDENTIAL MISCELLANEOUS							
PB16-065	2212 AUBURN AVENUE	R. HACKBARTH & SON	INSTALL SUPPORT POST ON REAR LEAN TO ROOF & UPGRADE HEADER	\$1,200	\$60.00		
PB16-069	1982 WALNUT STREET	AMERICA REMODELING BUILDING	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00		
PB16-073	4682 CRAMPTON WAY	HOME PRO ROOFING	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00		
PB16-081	3818 HOLT ROAD	SIMON ROOFING	TEAR OFF AND RE-ROOF EXISTING DWELLING - FRONT & SIDE	\$0	\$60.00	Y	
PB16-083	2060 HAMILTON STREET	TATE, TERRIE & CASSANDRA	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00		
PB16-089	3585 FERNWOOD LANE	MAYBERRY HOMES, INC.	14 x 12' DECK AND 528 SQ. FT. BASEMENT FINISH	\$14,520	\$105.00		
PB16-090	3081 ROSEHILL DRIVE	PALMER CONSTRUCTION SERVICES LLC	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00		
PB16-091	2225 CALYPSO LANE	HOME PRO ROOFING	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00	Y	
PB16-094	1518 HOLBROOK DRIVE	TODD R HOVEY	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00	Y	
PB16-095	4681 CRAMPTON WAY	JIMMERSON ROOFING	TEAR OFF AND RE-ROOF	\$8,000	\$60.00		
PB16-097	1250 AURELIUS ROAD	PALMER CONSTRUCTION SERVICES LLC	TEAR OFF AND RE-ROOF EXISTING DWELLING	\$8,000	\$60.00		
RESIDENTIAL MISCELLANEOUS				\$79,720	\$705.00	Total: 11	
RESIDENTIAL STORAGE/GARAGE							
PB16-093	6098 NICHOLS ROAD	JECKS, STEVEN EDWARD	CONSTRUCT A 20 FT X 40 FT POLE BARN	\$21,840	\$150.00		
PB16-096	1828 MERGANSER DRIVE	GARBER, JESSIE N & AMANDA S	CONSTRUCT A 12' X 20' SHED	\$6,000	\$150.00		
RESIDENTIAL STORAGE/GARAGE				\$27,840	\$300.00	Total: 2	

DELHI CHARTER TOWNSHIP
Building Permit Details

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Permits

Permit No.	Property Address	Permit Applicant	Work Description	Estimated Cost	Permit Fee	DDA?	
Totals:				\$1,818,657	\$13,711.80		36

Permit.DateIssued Between 3/1/2016 12:00:00 AM AND
3/31/2016 11:59:59 PM
AND
Permit.PermitType = Building OR
Permit.PermitType = Sign

SUMMARY OF CONSTRUCTION VALUES

Year	2010		2011		2012		2013		2014		2015	
	Total Permits	Total Value	Total Permits	Total Value	Total Permits	Total Value	Total Permits	Total Value	Total Permits	Total Value	Total Permits	Total Value
Commercial Addition, Alteration & Commercial Misc	27	\$ 1,665,320.00	37	\$1,029,347.00	38	\$3,549,664.00	37	\$3,970,461.00	29	\$1,475,494.00	40	\$ 2,009,133.00
Commercial New Structures	3	\$ 1,712,188.00	5	\$3,951,772.00	4	\$906,716.00	1	\$396,560.00	3	\$164,680.00	7	\$ 1,401,179.00
Commercial Sub-Totals	30	\$ 3,377,508.00	42	\$ 4,981,119.00	42	\$ 4,456,380.00	38	\$4,367,021.00	32	\$1,640,174.00	47	\$ 3,410,312.00
Deck, Fence, Pool, Residential Misc, Residential Storage/Garage, Demolition, Sign, Sign Business, Sign Grand Openings	372	\$ 2,103,596.00	233	\$ 1,262,153.00	243	\$ 1,097,292.00	305	\$ 1,433,877.00	295	\$ 1,270,494.00	332	\$ 1,480,872.00
Pre-Manufactured Home, Residential Condo w/Garage, Residential Dwelling, Residential Dwelling/Garage	37	\$ 5,998,675.00	28	\$ 3,849,279.00	25	\$ 3,065,174.00	37	\$ 7,191,454.00	59	\$ 10,028,527.00	168	\$ 16,725,746.00
Residential Addition, Residential Alteration	51	\$ 1,105,827.00	46	\$ 1,021,182.00	48	\$ 1,055,333.00	46	\$ 774,740.00	47	\$ 984,157.00	50	\$ 1,031,243.00
Residential Multiple Family & Apartment Units	2	\$ 1,237,795.00	3	\$ 3,694,734.00	0	\$ -	3	\$ 4,098,671.00	5	\$ 6,512,129.00	9	\$ 6,982,113.00
Residential Sub-Totals	462	\$ 10,445,893.00	310	\$ 9,827,348.00	316	\$ 5,217,799.00	391	\$ 13,498,742.00	406	\$ 18,795,307.00	559	\$ 26,219,974.00

2016 Year to date Construction Values:

Commercial / Industrial:	\$ 274,000.00
Residential:	\$ 1,544,657.00
Total Single Family Homes:	6

**DELHI CHARTER TOWNSHIP
MINUTES OF REGULAR MEETING HELD ON APRIL 19, 2016**

Delhi Charter Township Board of Trustees met in a regular meeting on Tuesday, April 19, 2016 in the Multipurpose Room at the Community Services Center, 2074 Aurelius Road, Holt, Michigan. Supervisor Davis called the meeting to order at 7:30 p.m.

PLEDGE OF ALLEGIANCE

ROLL CALL

Members Present: Supervisor C.J. Davis, Clerk Evan Hope, Treasurer Roy Sweet, Trustees Jon Harmon, John Hayhoe, DiAnne Warfield

Members Absent: Trustee Megan Ketchum

COMMENTS FROM THE PUBLIC – Blake Kelly, 1556 Stonehaven Dr., commented on the need for streetlights on Wilcox Road and Laurel Drive.

Tom Cochran, State Representative, 67th District – congratulated the Board members that are not seeking re-election on their time served on the Township Board.

Derrick Quinney, Ingham County Register of Deeds, addressed the Board.

CONSENT AGENDA

- A. Approval of Minutes – Committee Meeting of April 5, 2016
- B. Approval of Minutes – Regular Meeting of April 5, 2016
- C. Approval of Claims – April 12, 2016 (ATTACHMENT I)
- D. Approval of Payroll – April 7, 2016 (ATTACHMENT II)
- E. Request for Proposals for Public Art Sculpture (ATTACHMENT III)
- F. Cancel May 17, 2016 Committee of the Whole Meeting and Schedule Joint School Board Meeting (ATTACHMENT IV)
- G. Set Public Hearing on the Application of a Proposed Brownfield Redevelopment Plan (4136 and 4184 Willoughby Road) (ATTACHMENT V)

Harmon moved to approve the Consent Agenda as presented.

A Roll Call Vote was recorded as follows:
Ayes: Warfield, Davis, Harmon, Hayhoe, Hope, Sweet
Absent: Ketchum

MOTION CARRIED

SUBJECT TO APPROVAL

**DELHI CHARTER TOWNSHIP
MINUTES OF REGULAR MEETING HELD ON APRIL 19, 2016**

NEW BUSINESS

RESOLUTION NO. 2016-003 – TRI-COUNTY REGIONAL HAZARD MITIGATION PLAN

The Board reviewed memorandums dated April 13, 2016 from Twp. Mgr. Elsinga and April 12, 2016 from Brian Ball, Fire Chief (ATTACHMENT VI).

Hayhoe moved to adopt Resolution No. 2016-003 which adopts the Tri-County Regional Hazard Mitigation Plan effective April 19, 2016.

A Roll Call Vote was recorded as follows:

Ayes: Davis, Harmon, Hayhoe, Hope, Sweet, Warfield

Absent: Ketchum

MOTION CARRIED

RESOLUTION NO. 2016-004 – AUTHORIZING THE ISSUANCE AND DELEGATING THE SALE OF CHARTER TOWNSHIP OF DELHI 2016 REFUNDING BONDS

The Board reviewed a memorandum dated April 15, 2016 from Twp. Mgr. Elsinga (ATTACHMENT VII).

Harmon moved to adopt Resolution No. 2016-004 authorizing the issuance and delegating the sale of Charter Township of Delhi 2016 Refunding Bonds.

Fredric Heidemann, Thrun Law Firm and Andrew Campbell, Umbaugh & Associates, gave a summary of the 2016 refunding bonds for the Series 2011 Bonds which were used to finance both sewage and water capital improvement projects in 2002. The sole purpose of these 2016 refunding bonds is to save approximately \$80,000 on the interest payments through 2022.

It was stated that the average true interest rate on the Bonds shall not exceed 4% and the present value savings from the refunding shall not be less than 1% of the par of the prior Bonds. However, industry standards state that at any refunding you should get at least 1%-2% at the very minimum unless you are eliminating a covenant. Mr. Campbell stated that the Township would not get a recommendation from Umbaugh & Associates unless they get at least 2.5% of the par of the prior Bonds.

Trustee Harmon questioned why the floor was set at 1% if a recommendation is not going to be given for less than 2.5%. It was stated that Twp. Mgr. Elsinga has the authorization to accept anything 1% and above; however, it would be unlikely that he would.

Amendment to Motion:

Harmon moved to amend paragraph 19 b. to set the floor at 2% so that it would read “the present value savings from the refunding shall not be less than 2% of the par of the Prior Bonds;”

Roll Call on Amended Motion

A Roll Call Vote on the amended motion was recorded as follows:

Ayes: Harmon, Warfield, Davis

Nays: Hayhoe, Hope, Sweet

SUBJECT TO APPROVAL

**DELHI CHARTER TOWNSHIP
MINUTES OF REGULAR MEETING HELD ON APRIL 19, 2016**

Absent: Ketchum
MOTION FAILED

Roll Call on Main Motion

A Roll Call Vote on the mail motion was recorded as follows:

Ayes: Hayhoe, Hope, Sweet, Warfield, Davis

Nays: Harmon

Absent: Ketchum

MOTION CARRIED

FARM LAND PROPERTY LEASE BETWEEN DELHI CHARTER TOWNSHIP AND MICHAEL WEBB - 2016

The Board reviewed memorandums dated April 14, 2016 from Twp. Mgr. Elsinga and April 13, 2016 from Sandra Diorka, Director of Public Services (ATTACHMENT VIII).

Hayhoe moved to approve the Property Lease between Delhi Charter Township and Michael Webb for a one year term commencing upon execution and expiring December 31, 2016.

A Roll Call Vote was recorded as follows:

Ayes: Hayhoe, Hope, Sweet, Warfield, Davis, Harmon

Absent: Ketchum

MOTION CARRIED

FARM LAND PROPERTY LEASE BETWEEN DELHI CHARTER TOWNSHIP AND MICHAEL WEBB – 2017-2020

The Board reviewed memorandums dated April 14, 2016 from Twp. Mgr. Elsinga and April 13, 2016 from Sandra Diorka, Director of Public Services (ATTACHMENT IX).

Warfield moved to approve the Property Lease between Delhi Charter Township and Michael Webb for a four year term commencing January 1, 2017 and expiring December 31, 2020.

A Roll Call Vote was recorded as follows:

Ayes: Hope, Sweet, Warfield, Davis, Harmon, Hayhoe

Absent: Ketchum

MOTION CARRIED

REPORTS

SUPERVISOR

Supervisor Davis reported on the Supervisors Panel Discussion hosted by the Holt/Delhi Historical Society on April 13, 2016.

The World War II video project is moving forward. Supervisor Davis stated that donations are being accepted for the editing of the video presentation.

SUBJECT TO APPROVAL

**DELHI CHARTER TOWNSHIP
MINUTES OF REGULAR MEETING HELD ON APRIL 19, 2016**

Supervisor Davis stated that the Township will be celebrating its 175th Anniversary in 2017 and suggested budgeting funds to support this celebration.

TREASURER

Treasurer Sweet reported on the 1st Quarter Investment Report (ATTACHMENT X).

TRUSTEES

Trustee Hayhoe stated that there will be a ribbon cutting at the Hubbell, Roth & Clark offices on Aurelius Road on April 21, 2016. The Sam Corey Senior Citizen Center will be hosting a senior services expo on April 30, 2016.

TOWNSHIP MANAGER

Twp. Mgr. Elsinga reported on the first brush drop off of the year using a new setup.

LIMITED PUBLIC COMMENTS – Nick Johnson, 2575 Hummingbird Lane, spoke in regards to the Brownfield Plan #6 (proposed development of 4136 and 4184 Willoughby Road).

ADJOURNMENT

Meeting adjourned at 8:25 p.m.

Date: May 3, 2016

Evan Hope, Township Clerk

Date: May 3, 2016

C.J. Davis, Supervisor

/af

SUBJECT TO APPROVAL

ACCOUNTS PAYABLE APPROVAL

April 12, 2016

I. Certification of Authorized Signatures: The attached Check Register and Invoice Distribution Report encompass checks dated April 12, 2016 numbered 91123 thru 91200 & ACH 4130 thru 4158. Every invoice has a payment authorizing signature(s).

Dated: April 12, 2016

Lora Behnke, Accounting Clerk

II. Certification of Fund Totals:

The attached Invoice Distribution Report and Check Register for checks dated April 12, 2016 show payments made from the following funds:

General Fund	\$	64,364.31
Fire Fund		9,246.21
Fire Equip. & Apparatus Fund		2,984.32
Downtown Development Fund		5,563.33
Sewer Fund		41,812.35
Local Site Remediation Fund		8,100.00
Trust & Agency Fund		4,707.16
Grand Total	\$	<u>136,777.68</u>

Includes the following to be reimbursed from separate bank accounts:

Employee Flexible Spending Acct	\$	2,709.82
Farmer's Market Account	\$	2,348.00

Dated: April 12, 2016

John B. Elsinga, Township Manager

III. Approval for Distribution: I have reviewed the above checks and invoices and all of them should be distributed. All invoices over \$10,000.00 have been approved by general policy or previous motions of the board. (None)

Dated: April 12, 2016

John B. Elsinga, Township Manager

Evan Hope, Township Clerk

Roy W. Sweet, Treasurer

IV Board Audit and Approval: At a regular meeting of the Township Board held on April 19, 2016 a motion was made by _____ and passed by ___yes votes and ___no votes (____absent) that the list of claims dated April 12, 2016, was reviewed, audited and approved

Evan Hope, Township Clerk

INVOICE GL DISTRIBUTION REPORT FOR DELHI CHARTER TOWNSHIP
 EXP CHECK RUN DATES 04/12/2016 - 04/12/2016

Vendor	Invoice Line Desc	Amount
Fund 101 GENERAL FUND		
Dept 000.00		
MATTHEW WOOTEN	AFLAC REFUND	23.22
		23.22
Dept 171.00 MANAGER		
BANK OF AMERICA	PARKING/ELSINGA	10.00
BANK OF AMERICA	PARKING/ELSINGA	9.00
BANK OF AMERICA	PARKING/ELSINGA	4.00
BANK OF AMERICA	PARKING/ELSINGA	9.00
BANK OF AMERICA	LUNCH/HONEYWELL	64.49
MICHIGAN.COM	JOB POSTING	1,628.80
	Total For Dept 171.00 MANAGER	1,725.29
Dept 215.00 CLERK		
BANK OF AMERICA	DOCUMENT SHREDDING	150.32
MICHIGAN.COM	PUBLISHING LEGALS	680.55
	Total For Dept 215.00 CLERK	830.87
Dept 228.00 INFORMATION TECHNOLOGY		
BANK OF AMERICA	REMOTE CONNECTION SOFTWARE	30.00
BANK OF AMERICA	INTERNATIONAL TRANSACTION FEE	0.24
BANK OF AMERICA	AC ADAPTER	57.99
DELHI CHARTER TOWNSHIP-I.T.	(2) 8GB RAM MEMORY	78.00
DELHI CHARTER TOWNSHIP-I.T.	5-PORT GIGABIT ETHERNET SWITCH	29.99
DELHI CHARTER TOWNSHIP-I.T.	3 PK BLACK LASER TONER CARTRIDGE	37.86
DELHI CHARTER TOWNSHIP-I.T.	CABLE & SHIPPING/MURPHY	24.24
DELHI CHARTER TOWNSHIP-I.T.	(4) TONERS	164.88
DELHI CHARTER TOWNSHIP-I.T.	UNIVERSAL BATTERY TESTER	5.98
DELHI CHARTER TOWNSHIP-I.T.	9 CELL LI-ION LAPTOP BATTERY	33.99
DELHI CHARTER TOWNSHIP-I.T.	COMPACT FLASH MULTI CARD READER	14.99
ACD.NET, INC.	ACD FIBER MONTHLY	616.00
BANK OF AMERICA	2 PRINTERS-ASSG & COM DEV/TONER/	387.97
	Total For Dept 228.00 INFORMATION TECHNOLOGY	1,482.13
Dept 253.00 TREASURERS		
55TH DISTRICT COURT	DISCOVERY SUBPOENA	15.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	15.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	15.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	15.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	15.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
55TH DISTRICT COURT	DISCOVERY SUBPOENA	25.00
	Total For Dept 253.00 TREASURERS	200.00

Dept 257.00 ASSESSING		
BANK OF AMERICA	TIMER/BOARD OF REVIEW HEARINGS	5.29
BANK OF AMERICA	THUMB DRIVE FOR ASSESSMENT ROLL	9.99
DELTA CHARTER TOWNSHIP	ASSESSING FEES APRIL	2,000.00
MICHIGAN ASSESSORS ASSOC	MI CERTIFIED ASSESSING TECH COURSE	200.00
MICHIGAN ASSESSORS ASSOC	JOURNEY TO A SIGNED ASSESSMENT	150.00
	Total For Dept 257.00 ASSESSING	2,365.28

Dept 262.00 ELECTIONS		
BANK OF AMERICA	2 BOXES PENS/ELECTION USE	11.98
BANK OF AMERICA	ENVELOPES 5/3/16 ELECTION	29.99
BANK OF AMERICA	ENVELOPES 5/3/16 ELECTION	29.99
BANK OF AMERICA	ENVELOPES RETURNED	(29.99)
BANK OF AMERICA	I VOTED STICKERS	125.72
BANK OF AMERICA	I VOTED ABSENTEE STICKERS	95.40
PRINTING SYSTEMS, INC.	3,000 VOTER ID CARDS	326.25
PRINTING SYSTEMS, INC.	FREIGHT	16.48
MICHIGAN.COM	PUBLISHING LEGALS	181.90
BANK OF AMERICA	AV COUNTING BD LUNCH 3/8/16	66.78
BANK OF AMERICA	AV COUNTING BD DINNER 3/8/16	39.37
BANK OF AMERICA	AV COUNTING BD DINNER 3/8/16	17.74
	Total For Dept 262.00 ELECTIONS	911.61

Dept 265.00 BUILDING & GROUNDS		
LANSING ICE & FUEL CO	GASOLINE 3/26-31/2016	105.26
MODEL COVERALL SERVICE	UNIFORM/POWERS	11.69
MODEL COVERALL SERVICE	UNIFORM/POWERS	11.69
ZEP SALES & SERVICE	CASE OF TRANQUIL MEADOWS	59.24
ZEP SALES & SERVICE	SHIPPING	25.90
QUALITY FIRST MAID SERVICE	CLEANING SERVICES/CSC	812.50
METRONET LONG DISTANCE	LONG DISTANCE MARCH	27.51
TDS METROCOM	LOCAL SERVICE MARCH	1,101.79
B & D ELECTRIC, INC.	CRANE RENTAL/STREET LIGHT	236.50
B & D ELECTRIC, INC.	ELECTRICAL LABOR/STREET LIGHT	682.50
DELHI CHARTER TOWNSHIP-I.T.	ALARM LOCK PILFERGARD DUAL PIEZO	40.00
SIEMENS INDUSTRY, INC.	BUILDING MAINTENANCE & REPAIRS	3,674.46
ACE HARDWARE	8 PC SCREWDRIVER SET/4 CAULK CAPS	15.95
SAFETY SYSTEMS, INC	LIBRARY DOOR ALARM	116.00
WESCO DISTRIBUTION, INC	12LED BULBS FOR THE CAN LIGHTS	516.00
SALLY DEGNAN	BURIAL PLOT BUY BACK	750.00
	Total For Dept 265.00 BUILDING & GROUNDS	8,186.99

Dept 281.00 STORMWATER		
STATE OF MICHIGAN	2016 STORMWATER ANNUAL PERMIT	500.00
	Total For Dept 281.00 STORMWATER	500.00

Dept 446.00 INFRASTRUCTURE		
CONSUMERS ENERGY	STREETLIGHTS ACCT#6730	18,333.07
CONSUMERS ENERGY	STREETLIGHTS ACCT#7043	92.40
HUBBELL, ROTH & CLARK, INC	RAM TRAIL PHASE II PLANS & SPEC	2,257.59
HUBBELL, ROTH & CLARK, INC	RAM TRAIL CONTRACT ADMINISTRATION	1,235.04
HUBBELL, ROTH & CLARK, INC	RAM TRAIL TESTING	3,770.25
	Total For Dept 446.00 INFRASTRUCTURE	25,688.35

Dept 721.00 PLANNING/COMMUNITY DEVELOPMENT		
D & M SILKSCREENING	COAT/MASTIN	70.00
LEWIS PAPER INTERNATIONAL	COPY PAPER	104.40
LANSING ICE & FUEL CO	GASOLINE 3/16-31/2016	99.72
BANK OF AMERICA	POSTAGE FOR MAILING PACKETS	10.20
BANK OF AMERICA	CEDAR STREET PLAN STAFF LUNCH	49.90
BANK OF AMERICA	RELIZE CEDAR CARDS	56.00
METRONET LONG DISTANCE	LONG DISTANCE MARCH	15.83
TDS METROCOM	LOCAL SERVICE MARCH	55.94
MICHIGAN.COM	PUBLISHING LEGAL	132.46
BANK OF AMERICA	GROVE ST-DEMO REBUILD FEES	655.00
CHIRCO TITLE AGENCY, INC.	TITLE WORK 1746 WAVERLY RD.	250.00
PLUMBING INSPECTORS ASSOC	PIAM SPRING CONFERENCE/SIMONS	380.00
Total For Dept 721.00 PLANNING/COMMUNITY DEVELOPMENT		1,879.45

Dept 752.00 PARKS ADMINISTRATION		
METRONET LONG DISTANCE	LONG DISTANCE MARCH	0.29
TDS METROCOM	PHONES/SENIOR CENTER	297.80
TDS METROCOM	LOCAL SERVICE MARCH	98.11
INGHAM COUNTY HEALTH DEP	FOOD SERVICE LICENSE- SENIOR CTR	470.00
Total For Dept 752.00 PARKS ADMINISTRATION		866.20

Dept 771.00 PARKS		
LANSING ICE & FUEL CO	GASOLINE 3/16-31/2016	153.06
MODEL COVERALL SERVICE	UNIFORM PANTS	14.48
MODEL COVERALL SERVICE	UNIFORM PANTS	14.48
ACE HARDWARE	1 MISC. MDSE.	1.39
ACE HARDWARE	2 DURA C BATTERIES	17.98
AMERICAN RENTALS, INC.	PORTABLE TOILET	140.00
AMERICAN RENTALS, INC.	PORTABLE TOILET	140.00
QUALITY FIRST MAID SERVICE	CLEANING SERVICES/SENIOR CENTER	260.00
BOARD OF WATER & LIGHT	WATER 4030 KELLER	37.48
CONSUMERS ENERGY	ELECTRIC 1771 MAPLE	81.53
B & D ELECTRIC, INC.	INSTALL LED LIGHT HEADS/SENIOR CTR	727.00
H & H WELDING & REPAIR LLC	SKATE PARK RAMP PARTS & LABOR	314.00
ACE HARDWARE	EXT TUBE/SLIP JOINT NUT/TRAP	14.47
ACE HARDWARE	2 STAINLESS STEEL CLEANER	12.98
LOWE'S CREDIT SERVICES	SCREWS & HANDLE/SENIOR CENTER	3.18
MENARDS LANSING SOUTH	PLUMBING SUPPLIES/RESTROOM	108.65
WESCO DISTRIBUTION, INC	LED RETRO FIT KIT FOR POLE LAMPS	2,788.26
ACE HARDWARE	3 BLUE PAINT/SKATE PARK	11.97
ACE HARDWARE	2 SPRAY PAINT/SKATE PARK	9.98
POLLY PRODUCTS	REPAIRS TO TRAIL HEAD SIGN PARK	823.00
BANK OF AMERICA	2 AIR FILTERS/2 SPARK PLUGS/2 DRAIN	291.38
BANK OF AMERICA	FWD & REV SWITCH ASY/GOLF CART	211.98
BANK OF AMERICA	LIGHT ASSEMBLY & SHIPPING/FOUNTAIN	1,036.00
SPARTAN DISTRIBUTORS	6 OIL FILTERS/7 BLADES/2 V-BELTS/2	632.96
THE PARTS PLACE	BATTERY/#44	104.31
FRANKIE D'S AUTO & TRUCK	LOF/REPLACE BRAKE LINES/LABOR/#44	222.00
FRANKIE D'S AUTO & TRUCK	SPARK PLUGS/IGNITION COIL/LOF/#41	530.00
Total For Dept 771.00 PARKS		8,702.52

Dept 774.00 RECREATION

BANK OF AMERICA	2 EASTER BASKETS/EASTER EGG HUNT	30.58
JOHNNY MAC'S	1 MEGAPHONE	89.99
M.A.S.A.	SOFTBALLS	380.00
O'LEARY PAINT CO.	PAINT FOR BALLFIELD RESTROOMS	405.06
BANK OF AMERICA	YMCA VOLLEYBALL TEAM REGISTRATION	30.00
	Total For Dept 774.00 RECREATION	<u>935.63</u>

Dept 850.00 OTHER FUNCTIONS

BANK OF AMERICA	TOWNSHIP LETTERHEAD	149.80
BANK OF AMERICA	#10 TOWNSHIP ENVELOPES	204.93
EXTEND YOUR REACH	50 CERTIFIED WINDOW ENVELOPES	12.00
LEWIS PAPER INTERNATIONAL	FUEL SERCHARGE	5.00
LEWIS PAPER INTERNATIONAL	COPY PAPER	574.20
BANK OF AMERICA	POSTAGE	2.40
MEDICAL MANAGEMENT SYST	AMBULANCE BILLING FEES MARCH	3,597.89
BANK OF AMERICA	WEB HOSTING - GIS 3/10-4/9/16	1.00
BANK OF AMERICA	WEB HOSTING - BUSINESS 3/10-6/9/16	65.85
BANK OF AMERICA	FACEBOOK ADS	250.03
BANK OF AMERICA	AT&T LED SIGN 3/16-4/15/16	93.88
BANK OF AMERICA	WUFOO SUBSCRIPTION 3/26-4/26/16	9.00
BANK OF AMERICA	FACEBOOK ADS	500.14
BANK OF AMERICA	FACEBOOK ADS	50.21
BANK OF AMERICA	MUSIC SERVICE/CSC	24.95
BANK OF AMERICA	REFRESHMENTS/QUARTERLY MEETING	18.07
BANK OF AMERICA	REFRESHMENTS/QUARTERLY MEETING	37.92
CLEARWATER MEDIA PARTNER	PRODUCE "HAPPY IN HOLT" VIDEO	2,100.00
INGHAM COUNTY TREASURER	MTT BOR PREVIOUS YEARS	2,369.50
	Total For Dept 850.00 OTHER FUNCTIONS	<u>10,066.77</u>

Total For Fund 101 GENERAL FUND 64,364.31

Fund 206 FIRE FUND

Dept 336.00 FIRE DEPARTMENT

BANK OF AMERICA	500 BUSINESS CARDS/SHIPPING/TAX	26.49
LEWIS PAPER INTERNATIONAL	COPY PAPER	78.30
LANSING ICE & FUEL CO	GASOLINE 3/16-31/2016	605.36
LANSING UNIFORM CO	2 BADGES/CLOTHING/4 LOGOS	975.20
LANSING UNIFORM CO	3 BREASST CLIP BADGES/1 JACKET	495.00
LIFEGAS LLC	OXYGEN AND OXYGEN TANK RENTAL	345.59
LIFEGAS LLC	OXYGEN	21.73
MICHIGAN STATE UNIVERSITY	MEDICAL SUPPLIES	559.14
ZOLL MEDICAL CORPORATION	MEDICAL SUPPLIES	403.75
ZOLL MEDICAL CORPORATION	SHIPPING	10.99
CALLBACK STAFFING SOLUT	CALLBACK STAFFING/APRIL	99.99
ACD.NET, INC.	ACD FIBER MONTHLY	182.00
PHYSIO-CONTROL, INC.	MILEAGE	200.00
PHYSIO-CONTROL, INC.	LIFEPAK LP12-OSPM 1 YR	345.00
PHYSIO-CONTROL, INC.	LIFEPAK LP 15-OSPM 1 YR	792.00
PHYSIO-CONTROL, INC.	LUCAS-OSPM 1 YR	1,188.04
METRONET LONG DISTANCE	LONG DISTANCE MARCH	2.98
TDS METROCOM	LOCAL SERVICE MARCH	41.93
CONSUMERS ENERGY	ELECTRIC 6139 BISHOP	52.58
CONSUMERS ENERGY	GAS 6139 BISHOP	158.69

BANK OF AMERICA	METRO CHIEFS LUNCH/BALL	8.47
BANK OF AMERICA	I PHONE CASE & I PAD CASE/SHIPPING/	181.96
BANK OF AMERICA	REFRESHMENTS/CEREMONY	7.49
BANK OF AMERICA	SHARED SERVICES LUNCH/DRURY	12.88
ACE HARDWARE	OUTLET STRIP/2 PKG VELCRO/#21	15.97
BANK OF AMERICA	CFI-I RECERTIFICATION/DRURY	150.00
APPLICATION SPECIALIST KO	LENOVO THINK PAD & ACCESSORIES	2,284.68
	Total For Dept 336.00 FIRE DEPARTMENT	9,246.21

Total For Fund 206 FIRE FUND 9,246.21

Fund 211 FIRE EQUIP. & APPARATUS FUND

Dept 339.00 EQUIPMENT & APPARATUS

BANK OF AMERICA	UPS SHIPPING	18.83
BANK OF AMERICA	UPS SHIPPING	29.07
BANK OF AMERICA	UPS SHIPPING	20.31
THE PARTS PLACE	(5) 40 LB BAGS OIL DRY	52.45
COMMUNICATIONS SERVICES	(3) HARRIS 97100 ANTENNAS	96.00
BANK OF AMERICA	6 BOXES BATTERIES	133.20
BANK OF AMERICA	NCE MONITOR BRACKET/PHYSIO	390.00
THE PARTS PLACE	2 THIN-LINE LED PIGTAILS	4.10
WEST SHORE FIRE INC	SCBA REPAIR & SHIPPING	205.04
WEST SHORE FIRE INC	SCBA REPAIR	65.80
CRAIG'S AUTO BODY SHOP	SEAL WINDOWS & REPLACE HANDLE	328.90
R & R FIRE TRUCK REPAIR INC	LIGHT & SIREN REPAIR/#373	506.62
R & R FIRE TRUCK REPAIR INC	SIREN INOPERATIVE/#373	82.00
BANK OF AMERICA	CPR/AED CARD/JUSTICE	4.00
BANK OF AMERICA	CPR/AED CARDS	76.00
TARGETSOLUTIONS LEARNING	54 ONLINE TRAINING PROGRAM	972.00
	Total For Dept 339.00 EQUIPMENT & APPARATUS	2,984.32

Total For Fund 211 FIRE EQUIP. & APPARATUS FUND 2,984.32

Fund 248 DOWNTOWN DEVELOPMENT AUTHORITY

Dept 000.00

CRISP COUNTRY ACRES	VENDOR PAYMENT MARCH	216.00
TODD DELO	VENDOR PAYMENT MARCH	66.00
LONESOME PINES BEEF	VENDOR PAYMENT MARCH	100.00
ANNA PRYOR	VENDOR PAYMENT MARCH	15.00
RED'S SMOKEHOUSE BBQ	VENDOR PAYMENT MARCH	124.00
WILLOW BLOSSOM FARMS	VENDOR PAYMENT MARCH	65.00
NEVA AUSTIN	VENDOR PAYMENT MARCH	58.00
CORINNE P. CARPENTER	VENDOR PAYMENT MARCH	19.00
KIMBERLYNN COLLINS	VENDOR PAYMENT JANUARY	41.00
OFILIA DIAZ	VENDOR PAYMENT MARCH	121.00
DESIRAHY FARNSWORTH	VENDOR PAYMENT MARCH	42.00
OTTO'S POULTRY, INC	VENDOR PAYMENT MARCH	1,201.00
SHAYNA QUILLIN	VENDOR PAYMENT MARCH	42.00
MAI KOU VANG	VENDOR PAYMENT MARCH	63.00
	Total For Dept 000.00	2,173.00

Dept 728.00 DDA ADMINISTRATION		
FAHEY SCHULTZ BURZYCH	HCC LEGAL FEES MARCH	518.00
THRUN LAW FIRM, P.C.	LEGAL FEES FEBRUARY/MARCH	1,177.25
ACD.NET, INC.	ACD FIBER MONTHLY	42.00
METRONET LONG DISTANCE	LONG DISTANCE MARCH	4.83
TDS METROCOM	LOCAL SERVICE MARCH	127.12
	Total For Dept 728.00 DDA ADMINISTRATION	<u>1,869.20</u>

Dept 729.00 DDA MARKETING & PROMOTION		
BLOHM CREATIVE PARTNERS	HAPPY IN HOLT LOGO	632.50
BANK OF AMERICA	MIFMA MEMBERSHIP RENEWAL	250.00
ACD.NET, INC.	WIFI 4/1-5/1/2016	69.95
ACE HARDWARE	AAA 6PK BATTERIES/CABLE TIES	12.68
CRISP COUNTRY ACRES	DOUBLE UP BUCKS MARCH	216.00
	Total For Dept 729.00 DDA MARKETING & PROMOTION	<u>1,181.13</u>

Dept 850.00 OTHER FUNCTIONS		
QUALITY FIRST MAID SERVICE	CLEANING SERVICES/SHERIFF & DDA	340.00
	Total For Dept 850.00 OTHER FUNCTIONS	<u>340.00</u>

Total For Fund 248 DOWNTOWN DEVELOPMENT AUTHORITY	<u><u>5,563.33</u></u>
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Fund 590 SEWAGE DISPOSAL SYSTEM		
Dept 000.00		
HUBBELL, ROTH & CLARK, INC	PRESTWICK VILLAGE APTS CONSTRUCT	6,258.51
	Total For Dept 000.00	<u>6,258.51</u>

Dept 548.00 ADMINISTRATION & OVERHEAD		
LEWIS PAPER INTERNATIONAL, INC	COPY PAPER	156.60
PROGRESSIVE IMPRESSIONS INTL	SEWER BILLS MARCH	574.76
	Total For Dept 548.00 ADMINISTRATION & OVERHEAD	<u>731.36</u>

Dept 558.00 DEPT OF PUBLIC SERVICE		
LEWIS PAPER INTERNATIONAL	COPY PAPER	339.30
LANSING ICE & FUEL CO	GASOLINE 3/16-31/2016	824.15
MODEL COVERALL SERVICE	STAFF UNIFORMS/POTW	67.54
MODEL COVERALL SERVICE	STAFF UNIFORMS/MAINTENANCE	45.11
MODEL COVERALL SERVICE	STAFF UNIFORMS/POTW	67.54
MODEL COVERALL SERVICE	STAFF UNIFORMS/MAINTENANCE	45.11
MODEL COVERALL SERVICE	STAFF UNIFORMS/POTW	67.54
MODEL COVERALL SERVICE	STAFF UNIFORMS/MAINTENANCE	45.11
RS TECHNICAL SERVICES, INC.	TROUBLESHOOT BLOWERS 2,3,4	475.00
ENVIRONMENTAL RESOURCE	2ND QTR CHECK SAMPLES	852.26
ENVIRONMENTAL RESOURCE	DMRQA SAMPLES	927.26
FISHER SCIENTIFIC	TC517X1A THERMO COUPLE	103.19
FISHER SCIENTIFIC	SHIPPING	17.20
FISHER SCIENTIFIC	ACID REAGENT	81.03
FISHER SCIENTIFIC	IODIDE REAGENT	94.44
FISHER SCIENTIFIC	HAZARDOUS MATERIAL CHARGE	22.75
FISHER SCIENTIFIC	SHIPPING	25.29
FISHER SCIENTIFIC	SHIPPING-FUEL SURCHARGE	2.20
ALEXANDER CHEMICAL CORP	CREDIT	(270.00)
ALEXANDER CHEMICAL CORP	SODIUM BISULFITE	884.50
ALEXANDER CHEMICAL CORP	CREDIT	(270.00)

ALEXANDER CHEMICAL CORP	CALCIUM NITRATE	10,644.00
ALS LABORATORY GROUP	FEED TANK PIPING	150.00
BANK OF AMERICA	SOIL SAMPLING/BIOSOLIDS PROGRAM	9.35
FIBERTEC ENVIRONMENTAL	MERCURY ANALYSIS/LSD	50.00
SPICER GROUP, INC.	GIS NETWORK & ASSET MANAGEMENT	5,485.50
UNITED PARCEL SERVICE	SHIPPING CHARGES	73.02
METRONET LONG DISTANCE	LONG DISTANCE MARCH	4.80
SPOK, INC	PAGER SERVICE	29.42
ACD.NET, INC.	ACD FIBER MONTHLY	560.00
COMCAST	HIGH SPEED INTERNET/POTW	144.85
COMCAST	HIGH SPEED INTERNET/MAINTENANCE	144.85
TDS METROCOM	LOCAL SERVICE MARCH	396.69
BOARD OF WATER & LIGHT	WATER 4280 DELL	20.15
BOARD OF WATER & LIGHT	ELECTRIC 2481 DELHI COMMERCE	51.79
CONSUMERS ENERGY	ELECTRIC-1988 WAVERLY	682.19
CONSUMERS ENERGY	ELECTRIC-4000 N MICHIGAN#B	226.77
CONSUMERS ENERGY	ELECTRIC-5961 MC CUE #2723	42.61
CONSUMERS ENERGY	GAS-1988 WAVERLY	27.34
THE SALT STORE, INC.	(98) 50# BAGS ICE-A-WAY	508.62
WESCO DISTRIBUTION, INC	GREENLEE 100W MH POWER PACKS	363.00
WESCO DISTRIBUTION, INC	BUSS FRS-R-30 FUSES	28.20
BANK OF AMERICA	4 AXIAL FANS & FREIGHT	447.72
BANK OF AMERICA	HOOK & 6"X100' CORRUGATED TUBING	99.98
ECLIPSE, INC	.75 HP MOTOR	894.00
ECLIPSE, INC	SHIPPING	24.42
ACE HARDWARE	PVC CEMENT/PVC PRIMER/NIPPLE	26.47
ACE HARDWARE	CREDIT	(1.00)
ACE HARDWARE	BATTERIES/POTW	15.98
CATHEY COMPANY	ROLL 1/4 X 8 X 50' NEOPRENE RUBBER	126.90
XYLEM WATER SOLUTIONS	9" SILVER SERIES DIFFUSERS	1,200.00
XYLEM WATER SOLUTIONS	SHIPPING	15.14
QUALITY FIRST MAID SERVICE	CLEANING SERVICES/MAINTENANCE	195.00
QUALITY FIRST MAID SERVICE	CLEANING SERVICES/POTW	195.00
BANK OF AMERICA	SKYTRAC RENTAL	1,152.75
BANK OF AMERICA	REFUND OF SALES TAX	(65.25)
ALTA EQUIPMENT COMPANY	FORK TRUCK ANNUAL SERVICE	183.44
MACALLISTER RENTALS	SKYTRAC TRANS REPAIR	1,694.37
MACALLISTER RENTALS	SKYTRAC RENTAL	807.63
FRANKIE D'S AUTO & TRUCK	REPLACE WIPER TRANS/#26	259.00
MENARDS LANSING SOUTH	YARD HYDRANT PARTS	285.53
BANK OF AMERICA	LUNCH & TAX/STAFF MEETING	78.02
BANK OF AMERICA	WEF BIOSOLIDS REGISTRATION/DIORKA	885.00
BANK OF AMERICA	MWEA LODGING/DIORKA	237.63
BANK OF AMERICA	MWEA LODGING/LENON	237.63
BANK OF AMERICA	MWEA LODGING/BRYANT	237.63
BANK OF AMERICA	WEF TRAIN TICKET/DIORKA	137.00
BANK OF AMERICA	MWEA REGISTRATION/BRYANT	25.00
BANK OF AMERICA	MICHIGAN RECYCLING REGISTRATION	900.00
D HILL ENVIRONMENTAL	OXIDATION DITCH CLASS/TRIGO	325.00
LASSARO N. TRIGO	3/29-31/2016 MEALS & MILEAGE/TRIGO	112.82
	Total For Dept 558.00 DEPT OF PUBLIC SERVICE	34,822.48
	Total For Fund 590 SEWAGE DISPOSAL SYSTEM	41,812.35

Fund 643 LOCAL SITE REMEDIATION REVOLVING FUND

Dept 735.00 LOCAL SITE REMEDIATION

DLZ	1600/1694 CEDAR/PARK DESIGN	8,100.00
	Total For Dept 735.00 LOCAL SITE REMEDIATION	8,100.00

Total For Fund 643 LOCAL SITE REMEDIATION REVOLVING FUND	8,100.00
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Fund 701 TRUST & AGENCY FUND

Dept 000.00

AFLAC	WITH DEDUCT-AFLAC DISABILITY	642.04
AFLAC	WITH DEDUCT-AFLAC LIFE INSUR	7.62
AFLAC	WITH DEDUCT-AFLAC ACCIDENT	542.10
AFLAC	WITH DEDUCT-AFLAC SICKNESS	324.38
AFLAC	WITH DEDUCT-AFLAC CANCER	450.84
AFLAC	WITH DEDUCT-DISABILITY RIDER	18.48
AFLAC	WITH DEDUCT-AFLAC ACCIDENT RIDER	11.88
C. J. DAVIS	AFLAC_URM (FSA)	160.00
BRAD DRURY	AFLAC_URM (FSA)	2,549.82
	Total For Dept 000.00	4,707.16

Total For Fund 701 TRUST & AGENCY FUND	4,707.16
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Total For All Funds:	136,777.68
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**DELHI CHARTER TOWNSHIP
FUND TRANSFERS AND PAYROLL APPROVAL
For Payroll Dated April 7, 2016**

I. Certification of Preparation and Distribution

The attached check and payroll registers encompass check numbers: 108857 through 108878 & direct deposits numbers: DD22180 through DD22260. The payroll was prepared in accordance with established payroll rates and procedures. The Treasurer's & Clerk's signatures were printed on the payroll checks using an electronic image signature

Lora Behnke, Accounting Clerk

The attached Check and Payroll Registers were reviewed. The payroll checks were distributed in accordance with established procedures.

Dated: April 7, 2016

Director of Accounting

II. Payroll Report

The April 7, 2016 payroll encompasses the following funds and expenditures:

	Gross Payroll	Payroll Deductions	Net Pay
General Fund	\$68,415.10	\$21,014.09	\$47,401.01
Fire Dept. Fund	52,172.84	17,411.17	\$34,761.67
DDA	4,924.57	1,254.19	\$3,670.38
Sewer Fund/Receiving	37,695.01	12,219.14	\$25,475.87
Total Payroll	\$163,207.52	\$51,898.59	\$111,308.93
	Township FICA	Township RHS & Pension Plan	Total Deductions & TWP Liabilities
General Fund	\$4,946.67	\$6,334.68	\$32,295.44
Fire Dept. Fund	3,877.71	4,279.49	25,568.37
DDA	204.43	83.37	1,541.99
Sewer Fund/Receiving	2,776.74	4,158.73	19,154.61
Total Payroll	\$11,805.55	\$14,856.27	\$78,560.41

Director of Accounting

III. FUND TRANSFERS

Transfers covering the foregoing payroll were made on April 7, 2016 and identified as follows:

4/07 Net Pay Disbursement in Common Savings (\$111,308.93)

Roy W. Sweet, Treasurer

IV. Board Audit and Approval:

At a regular meeting of the Township Board held on April 19, 2016, a motion was made by _____ and passed by _____ yes votes and _____ no votes(_____ absent) that the payroll dated April 7, 2016 was reviewed, audited, and approved.

Attachment to Payroll Register

cc: Sweet(1)\Vander Ploeg(1)

Evan Hope, Clerk



**Delhi Charter Township
Department of Community Development**

MEMORANDUM

TO: John B. Elsinga, Township Manager

FROM: Tracy L.C. Miller, Director of Community Development

DATE: April 13, 2016

RE: RFP for Public Sculpture

As you know, Delhi Township has been awarded a grant to help fund the purchase and installation of a sculpture that will be located in front of the Community Services Center building. At the last Board meeting an Ad-Hoc committee was appointed and charged with implementation of this project. This committee met on Monday, April 11th to develop and finalize the attached RFP. Township Policy No. 129, which pertains to Public Art, states that the Township Board must approve the recommended RFP prior to it being made available to prospective artists.

Therefore, I request that the Board consider the attached RFP and approve it at the upcoming meeting on April 19th. Immediately thereafter the RFP will be issued. The committee anticipates reviewing all submittals on May 12th. A recommendation regarding the preferred selection will be provided to the Board at the May 17th meeting.

If you have any questions or require additional information, please do not hesitate to ask. Otherwise, please forward the attached information, along with your concurrence, to the Township Board for consideration and action.

Recommended Motion:

To approve the Request for Proposal for a sculpture to be located in front of the Community Services Center Building as recommended by the Ad-Hoc Public Art Committee for this project.

Public Art Opportunity
Request for Artist Proposals

PROPOSAL DEADLINE:

May 16, 2014

TOTAL BUDGET FOR SCULPTURE PROJECT:

\$10,000 - \$19,000

GENERAL INFORMATION

Delhi Township has received a Placemaking Public Art Grant from the Lansing Economic Area Partnership (LEAP) in the amount of \$10,000. The grant was awarded to the Township for the purpose of commissioning, creating and installing a piece of public art. The art will be for public year round display. The grant is designed to strengthen economic development efforts in the Greater Lansing region by enhancing the sense of place for residents and visitors through public art.

In addition to the grant funding, Delhi Township has budgeted additional funding for this project. However, the total available funding (\$19,000) must include installation costs, foundations, lighting, etc. as well as the sculpture itself. All proposals must include a detailed breakdown of the budget to account for these items.

Delhi Township applied for the grant to allow the installation of a sculpture in front of the Community Services Center (CSC) building located on Aurelius Road. The art piece must be highly visible to both automobile and pedestrian traffic, and act as an iconic landmark representing the unique character of Delhi Township. It will highlight the community and sense of place exemplified at the CSC and surrounding public places. The embodiment of this project will engage the community through visual, spatial and sensory experience while helping to define the sense of place being created within the Township.

Physical installation of the Sculpture must occur by no later than October 14, 2016.

CALL

The competition is open to all artists, architects, designers, etc. living or working in Clinton, Eaton or Ingham Counties.

Artists should provide the following information in their response to this RFP:

1. Small scale model or rough draft of a three-dimensional work or complete drawing of a two-dimensional work
2. Drawings or photographs that demonstrate the relationship of the sculpture to the site (e.g. demonstrate the scale of the sculpture relative to surroundings).
3. Material samples for the sculpture and any relevant construction materials, as appropriate.
4. Installation details.

5. Description of routine maintenance and a reasonable estimate of maintenance costs.
6. Description of any warranty offered or future services/availability to make repairs.
7. Artist's resume.
8. Statement of interest in the project.
9. Detailed Budget – including sculpture, lighting, foundation, etc.

Note: Art pieces that have been previously fabricated or completed will also be considered for this project.

Proposals must be submitted by 5 PM on Wednesday, May 11, 2016. For purposes of ensuring a fair process, late proposals will not be accepted. It is anticipated that the successful artist would be notified by 18th.

Submissions may be made as follows:

By Mail:

Delhi Township
Attn: Tracy Miller
2074 Aurelius Road
Holt, MI 48842

Personal Delivery:

Delhi Township Community Service Building
Community Development Department
Attn: Tracy Miller
2074 Aurelius Road
Holt, MI 48842

Electronic Delivery:

Tracy.miller@delhitownship.com

Please note that, regardless of the delivery method used, is it the sole responsibility of the respondent to ensure proper delivery.

PROJECT BACKGROUND

The sculpture will be placed outdoors within the retention area in front of the CSC building, as shown in the attached maps and drawings. Respondents should be aware that this area does have storm water in it at various times throughout the year and that there are cattails growing there that will remain. The sculpture should appear to emerge from the basin and rise above it. The sculpture must be visible from the road and appear substantial and significant. It is envisioned that the sculpture will be illuminated at night so that it is visible at all times for the community to enjoy.

The sculpture should provide a focal point that complements its immediate surroundings, the CSC building and offers a primer to the beautiful Veteran's Memorial Garden located behind the building. The CSC building itself contains the Township's municipal offices, but also the community's fire station and extremely popular library. The garden is used throughout the year

for a number of public happenings such as concerts, movies and events, but it is also a passive space that can be simply enjoyed by walking thru or relaxing within it.

The sculpture will be readily visible not just to those visiting the CSC building, but also to those driving and walking by. In fact, data reveals that over ¼ million people per year are likely to be in a position to view or enjoy the new public sculpture.

The CSC building is located within the “Triangle Area” of the Township. Historically, Holt has lacked a traditional downtown. For the past 20 years, the community has made public improvements and has specifically planned for the development of the Triangle Area to fulfill this need within the Township. The Triangle area includes shopping, dining, services and municipal/public services that are important in a community activity center. The library, Sherriff’s department, senior center, municipal offices, post office, various public spaces, and Farmer’s Market are all located within this area. Incorporating a piece of public sculpture at the CSC will help continue the redevelopment of this area and create a community center and sense of place for the Township.

Please see the attached map for placement and area information.

ABOUT THE TOWNSHIP

Delhi Township has been a quiet leader in the Lansing Region with regards to placemaking efforts and has fully embraced the associated concepts and practices. Delhi works diligently to create a sense of place within the Township through actions, programming, investment and community involvement. Below is a listing of those activities that we believe provide good examples of our placemaking efforts, although it is not all-inclusive:



- In 2014, a sculpture was installed at the Farmer’s Market. The butterfly sculpture was the first public sculpture installed within the Community using the LEAP public art grant program. The butterflies were designed and installed by Craig Mitchell Smith and have been very popular with the community.
- **Veteran’s Memorial Garden Park** is a beautiful community facility. In addition to providing passive recreation opportunities, it also hosts outdoor summer concerts and movies, salsa



making competitions, weddings, community picnics and many other events throughout the year. In spring 2014, a shade sail system was installed over the existing **amphitheater** so that the use of the facility can be expanded to include performance art, additional concerts, etc.

- Delhi Township is one of only a couple of communities in the country that has a **facility-sharing arrangement** with the public school district. Delhi Township and the Holt School District partner in the use, maintenance and



programming for Township and school sports facilities and other resources. The two entities coordinate to ensure that

recreation programming is complementary and provides a seamless transition from recreational to school-based sports and activities, without



duplicated effort. The arrangement saves both the school and the Township money and greatly improves our mutual ability to provide recreation opportunities. This agreement has been in place for many years and serves as a local, State and national model for cooperation and coordination of services.



- Delhi has invested millions over the past 25 years in **infrastructure improvements** to accommodate the demand for residential housing and to facilitate the development of industrial and commercial uses. Public infrastructure investments, in both installation and maintenance, ensure that the Township benefits from a safe and healthy environment, reliable services and encourages private economic development.
- Delhi Township, in partnership with its Downtown Development Authority (DDA), has funded, facilitated or built the following projects, all of which have been critical to developing a sense of place within the community:

Corner Park redevelopment includes original public sculpture piece.

LEED Certified **Senior Citizens Center** <http://www.delhitownship.com/parks-SeniorCenter.htm>

Holt **Farmer's Market** <http://holtfarmersmarket.org/>

The Delhi **Recycling Center** is free to use and open to the public. It was constructed by the Township and is operated in partnership with Granger.

<http://www.delhitownship.com/Recycling.htm>

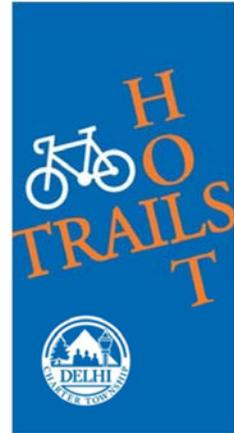


Delhi Township provides free public **garden plots** at two locations within the Township, and consistently “**thinks outside the box**” when it comes to getting things done. For example, at our wastewater treatment plant, a flock of sheep is used to maintain the grass and to recycle Christmas trees and Jack-o'-lanterns left over from the holidays. As strange as it might seem, the community and

its children love the sheep! The flock even has its own Facebook page

(<https://www.facebook.com/pages/Firebird-and-Flock/194004460620807>).

Delhi Township has prioritized the construction of **trails and walkable infrastructure** throughout the community. Construction of the Sycamore Trail has been completed, which connects Delhi's Valhalla Trail to the Lansing River Trail. The Ram Trail, which connects "downtown Holt" to the Holt Schools Complex was completed in fall of 2015 and design work for the second phase of the Ram Trail is currently underway. Numerous sidewalk construction projects have also occurred and Delhi Township adopted a **Complete Streets** Ordinance in 2012.



In 2013, Delhi Township was one of the first communities in the Lansing region to adopt a Non-Discrimination Ordinance. By adopting this Ordinance, the Township declares its intent to be an **inclusive place where all people are welcome**.



Figure 1

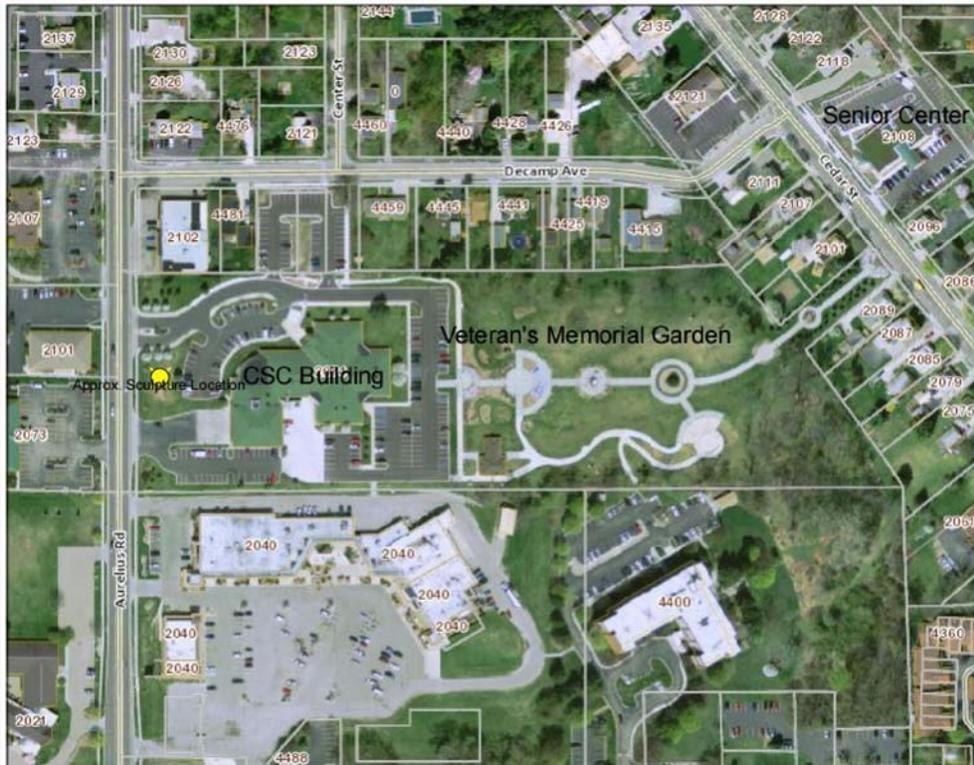


Figure 2



Figure 3

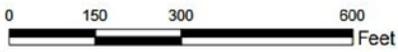
Sculpture Placement Location



Legend

- Block
- Drain
- Pond/Lake
- Building
- Lot Line
- Mobile Home Lots
- City of Lansing

1 inch = 200.7 feet



This map is provided for use as a general guide only and there are no warranties that accompany this product. The Township is not responsible for any errors or omissions in this map or its use. The Township is not liable for decisions made with the use of this product.



Notes:

Map Source: DeWitt Charter Township
Map Printed Tuesday, April 13, 2010

DELHI CHARTER TOWNSHIP

MEMORANDUM

TO: Delhi Township Board Members

FROM: Evan Hope, Township Clerk

DATE: April 14, 2016

RE: Cancel May 17, 2016 Committee of the Whole Meeting and Schedule Joint Holt Public Schools Board of Education Joint Meeting

On May 17, 2016 the Township Board has been invited by the Holt Public Schools Board to hold a joint meeting to discuss mutual items of interest. This year it is Delhi Township's turn to host the meeting which usually begins at 6:00 p.m. Because this is a regularly scheduled Board meeting night I propose the Board cancel the Committee of the Whole meeting at 6:30 p.m. and hold the joint School Board meeting in its place beginning at 6:00 p.m.

Recommended Motion:

To cancel the May 17, 2016 Township Committee of the Whole meeting at 6:30 p.m. and instead hold a joint meeting with the Holt Public Schools Board of Education at 6:00 p.m. on May 17, 2016.

DELHI CHARTER TOWNSHIP

MEMORANDUM

TO: Delhi Township Board Members

FROM: John B. Elsinga, Township Manager

DATE: April 14, 2016

RE: Set Public Hearing on the Application of a Proposed Brownfield Redevelopment Plan No. 6 (4136 and 4184 Willoughby Road)

Enclosed is a memorandum from Charles Barbieri, Attorney for the DDA (on behalf of Howard Haas, DDA Executive Director) requesting the Township Board set a public hearing to hear comments on a Proposed Brownfield Redevelopment Plan (Brownfield Plan No. 6) for 4136 and 4184 Willoughby Road.

This property was purchased by the DDA and at that time an Environmental Phase I and II study was completed on the property since it previously housed an industrial operation on site. The study indicated that there was both soil and groundwater contamination making it an eligible Brownfield. Therefore, the DDA hopes to utilize the Brownfield Redevelopment Program to assist in recovering expenses related to environmental remediation.

At their April 26, 2016 meeting, the Brownfield Redevelopment Authority will consider the proposed "Plan" and at this time recommends the Township Board hold a public hearing to hear comments on the Plan prior to its adoption.

Therefore, I am recommending that the Board set a public hearing for 7:45 p.m. on Wednesday, May 4, 2016.

Recommended Motion:

To set a public hearing for May 4, 2016 at 7:45 p.m. to hear comments on proposed Brownfield Redevelopment Plan No. 6 for the Charter Township of Delhi pursuant to and in accordance with Act 381 of the Public Acts of the State of Michigan 1996, as amended.

MEMO

FOSTER SWIFT
FOSTER SWIFT COLLINS & SMITH PC | ATTORNEYS

Confidential & Privileged

TO: Howard Haas and Delhi Charter Township Board of Trustees
FROM: Charles (Chuck) Barbieri
DATE: April 13, 2016
RE: REQUEST TO SET PUBLIC HEARING ON PROPOSED BROWNFIELD PLAN #6

A. OVERVIEW

Scott Wieland on behalf of Willoughby Estates I, LLC and Willoughby Estates II, LLC (together the "Developer") is requesting that the Township approve Brownfield Plan #6 for the redevelopment of 4184 and 4136 Willoughby Road in the Township. The Brownfield Plan should stimulate the acquisition of the property, which is now owned by the Township's Downtown Development Authority ("DDA"), and construction of 243 apartments, 8 townhouses and 18 cottage style home rentals. Altogether, the Developer anticipates \$35.5 million in total future investment into this project.

The Plan as drafted and attached provides a preliminary evaluation of (1) proposed eligible activities that the Developer would like to have reimbursed through tax increment financing under Michigan's Brownfield Statute and (2) the potential tax increments that are currently expected to be realized and recaptured for the redevelopment. The plan, if adopted and implemented, would not only reimburse the Developer for eligible cost but also allow the Township and its Brownfield Redevelopment Authority ("BRA") to cover administrative expenses and reap the benefit of tax recapture after eligible activities have been reimbursed for deposit into the BRA's local site remediation revolving fund ("LSRRF"). The LSRRF monies would be available for the BRA to cover eligible activities for other potential Brownfield projects in the future.

B. ANALYSIS

1. Suitability of Project

The Brownfield Redevelopment Financing Act authorizes the creation of brownfield redevelopment plans that would allow recapture of tax increments that are realized from a potential development to reimburse a Developer for the cost of eligible environmental and non-environmental activities on eligible properties. MCL 125.2663. In this instance, the proposed site of brownfield activity at 4184 and 4136 Willoughby Road in the Township should qualify as an eligible property because it is a facility which has both soil and groundwater contamination. Eligible properties include properties that constitute a "facility," which is essentially any site having contamination above residential criteria. MCL § 125.2652(n).

Presently, the Developer has identified several eligible activities for which it intends to seek reimbursement, including baseline environmental assessment activities, due care activities, additional response activities and demolition activities. A breakdown of those projected expenses are contained in the draft Brownfield Plan.

As currently projected, the brownfield redevelopment will result in post-development taxable value of about \$8.2 million, although it may be more. Over the life of the project, which is now estimated to be about 18 years, about \$5.3 million may be recaptured. In addition to the reimbursement of about \$3.1 Million of eligible activities during the duration of the Plan, about \$325,000 is currently estimated to be reimbursed as administrative expenses to the BRA, and about \$1.86 million will be recaptured after the eligible expenses are covered to be placed into the LSRRF. In fact, the LSRRF should receive an initial boost of approximately \$21,000 when the tax recapture begins in about two years as a result of the Lansing Economic Area Partnership (“LEAP”) specifying that a brownfield loan repayment is to be made to the BRA's LSRRF instead of LEAP.

We would note that the Developer only seeks to recapture incremental taxes from local taxing sources, and not from state taxing sources. We would note, however, that the intermediate school district taxes are not considered state school taxing amounts for purposes of the Plan recapture based on definitions in the brownfield statute.

2. Approval Steps and Proposed Schedule

To facilitate this project, the Township Board must conduct a hearing which needs to be posted and sent to the taxing jurisdictions informing them of the Brownfield Plan. (We attach the proposed hearing notice and intended letter for the taxing jurisdictions). Such notice must be given at least 10 days before the hearing by the Township Board. The Township Board has discretion following the public hearing to adopt a resolution approving the plan if the Township Board is comfortable in doing so later at the same meeting when the public hearing is planned.

Currently, the Developer is hoping that the hearing can be conducted on May 4, 2016 and that the Board following the hearing will approve the Brownfield Plan. Prior to that time, the BRA will meet on April 26, 2016, at which time it is expected that it will review and approve a recommendation for Brownfield Plan #6.

As part of the ultimate arrangement to facilitate this proposed action, the BRA and the DDA likely will need to sign an inter-local agreement allowing for the BRA to recapture amounts it is entitled to recapture while the Brownfield Plan is in effect. This would avoid the conflict that might otherwise result because of the DDA's current entitlement to recapture taxes when paid. In addition, a brownfield reimbursement agreement will need to be executed between the BRA and the Developer to set up a process for reviewing and reimbursing eligible costs.

C. CONCLUSION

I hope that this outline of the Brownfield Plan as it is now proposed and the steps necessary to implement the Plan will assist the Township Board in understanding the project and deciding whether to schedule a public hearing.

I will be happy to address questions and comments on this legal memorandum at the time of the Board's meeting on April 19, 2016.

:ldh

15322:00021:2621806-1

**CHARTER TOWNSHIP OF DELHI
NOTICE OF PUBLIC HEARING ON THE ADOPTION OF A PROPOSED
RESOLUTION APPROVING BROWNFIELD PLAN #6
FOR THE CHARTER TOWNSHIP OF DELHI PURSUANT TO AND IN ACCORDANCE
WITH ACT 381 OF THE PUBLIC ACTS OF THE STATE OF MICHIGAN 1996, AS
AMENDED**

PLEASE TAKE NOTICE THAT a Public Hearing shall be held before the Township Board of Trustees of the Charter Township of Delhi on the 4th day of May, 2016 at 7:45 p.m. at the Community Services Center at 2074 Aurelius Road, Holt, Michigan on the adoption of a proposed resolution approving Brownfield Plan #6 for the proposed development of 4136 and 4184 Willoughby Road in the Charter Township of Delhi, within the municipal limits of which the Charter Township of Delhi Brownfield Redevelopment Authority shall exercise its powers, all pursuant to and in accordance with the provisions of the Brownfield Redevelopment Financing Act, being Act 381 of the Public Acts of the State of Michigan of 1996, as amended.

A copy of the complete property description, property map and description of the Brownfield Plan is available for public review at the Clerk's office of the Charter Township of Delhi at 2074 Aurelius Road, Holt, Michigan.

This Brownfield Plan #6 applies to a property located at or near 4136 and 4184 Willoughby Road, Delhi Township, Michigan.

All aspects of the proposed Plan are open for discussion.

Date: _____

Delhi Township Clerk

WILLOUGHBY ESTATES

4184 E. Willoughby Road, Tax ID 33-25-05-11-452-001
4136 E. Willoughby Road, Tax ID 33-25-05-11-452-005
0 E. Willoughby Road, Tax ID 33-25-05-11-452-004
Delhi Charter Township, Holt, MI 48842

Brownfield Plan No.6

April 11, 2016



Delhi Charter Township Brownfield Redevelopment Authority

2045 North Cedar Street
Holt, Michigan 48842
Contact: Howard Haas, Executive Director
Phone: (517) 699-3866

Prepared with assistance from:
ADVANCED REDEVELOPMENT SOLUTIONS
PO Box 204
Eagle, Michigan 48822
Contact: Eric P. Helzer, EDFP
Phone: (517) 648-2434

Approved by the Delhi Charter Township Brownfield Redevelopment Authority – *TBD/TBD/2016*

Approved by the Delhi Charter Township Board of Trustees – *TBD/TBD/2016*

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- B. Basis of Eligibility Supportive Environmental and Non-Environmental Brownfield Information
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PROJECT SUMMARY SHEET: BROWNFIELD PLAN NO.6 – WILLOUGHBY ESTATES

Project Name: Willoughby Estates

Applicant/Developer: Entity Name: Willoughby Estates, LLC
Contact: Scott Wieland
Mailing Address: 4162 English Oak Dr., Lansing, MI 48911
Phone: (517) 719-7416
Email: Scott.Wieland@wieland-davco.com

Eligible Property Location: The eligible property (“Property”) consists of three (3) parcels located at:
4184 E. Willoughby Road, Tax ID 33-25-05-11-452-001;
4136 E. Willoughby Road, Tax ID 33-25-05-11-452-005;
0 E. Willoughby Road, Tax ID 33-25-05-11-452-004
Delhi Charter Township, Holt, Michigan 48842

Property Size: Approximately 38.51 acres
(16.86 acres {-001} + 1.34 acres {-005} + 20.31 acres {-004})

Type of Eligible Property: Facility (Contaminated)

Project Description: **Willoughby Estates Project**
This Brownfield Plan (the “Plan”) anticipates approximately \$35.5 million in future investments by Willoughby Estates, LLC, a Lansing-based Developer that primarily manages and builds residential and rental housing. This Plan contemplates redevelopment upon all three (3) Eligible Properties. 4184 E. Willoughby Road (Tax ID 33-25-05-11-452-001), 4136 E. Willoughby Road (Tax ID 33-25-05-11-452-005) and 0 E. Willoughby Road (Tax ID 33-25-05-11-452-004) have been vacant for approximately 13 years (since 2003) and are blighted, underutilized and contaminated property.

The project is on the east side of Holt and will occur on approximately 21.6 acres of the 38.51 acre Property north of Willoughby Road and east of the Jackson & Lansing Railroad (former Michigan Central Railroad) tracks. The applicant proposes to raze the remaining portions of above grade buildings/structures, prior site improvements, address the extensive subsurface debris/fill and construct the proposed project.

The Property features a large pond and direct access to the new River Trail. The Trail connects the residents to over 20 miles of walkway through Michigan State University (“MSU”), Potter Park Zoo to Downtown Lansing. Shopping and restaurants are located less than a mile away. Willoughby Estates is a residential redevelopment project with 269 Class A+ rental units, open space, a club house, pavilion, dog park, kids play area, grilling stations and pool area. The club house will figure a great room for meetings or family gatherings, a game room and business center. The pool will have an infinity element that feels like the pool flows into the large pond. The pavilion is also another family gathering space. There will also be a coin operated single car wash down and vacuum area on the premises for all residents to use. The

project will be a complimentary development to the surrounding residential areas and consists of 243 apartments, 8 townhouses and 18 cottage style home rentals. The units will have a mix of attached and detached garages, covered parking and open-air parking. Storage units will also be available to the residents.

Construction is scheduled to begin in the spring 2016, with occupancy available by August 2017. However, environmental contamination and increased costs threaten the redevelopment planned. The completion of this project represents a unique opportunity to accomplish long term environmental benefits and redevelop this blighted Property. The project is seeking tax increment financing through the Brownfield Redevelopment Financing Act (Public Act 381 of 1996), which is the subject of this Plan, to allow for a successful redevelopment and environmental cleanup at this site.

Estimated Job Creation: Once complete, up to 3 immediate on-site new full time jobs will be created.

Estimated Gain in Taxes:
(after Project completion)

	Current Taxable Value	Future Taxable Value	Increased/ Taxable Value (Increment)
	(2016)	(2018)	(2018)
	\$0	\$8,316,150	\$8,316,150
Annual Taxes Paid	\$0	\$563,552	\$563,552

Duration of Plan: 18 years (2034) Total estimated Plan duration with tax capture for reimbursement of Eligible Activities, Brownfield Plan Preparation, Contingency, Interest, Authority Administrative Fees, and Local Site Remediation Revolving Fund.

Total Plan Capture Breakdown:

(Capture Years in Plan)	Developer Reimbursement (13 Years)	\$3,194,346
	Township Administrative Reimbursement (<i>adds 1.5 Years</i>)	\$325,000
	<u>Township LSRRF Deposits (5 Years)</u>	<u>\$1,860,171</u>
	TOTAL CAPTURE (18 Years Plan Duration)	\$5,379,516

Gain in Taxes Breakdown:
(Total Plan Duration)

Gain In Taxes Breakdown			
	Notes	Total/ Cumulative	Annual Average
Total Taxes Paid During Brownfield Plan Tax Capture Period		\$ 11,506,938	\$ 639,274
	Capture Period in # of Years	18	-
Total New Tax Revenue Received by each Taxing Unit/ Entity	-	Total/ Cumulative	Annual Average
DELHI CHARTER TOWNSHIP			
Operating - Delhi Township		\$ -	\$ -
Fire/EMS		\$ -	\$ -
Police		\$ -	\$ -
<i>Subtotal to Above</i>	-	\$ -	\$ -
INGHAM COUNTY			
County Operating - General Operations & Indigent Veterans Support		\$ -	\$ -
Potter Park Zoo & Potter Park		\$ -	\$ -
Public Transportation		\$ -	\$ -
911 System - Emergency Telephone Services		\$ -	\$ -
Juvenile Justice		\$ -	\$ -
Farmland/ Open Space Preservation		\$ -	\$ -
Health Care Services		\$ -	\$ -
Parks/Trails		\$ -	\$ -
<i>Subtotal to Above</i>	-	\$ -	\$ -
Capital Region Airport Authority - CRAA		\$ -	\$ -
Capital Area Transportation Authority - CATA		\$ -	\$ -
LIBRARY			
Capital Area District Libraries - CADL		\$ -	\$ -
COMMUNITY COLLEGE			
Lansing Community College - LCC		\$ -	\$ -
<i>Subtotal to Above</i>	-	\$ -	\$ -
LOCAL SCHOOL MILLAGES: excludes State School millages			
Holt School District Debt (District #33070)		\$ 1,738,261	\$ 96,570
<i>Subtotal to Above</i>	-	\$ 1,738,261	\$ 96,570
<i>Added taxes not captured but redistributed from the final year(s) of capture*</i>	-	\$ 217,335	\$ -
<i>Subtotal of All of the Above</i>	-	\$ 1,955,596	\$ -
STATE SCHOOL MILLAGES: excludes Local School millages			
State Education Tax - SET		\$ 1,042,956	\$ 57,942.02
Local School Operating (District #33070 - Holt) - LSO: Full rate for for Non-Homestead/Non-PRE Real Property; 0 mills for for Homestead/PRE Real Property; 6 mills for Commercial Personal Property.		\$ 3,128,869	\$173,826.06
<i>Subtotal to Above</i>	-	\$ 4,171,825	\$ 231,768
<i>Added taxes not captured but redistributed from the final year(s) of capture</i>	-	\$ -	\$ -
GRAND TOTAL OF NEW TAX REVENUE TO THE ABOVE	-	\$ 6,127,421	-

*Excluding any Taxing Unit levying a millage not allowed for tax capture (e.g. debt millages)

Total Taxes Captured:
(Total Plan Duration)

Total Taxes Captured During Brownfield Plan Tax Capture Period	Total/ Cumulative	Annual Average
Brownfield Redevelopment Authority (BRA) Administration	\$ 325,000	\$ 18,056
BRA Local Site Remediation Revolving Fund (LSRRF)	\$ 1,860,171	\$ 103,343
State of Michigan Brownfield Redevelopment Fund (MBRF)	\$ -	\$ -
Local Taxes To Developer (Reimburse Eligible Activities)	\$ 3,194,346	\$ 177,464
State School Taxes To Developer (Reimburse Eligible Activities)	\$ -	\$ -
Total New Tax Capture (See Table 1a)	\$ 5,379,516	\$ 298,862

Distribution of Total New Taxes Paid:
(Total Plan Duration)

Total New Taxes Received by Taxing Units	\$ 6,127,421
Total New Taxes Captured	\$ 5,379,516
Total New Taxes	\$ 11,506,938

Eligible Activities and Eligible Costs:

Eligible Activities	Eligible Costs
Baseline Environmental Assessment (BEA) Activities	\$ 2,009
Due Care Activities	\$ 312,058
Additional Response Activities	\$ 96,700
Demolition Activities	\$ 1,719,992
<i>Subtotal</i>	<i>\$ 2,130,759</i>
Contingency (15%)	\$ 319,614
<i>Subtotal</i>	<i>\$ 2,450,373</i>
Interest (5% Simple)	\$ 722,972
<i>Subtotal</i>	<i>\$ 3,173,346</i>
Brownfield Plan & Work Plan Preparation (and application fees, if any)	\$ 21,000
<i>Subtotal (to Developer)</i>	<i>\$ 3,194,346</i>
BRA Administration	\$ 325,000
BRA LSRRF	\$ 1,860,171
State of Michigan Brownfield Redevelopment Fund	\$ -
<i>Subtotal (to Others)</i>	<i>\$ 2,185,171</i>
GRAND TOTAL	\$ 5,379,516

INTRODUCTION

Delhi Charter Township, Michigan (the “Township”), established the Delhi Charter Township Brownfield Redevelopment Authority (the “Authority”) on October 5, 2001 (Secretary of State filing date), pursuant to the Brownfield Redevelopment Financing Act, Michigan Public Act 381 of 1996, MCLA 125.2651 et. seq., as amended (“Act 381”), is authorized to exercise its powers within Delhi Charter Township, Michigan.

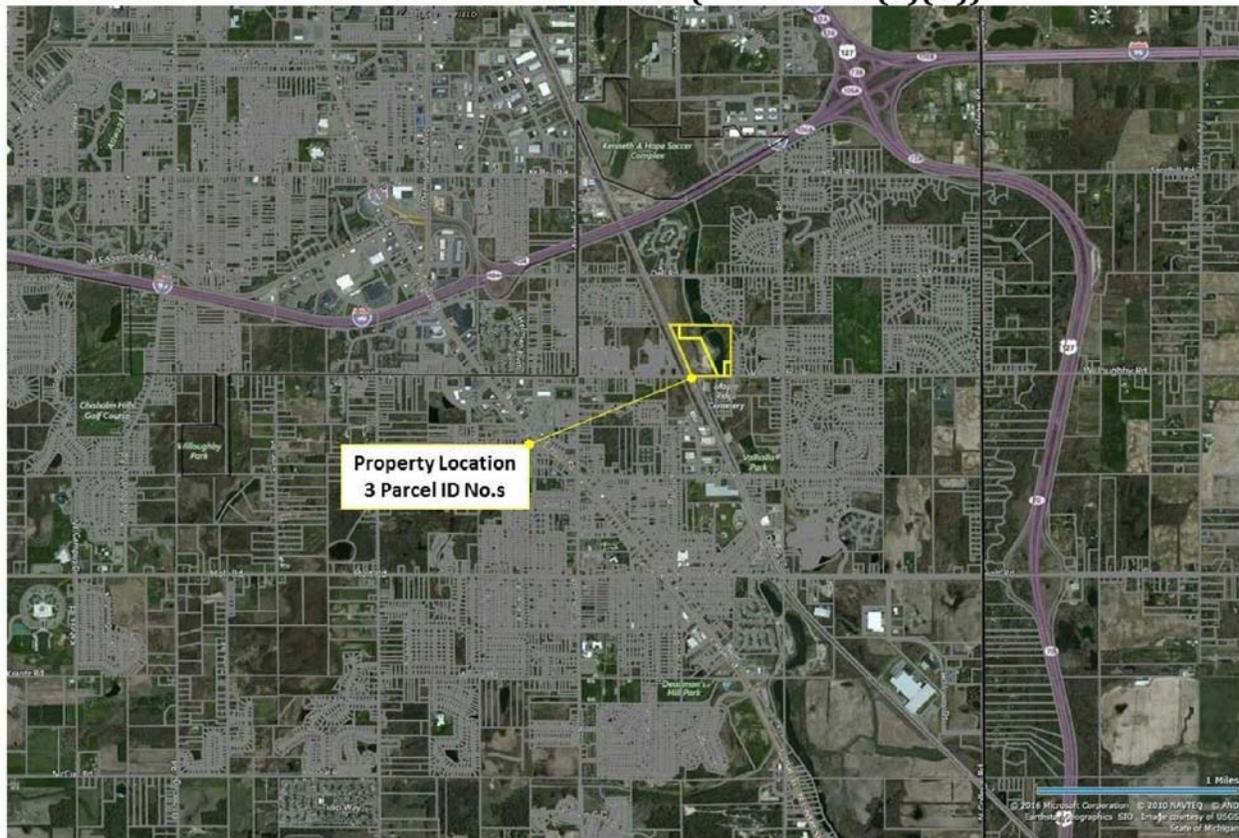
The purpose of this Brownfield Plan (the “Plan”) to be implemented by the Authority, is to satisfy the requirements of Act 381 for including the eligible property described below in a Plan. This Plan promotes the redevelopment of and investment in the eligible “Brownfield” Property within the Township, to facilitate financing of eligible activities at the Property. Inclusion of Property within any Plan in the Township will facilitate financing of eligible activities at eligible properties, and will also provide tax incentives to eligible taxpayers willing to invest in revitalization of eligible sites, commonly referred to as “Brownfields” that are either environmentally contaminated (a “facility”), blighted property, historic resource or deemed functionally obsolete property. By facilitating redevelopment of the Property, this Plan is intended to promote economic growth for the benefit of the residents of the Township and all taxing units located within and benefited by the Authority.

This Plan is intended to apply to the Eligible Property identified in this Plan and, if tax increment revenues are proposed to be captured from that Eligible Property, to identify and authorize the eligible activities to be funded by such tax increment revenues.

This Plan is intended to be a living document, which may be modified or amended in accordance with the requirements of Act 381, as necessary to achieve the purposes of Act 381. The applicable sections of Act 381 are noted throughout the Plan for reference purposes.

This Plan contains information required by Section 13(1) of Act 381.

1. DESCRIPTION OF THE ELIGIBLE PROPERTY (SECTION 13(1)(H))



The Eligible Property is located in the southwest quarter of the southeast quarter of Section 11 (T.3N., R.2W), Delhi Township, Ingham County, Michigan. The Eligible Property (“Property”) consists of three parcels and is located at 4184 E. Willoughby Road (Tax ID 33-25-05-11-452-001), 4136 E. Willoughby Road (Tax ID 33-25-05-11-452-005) and 0 E. Willoughby Road (Tax ID 33-25-05-11-452-004), Delhi Charter Township, Ingham County, Michigan. The Property is situated to the north of E. Willoughby Road and east of the Jackson & Lansing Railroad (former Michigan Central Railroad) tracks. The Property contains approximately 38.51 acres in Delhi Charter Township (“Township”).

The Property is surrounded by the PD District (Planned Development District) and TC District (Town Center District) to the south, R-1B District (One-family low-density residential) to the east, R-1C District (One-family medium-density residential) and RM District (Multiple-family residential) to the north, and C-1 District (Low-impact commercial) and PD District (Planned development) to the west. Two large ponds comprise the east side of the Property, the west side of the Property is bordered by the Jackson & Lansing Railroad (former Michigan Central Railroad) tracks, and the Property is abutted by a Primary County roadway (Willoughby Road), municipal water & sanitary sewer services, and electrical and gas utilities to the south. The Green Drain runs through the Property in a north/south direction.

The existing Property contains numerous portions of above grade buildings/structures, prior site improvements and extensive subsurface debris/fill from the original industrial operations on-site. Early records identified that mining operations may have begun on-site as early as sometime in the 1940’s and continued through approximately 2003. The manufacturing plant buildings were razed in 2006. During this timeframe, numerous other activities occurred such as concrete production and manufacturing operations, block plant operations and manufacturing, and significant filling of the Property. These activities left the Property in a blighted and contaminated state with an uncertain future for its reuse or redevelopment options.



1986 Aerial Photo



2015 (approximately) Aerial Photo

See Exhibit A, Legal Descriptions and Eligible Property Boundary Map. The Eligible Property Map & Topographic Survey serve together to describe the Eligible Property Boundary.

Eligible Property				
Address	Tax ID	Basis of Eligibility	Approximate Acreage	Current Zoning
4184 E. Willoughby Road	33-25-05-11-452-001	Facility	16.86	RM District
4136 E. Willoughby Road	33-25-05-11-452-005	Adjacent or Contiguous to Facility Property	1.34	RM District
0 E. Willoughby Road	33-25-05-11-452-004	Facility	20.31	RM District
RM District = Multiple-family residential				

The Property consists of three parcels of land. Two of the three parcels are a "facility" as defined by Part 201 of Michigan's Natural Resources and Environmental Protection Act (P.A. 451, as amended). In accordance with Act 381, the remaining parcel included in this Plan is adjacent or contiguous to the facility-designated properties and is estimated to increase the captured taxable value of the facility-designated parcels. The parcels are located within the boundaries of the Township.

The Property is zoned RM District (Multiple-family residential) but is in the process of a rezoning to PD District (Planned development). The PD District permits the proposed Projects Site Plan. Mixture of residential uses proposed on Property is consistent with the Township's Master Plan Future Land Use Map 4 approved by the Township Planning Commission on 10/28/13 identifying High Density Residential for this Property. This Property is also located in the Downtown Development Authority District.

The Project proposes to redevelop underutilized and vacant Property into a multi-family residential development. The redevelopment integrates design elements, environmental response activities, and economic development to further goals of the Township, the Michigan Department of Environmental Quality ("MDEQ") and the Michigan Economic Development Corporation ("MEDC"). It will result in: (1) the community and municipal benefits of increased property taxes on the Property; (2) due care and additional response activities that will address the contamination on the Property, reducing the threat to human health and the environment; and (3) a substantial improvement to the appearance and aesthetics of the Property which will assist in increasing the property values of the neighboring community. The overall redevelopment of this site will include site demolition of the wide-spread fill and debris found across most of the Property, environmental due care and additional response activities, and redevelopment into a multi-family redevelopment project. The applicant has a strong desire to put this vacant property back to productive use and drastically improve the aesthetics of the area.

The parcel and all tangible real and personal property located thereon will comprise the Eligible Property and is referred to herein as the "Property." Incremental tax revenues resulting from new personal property will be captured if available. Any such funds will be used to reimburse the Authority and Developer for eligible activities, to the extent authorized by this Plan, and an executed reimbursement agreement between the Developer and the Authority.



Proposed 4 Unit



Proposed 33 Unit

2. BASIS OF ELIGIBILITY (SECTION 13 (1)(H), SECTION 2 (M)), SECTION 2(R)

The Property is considered “eligible property” as defined by Act 381, Section 2 because (a) the Property was previously utilized or is currently utilized for a commercial or residential purpose; (b) two of the three parcels comprised by the Property has been determined to be a “facility”; (c) includes parcels that are adjacent or contiguous to that Property because the development of the adjacent and contiguous parcels is estimated to increase the captured taxable value of that property; and, (d) the subject property is in Delhi Charter Township, which is not a qualified local governmental unit under Act 381.

Eligible Property			
Address	Tax ID	Basis of Eligibility	Approximate Acreage
4184 E. Willoughby Road	33-25-05-11-452-001	Facility	16.86
4136 E. Willoughby Road	33-25-05-11-452-005	Adjacent or Contiguous to Facility Property	1.34
0 E. Willoughby Road	33-25-05-11-452-004	Facility	20.31

Exhibit B includes an overview of the environmental conditions on the Property as it is related to its basis of eligibility and inclusion in the Plan. As Eligible Property, the Property is eligible for Brownfield redevelopment incentives from the Authority.

3. SUMMARY OF ELIGIBLE ACTIVITIES AND DESCRIPTION OF COSTS (SECTION 13 (1)(A),(B))

The “eligible activities” that are intended to be carried out at the Property are considered “eligible activities” as defined by Sec 2 of Act 381, because they include Baseline Environmental Activities (BEA) {Phase I ESA, Phase II ESA, and BEA}, due care activities, additional response activities, demolition (building and site), and preparation of a Brownfield Plan. Exhibit B includes an overview of the Brownfield eligible activities that are contemplated for the Property.

A summary of the eligible activities and the estimated cost of each eligible activity intended to be paid for with Tax Increment Revenues from the Property are shown in the following tables (Tables 1a and 1b).

Focus of specific environmental eligible activities anticipated will involve: contaminated material repurposing; removal of contaminated fill/debris and soil; soil management (demarcation liner and topsoil cap or protective cap/direct contact barrier); potential excavation, transportation, disposal, sampling & analysis verification, and; special construction in areas of restricted access along with special stormwater design criteria (if required). Transportation and disposal of fill and debris is currently anticipated to be treated as non-hazardous (contaminated) material and will be disposed of at a licensed Class II landfill as an environmental eligible activity if it cannot be repurposed on-site. If any material is deemed non-contaminated, in an effort to significantly reduce costs, the fill and debris will be managed appropriately on-site or off-site under the demolition eligible activity category as permitted by state non-environmental eligible activity guidance.

For Environmental Activities, the line item costs for any eligible activity may be adjusted after the date the Plan is approved by the Brownfield Redevelopment Authority and/or Governing Body, so long as the costs do not exceed the total combined costs of said activities plus a pro-rata contingency amount, to the extent that the adjustments do not violate the terms of any approved documents, such as a Development Reimbursement Agreement or Work Plan (if applicable).

For Non-Environmental Activities, the line item costs for any eligible activity may be adjusted after the date the Plan is approved by the Brownfield Redevelopment Authority and/or

Governing Body, so long as the costs do not exceed the total Non-Environmental costs plus a pro-rata contingency amount, to the extent that the adjustments do not violate the terms of any approved documents, such as a Development Reimbursement Agreement or Work Plan (if applicable).

Furthermore, costs in this Plan are subject to approval by the Brownfield Redevelopment Authority and/or Governing Body for the use of local-only tax increment revenues from locally levied millages. The Authority may adjust specific eligible activities amongst environmental and non-environmental eligible activities. These adjustments are allowed and do not change the validity of this Plan, so long as the Grand Total of eligible activity costs identified in Table 1a, \$5,379,516, are not exceed.

The Developer desires to be reimbursed for the costs of eligible activities. Tax increment revenue generated by the Property will be captured by the Authority and used to reimburse the cost of the eligible activities completed on the Property. Amendments to Act 381 that were signed in to law on December 28, 2012 allow local units of government to approve reimbursement of eligible activities with tax increment revenues attributable to local taxes on any eligible activities conducted on eligible property or prospective eligible properties prior to approval of the Plan, if those costs and the eligible property are subsequently included in an approved Plan. In the event that eligible activities are performed prior to Plan approval, approved eligible activity costs will be reimbursable in accordance with Act 381.

In accordance with this Plan and the associated Development Reimbursement Agreement (the "Agreement") with the Authority, the amount advanced by the Developer will be repaid by the Authority solely from the tax increment revenues realized from the eligible property.

Tax increment revenues will first be used to pay or reimburse Administrative expenses for the Authority and second to reimburse eligible costs incurred by the Developer. Local Site Remediation Revolving Fund (LSRRF) capture will occur briefly in the first year of capture and then again at the end of Developer reimbursement for a full five (5) years as described in the tables. Local-only tax capture was assumed to reimburse eligible activity costs in this Plan.

The costs listed in the tables are estimated costs and may increase or decrease depending on the nature and extent of the actual conditions encountered on the Property. The actual cost of those eligible activities encompassed by this Plan that will qualify for reimbursement from tax increment revenues of the Authority from the Property shall be governed by the terms of the Agreement. No costs of eligible activities will be qualified for reimbursement except to the extent permitted in accordance with the terms and conditions of the Agreement.

Table 1a - Itemized Eligible Activities	Notes	Eligible Activity Amount Supported in Brownfield Plan	Local Tax Capture	State School Tax Capture
			100.00%	0.00%
Baseline Environmental Assessment (BEA) Activities		\$ 2,009	\$ 2,009	\$ -
Due Care Activities		\$ 312,058	\$ 312,058	\$ -
Additional Response Activities		\$ 96,700	\$ 96,700	\$ -
Total Environmental		\$ 410,767	\$ 410,767	\$ -
Demolition Activities		\$ 1,719,992	\$ 1,719,992	\$ -
Total Non Environmental		\$ 1,719,992	\$ 1,719,992	\$ -
	Percentage / Rate			
Contingency Environmental	15.0%	\$ 61,615	\$ 61,615	\$ -
Contingency Non-Environmental	15.0%	\$ 257,999	\$ 257,999	\$ -
<i>Sub Total: Contingencies</i>		\$ 319,614	\$ 319,614	\$ -
Interest Environmental	5.0%	\$ 139,374	\$ 139,374	\$ -
Interest Non-Environmental	5.0%	\$ 583,598	\$ 583,598	\$ -
<i>Sub Total: Interest</i>		\$ 722,972	\$ 722,972	\$ -
<i>Sub Total: EAs + Contingencies + Interest</i>		\$ 3,173,346	\$ 3,173,346	\$ -
Brownfield Plan & Work Plan Preparation		\$ 21,000	\$ 21,000	\$ -
Local Application Fees		\$ -	\$ -	\$ -
Total Administrative: Brownfield Plan + Work Plan + Application Fees		\$ 21,000	\$ 21,000	\$ -
<i>Sub Total: EAs + Contingencies + Interest + Administrative</i>		\$ 3,194,346	\$ 3,194,346	\$ -
Brownfield Redevelopment Authority (BRA) Administration		\$ 325,000	\$ 325,000	\$ -
BRA Local Site Remediation Revolving Fund (LSRRF)		\$ 1,860,171	\$ 1,860,171	\$ -
Total BRA: BRA Administration + LSRRF		\$ 2,185,171	\$ 2,185,171	\$ -
<i>Sub Total: EAs + Contingencies + Interest + Administrative + BRA</i>		\$ 5,379,516	\$ 5,379,516	\$ -
State of Michigan Brownfield Redevelopment Fund (MBRF)		\$ -	\$ -	\$ -
GRAND TOTAL: EAs + Contingencies + Interest + Administrative + BRA + MBRF		\$ 5,379,516	\$ 5,379,516	\$ -

Table 1b - Summary of Eligible Activities	Eligible Activity Amount Supported in Brownfield Plan
Total Local Taxes to Developer Eligible Activities, Contingency and Interest	\$ 3,194,346
Total Local Taxes to BRA Eligible Activities, Contingency and Interest	\$ -
Total Local Tax Capture Eligible Activities, Contingency and Interest	\$ 3,194,346
Total Local Taxes to BRA Administration	\$ -
Total Local Taxes to Local Site Remediation Revolving Fund (LSRRF)	\$ -
Total Local Taxes to BRA	\$ -
Total School Taxes to Developer Eligible Activities, Contingency and Interest	\$ -
Total School Taxes to BRA Eligible Activities, Contingency and Interest	\$ -
Total School Taxes to State of Michigan Brownfield Redevelopment Fund (MBRF)	\$ -
Total School Tax Capture Eligible Activities	\$ -
Total Capture by Brownfield Redevelopment Authority (BRA)	\$ -
Total Capture by State of Michigan Brownfield Redevelopment Fund (MBRF)	\$ -
Total Capture by Developer	\$ 3,194,346
GRAND TOTAL	\$ 3,194,346

4. CAPTURED TAXABLE VALUE AND TAX INCREMENT REVENUES (SECTION 13(1)(C))

This Plan anticipates the capture of tax increment revenues to reimburse the Developer for the costs of eligible activities under this Plan in accordance with the Agreement. The initial taxable value of the Property shall be determined by the use of tax year 2016 tax values. Tax increment revenue capture will begin when tax increment is generated by redevelopment on the Property; this is expected to begin in 2017. Estimates project that the Authority is expected to capture the tax increment revenues from 2017 through 2034 which will be generated by the increase in taxable value. The following table provides a summary of the captured incremental taxable values and tax increment revenues captured which it will provide after completion of the redevelopment project. In addition, detailed tables of estimated tax increment revenues to be captured is attached to this Plan as Exhibit C, Table 4 - Tax Increment Financing Estimates. Prior to commencement of reimbursement to the Developer, payment of Authority Administrative fees will occur first. Local Site Remediation Revolving Fund (LSRRF) capture will occur briefly in the first year of capture and then again at the end of Developer reimbursement for a full five (5) years as described in the tables.

The captured incremental taxable value and associated tax increment revenue will be based on the actual increased taxable value from all taxable improvements (real property) on the Property set through the property assessment process by the local unit of government and equalized by the County. The actual increased taxable value of the land and all future taxable improvements on the Property may vary. Furthermore, the amount of tax increment revenue available under this Plan will be based on the actual millage levied annually by each taxing jurisdiction on the increase in tax value resulting from the redevelopment project that is eligible and approved for capture.

Table 2 - Captured Incremental Taxable Values & Tax Increment Revenues Captured

Tax Year	Captured Incremental Taxable Values	Tax Increment Revenues Captured
2016 - Base Year	\$ -	\$ -
2017 - Start of Tax Capture	\$ 2,160,713	\$ 69,571
2018	\$ 8,316,150	\$ 267,763
2019	\$ 8,513,124	\$ 274,106
2020	\$ 8,714,825	\$ 280,600
2021	\$ 8,921,368	\$ 287,250
2022	\$ 9,132,867	\$ 294,060
2023	\$ 9,349,442	\$ 301,033
2024	\$ 9,571,215	\$ 308,174
2025	\$ 9,798,311	\$ 315,486
2026	\$ 10,030,856	\$ 322,974
2027	\$ 10,268,983	\$ 330,641
2028	\$ 10,512,825	\$ 338,492
2029	\$ 10,762,520	\$ 346,532
2030	\$ 11,018,206	\$ 354,764
2031	\$ 11,280,030	\$ 363,194
2032	\$ 11,548,137	\$ 371,827
2033	\$ 11,822,679	\$ 380,667
2034	\$ 12,103,809	\$ 389,718
Total	-	\$ 5,596,851
<i>Total of "Surplus Revenue/Surplus Incremental Taxes Paid" to be returned to the applicable Taxing Jurisdictions on a pro-rata basis</i>		\$ 217,335
Total Tax Increment Revenues Captured		\$ 5,379,516

5. METHOD OF BROWNFIELD PLAN FINANCING (SECTION 13(1)(D))

Eligible activities are to be financed by the Developer. The Developer will be reimbursed for eligible costs as listed in Tables 1a and 1b above. The current estimated amount of capture used to reimburse the Developer and Authority for costs in this Plan is \$5,379,516 (includes contingency, interest, Brownfield Plan preparation, Authority Administrative fees and LSRRF deposits).

All reimbursements authorized under this Plan shall be governed by the Agreement. The Authority shall not incur any note or bonded indebtedness to finance the purposes of this Plan. The inclusion of eligible activities and estimates of costs to be reimbursed in this Plan is intended to authorize the Authority to fund such reimbursements and does not obligate the Authority or the Township to fund any reimbursement or to enter into the Agreement providing for the reimbursement of any costs for which tax increment revenues may be captured under this Plan, or which are permitted to be reimbursed under this Plan. The amount and source of any tax increment revenues that will be used for purposes authorized by this Plan, and the terms and conditions for such use and upon any reimbursement of the expenses permitted by the Plan, will be provided solely under the Agreement contemplated by this Plan.

The Authority anticipates collecting \$325,000 in Administrative costs and \$1,860,171 in LSRRF deposits under this Plan. Administrative costs and LSRRF deposits are reflective of the redevelopment project being completed.

6. AMOUNT OF NOTE OR BONDED INDEBTEDNESS INCURRED (SECTION 13(1)(E))

The Authority will not incur a note or bonded indebtedness for this Brownfield project under this Plan.

7. DURATION OF THE BROWNFIELD PLAN AND EFFECTIVE DATE (SECTION 13(1)(F))

In no event shall the duration of the Plan exceed 35 years following the date of the resolution approving the Plan, nor shall the duration of the tax capture exceed the lesser of the period authorized under subsection (4) and (5) of Section 13 of Act 381 or 30 years. The date of tax capture shall commence during the year construction begins or the immediate following year—as increment revenue becomes available, but the beginning date of tax increment revenues capture shall not exceed five years beyond the date of the governing body resolution approving the Plan.

8. ESTIMATED IMPACT ON TAXING JURISDICTIONS (SECTION 13(1)(G), SECTION 2(E))

The following table presents a summary of the impact to taxing jurisdictions (if the redevelopment project is completed).

Table 3 - Impact to Taxing Jurisdictions			
Taxing Unit	Incremental Taxes Paid	Taxes Returned to Taxing Unit	Impact to Taxing Jurisdiction
DELHI CHARTER TOWNSHIP	-	-	-
Operating - Delhi Township	\$ 749,086	\$ -	\$ 749,086
Fire/EMS	\$ 260,739	\$ -	\$ 260,739
Police	\$ 260,739	\$ -	\$ 260,739
INGHAM COUNTY	-	-	-
County Operating - General Operations & Indigent Veterans Support	\$ 1,109,740	\$ -	\$ 1,109,740
Potter Park Zoo & Potter Park	\$ 71,269	\$ -	\$ 71,269
Public Transportation	\$ 20,859	\$ -	\$ 20,859
Special Transportation	\$ 83,437	\$ -	\$ 83,437
911 System - Emergency Telephone Services	\$ 146,553	\$ -	\$ 146,553
Juvenile Justice	\$ 104,296	\$ -	\$ 104,296
Farmland/ Open Space Preservation	\$ 24,336	\$ -	\$ 24,336
Health Care Services	\$ 60,839	\$ -	\$ 60,839
Parks/Trails	\$ 86,913	\$ -	\$ 86,913
Capital Region Airport Authority - CRAA	\$ 121,504	\$ -	\$ 121,504
Capital Area Transportation Authority - CATA	\$ 522,695	\$ -	\$ 522,695
LIBRARY	-	-	-
Capital Area District Libraries - CADL	\$ 271,169	\$ -	\$ 271,169
INTERMEDIATE SCHOOL DISTRICTS (ISD)	-	-	-
RESA Operating	\$ 32,923	\$ -	\$ 32,923
RESA Special Education	\$ 783,295	\$ -	\$ 783,295
RESA Vocational Education	\$ 224,670	\$ -	\$ 224,670
COMMUNITY COLLEGE	-	-	-
Lansing Community College - LCC	\$ 661,791	\$ -	\$ 661,791
LOCAL SCHOOL MILLAGES: excludes State School millages	-	-	-
Holt School District Debt (District #33070)	\$ 1,738,261	\$ 1,738,261	\$ -
STATE SCHOOL MILLAGES: excludes Local School millages	-	-	-
State Education Tax - SET	\$ 1,042,956	\$ 1,042,956	\$ -
Local School Operating (District #33070 - Holt) - LSO: Full rate for for Non-Homestead/Non-PRE Real Property; 0 mills for for Homestead/PRE Real Property; 6 mills for Commercial Personal Property.	\$ 3,128,869	\$ 3,128,869	\$ -
Totals	\$ 11,506,938	\$ 5,910,086	\$ 5,596,851
<i>"Surplus Revenue/Surplus Incremental Taxes Paid" from Local Millages (all but State School Millages) to be returned to the applicable Taxing Jurisdictions on a pro-rata basis (excluding any millages not allowed for tax capture)</i>			\$ 217,335
<i>"Surplus Revenue/Surplus Incremental Taxes Paid" from State School Millages to be returned to the applicable Taxing Jurisdictions on a pro-rata basis</i>			\$ -
Total Tax Increment Revenues Captured			\$ 5,379,516

Additional information related to the impact of tax increment financing on the various taxing jurisdictions is presented Exhibit C, Table 4.

9. DISPLACEMENT OF PERSONS (SECTION 13(1)(I-L))

There is currently no persons or businesses residing on the Property. Additionally no occupied residences will be acquired or cleared; therefore there will be no displacement or relocation of persons or businesses under this Plan.

10. AUTHORITY REVOLVING FUND (SECTION 8; SECTION 13(1)(M))

The Authority has established a Local Site Remediation Revolving Fund (LSRRF). The LSRRF may be used to reimburse the Township, the Authority, or private parties for eligible costs at eligible properties as identified in other Brownfield Plans adopted by the Township. It may also be used for eligible activities on eligible properties for which there are no other means to capture tax increment revenues, or where there are insufficient tax increment revenues to fund all eligible activities. The LSRRF provides additional flexibility to the Township and its Authority in facilitating redevelopment of Brownfield properties by providing another source of financing for eligible activities.

For this Plan, the Authority will capture incremental local taxes to fund the LSRRF briefly in the first year of capture up to \$21,035 for the benefit of a grant received for the Project from funding made possible through the Lansing Regional Brownfields Coalition (LRBC). In 2015, the LRBC received a Brownfield Assessment Grant from the U.S. Environmental Protection Agency (EPA). The grant is administered by the Lansing Economic Area Partnership (LEAP). LSRRF capture will again resume starting in Year 14 (first full year) through the life of the Plan, to the extent allowed by law. The LSRRF will capture approximately on average \$372,034 per year (see Table 4d for LSRRF distribution). The Authority anticipates depositing \$1,860,171 of local captured taxes into its LSRRF if the redevelopment project is completed and all eligible activities are incurred as summarized in Table 1a.

The funds deposited in the LSRRF as part of this and other Brownfield Plans will be used in a manner consistent with the requirements of Act 381 of 1996, as amended.

11. OTHER INFORMATION (SECTION 8; SECTION 13(1)(N))

The Authority, in accordance with the Act, may amend this Plan in the future in order to fund additional eligible activities associated with the Project described herein.

Exhibit A

Legal Descriptions And Eligible Property Boundary Maps

Legal Descriptions from Assessing Records

The Eligible Property consists of three adjoining parcels at 4184 and 4136 Willoughby Road, Delhi Charter Township, Michigan, comprising approximately 38.51 acres as follows:

Parcel Identification No. 33-25-05-11-452-001 located at 4184 E. Willoughby Road (16.86 acres):

(D 11-40-1 11-30-1) BEG ON S SEC LN AT PT 1700 FT W OF SE COR SEC 11, TH W 685 FT ALG SEC LN TO TNT W/ ELY LN MCRR R/W, TH NWLY 823 FT ALG ELY R/W LN TO INT W/ N-S 1/4 LN, TH N 236 F, TH ELY 558 FT TH SELY TO BEG; ALSO SE 1/4 OF SW 1/4 LYING N & E OF MCRR R/W; SEC 11, T3NR2W.

Parcel Identification No. 33-25-05-11-452-004 no address therefore 0 E. Willoughby Road (20.31 acres):

(D 11-40) SW 1/4 OF SE 1/4 OF SEC 11, EXC BEG ON S SEC LN 1700 FT W OF SE COR OF SEC 11, TH W 685 FT ALG S SEC LN TO ELY LN OF MCRR R/W, TH NW'LY 823 FT ALG ELY RIW LN TO N-S 1/4 LN SEC 11, TH N 236 Fr, TH ELY 558 FT, TH SE'LY TO POB; ALSO EXC A PCL IN SE COR OF SW 1/4 OF SE 1/4 OF SEC 11 BEING 363 FT N & S BY 160 FT E & W; ALSO EXC THAT PT OF SW 1/4 OF SE 1/4 OF SEC 11 LYING SW OF NE'LY LN OF MCRR R/W; SEC 11 T3N R2W.

Parcel Identification No. 33-25-05-11-452-005 located at 4136 E. Willoughby Road (1.34 acres):

D 11-40-3 A PCL OF LAND IN SE COR OF SW 1/4 OF SE 1/4 OF SEC 11 BEING 363 FT N & S BY 160 FT E & W, SEC 11, T3NR2W. 1.34 AC M/L.

Eligible Property Boundary Maps

(Eligible Property Map & Topographic Survey serve together to describe the Eligible Property Boundary)

Eligible Property Map



Topographic Survey

Project Number: 1508 – Date of Survey 1/19/2016

(See next page)

LEGAL DESCRIPTION:

TAK ON 33-25-05-11-452-001
(2) 11'-40" SW 1/4 OF SE 1/4 OF SEC 11, T34N, R24W, S25E
(3) 11'-40" SW 1/4 OF SE 1/4 OF SEC 11, T34N, R24W, S25E
(4) 11'-40" SW 1/4 OF SE 1/4 OF SEC 11, T34N, R24W, S25E

TAK ON 33-25-05-11-452-002
(1) 11'-40" SW 1/4 OF SE 1/4 OF SEC 11, T34N, R24W, S25E
(2) 11'-40" SW 1/4 OF SE 1/4 OF SEC 11, T34N, R24W, S25E

Table with 5 columns: BEET NO., TYPE, SIZE, CATEGORY, CONDITION. Lists various tree species and their counts.

STRUCTURE INVENTORY:

Table with 5 columns: AREA NO., TYPE, SIZE, CATEGORY, CONDITION. Lists various structures and their details.

TREE INVENTORY:

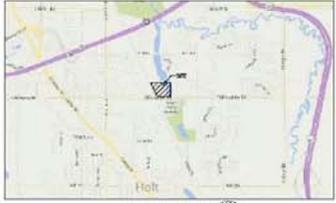
Table with 5 columns: AREA NO., TYPE, SIZE, CATEGORY, CONDITION. Lists various trees and their details.

GENERAL NOTES:

1) All bearings are based upon the South line of Section 11 as being...
2) A current Title Commitment and Schedule A Survey...
3) By grading existing only, this property is to be...
4) A certified boundary survey has not been performed...

BENCHMARK:

Control BM - Existing water bench at top of oak between...
BM 1 - Followed oak to the West face of power pole...
BM 2 - Bench to the West face of 30' steel oak...



LEGEND: Symbols for various features like STUMP REMOVAL, EXISTING DRIVE, POOL, etc. Includes a scale bar and north arrow.



Table with 2 columns: DATE, REVISIONS. A table for tracking changes to the drawing.

TOPOGRAPHIC SURVEY FOR WILLOUGHBY ROAD DEVELOPMENT. Part of SE 1/4 & SW 1/4 of SECTION 11, T34N, R24W, DELHI TOWNSHIP, INDIAN COUNTY, MICHIGAN.

MISS DIG logo and text: BEFORE YOU DIG OR DRILL, CALL 1-800-482-7171 (TOLL FREE).

Project information: PROJECT NO. 1508, SHEET NO. 1 OF 1. Includes a small diagram of a dig site.

EXHIBIT B
Basis of Eligibility
Supportive Environmental and Non-Environmental Information

A. HISTORY

According to historical documents summarized in a Phase I Environmental Site Assessment (ESA) prepared by Triterra on March 14, 2016, on behalf of Willoughby Estates, LLC prior to their acquisition of the Property, the Property was a gravel mine prior to 1950 until it began use as a masonry and concrete production plant in 1965. A house was built in the southeast Property corner in 1951, and an increase in mining operations influenced the formation of the 9-acre pond. By 1996, Décor Precast of Michigan occupied the Property and produced concrete landscaping products and concrete patio blocks. The production plant operations involved mixing raw materials (i.e. various grades of sand and graded gravel) and casting cement to molds. The product was then stacked, washed, and stored before shipment. Materials and chemical substances stored and used at the facility included diesel fuel, hydraulic oil, motor oil, gear oil, boiler chemicals, concrete mixtures, and cement dyes. A manufacturing building was consequently built for the concrete production activities. A warehouse building was constructed in 1972 but blew down in 1996. In 1989, a modular office was placed south from the manufacturing building. In 1999, a storage building was constructed onto to the north side of the modular office. Operations continued until approximately 2003. In 2004, the house was removed from the Property and the basement backfilled. The manufacturing plant and office buildings were razed in 2006. The Property has since been vacant land aside from paved parking and concrete slab foundations left behind from the demolished buildings.

The Eligible Property ("Property") consists of the three parcels listed below. For the purpose of this document and according to Triterra's Phase I ESA, the Property will hereinafter be referred to as 4184 E. Willoughby Road.

Eligible Property		
Address	Tax ID	Approximate Acreage
4184 E. Willoughby Road	33-25-05-11-452-001	16.86
4136 E. Willoughby Road	33-25-05-11-452-005	1.34
0 E. Willoughby Road	33-25-05-11-452-004	20.31

B. ENVIRONMENTAL FINDINGS

Phase I Environmental Site Assessment Findings - March 14, 2016

Triterra performed a Phase I Environmental Site Assessment on March 14, 2016 and in conformance with the scope and limitations of ASTM Designation: E 1527-13 for 4184 E. Willoughby Road in Holt, Michigan. The assessment revealed the following recognized environmental concerns (RECs) in connection with the Property:

- **The documented presence of soil and groundwater contamination from historical operations at the Property (Tax ID No's 33-25-05-11-452-001 and 33-25-05-11-452-004).** Subsurface investigations were conducted on the Property in 1996, 2001, and 2008. According to the most recent data, aluminum, iron, magnesium, and manganese were present in subsurface fill material at concentrations above MDEQ Part 201 generic Residential Cleanup Criteria (RCC). The fill material included concrete block debris, brick debris, wood pallets, sand, and gravel. Impacted subsurface fill and debris material was located in banks along the Green Drain, berms near the railroad and East Willoughby Road, and banks adjacent to the west-central side of quarry pond, however, the extent of subsurface fill and debris material has not been delineated at the Property. In addition, aluminum, chromium (total), iron, lead, manganese, and vanadium were detected in shallow groundwater at concentrations above Part 201 MDEQ RCC. Ammonia from soil and groundwater was found to impact the Green Drain and pond above groundwater surface interface (GSI) for cold surface water bodies. Based on the laboratory analytical results, the Property for Tax ID No's 33-25-05-11-452-001 and 33-25-05-11-452-004 meets the definition of a "facility", as defined in Part 201 of the NREPA, Michigan Public Act (PA) 451, 1994, as amended.

- **The potential for additional contamination associated with additional subsurface fill material at the former residential building located on the Property (Tax ID No. 33-25-05-11-452-005).** From 1951 to 2004, a house existed on the southeast portion of the Property. According to historical records, the house was transported to a new location. The basement was then backfilled with fill material (source and nature of fill is unknown). Triterra observed fill and debris material at the location of the former house and sheds. The debris included wood boards, concrete block, brick, tires, and miscellaneous metal items. Based on Triterra's experience, subsurface fill materials may contain metals and PAHs at concentrations above Part 201 RCC, however, there currently is no evidence to determine that Tax ID No. 33-25-05-11-452-005 meets the facility definition. Tax ID No. 33-25-05-11-452-005 is however adjacent or contiguous to that facility Property described above and because the development of this adjacent and contiguous parcel is estimated to increase the captured taxable value of that property it is deemed an Eligible Property.

Eligible Property			
Address	Tax ID	Basis of Eligibility	Approximate Acreage
4184 E. Willoughby Road	33-25-05-11-452-001	Facility	16.86
4136 E. Willoughby Road	33-25-05-11-452-005	Adjacent or Contiguous to Facility Property	1.34
0 E. Willoughby Road	33-25-05-11-452-004	Facility	20.31

Historical Documents Reviewed and Known Property Contamination

Triterra reviewed the following historical documents pertaining to the Property during its March 14, 2016 Phase I ESA:

- Baseline Environmental Assessment (BEA) prepared by AKT Peerless on December 4, 2013 on behalf of Delhi Township prior to their acquisition of the Property;
- Documentation of Due Care Plan Compliance Report prepared by AKT Peerless on December 4, 2013 on behalf of Delhi Township prior to their acquisition of the Property;
- Phase I Environmental Site Assessment (ESA) prepared by AKT Peerless on December 2, 2013 on behalf of Delhi Township prior to their acquisition of the Property;
- Phase II ESA prepared by AKT Peerless, dated November 24, 2008 on behalf of a prospective purchaser at that time, Prairie Hills Management, LLC;
- Phase I ESA prepared by Tetra Tech EM, Inc. (Tetra Tech) on April 24, 2008 on behalf of a prospective purchaser at that time, Prairie Hills Operations;
- Phase II ESA prepared by Tetra Tech EM, Inc. on March 27, 2001 on behalf of Oldcastle Architectural Products Group prior to their acquisition of the Property; and
- Phase I ESA prepared by Tetra Tech EM, Inc. on March 14, 2001 on behalf of Oldcastle Architectural Products Group prior to their acquisition of the Property.

It was reported in Tetra Tech's 2001 Phase I ESA that Strata Environmental Services (Strata) conducted a Phase I ESA and a Phase II ESA on the Property in 1996. Copies of Strata's Phase I and Phase II ESA reports were not provided in Tetra Tech's Phase I ESA nor in other historical reports reviewed during the course of Triterra's Phase I ESA. Tetra Tech indicated Strata reported an oil-leaking air compressor in one of the buildings and parts washer fluid used on site. In addition, Strata reported that two USTs containing gasoline and/or diesel formerly existed on the Property but were removed in 1991 by Snell Environmental Group (SEG). Tetra Tech reported SEG collected four soil samples from the UST excavation area and in accordance with minimum requirements of MDEQ regulations. Laboratory analytical results indicated no petroleum constituents present in the soil. However, a "Closure Letter" or "No Further Action Required" letter was not filed with the MDEQ.

In 2001, Tetra Tech conducted a subsurface investigation on the Property to evaluate the potential for contamination from the former UST area, area of staining proximal to the air compressor, and a 500-gallon diesel AST. Tetra Tech advanced three soil borings and collected six soil samples. Samples were analyzed for diesel range organics (DRO), polynuclear aromatic hydrocarbons (PAHs), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Laboratory analytical results were non-detect for PAHs and BTEX and below cleanup criteria for DRO. Tetra Tech also observed large piles of debris on the Property that consisted of sand, gravel, concrete block, and wood pallets. Some of the debris appeared to be eroding into Green Drain. According to previous Property owner, Cheney Block, excess concrete and waste products were used as fill on the Property and dumped in areas behind the block plant and adjacent to the quarry pond.

By approximately 2003 the Property operations stopped and in 2006 the buildings were demolished.

In 2008, AKT Peerless (AKT) conducted a subsurface investigation on the Property in order to assess potential for impact from observed fill and reported subsurface fill material, potential impact from historical Property operations and potential impact at the Property due to migration from the south-adjacent LUST site. AKT advanced 12 soil borings and installed two temporary monitoring wells. Twelve soil samples, three groundwater, and two surface water samples were collected and submitted for analysis of one or more of the following constituents: volatile organic compounds (VOCs), base neutral acids (BNAs), PAHs, polychlorinated biphenyls (PCBs), inorganic anions, pH, leaded gasoline parameters, distillate oils, and Target Analyte List (TAL) 23 metals. Laboratory analytical results revealed levels of aluminum, iron, magnesium, and manganese in soil above MDEQ Part 201 RCC. In addition, laboratory analytical results revealed aluminum, chromium (total), iron, lead, manganese, and vanadium in shallow groundwater above MDEQ Part 201 RCC. Environmental impact was identified in subsurface fill and debris material located in banks along the Green Drain, berms near the railroad and East Willoughby Road, and banks adjacent to the west-central side of quarry pond. The subsurface fill material included concrete block, brick, wood pallets, sand, and gravel. Significant subsurface fill and debris material was reported to depths of 4.0 to 5.0 feet below ground surface.

Based on the historical laboratory analytical results, the Property meets the definition of a facility, as defined in Part 201 of the NREPA, Michigan Public Act (PA) 451, 1994, as amended.

Attachment A includes excerpts from the Baseline Environmental Assessment (BEA) prepared by AKT Peerless on December 4, 2013 on behalf of Delhi Township prior to their acquisition of the Property evidencing the facility status of the two aforementioned parcels, Tax ID No.s 33-25-05-11-452-001 and 33-25-05-11-452-004:

- BEA Report Pages 6 and 7
- Figure 3 - Site Map with Soil Results Above MDEQ Cleanup Criteria
- Figure 4 - Site Map with Groundwater Results Above MDEQ Cleanup Criteria
- Table 1 - Summary of Soil Analytical Results
- Table 2 - Summary of Groundwater Analytical Results

Next Steps – Supplemental Phase II ESA and Due Care Investigation

Triterra plans to conduct supplemental Phase II ESA and Due Care Investigation activities on April 11, 2016 based on their completed Phase I ESA dated March 14, 2016. The purpose of the investigation is to collect and analyze soil samples and further evaluate for the presence of environmental contamination as a result of historical operations and the known placement of fill and debris material at the Property. Sample locations for the investigation have been selected based on the following rationale:

- 1) characterize areas of the Property not fully evaluated by previous investigations, and
- 2) characterize areas of the Property where development plans include subsurface excavation and/or earthwork.

As illustrated in Attachment B (Figure 3, Sampling Plan) Triterra plans to advance up to 15 soil borings (B1 through B15) on the Property using hydraulically driven, direct-push coring equipment and/or hand auger. Up to 21 soil samples will be collected for visual classification, field screening, and laboratory analyses of Target Analyte List 23 Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc). The depth to which soil borings are advanced will be dependent on the soil conditions encountered during drilling and the depth to native sediments. Data collected during field activities and from analyses of soil samples will be used to evaluate current soil conditions at the Property.

Environmental Brownfield Eligible Activities

The principal activities and costs for the environmental eligible activities involve Baseline Environmental Activities (BEA) {Phase I ESA, Phase II ESA, and BEA}, Due Care Activities {Due Care Plans and activities}, potential Additional Response Activities, and Brownfield Plan preparation.

Current environmental conditions and environmental eligible activities will be further discussed in future environmental reports upon completion of the supplemental Phase II ESA and Due Care Investigation activities planned for April 11, 2016. Specific environmental eligible activities anticipated include: completion of other assessments/supplemental investigations; survey for contaminated material repurposing; removal of contaminated fill/debris and soil; soil management (demarcation liner and topsoil cap or protective cap/direct contact barrier; potential excavation, transportation, disposal, sampling & analysis verification; special construction in areas of restricted access along with special stormwater design criteria (if required), and; Brownfield Plan preparation. Transportation and disposal of fill and debris is currently anticipated to be treated as non-hazardous (contaminated) material and will be disposed of at a licensed Class II landfill as an environmental eligible activity if it cannot be repurposed on-site. If any material is deemed non-contaminated, in an effort to reduce costs, the fill and debris will be managed appropriately on-site or off-site under the demolition eligible activity category (see Non-Environmental Brownfield Eligible Activities below) as permitted by state non-environmental eligible activity guidance. Project management both on-site and off-site will be completed to appropriately oversee activities including: planning, evaluation & supervision; eligible activity compliance such as bid specifications, eligible activity tracking & supervision, and; construction management.

C. OTHER FINDINGS

In addition to the Property being a “facility” (contaminated), several tons of buried debris and fill are estimated to exist across Tax ID No’s 33-25-05-11-452-001 and 33-25-05-11-452-004. To further investigate the aforementioned fill and debris encountered, a geotechnical investigation followed by a spot test pit investigation was conducted at the Property. Additional geotechnical investigations are planned for April 2016. As a result of the previous studies, including environmental work,

significant above grade and subsurface fill and debris were identified consisting of general junk and construction debris along with excess concrete and waste products dumped across the Property from former operations. Significant subsurface fill and debris material was reported to depths of 4 to 5 feet below ground surface. It is anticipated based upon the topography that areas exist with extensive fill beyond 5 feet below ground surface. Additionally, significant existing site improvements from past operations remain on the Property from surface concrete pavement, bollard's and loading/storage areas, and former foundations and partial building remnants. This material and debris extends across the surface of the two main Tax ID No's 33-25-05-11-452-001 and 33-25-05-11-452-004 west of the ponds. The remaining site conditions, fill and debris may have been the impediment to redevelopment for the last 13 years.

Non-Environmental Brownfield Eligible Activities

The principal activities and costs for the non-environmental eligible activities involve demolition (site demolition) activities and Brownfield Plan preparation. The largest demolition costs are associated with material management of wide-spread fill and debris found across most of the two main Tax ID No's 33-25-05-11-452-001 and 33-25-05-11-452-004. The approach is to perform site demolition activities by through material management (excavation/pulverize/repurpose) all possible material (concrete, block, brick) encountered. A large percentage of the excavated fill and debris areas will be replaced with imported, compacted engineered fill to "green" the Property and allow for construction by bring the Property back up to a buildable condition. Material testing during repurposing operations and backfilling will be conducted. Any material that cannot be repurposed and that requires transportation and disposal because it is deemed as non-hazardous (contaminated) material, will be disposed of at a licensed Class II landfill as an environmental eligible activity, as described above. If any material is deemed non-contaminated, in an effort to significantly reduce costs, the fill and debris will be managed appropriately on-site or off-site under the demolition eligible activity category as permitted by state non-environmental eligible activity guidance. Project management both on-site and off-site will be completed to appropriately oversee activities including: planning, evaluation & supervision; eligible activity compliance such as bid specifications, eligible activity tracking & supervision, and; construction management.

Exhibit B

Attachment A

**Excerpts from Baseline Environmental Assessment (BEA) prepared by
AKT Peerless on December 4, 2013 on behalf of Delhi Township**

- **BEA Report Pages 6 and 7**
- **Figure 3 - Site Map with Soil Results Above MDEQ Cleanup Criteria**
- **Figure 4 - Site Map with Groundwater Results Above MDEQ Cleanup Criteria**
- **Table 1 - Summary of Soil Analytical Results**
- **Table 2 - Summary of Groundwater Analytical Results**

Latitude (North): 42.65662

Longitude (West): -84.51201

3.0 Facility Status

3.1 Summary of Known Hazardous Substances

Hazardous substances known to exceed Part 201 RCC, Chemical Abstract Service (CAS) registration numbers, sample location, depths, and media affected are summarized in the following table:

Table 3-1 Summary of Soil Analytical Results

Parameter	CAS Number	Sample Identification with Criteria Exceedance	Part 201 Residential Criteria Exceeded/ Established Criteria (ug/kg)	Maximum Concentration (ug/kg)/Sample Location
Aluminum	7429-90-5	B-1 (7-8') and B-5A (3-4')	DWP/1,000	7,900,000/B-1 (7-8')
Iron	7439-89-6	B-1 (7-8')	DWP/6,000	14,000,000/ B-1 (7-8')
Magnesium	7439-95-4	B-1 (7-8'); B-4 (0.5-2'); B-5 (3-4'); and B-5A (3-4')	DWP/8,000,000	19,000,000/B-4 (0.5-2')
Manganese	7439-96-5	B-1 (7-8')	DWP/1,000	750,000/B-1 (7-8')

Table Notes:

ug/kg – microgram per kilogram

DWP – Drinking Water Protection Criteria

Table 3-2 Summary of Groundwater Analytical Results

Parameter	CAS Number	Sample Identification with Criteria Exceedance	Part 201 Residential Criteria Exceeded/ Established Criteria (ug/kg)	Maximum Concentration (ug/L)/Sample Location
Aluminum	7429-90-5	B-1 TMW; FD; and B-6 TMW	DW/50	5,200/B-6 TMW
Chromium	7440-47-3	B-6 TMW	GSI/11	36/B-6 TMW
Iron	7439-89-6	B-6 TMW	DW/300	8,000/B-6 TMW
Lead	7439-92-1	B-6 TMW	DW/4.0	4.9/B-6 TMW
Manganese	7439-96-5	B-6 TMW	DW/50	230/B-6 TMW

Parameter	CAS Number	Sample Identification with Criteria Exceedance	Part 201 Residential Criteria Exceeded/ Established Criteria (ug/kg)	Maximum Concentration (ug/L)/Sample Location
Vanadium	7440-62-2	B-6 TMW	DW/4.5	16/B-6 TMW

Table Notes:

ug/L – microgram per liter

DW – Drinking Water Criteria

GSI – Groundwater Surface Water Interface Criteria

Also refer to Tables 1 and 2 in the attachments for a complete summary of hazardous substances detected at the subject property and a comparison to current Part 201 RCC.

3.2 Laboratory Analytical Data

Laboratory analytical data sheets and chain of custody documents are included in AKT Peerless’ Phase II ESA findings, which are incorporated in their BEA provided in Appendix C of this report.

4.0 Signatures of Environmental Professionals and Qualifications

The following individuals contributed to the completion of this BEA. Copies of their resumes are provided as Appendix D.



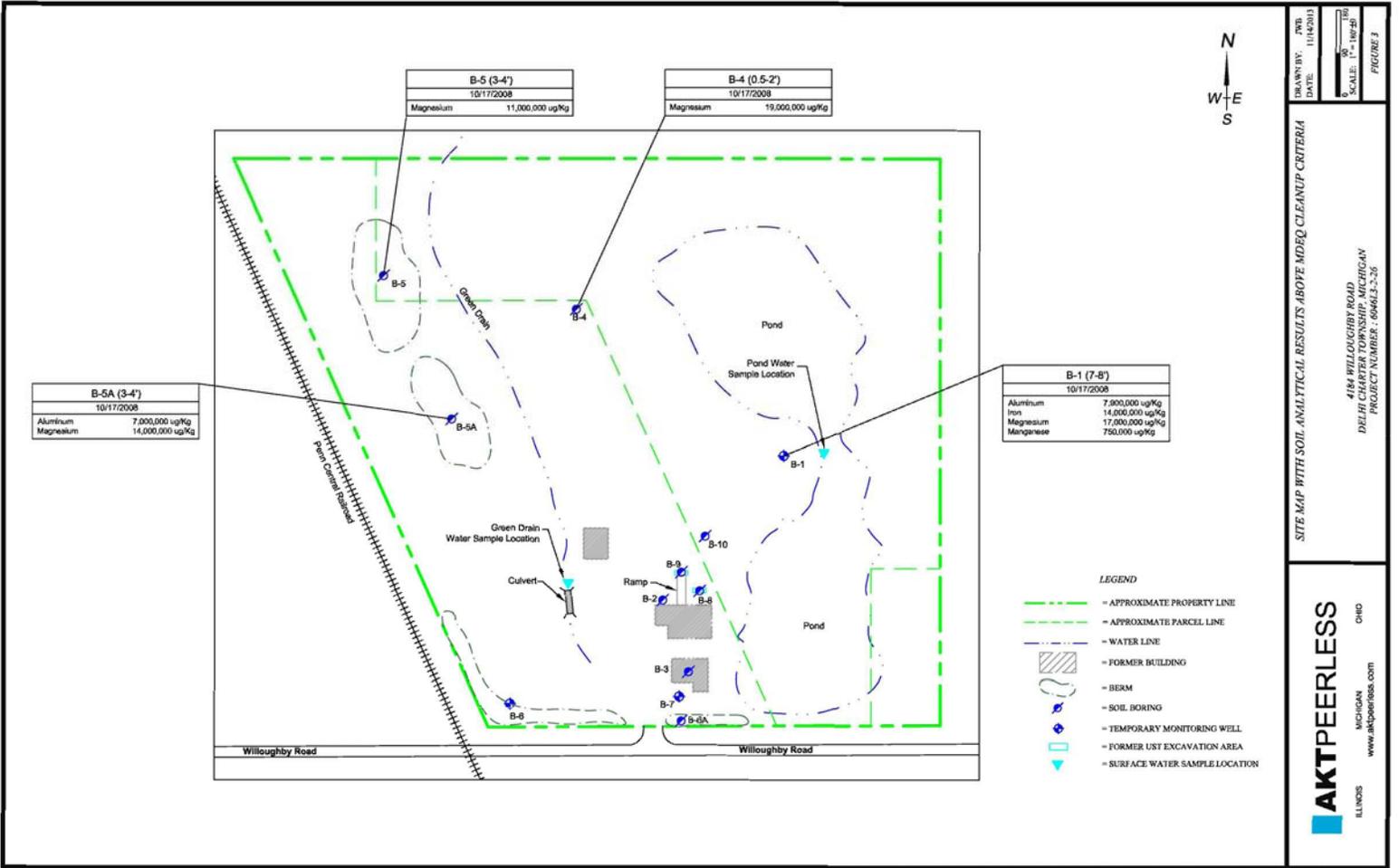
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 E-mail: skrotzkit@aktpeerless.com



Douglas S. Kilmer, PG
 Senior Geologist – Group Leader
 AKT Peerless
 Mid & West Michigan Region
 Phone: 616.916.4129
 E-mail: kilmerd@aktpeerless.com

5.0 All Appropriate Inquiry Report

A copy of the AKT Peerless Phase I ESA, dated December 2, 2013 is included in Appendix B.

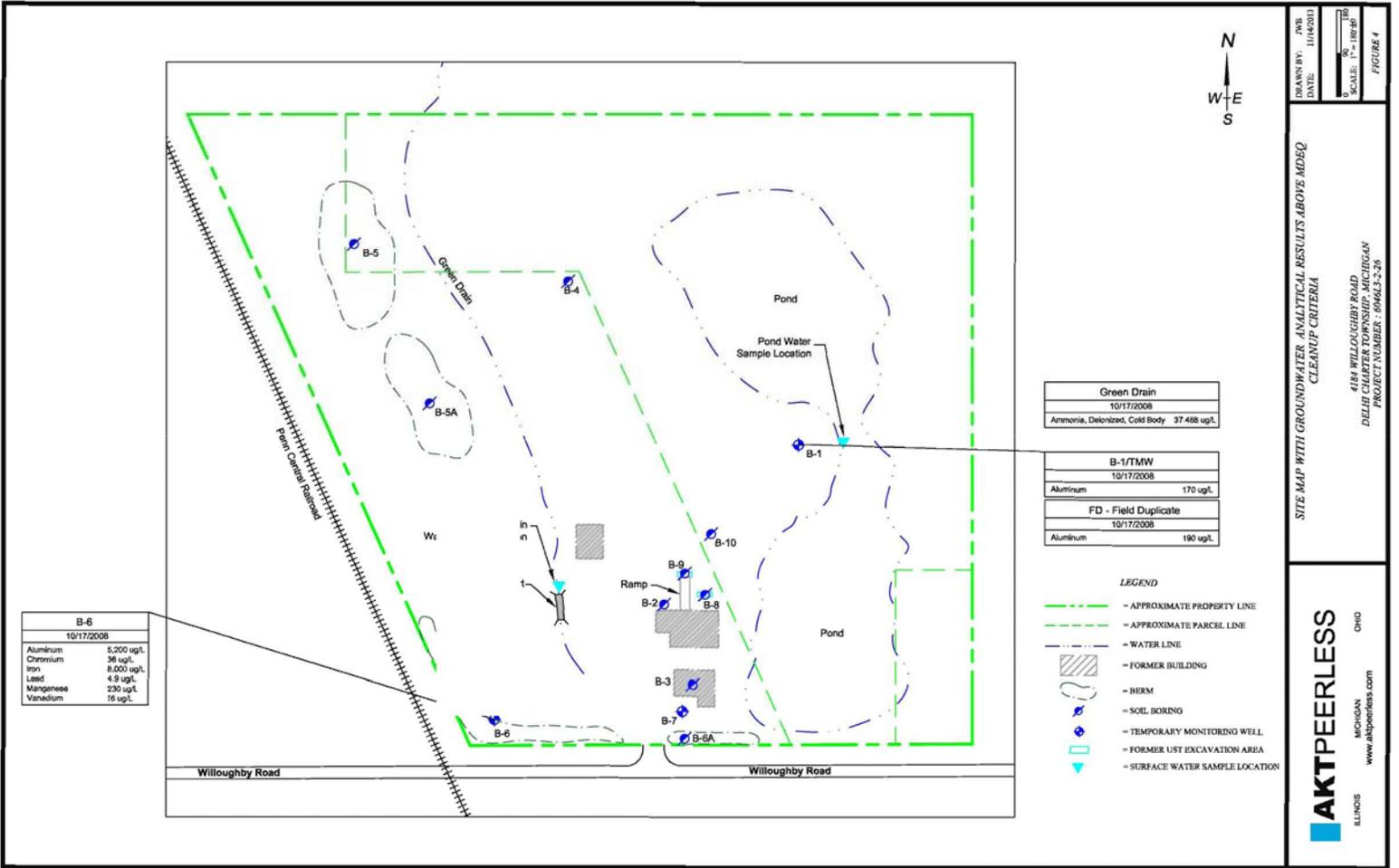


DRAWN BY: JWB
 DATE: 11/14/2013
 SCALE: 1" = 100'±
 FIGURE 3

SITE MAP WITH SOIL ANALYTICAL RESULTS ABOVE MDEQ CLEANUP CRITERIA

4184 WILLOUGHBY ROAD
 DELHI CHARTER TOWNSHIP, MICHIGAN
 PROJECT NUMBER: 160615-23

AKTPEERLESS
 ILLINOIS MICHIGAN
 www.aktpeerless.com



DRAWN BY: JWE
 DATE: 11/14/2011
 SCALE: 1" = 100'±
 FIGURE 1

4154 WILLOUGHBY ROAD
 DELHI CHARTER TOWNSHIP, MICHIGAN
 PROJECT NUMBER: 06463-526

AKTPEERLESS
 ILLINOIS MICHIGAN OHIO
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Green Drain	10/17/2008
Ammonia, Deltonized, Cold Body	37.488 ug/L
B-1/TMW	10/17/2008
Aluminum	170 ug/L
FD - Field Duplicate	10/17/2008
Aluminum	190 ug/L

- LEGEND**
- - - - - APPROXIMATE PROPERTY LINE
 - - - - - APPROXIMATE PARCEL LINE
 - - - - - WATER LINE
 - [Hatched Box] FORMER BUILDING
 - [Dashed Line] BERM
 - [Circle with Dot] SOIL BORING
 - [Square with Dot] TEMPORARY MONITORING WELL
 - [Dotted Area] FORMER UST EXCAVATION AREA
 - [Triangle with Dot] SURFACE WATER SAMPLE LOCATION

B-6	10/17/2008
Aluminum	8,200 ug/L
Chromium	36 ug/L
Iron	8,600 ug/L
Lead	4.9 ug/L
Manganese	230 ug/L
Vanadium	16 ug/L

Willoughby Road

Willoughby Road

Paint Control Release

Wi

in

t

Ramp

Pond

Pond Water Sample Location

Pond

Pond

**Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26**

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIQ) and RBSLs	Residential Finite VSIQ for 5	Residential Finite VSIQ for 2	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-1 (7-8)	B-2 (5-6)	B-3 (0.5-1.5)	B-4 (0.5-2)	B-5 (3-4)
													Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008
*Refer to detailed laboratory report for method reference data													Depth (feet bgs)	7-8'	5-6'	0.5-1.5'	0.5-2'	3-4'
Metals ug/Kg																		
Aluminum (B)	7429-90-5	6.9E+6	1,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.0E+7 (DD)	NA		7,900,000	NT	NT	3,000,000	5,600,000
Antimony	7440-36-0	NA	4,300	94,000 (X)	4.9E+7	NLV	NLV	NLV	NLV	1.3E+7	1.8E+5	NA		<300	NT	NT	<300	<300
Arsenic	7440-38-2	5,800	4,600	4,600	2,000,000	NLV	NLV	NLV	NLV	720,000	7,600	NA		5,800	NT	NT	3,100	3,400
Barium (B)	7440-39-3	75,000	1,300,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	330,000,000	37,000,000	NA		63,000	NT	NT	12,000	27,000
Beryllium	7440-41-7	NA	51,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1,300,000	410,000	NA		<200	NT	NT	<200	<200
Cadmium (B)	7440-43-9	1,200	6,000	(G,X)	230,000,000	NLV	NLV	NLV	NLV	1,700,000	550,000	NA		120	NT	NT	78	100
Chromium, Total	7440-47-3	18,000 (total)	30,000	3,300	140,000,000	NLV	NLV	NLV	NLV	260,000	2,500,000	NA		11,000	NT	NT	6,400	8,900
Cobalt	7440-48-4	6,800	800	2,000	48,000,000	NLV	NLV	NLV	NLV	13,000,000	2,600,000	NA		4,800	NT	NT	2,600	2,900
Copper (B)	7440-50-8	32,000	5,800,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	130,000,000	20,000,000	NA		10,000	NT	NT	5,700	5,900
Iron (B)	7439-89-6	12,000,000	6,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	160,000,000	NA		14,000,000	NT	NT	6,500,000	11,000,000
Lead (B)	7439-92-1	21,000	700,000	(G,X)	ID	NLV	NLV	NLV	NLV	100,000,000	400,000	NA		7,200	NT	NT	3,800	5,500
Magnesium (B)	7439-95-4	NA	8,000,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	6,700,000,000	1.0E+9 (D)	NA		17,000,000	NT	NT	19,000,000	11,000,000
Manganese (B)	7439-96-5	440,000	1,000	(G,X)	180,000,000	NLV	NLV	NLV	NLV	3,300,000	25,000,000	NA		750,000	NT	NT	170,000	220,000
Mercury, Total	7439-97-6	130	1,700	50 (M); 1.2	47,000	48,000	52,000	52,000	52,000	20,000,000	160,000	NA		<50	NT	NT	<50	<50
Nickel (B)	7440-02-0	20,000	100,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	13,000,000	40,000,000	NA		13,000	NT	NT	7,000	7,900
Selenium (B)	7782-49-2	410	4,000	400	78,000,000	NLV	NLV	NLV	NLV	130,000,000	2,600,000	NA		<200	NT	NT	<200	<200
Silver (B)	7440-22-4	1,000	4,500	100 (M); 27	200,000,000	NLV	NLV	NLV	NLV	6,700,000	2,500,000	NA		<100	NT	NT	<100	<100
Sodium	7440-23-5	NA	2,500,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA		140,000	NT	NT	370,000	630,000
Thallium (B)	7440-28-0	NA	2,300	4,200 (X)	15,000,000	NLV	NLV	NLV	NLV	13,000,000	35,000	NA		<500	NT	NT	<500	<500
Vanadium	7440-62-2	NA	72,000	430,000	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA		17,000	NT	NT	9,300	13,000
Zinc (B)	7440-66-6	47,000	2,400,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	170,000,000	NA		26,000	NT	NT	42,000	29,000
Nitrogen Forms ug/Kg																		
Ammonia	7664-41-7	NA	ID	(CC)	ID	ID	ID	ID	ID	6,700,000,000	ID	10,000,000		12,000	NT	NT	NT	NT
Nitrate (B,N)	14797-55-8	NA	2.0E+5 (N)	ID	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	ID	NA		1,100	NT	NT	NT	NT
Nitrite (B,N)	14797-65-0	NA	20,000 (N)	NA	380,000,000	NLV	NLV	NLV	NLV	ID	ID	NA		ND	NT	NT	NT	NT
PCBs ug/Kg																		
Polychlorinated biphenyls (PCBs) (L1)	1336-36-3	NA	NLL	NLL	NLL	3,000,000	240,000	7,900,000	7,900,000	5,200,000	(T)	NA		ND	NT	ND	NT	NT
Semivolatiles, PNAs ug/Kg																		
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	<330	<330	NT	<330
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330	<330	<330
Remaining PNAs	various	NA	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--
Volatiles, VOCs ug/Kg																		

Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC) and RBSLs	Residential Finite VSIC for 5 Meter Source Thickness	Residential Finite VSIC for 2 Meter Source Thickness	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-1 (7-8)	B-2 (5-6)	B-3 (0.5-1.5)	B-4 (0.5-2)	B-5 (3-4)
													Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008
													Depth (feet bgs)	7-8'	5-6'	0.5-1.5'	0.5-2'	3-4'
Benzene (l)	71-43-2	NA	100	4,000 (X)	220,000	1,600	13,000	34,000	79,000	380,000,000	180,000	400,000		<50	<50	NT	NT	<50
Ethylbenzene (l)	100-41-4	NA	1,500	360	1.4E+5 (C)	87,000	720,000	1,000,000	2,200,000	10,000,000,000	1.4E+5 (C)	140,000		<50	<50	NT	NT	<50
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	<330	<330	NT	<330
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330	NT	<330
Toluene (l)	108-88-3	NA	16,000	5,400	2.5E+5 (C)	2.5E+5 (C)	2,800,000	5,100,000	12,000,000	27,000,000,000	2.5E+5 (C)	250,000		<50	<50	NT	NT	<50
1,2,3-Trimethylbenzene	526-73-8	--	--	--	--	--	--	--	--	--	--	--		<100	<100	NT	NT	<100
1,2,4-Trimethylbenzene (l)	95-63-6	NA	2,100	570	1.1E+5 (C)	1.1E+5 (C)	21,000,000	500,000,000	500,000,000	82,000,000,000	1.1E+5 (C)	110,000		<100	<100	NT	NT	<100
1,3,5-Trimethylbenzene (l)	108-67-8	NA	1,800	1,100	94,000 (C)	94,000 (C)	1.6E+7	3.8E+8	3.8E+8	8.2E+10	94,000 (C)	94,000		<100	<100	NT	NT	<100
Xylenes (l)	1330-20-7	NA	5,600	820	1.5E+5 (C)	1.5E+5 (C)	46,000,000	61,000,000	130,000,000	290,000,000,000	1.5E+5 (C)	150,000		<150	<150	NT	NT	<150
Remaining VOCs	various	NA	--	--	--	--	--	--	--	--	--	--		ND	NT	NT	NT	ND
Water Quality																		
pH	PH													8.56 *	8.82 *	8.6 *	8.81 *	11.38 *

**Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26**

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIQ) and RBSLs	Residential Finite VSIQ for 5	Residential Finite VSIQ for 2	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-5 A (3-4)	B-6 (0.5-1.5)	B-6 A (3-4)	B-7 (14-15)	B-8 (13-15)					
													Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	11/3/2008					
*Refer to detailed laboratory report for method reference data													Depth (feet bgs)	3-4'	0.5-1.5'	3-4'	14-15'	13-15'					
Metals ug/Kg																							
Aluminum (B)	7429-90-5	6.9E+6	1,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.0E+7 (DD)	NA		7,000,000	3,200,000	4,700,000	NT	NT					
Antimony	7440-36-0	NA	4,300	94,000 (X)	4.9E+7	NLV	NLV	NLV	NLV	1.3E+7	1.8E+5	NA		<300	<300	<300	NT	NT					
Arsenic	7440-38-2	5,800	4,600	4,600	2,000,000	NLV	NLV	NLV	NLV	720,000	7,600	NA		3,800	2,700	3,300	NT	NT					
Barium (B)	7440-39-3	75,000	1,300,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	330,000,000	37,000,000	NA		39,000	13,000	24,000	NT	NT					
Beryllium	7440-41-7	NA	51,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1,300,000	410,000	NA		<200	<200	<200	NT	NT					
Cadmium (B)	7440-43-9	1,200	6,000	(G,X)	230,000,000	NLV	NLV	NLV	NLV	1,700,000	550,000	NA		110	60	140	NT	NT					
Chromium, Total	7440-47-3	18,000 (total)	30,000	3,300	140,000,000	NLV	NLV	NLV	NLV	260,000	2,500,000	NA		12,000	6,300	8,000	NT	NT					
Cobalt	7440-48-4	6,800	800	2,000	48,000,000	NLV	NLV	NLV	NLV	13,000,000	2,600,000	NA		3,400	2,300	3,400	NT	NT					
Copper (B)	7440-50-8	32,000	5,800,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	130,000,000	20,000,000	NA		6,200	4,700	6,500	NT	NT					
Iron (B)	7439-89-6	12,000,000	6,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	160,000,000	NA		11,000,000	8,500,000	8,400,000	NT	NT					
Lead (B)	7439-92-1	21,000	700,000	(G,X)	ID	NLV	NLV	NLV	NLV	100,000,000	400,000	NA		5,900	2,900	8,300	3,400	3,700					
Magnesium (B)	7439-95-4	NA	8,000,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	6,700,000,000	1.0E+9 (D)	NA		14,000,000	7,800,000	7,600,000	NT	NT					
Manganese (B)	7439-96-5	440,000	1,000	(G,X)	180,000,000	NLV	NLV	NLV	NLV	3,300,000	25,000,000	NA		250,000	200,000	200,000	NT	NT					
Mercury, Total	7439-97-6	130	1,700	50 (M); 1.2	47,000	48,000	52,000	52,000	52,000	20,000,000	160,000	NA		<50	<50	<50	NT	NT					
Nickel (B)	7440-02-0	20,000	100,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	13,000,000	40,000,000	NA		9,100	6,800	8,000	NT	NT					
Selenium (B)	7782-49-2	410	4,000	400	78,000,000	NLV	NLV	NLV	NLV	130,000,000	2,600,000	NA		<200	<200	230	NT	NT					
Silver (B)	7440-22-4	1,000	4,500	100 (M); 27	200,000,000	NLV	NLV	NLV	NLV	6,700,000	2,500,000	NA		<100	<100	<100	NT	NT					
Sodium	7440-23-5	NA	2,500,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA		960,000	260,000	70,000	NT	NT					
Thallium (B)	7440-28-0	NA	2,300	4,200 (X)	15,000,000	NLV	NLV	NLV	NLV	13,000,000	35,000	NA		<500	<500	<500	NT	NT					
Vanadium	7440-62-2	NA	72,000	430,000	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA		15,000	8,600	11,000	NT	NT					
Zinc (B)	7440-66-6	47,000	2,400,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	170,000,000	NA		26,000	14,000	24,000	NT	NT					
Nitrogen Forms ug/Kg																							
Ammonia	7664-41-7	NA	ID	(CC)	ID	ID	ID	ID	ID	6,700,000,000	ID	10,000,000		NT	NT	NT	NT	NT					
Nitrate (B,N)	14797-55-8	NA	2.0E+5 (N)	ID	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	ID	NA		NT	NT	NT	NT	NT					
Nitrite (B,N)	14797-65-0	NA	20,000 (N)	NA	380,000,000	NLV	NLV	NLV	NLV	ID	ID	NA		NT	NT	NT	NT	NT					
PCBs ug/Kg																							
Polychlorinated biphenyls (PCBs) (L1)	1336-36-3	NA	NLL	NLL	NLL	3,000,000	240,000	7,900,000	7,900,000	5,200,000	(T)	NA		NT	NT	NT	NT	NT					
Semivolatiles, PNAs ug/Kg																							
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	<330	<330	<330	<330					
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330	<330	<330					
Remaining PNAs	various	NA	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--					
Volatiles, VOCs ug/Kg																							

Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC) and RBSLs	Residential Finite VSIC for 5 Meter Source Thickness	Residential Finite VSIC for 2 Meter Source Thickness	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-5 A (3-4)	B-6 (0.5-1.5)	B-6 A (3-4)	B-7 (14-15)	B-8 (13-15)			
													Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	11/3/2008			
													Depth (feet bgs)	3-4'	0.5-1.5'	3-4'	14-15'	13-15'			
Benzene (l)	71-43-2	NA	100	4,000 (X)	220,000	1,600	13,000	34,000	79,000	380,000,000	180,000	400,000		<50	<50	<50	<50	<50			
Ethylbenzene (l)	100-41-4	NA	1,500	360	1.4E+5 (C)	87,000	720,000	1,000,000	2,200,000	10,000,000,000	1.4E+5 (C)	140,000		<50	<50	<50	<50	<50			
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	<330	<330	<330	<330			
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330	<330	<330			
Toluene (l)	108-88-3	NA	16,000	5,400	2.5E+5 (C)	2.5E+5 (C)	2,800,000	5,100,000	12,000,000	27,000,000,000	2.5E+5 (C)	250,000		<50	<50	<50	<50	<50			
1,2,3-Trimethylbenzene	526-73-8	--	--	--	--	--	--	--	--	--	--	--		<100	<100	<100	<100	<100			
1,2,4-Trimethylbenzene (l)	95-63-6	NA	2,100	570	1.1E+5 (C)	1.1E+5 (C)	21,000,000	500,000,000	500,000,000	82,000,000,000	1.1E+5 (C)	110,000		<100	<100	<100	<100	<100			
1,3,5-Trimethylbenzene (l)	108-67-8	NA	1,800	1,100	94,000 (C)	94,000 (C)	1.6E+7	3.8E+8	3.8E+8	8.2E+10	94,000 (C)	94,000		<100	<100	<100	<100	<100			
Xylenes (l)	1330-20-7	NA	5,600	820	1.5E+5 (C)	1.5E+5 (C)	46,000,000	61,000,000	130,000,000	290,000,000,000	1.5E+5 (C)	150,000		<150	<150	<150	<150	<150			
Remaining VOCs	various	NA	--	--	--	--	--	--	--	--	--	--		ND	ND	ND	NT	NT			
Water Quality																					
pH	PH													10.26 *	11.53 *	8.20 *	8.59 *	NT			

**Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26**

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSI) and RBSLs	Residential Finite VSI for 5 Meter Source Thickness	Residential Finite VSI for 2 Meter Source Thickness	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-9 (8-9')	B-10 (5-6')	Methanol Blank
													Collection Date	11/3/2008	11/3/2008	10/17/2008
*Refer to detailed laboratory report for method reference data													Depth (feet bags)	8-9'	5-6'	na
Metals ug/Kg																
Aluminum (B)	7429-90-5	6.9E+6	1,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	5.0E+7 (DO)	NA		NT	NT	NT
Antimony	7440-36-0	NA	4,300	94,000 (X)	4.9E+7	NLV	NLV	NLV	NLV	1.3E+7	1.8E+5	NA		NT	NT	NT
Arsenic	7440-38-2	5,800	4,600	4,600	2,000,000	NLV	NLV	NLV	NLV	720,000	7,600	NA		NT	NT	NT
Barium (B)	7440-39-3	75,000	1,300,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	330,000,000	37,000,000	NA		NT	NT	NT
Beryllium	7440-41-7	NA	51,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	1,300,000	410,000	NA		NT	NT	NT
Cadmium (B)	7440-43-9	1,200	6,000	(G,X)	230,000,000	NLV	NLV	NLV	NLV	1,700,000	550,000	NA		NT	NT	NT
Chromium, Total	7440-47-3	18,000 (total)	30,000	3,300	140,000,000	NLV	NLV	NLV	NLV	260,000	2,500,000	NA		NT	NT	NT
Cobalt	7440-48-4	6,800	800	2,000	48,000,000	NLV	NLV	NLV	NLV	13,000,000	2,600,000	NA		NT	NT	NT
Copper (B)	7440-50-8	32,000	5,800,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	130,000,000	20,000,000	NA		NT	NT	NT
Iron (B)	7439-89-6	12,000,000	6,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	160,000,000	NA		NT	NT	NT
Lead (B)	7439-92-1	21,000	700,000	(G,X)	ID	NLV	NLV	NLV	NLV	100,000,000	400,000	NA	4,300	NT	NT	NT
Magnesium (B)	7439-95-4	NA	8,000,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	6,700,000,000	1.0E+9 (D)	NA		NT	NT	NT
Manganese (B)	7439-96-5	440,000	1,000	(G,X)	180,000,000	NLV	NLV	NLV	NLV	3,300,000	25,000,000	NA		NT	NT	NT
Mercury, Total	7439-97-6	130	1,700	50 (M); 1.2	47,000	48,000	52,000	52,000	52,000	20,000,000	160,000	NA		NT	NT	NT
Nickel (B)	7440-02-0	20,000	100,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	13,000,000	40,000,000	NA		NT	NT	NT
Selenium (B)	7782-49-2	410	4,000	400	78,000,000	NLV	NLV	NLV	NLV	130,000,000	2,600,000	NA		NT	NT	NT
Silver (B)	7440-22-4	1,000	4,500	100 (M); 27	200,000,000	NLV	NLV	NLV	NLV	6,700,000	2,500,000	NA		NT	NT	NT
Sodium	7440-23-5	NA	2,500,000	NA	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA		NT	NT	NT
Thallium (B)	7440-28-0	NA	2,300	4,200 (X)	15,000,000	NLV	NLV	NLV	NLV	13,000,000	35,000	NA		NT	NT	NT
Vanadium	7440-62-2	NA	72,000	430,000	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	7.5E+5 (DO)	NA		NT	NT	NT
Zinc (B)	7440-66-6	47,000	2,400,000	(G)	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	170,000,000	NA		NT	NT	NT
Nitrogen Forms ug/Kg																
Ammonia	7664-41-7	NA	ID	(CC)	ID	ID	ID	ID	ID	6,700,000,000	ID	10,000,000		NT	NT	NT
Nitrate (B,N)	14797-55-8	NA	2.0E+5 (N)	ID	1.0E+9 (D)	NLV	NLV	NLV	NLV	ID	ID	NA		NT	NT	NT
Nitrite (B,N)	14797-65-0	NA	20,000 (N)	NA	380,000,000	NLV	NLV	NLV	NLV	ID	ID	NA		NT	NT	NT
PCBs ug/Kg																
Polychlorinated biphenyls (PCBs) (L,T)	1336-36-3	NA	NLL	NLL	NLL	3,000,000	240,000	7,900,000	7,900,000	5,200,000	(T)	NA		NT	NT	NT
Semivolatiles, PNAs ug/Kg																
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	<330	<330
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330
Remaining PNAs	various	NA	--	--	--	--	--	--	--	--	--	--				
Volatiles, VOCs ug/Kg																

**Table 1, Summary of Soil Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26**

Parameters*	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria and RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Groundwater Contact Protection Criteria & RBSLs	Residential Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIIC) and RBSLs	Residential Finite VSIC for 5 Meter Source Thickness	Residential Finite VSIC for 2 Meter Source Thickness	Residential Particulate Soil Inhalation Criteria and RBSLs	Residential Direct Contact Criteria and RBSLs	Residential Soil Saturation Concentration Screening Levels	Sample Location	B-9 (8-9')	B-10 (5-6')	Methanol Blank
													Collection Date	11/3/2008	11/3/2008	10/17/2008
													Depth (feet bags)	8-9'	5-6'	na
Benzene (l)	71-43-2	NA	100	4,000 (X)	220,000	1,600	13,000	34,000	79,000	380,000,000	180,000	400,000		<50	<50	<50
Ethylbenzene (l)	100-41-4	NA	1,500	360	1.4E+5 (C)	87,000	720,000	1,000,000	2,200,000	10,000,000,000	1.4E+5 (C)	140,000		<50	<50	<50
2-Methylnaphthalene	91-57-6	NA	57,000	4,200	5,500,000	2,700,000	1,500,000	1,500,000	1,500,000	670,000,000	8,100,000	NA		<330	NT	<330
Naphthalene	91-20-3	NA	35,000	730	2,100,000	250,000	300,000	300,000	300,000	200,000,000	16,000,000	NA		<330	<330	<330
Toluene (l)	108-88-3	NA	16,000	5,400	2.5E+5 (C)	2.5E+5 (C)	2,800,000	5,100,000	12,000,000	27,000,000,000	2.5E+5 (C)	250,000		<50	<50	<50
1,2,3-Trimethylbenzene	526-73-8	--	--	--	--	--	--	--	--	--	--	--		<100	<100	<100
1,2,4-Trimethylbenzene (l)	95-63-6	NA	2,100	570	1.1E+5 (C)	1.1E+5 (C)	21,000,000	500,000,000	500,000,000	82,000,000,000	1.1E+5 (C)	110,000		<100	<100	<100
1,3,5-Trimethylbenzene (l)	108-67-8	NA	1,800	1,100	94,000 (C)	94,000 (C)	1.6E+7	3.8E+8	3.8E+8	8.2E+10	94,000 (C)	94,000		<100	<100	<100
Xylenes (l)	1330-20-7	NA	5,600	820	1.5E+5 (C)	1.5E+5 (C)	46,000,000	61,000,000	130,000,000	290,000,000,000	1.5E+5 (C)	150,000		<150	<150	<150
Remaining VOCs	various	NA	--	--	--	--	--	--	--	--	--	--		NT	NT	ND
Water Quality																
pH	PH													NT	NT	NT

Table 2, Summary of Groundwater Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26

Parameters*	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Non-residential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level	Maximum Concentration Detected	Sample Location	B-1/TMW	FD	B-6/TMW	B-7/TMW	POND	GREEN DRAIN
												Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008
Metals ug/L																		
Aluminum (B)	7429-90-5	50 (V)	50 (V)	NA	NLV	NLV	6.4E+7	NA	ID	ID	5,200		170	190	5,200	NT	NT	NT
Antimony	7440-36-0	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	68,000	NA	ID	ID	<2.0		<2.0	<2.0	<2.0	NT	NT	NT
Arsenic	7440-38-2	10 (A)	10 (A)	10	NLV	NLV	4,300	NA	ID	ID	5.3		<5.0	<5.0	5.3	NT	NT	NT
Barium (B)	7440-39-3	2,000 (A)	2,000 (A)	(G)	NLV	NLV	1.4E+7	NA	ID	ID	<100		<100	<100	<100	NT	NT	NT
Beryllium	7440-41-7	4.0 (A)	4.0 (A)	(G)	NLV	NLV	2.9E+5	NA	ID	ID	<1.0		<1.0	<1.0	<1.0	NT	NT	NT
Cadmium (B)	7440-43-9	5.0 (A)	5.0 (A)	(G,X)	NLV	NLV	1.9E+5	NA	ID	ID	<1.0		<1.0	<1.0	<1.0	NT	NT	NT
Chromium, Total	7440-47-3	100 (A)	100 (A)	11	NLV	NLV	4.6E+5	NA	ID	ID	36		<10	<10	36	NT	NT	NT
Cobalt	7440-48-4	40	100	100	NLV	NLV	2.4E+6	NA	ID	ID	<20		<20	<20	<20	NT	NT	NT
Copper (B)	7440-50-8	1,000 (E)	1,000 (E)	(G)	NLV	NLV	7.4E+6	NA	ID	ID	16		<4.0	<4.0	16	NT	NT	NT
Iron (B)	7439-89-6	300 (E)	300 (E)	NA	NLV	NLV	5.8E+7	NA	ID	ID	8,000		220	240	8,000	NT	NT	NT
Lead (B)	7439-92-1	4.0 (L)	4.0 (L)	(G,X)	NLV	NLV	ID	NA	ID	ID	4.9		<3.0	<3.0	4.9	<3.0	NT	NT
Magnesium (B)	7439-95-4	4.0E+5	1.1E+6	NA	NLV	NLV	1.0E+9 (D)	NA	ID	ID	15,000		15,000	15,000	12,000	NT	NT	NT
Manganese (B)	7439-96-5	50 (E)	50 (E)	(G,X)	NLV	NLV	9.1E+6	NA	ID	ID	230		<50	<50	230	NT	NT	NT
Mercury, Total	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56 (S)	56	ID	ID	<0.20		<0.20	<0.20	<0.20	NT	NT	NT
Nickel (B)	7440-02-0	100 (A)	100 (A)	(G)	NLV	NLV	7.4E+7	NA	ID	ID	<20		<20	<20	<20	NT	NT	NT
Selenium (B)	7782-49-2	50 (A)	50 (A)	5.0	NLV	NLV	9.7E+5	NA	ID	ID	<5.0		<5.0	<5.0	<5.0	NT	NT	NT
Silver (B)	7440-22-4	34	98	0.2 (M); 0.06	NLV	NLV	1.5E+6	NA	ID	ID	0.20		<0.20	<0.20	0.20	NT	NT	NT
Sodium	7440-23-5	1.2E+5	3.5E+5	NA	NLV	NLV	1.0E+9 (D)	NA	ID	ID	35,000		35,000	35,000	16,000	NT	NT	NT
Thallium (B)	7440-28-0	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	13,000	NA	ID	ID	<2.0		<2.0	<2.0	<2.0	NT	NT	NT
Vanadium	7440-62-2	4.5	62	27	NLV	NLV	9.7E+5	NA	ID	ID	16		<4.0	<4.0	16	NT	NT	NT
Zinc (B)	7440-66-6	2,400	5,000 (E)	(G)	NLV	NLV	1.1E+8	NA	ID	ID	<50		<50	<50	<50	NT	NT	NT
Nitrogen Farms ug/L																		
Ammonia	7664-41-7	10,000 (N)	10,000 (N)	(CC)	3.2E+6	7.1E+6	ID	5.30E+8	ID	ID	37,488		NT	NT	NT	NT	5,104	37,488
Nitrate (B,N)	14797-55-8	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	3.1E+8	NA	ID	ID	88		88	78	NT	NT	NT	NT
PCBs ug/L																		
Polychlorinated biphenyls (PCBs) (LT)	1336-36-3	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	45 (S)	3.3 (AA)	44.7	ID	ID	<0.20		<0.20	<0.20	NT	NT	NT	NT
Semivolatiles, PNAs ug/L																		
2-Methylnaphthalene	91-57-6	250	750	19	25,000 (S)	25,000 (S)	25,000 (S)	24,600	ID	ID	<5.0		<5.0	<5.0	<5.0	<5.0	NT	NT
Naphthalene	91-20-3	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	31,000	NA	31,000 (S)	<5.0		<5.0	<5.0	<5.0	<5.0	NT	NT
PNAs	Constituent Specific (CS)	CS	CS	CS	CS	CS	CS	CS	CS	CS	ND		ND	ND	ND	NT	NT	NT

Table 2, Summary of Groundwater Analytical Results
4184 Willoughby Road
Delhi Charter Township, Michigan
AKT Peerless Project No. 6046L3-2-26

Parameters*	Chemical Abstract Service Number	Residential Drinking Water Criteria & RBSLs	Non-residential Drinking Water Criteria & RBSLs	Groundwater Surface Water Interface Criteria & RBSLs	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	Groundwater Contact Criteria & RBSLs	Water Solubility	Flammability and Explosivity Screening Level	Acute Inhalation Screening Level	Maximum Concentration Detected	Sample Location	B-1/TMW	FD	B-6/TMW	B-7/TMW	POND	GREEN DRAIN
												Collection Date	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008	10/17/2008
Volatiles, VOCs ug/L																		
Benzene (l)	71-43-2	5.0 (A)	5.0 (A)	200 (K)	5,600	35,000	11,000	1.75E+6	68,000	67,000	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
1,2-Dichloroethane (l)	107-06-2	5.0 (A)	5.0 (A)	360 (K)	9,600	59,000	19,000	8.52E+6	2.5E+6	ID	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
Ethylbenzene (l)	100-41-4	74 (E)	74 (E)	18	1.1E+5	1.7E+5 (S)	1.7E+5 (S)	1.69E+5	43,000	1.7E+5 (S)	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
Ethylene dibromide	106-93-4	0.05 (A)	0.05 (A)	5.7 (K)	2,400	15,000	25	4.20E+6	ID	ID	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
2-Methylnaphthalene	91-57-6	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	24,600	ID	ID	<5.0		<5.0	<5.0	<5.0	<5.0	NT	NT
Naphthalene	91-20-3	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	31,000	NA	31,000 (S)	<5.0		<5.0	<5.0	<5.0	<5.0	NT	NT
Toluene (l)	108-88-3	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.3E+5 (S)	5.26E+5	61,000	ID	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
1,2,3-Trimethylbenzene	526-73-8					NA	NA	NA	NA	NA	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
1,2,4-Trimethylbenzene (l)	95-63-6	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	56,000 (S)	55,890	56,000 (S)	ID	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
1,3,5-Trimethylbenzene (l)	108-67-8	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,000 (S)	61,150	ID	ID	<1.0		<1.0	<1.0	<1.0	<1.0	NT	NT
Xylenes (l)	1330-20-7	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.9E+5 (S)	1.86E+5	70,000	1.9E+5 (S)	<3.0		<3.0	<3.0	<3.0	<3.0	NT	NT
VOCs	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	ND		ND	ND	ND	NT	NT	NT
Water Quality																		
pH	PH	6.5 to 8.5 (E)	6.5 to 8.5 (E)	6.5 to 9.0	ID	ID	ID	NA	NA	NA	8.16		8.02 *	8.16 *	NT	6.50	7.60	7.53

* indicates hold time was exceeded

Exhibit B
Attachment B

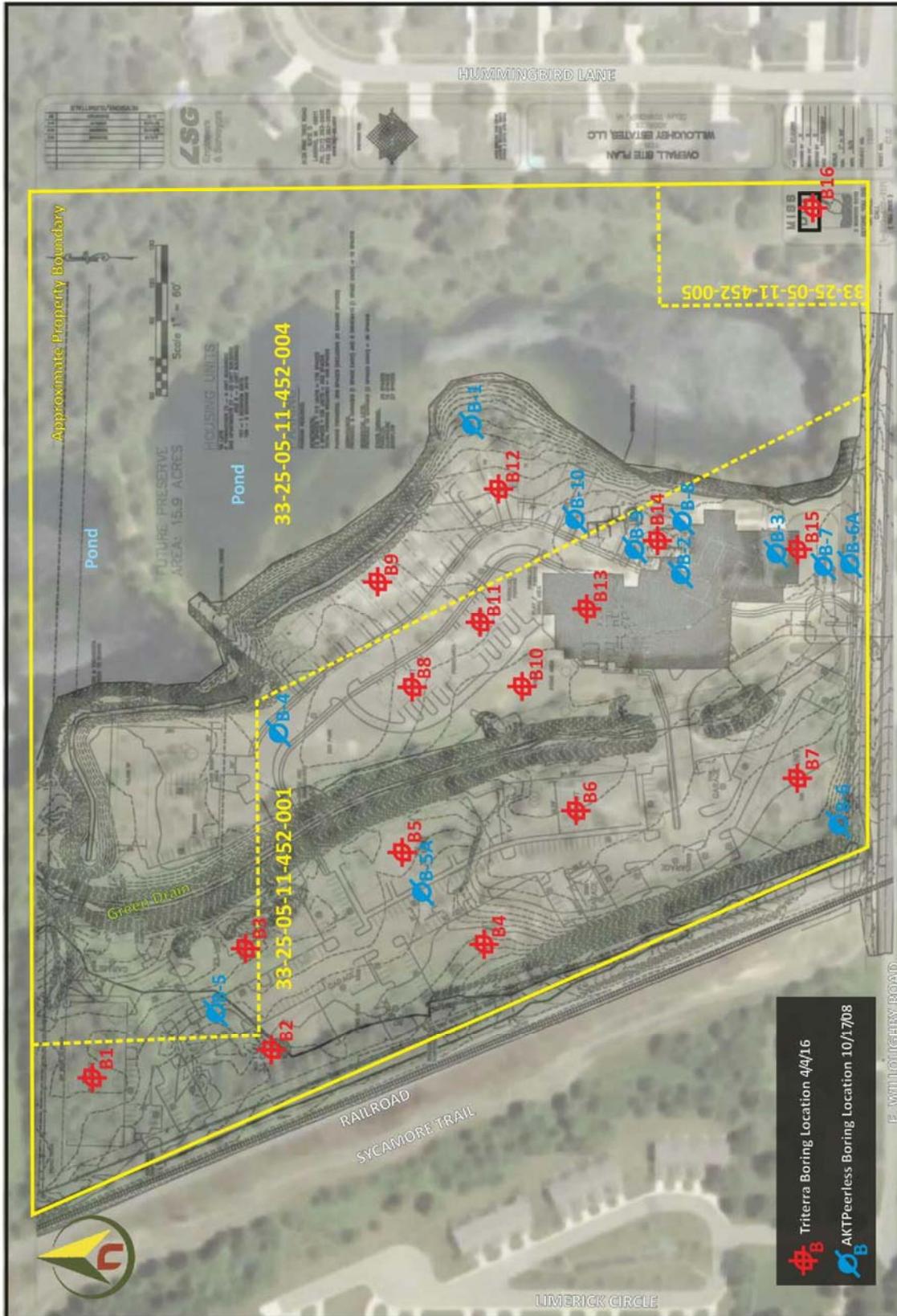


FIGURE 3	4184 E. WILLOUGHBY ROAD HOLT, MICHIGAN	
	PROJECT NUMBER: 15-1536-11	
SAMPLING PLAN		DATE: 3/15/2016
DIAGRAM CREATED BY: IOS		



 Triterra Boring Location 4/4/16
 AKT Peerless Boring Location 10/1/08

Exhibit C

Table 4 - Tax Increment Financing Estimates

WILLOUGHBY ESTATES - DELHI CHARTER TOWNSHIP, MICHIGAN

BROWNFIELD PLAN NO. 6

Table 4a1 - Base Year/ Initial Taxable Value (ITV) Information

Notes	Property Identification		Base Year/ Initial Taxable Value (ITV) of All Eligible Property in the Brownfield Plan by Property Classification						Total Taxes Paid on Base Year/ ITV		Notes
			Land	Land Improvements	Building	Real Property Subtotal	Personal Property	Total	Real Property	Personal Property	
	Address	Tax Parcel Number									BASE YEAR = 2016
	4136 E. Willoughby Road	33-25-05-11-452-005	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Actual Value for 2016 Based on Actual Taxable Value for 2016 (as of 12/31/2015)
	4184 E. Willoughby Road	33-25-05-11-452-001	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Actual Value for 2016 Based on Actual Taxable Value for 2016 (as of 12/31/2015)
	No Address Assigned - E. Willoughby Road	33-25-05-11-452-004	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Actual Value for 2016 Based on Actual Taxable Value for 2016 (as of 12/31/2015)
Totals			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-

**WILLOUGHBY ESTATES - DELHI CHARTER TOWNSHIP, MICHIGAN
BROWNFIELD PLAN NO. 6**

Table 4a2 - Total Estimated Taxes Paid to All Taxing Jurisdictions on the Base Year Taxable Value/ Initial Taxable Value (ITV)

	AD VALOREM TAXING AUTHORITIES/ TAXING JURISDICTIONS (TJs)	Millage Rate Paid on Real Property	Millage Rate Paid on Personal Property	Base Year	2016
		Annual	Annual	BP Year Number	0
-	DELHI CHARTER TOWNSHIP	-	-	-	-
-	Operating - Delhi Township	4.3094	4.3094		\$ 0
-	Fire/EMS	1.5000	1.5000		\$ 0
-	Police	1.5000	1.5000		\$ 0
-	<i>Subtotal of Local Government Unit (LGU): Annual</i>	<i>7.3094</i>	<i>7.3094</i>		<i>\$ 0</i>
-	INGHAM COUNTY	-	-	-	-
-	County Operating - General Operations & Indigent Veterans Support	6.3842	6.3842		\$ 0
-	Potter Park Zoo & Potter Park	0.4100	0.4100		\$ 0
-	Public Transportation	0.1200	0.1200		\$ 0
-	Special Transportation	0.4800	0.4800		\$ 0
-	911 System - Emergency Telephone Services	0.8431	0.8431		\$ 0
-	Juvenile Justice	0.6000	0.6000		\$ 0
-	Farmland/ Open Space Preservation	0.1400	0.1400		\$ 0
-	Health Care Services	0.3500	0.3500		\$ 0
-	Parks/Trails	0.5000	0.5000		\$ 0
-	Capital Region Airport Authority - CRAA	0.6990	0.6990		\$ 0
-	Capital Area Transportation Authority - CATA	3.0070	3.0070		\$ 0
-	LIBRARY	-	-	-	-
-	Capital Area District Libraries - CADL	1.5600	1.5600		\$ 0
-	INTERMEDIATE SCHOOL DISTRICTS (ISD)	-	-	-	-
-	RESA Operating	0.1894	0.1894		\$ 0
-	RESA Special Education	4.5062	4.5062		\$ 0
-	RESA Vocational Education	1.2925	1.2925		\$ 0
-	COMMUNITY COLLEGE	-	-	-	-
-	Lansing Community College - LCC	3.8072	3.8072		\$ 0
-	LOCAL SCHOOL MILLAGES: excludes State School millages	-	-	-	-
-	Holt School District Debt (District #33070)	10.0000	10.0000		\$ 0
-	<i>Subtotal of Non-Local Government Unit (LGU) Local: Annual</i>	<i>34.8886</i>	<i>34.8886</i>		<i>\$ 0</i>
-	Total Local: Annual	42.1980	42.1980		\$ 0
-	STATE SCHOOL MILLAGES: excludes Local School millages	-	-	-	-
-	State Education Tax - SET	6.0000	6.0000		\$ 0
-	Local School Operating (District #33070 - Holt) - LSO: Full rate for for Non-Homestead/Non-PRE Real Property; 0 mills for for Homestead/PRE Real Property; 6 mills for Commercial Personal Property.	18.0000	6.0000		\$ 0
-	Total State & Local School: Annual	24.0000	12.0000		\$ 0
-	TOTAL LOCAL AND STATE & LOCAL SCHOOL: ANNUAL	66.1980	54.1980		\$ 0

**WILLOUGHBY ESTATES - DELHI CHARTER TOWNSHIP, MICHIGAN
BROWNFIELD PLAN NO. 6**

Table 4b - Estimated Future Taxable Value (FTV) Information

Estimated Percentage (%) Change In Future Taxable Values (TV) of Building(s) & Land Improvements shown below					
Estimated Percentage (%) Change In Future Taxable Values (TV) of Raw Land shown below					
Notes	Future Taxable Value (FTV) of Building(s) & Land Improvements Upon Completion	Estimated FTV Upon Completion	Estimated True Cash Value (TCV) Upon Completion	FTV Assumptions	Notes
	<i>Multi-Family Housing Development</i>	\$ 8,207,250	\$ 16,414,500	See Data Assumptions in Separate Table	-
	Subtotal	\$ 8,207,250	\$ 16,414,500		
<i>Subtotal Future Taxable Value (FTV) of Building(s), Land Improvements, and Any Pre-Existing Personal Property (if applicable)</i>					
Notes	Future Taxable Value (FTV) of Raw Land	Estimated FTV	Notes		
	Address	-			-
	4136 E. Willoughby Road	\$ 15,800	Estimated Land Value	Based on 2013 Land Value from Township Web site when property was last assessed. Assumes future annual increase noted above for Raw Land, if any.	
	4184 E. Willoughby Road	\$ 79,300	"		
	No Address Assigned - E. Willoughby Road	\$ 13,800	"		
	<i>Subtotal Future Taxable Value (FTV) of Raw Land</i>	<i>\$ 108,900</i>			
Total Future Taxable Value (FTV) of Building(s) and Land Improvements, Raw Land & Any Pre-Existing Personal Property (if applicable)					
Total Captured Taxable Value: Equal to Total FTV of Building(s) and Land Improvements, Personal Property (if any) & Raw Land minus Base Year Taxable Value					

Notes:

All Future Taxable Values (FTV)/Future Assessed Values (FAV) are estimates only; the actual FTV/FAV may be higher or lower than estimated, and must be determined upon project completion by the governing body's Assessing personnel. FTV/FAV per square foot and/or per room/unit for both new construction and renovations may vary widely depending on the quality, quantity, type of improvements, and the property's location. Additionally, for any renovations (if applicable), the FTV/FAV depends on whether improvements are assessed as "new improvements" or just "replacement/repair," as determined by Assessing personnel. Until improvements are completed and assessed, it is only possible to estimate the FTV/FAV based on various assumptions.

The Brownfield Plan will also capture all Personal Property taxes allowed for tax capture. The estimates of the Future Assessed Value (FAV) of Personal Property, if any are provided, and any associated Tax Increment Revenues, are estimates only, and the actual values of Personal Property and any associated property taxes generated are difficult to estimate due to the following: (a) uncertainty regarding the amount, value and type of Personal Property to be included in the project; (b) different depreciation rates applying to the various categories of Personal Property, such as Furniture and Fixtures, Office and Electronic Equipment, Machinery and Equipment, and Computer Equipment; and (c) Personal Property being exempt from taxes if its True Cash Value (after depreciation) is less than \$80,000 and the proper forms are submitted to the local unit of government (pursuant to Michigan Public Act 153 of 2013, as amended). The estimated Assessed/Taxable Value of any existing Personal Property is included in the Plan's Base Year/Initial Taxable Value.

		Calendar Year	2016	2017	2018	2019	2020	2021
		BP Year Number	0	1	2	3	4	5
			0.00%	0.00%	0.00%	2.40%	2.40%	2.40%
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
% Completed by 12/31/16	% Completed by 12/31/17		-	-	-	-	-	-
		25%	100%					
			\$ -	\$ 2,051,813	\$ 8,207,250	8,404,224	8,605,925	8,812,468
			\$ -	\$ 2,051,813	\$ 8,207,250	\$ 8,404,224	\$ 8,605,925	\$ 8,812,468
			-	2,051,813	8,207,250	8,404,224	8,605,925	8,812,468
			-	-	-	-	-	-
			-	-	-	-	-	-
			\$ -	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800
			\$ -	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300
			\$ -	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800
			\$ -	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900
			\$ -	\$ 2,160,713	\$ 8,316,150	\$ 8,513,124	\$ 8,714,825	\$ 8,921,368
			\$ -	\$ 2,160,713	\$ 8,316,150	\$ 8,513,124	\$ 8,714,825	\$ 8,921,368

2022	2023	2024	2025	2026	2027	2028	2029
6	7	8	9	10	11	12	13
2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%	2.40%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
-	-	-	-	-	-	-	-
9,023,967	9,240,542	9,462,315	9,689,411	9,921,956	10,160,083	10,403,925	10,653,620
\$ 9,023,967	\$ 9,240,542	\$ 9,462,315	\$ 9,689,411	\$ 9,921,956	\$ 10,160,083	\$ 10,403,925	\$ 10,653,620
<i>9,023,967</i>	<i>9,240,542</i>	<i>9,462,315</i>	<i>9,689,411</i>	<i>9,921,956</i>	<i>10,160,083</i>	<i>10,403,925</i>	<i>10,653,620</i>
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800
\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300
\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800
\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900
\$ 9,132,867	\$ 9,349,442	\$ 9,571,215	\$ 9,798,311	\$ 10,030,856	\$ 10,268,983	\$ 10,512,825	\$ 10,762,520
\$ 9,132,867	\$ 9,349,442	\$ 9,571,215	\$ 9,798,311	\$ 10,030,856	\$ 10,268,983	\$ 10,512,825	\$ 10,762,520

2030	2031	2032	2033	2034
14	15	16	17	18
2.40%	2.40%	2.40%	2.40%	2.40%
0.00%	0.00%	0.00%	0.00%	0.00%
-	-	-	-	-
10,909,306	11,171,130	11,439,237	11,713,779	11,994,909
\$ 10,909,306	\$ 11,171,130	\$ 11,439,237	\$ 11,713,779	\$ 11,994,909
<i>10,909,306</i>	<i>11,171,130</i>	<i>11,439,237</i>	<i>11,713,779</i>	<i>11,994,909</i>
-	-	-	-	-
-	-	-	-	-
\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800	\$ 15,800
\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300	\$ 79,300
\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800	\$ 13,800
\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900	\$ 108,900
\$ 11,018,206	\$ 11,280,030	\$ 11,548,137	\$ 11,822,679	\$ 12,103,809
\$ 11,018,206	\$ 11,280,030	\$ 11,548,137	\$ 11,822,679	\$ 12,103,809

**WILLOUGHBY ESTATES - DELHI CHARTER TOWNSHIP, MICHIGAN
BROWNFIELD PLAN NO. 6**

Table 4c - Impact of Tax Capture on Taxing Jurisdictions

	AD VALOREM TAXING AUTHORITIES/ TAXING JURISDICTIONS (TJs)	Millage Summary: Millage Rate Paid on Non-Homestead/Non-PRE Real Property without any Tax Exemptions			Millage Rate Paid on Commercial Personal Property	Millage Rate Allowed for Capture on Commercial Personal Property	Percent (%) of Millage Rate Captured
		Annual	Not Allowed for Capture	Allowed for Capture (Net)			
		BP Years: All Years	BP Years: All Years	BP Years: All Years			
-	DELHI CHARTER TOWNSHIP	-	-	-	-	-	-
-	Operating - Delhi Township	4.3094	0.0000	4.3094	4.3094	4.3094	100.00%
-	Fire/EMS	1.5000	0.0000	1.5000	1.5000	1.5000	100.00%
-	Police	1.5000	0.0000	1.5000	1.5000	1.5000	100.00%
-	<i>Subtotal of Local Government Unit (LGU) Millages and Tax Capture: Annual</i>	7.3094	0.0000	7.3094	7.3094	7.3094	
-	<i>Local Government Unit (LGU) Tax Capture: Cumulative</i>						
-	INGHAM COUNTY	-	-	-	-	-	-
-	County Operating - General Operations & Indigent Veterans Support	6.3842	0.0000	6.3842	6.3842	6.3842	100.00%
-	Potter Park Zoo & Potter Park	0.4100	0.0000	0.4100	0.4100	0.4100	100.00%
-	Public Transportation	0.1200	0.0000	0.1200	0.1200	0.1200	100.00%
-	Special Transportation	0.4800	0.0000	0.4800	0.4800	0.4800	100.00%
-	911 System - Emergency Telephone Services	0.8431	0.0000	0.8431	0.8431	0.8431	100.00%
-	Juvenile Justice	0.6000	0.0000	0.6000	0.6000	0.6000	100.00%
-	Farmland/ Open Space Preservation	0.1400	0.0000	0.1400	0.1400	0.1400	100.00%
-	Health Care Services	0.3500	0.0000	0.3500	0.3500	0.3500	100.00%
-	Parks/Trails	0.5000	0.0000	0.5000	0.5000	0.5000	100.00%
-	Capital Region Airport Authority - CRAA	0.6990	0.0000	0.6990	0.6990	0.6990	100.00%
-	Capital Area Transportation Authority - CATA	3.0070	0.0000	3.0070	3.0070	3.0070	100.00%
-	LIBRARY	-	-	-	-	-	-
-	Capital Area District Libraries - CADL	1.5600	0.0000	1.5600	1.5600	1.5600	100.00%
-	INTERMEDIATE SCHOOL DISTRICTS (ISD)	-	-	-	-	-	-
-	RESA Operating	0.1894	0.0000	0.1894	0.1894	0.1894	100.00%
-	RESA Special Education	4.5062	0.0000	4.5062	4.5062	4.5062	100.00%
-	RESA Vocational Education	1.2925	0.0000	1.2925	1.2925	1.2925	100.00%
-	COMMUNITY COLLEGE	-	-	-	-	-	-
-	Lansing Community College - LCC	3.8072	0.0000	3.8072	3.8072	3.8072	100.00%
-	LOCAL SCHOOL MILLAGES: excludes State School millages	-	-	-	-	-	-
-	Holt School District Debt (District #33070)	10.0000	10.0000	0.0000	10.0000	0.0000	0.00%
-	<i>Subtotal of Non-LGU Local Millages and Tax Capture: Annual</i>	34.8886	10.0000	24.8886	34.8886	24.8886	
-	<i>Non-LGU Local Tax Capture: Cumulative</i>						
-	Total Local Tax Capture: Annual	42.1980	10.0000	32.1980	42.1980	32.1980	
-	Total Local Tax Capture: Cumulative						
-	STATE SCHOOL MILLAGES: excludes Local School millages	-	-	-	-	-	-
-	State Education Tax - SET	6.0000	6.0000	0.0000	6.0000	0.0000	0.00%
-	Local School Operating (District #33070 - Holt) - LSO: Full rate for for Non-Homestead/Non-PRE Real Property; 0 mills for for Homestead/PRE Real Property; 6 mills for Commercial Personal Property.	18.0000	18.0000	0.0000	6.0000	0.0000	0.00%
-	Total State & Local School Tax Capture: Annual	24.0000	24.0000	0.0000	12.0000	0.0000	
-	Total State & Local School Tax Capture: Cumulative						
-	TOTAL LOCAL TAX AND STATE & LOCAL SCHOOL TAX CAPTURE: ANNUAL	66.1980	34.0000	32.1980	54.1980	32.1980	
-	TOTAL LOCAL TAX AND STATE & LOCAL SCHOOL TAX CAPTURE: CUMULATIVE						
-	Percentage of Local Millages/Taxes Available & Captured	63.75%	-	100.00%	-	-	
-	Percentage of State & Local School Millages/Taxes Available & Captured	36.25%	-	0.00%	-	-	

Notes:

Unless otherwise noted, the most current available millage rates are utilized and are assumed to be in effect for the 1 duration of the Plan. Actual rates are subject to change and may be higher or lower, and may include the elimination of existing millages and/or the addition of new millages.

Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
BP Year Number	0	1	2	3	4	5	6	7	8	9	10

-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 9,311	\$ 35,838	\$ 36,686	\$ 37,556	\$ 38,446	\$ 39,357	\$ 40,290	\$ 41,246	\$ 42,225	\$ 43,227	
\$ 0	\$ 3,241	\$ 12,474	\$ 12,770	\$ 13,072	\$ 13,382	\$ 13,699	\$ 14,024	\$ 14,357	\$ 14,697	\$ 15,046	
\$ 0	\$ 3,241	\$ 12,474	\$ 12,770	\$ 13,072	\$ 13,382	\$ 13,699	\$ 14,024	\$ 14,357	\$ 14,697	\$ 15,046	
\$ 0	\$ 15,794	\$ 60,786	\$ 62,226	\$ 63,700	\$ 65,210	\$ 66,756	\$ 68,339	\$ 69,960	\$ 71,620	\$ 73,320	
\$ 0	\$ 15,794	\$ 76,580	\$ 138,805	\$ 202,506	\$ 267,715	\$ 334,471	\$ 402,810	\$ 472,770	\$ 544,390	\$ 617,709	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 13,794	\$ 53,092	\$ 54,349	\$ 55,637	\$ 56,956	\$ 58,306	\$ 59,689	\$ 61,105	\$ 62,554	\$ 64,039	
\$ 0	\$ 886	\$ 3,410	\$ 3,490	\$ 3,573	\$ 3,658	\$ 3,744	\$ 3,833	\$ 3,924	\$ 4,017	\$ 4,113	
\$ 0	\$ 259	\$ 998	\$ 1,022	\$ 1,046	\$ 1,071	\$ 1,096	\$ 1,122	\$ 1,149	\$ 1,176	\$ 1,204	
\$ 0	\$ 1,037	\$ 3,992	\$ 4,086	\$ 4,183	\$ 4,282	\$ 4,384	\$ 4,488	\$ 4,594	\$ 4,703	\$ 4,815	
\$ 0	\$ 1,822	\$ 7,011	\$ 7,177	\$ 7,347	\$ 7,522	\$ 7,700	\$ 7,883	\$ 8,069	\$ 8,261	\$ 8,457	
\$ 0	\$ 1,296	\$ 4,990	\$ 5,108	\$ 5,229	\$ 5,353	\$ 5,480	\$ 5,610	\$ 5,743	\$ 5,879	\$ 6,019	
\$ 0	\$ 302	\$ 1,164	\$ 1,192	\$ 1,220	\$ 1,249	\$ 1,279	\$ 1,309	\$ 1,340	\$ 1,372	\$ 1,404	
\$ 0	\$ 756	\$ 2,911	\$ 2,980	\$ 3,050	\$ 3,122	\$ 3,197	\$ 3,272	\$ 3,350	\$ 3,429	\$ 3,511	
\$ 0	\$ 1,080	\$ 4,158	\$ 4,257	\$ 4,357	\$ 4,461	\$ 4,566	\$ 4,675	\$ 4,786	\$ 4,899	\$ 5,015	
\$ 0	\$ 1,510	\$ 5,813	\$ 5,951	\$ 6,092	\$ 6,236	\$ 6,384	\$ 6,535	\$ 6,690	\$ 6,849	\$ 7,012	
\$ 0	\$ 6,497	\$ 25,007	\$ 25,599	\$ 26,205	\$ 26,827	\$ 27,463	\$ 28,114	\$ 28,781	\$ 29,464	\$ 30,163	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 3,371	\$ 12,973	\$ 13,280	\$ 13,595	\$ 13,917	\$ 14,247	\$ 14,585	\$ 14,931	\$ 15,285	\$ 15,648	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 409	\$ 1,575	\$ 1,612	\$ 1,651	\$ 1,690	\$ 1,730	\$ 1,771	\$ 1,813	\$ 1,856	\$ 1,900	
\$ 0	\$ 9,737	\$ 37,474	\$ 38,362	\$ 39,271	\$ 40,201	\$ 41,155	\$ 42,130	\$ 43,130	\$ 44,153	\$ 45,201	
\$ 0	\$ 2,793	\$ 10,749	\$ 11,003	\$ 11,264	\$ 11,531	\$ 11,804	\$ 12,084	\$ 12,371	\$ 12,664	\$ 12,965	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 8,226	\$ 31,661	\$ 32,411	\$ 33,179	\$ 33,965	\$ 34,771	\$ 35,595	\$ 36,440	\$ 37,304	\$ 38,189	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
\$ 0	\$ 53,777	\$ 206,977	\$ 211,880	\$ 216,900	\$ 222,040	\$ 227,304	\$ 232,695	\$ 238,214	\$ 243,866	\$ 249,654	
\$ 0	\$ 53,777	\$ 260,754	\$ 472,634	\$ 689,534	\$ 911,574	\$ 1,138,879	\$ 1,371,573	\$ 1,609,787	\$ 1,853,653	\$ 2,103,307	
\$ 0	\$ 69,571	\$ 267,763	\$ 274,106	\$ 280,600	\$ 287,250	\$ 294,060	\$ 301,033	\$ 308,174	\$ 315,486	\$ 322,974	
\$ 0	\$ 69,571	\$ 337,334	\$ 611,440	\$ 892,040	\$ 1,179,290	\$ 1,473,350	\$ 1,774,383	\$ 2,082,557	\$ 2,398,043	\$ 2,721,017	
-	-	-	-	-	-	-	-	-	-	-	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	
\$ 0	\$ 69,571	\$ 267,763	\$ 274,106	\$ 280,600	\$ 287,250	\$ 294,060	\$ 301,033	\$ 308,174	\$ 315,486	\$ 322,974	
\$ 0	\$ 69,571	\$ 337,334	\$ 611,440	\$ 892,040	\$ 1,179,290	\$ 1,473,350	\$ 1,774,383	\$ 2,082,557	\$ 2,398,043	\$ 2,721,017	
-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2027	2028	2029	2030	2031	2032	2033	2034	Total Tax Capture During Brownfield Plan Tax Capture Period
11	12	13	14	15	16	17	18	
-	-	-	-	-	-	-	-	-
\$ 44,253	\$ 45,304	\$ 46,380	\$ 47,482	\$ 48,610	\$ 49,766	\$ 50,949	\$ 52,160	\$ 749,086
\$ 15,403	\$ 15,769	\$ 16,144	\$ 16,527	\$ 16,920	\$ 17,322	\$ 17,734	\$ 18,156	\$ 260,739
\$ 15,403	\$ 15,769	\$ 16,144	\$ 16,527	\$ 16,920	\$ 17,322	\$ 17,734	\$ 18,156	\$ 260,739
\$ 75,060	\$ 76,842	\$ 78,668	\$ 80,536	\$ 82,450	\$ 84,410	\$ 86,417	\$ 88,472	\$ 1,270,564
\$ 692,769	\$ 769,612	\$ 848,279	\$ 928,816	\$ 1,011,266	\$ 1,095,676	\$ 1,182,093	\$ 1,270,564	-
-	-	-	-	-	-	-	-	-
\$ 65,559	\$ 67,116	\$ 68,710	\$ 70,342	\$ 72,014	\$ 73,726	\$ 75,478	\$ 77,273	\$ 1,109,740
\$ 4,210	\$ 4,310	\$ 4,413	\$ 4,517	\$ 4,625	\$ 4,735	\$ 4,847	\$ 4,963	\$ 71,269
\$ 1,232	\$ 1,262	\$ 1,292	\$ 1,322	\$ 1,354	\$ 1,386	\$ 1,419	\$ 1,452	\$ 20,859
\$ 4,929	\$ 5,046	\$ 5,166	\$ 5,289	\$ 5,414	\$ 5,543	\$ 5,675	\$ 5,810	\$ 83,437
\$ 8,658	\$ 8,863	\$ 9,074	\$ 9,289	\$ 9,510	\$ 9,736	\$ 9,968	\$ 10,205	\$ 146,553
\$ 6,161	\$ 6,308	\$ 6,458	\$ 6,611	\$ 6,768	\$ 6,929	\$ 7,094	\$ 7,262	\$ 104,296
\$ 1,438	\$ 1,472	\$ 1,507	\$ 1,543	\$ 1,579	\$ 1,617	\$ 1,655	\$ 1,695	\$ 24,336
\$ 3,594	\$ 3,679	\$ 3,767	\$ 3,856	\$ 3,948	\$ 4,042	\$ 4,138	\$ 4,236	\$ 60,839
\$ 5,134	\$ 5,256	\$ 5,381	\$ 5,509	\$ 5,640	\$ 5,774	\$ 5,911	\$ 6,052	\$ 86,913
\$ 7,178	\$ 7,348	\$ 7,523	\$ 7,702	\$ 7,885	\$ 8,072	\$ 8,264	\$ 8,461	\$ 121,504
\$ 30,879	\$ 31,612	\$ 32,363	\$ 33,132	\$ 33,919	\$ 34,725	\$ 35,551	\$ 36,396	\$ 522,695
-	-	-	-	-	-	-	-	\$ 0
\$ 16,020	\$ 16,400	\$ 16,790	\$ 17,188	\$ 17,597	\$ 18,015	\$ 18,443	\$ 18,882	\$ 271,169
-	-	-	-	-	-	-	-	\$ 0
\$ 1,945	\$ 1,991	\$ 2,038	\$ 2,087	\$ 2,136	\$ 2,187	\$ 2,239	\$ 2,292	\$ 32,923
\$ 46,274	\$ 47,373	\$ 48,498	\$ 49,650	\$ 50,830	\$ 52,038	\$ 53,275	\$ 54,542	\$ 783,295
\$ 13,273	\$ 13,588	\$ 13,911	\$ 14,241	\$ 14,579	\$ 14,926	\$ 15,281	\$ 15,644	\$ 224,670
-	-	-	-	-	-	-	-	\$ 0
\$ 39,096	\$ 40,024	\$ 40,975	\$ 41,949	\$ 42,945	\$ 43,966	\$ 45,011	\$ 46,082	\$ 661,791
-	-	-	-	-	-	-	-	\$ 0
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 255,581	\$ 261,650	\$ 267,864	\$ 274,228	\$ 280,744	\$ 287,417	\$ 294,250	\$ 301,247	\$ 4,326,287
\$ 2,358,888	\$ 2,620,538	\$ 2,888,402	\$ 3,162,629	\$ 3,443,374	\$ 3,730,790	\$ 4,025,040	\$ 4,326,287	-
\$ 330,641	\$ 338,492	\$ 346,532	\$ 354,764	\$ 363,194	\$ 371,827	\$ 380,667	\$ 389,718	\$ 5,596,851
\$ 3,051,657	\$ 3,390,149	\$ 3,736,681	\$ 4,091,445	\$ 4,454,640	\$ 4,826,466	\$ 5,207,133	\$ 5,596,851	-
-	-	-	-	-	-	-	-	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 330,641	\$ 338,492	\$ 346,532	\$ 354,764	\$ 363,194	\$ 371,827	\$ 380,667	\$ 389,718	\$ 5,596,851
\$ 3,051,657	\$ 3,390,149	\$ 3,736,681	\$ 4,091,445	\$ 4,454,640	\$ 4,826,466	\$ 5,207,133	\$ 5,596,851	-
100%	100%	100%	100%	100%	100%	100%	100%	-
0%	0%	0%	0%	0%	0%	0%	0%	-

**WILLOUGHBY ESTATES - DELHI CHARTER TOWNSHIP, MICHIGAN
BROWNFIELD PLAN NO. 6**

Table 4d - Reimbursement of Eligible Activities & Disbursements¹

Notes	DISBURSEMENTS TO BROWNFIELD REDEVELOPMENT AUTHORITY & MBRF		
-	State of Michigan Brownfield Redevelopment Fund (MBRF): Funded from the capture of the State Education Tax (SET) millages (if applicable) - Estimated State Education Tax (SET) Captured		
-	Reimbursement of Local Brownfield Redevelopment Authority Administrative & Operating Expenses	\$ 25,000	of Local Tax Capture per year during Brownfield Plan.
-		0.00%	of Local Tax Capture thereafter.
-	Local Brownfield Redevelopment Authority Site Remediation Revolving Fund (LSRRF) ³	0.00%	of Local Tax Capture during Brownfield Plan reimbursement to Developer. ³
-	Note: The LSRRF may capture Local Tax Increment for not more than 5 years after the time that tax capture is required to reimburse all Eligible Activities.	100.00%	of Local Tax Capture thereafter.
-			LSRRF is allowed to capture an amount of Local Tax Increment \$ 1,860,171 up to:
-	Local Tax Increment: <u>Annual</u> Remaining Revenue Available for Reimbursement		
-	Local Tax Increment: <u>Cumulative</u> Remaining Revenue Available for Reimbursement		

Notes	REIMBURSEMENT OF ELIGIBLE ACTIVITIES	Year that Expenses Identified in the Eligible Activities Table Will Be Recognized ²		
		2015	2016	2017
-	Environmental Activities: Michigan Department of Environmental Quality (MDEQ)			
-	Local Tax Increment Reimbursement	\$ -	\$ 611,757	\$ -
-	State & Local School Tax Increment Reimbursement (LSO & SET)	\$ -	\$ -	\$ -
-	TOTAL MDEQ REIMBURSEMENT (Eligible Costs)	\$ 0	\$ 611,757	\$ 0
-	Cumulative Reimbursement: MDEQ			
-	Remaining Environmental Activities to be Reimbursed: with Local Taxes			
-	Remaining Environmental Activities to be Reimbursed: with Non-Local Taxes, e.g., LSO & SET			
-	Non-Environmental Activities: Brownfield Redevelopment Authority (BRA) & Michigan Strategic Fund (MSF)			
-	Local Tax Increment Reimbursement	\$ -	\$ 2,582,589	\$ -
-	State & Local School Tax Increment Reimbursement (LSO & SET)	\$ -	\$ -	\$ -
-	TOTAL BRA & MSF REIMBURSEMENT (Eligible Costs)	\$ 0	\$ 2,582,589	\$ 0
-	Cumulative Reimbursement: BRDA & MSF			
-	Remaining Non-Environmental Activities to be Reimbursed: with Local Taxes			
-	Remaining Non-Environmental Activities to be Reimbursed: with Non-Local Taxes, e.g., LSO & SET			
-	TOTAL ANNUAL REIMBURSEMENT: BRA, MDEQ & MSF (Eligible Costs)	\$ 0	\$ 3,194,346	\$ 0
-	TOTAL CUMULATIVE REIMBURSEMENT: BRA, MDEQ & MSF (Eligible Costs)			
-	<i>Remaining Unreimbursed Balance</i>			
-	<i>Surplus Revenue from Local Tax Increment =</i>			
-	<i>Surplus Revenue from State and Local School Tax Increment =</i>			

Notes:

¹ Unless amended by the local unit of government, the Plan is anticipated to remain in effect until all approved activities in the Plan are reimbursed.

² The "Year of Tax Capture" indicates the year that any allowed tax increment will be captured by the Brownfield Plan, but not necessarily distributed as Reimbursement Payments; generally, Reimbursement Payments for Eligible Activities, Bonds (if applicable), etc., will be distributed in the following year, but the specific terms and conditions of reimbursement will be subject to a Development Reimbursement Agreement with the local unit of government.

³ The Brownfield Plan prioritizes reimbursement in the first year of capture of \$21,035 into the LSRRF for use of an Environmental Protection Agency (EPA) grant fund that the Lansing Regional Brownfield Coalition (LRBC) contributed to the project. After the Developer is fully reimbursed, the local unit of government's LSRRF will capture the remaining balance available over a five-year period at the end of the Brownfield Plan.

Totals	Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024
	BP Year Number	0	1	2	3	4	5	6	7	8
\$ 0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ 325,000	Annual:	\$ -	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000
	Cumulative:	\$ 0	\$ 25,000	\$ 50,000	\$ 75,000	\$ 100,000	\$ 125,000	\$ 150,000	\$ 175,000	\$ 200,000
\$ 1,860,171	Annual:	\$ -	\$ 21,035	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Cumulative:	\$ 0	\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035
		\$ 0	\$ 23,536	\$ 242,763	\$ 249,106	\$ 255,600	\$ 262,250	\$ 269,060	\$ 276,033	\$ 283,174
		\$ 0	\$ 23,536	\$ 266,299	\$ 515,405	\$ 771,005	\$ 1,033,255	\$ 1,302,315	\$ 1,578,348	\$ 1,861,522
Totals	Year of Tax Capture ²	2016	2017	2018	2019	2020	2021	2022	2023	2024
\$ 611,757		\$ 0	\$ 23,536	\$ 242,763	\$ 249,106	\$ 96,352	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 611,757		\$ 0	\$ 23,536	\$ 242,763	\$ 249,106	\$ 96,352	\$ 0	\$ 0	\$ 0	\$ 0
		\$ 0	\$ 23,536	\$ 266,299	\$ 515,405	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757
			\$ 588,221	\$ 345,458	\$ 96,352	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
			\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 2,582,589		\$ 0	\$ 0	\$ 0	\$ 0	\$ 159,248	\$ 262,250	\$ 269,060	\$ 276,033	\$ 283,174
\$ 0		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 2,582,589		\$ 0	\$ 0	\$ 0	\$ 0	\$ 159,248	\$ 262,250	\$ 269,060	\$ 276,033	\$ 283,174
		\$ 0	\$ 0	\$ 0	\$ 0	\$ 159,248	\$ 421,498	\$ 690,558	\$ 966,591	\$ 1,249,765
			\$ 2,582,589	\$ 2,582,589	\$ 2,582,589	\$ 2,423,341	\$ 2,161,091	\$ 1,892,031	\$ 1,615,997	\$ 1,332,823
		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 3,194,346		\$ 0	\$ 23,536	\$ 242,763	\$ 249,106	\$ 255,600	\$ 262,250	\$ 269,060	\$ 276,033	\$ 283,174
		\$ 0	\$ 23,536	\$ 266,299	\$ 515,405	\$ 771,005	\$ 1,033,255	\$ 1,302,315	\$ 1,578,348	\$ 1,861,522
		\$ 0	\$ 3,170,810	\$ 2,928,047	\$ 2,678,941	\$ 2,423,341	\$ 2,161,091	\$ 1,892,031	\$ 1,615,997	\$ 1,332,823
		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

Capture Period Ends for Developer Reimbursement					Capture Period Ends for Reimbursement to LSRRF					Totals
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Totals
9	10	11	12	13	14	15	16	17	18	-
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0
\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 325,000
\$ 225,000	\$ 250,000	\$ 275,000	\$ 300,000	\$ 325,000	\$ 325,000	\$ 325,000	\$ 325,000	\$ 325,000	\$ 325,000	-
\$ -	\$ -	\$ -	\$ -	\$ 196,300	\$ 354,764	\$ 363,194	\$ 371,827	\$ 380,667	\$ 172,383	\$ 1,860,171
\$ 21,035	\$ 21,035	\$ 21,035	\$ 21,035	\$ 217,335	\$ 572,100	\$ 935,294	\$ 1,307,121	\$ 1,687,787	\$ 1,860,171	-
\$ 290,486	\$ 297,974	\$ 305,641	\$ 313,492	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 217,335	\$ 3,411,681
\$ 2,152,008	\$ 2,449,982	\$ 2,755,622	\$ 3,069,114	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,411,681	-
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Totals
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 611,757
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 611,757
\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	\$ 611,757	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 290,486	\$ 297,974	\$ 305,641	\$ 313,492	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 2,582,589
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
\$ 290,486	\$ 297,974	\$ 305,641	\$ 313,492	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 2,582,589
\$ 1,540,251	\$ 1,838,225	\$ 2,143,865	\$ 2,457,357	\$ 2,582,589	\$ 2,582,589	\$ 2,582,589	\$ 2,582,589	\$ 2,582,589	\$ 2,582,589	-
\$ 1,042,337	\$ 744,364	\$ 438,723	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 290,486	\$ 297,974	\$ 305,641	\$ 313,492	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 3,194,346
\$ 2,152,008	\$ 2,449,982	\$ 2,755,622	\$ 3,069,114	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	\$ 3,194,346	-
\$ 1,042,337	\$ 744,364	\$ 438,723	\$ 125,231	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 217,335	-
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	-

DELHI CHARTER TOWNSHIP**MEMORANDUM**

TO: Delhi Township Board Members

FROM: John B. Elsinga, Township Manager

DATE: April 13, 2016

RE: Resolution No. 2016-003 – Tri-County Regional Hazard Mitigation Plan

Enclosed for your review and approval is Resolution No. 2016-003 which would adopt the Tri-County Regional Hazard Mitigation Plan to be utilized by Delhi Charter Township.

This Plan was established by the Tri-County Regional Planning Commission to protect the health, safety and economic interests of residents and businesses in the tri-county area by examining potential hazard activities and developing a mitigation plan for each for communities to utilize to help ensure the safety and welfare of their residents.

In order for Delhi Township to continue to be eligible for Federal Emergency Management Agency (FEMA) grants, the Board must adopt the Tri-County Regional Hazard Mitigation Plan. The Plan has been reviewed by the Fire Chief and the Emergency Management Coordinator who feel it adequately reflects Delhi Township's needs. Therefore, I recommend the Board approve the same.

Recommended Motion:

To adopt Resolution No. 2016-003 which adopts the Tri-County Regional Hazard Mitigation Plan effective April 19, 2016.



Delhi Township Fire Department

2074 AURELIUS ROAD
PHONE (517) 694-3327

HOLT, MICHIGAN 48842-6320
FAX (517) 699-3879

To: John Elsinga, Township Manager

From: Brian Ball, Fire Chief

Date: April 12, 2016

RE: Tri-County Hazard Mitigation resolution

Attached is a resolution for the Township to consider for approval. The Tri-County Regional Planning Commission has been meeting and working on a Hazard Mitigation plan of which encompasses Ingham, Eaton and Clinton counties as well as the communities within. This now complete plan has taken into account the hazards that may strike both man-made and natural and has attempted to map out a path for mitigation. In order for Delhi Township to preserve our eligibility for Federal Emergency Management Agency (FEMA) project grant applications it is necessary to formally adopt the plan through resolution. I will have a printed copy of the plan in the fire department administrative office for review if needed. I have reviewed this plan with my Emergency Management Coordinator Jim Porcello and we both feel this plan is both well written and necessary for Delhi Township.

I am requesting the formal adoption of the Tri-County Hazard Mitigation Plan by resolution at the April 19, 2016 Delhi Township Board of Trustees meeting. This plan is for public knowledge and will be placed on the fire department webpage after formal approval. Any questions on this matter can be directed to myself or Jim Porcello in the fire department.

Thank You for your consideration in this important matter.

Hazard Mitigation Plan Adoption Resolution
Resolution No. 2016-003

At a regular meeting of the Delhi Charter Township Board of Trustees of the Charter Township of Delhi, Ingham County, Michigan, held at the Community Services Center, 2074 Aurelius Road, Holt, Michigan 48842 on Tuesday, the 19th day of April, 2016, at 7:30 p.m.

PRESENT:

ABSENT:

The following Resolution was offered by _____.

Whereas, Delhi Charter Township, Michigan has experienced risks that may damage commercial, residential and public properties, displace citizens and businesses, close streets and impair infrastructure, and present general public health and safety concerns; and

Whereas, the Tri-County Regional Planning Commission has prepared a *Hazard Mitigation Plan* that outlines the community's options to reduce damages and impacts from natural and technological hazards; and

Whereas, the *Hazard Mitigation Plan* has been reviewed by community residents, business owners, and federal, state and local agencies, and has been revised where appropriate to reflect their concerns;

Now, therefore, be it resolved that, the *Hazard Mitigation Plan* is hereby adopted as an official plan of the Delhi Charter Township.

The Emergency Management Coordinator is charged with supervising the implementation of the Plan's recommendations within the funding limitations as provided by Delhi Charter Township or other sources.

AYES:

NAYES:

ABSENT:

The foregoing Resolution declared adopted on the date written above.

Evan Hope, Township Clerk

**STATE OF MICHIGAN)
COUNTY OF INGHAM)§**

I, the undersigned, the duly qualified Clerk for the Charter Township of Delhi, Ingham County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and complete copy of the proceedings taken by the Township Board at a regular meeting held on the 19th day of April 2016.

IN WITNESS WHEREOF, I have hereunto affixed my official signature this ___ day of April 2016.

Evan Hope, Township Clerk

NOTE: AN OFFICIAL SIGNED COPY OF A RESOLUTION OF ADOPTION MUST BE SUBMITTED TO THE MICHIGAN STATE POLICE EMERGENCY MANAGEMENT AND HOMELAND SECURITY DIVISION (to comply with the requirements of the Disaster Mitigation Act of 2000).

Optional elements and other language in this example may be removed or changed.

Tri-County Regional Hazard Mitigation Plan

For
Clinton, Eaton, Ingham Counties
And
Delta Charter Township
In Mid-Michigan



Prepared by
Tri-County Regional Planning Commission
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JUNE 2015

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**We wish to recognize and express special thanks
for the important contributions of the**

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EXECUTIVE SUMMARY

The Tri-County Regional Hazard Mitigation Plan was created to protect the health, safety, and economic interests of residents and businesses in Clinton, Eaton, and Ingham Counties and Delta Charter Township in mid-Michigan's greater Lansing region. The regional Plan will reduce the impacts of natural and technological hazards through hazard mitigation planning, awareness, and implementation.

This Plan is the foundation for hazard mitigation activities and actions within Michigan's Tri-County Capital area region. Implementation of recommendations will reduce loss of life, destruction of property, and economic losses due to natural and technological hazards. The plan provides a path toward continuous, proactive reduction of vulnerability to hazards that result in repetitive and oftentimes severe social, economic and physical damage. The ideal end state is full integration of hazard mitigation concepts into day-to-day governmental and business functions and management practices.

This Plan employs a broad perspective in examining multi-hazard mitigation activities and opportunities in the Tri-County region. Emphasis is placed on hazards that have resulted in threats to the public health, safety and welfare, as well as the social, economic and physical fabric of the community. The plan addresses such hazards as floods, tornadoes, windstorms, winter storms, forest fires, structural fires, hazardous material incidents, and secondary technological hazards that result from natural hazard events. Each hazard was analyzed from a historical perspective, evaluated for potential risk, and considered for possible mitigative action. The plan also lays out the legal basis for planning and the tools to be used for its implementation.

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Preface

This 2015 Tri-County Regional Hazard Mitigation Plan provides a combined plan with updated data, opportunities, and recommendations to address hazards in the mid-Michigan area. This Plan offers actions that complement and expand on existing efforts and provide a strong foundation for hazard mitigation activities and actions within the region. In mid-Michigan, Clinton, Eaton and Ingham Counties and Delta Charter Township make up an active Emergency Management community. Together they implement related programs and initiatives that improve the general health, safety and welfare within the region. They have worked together through the Tri-County Regional Planning Commission to improve and update this regional Hazard Mitigation Plan.

Although not all hazards can be mitigated completely, implementation of recommendations in this plan will reduce loss of life, destruction of property, and economic losses that result from natural, technological and human-related hazards. This Plan provides a path toward continuous, proactive reduction of vulnerability to hazards, and can prevent repetitive and oftentimes severe social, economic and physical damage. One important goal for our region is to fully integrate hazard mitigation concepts into routine governmental and business functions and management practices including planning, regulation, procedures and policy.

This new Plan is a regional plan. In 2005, Ingham, Clinton and Eaton Counties and Delta Charter Township completed four separate hazard mitigation plans. In 2015, these same entities now adopt a combined plan that meets the requirements of the Federal Emergency Management Agency (FEMA). This plan provides updated data on our region. It was developed with public input and with expert input from area emergency managers, municipal officials, and various municipal and infrastructure managers so the Plan describes the processes used to develop the plan. This Plan includes new goals and objectives that were not in previous plans.

This Plan employs a broad perspective in examining multi-hazard mitigation activities in the Michigan's Capital area region. Emphasis is placed on hazards that result in threats to the public health, safety and welfare, as well as those that impact the social, economic and physical fabric of the region. The plan addresses such hazards as floods, storms, hazardous material incidents, and school/institutional violence. The Plan provides a historical analysis of each hazard, evaluates each hazard for potential risk, and shares possible mitigation actions. This Plan also lays out the tools and strategies to be used for its overall implementation.

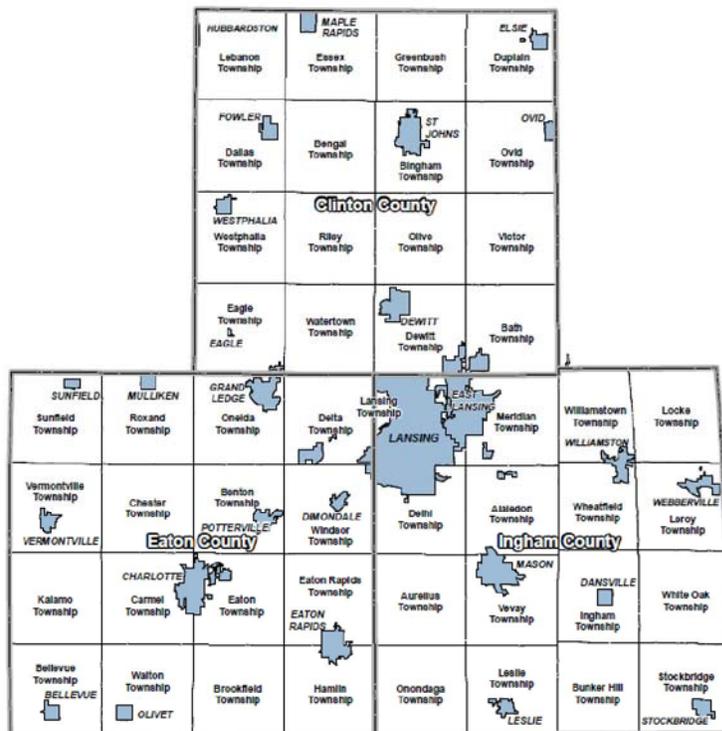
This Plan is a step toward fully integrating hazard mitigation into the normal operation of government and business. In the process of completing this Plan update, substantial effort was made to incorporate a range of expertise and information regarding local hazards. In addition, the Plan process included opportunities for the community to make adjustments so that it accurately represents specific jurisdictions, businesses and changes in our region. This Plan will remain active for a period of five years. Regional leaders should review and update this Plan again by 2020.

Chapter 1 - Planning Background and Process

Hazard mitigation is any action taken before, during, or after a disaster to permanently eliminate or reduce the long-term risk to human life and property. This 2015 Tri-County Regional Hazard Mitigation Plan provides a framework to enhance the general health, welfare and safety of residents in mid-Michigan’s Ingham, Clinton and Eaton Counties and Delta Charter Township (see map below). Each of these four jurisdictions are continuing their participation since the adopting their 2004 Hazard Mitigation Plans. This Plan considers the potential impact of natural, technological and social hazards on our region, and identifies some level of mitigation for each hazard.

Hazard mitigation is an essential element of emergency management, along with preparedness, response, and recovery. There is a cyclical relationship between the four phases of emergency management. A community prepares for a disaster, and then responds when it occurs. Following the response, there is a transition into the recovery process when mitigation measures are evaluated and adopted. This, in turn, improves the preparedness of the community for the next incident, and so on. When successful, mitigation will lessen the impacts to such a degree that succeeding incidents will remain incidents and not become disasters. This Plan updates a regional plan adopted in 2004. All jurisdictions depicted in the map below are represented in this updated Plan except for the City of Lansing, which updated their plan separately.

Fig.1 Map of Tri-County Region



Source: TCRPC

The Greater Lansing Michigan Metropolitan Area last acted on its hazard mitigation plans with the 2004 adoption of four plans: the Ingham County plan, Clinton County plan, Eaton County plan and Delta Charter Township plan. We provide here the regional hazard analysis, mitigation actions, in support of each of those goals. There is brief comment on implementation steps for this Plan, but that is discussed at more length throughout the document.

The hazard mitigation planning process is a public and transparent activity with many steps and initiatives over time. The planning process is punctuated by specific planning events, activities, and documents. They included reestablishing goals and objectives, scoping and technical analyses, soliciting and integrating the needs and desires of our region's populace, then sharing and seeking responses to the resultant proposed plan. This chapter describes the planning steps implemented to update our 2004 plans.

The Tri-County Regional Planning Commission is committed to ensuring that citizen input figures prominently in the planning process. We implement a multi-faceted process to include citizens, residents, visitors, and others in developing, reviewing, and commenting on the Plan. In the development of this updated Plan, we sought input through traditional public meetings online forums, committee and workgroup sessions, public comment periods, and other approaches.

In addition to soliciting public participation, TCRPC acknowledges the critically important role of cooperating, collaborating, and coordinating regional activities with the many agencies and organizations with roles in transportation. This chapter also describes the consultation process that we followed for this Plan. We consulted with agencies and organizations responsible for land use planning, transit, air travel, non-motorized travel, environmental protection, natural resources management, economic development, human services and assistance, and community development. Their technical and specific expertise was invaluable in developing our regional plan.

Of the 78 local jurisdictions within the tri-county region, the following are those who have actively participated in this plan update as of its finalization and local adoption in July 2015:

Ingham County	Total 2010 population:	280,895
City of East Lansing	population:	46,605
Meridian Charter Township	population:	39,685
Williamstown Township	population:	4953
City of Williamston	population:	3864
Village of Dansville	population:	563
Village of Webberville	population:	1272
City of Mason	population:	8261
Delhi Charter Township	population:	25,873

Lansing Charter Township	population:	8114
Eaton County	Total 2010 population:	107,759
Delta Charter Township	population:	32,405
City of Grand Ledge	population:	7790
City of Charlotte	population:	9082
City of Eaton Rapids	population:	5235
Clinton County	Total 2010 population	75,382
DeWitt Charter Township	population:	14,317
City of DeWitt	population:	4507
Bath Charter Township	population:	11,605
City of St Johns	population:	7878
Dallas Township	population:	1161
	Total Covered Population:	233,175

These eighteen participating communities constitute the majority of the region's population, including its top five most populous jurisdictions. This does not include the City of Lansing. They have their own hazard mitigation plan.

Hazard mitigation strives to reduce the impact of hazards on people and property through the coordination of resources, programs, and authorities. Hazard mitigation plans can prevent a cycle whereby communities contribute to the increasing severity of a hazard by allowing repairs and reconstruction that restore damaged property to pre-disaster conditions quickly. Such efforts may appear to expedite a return to normalcy. However, replication of pre-disaster conditions can result in a cycle of damage, reconstruction, and damage again. Through a combination of regulatory, administrative, and engineering approaches, losses can be limited by reducing susceptibility to damage. The mitigation process helps break disaster cycles by analyzing hazards and helping communities identify ways to create less vulnerable conditions before the next potential incident.

The tri-county region recognizes the importance of reducing vulnerability to natural and technological hazards, so we are actively addressing hazard mitigation through the development and implementation of this Plan. This effort will result in many benefits including protection of public health and safety, preservation of important services, reduction of property damage and more. This Plan is one important way to help our region remain a vibrant, safe and enjoyable place to live.

In 2004, the tri-county region developed and adopted its first Hazard Mitigation plan. Ingham, Clinton, Eaton Counties, the City of Lansing and Delta Charter Township each adopted their own plan and began implementing the mitigation actions that were recommended in each respective plan. Our region has undergone significant changes in the last ten years and will likely continue to experience change in the future. This Plan includes a revision of the previous plan, incorporating changes in technology, population and economic concerns.

Fig. 2 2005 Hazard Mitigation Plans



Source: TCRPC

This Plan includes a description of the planning update process and updated profiles of Clinton, Eaton, Ingham Counties and Delta Charter Township, the four jurisdictions addressed in the planning update. It provides an overview of the region and an analysis of hazards. The hazards analysis considers the current concerns and opinions of emergency services providers, citizens, and local government infrastructure managers. This Plan addresses the goals, objectives, and strategies of the original plan with a more current perspective and it provides a snapshot of potential and existing hazards to the mid-Michigan region.

In addition to meetings of the hazard mitigation steering group, the TCRPC Program and Grant Review Committee regularly discussed the plan update at their meetings in 2012-2013-2014 and 2015. Throughout the planning process technical groups such as the Greater Lansing Regional Committee for Stormwater Management and the Capital Area Regional Transportation Study-Technical Committee convened to discuss the Plan. These committees received progress reports, provided suggestions and gave input into planning for hazard mitigation and the prioritization of various hazards.

The following figure depicts the meetings, the number of attendees and communities/agencies represented.

Fig. 3 Plan Update Meetings

Hazard Mitigation Plan Update Meetings & Outreach			
Group	Date	# of Attendees	Communities
Program & Grant Committee	March&June 2013 July 2014	12	Eaton, Ingham, Clinton and Charlotte
Hazard Mitigation Advisory Group	May 2012 June 2013 April 2015	24	MSP, Eaton, Ingham, Clinton & Delta Twp
Public Forums (Presented findings of existing plans, presented overview of hazard occurrences, facilitated discussion on planning process and outcomes)	July, August, September 2013	9	Clinton County EM (representing DeWitt & Bath Charter Townships) Village of Ovid Clinton Co Sheriff City of Potterville Eaton Co EM (representing Charlotte/Eaton Rapids etc) Ingham Co EM (representing Mason/Meridian Township/Williamston/Williamstown Township, Lansing Charter Township, etc.)
Hazard Analysis Survey (online)	2015	24	The Library of Michigan The Michigan Dept of Transportation The City of East Lansing MSU City of Charlotte City of DeWitt Delhi Charter Township CATA

Hazard Mitigation: Unlocking the Disaster Equation

A good way to understand hazard mitigation is to understand the nature of disasters themselves. The basic equation for a disaster is simple: **Hazards + People and Structures = Disaster**. Disasters only occur because people and structures are in harm's way. The key to preventing or limiting disaster damage and impact is to unlock and separate the key components of this equation. Controlling the hazard may be difficult or impossible. A tornado is a good example. However, there are situations when vulnerability can be effectively reduced. Strategies to reduce or mitigate hazards include modifying the hazard (see strategy #1) or modifying the people and structures portion of the disaster equation (see strategies #2-5). Modifying the characteristics of people and structures is often easier and more effective in reducing or eliminating hazard vulnerability because these elements are more closely under our control. However, even that can be a daunting proposition at times, given the freedom of choice that our

citizens value and the widespread appeal of living near or in hazard-prone or at-risk areas such as by water, in the woods, on hillsides, etcetera. The following five basic hazard mitigation strategies can reduce or prevent the harmful interaction between hazards, people, and development that results in a disaster:

Strategy #1: Modification of the Hazard

The first strategy is to modify the hazard itself. That involves removing or eliminating the hazard, reducing its size or amount, or controlling the rate of release of the hazard. This strategy can be successful in the right circumstances but it is often difficult to do. Examples of this strategy include cloud seeding, slope planting to prevent erosion, and stream widening or modification to improve water flow. These measures can be cost-effective, but their application is limited and therefore may not be as effective as other strategies in reducing or eliminating damage on a wide scale.

Strategy #2: Segregating the Hazard

Segregating the hazard attempts to “*keep the hazard away from people.*” In flood-prone areas this is accomplished through the construction of structural protection measures such as dams, levees, floodwalls, and debris basins. These and other public works projects redirect the impacts of a flood away from people and development. This strategy can be highly effective, but it can also be expensive and may cause or exacerbate environmental problems. Also, history has shown that structural protection measures constructed to protect one community can increase problems in other communities. For example, levees channel and increase the velocity of floodwaters which can cause severe flooding downstream. Economics and limited effectiveness may make this a marginal strategy in many situations and locations.

Strategy #3: Preventing or Limiting Development

The third strategy is to prevent or limit development in where people and development would be at risk. This approach is based on “*keeping the people away from the hazard*” and includes a variety of land use planning and development regulation tools, such as comprehensive planning, zoning, floodplain management ordinances, capital improvements planning, disclosure laws, and acquisition and relocation of hazard prone properties. This strategy is to reduce or eliminate community hazard vulnerability through prudent land use and development decision-making. When properly applied, this strategy can be highly effective in promoting safe, sustainable development.

Strategy #4: Altering Design or Construction

The fourth strategy involves altering developments’ design or construction to make it less vulnerable to disaster damage. This strategy, commonly known as “*interacting with the hazard,*” allows the hazards to interact with human systems that have been planned and designed to withstand potentially destructive impacts. Examples of this strategy include elevating structures, employing wet and dry flood-proofing to resist flood damage, managing vegetation buffer zones in urban/wild land intermix areas, using wind bracing to resist wind damage, and insulating water and sewer lines to prevent ground freeze damage. This strategy allows development in hazard prone areas on the condition that it meets stringent disaster resistant performance criteria. This approach

can balance the dual needs of enhancing a community's economic base while also reducing community hazard vulnerability. History has shown that the two goals are not mutually exclusive. When careful and prudent development decisions are made that take into account the reduction of hazard vulnerabilities, the result is safe and sustainable community development.

Strategy #5: Early Warning and Public Education (overlaps with emergency management preparedness/response) This strategy seeks to ensure that the public is aware of the hazards it faces and that proper warning and communication systems and practices are in place to save lives and protect property. This strategy should be applied in all communities, as it is typically the last line of defense against serious disaster-related injury or loss of life.

Hazard Mitigation: Corrective and Preventive

Hazard mitigation strategies may also be grouped into two other broad categories:

Corrective Mitigation – correcting past practices that have increased hazard vulnerability; and

Preventative Mitigation – preventing future problems from occurring through public education, wise decision-making and disaster-resistant building and development practices.

The **corrective** form of hazard mitigation can be expensive, resource intensive, time consuming, and sometimes only marginally effective. Structural protection measures, hazard modification, and large-scale retrofitting fall under this category. Attempting to go back and fix something that is problematic is usually more difficult than doing it right the first time. However, when dealing with hazard prone property such as structures in a floodway, floodplain or other hazard area, it may be necessary to try to correct the problem in order to protect the affected community and individual property owners from future harm.

The **preventative** form of hazard mitigation is desirable because it seeks to prevent future problems from occurring in the first place. Wise land use planning and building design, small-scale retrofitting, and early warning and public education are considered preventative mitigation measures. When it comes to reducing community hazard vulnerability, the sensible old adage “an ounce of prevention is worth a pound of cure” could be restated as “an ounce of mitigation is worth a pound of recovery!”

Doing it right the first time is almost always preferable to going back and trying to correct recurring problems at a later date. Preventive mitigation is generally easier to implement than corrective mitigation because the administrative mechanisms that guide the land development process – planning and plan review, zoning, capital improvements programming, building codes and standards, etc. – are available to every local community and only require adoption and consistent application to be highly effective in reducing or eliminating hazard vulnerability. This plan addresses both types

of hazard mitigation—an ideal hazard mitigation program will involve both types being applied in appropriate amounts, in appropriate places, in a coordinated fashion.

Corrective hazard mitigation measures are effective and important for areas that suffer recurring or severe disaster damages or for areas with clear mitigation opportunities that can be addressed with existing resources. Preventive hazard mitigation helps state and local governments ensure that, at the very least, they do not contribute to the increasing severity of the problem through unwise decision-making.

Michigan's Vulnerability to Hazards

Michigan is vulnerable to a wide range of natural, technological and human-related hazards. Although Michigan is fortunate in that it is generally not susceptible to catastrophic disasters involving major earthquakes or hurricanes, it nonetheless has its share of potentially severe and widespread disasters and emergencies. Michigan is a heavily populated state with thousands of inland lakes, hundreds of rivers and streams, over 3,200 miles of Great Lakes shoreline, numerous major manufacturing centers, frequent wind and winter storms, and lies on the northern fringe of the nation's tornado belt. Michigan experiences major disasters and emergencies on a regular basis. The Hazard Analysis section in this document describes the state's vulnerability to more than two dozen different types of natural, technological, and human-related hazards, ranging from civil disturbances to snowstorms. Although these hazards all potentially affect Michigan, several of them cause more disaster events and generally result in more damage and/or impact to affected communities. Summaries and analyses appear in the Hazard Analysis sections of this plan.

Since 1953, Michigan has experienced 34 events that were declared a major disaster or emergency by the U.S. President. Since 1977, Michigan has experienced 64 events that resulted in a Governor's declaration of disaster or emergency. The majority of those declarations were granted for flooding, tornadoes, winter storms, or severe thunderstorms. Those disasters or emergencies resulted in hundreds of millions of dollars in damage and destruction and caused tremendous disruption to the affected communities. Clearly, there is a need to focus hazard mitigation efforts on those four particular hazards in Michigan. In addition to these natural hazards, the U.S. Federal Emergency Management Agency (FEMA) requires the state of Michigan to address land subsidence, coastal erosion, extreme temperatures, dam failures, earthquakes, and drought as part of Hazard Mitigation Planning.

Hazard Mitigation: National Perspective and Federal Government Role

The Michigan Hazard Mitigation Plan of 2014 states that nationally, hazard mitigation is at a crossroads. Recent catastrophic disasters across the United States resulted in unparalleled devastation, suffering, and economic loss. These events suggest that certain aspects of development strategy throughout the United States have been on a collision course with our natural environment. Increased development in hazard prone areas has put an ever-increasing number of people and structures in harm's way, greatly exacerbating our risk and vulnerability to natural, technological, and human-related hazards. As a result, when disasters occur they increasingly cause tremendous economic, social, and physical losses to the communities and people they affect.

Fortunately, due to a depressed economy in recent years, Michigan's slowed rate of development offers many of its communities a chance to prevent many risks from increasing through appropriate plans and policies. Michigan's population declined between the previous U.S. Censuses but, in some communities, the trend did not halt green field development trends and patterns. National efforts are under way to promote resilient communities and hazard mitigation.

Grant programs and updated guidance from the Federal Emergency Management Agency (FEMA) have supported the development of plans nationwide. The National Mitigation Strategy, National Pre-Disaster Mitigation Plan, National Flood Insurance Program (NFIP), Flood Mitigation Assistance Program (FMAP), Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDMP), and the Disaster Mitigation Act of 2000 are the most prominent of the federal government's current efforts to reduce or eliminate the nation's risk and vulnerability to hazards. FEMA's efforts are in partnership with federal agencies, the Congress, the states, local governments, academia, the private sector, and individual citizens. The approach is one that invites the participation of the whole community—public, private, nonprofit, and the civil sectors.

Hazard Mitigation Plans Identify and Create Implementable Hazard Mitigation Opportunities

It must be emphasized that the hazard mitigation measures identified in this Plan and in counterpart local plans are, in reality, **hazard mitigation opportunities**. Identification of a possible hazard mitigation measure does not necessarily mean that it can or even should be implemented. The desirability or implementation of a hazard mitigation measure is highly dependent on a number of factors—environmental, social, economic and political. Just because a measure may reduce or eliminate hazard effects does not necessarily mean that it should be implemented. There may be factors or circumstances that could or should preclude its implementation. Decisions to adopt or implement hazard mitigation measures will be made in the local and state political arenas and in the land use and land development decision-making processes.

Typically, hazard mitigation measures will be implemented if they are able to balance environmental, social, economic and political factors, and are cost-effective. It does not make sense to implement a measure that will not be supported by officials and citizens or that cannot be economically justified. Accomplishing everything proposed in this plan will be a very tall order and will take years. Nevertheless, it is important to the future of this state that these issues be addressed, at least to some degree. Our nation, our state, our local communities and the insurance industry cannot continue to respond to and pay for increasingly large disasters. Proper application of hazard mitigation measures and strategies, coupled with wise land use and land development decision-making, can help our communities become more safe and sustainable, and our future as disaster-free as possible

The Role of the Citizen

The Michigan Hazard Mitigation Plan states that each citizen or resident of Michigan has a role in disasters and emergency preparedness that can protect lives during a serious event. Most of this document addresses the analysis and mitigation of hazards that could have a serious impact upon mid-Michigan or its communities. However, this small section describes personal and household preparedness actions that may become more important to your safety during a disaster than governmental efforts. Everyone should study the following list of preparedness actions along with a consideration of the types of hazards described throughout this document.

1. Develop an emergency plan for your household! Even an informal draft plan is a useful starting point. Consider the ways to prepare for responses to the various hazards that could occur in your area. Do you have a way to contact and meet your family members if something prevents you from staying in or returning to your home? Do you know the most reliable evacuation route if you have to leave your community in an evacuation?

2. Keep a supply of food and water. How many days could your home or community be without power or other utilities during a disaster event? You should always have a supply of fresh water (e.g. in bottles) and food that does not require refrigeration or cooking to help you endure periods without your community's normal utilities and services. In your preparation, consider the medicines that will be needed. Many emergencies cause a loss of power for 2 or 3 days, so your preparations should allow you to live independently for at least that long or longer.

3. Equip your home and vehicle. At a minimum, useful items to enable survival during a disaster would include a first aid kit, flashlight with batteries, a battery operated radio, and adequate clothing and blankets. Basic training in first aid may be vital to deal with the effects of injuries and weather.

4. During a disaster, use your available communication devices (battery operated radios and phones) to listen for instructions from official sources. Do what you can to obey those instructions. Be prepared to change your evacuation route, for example, if you learn that your original route is unavailable. Consider alternatives that you could evacuate to such as friends and family who live in areas less seriously affected by the emergency.

Process to Update the Tri-County Regional Plan

The Local Hazard Mitigation Planning Workbook (EMHSD-PUB207), with information on completing a successful mitigation plan, guided the planning process for this Tri-County Regional Hazard Mitigation Plan. This Plan update was based upon the extensive process to create a regional Hazard Mitigation Plan which was completed and adopted by the region in 2004. And, new and refreshed data for our area along with discussions, work sessions, and input from throughout the region in a variety of formats and venues over the past three years guided the development of the 2015 Tri-county Regional Hazard Mitigation Plan. The work was supported by a grant from the United States

Federal Emergency Management Agency, administered through the Michigan State Police, the tri-county region with the Ingham County Emergency Management Office serving as fiduciary. The Tri-County Regional Planning Commission facilitated the grant application in 2010 and, once awarded, was hired to develop a work agreement and lead the planning process to develop the plan.

The overall planning process included two approaches, one technical analysis in-house by TCRPC staff and the other a public planning process. The public planning process was conducted on two levels- level one with the direct and frequent interaction with area emergency management offices and level two interactions with other interested and concerned agencies or organizations in the region and with the general public.

In 2011, the process began with meetings and work plan agreements between the State of Michigan Police Planning Department (MSP) and Ingham County Emergency Management. TCRPC staff began a thorough review and analysis of the previous planning documents. Staff also began acquisition and compilation of updated data for the region including geographic information systems data for parcels and land use, hazard areas, and contracted for elevations and other data. Population changes, development densities, and other development data were compiled. Analysis for changes from the previous plan development began and continued alongside public involvement activities. In late 2011, TCRPC secured updated aerial photography data for the region from a 2010 flyover supported by U.S. Geological Survey and area municipalities. However, while the photography was collected with some elevations information, elevations detail was unavailable to use without necessary software and training. So, in 2012 TCRPC staff acquired ERDAS software and attended a national training workshop in Denver, CO to learn how to manipulate LiDAR data with ERDAS. TCRPC staff developed and analyzed the region with newly acquired LiDAR data that provided a detailed view of topography in the region. LiDAR maps of the region are included as supporting documents to this plan.

The Public Process, with a role for the technical advisory group began with a kick-off meeting for the Steering Committee hosted at the offices of the Tri-County Regional Planning Commission. The meeting included the emergency managers of the three Counties and Delta Charter Township and the Community Development Director of Eaton County. The Michigan State Police planner, Mike Sobocinski attended the meeting and provided an overview of the expected planning process for this project. The kick-off meeting provided the Committee with an understanding of FEMA requirements for a successfully adopted plan. The Steering Committee also reviewed the hazards and mitigation actions from the 2004 plans and narrowed them down to a new list of hazards and mitigation actions that address the known issues within our region nearly ten years later. This Plan is a product of those discussions about known hazards.

Throughout 2012 and 2013, TCRPC staff reviewed the existing Hazard Mitigation plans for the region and began editing the documents into one regional plan. In October of 2012, the Steering Committee met again at TCRPC to review the hazards that were

presented in the 2006 Plans and to discuss the applicability of these hazards to the new plan. Attendees included Sgt. Robert Ott of Ingham County's Emergency Management Office, Larry St. George of the Clinton County Emergency Management Office, and Claudine Williams of the Eaton County Community Development Office and staff members of the Tri-County Regional Planning Commission staff (Dan Dillinger, Harmony Gmazel). Discussions revolved around the need to remove certain hazards that deemed inapplicable in 2014, and to add certain hazards that have become an issue in recent years.

In 2013, four public workshops were publicized and held in Eaton, Ingham, Clinton Counties and Delta Charter Township, on August 20, 21, 23 and September 30 respectively. Emergency managers, Sherriff deputies, planning staff and local jurisdictions' representatives participated. The Clinton workshop, held at the Clinton County Courthouse in St. Johns, MI was attended by the County Sheriff and his staff; staff from the Villages of Ovid and Fowler, area townships and many others. The Eaton workshop, held at the Eaton County Courthouse in Charlotte, MI, was attended by Eaton County Sherriff's office staff, Charlotte residents, Village of Potterville staff. A workshop was scheduled for the Delta Charter Township Fire Department in Lansing, MI and was cancelled due to lack of response. The Ingham workshop was at the Hilliard Building in Mason, MI, and Ingham County Sheriff Department staff attended. In each jurisdiction TCRPC staff presented a PowerPoint show that reviewed existing plans, hazards and analyses and shared new topographic maps. Then TCRPC facilitated a discussion on recent hazard occurrences and preferred mitigation strategies.

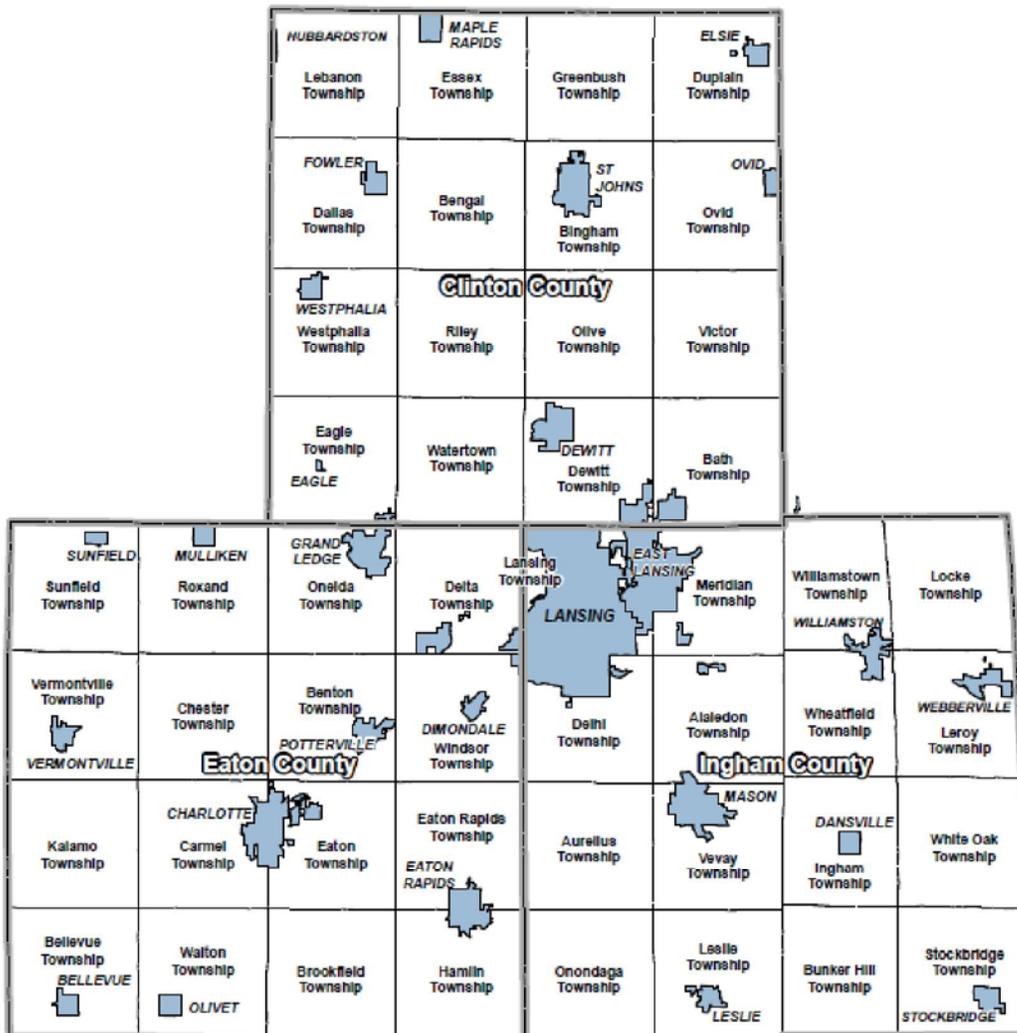
TCRPC provided a rough outline of the Plan document to workshop attendees and the region's emergency managers to share with emergency committee members and others in each county. Comments from agencies and the public in all jurisdictions were collected and incorporated into the plan. Neighborhood leaders, residents, local and regional agencies involved in emergency management and others such as academic institutions, non-profits and businesses were invited to the workshops and provided access to the draft plan. As a result of these activities, the Committee developed a general outline of this Plan. The major chapters are listed here:

- Community profile.
- Hazards and risks.
- Mitigation strategies.
- Maintenance of the plan.

TCRPC, working with representatives from each jurisdiction, researched and compiled data from the Regional Growth: Choice for our Future report, Greening Mid-Michigan and the Michigan State Hazard Mitigation Plan of 2014 about likely hazards, and also about potential responses. Maps of the region were developed and shared with committee members and the public at the workshops and the draft Plan was distributed and posted for public comment and adoption by FEMA and by the four local jurisdictions.

Chapter 2 - Community Profiles

Presenting a full Community Profile is the first step in creating an effective Hazard Mitigation plan. The information and data in this chapter provides an in-depth look at the different characteristics of the mid-Michigan region and its communities. Examination of characteristics that define each community's unique fabric is an effective means of identifying potential vulnerabilities that relate to a specific area in the county. This Community Profile contains a range of data and information about our region overall. It is also specific to the population and geography of each of the three counties and the township. The profiles are presented in alphabetical order, Clinton County, Delta Charter Township, Eaton County and Ingham County. Below is a map of the tri-county region, created by the Tri-County Regional Planning Commission.



Tri-County Regional Population Estimates and Projections

Population information for the tri-county region comes from a variety of sources. The most recent U.S. Census was 2010, so the Tri-County Regional Planning Commission analyzed and compiled data from a number of other sources to generate accurate estimates of current population and forecasts of future population. The base year calculations and projections were reviewed and adopted by the TCRPC board of Commissioners on behalf of the region most recently in spring 2014. Per those analyses, computing firm Woods & Poole estimated area population at 464,076. This is an increase of 7% or 30,662 persons since 1990. TCRPC projects that by 2045, our region will have 508,613 persons, an increase of 9.5% or 44,537 persons. The following chart, developed by the Tri-County Regional Planning Commission, depicts the historical population numbers and a projected forecast of regional population out to 2045.

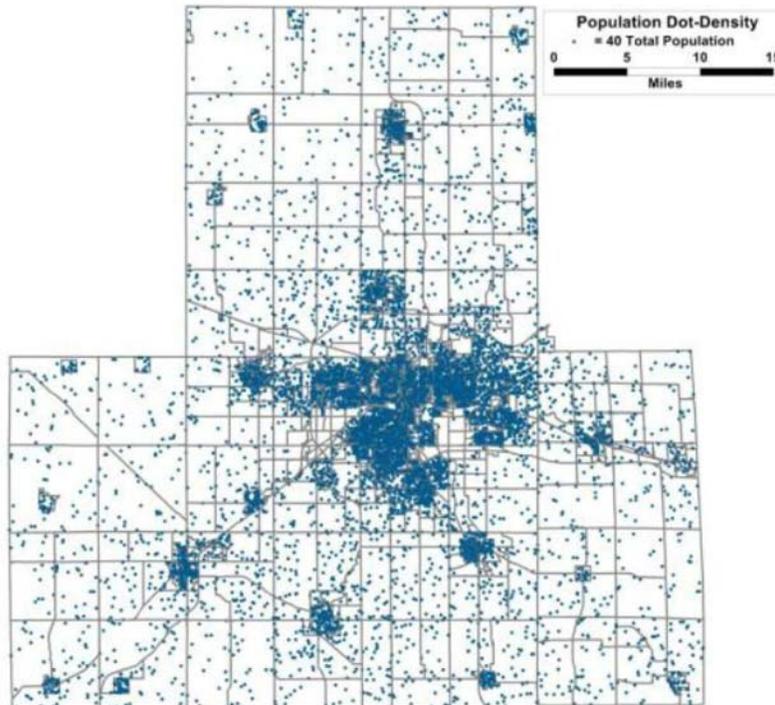
Fig. 4 Regional Population Estimates

Year	Historical Census	Global Insight	2012 Woods & Poole	REMI	Projected Population
1990	433,414	433,899	433,414		
1995	443,395	444,030	443,395		
2000	448,355	448,569	448,735		
2005	455,315	455,335	462,743		
2010	464,036	462,604	464,076	464,036	464,036
2015		470,666	474,086	470,032	473,192
2020		477,938	485,260	476,850	482,656
2025		484,405	496,862	485,021	490,995
2030		490,055	508,383	491,545	498,257
2035		494,101	519,719	495,706	502,207
2040		498,147	531,273	497,953	504,465
2045		502,193	542,827	502,090	508,613

Source: Tri-County Regional Planning Commission (2014)

TCRPC developed the following population density map with the above data and traffic/movement analyses in 2014. It depicts population centers across the three counties, providing a visual for where our urban centers are located.

Fig. 5 Population Density Map



Regional Climate

The continental type climate of mid-Michigan means that the area typically experiences larger temperature ranges than in locations of similar latitude. Our mid-peninsula location away from the Great Lakes can impact or moderate temperatures. The area seldom experiences prolonged periods of either extreme cold in the winter or extreme heat and humidity during the summer. The average possible sunshine varies from about 28% during December and 70% during July. The average possible sunshine is an average 51% annually in mid-Michigan.

Mid-Michigan has moderately warm summers with an average of eleven days annually that reach or exceed 90°F. There have been occasions with temperatures exceeding 100°F, but this is a rare event in our tri-county region. The record for temperature maximum occurred in 1936 with a temperature of 106°F. Winter weather in the county can bring extreme cold, but the Great Lakes typically modify the coldest arctic air masses. This area averages eleven days annually when the minimum temperature reaches zero or below. There is an average of fifty-seven days annually when the temperature does not rise above the freezing mark (32°F).

The average number of heating degree days in January is approximately 1360 and approximately 450 on average in October. On average the month of July brings 200 cooling degree days to the area, while in May the number of cooling degree days is closer to thirty. The average date of the last freezing temperature in the area is May 11th and the average date of the first freezing temperature is October 3rd. On average mid-Michigan experiences 145 freeze-free growing days.

Michigan is located on the northeast fringes of the Midwest tornado belt and mid-Michigan has experienced occasional severe tornados or high winds. But the severe weather events are primarily warmer weather activity, in the form of afternoon showers and thundershowers. Thunderstorms will occur in the area an average of about 33 days during the spring, summer and early fall.

Fig.6 Regional Climate Data

Month	Avg. Max	Avg. Min	Mean	Rec. Max	Rec. Min
January	28.5°	13.0°	20.7°	60°	-23°
February	31.6°	13.7°	22.6°	62°	-30°
March	41.3°	22.6°	31.9°	77°	-15°
April	57.1°	34.5°	45.8°	88°	8°
May	69.7°	44.5°	57.1°	92°	23°
June	79.1°	54.1°	66.6°	100°	34°
July	83.2°	58.3°	70.7°	106°	41°
August	81.2°	56.8°	69.0°	100°	36°
September	73.2°	49.4°	61.3°	99°	27°
October	61.5°	39.8°	50.6°	87°	16°
November	46.2°	30.1°	38.1°	77°	-6°
December	33.5°	19.4°	26.4°	67°	-14°

All temperatures are in degrees Fahrenheit.

Month	Mean Liquid	Max Daily	Avg precipitation/day			Mean Snowfall	Max Monthly Amount	Max Daily Amount	Max Total Depth
			.10	.25	.50				
January	1.37	1.28	4	2	1	10.0	28.1	17.0	26
February	1.12	1.05	3	2	1	6.8	38.0	7.0	22
March	1.99	2.15	5	3	1	6.6	24.0	12	14
April	3.19	3.35	7	4	2	1.9	11.6	8.7	10
May	2.84	3.35	6	4	2	0	T	0	0
June	3.20	3.39	6	4	2	0	0	0	0
July	3.22	4.25	6	4	2	0	0	0	0

Month	Mean Liquid	Max Daily	Avg precipitation/day			Mean Snowfall	Max Monthly Amount	Max Daily Amount	Max Total Depth
			.10	.25	.50				
August	3.57	3.42	6	4	2	0	0	0	0
September	2.95	9.35	6	4	2	0	T	0	0
October	2.60	3.79	6	3	1	0.3	6.0	6.0	3
November	2.33	2.12	5	3	1	3.0	14.0	9.0	8
December	1.86	1.81	5	3	1	7.7	17.0	10.0	15
T = Trace.									
Precipitation values given in inches									

Environmental Protection Priorities

The U.S. Environmental Protection Agency has identified two National Priorities for contaminant clean up in this Plan region. Sites registered as National Priorities are eligible for long-term cleanup actions under the federal Superfund Program. These sites are scored in relation to their impact to public health and environment. For example, in Lansing Charter Township, Ingham County, Adams Plating Co. began doing chrome, nickel and copper electroplating in 1964. In 1989, it was placed on the National Priorities List of hazardous waste sites, making it eligible for cleanup under the EPA Superfund program. Waste disposal practices prior to 1980 led to contamination of surrounding soil and ground water. A Superfund cleanup in 1994 removed contaminated soil, placed vertical barriers to prevent recontamination of the clean fill dirt, restricted well use and installed monitoring wells to check whether the soil removal was helping reduce ground water pollution. Then the site entered a long-term maintenance phase, and MDEQ assumed oversight from EPA. Fire destroyed the building in December 2010 and a plan to monitor the site is in place.

Immediately to the south of our region, with potential marginal impacts on southern Ingham county communities of Stockbridge, Leslie, and Onondaga Township was an Enbridge Oil Pipeline leak. In the fall of 2014, Enbridge completed its remaining obligations to the 2013 EPA Order that directed specific sub-oil and sediment removal criteria pursuant to EPA authority. The final portion of this work, the sediment removal by dredging at Morrow Lake and the Delta, was completed in October 2014. Based on successful completion of the other work requirements of the 2013 Order, EPA determined that Enbridge has completed all of the prescribed actions, and has now transitioned the site to the Michigan Department of Environmental Quality.

The State of Michigan Department of Environmental quality has also identified sites potentially contaminated with hazardous materials throughout this region, particularly from Leaking Underground Storage Tanks (LUST) sites. This detailed information on those sites and their status is at http://www.deq.state.mi.us/sid-web/LUST_Search.aspx. The maps on the following pages depict the leaking underground storage tanks within the tri-county region at the northwest corner of Ingham County, the northeast corner of Eaton County and south east corner of Clinton County. All other LUST maps of the counties are available at www.mitcrpc.org.

Fig.7 LUST Map- NW Ingham Co.

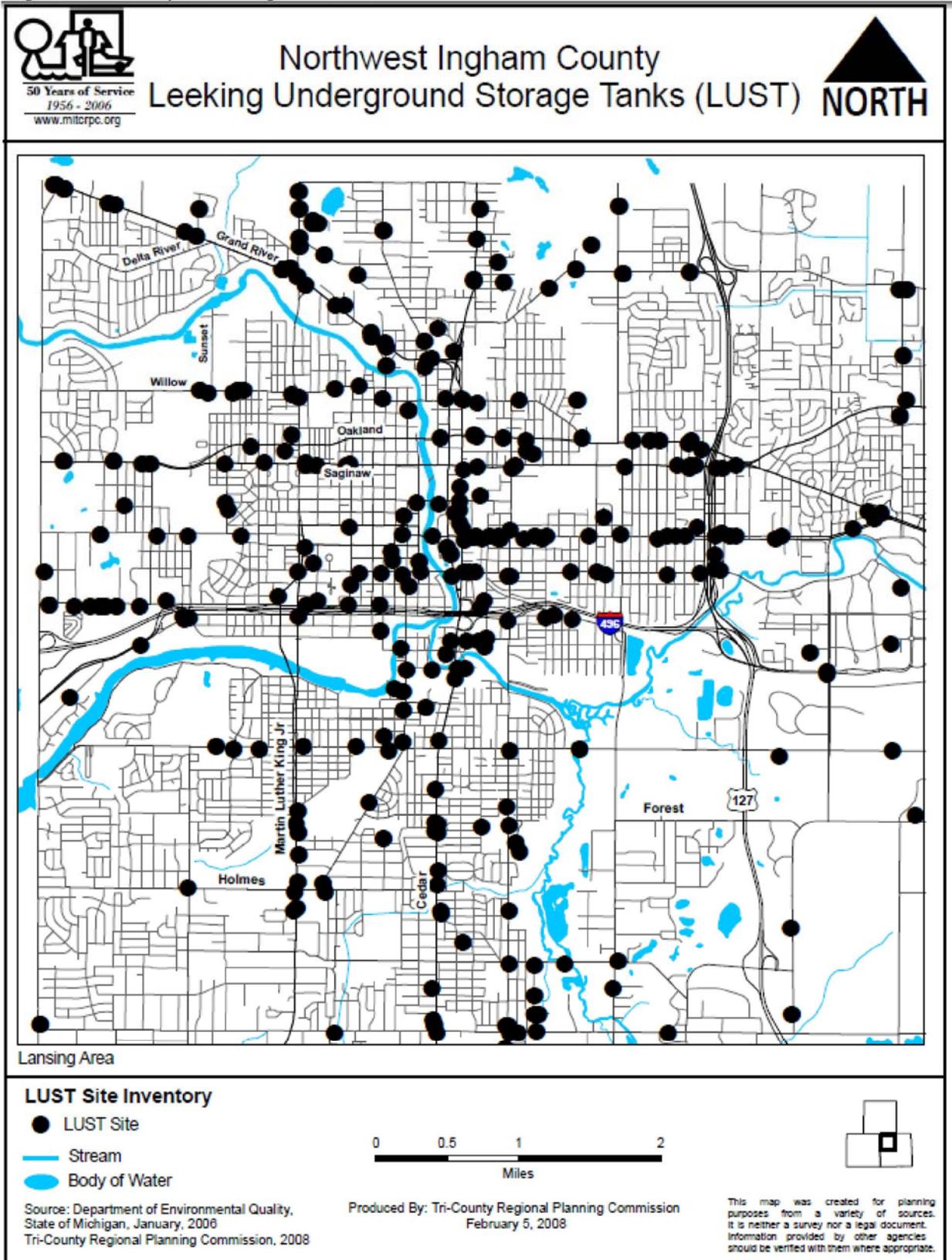


Fig. 8 LUST Map- NE Eaton Co.

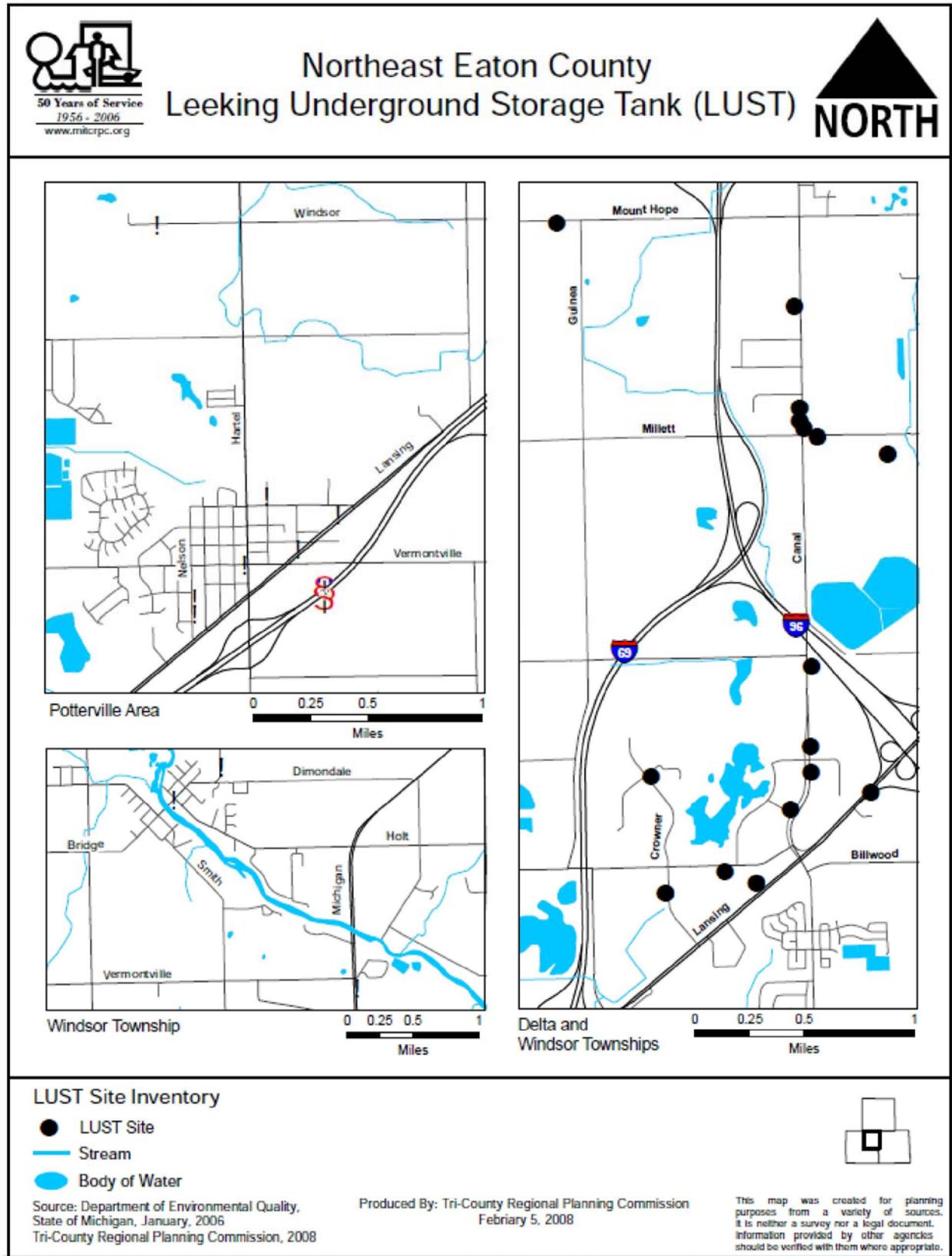
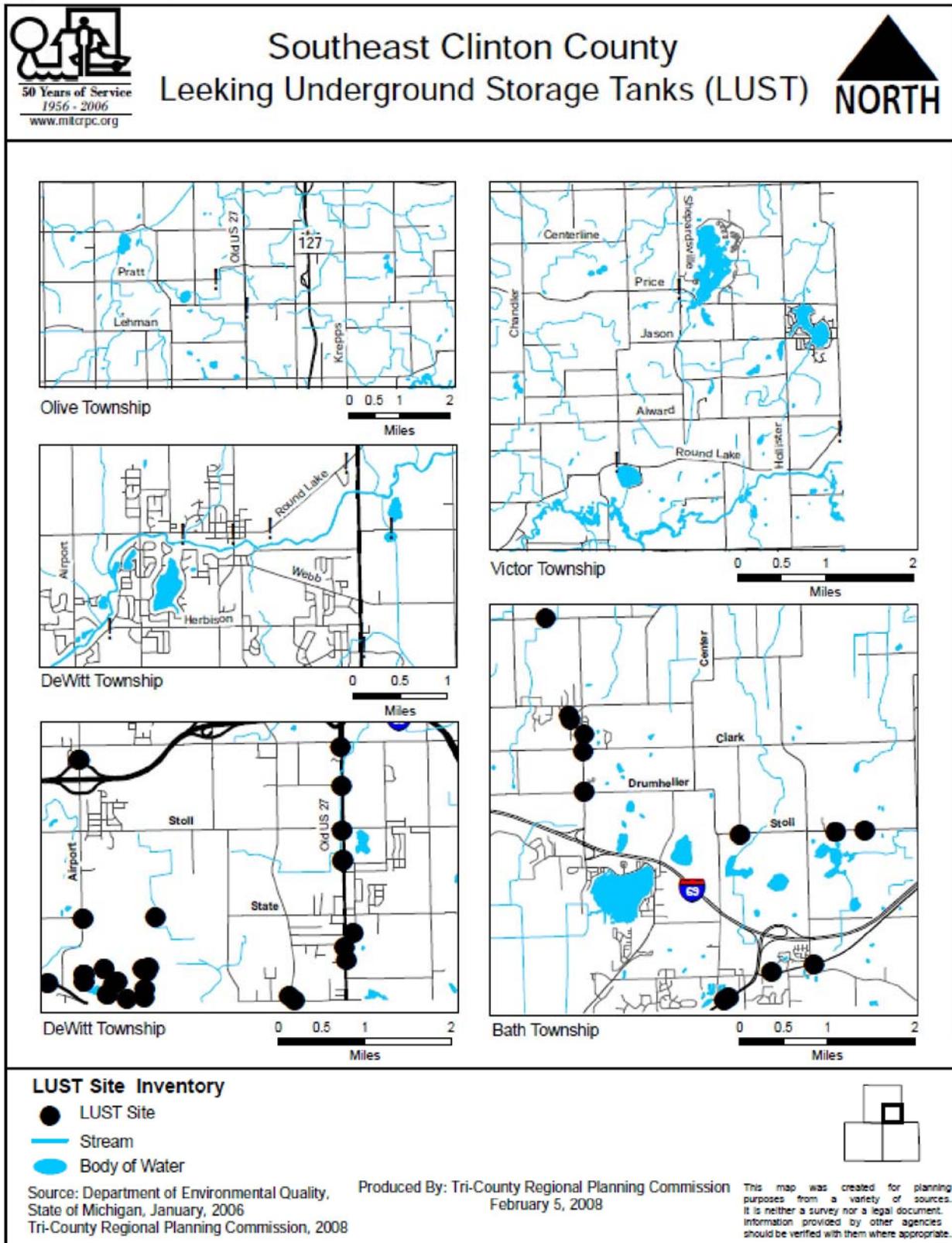


Fig. 9 LUST Map- SE Clinton Co.



Infrastructure & Historic Characteristics

The region's public infrastructure, excluding transportation features, is limited to population centers where sewer and water services are provided by the local municipality. The most comprehensive systems (sewer/water) are in place to serve residents in urbanized areas in East Lansing; all charter townships, St. Johns, Grand Ledge, DeWitt, Charlotte, Eaton Rapids, Leslie, Mason and Williamston. The following two maps are from the Tri-County Regional Planning Commission's *Urban and Rural Service Management Study* of 2011 developed by the Land Information Access Association. The top map depicts existing water service areas in fifteen jurisdictions and water treatment plants located at the geographical center of the tri-county region. The second map depicts existing sewer service and the locations of wastewater treatment plants.

Fig. 10 Water Service Area

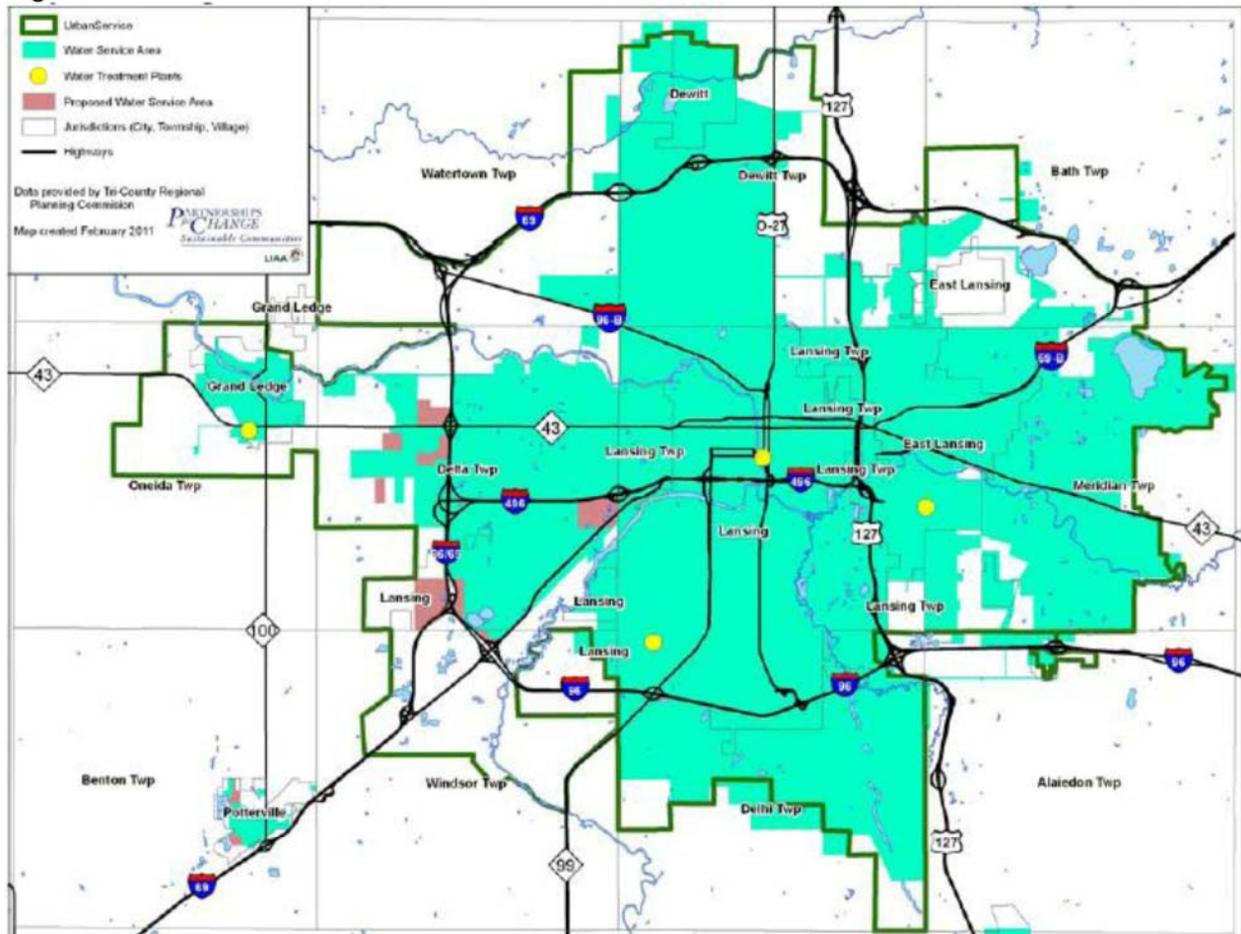
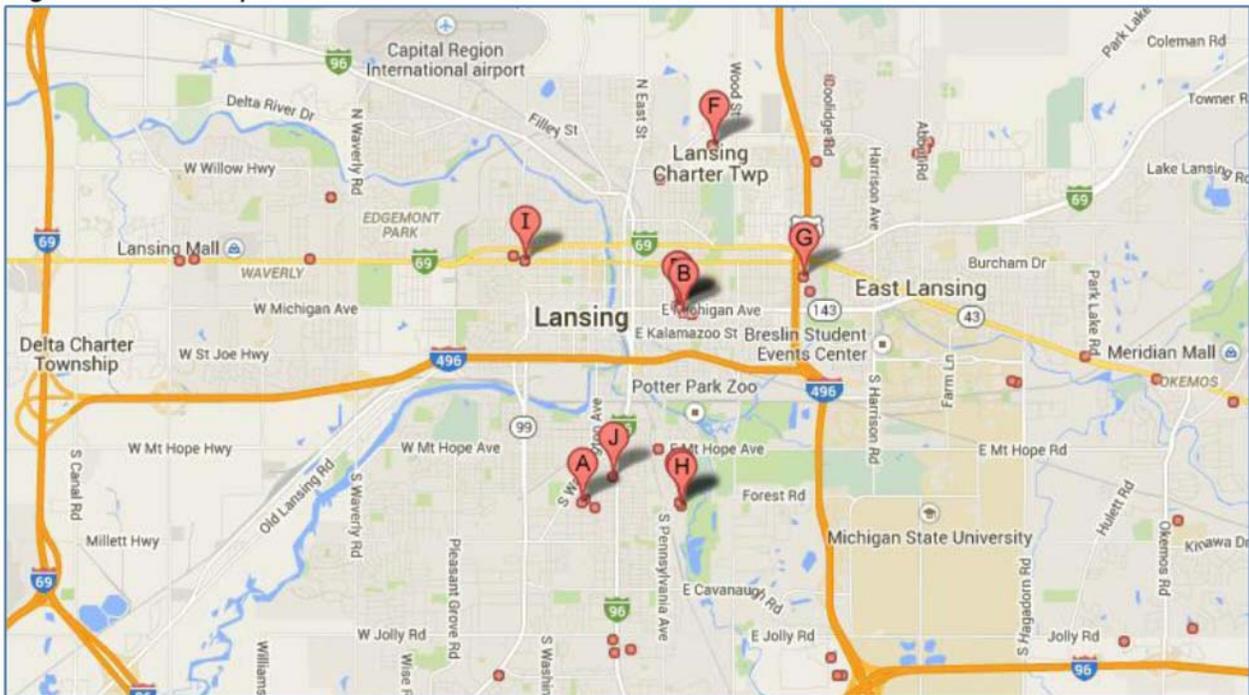


Fig. 12 Area Hospital Locations



The counties provide emergency operations services on a countywide basis through their Emergency Operations Centers (EOCs). The EOC offices are co-located with 911 Dispatch, which also provides countywide 911 dispatch services.

Municipal level public works services of sewer and water exist at some level in incorporated cities region-wide. Municipalities with services include the larger communities of each county such as City of Charlotte, City of Eaton Rapids, City of Grand Ledge, and Delta Charter Township in Eaton County; the cities of East Lansing, Mason, Williamston, Meridian Township, Lansing Township, and Delhi Township in Ingham County; and the cities of St. Johns and DeWitt, and Watertown Townships in Clinton County. A variety of communities in the urbanized core area of the region has water and/or sewer services provided through contracts and joint services agreements with the Lansing Board of Water and Light. Partial services of water or sewer are common in the region's smaller villages and towns such as Sunfield, Olivet, and Vermontville in Eaton County; Webberville, Stockbridge, and Dansville in Ingham County; Ovid, Fowlerville, and Bath in Clinton County.

This region still maintains a good number of residents and businesses outside of public water and sewer service areas. There are rural individual structures and small residential and commercial developments throughout the region still only served by groundwater wells and individual or small shared septic systems.

Key Community Facilities/Organizations: Utility Services

Consumers Energy Company, the Lansing Board of Water and Light, and Detroit Edison provide electrical power and natural gas to residents and businesses in this region. The City of Eaton Rapids also has an electric generating utility. Natural Gas is

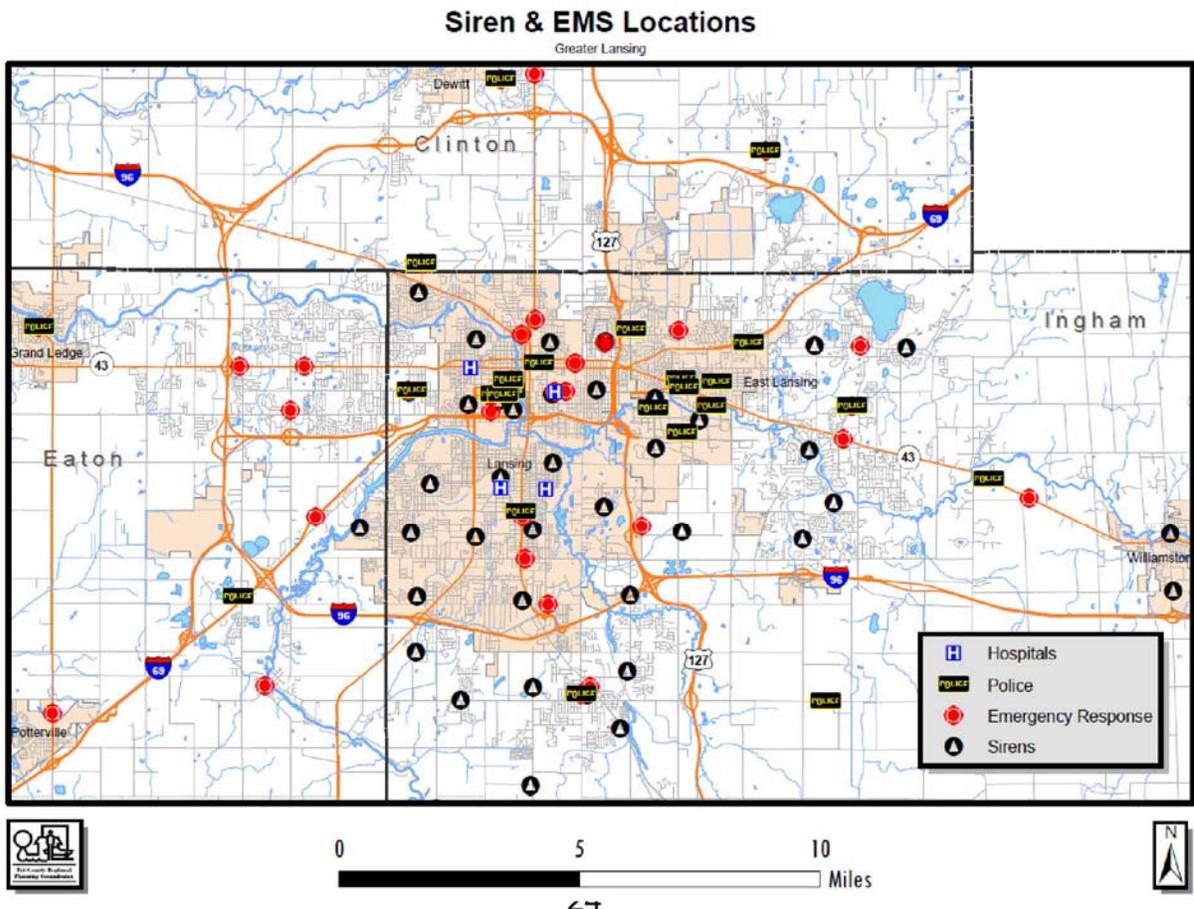
the most common form of heating fuel type for households and the communities in the urbanized central area of our region are mostly served by traditional gas utility lines. Bottled, tank or LP gas provides a large portion of the heat fuel to homes and businesses in the regions more rural areas. Some older areas still rely on oil fuel. There has been a growing trend to use wood-burning furnaces located outside the home. Fuel cost increases over the past few years caused a spike in the number of fuel-efficient burners such that use corn or wood pellets.

Emergency/Crisis Services

There are a number of organizations that provide emergency and/or crisis services in the mid-Michigan area. Primary amongst them is Central Michigan Chapter of the American Red Cross. The American Red Cross has created this Disaster and Safety Library in the event of a disaster or emergency. Here you will find fact sheets, preparedness checklists, recovery guides and other helpful information to keep you informed and safe. More information about the Red Cross and its emergency plan assistance for this region is available at <http://www.redcross.org/prepare/disaster-safety-library>. There are a variety of other organizations and entities listed hear: <http://theear.org/newear/>.

The region is home to many emergency warning sirens. They are depicted below, along with hospital locations, police stations and emergency response facilities.

Fig. 13 Area Siren and ER Locations



The regional 211 Service now serves all areas of our region and offers an online and telephone access line for assistance. <http://www.referweb.net/uwjc/>

Higher Learning Institutions

Michigan State University is the largest four-year institution located in the region. Olivet College is located in southern Eaton County. Great Lakes Christian College is located in Delta Township. Lansing Community College, a two-year institution, has a main campus in Lansing city and a large branch campus in Delta Charter Township. Western Michigan and Central Michigan Universities have small branches within the region, and Davenport University as well as Cooley Law School has campuses located in downtown Lansing.

Michigan State University (MSU) is located in the City of East Lansing and has an enrollment of more than 40,000 students on the local campus. Additionally, MSU employs approximately 10,000 faculty and staff. MSU's campus occupies a large portion of the City of East Lansing's land area and MSU provides many benefits to the community, but it also presents new challenges with respect to new potential threats to public safety and welfare. MSU operates its own infrastructure system of water, sewer, and power. It is also implementing its own master land use plan with transportation and utility developments.

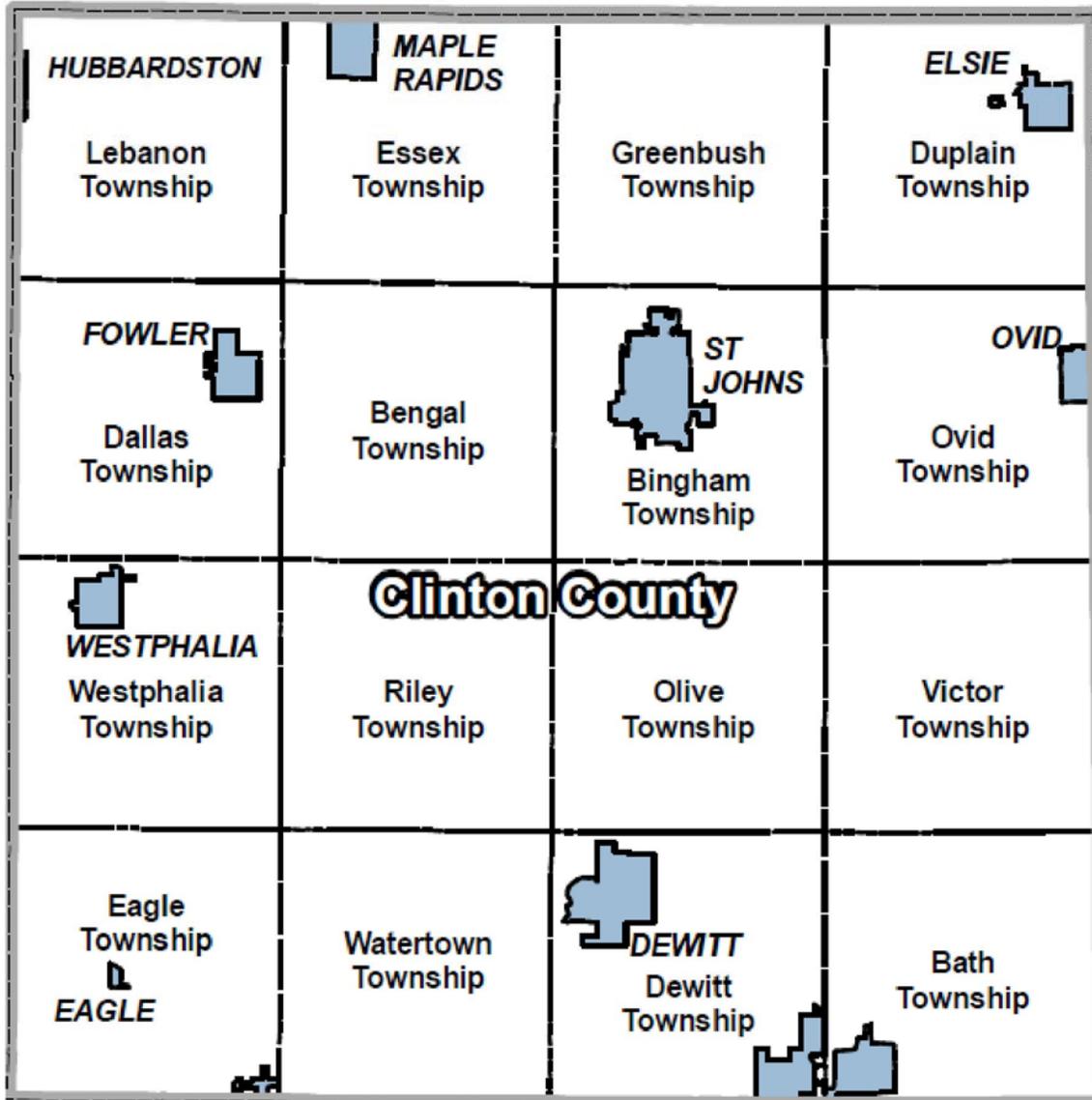
Major Events & Activities

Major events and activities occur frequently throughout mid-Michigan. They include a regular schedule of festivals and fairs in communities region-wide. Please see the regional convention and visitor's website for a current and comprehensive list of events at <http://www.lansing.org/events/>. The East Lansing and MSU area, as well as city of Charlotte, Olivet College and Lansing Community College maintain large entertainment venues that host concerts and performances throughout the year. Each County hosts a County Fairgrounds that host events each year. The largest conference and event facilities are located in the city of Lansing and in East Lansing. There are a number of hotels and banquet conference centers located in Delta Township and East Lansing/Meridian Township areas. There are many smaller venues throughout the three counties, mostly in or near the larger cities and adjacent to major roadways.

The region has a number of large sports event venues including fields and field houses for football, baseball, soccer, lacrosse, basketball, and hockey. There are large ice arenas in Delta Township and East Lansing that host events drawing thousands from around and outside of the region. Michigan State University (MSU) sporting events such as football games draw crowds from 1,000-70,000 persons for games throughout the fall. New baseball fields at MSU and a new special needs sport complex in DeWitt draw thousands of people a season. For a complete schedule of entertainment events, including concerts, performances and sporting events visit Michigan State University's website at www.msu.edu.

CLINTON COUNTY PROFILE

Fig. 14 Clinton Co. Map



Clinton County is the northern most County of the Tri-County Region. It consists of 14 general law townships, 2 charter townships, 5 villages and 2 cities as presented in the following map. The charter townships and cities do not operate under the county planning commission. Clinton County is five hundred seventy-one (571) square miles in size and is centrally located in the lower peninsula of the State of Michigan. The County is bordered by Shiawassee County to the east, Gratiot County to the north, Ionia County to the west, and Eaton and Ingham Counties to the south. The City of Lansing, the State's capital is located immediately south of Clinton County. Interstate 69 and Interstate 96 pass through the southern portion of the County and US-127 bisects the county. The major east-west connector is State Highway 21, which connects Flint to

Grand Rapids. Considering its close proximity to the urbanized core city of Lansing, the County remains predominantly rural. The density of development is located in the southern tier of the County with concentrations in the County seat of St. Johns.

Population

Clinton County's current population is 72,922. Growth in Clinton County's resident population accelerated during the 1960's and 1970's with the construction and opening of regional highways. (I-496, I-96, I-69 and US-127). These trends continued during the 1970s and '80s and, by the 1990 Census, almost 58,000 people were living in the county. Though slowing somewhat through the decade of the 1990s, the county's rate of growth exceeds that of neighboring jurisdictions.

Clinton County's population is expected to approach 75,357 by 2020, a 9% increase from 69,360 residents in 2005. The combination of further regional in-migration and natural increase as county residents form new households and have children will result in continued growth to the year 2020 and beyond.

Fig. 15 Clinton Co. Population

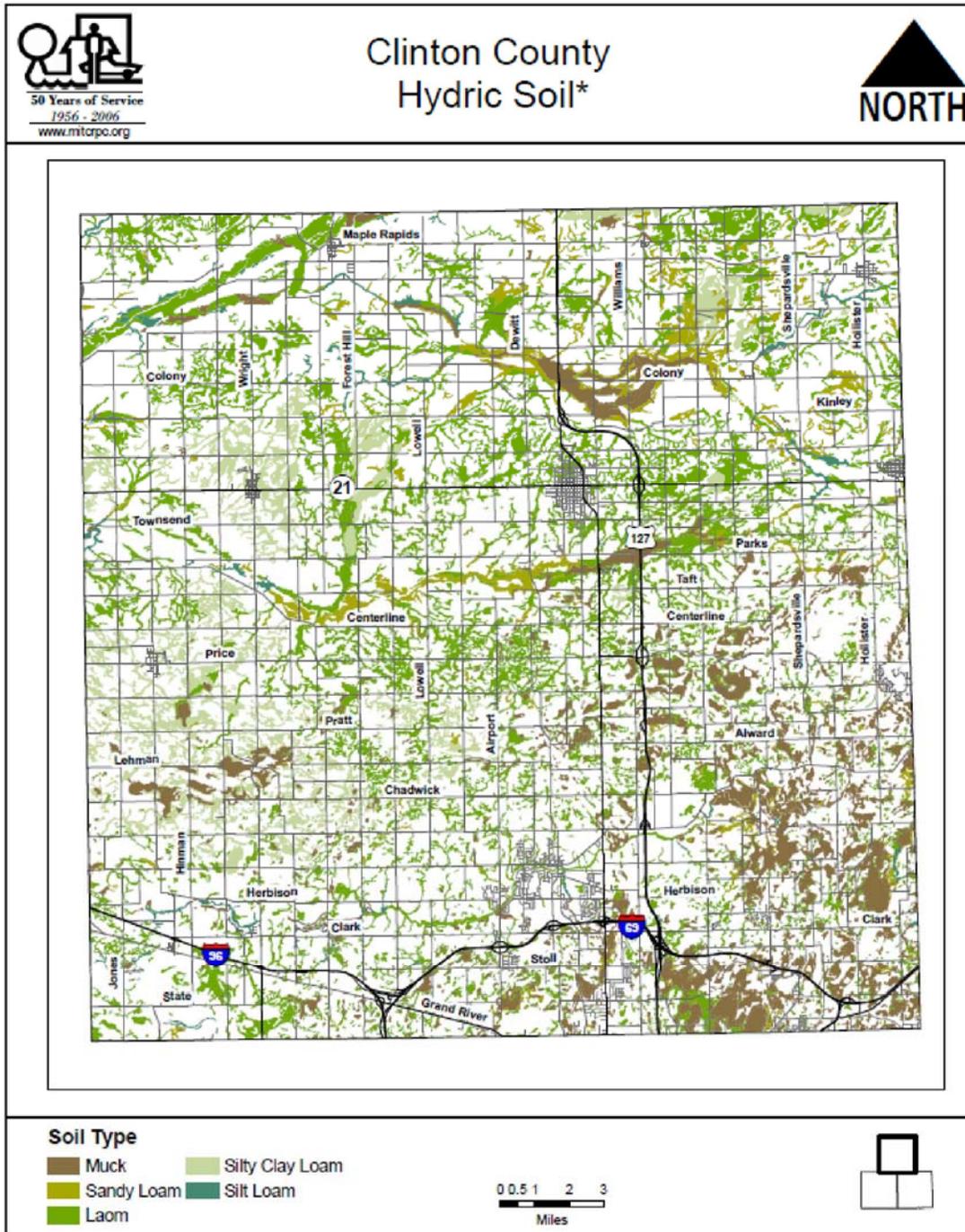
	POPULATION BY FORECAST YEAR								
Clinton County	2005	2010	2015	2020	2025	2030	2035	2040	2045
MCD	10,484	10,513	10,593	10,734	10,930	11,135	11,311	11,495	11,682
Bath Twp	1,241	1,252	1,279	1,323	1,380	1,434	1,474	1,512	1,548
Bingham Twp	2,391	2,413	2,467	2,556	2,670	2,777	2,857	2,999	3,155
Dallas Twp	1,259	1,270	1,299	1,346	1,407	1,464	1,506	1,546	1,585
Dewitt	4,396	4,412	4,452	4,518	4,602	4,681	4,740	4,796	4,849
Dewitt Twp	12,947	14,001	14,817	15,720	16,556	17,053	17,186	17,284	17,366
Duplain Twp	1,321	1,333	1,362	1,411	1,474	1,532	1,576	1,618	1,657
Eagle	130	141	149	158	166	171	173	174	174
Eagle Twp	2,220	2,237	2,276	2,342	2,425	2,504	2,563	2,618	2,672
East Lansing	1,020	1,022	1,028	1,036	1,045	1,054	1,059	1,063	1,066
Elsie	1,002	1,009	1,024	1,050	1,083	1,114	1,137	1,159	1,180
Essex Twp	1,227	1,238	1,266	1,313	1,372	1,428	1,470	1,509	1,547
Fowler	1,082	1,086	1,096	1,113	1,135	1,155	1,171	1,185	1,199
Grand Ledge	5	5	5	6	6	6	6	6	6
Greenbush Twp	2,126	2,145	2,192	2,269	2,368	2,461	2,530	2,596	2,659
Lebanon Twp	792	800	818	848	886	922	949	975	999
Maple Rapids	614	619	631	651	677	700	718	735	751
Olive Twp	2,323	2,344	2,394	2,478	2,584	2,685	2,820	2,983	3,166
Ovid	1,416	1,422	1,437	1,462	1,494	1,524	1,547	1,568	1,588
Ovid Twp	2,024	2,042	2,088	2,163	2,259	2,350	2,417	2,481	2,542
Riley Twp	1,797	1,813	1,853	1,920	2,004	2,084	2,144	2,200	2,254
St Johns	7,574	7,595	7,648	7,735	7,846	7,951	8,029	8,103	8,174
Victor Twp	3,241	3,262	3,314	3,399	3,508	3,610	3,686	3,758	3,828
Watertown Twp	4,460	4,823	5,104	5,415	5,702	5,874	5,920	5,953	5,981
Westphalia	835	839	848	863	882	899	913	925	937
Westphalia Twp	1,436	1,449	1,480	1,531	1,597	1,659	1,705	1,749	1,790
Total Clinton County	69,360	71,084	72,922	75,357	78,058	80,229	81,604	82,979	84,354
% Change vs 2005		2%	5%	9%	13%	16%	18%	20%	22%

Source: Tri-County Regional Planning Commission (2014)

Soils

Clinton County has been an agricultural community since its settlement in the early 1800's. Clinton County's rich agricultural soils range from loam types to muck. In the map below, created by the Tri-County Regional Planning Commission from Natural Resource Conservation Service data, the majority of the county is covered by loam-type soils. Areas associated with water features provide a more muck-based soil.

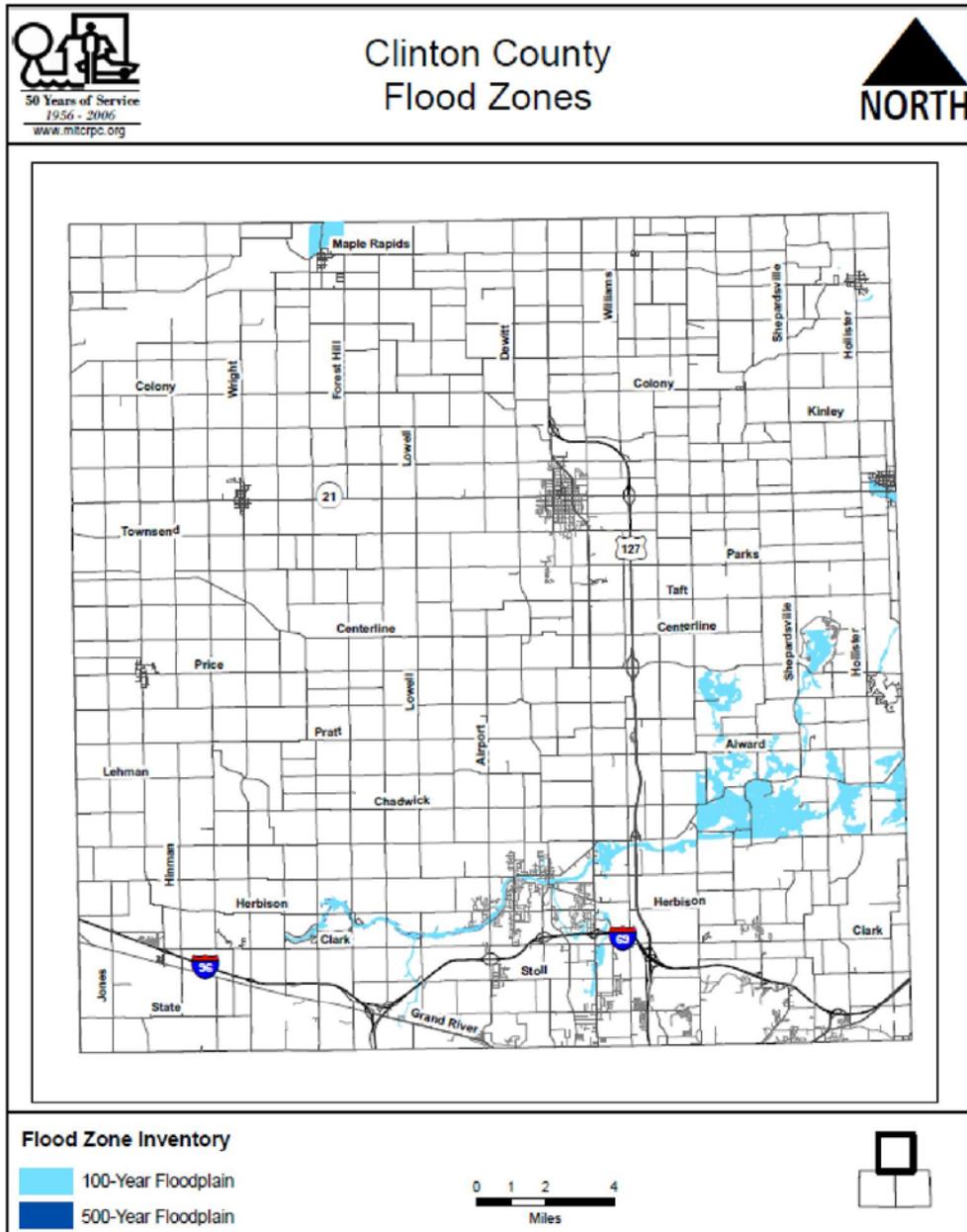
Fig. 16 Clinton Co. Soils



Water Features

Significant water features, including lakes and rivers in Clinton County include: Lake Ovid, Park Lake, Round Lake, Looking Glass River, Maple River, and Muskrat Lake. The map below, created by the Tri-County Regional Planning Commission using FEMA Flood Insurance Rate maps, depicts the flood zones across Clinton County. Significant areas include the Maple River area along the northern border of the county, and the Lake Ovid area on the eastern edge of the county. The Looking Glass River, which runs along the southern tier of the county, is also an area of flood concern.

Fig. 17 Clinton Co. Flood Zones



Existing and Future Land Use

Clinton County land use categories were determined through analysis and revision of existing land use maps and field inspections. In an effort to simplify analysis and allocation of future land use, several of the existing land use categories were combined into more generalized categories. These generalized categories, along with a brief description and examples, are provided below.

Clinton County's land use statistics have changed significantly since the previous inventory in 1978. According to the 1999 land use statistics, over ten percent (10%) of the County is single family residential. This is an increase from 3.14 percent in 1978. This increase comes at the expense to agricultural land whose land share dropped from seventy-four percent (74%) in 1978 to sixty-six percent (66%) in 1999, almost 29,000 acres. In the Future Land Use Map, created by TCRPC, Clinton County is planning for increased residential growth near city and village centers.

Fig. 18 Clinton Co Land Use

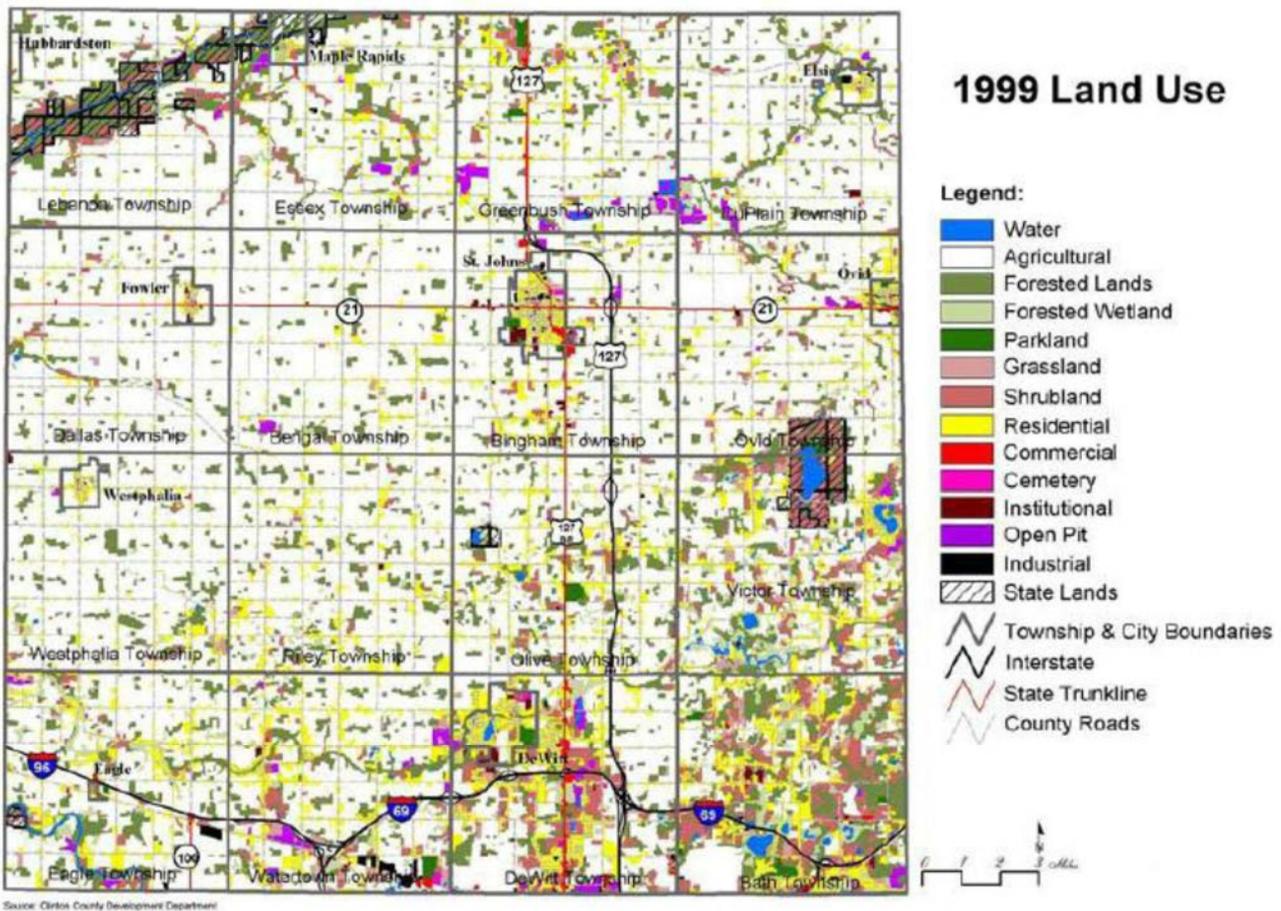
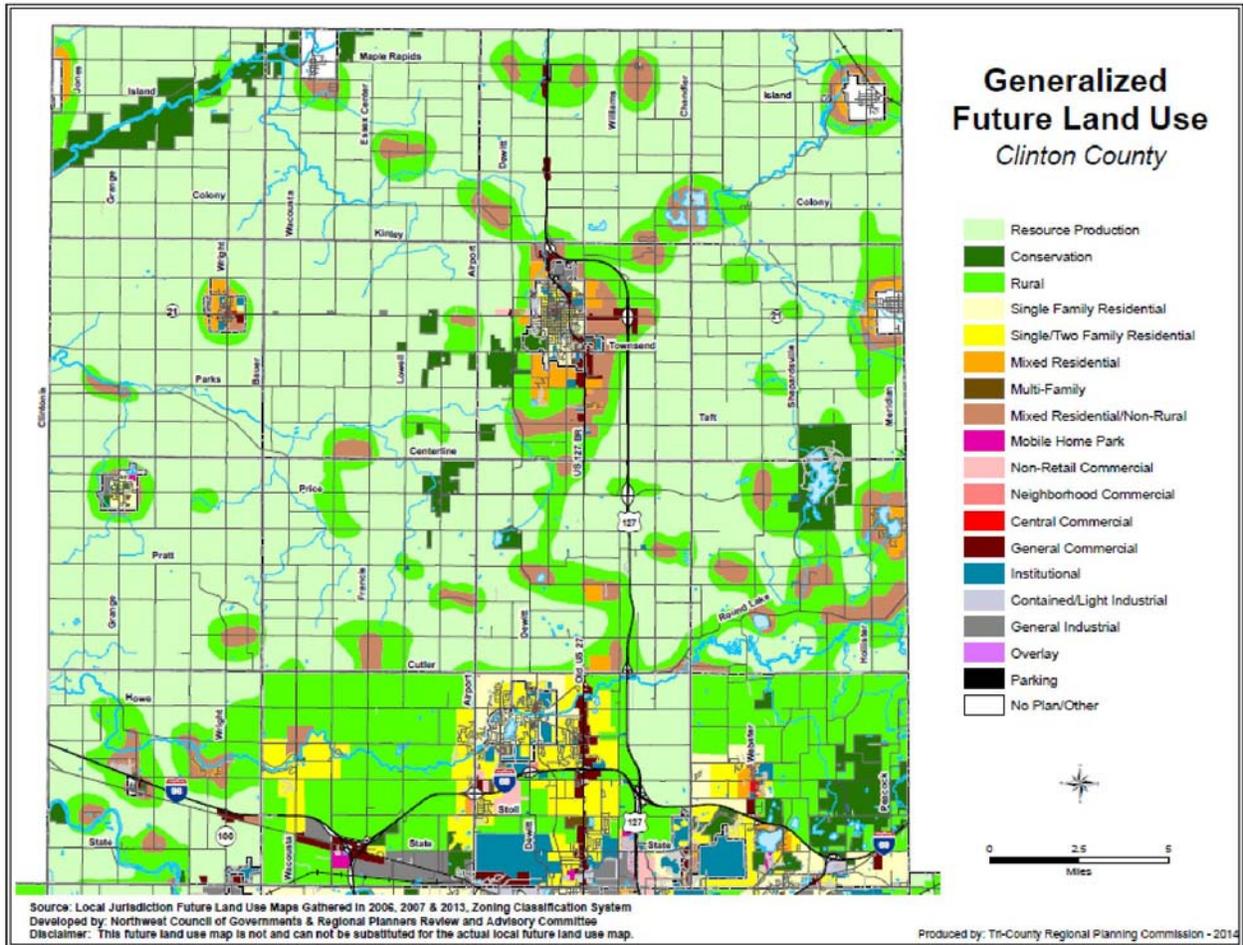


Fig. 19 Clinton Co Future Land Use



Population

According to the 2010 Census, Delta Township's population was 32,408. According to the Tri-County Regional Planning Commission, the Township's population in 2015 is estimated at 35,390 residents. The table below, taken from Delta Charter Township, depicts Delta's population growth in comparison to neighboring communities. It predicts a 25% growth rate between 2000 and 2025, compared to lesser growth rates nearby.

Fig. 21 Delta Township Population

POPULATION GROWTH ESTIMATES							
	2000	2005	2010	2015	2020	2025	Growth
Grand Ledge	7,804	7,956	8,124	8,420	8,719	8,965	15%
Delhi Township	22,570	24,678	25,250	25,732	26,462	27,278	21%
Delta Township	29,682	31,835	32,408	35,390	36,861	36,971	25%
Meridian Township	39,119	40,964	41,875	43,079	44,850	46,805	20%

Current and Future Land Use

The township has an area of approximately 23,096 acres. The majority of the central and northern areas are residential and commercial. The western area of the township is mainly agricultural, while the southern portions are typically industrial. In Delta Township's Future Land Use map, below, an urban service boundary is depicted and much of the northwest portion of the township is planned for residential.

Fig. 22 Delta Township Land Use Map

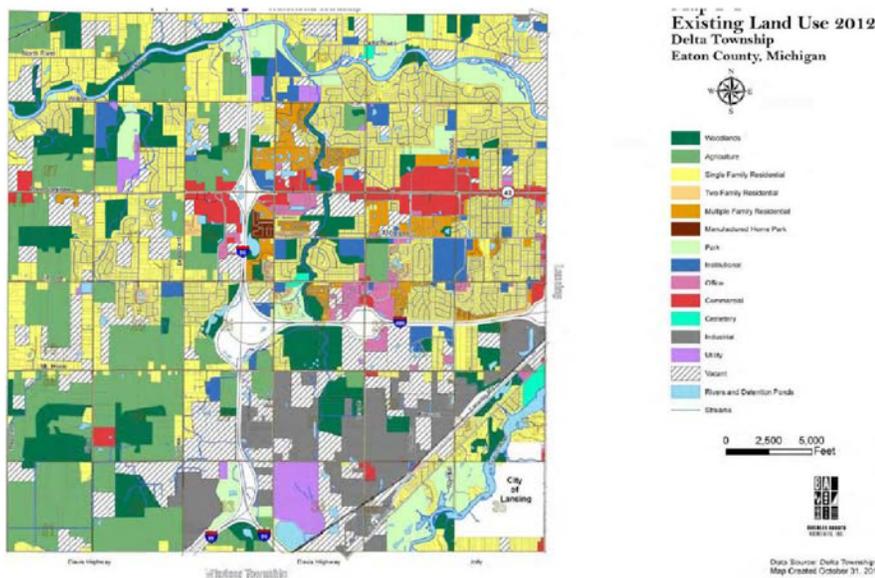
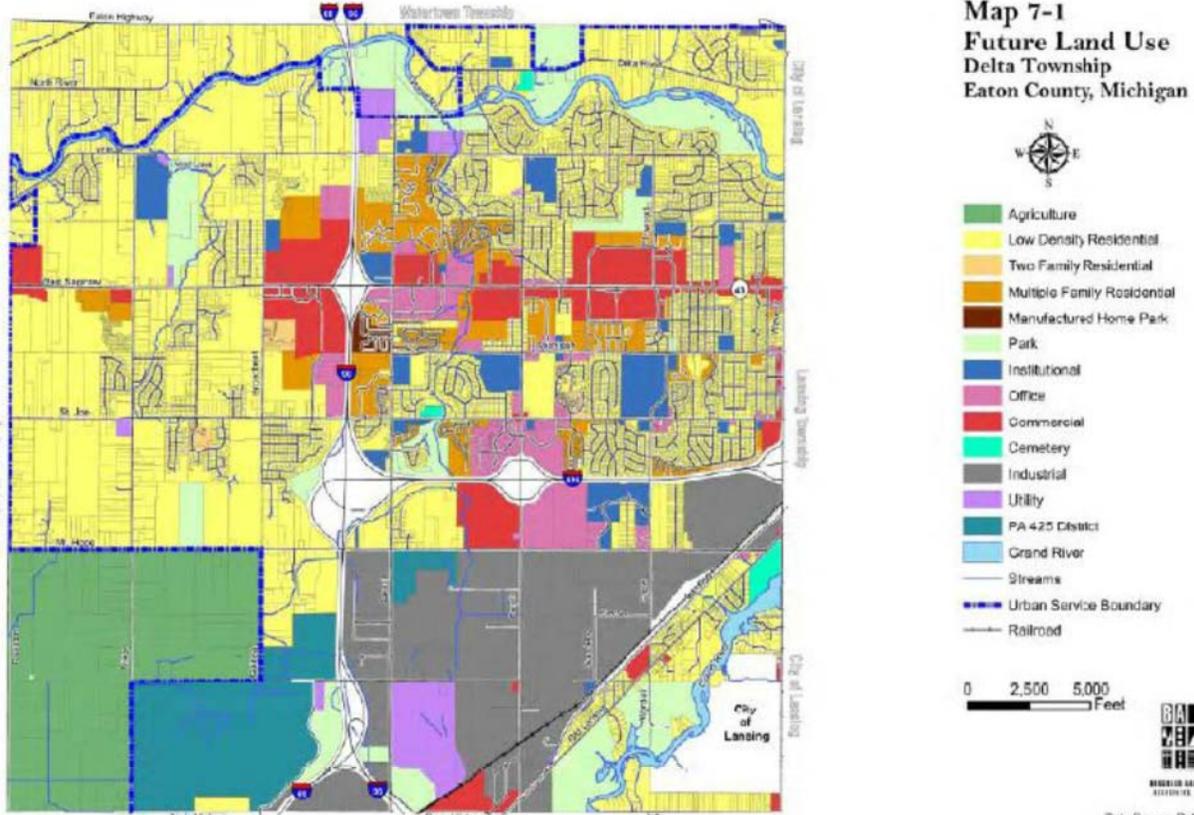


Fig. 23 Delta Township Future Land Use



Roads The transportation network within the Township can be divided into four classifications: freeways, arterial, collector and local streets. These classifications are based on the service function of the street and its relationship to other streets in the Township. In total, the transportation network within the Township occupies more than 2,500 acres and consists of more than 175 miles of roads. Interstates

Delta Township Transportation

Interstate highways I-69 and I-96 and the urban beltway, I-496 are the principal highways within the Township. I-69 is a major north/south highway in southern Lower Michigan. It passes through the Township connecting it to the county seat, Charlotte and providing access to I-94 to the south and offers a connection to Flint (I-75) to the east. It is part of an international trade corridor connecting to the U.S.- Canada border. I-96 connects Delta Township with Grand Rapids on the west and Lansing then Detroit to the east. Within the Township, I-96 and I-69 occupy much of the same highway right-of-way. Interstate 96 merges with I-69 north of the Township where they continue south several miles as a single highway until they split just south of Delta Township. Interstate 96 continues east while I-69 continues southwest. A traffic count of 63,000 vehicles per day was recorded in 2003 for I-96 and I-69 just south of M-43. The I-96, I-69, and I-496 junctions is located in the southern portion of the Township, where I-496 penetrates

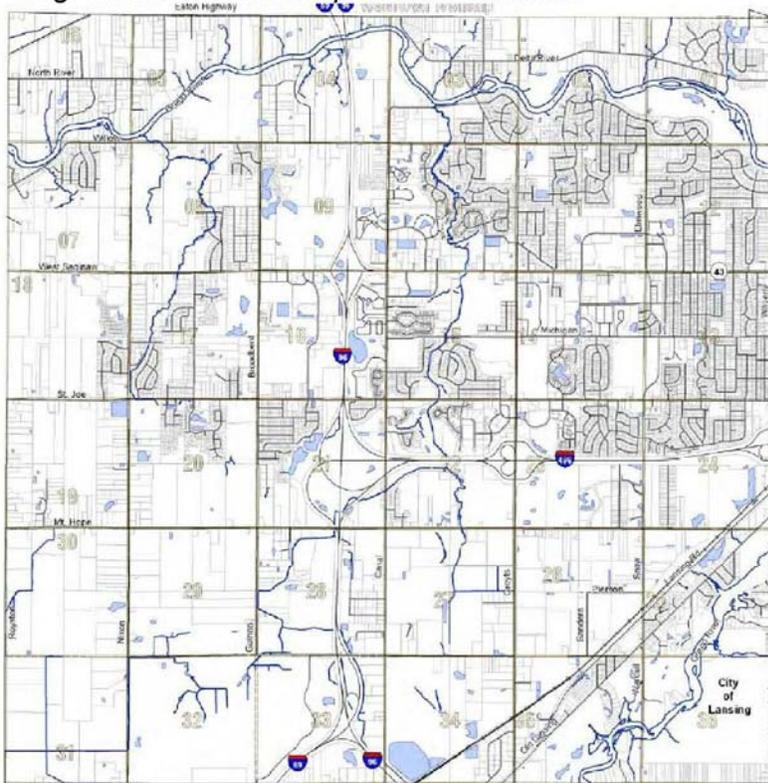
east into the City of Lansing.

Roads classified as “arterial roads” serve as the primary collectors of traffic generated on the collector and local streets in Delta Township. The collector streets in the Township generally follow a one-mile grid pattern that mirrors the township’s one-mile section lines that date back to the 19th century survey of the area. Some of the major roads in the Township include the following east-west routes: Michigan Avenue, M-43/Saginaw Highway, Mt. Hope Highway, Willow Highway and St. Joe Highway. In Delta Township, Creyts Road, Canal Road, Nixon Road, and Waverly Road, all north-south routes within the Township.

Water Resources

Located in the Grand River Watershed, the township has over 410 acres of ponds, rivers and streams within its boundaries. The principle water feature is the Grand River. The Grand River occupies approximately 348 acres and stretches more than 10 miles the Township. More of the Grand River is located in Delta Township than any other single governmental unit in the Tri-County area. Other water features in the Township include Miller Creek and Carrier Creek, both tributaries of the Grand River. These creeks, and the drains which feed them, flow from south to north draining much of the Township. The water features within the township are depicted in the map below, taken from Delta Township’s Master Plan.

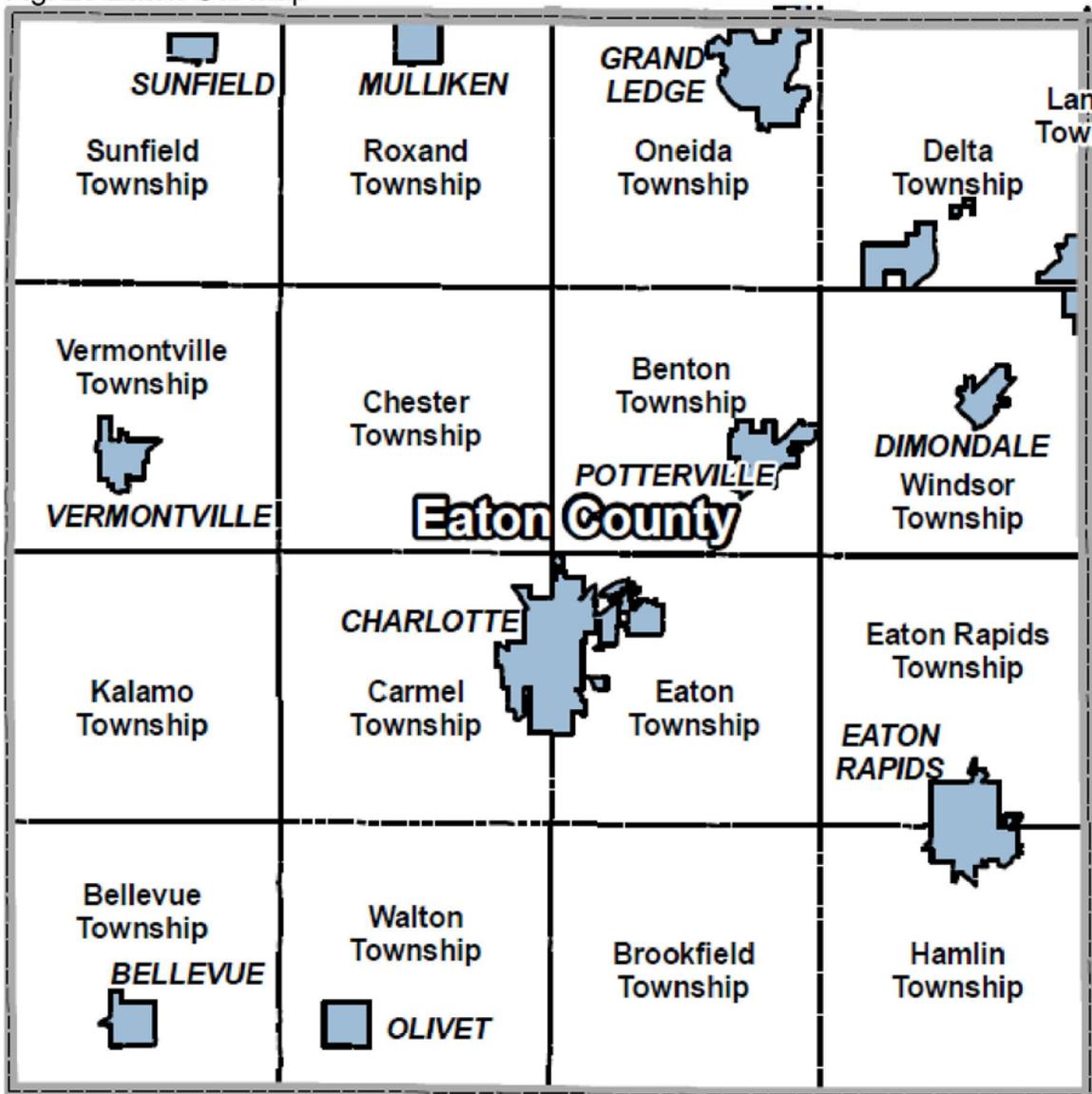
Fig. 24 Delta Township Water Features



EATON COUNTY PROFILE

Eaton County is located in south central Michigan and is part of the Tri-County region that also includes Ingham and Clinton Counties. The City of Lansing, the region's urban focal point, lies in the center of the three-counties. While the bulk of the urban area is within Ingham County, a portion of the City of Lansing extends into Eaton County at its northeastern corner.

Fig. 25 Eaton Co. Map



Source: Tri-County Regional Planning Commission (2013)

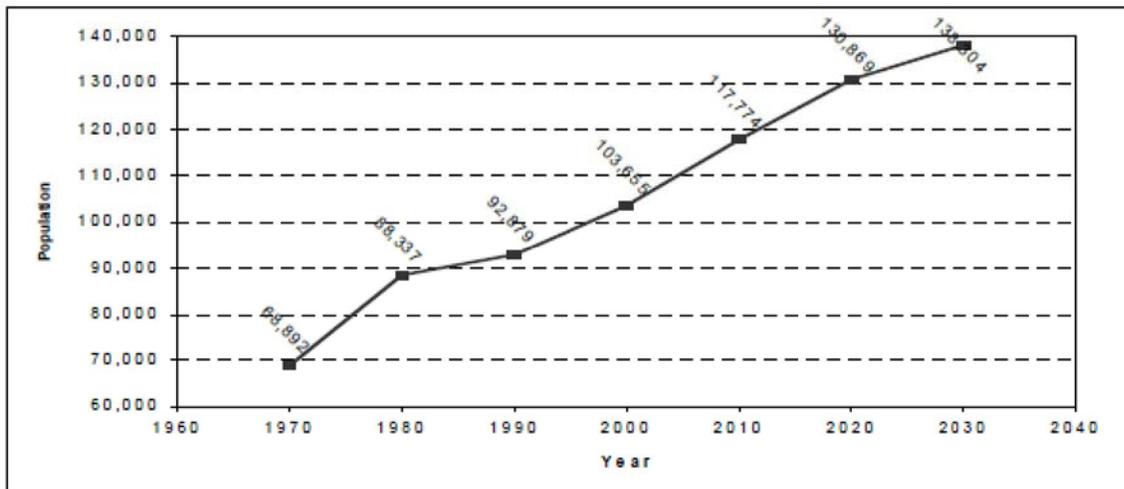
Eaton County is a mixture of rural farmlands, small industrial parks, traditional communities and suburban development. Within Eaton County's approximate 580 square miles are twenty-seven units of government including, six cities (including part of Lansing), five villages and sixteen townships. The higher development concentrations occur in the northeastern corner and along the eastern border of the County. The

County seat, Charlotte, is located just south of the county’s geographic center. The county includes two other larger incorporated cities- Grand Ledge and Eaton Rapids- and villages including Sunfield, Milliken, Vermontville, Potterville, Bellevue, and Olivet. Population concentrations are highest in Delta Charter Township and in the City of Charlotte. Large and heavy industrial development is concentrated in southern Delta Township, in Charlotte, and adjacent to Eaton Rapids. Eaton County has planning and zoning authority over all unincorporated areas. Delta Charter Township controls its own planning and zoning, as do most incorporated municipalities.

Population

According to Eaton County’s 2011 Master Plan, their 2000 Census population totaled 103,655 residents. As depicted in the table below, created by the Tri-County Regional Planning Commission, Eaton County’s population is projected to increase to 117,400 residents by 2020. This is an 11.7% increase.

Fig. 26 Eaton Co. Population Chart

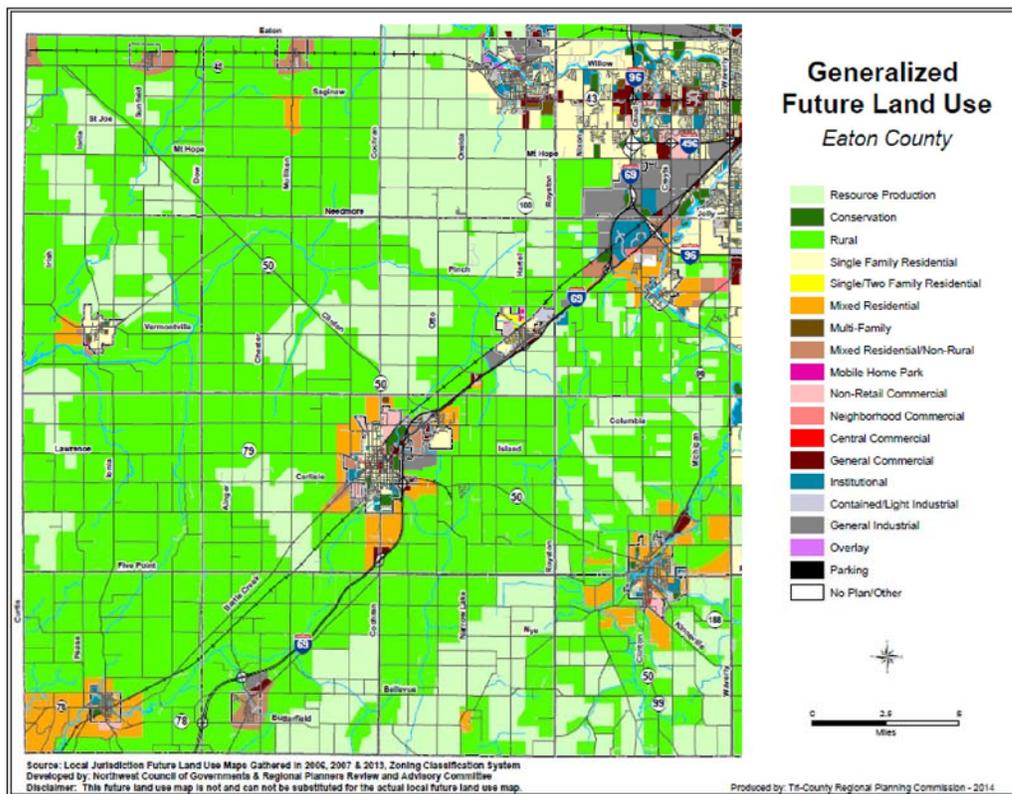
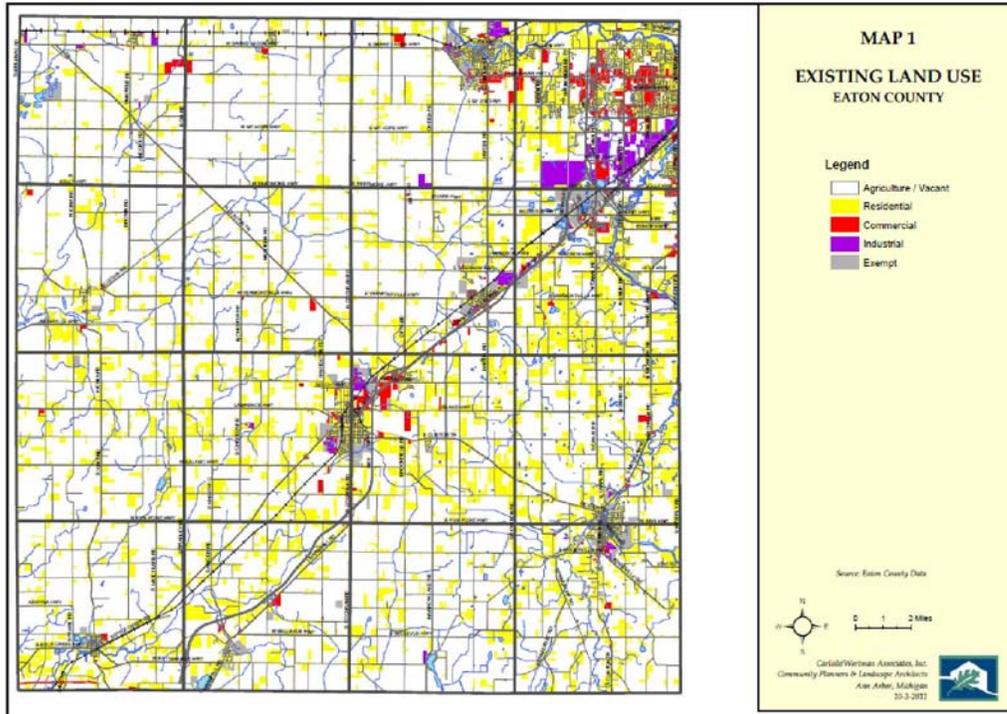


Transportation

Eaton County is reliant mostly on automobiles. The Interstate highway I-69 bisects the County southwest to northeast and is part of an international trade corridor connecting to the U.S-Canada border. It connects the county seat, Charlotte, to points south with access to I-94 and offers a connection to Flint (I-75) to the northeast. Michigan route M-43, a major east-west highway, crosses the top third of the county from west to east. I-69 and M-43 connect County residents to Lansing, East Lansing and points east via I-96 and the region’s urban beltway, I-496. Within the county, I-96 and I-69 occupy much of the same highway right-of-way. M-100 is a north-south collector serving the County’s northern tier and M-99 is another north-south route that connects the city of Lansing to Eaton Rapids and points south. M-50 slices across the County from west to east connecting Charlotte and Eaton Rapids with points east and south of the region.

There are active rail lines across the County with daily passenger service. There are no active passenger stops in Eaton County. Most rail lines carry very heavy freight traffic.

Fig. 27 & 28 Existing and Future Land Use Maps, Eaton Co.



Those lines run directly through population centers in Olivet, Charlotte, and Potterville and Grand Ledge and serve industrial developments in the county.

Current and Future Land Use

Agricultural property remains the predominant land use in Eaton County, encompassing approximately 72.8 percent of the County's entire area. The land use map developed for Eaton County's Master Plan demonstrates the rural nature of the county. Residential development currently occupies approximately 22.7% or 82,220 acres Eaton County's total land area. Residential uses are focused around the population centers and extend along the major transportation routes throughout the County. Whereas, commercial and industrial land uses continue to make up a relatively small portion of the County's land area, with the majority of commercial land uses found in the concentrated population centers such as Delta Township, Grand Ledge, Eaton Rapids and Charlotte. The Future Land Use Map, below, created by TCRPC depicts a growth of residential areas near town and city centers.

Eaton County Soils

Soils within the County are one of its most valuable natural resources. Agricultural land uses represent 62% (230,000 acres) of the County, and \$53,054,000 in revenues through agricultural products. While half of the County contains well and moderately drained soils (43% or 160,000 acres), 48% of the County contains somewhat poorly Soils

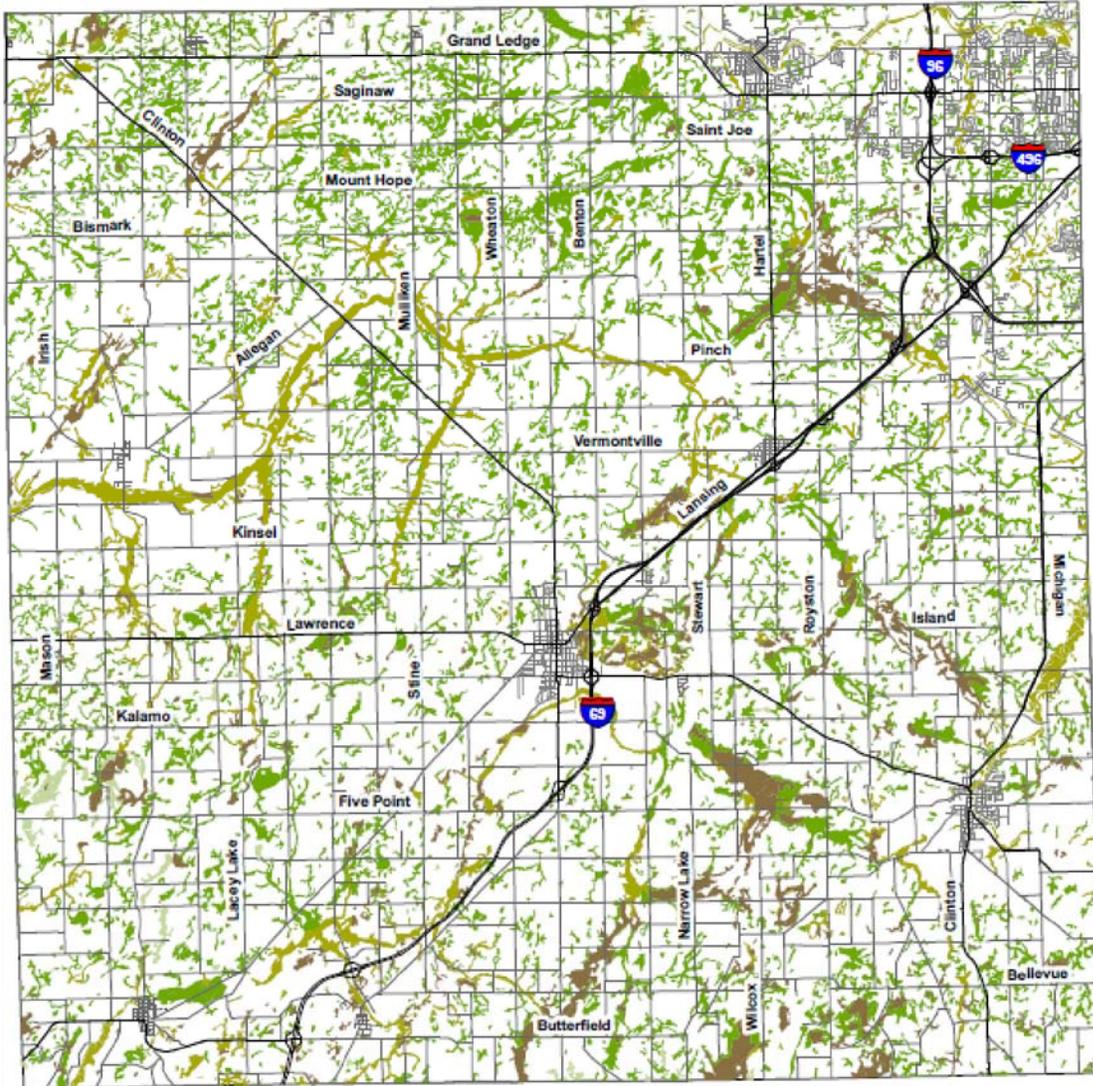
Eaton County soils include large areas of well drained farmland and some poorly drained mineral soils. Those areas lend themselves to sand and gravel mining and there are a number of small mining operations throughout the county. The map below identifies where these soil categories are located. Prime farmland and farmland of local importance makes up approximately 51% of the County, while prime farmland if drained makes up 43%. Areas that are not considered prime farmland are primarily in urban areas or directly adjacent to rivers and other waterways. The map below, created by TCRPC, shows the muck and loam soils along areas affiliated with water features.

Fig. 29 Eaton County Soil Map



50 Years of Service
1956 - 2006
www.mitrpc.org

Eaton County Hydric Soil*



Soil Type

- | | |
|--|---|
|  Muck |  Loam |
|  Sandy Loam |  Silty Clay Loam |

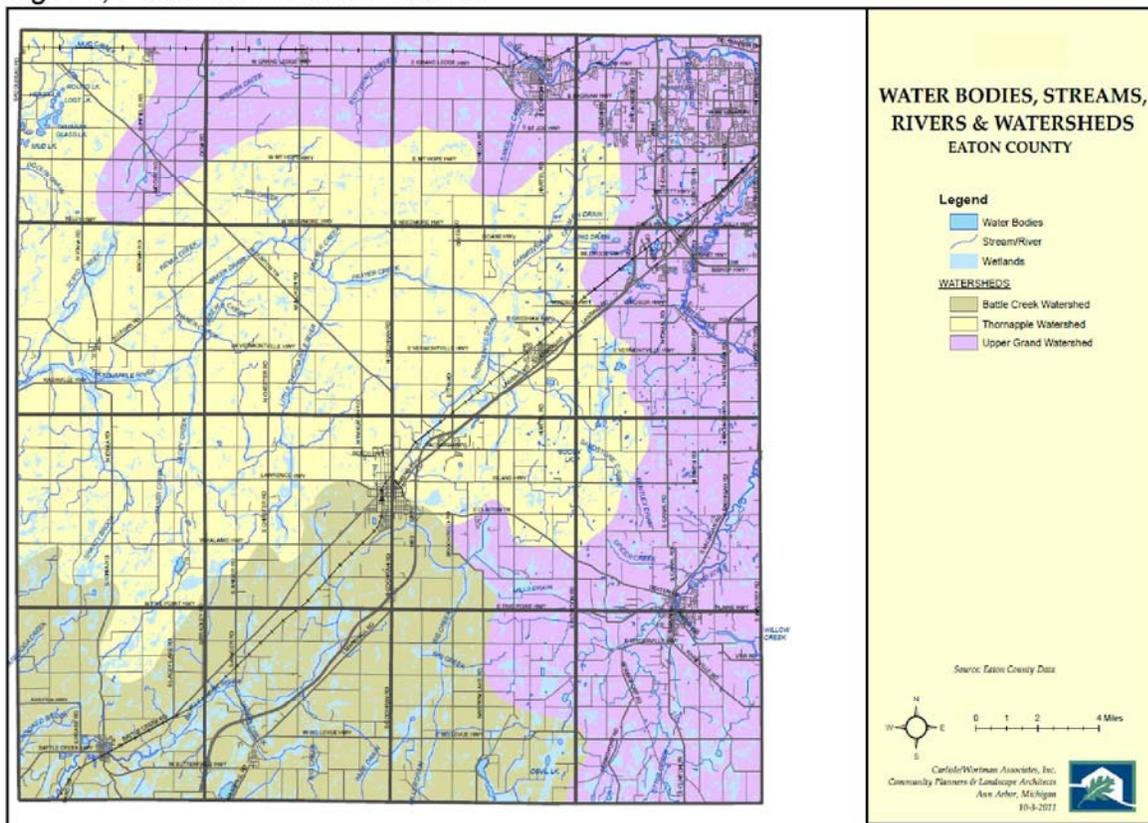


Water Resources

Eaton County is part of three watersheds. One is the Upper Grand River watershed, covering approximately 34% (or 128,000 acres) of the County. Another is the Thornapple River watershed, a sub-watershed of the Lower Grand River watershed. The Thornapple River watershed covers approximately 44% (or 163,000 acres) of Eaton County. The Battle Creek watershed, a sub-watershed of the Kalamazoo River watershed, covers approximately 21% (or 79,000 acres) of the County. These areas are depicted in the map below, taken from the 2011 County Master Plan.

Since 1999, the County has participated in several watershed-planning efforts, in conjunction with applying for and receiving a storm water permit from the state through the Phase II Stormwater National Pollutant Discharge Elimination System (NPDES). The Eaton County Drain Commissioner's office has spearheaded these efforts in the County. The goal of NPDES is twofold: 1) to protect water *quality* in the nation's surface waters, and 2) to control the amount of storm water that reaches streams and rivers (or storm water *quantity*).

Fig. 30, Eaton Co. Water Features

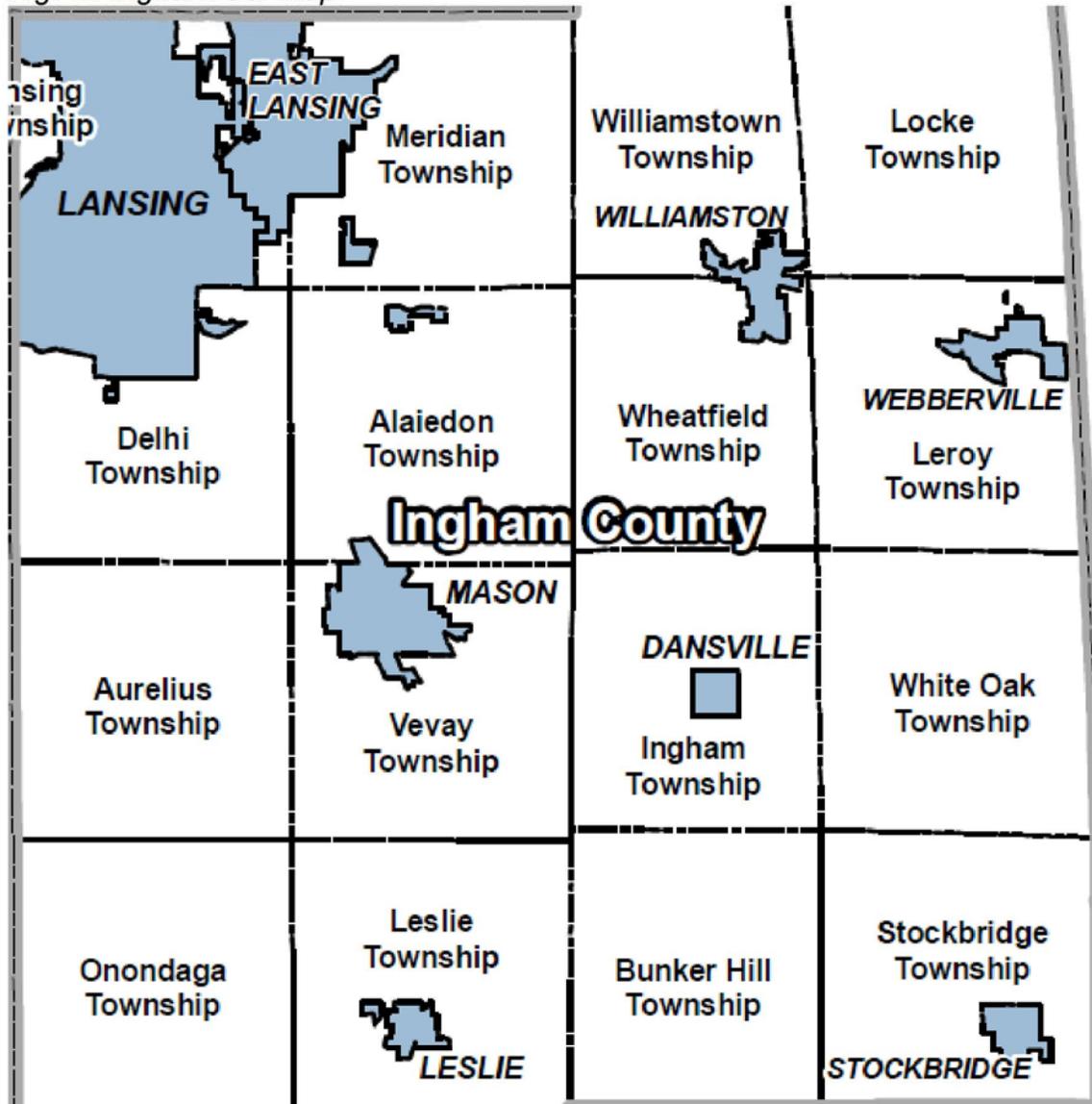


Watershed management plans were developed for the Upper Grand River, the Lower Grand River (which includes the Thornapple River sub-watershed), and the Battle Creek River. These plans describe the current condition of each watershed, and identify significant pollutants that need to be addressed in each watershed.

INGHAM COUNTY PROFILE

Ingham County is located in south central Michigan. As depicted in the Tri-County the map below, there are 13 general law townships, three charter townships, three villages and five cities in Ingham County. The City of Lansing has developed its separate Hazard Mitigation Plan and so that is not addressed in this plan. Besides the city of Lansing, Ingham County's largest communities include Meridian Township,

Fig. 31 Ingham Co. Map



Population

Population statistics indicate that Ingham County has a larger share of the region's population base. According to the 2010 U.S. Census, Ingham County's population was 280,895. It has steadily increased over the past several decades, and is projected to do so through 2045. By 2020, the population is projected to be 279,954 persons, According to TCRPC, by 2045, the population is projected to be 299,661, an increase of 8% since 2005.

Most of Ingham County's population is centered in the greater Lansing metropolitan area. Growth patterns tend to radiate primarily from the Lansing area outward, with growth decreasing as the distance from Lansing increases. There is a limited amount of commuting between the Lansing metropolitan area and outlying major cities such as Flint, Detroit, Ann Arbor, Jackson, Kalamazoo, Grand Rapids and Saginaw. Most Ingham County residents work within the Lansing metropolitan area.

Current and Future Land Use

The current and future land use maps, below, depict a pattern of residential and commercial land uses in urban core areas. A notable growth of residential near city and village centers is depicted in the future land use map.

Fig. 32 Ingham Co Land Use Cover

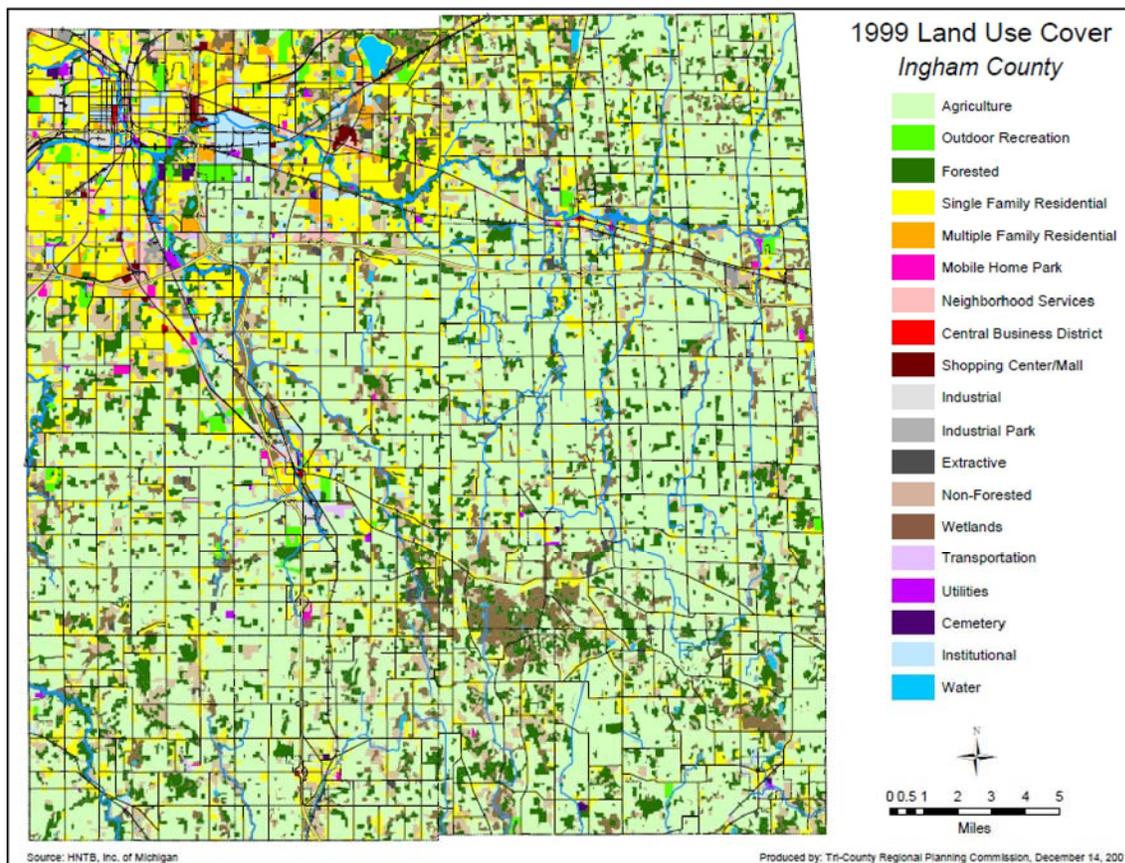
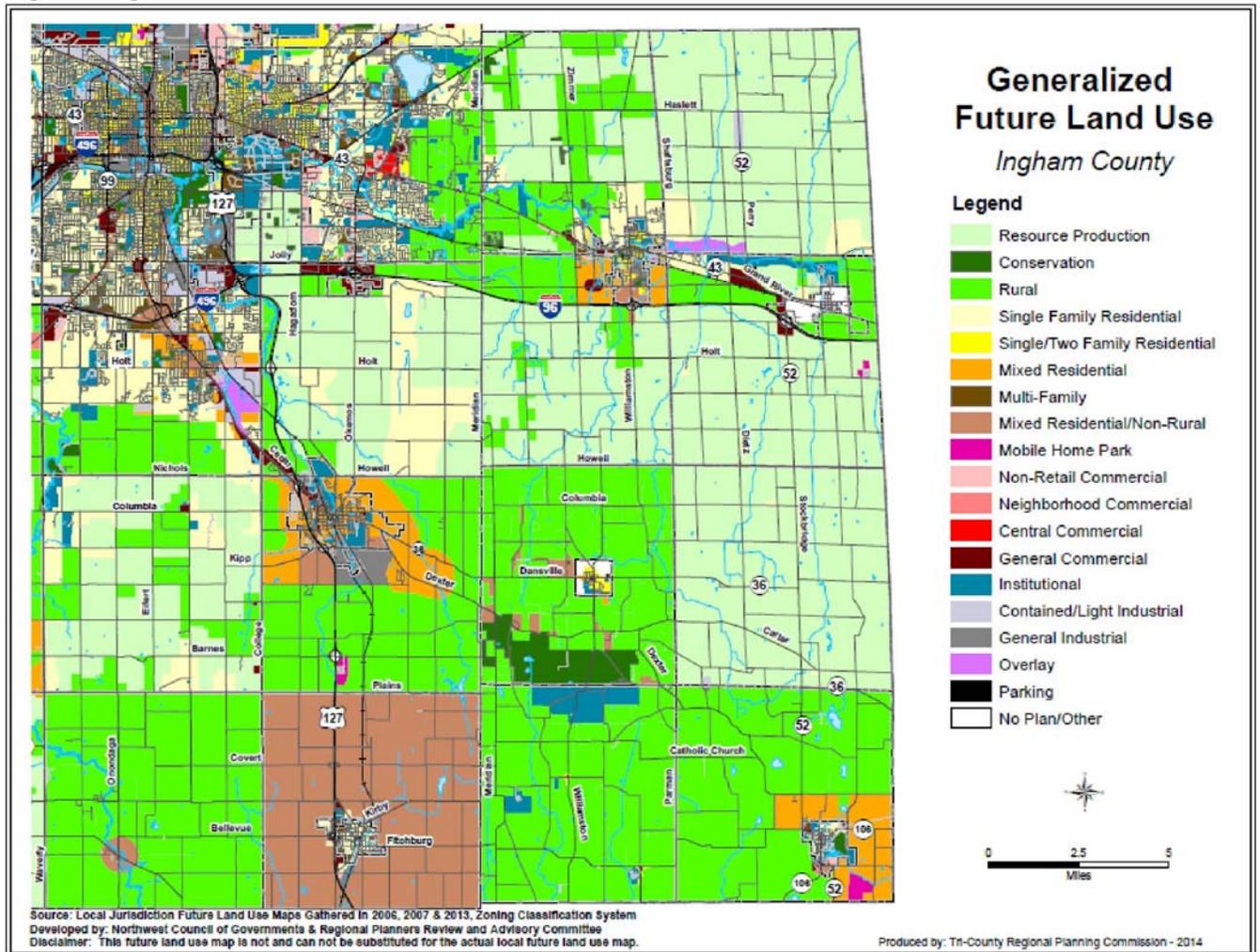


Fig. 33 Ingham Co. Future Land Use



Soils

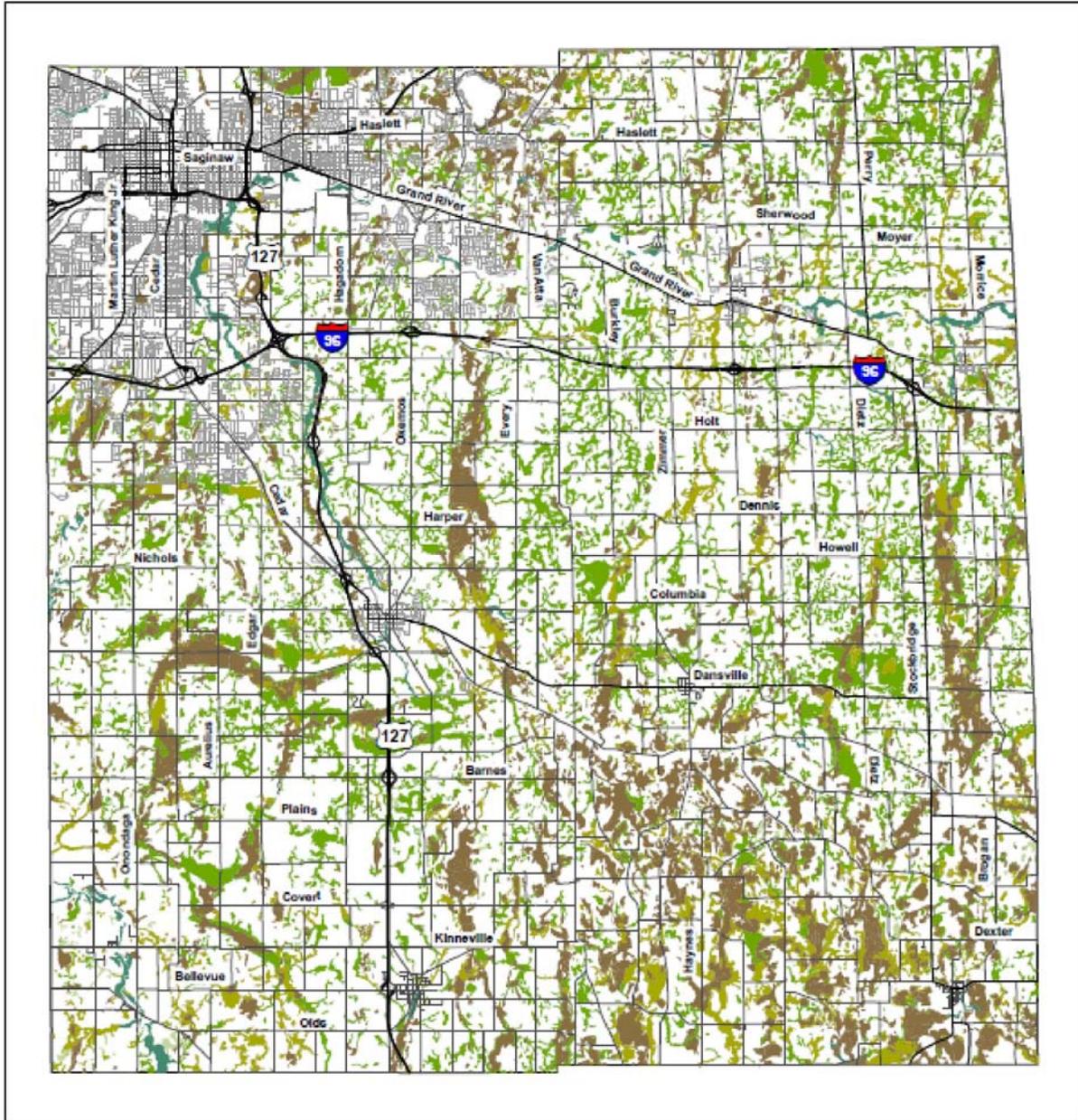
Ingham County topography is characterized as flat to gently rolling. Two major rivers traverse the county: the Grand River and the Red Cedar River. Several glacial eskers also pass through the county. Land uses include: 15% urban areas, 67% agriculture and open space, 14% woodland and 4% wetlands. Of the wetlands, only 0.5% is classified as water, including both rivers and lakes.

Wetlands cover 4% of the county, with lakes and rivers accounting for 0.5%. Lake Lansing, located in the north-central part of the county, is the largest natural lake. Several smaller lakes are located in the southeastern portion of the county,

Fig. 34 Ingham County Soil Map

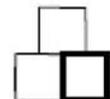


Ingham County Hydric Soil*



Soil Type

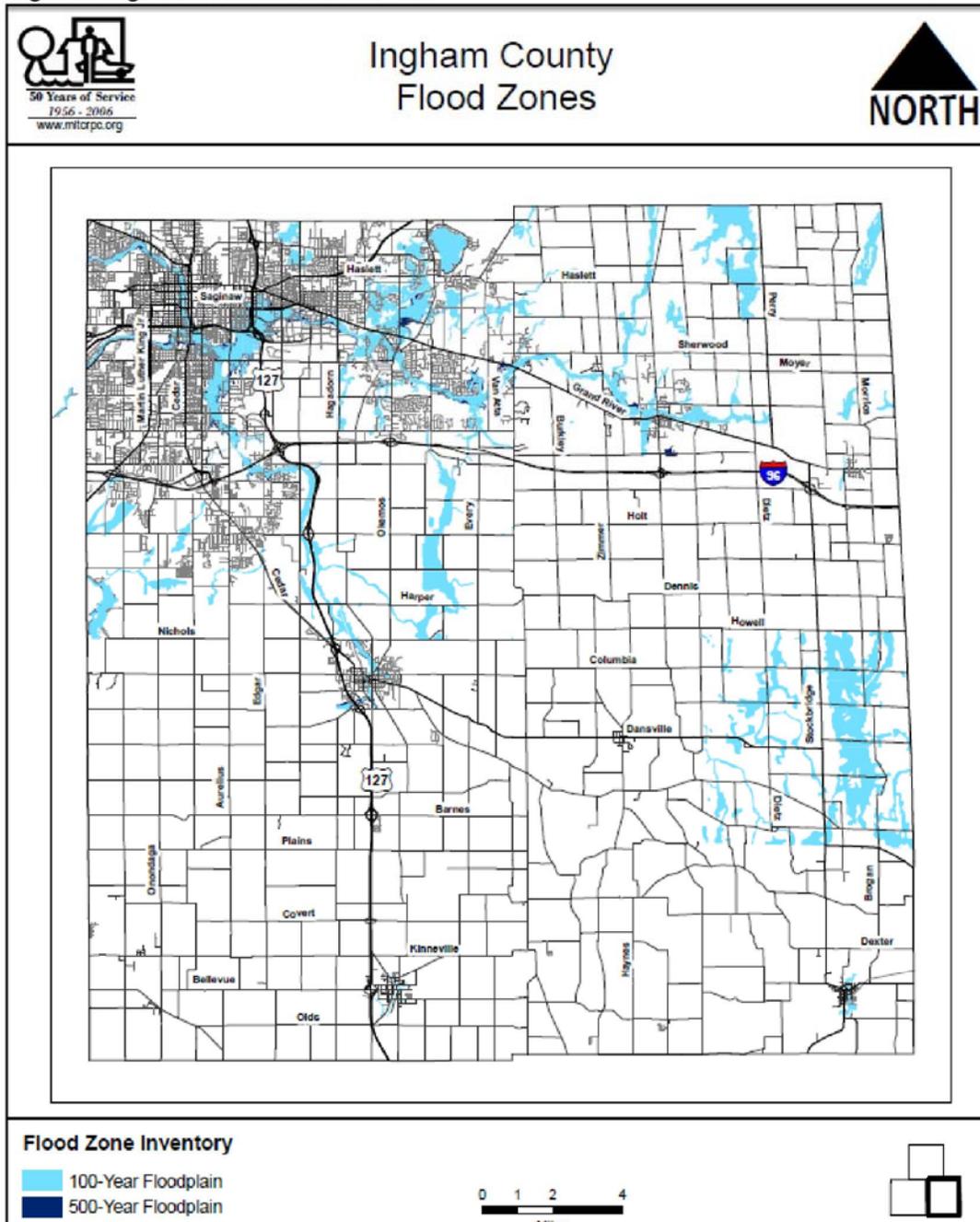
- Muck
- Silty Clay Loam
- Sandy Loam
- Silt Loam
- Loam



Water

Both the Grand River and Red Cedar River are significant in their impact on the county. The Grand River flows to the north along the west side of the county. The Red Cedar River flows westward along the northern portion of the county. Both meet in Lansing and flow out toward the northwest corner. Ingham County is within the Grand River drainage basin.

Fig. 35 Ingham Co. Flood Zones



Transportation

The people of Ingham County are mainly dependent on the automobile for transportation. Other modes are available, but play a minor role in moving people. Roads and highways in the county are part of the regional and state network. The freeways, particularly I-96, I-496 and U.S. Route 127, are routes to destinations outside of Ingham County. Commercial centers are located adjacent to these routes to take advantage of the access.

The Capital Region International Airport, located north of Lansing, is the largest in the area. It is a full-service, all-weather, commercial-airline airport, serving the entire Lansing metropolitan area. In addition, the Airport Authority includes a smaller airfield, Jewett Airport, in Mason. It is used by crop dusters, small clubs and recreational pilots. There are a number of small airfields in rural areas. Conrail, CSX and Canadian National operate railroads in the county. Some railways, however, are no longer in use.

Fig. 36 Ingham Co. Map

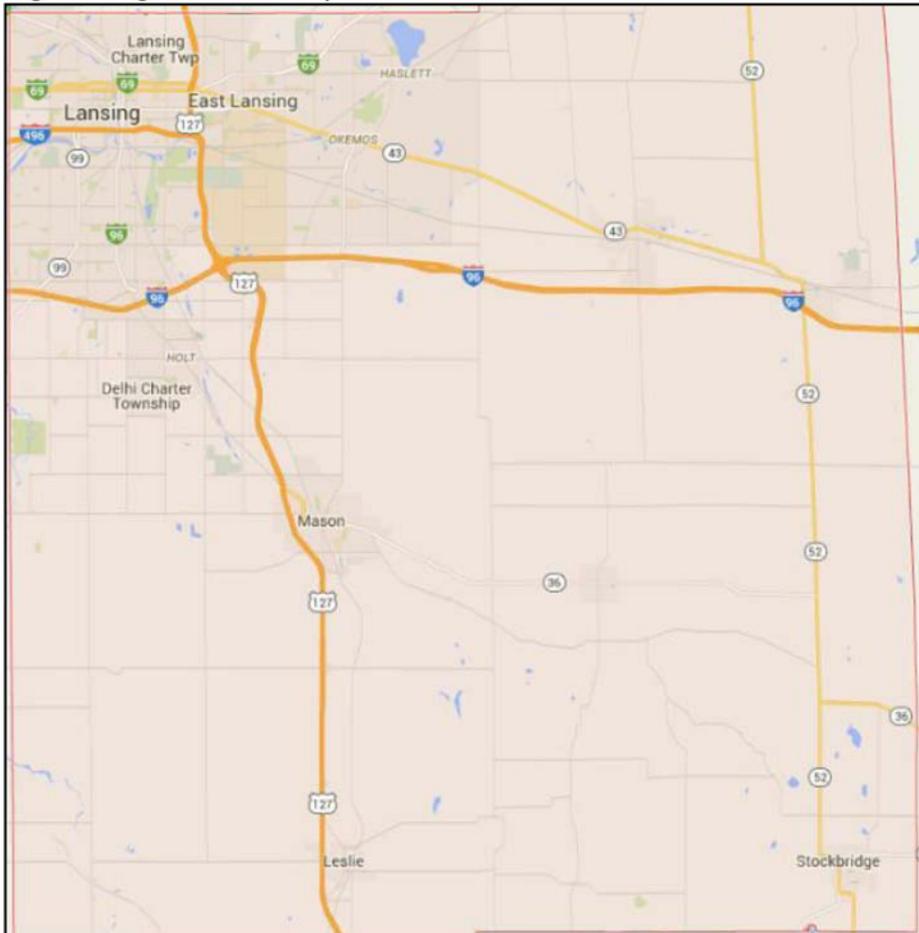


Fig. 38 2004 Hazards- Eaton Co.

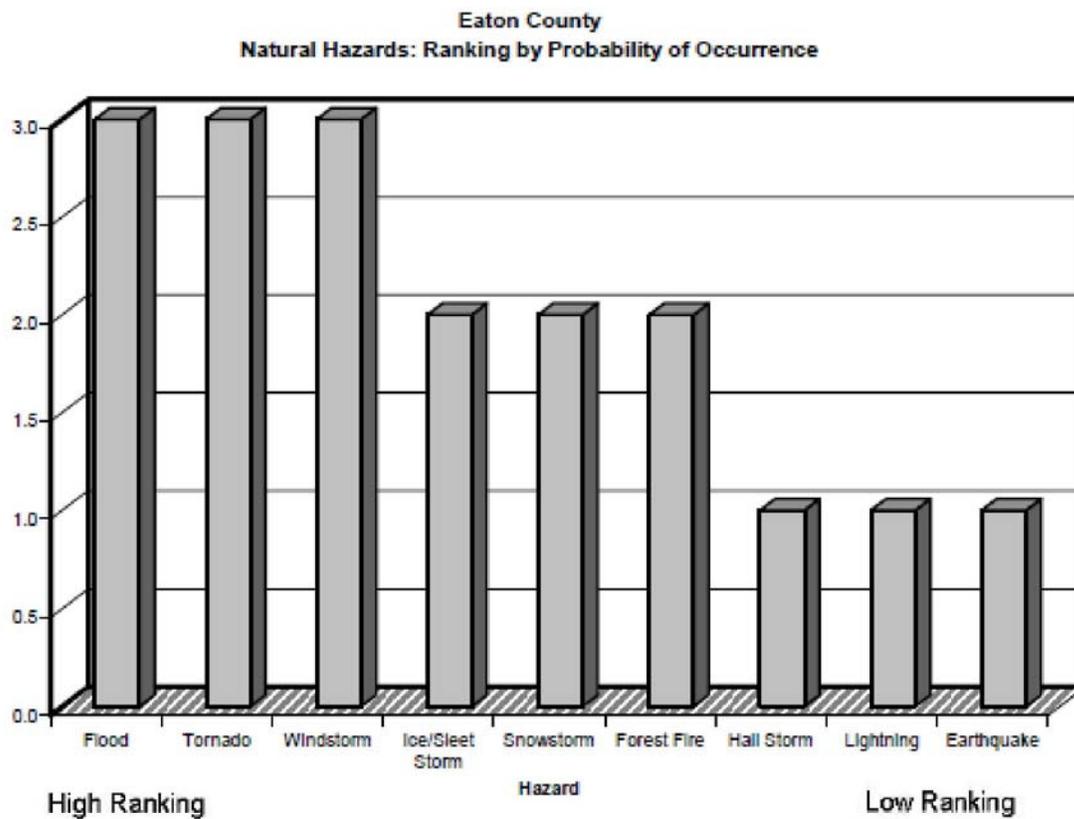


Fig. 39 2004 Hazards- Ingham Co.

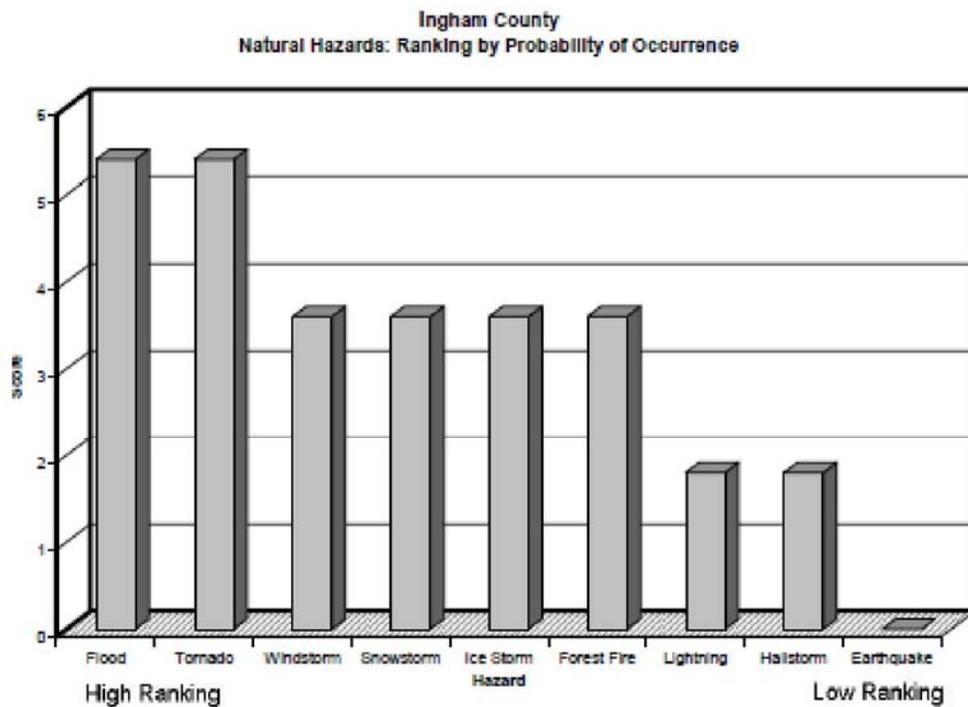


Fig. 40 2005 Hazards- Delta Township

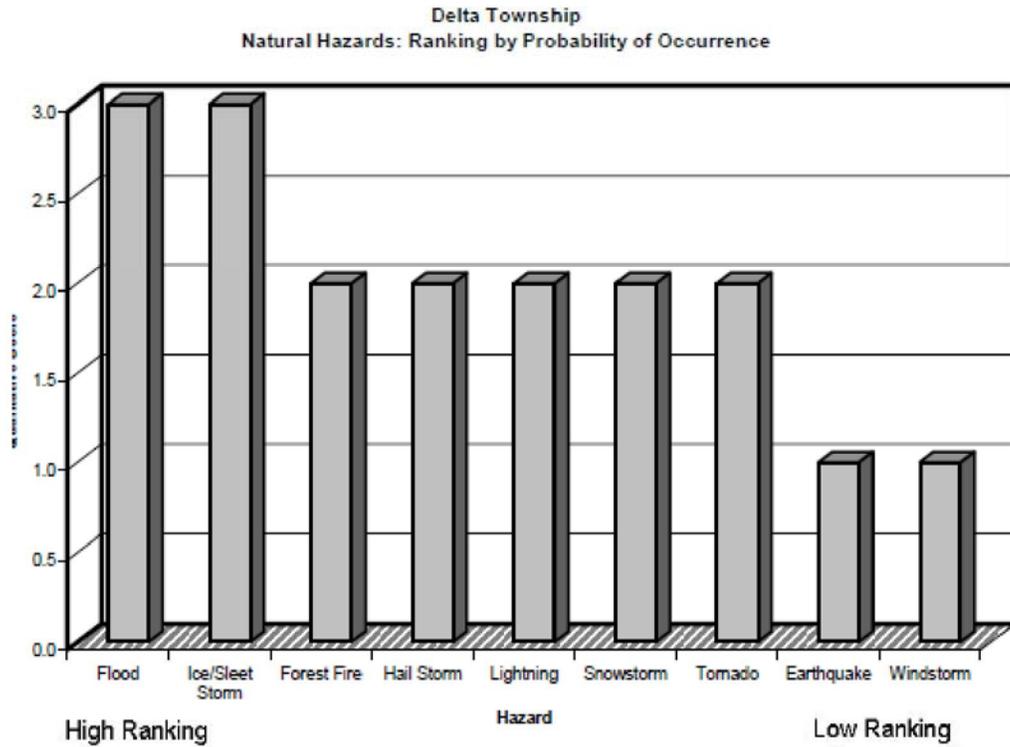


Fig. 41 Ingham County Flood Zones and Land Uses, Area 1

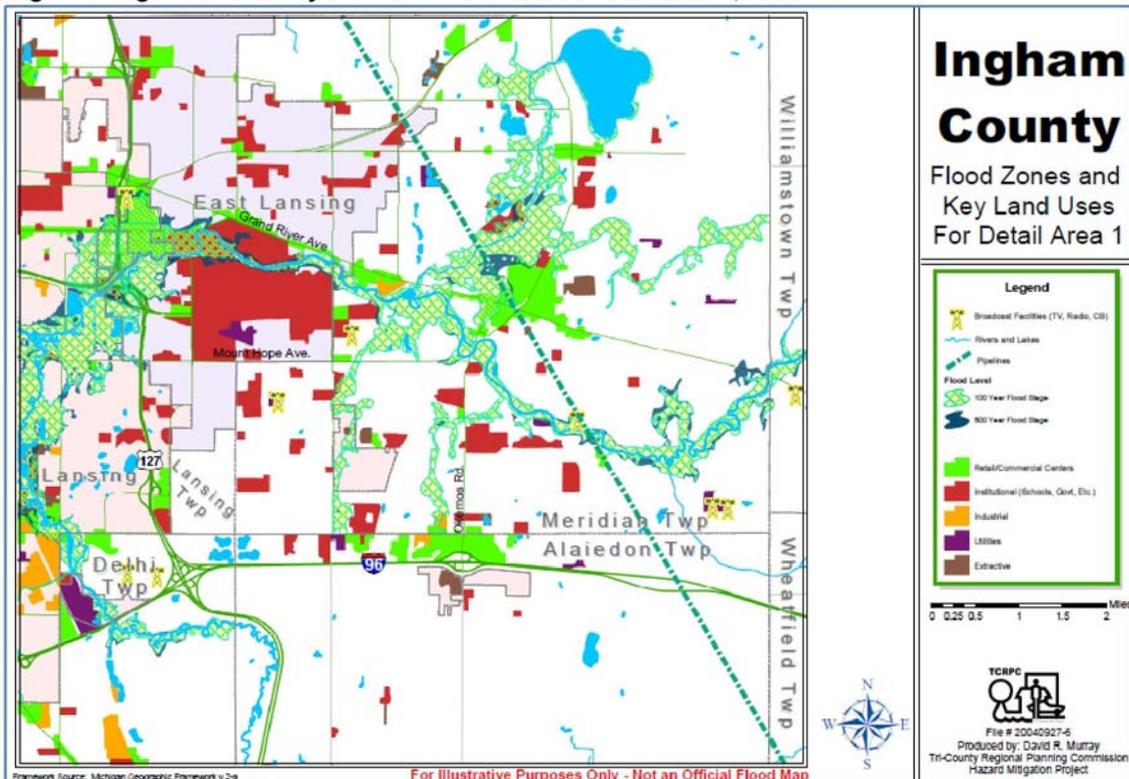


Fig. 42 Ingham County Flood Zones and Land Uses, Area 2

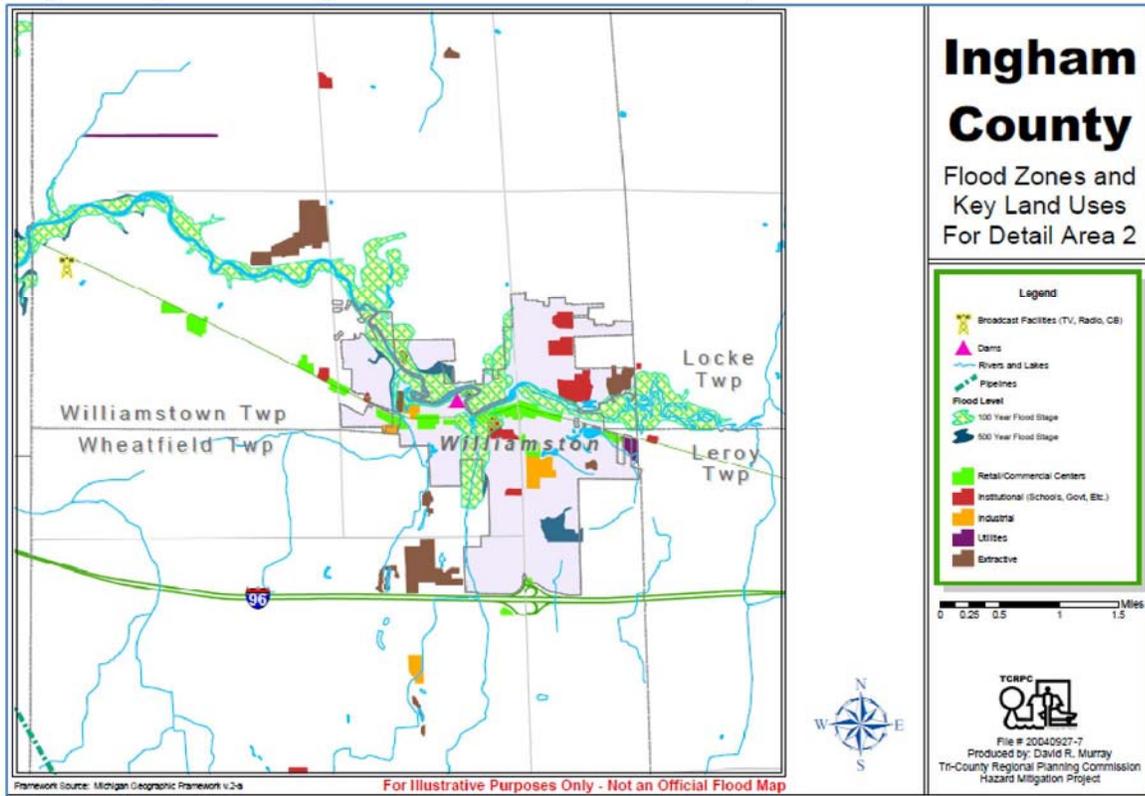
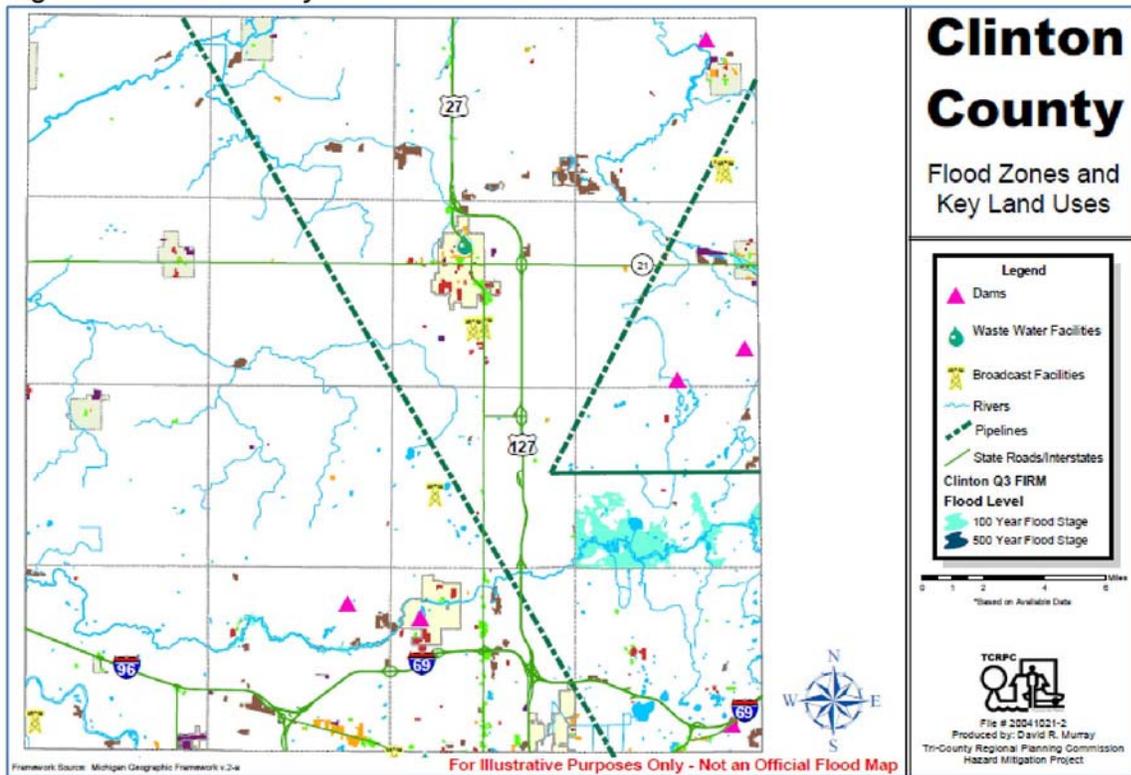


Fig. 43 Clinton County Flood Zones and Land Uses



The hazard analysis used for this plan is the process suggested in *The Local Hazard Mitigation Planning Workbook*. The Michigan Hazard Mitigation Plan of 2014 offers the following summary of top hazards in Clinton, Eaton and Ingham County and Delta Charter Township: Hail, Lightning, Ice/Sleet, Snowstorms, Severe winds, tornadoes, Extreme Heat and Cold, Fog, Flooding, Drought and Wildfires.

The following table summarizes historical information about these natural hazards in Clinton, Eaton, and Ingham Counties. *The Michigan Hazard Mitigation Plan* served as a reference for many of the hazards discussed in this section. Some multi-county damages and events may be counted twice in these data (once for each involved county). For clarification, when multiple events have happened in the same day, the number of event-days also is listed. Averages involve: tri-county average events, the average number of events per year, and the average county impact per event.

Fig. 44 Natural Hazards Historical Data (1996 2013)

PD = Property Damage, CD = Crop Damage, I = injuries, D = deaths

Hazard	Clinton events	Impacts	Eaton events	Impacts	Ingham events	Impacts	Avg events regional	Average impacts per event
Hail	26 (19 days)	\$150,000 PD \$115,000 CD	41 (33 days)	\$435,000 PD \$325,000 CD	40 (26 days)	\$400,000 PD \$235,000 CD	2 per year	\$9,206 PD \$6,308 CD
Lightning	0	--	0	--	0	--	0	Above \$0
Ice/Sleet Storms	7	\$330,000 PD	7	\$325,000 PD	7	\$340,000 PD	7 (0.4/year)	\$47,381 PD
Snowstorms	40	\$1,025,000 PD	45	\$1,025,000 PD	46	\$1,025,000 PD	43.7 (2.4/year)	\$23,295 PD
Severe Winds	196 (116 days)	\$3,077,000 PD \$100,000 CD 2 deaths	196 (116 days)	\$5,255,000 PD \$210,000 CD	210 (116 days)	\$6,060,000 PD \$85,000 CD	200.7 (11.3/year)	\$23,907 PD \$342 CD 0.003 deaths
Tornadoes	2	\$450,000 PD \$150,000 CD	8	\$50,357,000 PD \$225,000 CD 6 injuries	7	\$20,850,000 PD \$200,000 CD 2 injuries 2 deaths	5.7 (0.3/year)	\$4,215,118 PD \$33,824 CD 0.47 injuries 0.12 deaths
Extreme Heat	0	--	0	--	0	--	0	Above 0.0 injuries
Extreme Cold	0	--	0	--	0	--	0	Above 0.0 injuries
Fog	1	--	1	--	1	--	1 (0.01/year)	--
Flooding	26 (21 days)	\$12,395,000 PD \$475,000 CD	25 (21 days)	\$11,945,000 PD \$825,000 CD	26 (21 days)	\$17,420,000 PD \$475,000 CD	25.7 (1.4/year)	\$542,338 PD \$23,052 CD
Drought	0	--	0	--	0	--	0	\$0
Wildfires	0	--	0	--	0	--	0	\$0

Source: Michigan Hazard Mitigation Plan, March 2014, adapted from the National Climatic Data Center's online Storm Events database

When the average impacts per event are multiplied by the average events per year, the result is an estimate of the expected annual damage from each hazard. This allows the list of hazards to be prioritized based on the history of past impacts. However, it is important to note that this “history” is really just a sample of events from limited time period, and estimate, and not as accurate as a long term set of records were readily available for all of these hazards. Nevertheless, the table presents an estimate of how these natural hazards are tentatively ranked in terms of the expected annual damages based upon this sample of historical event records.

In March-April of 2015, the Tri-County Regional Planning Commission (TCRPC) created and conducted a survey in order to collect input on local perceptions of hazards. The survey questionnaire was distributed to TCRPC committee members, County Road Commissioners and staff, local government staff, community leaders, technical staff throughout the region, infrastructure managers, transportation and land use planners, and the public. Twenty-four responses were collected. In response to the questionnaire, participants identified some hazards as being a threat to property, crops and human life. Respondents from across the tri-county region provided comments about the ranking of the following hazards and how they impact the region and our local communities.

- 1. Tornadoes**
- 2. Flooding**
- 3. Severe Winds**
- 4. Snowstorms**
- 5. Hail**
- 6. Ice/Sleet Storms**
- 7. Drought**
- 8. Wildfires**
- 9. Lightning**
- 10. Extreme Heat**
- 11. Extreme Cold**
- 12. Fog**

Eighty percent of the 24 respondents replied that this ranking was in keeping with their experience. After questions about the natural hazards, the following technological and social hazards were presented in the survey. Respondents were invited to comment and then rank them against the natural hazards previously listed. A majority of the respondents felt that these hazards were less of a threat to property, crops and human life than the top twelve natural hazards identified for the tri-county region.

Dam failures
 Invasive species
 Earthquakes
 Subsidence (ground cave-ins)
 Solar Storms
 Erosion on river or stream shorelines
 Major structural fires
 Hazardous materials accidents (onsite)
 Hazardous materials accidents (in transit)
 Pipeline accidents
 Oil or gas well accidents
 Infrastructure failures
 Civil disturbances
 Public health emergencies
 Terrorism/similar criminal activities

The majority of respondents reported that they felt hazardous material accidents should rank higher than a few natural hazards, namely tornadoes and snowstorms.

The following sections provide an overview of the main natural, technological and social hazards that face the tri-county region. The selection of Hazards discussed in this section is based on the Michigan Hazard Mitigation Plan of 2014 and the results of the tri-county region's 2015 survey. Each hazard is defined, placed into the context of the State of Michigan and also includes a statement of the impacts upon in the tri-county region. The following figure offers a snapshot of each participating jurisdiction and the natural hazards that they face.

Fig. 45 Hazard Overview of Local Participating Jurisdictions

Participating Jurisdictions	Identified Natural Hazards
City of East Lansing Meridian Charter Township Williamstown Township City of Williamston Village of Dansville Village of Webberville City of Mason Delhi Charter Township Lansing Charter Township Delta Charter Township City of Grand Ledge City of Charlotte City of Eaton Rapids DeWitt Charter Township City of DeWitt Bath Charter Township City of St Johns Dallas Township	<ol style="list-style-type: none"> 1. Tornadoes 2. Flooding 3. Severe Winds 4. Snowstorms 5. Hail 6. Ice/Sleet Storms 7. Drought 8. Wildfires 9. Lightning 10. Extreme Heat 11. Extreme Cold 12. Fog

Natural Weather Hazards

Thunderstorm Hazards (General)

Hazard Description - Weather systems accompanied by strong winds, lightning, heavy rain, and possibly hail and tornadoes. Severe thunderstorms can occur at any time in Michigan, although they are most frequent during the warm spring and summer months from May through September. The potential thunderstorm threat is often measured by the number of "thunderstorm days" – defined as days in which thunderstorms are observed. As the map below indicates, Michigan is subject to 20-60 thunderstorm days per year. According to the National Weather Service (NWS) the Lower Peninsula, in general, is subject to approximately 30-40 thunderstorm days per year per year.

Thunderstorms form when a deeper layer of cool air overrides a shallow layer of warm, moist air, dry air. Cumulonimbus clouds, frequently called "thunderheads", are formed in these conditions. These clouds are often enormous (up to six miles or more across and 40,000 to 50,000 feet high) and may contain tremendous amounts of water and energy. That energy is often released in the form of high winds, excessive rains, lightning, and possibly hail and tornadoes. Thunderstorms are typically short-lived (often lasting no more than 30-40 minutes) and fast moving (30-50 miles per hour). Strong frontal systems, however, may spawn one squall line after another composed of many individual thunderstorm cells.

Between 1996 and 2013 there were 726 major thunderstorm & high wind events reported in Ingham, Clinton and Eaton Counties. That amounts to an average of 13.6 events per year. The reported storms resulted in deaths that averaged 0.12 deaths per year directly attributed to the storms and property damage unadjusted for inflation valued at \$36.7 million. The following sections address in detail these specific storm hazards:

- 1) Hail;
- 2) Lightning;
- 3) Severe winds; and
- 4) Tornadoes.

Hail

Hazard Description - Conditions where atmospheric water particles from thunderstorms form into rounded or irregular lumps of ice that fall to the earth. Hail is a product of the strong thunderstorms. Hail is formed when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger until their weight can no longer be supported by the winds. As the thunderstorm passes over, hail usually falls near the center of the storm, along with the heaviest rain. Most hailstones range in size from a pea to a golf ball, but hailstones larger than baseballs have occurred. Sometimes, strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, causing an unexpected hazard at places that otherwise might not appear threatened. They finally fall to the ground, battering crops, denting autos and injuring wildlife and people. Large

hail is a characteristic of severe thunderstorms, and it may precede the occurrence of a tornado.

Between 1996 and 2013 there were a total of 107 hail events reported for the tri-county region. They accounted for \$985,000 in property damage and \$675,000 in damage to crops.

Lightning

Hazard Description - The discharge of electricity from within a thunderstorm. Lightning is a random and unpredictable product of a thunderstorm's tremendous energy. The energy in the storm produces an intense electrical field like a giant battery, with the positive charge concentrated at the top and the negative charge concentrated at the bottom. Lightning strikes when a thunderstorm's electrical potential (the difference between its positive and negative charges) becomes great enough to overcome the resistance of the surrounding air. Bridging that difference, lightning can jump from cloud to cloud, cloud to ground, ground to cloud, or even from the cloud to the air surrounding the thunderstorm. Lightning strikes can generate current levels of 30,000 to 40,000 amperes, with air temperatures often superheated to higher than 50,000 degrees Fahrenheit (hotter than the surface of the sun) and speeds approaching one-third the speed of light.

Globally, there are about 2,000 thunderstorms occurring at any given time, and those thunderstorms cause approximately 100 lightning strikes to earth each second. In the United States, approximately 100,000 thunderstorms occur each year, and every one of those storms generates lightning. It is commonplace for a single thunderstorm to produce hundreds or even thousands of lightning strikes. However, to the majority of the public, lightning is perceived as a minor hazard. That perception lingers despite the fact that lightning damages many structures and kills and injures more people in the United States per year, on average, than tornadoes or hurricanes. Many lightning deaths and injuries could be avoided if people would have more respect for the threat lightning presents to their safety. Lightning deaths are usually caused by the electrical force shocking the heart into cardiac arrest or throwing the heartbeat out of its usual rhythm. Lightning can also cut off breathing by paralyzing the chest muscles or damaging the respiratory center in the brain stem. It takes only about one-hundredth of an ampere of electric current to stop the human heartbeat or send it into ventricular fibrillation. Lightning can also cause severe skin burns that can lead to death.

Statistics compiled by the National Oceanic and Atmospheric Administration (NOAA) and the National Lightning Safety Institute (NLSI) for the period 1959-1994 revealed the following about lightning fatalities, injuries and damage in the United States:

- 40% are at unspecified locations
- 27% occur in open fields and recreation areas (not golf courses)
- 14% occur to someone under a tree (not on golf course)
- 8% are water-related (boating, fishing, swimming, etc.)
- 5% are golf related
- 3% are related to heavy equipment and machinery

2.4% are telephone-related

0.7% are radio, transmitter and antenna-related

The NLSI estimates that 85% of lightning victims are children and young men (ages 10-35) engaged in recreation or work-related activities. Approximately 20% of lightning strike victims die, and 70% of survivors suffer serious long-term after-effects such as memory and attention deficits, sleep disturbance, fatigue, dizziness and numbness.

Lightning is such a common occurrence that records of specific events are not generally kept. The regional database is incomplete. In terms of property losses from lightning, statistics vary widely. The Insurance Information Institute (a national clearinghouse of insurance industry information) estimates that lightning-caused damage amounts to nearly five percent of all paid insurance claims, with residential claims alone exceeding \$1 billion. Information from insurance companies shows one homeowner's damage claim for every 57 lightning strikes. The NLSI estimates that lightning causes more than 26,000 fires annually, with damage to property exceeding \$5-6 billion. Electric utility companies across the country estimate as much as \$1 billion per year in damaged equipment and lost revenue from lightning. The Federal Aviation Administration (FAA) reports approximately \$2 billion per year in airline industry operating costs and passenger delays from lightning. Because lightning-related damage information is compiled by so many different sources, using widely varying collection methods and criteria, it is difficult to determine a collective damage figure for the U.S. from lightning. However, suffice it to say that annual lightning-related property damages are conservatively estimated at several billion dollars per year, and those losses are expected to continue to grow as the use of computers and other lightning sensitive electronic components becomes more prevalent.

Severe Winds and Tornadoes

Tornado

Hazard Description - An intense rotating column of wind that extends from the base of a severe thunderstorm to the ground. Tornadoes in Michigan are most frequent in the spring and early summer when warm, moist air from the Gulf of Mexico collides with cold air from the Polar Regions to generate severe thunderstorms. These thunderstorms can produce the violently rotating columns of wind that are called tornadoes. Michigan lies at the northeastern edge of the nation's primary tornado belt, which extends from Texas and Oklahoma through Missouri, Illinois, Indiana and Ohio.

Most of a tornado's destructive force is exerted by the powerful winds that knock down walls and lift roofs from buildings in the storm's path. The violently rotating winds then carry debris aloft that can be blown through the air as dangerous missiles. A tornado may have winds up to 300+ miles per hour and an interior air pressure that is 10-20 percent below that of the surrounding atmosphere. The typical length of a tornado path is approximately 16 miles, but tracks up to 200 miles have been reported. Tornado path widths are generally less than one-quarter mile wide. Typically, tornadoes last only a few minutes on the ground. But those few minutes can result in extreme damage and

devastation. Historically, tornadoes have resulted in tremendous loss of life, with the mean national annual death toll of 87 persons. Property damage from tornadoes is in the hundreds of millions of dollars every year. Tornado intensity is measured on the Fujita Scale, which examines the damage caused by a tornado on homes, commercial buildings and other man-made structures. The Fujita Scale rates the intensity of a tornado based on damage caused, not by its size. It is important to remember that the size of a tornado does not necessarily indicate its intensity. Large tornadoes can be weak, and small tornadoes can be extremely strong, and vice versa. It is difficult to judge the intensity and power of a tornado while it is occurring. Measurements of the intensity of a tornado can be done after it has passed using the Fujita Scale.

The Enhanced Fujita Scale of Tornado Intensity:

EF0 Gale tornado 65-85: Light damage. Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.

EF1 Weak tornado 86-110: Moderate damage. The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.

EF2 Strong 111-135: Considerable damage. Roofs torn off frame houses; tornado mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.

EF3 Severe tornado 136-165 Severe damage. Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.

EF4 Devastating 166-200 Devastating damage. Well-constructed houses tornado leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

EF5 Incredible tornado; Over 200: Incredible damage. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile-sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged; incredible phenomena will occur.

Fig. 46 Typical Tornado Damage



Source: FEMA

According to the National Weather Service (NWS), since 1950 approximately 74% of the tornadoes that occurred in the United States were classified as weak tornadoes (F0 or F1 intensity). Approximately 25% were classified as strong tornadoes (F2 or F3 intensity), and only 1% were classified as violent tornadoes (F4 or F5 intensity). Those violent tornadoes, while few in number, caused 67% of all tornado-related deaths nationally. Strong tornadoes accounted for another 29% of tornado-related deaths, while weak tornadoes caused only 4% of tornado-related deaths.

Michigan's Tornado Experience

National Weather Service data indicates that Michigan has experienced 923 tornadoes and 242 related deaths during the period from 1950 through 2009, an average of 15 tornadoes and 4 tornado-related deaths per year. The greatest number of tornadoes per year during that period occurred in 1974 with 39 tornadoes. The least number occurred in 1959 with only 2 tornadoes. From 1950 to March 2005, Michigan experienced 508 "tornado days" (defined as days in which tornadoes are observed), an average of nearly 9 days per year. Between 1996 and 2013 the tri-county region experienced 17 tornado events, totaling \$71.7 Million total in property damage. These events caused \$575,000 in crop damage, 8 injuries and 2 deaths. On average, the tri-county region experiences \$4.2 Million in property damage per year, and \$33,824 in crop damages.

Severe winds, which are wind events measured at velocities less than gale force, occurred 210 times in the tri-county region between 1996 and 2013. The region incurred \$14.4 Million in property damage and \$395,000 in crop damages and 2 deaths were reported for the time between 1996 to 2013.

Extreme Temperatures

Hazard Description - Prolonged periods of very high or very low temperatures, often accompanied by other extreme meteorological conditions. Prolonged periods of extreme temperatures pose severe problems for Michigan's citizens. Whether extreme summer heat or extreme winter cold, extreme temperature can be life threatening. Although they are radically different in terms of initiating conditions, the two hazards share a commonality in that they both primarily affect the most vulnerable segments of the

population – the elderly, children, impoverished individuals, and people in poor health. Due to their unique characteristics, extreme summer heat and extreme winter cold hazards will be discussed individually.

Extreme Summer Heat

Extreme summer weather is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over a long period, this phenomenon is commonly called a heat wave. The major threats of extreme summer heat are heatstroke (a major medical emergency), and heat exhaustion. Because the combined effects of high temperatures and high humidity are more intense in urban centers, heatstroke and heat exhaustion are a greater problem in cities than in suburban or rural areas. Nationwide, approximately 200 deaths a year are directly attributable to extreme heat. Extreme summer heat is also hazardous to livestock and agricultural crops, and it can cause water shortages, exacerbate fire hazards and prompt excessive demands for energy. Roads, bridges, railroad tracks and other infrastructure are susceptible to damage from extreme heat.

Air conditioning is the most effective measure for mitigating the effects of extreme heat on people. However, many people most vulnerable to this hazard do not live or work in air-conditioned environments. The use of fans to move air may help some, but recent research indicates that increased air movement may actually exacerbate heat stress in many individuals.

Extreme Temperature Events: During the second week of July 1936, a terrible heat wave struck the mid-Michigan, with temperatures exceeding 100 degrees for up to seven consecutive days. The extreme heat was an equal opportunity killer, causing many healthy adults to succumb to the heat at work or in the streets. Also, because most people relied on iceboxes to keep their food fresh, many heat-related deaths and illnesses occurred when the ice melted, and food spoiled. The summer of 1953 included eleven days in a row with temperatures of 90 degrees or higher in Southern Michigan, nine of which were 95 degrees or hotter, and also including two days that each hit 100 degrees.

The 1988 summer drought and heat wave in the Central and Eastern U.S. also greatly impacted the tri-county region. Nationwide, the drought caused an estimated \$40 billion in damages from agricultural losses, disruption of river transportation, water supply shortages, wildfires, and related economic impacts. The heat wave that accompanied the drought conditions was particularly long in Michigan – 39 days with 90 degree or better heat – eclipsing the previous record of 36 days recorded in the “dust bowl” days of 1934. Nationwide, the 1988 drought/heat wave caused an estimated 5,000 to 10,000 deaths. Extreme heat and humidity in the Midwest and Central Plains during parts of June, July and August of 2001 sent heat stress index readings soaring well above 100 degrees Fahrenheit on many days. On August 1 and August 8, heat advisories were issued for many counties in the southern Lower Peninsula, with heat indices at 105 degrees for some jurisdictions on the former date, and 110 degrees for some jurisdictions on the latter date.

Summary: Approximately once or twice per decade, extreme heat waves tend to cause human and infrastructure impacts across the county including power failures. Their frequency may be increasing, due to climate change. An extreme summer heat event inventory for the tri-county region is incomplete.

Extreme Winter Cold

Cold weather can result in a significant number of temperature-related deaths. Each year in the United States, approximately 700 people die because of severe cold temperature-related causes. This is substantially higher than the average of 200 heat-related deaths each year. It should be noted that a significant number of cold-related deaths are not the direct result of “freezing conditions. Rather, many deaths are the result of illnesses and diseases that are negatively impacted by severe cold weather, such as stroke, heart disease and pneumonia. It could convincingly be argued that, were it not for the extreme cold temperatures, death in many cases would not have occurred at the time it did from the illness or disease alone.

Severe winter weather hazards include snowstorms, blizzards, and extreme cold, ice and sleet storms. As a northern state, Michigan is vulnerable to all of these winter hazards. Most of the severe winter weather events that occur in Michigan have their origin as Canadian and Arctic cold fronts that move across the state from the west or northwest.

Extreme summer heat event inventory in the tri-county region database is admittedly incomplete.

Ice and Sleet Storms

Hazard Description - A storm that generates sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage. Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is similar to hail only smaller and can be easily identified as frozen rain drops (ice pellets) which bounce when hitting the ground or other objects. Sleet does not stick to trees and wires, but sleet in sufficient depth does cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surface, coating the ground, trees, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. When electric lines are downed, households may be without power for several days, resulting in significant economic loss and disruption of essential services in affected communities.

In December of 2013, a severe ice storm event occurred across mid-Michigan, impacting power grids for 1,000’s of residents. In the tri-county region, there were 21 ice/sleet storm events between 1996 and 2013. Property damages totaled \$995,000, an average of \$47,381 per year.

The following is from a Report on the Lansing Board of Water and Light’s Response to the December 2013 Ice Storm by the City of Lansing Community Review Team, a group

of citizen leaders and technical experts who assessed the situation and published a report to the City.

The December 2013, ice storm was the most catastrophic event to ever hit the Lansing Board of Water & Light's (BWL) electric service territory. While the duration of the restoration effort was neither better nor worse than other similar restoration efforts based on national data, it did cause significant hardship and suffering for customers who were out of service during the holiday season. The combination of disrupted holiday plans, the duration of outages and the cold weather was particularly difficult for the BWL's customers. In the wake of the storm the BWL pledged a top-down review of its performance during the ice storm and its aftermath. T

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Ice storms frequently result in a large number of extended outages because falling branches and trees take down individual services, secondary distribution lines, single and three phase primary lines, and can even damage high voltage transmission lines. Simply stated, they impact every segment of a utility's transmission and distribution system. These storms typically occur during the year when daylight hours are at a minimum and temperatures are below freezing, so crews must protect themselves from exposure. They may be accompanied by snow storms that further hinder restoration efforts. Unless the ice melts quickly, branches and trees continue to break days after the storm has passed damaging lines that had been repaired only days earlier. The BWL's crews experienced all these difficulties and in their restoration efforts.

The ice storm resulted in approximately 40% of the BWL's customers losing power; there has been no comparable loss among Michigan utilities. The BWL sustained over 2,400 downed power lines and replaced 5 miles of service lines, or half the normal annual volume, in the ten day restoration period. The volume of restoration work was unprecedented.

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The ice storm had a devastating impact on the BWL's electric distribution system. Approximately 40,000, or about 40%, of the BWL's customers lost power. The combination of ice accumulation and wind gusts up to 64 mph tested the design limits of the BWL's distribution infrastructure. This combination of ice and wind caused widespread destruction and damage to trees and other vegetation causing them to fall onto power lines. The falling limbs, trees, and other vegetation combined with the ice loading on distribution lines caused more than 2,400 lines to break.

Since much of the Lansing area has overhead distribution lines and extensive tree cover, line failures were extensive and included primary voltage lines, secondary voltage lines, and individual services. More than 1,000 individual service line failures occurred and these individual services required intensive one-on-one attention from restoration crews. In fact, the BWL replaced approximately 5 miles of service wire during the ten day restoration period. This accounts for nearly half of the BWL's typical annual replacement.

Snowstorms

Hazard Description - A period of rapid accumulation of snow often accompanied by high winds, cold temperatures, and low visibility. Because of being surrounded by the Great Lakes, Michigan experiences large differences in snowfall in relatively short distances. The average annual snowfall accumulation ranges from 30 to 200 inches of snow. The highest accumulations are in the northern and western parts of the Upper Peninsula. In Lower Michigan, the highest snowfall accumulations occur near Lake Michigan and in the higher elevations of northern Lower Michigan. Blizzards are the most dramatic and perilous of all snowstorms, characterized by low temperatures and strong winds (35+ miles per hour) bearing enormous amounts of snow. Most of the snow accompanying a blizzard is in the form of fine, powdery particles that are wind-blown in such great quantities that, at times, visibility is reduced to only a few feet. Blizzards have the potential to result in property damage and loss of life. Just the cost of clearing the snow can be enormous.

Beginning on January 26, 1977, a significant snowstorm affected much of southern Michigan. Blizzard winds caused extensive drifting of snow, blocking many roads. Many residents were isolated in rural residences or stranded in public shelters. This storm also resulted in a Presidential Emergency Declaration for 15 counties in the southern part of the state. Then, a severe snowstorm struck the Midwest January 26-27, 1978 and Michigan was at the center of the storm. Dubbed a "white hurricane" by some meteorologists, the storm measured 2,000 miles by 800 miles and produced winds with the same strength of a small hurricane and tremendous amounts of snow. In Michigan, up to 34 inches of snow fell in some areas, and winds of 50-70 miles per hour piled the snow into huge drifts. At the height of the storm, it was estimated that over 50,000 miles of roadway were blocked, 104,000 vehicles were abandoned on the highways, 15,000 people were being cared for in mass care shelters, and over 390,000 homes were without electric power. In addition, 38 buildings suffered partial or total roof collapse. Two days after the storm, snow still blocked over 90% of the state's road system and 8,000 people were still being cared for in shelters. The storm stranded 70,000 vehicles and 52,000 homes were still without electricity days later. This storm resulted in a Presidential Emergency Declaration for the entire state to provide assistance with snow clearance and removal operations.

In the early morning hours of January 2, 1999 a severe winter storm moved across the middle and southern lower Michigan. The storm grew in intensity and size, producing record snowfall that affected much of the southern two-thirds of the Lower Peninsula by the evening of January 3rd. High winds and frigid temperatures created blizzard conditions that lasted until late in the day on January 4. Subsequent storms over the next several days dumped an additional foot of snow in many areas of the state, resulting in snowfall of historic proportions in several Michigan communities. Combined, these winter storms produced the worst winter conditions to hit Michigan since the 1978 statewide blizzard. A Presidential Emergency Declaration was granted for the 31

Michigan counties that received record or near-record snowfall making available Federal snow removal assistance under the Federal Emergency Management Agency's (FEMA) Public Assistance Grant Program.

Between 1996 and 2013, snowstorm events in the tri-county region totaled 131. Property damage totaled \$3.07 Million during those same years, for an average of \$23,295 per year. No deaths or injuries were reported.

Fig. 47 Severe Winter Driving Hazards



Source: TCRPC

Geologic Hazards

Subsidence

Hazard Description - The lowering or collapse of the land surface caused by natural or human-induced activities that erode or remove subsurface support. Subsidence is the lowering or collapse of the land surface due to loss of subsurface support. It can be caused by a variety of natural or human-induced activities. Natural subsidence occurs when the ground collapses into underground cavities produced by the solution of limestone or other soluble materials by groundwater. Human-induced subsidence is caused principally by groundwater withdrawal, drainage of organic soils, and underground mining. In the United States, these activities have caused nearly 17,000 square miles of surface subsidence, with groundwater withdrawal (10,000 square miles of subsidence) being the primary culprit. In addition, approximately 18% of the United States land surface is underlain by cavernous limestone, gypsum, salt, or marble, making the surface of these areas susceptible to collapse into sinkholes.

Generally, subsidence poses a greater risk to property than to life. Nationally, the average annual damage from all types of subsidence is conservatively estimated to be at least \$125 million according to The National Research Council. There is little information or tracking of subsidence issues in mid-Michigan.

Flooding Hazards

Hazard Description - The overflowing of rivers, streams, drains and lakes due to excessive rainfall, rapid snowmelt or ice. Flooding of land adjoining the normal course of a stream or river has been a natural occurrence since the beginning of history. If these

floodplain areas were left in their natural state, floods would not cause significant damage. Development has increased the potential for serious flooding because rainfall that used to soak into the ground or take several days to reach a river or stream via a natural drainage basin now quickly runs off streets, parking lots, and rooftops, and through man-made channels and pipes. Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for several days without power or heat, or they may be unable to reach their homes at all. Long-term collateral dangers include the outbreak of disease, widespread animal death, broken sewer lines causing water supply pollution, downed power lines, broken gas lines, fires, and the release of hazardous materials.

The primary flooding sources include the Great Lakes and connecting waters (Detroit River, St. Clair River and St. Mary's River), thousands of miles of rivers and streams, and hundreds of inland lakes. Michigan is divided into 63 major watersheds. All of these watersheds experience flooding, although the following watersheds have experienced the most extensive flooding problems or have significant damage potential: 1) Clinton River; 2) Ecorse River; 3) Grand River; 4) Huron River; 5) Kalamazoo River; 6) Muskegon River; 7) Saginaw River; 8) Rifle River; 9) River Raisin; 10) Rouge River; 11) St. Joseph River; and 12) Whitefish River. The flooding is not restricted to the main branches of these rivers.

Most riverine flooding occurs in early spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Ice jams also cause flooding in winter and early spring. Severe thunderstorms may cause flooding during the summer or fall, although these are usually localized and have more impact on watercourses with smaller drainage areas. Oftentimes, flooding may not necessarily be directly attributable to a river, stream or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall and/or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. That type of flooding is becoming increasingly prevalent in Michigan, as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Flooding also occurs due to combined storm and sanitary sewers that cannot handle the tremendous flow of water that often accompanies storm events. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns.

Flood Events in the Tri-County Region

One of the most disastrous and extensive floods ever to occur in Michigan struck the central and southern Lower Peninsula during March 24-27, 1904. The flooding was caused by runoff resulting from intense rainfall, compounded by heavy snow pack and frozen soils. The flooding was most prevalent in the Grand, Kalamazoo, Saginaw and River Raisin basins and to a lesser extent in the Huron and St. Joseph River basins.

(The flood peaks from this flood are still the highest associated with spring flooding in the southern Lower Peninsula since record keeping began.) Damage was widespread and severe.

A flood on April 4-11, 1947 was caused by a combination of snow and rainfall that began in late March of that year. Two frontal systems in early April dumped several inches of rain in many localities across central and eastern Lower Michigan. The areas primarily affected by the April, 1947 flood included the Clinton, Detroit, Grand, Kalamazoo, Saginaw and St. Clair Rivers, and the River Rouge.

A series of intense thunderstorms struck southern Lower Michigan in the last two weeks of April 1975, spawning several tornadoes and causing widespread flooding over a 21 county area. Total public and private damage was nearly \$58 million dollars. A Presidential Major Disaster Declaration was granted for the 21 affected counties.

Fig. 48 Flood of 1975, Lansing/East Lansing MI



Source: TCRPC

In May 2004, a stationary front over Iowa, Wisconsin, and Michigan brought severe thunderstorms and heavy rains, which caused widespread flooding across the region. Much of the rainfall occurred in saturated areas that had experienced well-above average precipitation for the month of May. Backyards were submerged under several feet of water. Total rainfall over the Grand River basin from May 20th through June 3rd varied from four to as much as seven inches. It was the biggest and longest duration flooding event in the past twenty years across southwestern and south central Lower Michigan. It was the wettest May on record in Lansing and Muskegon and the third wettest May on record in Grand Rapids. A Presidential Major Disaster Declaration was granted to 23 counties in Southern Lower Michigan.

Fig. 49 & 50 Flooding at MSU, and Meridian Township, 2004



Source: TCRPC

National Flood Insurance Program

For many years, the response to reducing flood damages followed a structural approach of building dams, levees and making channel modifications. However, this approach did not slow the rising cost of flood damage, plus individuals could not purchase insurance to protect themselves from flood damage. It became apparent that a different approach was needed.

The National Flood Insurance Program (NFIP) was instituted in 1968 to make flood insurance available in those communities agreeing to regulate future floodplain development. As a participant in the NFIP, a community must adopt regulations that:

- 1) Require any new residential construction within the 100- year floodplain to have the lowest floor, including the basement, elevated above the 100-year flood elevation;
- 2) Allow non-residential structures to be elevated or dry flood proofed (the flood proofing must be certified by a registered professional engineer or architect); and
- 3) Require anchoring of manufactured homes in flood prone areas. The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed.

In return for adopting floodplain management regulations, the federal government makes flood insurance available to the residents of that community. In 1973, the NFIP was amended to mandate the purchase of flood insurance as a condition of any federally regulated, supervised or insured loan on any construction or building within the 100-year floodplain. Currently, there are about 25,956 flood insurance policies in force in Michigan, which amounts to approximately \$2.5 billion worth of coverage. About 18,621 (71.1%) of these policies are within an identified flood hazard area, and the remainder are for properties located outside flood hazard areas. Officials from FEMA and the MDEQ estimate that only 15% of all flood prone structures in Michigan eligible to purchase flood insurance actually have flood insurance. Furthermore, since only about 40% of the communities in Michigan participate in the NFIP, there are thousands of structures that are flood prone, but are not eligible to purchase flood insurance.

All Flood Insurance Rate maps for the tri-county region are available at the FEMA Flood Map Service Center website:

<https://msc.fema.gov/portal/search?AddressQuery=lansing%20MI>.

Flood Insurance Rate Maps were analyzed as a part of this plan update. The four jurisdictions covered by this plan update are active in the NFIP. Any properties located within the identified flood areas are susceptible to flood events any given year. Sample maps from each County and Delta Charter Township are depicted below:

FEMA’s Community Status Book reports that the following communities are participating in the national flood program:

Fig. 51 FEMA Community Status Chart

Clinton County	Eaton County	Ingham County
Bath Charter Twp	Bellevue (Village and Twp)	Alaiedon Twp
Bengal Twp	Brookfield Twp	Aurelius Twp
Bingham Twp	Carmel Twp	Bunker Hill Twp
Dallas Twp	City of Charlotte	Delhi Charter Twp
DeWitt (City & Charter Twp)	Delta Charter Twp	Lansing Charter Twp
East Lansing	Village of Dimondale	Leroy Twp
Village of Elsie	Eaton Rapids (City & Twp)	Leslie (City & Twp)
Lebanon Twp	City of Grand Ledge	Locke Twp

Village of Maple Rapids	Hamlin Twp	City of Mason
Olive Twp	Kalamo Twp	Meridian Charter Twp
Ovid (Village & Twp)	City of Olivet	Onondaga Twp
City of St Johns	Oneida Charter Twp	Stockbridge (City & Twp)
Watertown Charter Twp	City of Pottersville	Vevay Twp
Westphalia Twp	Roxand Twp	Victor Twp
	Sunfield Twp	Village of Webberville
	Vermontville Twp	White Oak Twp
	Walton Twp	Williamstown Twp
	Windsor Charter Twp	City of Williamston

Fig. 52 Delta Charter Township FIRM

Fig.
of



53 City
Mason
FIRM

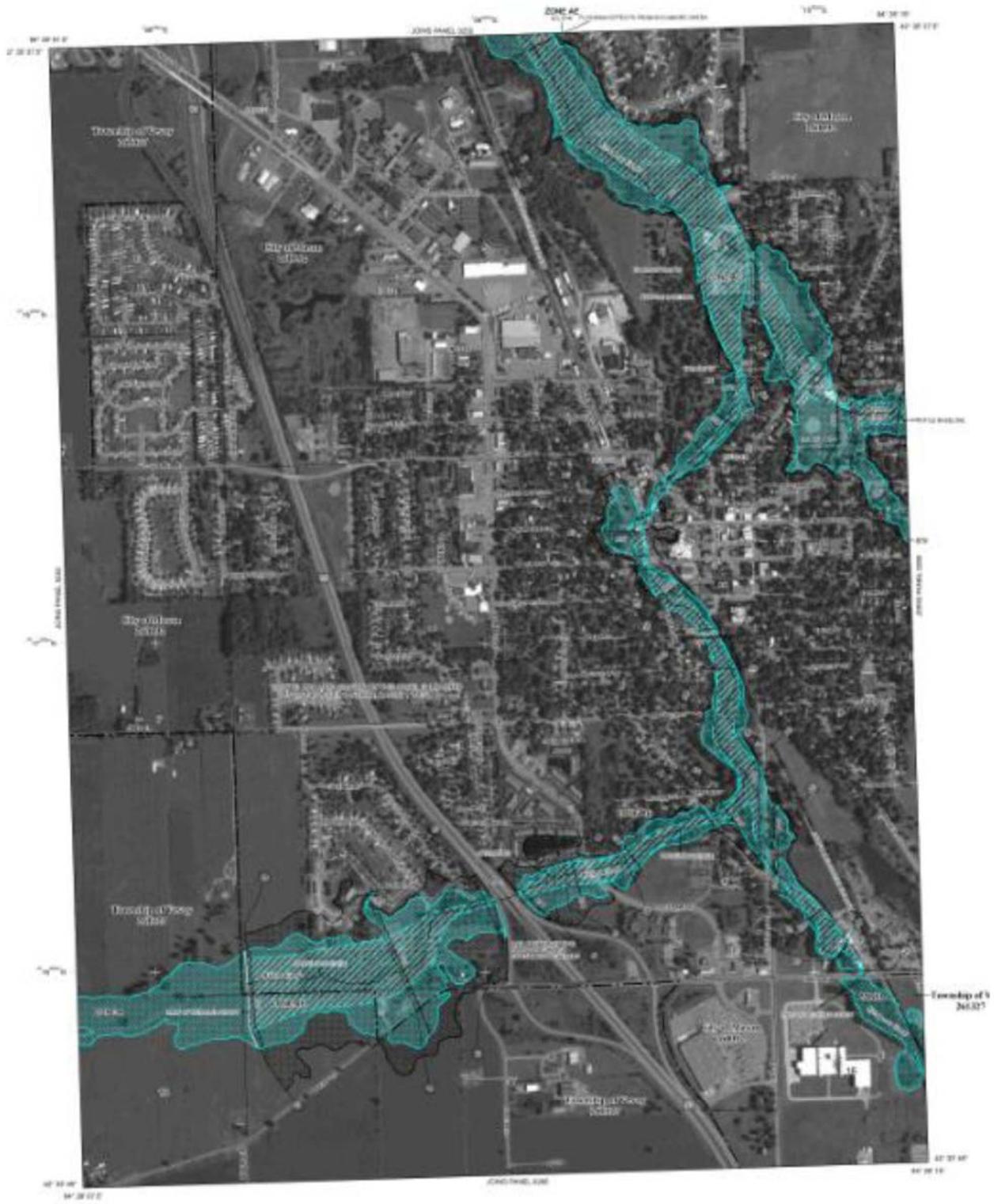
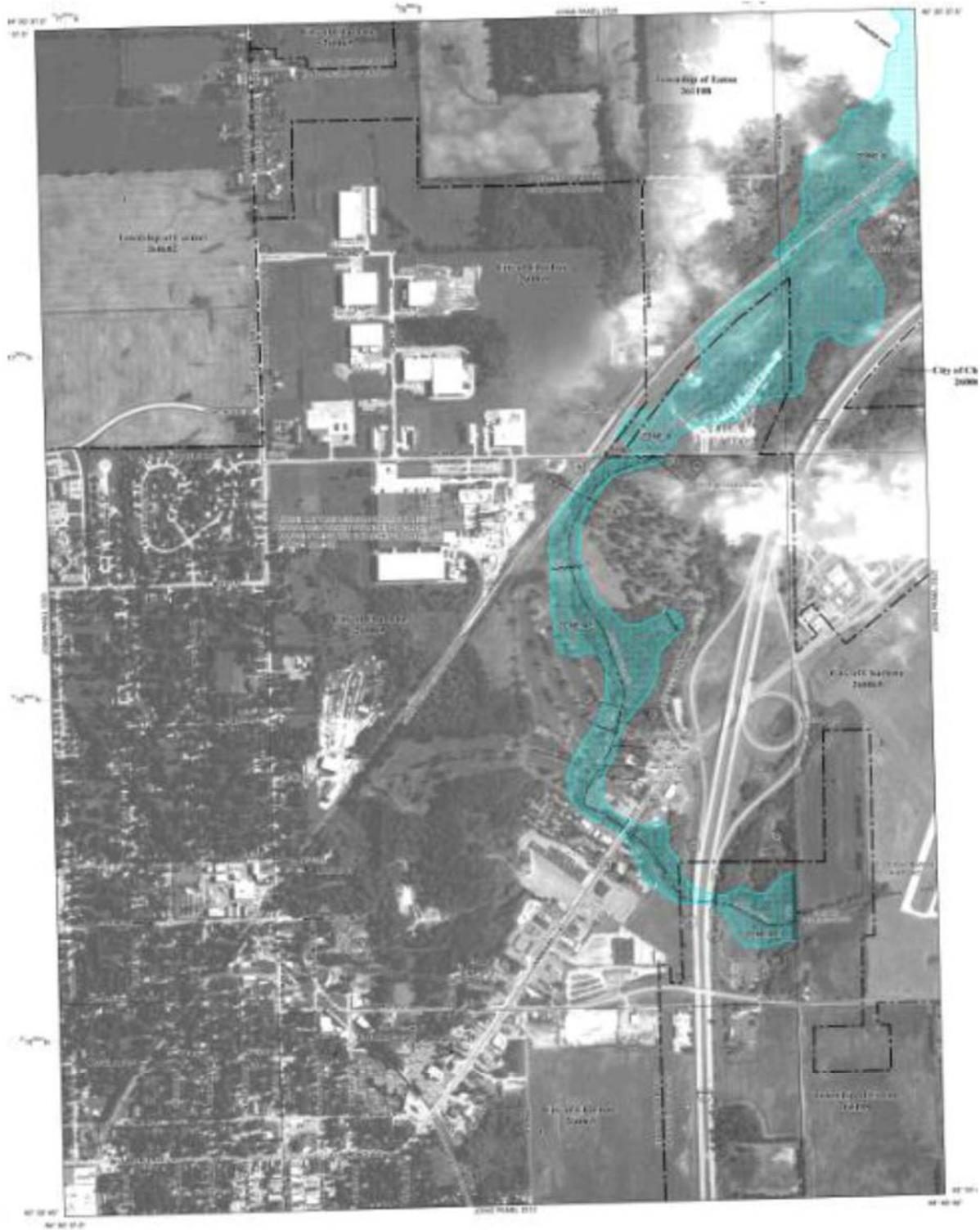


Fig. 54 City of St. Johns FIRM



Fig. 55 City of Charlotte



Repetitive Loss Property Information in the Tri-County Region

The National Flood Insurance Program (NFIP) maintains a list of “repetitive loss properties” that have suffered from multiple costly incidents of flood damage. Special funds can be obtained through the Repetitive Flood Claims program in order to achieve flood mitigation objectives for these structures at a reduced non-federal cost share (10% rather than 25%). Although detailed insurance information must be kept confidential, it is necessary for this plan to include a consideration of these high-priority properties that are vulnerable to regular flooding. Within each county, the following repetitive loss properties should be prioritized for flood mitigation activities, due to their demonstrated recent need.

Clinton County’s NFIP listings have a total of nine repetitive-loss properties officially identified by the NFIP. However, it is evident by inspecting the (confidential) property addresses that eight out of these nine properties have been misclassified by the NFIP as being within the wrong county, and should instead be included in the listings for Ingham County. Four of these properties are located in the City of East Lansing, and they include two single-family homes—the first of which had suffered an average of \$5,225 per flood event, over three events since 1980, and the second of which had suffered an average of \$15,780 per event in two events during the same time period. The other two East Lansing properties are classified as “other residential” type, which had suffered an average of \$3,868 per event during two events in the 1980s, and “2-4 family” type, which had suffered an average of \$8,900 per event during three events since 2008. There are four structures identified within the City of Lansing, one of which is listed as “mitigated.” The three non-mitigated structures include one non-residential building that had two flood events since 2000 which caused an average of \$38,062 per event; one single-family home that had two events during the 1980s with an average of about \$1,500 in damage per event; and one “other residential” structure that saw an average of \$2,123 in damage in each of its two reported flood events during the early 1980s. The one property on the list that is actually located in Clinton County is a non-residential structure within Victor Township, which suffered an average of \$82,836 in damages from each of its two reported events since 2000.

Eaton County has a total of twelve repetitive loss properties listed in the official NFIP database. Two are in Delta Township—a single family home that has suffered an average of \$4,263 per event during two events in the 1980s, and a non-residential structure that has seen an average of \$20,861 in damage during each of its three reported events since 1980. One property was noted within the City of Eaton Rapids, a single-family home with two flood events since 1999, which averaged \$2,498 in damage per event. Eaton Rapids Township also has a vulnerable single-family home that saw three damaging flood events starting in 2008, causing an average of \$5,287 in damage each time. Finally, Windsor Township has eight single-family homes on the official list, three of which are located on the same street. All eight of these homes have a history of two reported flood events, mostly during the 1980s but a quarter of the events have occurred since 2004. The average damage per event for each home was \$5,740.

Ingham County had eight properties mistakenly listed within Clinton County (see the paragraph above, for more information), but also has four properties correctly classified within the official NFIP database. (One additional listing of a property in the City of Mason has been denoted as “mitigated.”) All four of the remaining Ingham County properties in the repetitive loss list are single-family homes located in Meridian Township, and two of them are located on the same street. Two of these homes have endured three reported flood losses since 1980, while the other two have experienced two flood events during that same time. The average loss per event to each of these four houses was \$9,268.

Dam Failures

Hazard Description - The collapse or failure of an impoundment that results in downstream flooding. A dam failure can result in loss of life and extensive property or natural resource damage for miles downstream from the dam. Dam failures occur not only during flood events, which may cause overtopping of a dam, but also because of poor operation, lack of maintenance and repair, and vandalism. Such failures can be catastrophic because they occur unexpectedly, with no time for evacuation. The Michigan Department of Environmental Quality (MDEQ) has documented approximately 278 dam failures in Michigan.

The definition for these rating by Michigan law (Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act) is as follows: “High hazard potential dam” means a dam located in an area where a failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways, or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life. “Significant hazard potential dam” means a dam located in an area where its failure may cause damage limited to isolated inhabited homes, agricultural buildings, structures, secondary highways, short line railroads, or public utilities, where environmental degradation may be significant, or where danger to individuals exists. There are several dams whose failure would potentially harm area property and residents with flash flooding, but there is no history of this occurring at any recent time within the county.

Drought

Hazard Description – Drought is a water shortage caused by a deficiency of rainfall, generally lasting for an extended period. Drought is a normal part of the climate of Michigan and of virtually all other climates around the world – including areas with high and low average rainfall. Drought differs from normal arid conditions found in low rainfall areas in that aridity is a permanent characteristic of that type of climate. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period, usually a season or more in length. The severity of a drought depends not only on its location, duration and geographical extent, but also on the water supply demands made by human activities and vegetation. This multi-faceted nature of the hazard makes it difficult to define a drought and assess when and where one is likely to occur. Drought differs from other natural hazards in several ways. First, it is difficult to

determine the exact beginning and end of a drought, since its effects may accumulate slowly and linger even after the event is generally thought of as being over. Second, the lack of a clear-cut definition of drought often makes it difficult to determine whether one actually exists, and if it does, its degree of severity. Third, drought impacts are often less obvious than other natural hazards, and they are typically spread over a much larger geographic area. Fourth, due primarily to the aforementioned reasons, most communities do not have in place any contingency plans for addressing drought. This lack of pre-planning can greatly hinder a community's response capability when a drought does occur.

Droughts can cause many severe impacts on communities and regions. Impacts include 1) water shortages for human consumption, industrial, business and agricultural uses, power generation, recreation and navigation; 2) a drop in the quantity and quality of agricultural crops; 3) decline of water quality in lakes, streams and other natural bodies of water; 4) malnourishment of wildlife and livestock; 5) increase in wildfires and wildfire-related losses to timber, homes and other property; 6) declines in tourism in areas dependent on water-related activities; 7) declines in land values due to physical damage from the drought conditions and/or decreased economic or functional use of the property; 8) reduced tax revenue due to income losses in agriculture, retail, tourism and other economic sectors; 9) increases in insect infestations, plant disease, and wind erosion; and 10) possible loss of human life due to food shortages, extreme heat, fire, and other health-related problems such as diminished sewage flows and increased pollutant concentrations in surface water.

The available NCDC drought records (those that use the Palmer drought index) began with a period of extreme drought throughout Michigan. Every one of Michigan's climate divisions registered drought conditions for at least 8 months—some as long as 17 months—during this period from 1895-1986. Recovery was spotty and temporary over the following few years, and it is probable that numerous areas felt little distinction between this drought event and the only that followed closely afterward.

Without a doubt, the "Dust Bowl" drought of the 1930s was the most famous drought ever to occur in the U.S. It was caused by misuse of the land combined with years with lack of rainfall. As the land dried up, great clouds of dust and sand, carried by the wind, covered everything and the term "Dust Bowl" was coined. As a result of this drought, millions of acres of farmland became useless, forcing hundreds of thousands of people to leave their farms and seek an existence elsewhere. Although exact figures were not kept, some researchers estimate that nearly \$1 billion (in 1930s dollars) was provided in assistance to victims of the Dust Bowl drought. That event also ushered in a new era of farming and conservation programs and practices aimed at preventing a recurrence of a drought of the magnitude and impact of the Dust Bowl drought. In Michigan, this "dust bowl" period took the form of a most severe statewide drought condition from 1929 to 1932, followed by a less severe period from 1933 to 1937 in which the general pattern involved the south and western areas seeing the hardest conditions.

The most extreme conditions ever seen in Michigan occurred in the period from 1929 to 1932. Nine out of Michigan's ten climatic divisions set their all-time drought records during the beginning of 1931. Between 1930 and 1931, all nine of Michigan's most heavily affected climate divisions experienced this most unusual level of drought for at least 6 straight months. Unfortunately, those areas that experienced the more prolonged conditions of extreme drought were also the most heavily agricultural areas of the state, in the southern Lower Peninsula. The drought / heat wave that struck Michigan during the summer of 2001 damaged or destroyed approximately one-third of the state's fruit, vegetable and field crops, resulting in a U.S. Department of Agriculture Disaster Declaration for 82 of the state's counties. In 2002, moderate to extreme drought affected more than 45 percent of the country during the months of June, July and August. Nationwide, the summer was the third hottest on record, following only 1936 and 1934. The summer of 2002 was also very hot and dry in Michigan. During the first half of the month, hundreds of communities across the area were under water restrictions. Hardest hit from the drought was the agricultural industry. The severely dry weather was classified as a drought until mid-2003.

An analysis by year tends to overstate Michigan's drought-susceptibility, because the presence of a single drought month may be counted the same as an entire year of sustained drought (although longer drought periods often will be distinguished by having more severe Palmer Index values). A single month's drought will not necessarily cause severe agricultural impacts, because the timing of the drought with regard to the crop cycle is also important for the extent of drought impact. A drought event inventory in the tri-county region database is admittedly incomplete, with no damages or injuries reported between 1996 and 2013.

Storm Events

Clinton, Eaton, Ingham Counties and Delta Charter Township have each weathered many instances of storms since 2004. The National Climatic Data Center offers the following comprehensive listings of events within each jurisdiction. The following charts list the location, county, date, time, type of storm event, magnitude, deaths, injuries, property damage estimates and crop damage estimates beginning with Clinton County, then Eaton County and finishing with Ingham County.

Location	County/Zone	St	Date	Time	T.Z.	Type	Mag	Dth	Ini	PrD	CrD
Totals:								0	0	9.349M	320.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/14/2004	04:00	EST	Heavy Snow		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/27/2004	07:00	EST	Winter Storm		0	0	0.00K	0.00K
MAPLE RAPIDS	CLINTON CO.	MI	05/14/2004	14:38	EST	Tornado	F0	0	0	150.00K	50.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	05/21/2004	23:32	EST	Flood		0	0	1.000M	200.00K
DE WITT	CLINTON CO.	MI	05/23/2004	18:10	EST	Thunderstorm Wind	53 kts. EG	0	0	30.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	06/13/2004	16:43	EST	Thunderstorm Wind	53 kts. EG	0	0	5.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/14/2004	12:42	EST	Hail	1.00 in.	0	0	10.00K	10.00K
ST JOHNS	CLINTON CO.	MI	07/13/2004	20:10	EST	Hail	1.00 in.	0	0	5.00K	5.00K
DE WITT	CLINTON CO.	MI	07/13/2004	20:25	EST	Thunderstorm Wind	53 kts. EG	0	0	5.00K	0.00K
DE WITT	CLINTON CO.	MI	07/13/2004	21:15	EST	Thunderstorm Wind	53 kts. EG	0	0	10.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	10/30/2004	11:00	EST	High Wind	50 kts. EG	0	0	50.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	11/24/2004	12:00	EST	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/21/2005	23:00	EST	Heavy Snow		0	0	0.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	06/05/2005	17:06	EST	Thunderstorm Wind	52 kts. EG	0	0	20.00K	0.00K
DE WITT	CLINTON CO.	MI	06/09/2005	17:54	EST	Thunderstorm Wind	52 kts. EG	0	0	10.00K	10.00K
DE WITT	CLINTON CO.	MI	06/09/2005	18:26	EST	Thunderstorm Wind	52 kts. EG	0	0	10.00K	10.00K
MAPLE RAPIDS	CLINTON CO.	MI	07/24/2005	06:45	EST	Thunderstorm Wind	53 kts. EG	0	0	25.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	07/24/2005	07:05	EST	Thunderstorm Wind	53 kts. EG	0	0	10.00K	0.00K
ST JOHNS	CLINTON CO.	MI	09/22/2005	12:40	EST	Thunderstorm Wind	53 kts. EG	0	0	20.00K	0.00K
ST JOHNS	CLINTON CO.	MI	09/22/2005	16:30	EST	Thunderstorm Wind	53 kts. EG	0	0	10.00K	5.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/08/2005	16:00	EST	Heavy Snow		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/20/2006	19:00	EST	Heavy Snow		0	0	0.00K	0.00K
OVID	CLINTON CO.	MI	06/03/2006	13:20	EST	Hail	0.88 in.	0	0	5.00K	5.00K
LANSING ARPT	CLINTON CO.	MI	08/02/2006	20:49	EST	Thunderstorm Wind	51 kts. MG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	09/23/2006	17:30	EST	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	10/02/2006	13:45	EST-5	Hail	0.88 in.	0	0	10.00K	10.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/01/2006	04:00	EST-5	Ice Storm		0	0	30.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/14/2007	09:00	EST-5	Winter Storm		0	0	25.00K	0.00K
FOWLER	CLINTON CO.	MI	06/02/2007	13:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/04/2007	16:47	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/19/2007	04:10	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BATH	CLINTON CO.	MI	07/05/2007	12:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
OVID	CLINTON CO.	MI	07/19/2007	13:26	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
MAPLE RAPIDS	CLINTON CO.	MI	08/22/2007	20:58	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
WAOOUSTA	CLINTON CO.	MI	08/23/2007	18:12	EST-5	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
EUREKA	CLINTON CO.	MI	08/29/2007	14:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
ST JOHNS	CLINTON CO.	MI	08/29/2007	15:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
OVID	CLINTON CO.	MI	08/29/2007	15:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
EAGLE	CLINTON CO.	MI	09/25/2007	17:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	09/25/2007	17:15	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/01/2007	17:00	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/15/2007	19:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/01/2008	03:00	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/06/2008	12:30	EST-5	Winter Storm		0	0	0.00K	0.00K
MAPLE RAPIDS	CLINTON CO.	MI	04/11/2008	15:53	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K

MAPLE RAPIDS	CLINTON CO.	MI	04/11/2008	15:53	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
DE WITT	CLINTON CO.	MI	04/11/2008	16:32	EST-5	Hail	1.25 in.	0	0	10.00K	10.00K
DE WITT	CLINTON CO.	MI	04/11/2008	16:32	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
DE WITT	CLINTON CO.	MI	04/11/2008	16:34	EST-5	Hail	1.00 in.	0	0	10.00K	5.00K
MERLE BEACH	CLINTON CO.	MI	05/17/2008	17:03	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
ST JOHNS ARCHER FLD	CLINTON CO.	MI	05/17/2008	17:08	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
WESTPHALIA	CLINTON CO.	MI	06/06/2008	16:28	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/06/2008	16:29	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
MERLE BEACH	CLINTON CO.	MI	06/06/2008	16:30	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/06/2008	16:30	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
MERLE BEACH	CLINTON CO.	MI	06/06/2008	17:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/06/2008	17:15	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/06/2008	17:22	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	06/06/2008	17:36	EST-5	Thunderstorm Wind	65 kts. EG	0	0	50.00K	0.00K
DE WITT	CLINTON CO.	MI	06/07/2008	21:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DE WITT	CLINTON CO.	MI	06/07/2008	22:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	07/02/2008	14:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	11/30/2008	12:30	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/01/2008	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/19/2008	04:30	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/28/2008	04:00	EST-5	High Wind	52 kts. EG	0	0	0.00K	0.00K
EAGLE	CLINTON CO.	MI	06/19/2009	21:30	EST-5	Flash Flood		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/24/2009	12:00	EST-5	Winter Weather		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/09/2010	07:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/22/2010	00:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
EAGLE	CLINTON CO.	MI	06/04/2010	17:24	EST-5	Thunderstorm Wind	65 kts. EG	0	0	200.00K	0.00K
(LAN)CAPITOL CTY ARP	CLINTON CO.	MI	06/04/2010	17:51	EST-5	Thunderstorm Wind	55 kts. EG	0	0	50.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/01/2011	19:00	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/20/2011	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	03/22/2011	20:00	EST-5	Winter Weather		0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	04/19/2011	22:18	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
OVID KOSHT ARPT	CLINTON CO.	MI	06/22/2011	12:30	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
ST JOHNS GLOWACKI FL	CLINTON CO.	MI	08/20/2011	13:45	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	11/29/2011	18:00	EST-5	Winter Storm		0	0	1.000M	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	02/23/2012	20:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	05/03/2012	16:45	EST-5	Thunderstorm Wind	65 kts. EG	0	0	100.00K	0.00K
MERLE BEACH	CLINTON CO.	MI	05/03/2012	17:03	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
FOWLER	CLINTON CO.	MI	07/05/2012	02:07	EST-5	Thunderstorm Wind	51 kts. MG	0	0	1.00K	0.00K
FOWLER	CLINTON CO.	MI	07/05/2012	02:07	EST-5	Thunderstorm Wind	51 kts. MG	0	0	1.00K	0.00K
ST JOHNS	CLINTON CO.	MI	07/05/2012	02:15	EST-5	Thunderstorm Wind	52 kts. EG	0	0	25.00K	0.00K
MATHERTON	CLINTON CO.	MI	04/17/2013	16:00	EST-5	Flood		0	0	5.000M	0.00K
(LAN)CAPITOL CTY ARP	CLINTON CO.	MI	05/28/2013	19:07	EST-5	Thunderstorm Wind	70 kts. EG	0	0	25.00K	0.00K
MERLE BEACH	CLINTON CO.	MI	05/30/2013	18:45	EST-5	Thunderstorm Wind	61 kts. EG	0	0	15.00K	0.00K
(LAN)CAPITOL CTY ARP	CLINTON CO.	MI	11/17/2013	16:39	EST-5	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	11/17/2013	19:00	EST-5	High Wind	61 kts. EG	0	0	100.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	12/21/2013	18:00	EST-5	Ice Storm		0	0	1.000M	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	01/04/2014	20:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
CLINTON (ZONE)	CLINTON (ZONE)	MI	03/12/2014	01:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
ST JOHNS	CLINTON CO.	MI	04/12/2014	17:31	EST-5	Thunderstorm Wind	70 kts. EG	0	0	50.00K	0.00K
ST JOHNS	CLINTON CO.	MI	07/06/2014	23:50	EST-5	Thunderstorm Wind	61 kts. EG	0	0	50.00K	0.00K
ST JOHNS GLOWACKI FL	CLINTON CO.	MI	07/07/2014	00:00	EST-5	Tornado	EF0	0	0	50.00K	0.00K
EAST DE WITT	CLINTON CO.	MI	07/27/2014	14:30	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
DE WITT	CLINTON CO.	MI	08/19/2014	14:41	EST-5	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K

Location	County/Zone	St	Date	Time	T.Z	Type	Mag	Dth	Inj	PrD	CrD
Totals:									0 5	55.203M	925.00K
EATON (ZONE)	EATON (ZONE)	MI	01/27/2004	07:00	EST	Winter Storm			0 0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	05/09/2004	12:50	EST	Thunderstorm Wind	53 kts. EG		0 0	20.00K	5.00K
MULLIKEN	EATON CO.	MI	05/10/2004	17:35	EST	Thunderstorm Wind	65 kts. EG		0 0	50.00K	10.00K
BELLEVUE	EATON CO.	MI	05/10/2004	19:15	EST	Thunderstorm Wind	53 kts. EG		0 0	25.00K	10.00K
BELLEVUE	EATON CO.	MI	05/14/2004	14:56	EST	Thunderstorm Wind	53 kts. EG		0 0	50.00K	10.00K
CHARLOTTE	EATON CO.	MI	05/21/2004	12:12	EST	Hail	0.75 in.		0 0	40.00K	10.00K
EATON (ZONE)	EATON (ZONE)	MI	05/21/2004	23:32	EST	Flood			0 0	1.000M	200.00K
CHARLOTTE	EATON CO.	MI	05/23/2004	15:50	EST	Hail	1.75 in.		0 0	40.00K	40.00K
VERMONTVILLE	EATON CO.	MI	06/14/2004	12:35	EST	Hail	0.75 in.		0 0	10.00K	5.00K
GRAND LEDGE	EATON CO.	MI	07/13/2004	21:05	EST	Thunderstorm Wind	53 kts. EG		0 0	15.00K	0.00K
VERMONTVILLE	EATON CO.	MI	08/02/2004	15:57	EST	Hail	0.75 in.		0 0	10.00K	5.00K
VERMONTVILLE	EATON CO.	MI	08/25/2004	16:50	EST	Thunderstorm Wind	85 kts. EG		0 0	100.00K	25.00K
VERMONTVILLE	EATON CO.	MI	08/25/2004	16:53	EST	Tornado	F0		0 0	50.00K	25.00K
EATON (ZONE)	EATON (ZONE)	MI	10/30/2004	11:00	EST	High Wind	50 kts. EG		0 0	50.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	11/24/2004	12:00	EST	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	01/21/2005	23:00	EST	Heavy Snow			0 0	0.00K	0.00K
MULLIKEN	EATON CO.	MI	06/05/2005	16:58	EST	Thunderstorm Wind	52 kts. EG		0 0	25.00K	0.00K
GRAND LEDGE	EATON CO.	MI	06/05/2005	17:42	EST	Hail	0.75 in.		0 0	10.00K	10.00K
GRAND LEDGE	EATON CO.	MI	06/09/2005	19:05	EST	Hail	0.75 in.		0 0	25.00K	15.00K
NEEDMORE	EATON CO.	MI	06/14/2005	14:13	EST	Hail	0.75 in.		0 0	5.00K	5.00K
EATON RAPIDS	EATON CO.	MI	06/26/2005	16:50	EST	Thunderstorm Wind	52 kts. EG		0 0	15.00K	0.00K
OLIVET STATION	EATON CO.	MI	06/30/2005	08:45	EST	Thunderstorm Wind	52 kts. EG		0 0	10.00K	0.00K
CHARLOTTE	EATON CO.	MI	07/04/2005	17:00	EST	Thunderstorm Wind	53 kts. EG		0 0	10.00K	0.00K
CHARLOTTE	EATON CO.	MI	07/18/2005	13:45	EST	Thunderstorm Wind	53 kts. EG		0 0	10.00K	0.00K
BELLEVUE	EATON CO.	MI	07/20/2005	16:28	EST	Thunderstorm Wind	53 kts. EG		0 0	25.00K	0.00K
GRAND LEDGE	EATON CO.	MI	07/24/2005	07:15	EST	Thunderstorm Wind	53 kts. EG		0 0	25.00K	0.00K
EATON RAPIDS	EATON CO.	MI	07/26/2005	01:35	EST	Thunderstorm Wind	50 kts. MG		0 0	10.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/08/2005	16:00	EST	Heavy Snow			0 0	0.00K	0.00K
GRAND LEDGE	EATON CO.	MI	08/02/2006	20:37	EST	Thunderstorm Wind	53 kts. EG		0 0	10.00K	0.00K
BELLEVUE	EATON CO.	MI	09/13/2006	01:55	EST	Thunderstorm Wind	52 kts. EG		0 0	10.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/01/2006	04:00	EST-5	Ice Storm			0 0	25.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	01/14/2007	09:00	EST-5	Winter Storm			0 0	25.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/02/2007	19:00	EST-5	Blizzard			0 0	0.00K	0.00K
MILLETT	EATON CO.	MI	05/15/2007	18:11	EST-5	Thunderstorm Wind	50 kts. EG		0 0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	06/02/2007	12:40	EST-5	Hail	0.75 in.		0 0	0.00K	0.00K
EATON RAPIDS SKYWAY	EATON CO.	MI	08/23/2007	18:04	EST-5	Thunderstorm Wind	50 kts. EG		0 0	100.00K	0.00K
KALAMO	EATON CO.	MI	08/24/2007	15:07	EST-5	Thunderstorm Wind	52 kts. EG		0 0	40.00K	0.00K
CHARLOTTE	EATON CO.	MI	08/24/2007	15:25	EST-5	Tornado	EF3		0 5	40.000M	0.00K
BELLEVUE	EATON CO.	MI	08/29/2007	16:55	EST-5	Thunderstorm Wind	52 kts. EG		0 0	0.00K	0.00K
MULLIKEN	EATON CO.	MI	10/18/2007	18:41	EST-5	Funnel Cloud			0 0	0.00K	0.00K
POTTERVILLE	EATON CO.	MI	10/18/2007	22:12	EST-5	Thunderstorm Wind	52 kts. EG		0 0	1.00K	0.00K
GRESHAM	EATON CO.	MI	10/18/2007	22:12	EST-5	Thunderstorm Wind	52 kts. EG		0 0	1.00K	0.00K
BELLEVUE	EATON CO.	MI	10/18/2007	22:30	EST-5	Thunderstorm Wind	59 kts. EG		0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/01/2007	17:00	EST-5	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/15/2007	19:00	EST-5	Heavy Snow			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/31/2007	20:30	EST-5	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	01/01/2008	00:00	EST-5	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/01/2008	02:18	EST-5	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/06/2008	11:00	EST-5	Winter Storm			0 0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	03/21/2008	14:00	EST-5	Winter Storm			0 0	0.00K	0.00K
GRAND LEDGE	EATON CO.	MI	04/11/2008	16:24	EST-5	Hail	0.75 in.		0 0	0.00K	0.00K

SUNFIELD	EATON CO.	MI	06/06/2008	15:45	EST-5	Thunderstorm Wind	65 kts. EG	0	0	0.00K	0.00K
HOYTVILLE	EATON CO.	MI	06/06/2008	15:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MULLIKEN ARPT	EATON CO.	MI	06/06/2008	16:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
SHAYTOWN	EATON CO.	MI	06/06/2008	16:25	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
BELLEVUE	EATON CO.	MI	06/07/2008	21:12	EST-5	Flash Flood		0	0	600.00K	200.00K
ONEIDA CENTER	EATON CO.	MI	06/07/2008	21:41	EST-5	Thunderstorm Wind	65 kts. EG	0	0	0.00K	0.00K
DAWN HAVEN ESTATES	EATON CO.	MI	06/07/2008	21:45	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
DAWN HAVEN ESTATES	EATON CO.	MI	06/07/2008	21:50	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
DAWN HAVEN ESTATES	EATON CO.	MI	06/07/2008	21:50	EST-5	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
BELLEVUE	EATON CO.	MI	06/08/2008	14:42	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
KELLY	EATON CO.	MI	06/08/2008	14:43	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
NEEDMORE	EATON CO.	MI	06/08/2008	14:45	EST-5	Tornado	EF1	0	0	0.00K	0.00K
DAWN HAVEN ESTATES	EATON CO.	MI	06/08/2008	15:00	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
HOYTVILLE	EATON CO.	MI	06/08/2008	15:42	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
VERMONTVILLE	EATON CO.	MI	07/02/2008	16:12	EST-5	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
OLIVET STATION	EATON CO.	MI	07/02/2008	16:35	EST-5	Hail	1.25 in.	0	0	0.00K	100.00K
OLIVET STATION	EATON CO.	MI	07/02/2008	16:35	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
OLIVET STATION	EATON CO.	MI	07/02/2008	16:37	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	07/02/2008	16:37	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	07/02/2008	16:38	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	07/02/2008	16:46	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
BROOKFIELD	EATON CO.	MI	09/13/2008	17:00	EST-5	Tornado	EF0	0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/19/2008	04:00	EST-5	Winter Storm		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/28/2008	03:15	EST-5	High Wind	52 kts. EG	0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	01/09/2009	11:00	EST-5	Winter Storm		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	04/05/2009	22:30	EST-5	Winter Storm		0	0	0.00K	0.00K
DIMONDALE	EATON CO.	MI	06/08/2009	14:30	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
EATON RAPIDS	EATON CO.	MI	06/19/2009	21:30	EST-5	Thunderstorm Wind	55 kts. EG	0	0	50.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/24/2009	11:00	EST-5	Winter Weather		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/09/2010	07:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/21/2010	22:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
BELLEVUE	EATON CO.	MI	04/08/2010	10:04	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
BELLEVUE	EATON CO.	MI	07/10/2010	16:18	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/01/2011	19:00	EST-5	Winter Storm		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/20/2011	13:00	EST-5	Winter Storm		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	04/17/2011	12:20	EST-5	Strong Wind	41 kts. EG	0	0	1.00K	0.00K
CHARLOTTE	EATON CO.	MI	04/19/2011	22:18	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
WEST WINDSOR	EATON CO.	MI	05/13/2011	19:09	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
CHARLOTTE	EATON CO.	MI	05/29/2011	15:55	EST-5	Thunderstorm Wind	87 kts. EG	0	0	1.000M	0.00K
BROOKFIELD	EATON CO.	MI	05/29/2011	15:55	EST-5	Thunderstorm Wind	74 kts. EG	0	0	1.000M	0.00K
WOODBURY	EATON CO.	MI	07/28/2011	00:00	EST-5	Flash Flood		0	0	1.000M	250.00K
BELLEVUE	EATON CO.	MI	08/20/2011	13:01	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	11/29/2011	17:00	EST-5	Winter Storm		0	0	1.000M	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/23/2012	19:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
SUNFIELD	EATON CO.	MI	05/03/2012	18:00	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
WOODBURY	EATON CO.	MI	04/17/2013	16:00	EST-5	Flood		0	0	3.000M	0.00K
ONEIDA CENTER	EATON CO.	MI	06/13/2013	01:00	EST-5	Flash Flood		0	0	50.00K	0.00K
PETRIEVILLE	EATON CO.	MI	11/17/2013	16:45	EST-5	Thunderstorm Wind	61 kts. EG	0	0	50.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	11/17/2013	18:00	EST-5	High Wind	61 kts. EG	0	0	100.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	12/21/2013	18:00	EST-5	Ice Storm		0	0	5.000M	0.00K
EATON (ZONE)	EATON (ZONE)	MI	01/04/2014	19:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	02/17/2014	21:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	03/12/2014	01:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
CHARLESWORTH	EATON CO.	MI	07/27/2014	17:29	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K

OLIVET STATION	EATON CO.	MI	09/05/2014	17:43	EST-5	Thunderstorm Wind	65 kts. EG	0	0	500.00K	0.00K
EATON (ZONE)	EATON (ZONE)	MI	11/17/2014	07:00	EST-5	Lake-effect Snow		0	0	0.00K	0.00K
Totals:								0	5	55.203M	925.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								2	0	36.397M	320.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/27/2004	07:00	EST	Winter Storm		0	0	0.00K	0.00K
LANSING	INGHAM CO.	MI	05/10/2004	17:48	EST	Thunderstorm Wind	65 kts. MG	0	0	25.00K	10.00K
MASON	INGHAM CO.	MI	05/20/2004	22:25	EST	Hail	1.00 in.	0	0	15.00K	15.00K
MASON	INGHAM CO.	MI	05/21/2004	12:37	EST	Thunderstorm Wind	50 kts. MG	0	0	10.00K	0.00K
MASON	INGHAM CO.	MI	05/21/2004	12:46	EST	Thunderstorm Wind	53 kts. EG	0	0	25.00K	0.00K
LESLIE	INGHAM CO.	MI	05/21/2004	20:50	EST	Hail	1.00 in.	0	0	20.00K	10.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	05/21/2004	23:32	EST	Flood		0	0	1.000M	200.00K
LANSING	INGHAM CO.	MI	06/09/2004	12:30	EST	Hail	0.75 in.	0	0	10.00K	0.00K
LANSING	INGHAM CO.	MI	06/14/2004	13:25	EST	Hail	0.75 in.	0	0	5.00K	5.00K
HOLT	INGHAM CO.	MI	07/13/2004	21:15	EST	Thunderstorm Wind	53 kts. EG	0	0	20.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	10/30/2004	11:00	EST	High Wind	50 kts. EG	0	0	50.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	11/24/2004	12:00	EST	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/21/2005	23:00	EST	Heavy Snow		0	0	0.00K	0.00K
LESLIE	INGHAM CO.	MI	05/13/2005	16:30	EST	Thunderstorm Wind	53 kts. EG	0	0	0.00K	0.00K
MASON	INGHAM CO.	MI	06/05/2005	13:49	EST	Hail	1.50 in.	0	0	25.00K	25.00K
LANSING	INGHAM CO.	MI	06/05/2005	17:40	EST	Hail	1.00 in.	0	0	50.00K	25.00K
AURELIUS	INGHAM CO.	MI	06/26/2005	17:10	EST	Thunderstorm Wind	52 kts. EG	0	0	15.00K	0.00K
LANSING	INGHAM CO.	MI	07/18/2005	14:25	EST	Thunderstorm Wind	53 kts. EG	0	0	50.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/08/2005	16:00	EST	Heavy Snow		0	0	0.00K	0.00K
MASON	INGHAM CO.	MI	04/22/2006	19:44	EST	Hail	1.00 in.	0	0	10.00K	5.00K
WILLIAMSTON	INGHAM CO.	MI	04/22/2006	19:55	EST	Hail	0.75 in.	0	0	10.00K	5.00K
WEBBERVILLE	INGHAM CO.	MI	04/22/2006	19:57	EST	Hail	1.00 in.	0	0	10.00K	5.00K
WILLIAMSTON	INGHAM CO.	MI	06/19/2006	13:28	EST	Thunderstorm Wind	52 kts. EG	0	0	20.00K	10.00K
LANSING	INGHAM CO.	MI	08/02/2006	21:14	EST	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/01/2006	04:00	EST-5	Ice Storm		0	0	40.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/14/2007	09:00	EST-5	Winter Storm		0	0	25.00K	0.00K
NORTH AURELIUS	INGHAM CO.	MI	05/15/2007	17:40	EST-5	Thunderstorm Wind	63 kts. MG	0	0	15.00K	0.00K
ONONDAGA	INGHAM CO.	MI	06/02/2007	17:50	EST-5	Thunderstorm Wind	52 kts. EG	0	0	15.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/27/2007	15:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
WEBBERVILLE	INGHAM CO.	MI	07/05/2007	13:05	EST-5	Thunderstorm Wind	60 kts. EG	0	0	25.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	07/19/2007	13:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
WILLIAMSTON	INGHAM CO.	MI	07/19/2007	13:55	EST-5	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	08/23/2007	18:16	EST-5	Thunderstorm Wind	50 kts. MG	0	0	25.00K	0.00K
LANSING	INGHAM CO.	MI	08/24/2007	15:55	EST-5	Tornado	EF1	0	0	300.00K	0.00K
LESLIE	INGHAM CO.	MI	08/29/2007	16:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	08/29/2007	17:42	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
VANTOWN	INGHAM CO.	MI	10/18/2007	21:28	EST-5	Tornado	EF2	2	0	15.000M	0.00K
NORTH AURELIUS	INGHAM CO.	MI	10/18/2007	23:06	EST-5	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
BUNKER HILL CENTER	INGHAM CO.	MI	10/18/2007	23:06	EST-5	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
DANSVILLE	INGHAM CO.	MI	10/18/2007	23:27	EST-5	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/01/2007	17:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/15/2007	19:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	12/23/2007	06:35	EST-5	Thunderstorm Wind	56 kts. EG	0	0	50.00K	0.00K
VANTOWN	INGHAM CO.	MI	12/23/2007	06:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
NORTH LESLIE	INGHAM CO.	MI	12/23/2007	07:05	EST-5	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
MILLVILLE	INGHAM CO.	MI	12/23/2007	07:16	EST-5	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K

MILLVILLE	INGHAM CO.	MI	12/23/2007	07:16	EST-5	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/31/2007	20:30	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/01/2008	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/01/2008	02:17	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/06/2008	11:00	EST-5	Winter Storm		0	0	0.00K	0.00K
WAVERLY PARK	INGHAM CO.	MI	04/11/2008	16:25	EST-5	Hail	1.00 in.	0	0	10.00K	5.00K
NORTH LESLIE	INGHAM CO.	MI	06/06/2008	17:36	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/07/2008	21:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/07/2008	22:00	EST-5	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/08/2008	14:59	EST-5	Tornado	EF1	0	0	0.00K	0.00K
ONONDAGA	INGHAM CO.	MI	06/08/2008	15:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/08/2008	15:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	06/08/2008	15:05	EST-5	Thunderstorm Wind	54 kts. MG	0	0	0.00K	0.00K
EAST LANSING ARPT	INGHAM CO.	MI	06/08/2008	15:10	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
MASON	INGHAM CO.	MI	06/08/2008	15:14	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HASLETT	INGHAM CO.	MI	06/08/2008	15:15	EST-5	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
FOREST HILLS	INGHAM CO.	MI	06/08/2008	15:30	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
WAVERLY PARK	INGHAM CO.	MI	06/08/2008	15:40	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
KINNEVILLE	INGHAM CO.	MI	07/02/2008	17:09	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
ONONDAGA	INGHAM CO.	MI	07/02/2008	17:26	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
BUNKER HILL CENTER	INGHAM CO.	MI	09/03/2008	13:08	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/19/2008	04:30	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/28/2008	03:30	EST-5	High Wind	55 kts. MG	0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/09/2009	12:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	04/05/2009	22:30	EST-5	Winter Storm		0	0	0.00K	0.00K
ENSEL	INGHAM CO.	MI	04/25/2009	12:10	EST-5	Thunderstorm Wind	46 kts. EG	0	0	10.00K	0.00K
ONONDAGA	INGHAM CO.	MI	04/25/2009	16:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LANSING	INGHAM CO.	MI	06/08/2009	14:30	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
HOLT	INGHAM CO.	MI	06/08/2009	14:37	EST-5	Hail	1.50 in.	0	0	0.00K	0.00K
HOLT	INGHAM CO.	MI	06/08/2009	14:40	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
HOLT	INGHAM CO.	MI	06/08/2009	15:00	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
WILLIAMSTON	INGHAM CO.	MI	06/08/2009	15:02	EST-5	Hail	1.75 in.	0	0	0.00K	0.00K
WILLIAMSTON	INGHAM CO.	MI	06/08/2009	15:09	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
WEBBERVILLE	INGHAM CO.	MI	08/09/2009	19:24	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/24/2009	11:00	EST-5	Winter Weather		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/09/2010	07:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/21/2010	22:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/24/2010	05:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
NORTH AURELIUS	INGHAM CO.	MI	04/06/2010	10:20	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
EAST LANSING ARPT	INGHAM CO.	MI	06/04/2010	17:58	EST-5	Thunderstorm Wind	70 kts. EG	0	0	1.000M	0.00K
PACKARD	INGHAM CO.	MI	07/15/2010	15:25	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	09/16/2010	13:04	EST-5	Flood		0	0	25.00K	0.00K
WILLIAMSTON	INGHAM CO.	MI	09/21/2010	21:38	EST-5	Thunderstorm Wind	52 kts. EG	0	0	50.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/01/2011	19:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/20/2011	13:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	03/04/2011	05:00	EST-5	Winter Weather		0	0	0.00K	0.00K
LANSING	INGHAM CO.	MI	05/22/2011	21:05	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ONONDAGA	INGHAM CO.	MI	05/29/2011	16:05	EST-5	Thunderstorm Wind	74 kts. EG	0	0	1.000M	0.00K
NORTH AURELIUS	INGHAM CO.	MI	05/29/2011	16:07	EST-5	Thunderstorm Wind	74 kts. EG	0	0	500.00K	0.00K
MILLVILLE	INGHAM CO.	MI	05/29/2011	16:17	EST-5	Thunderstorm Wind	78 kts. EG	0	0	500.00K	0.00K
BELL OAK	INGHAM CO.	MI	05/29/2011	16:27	EST-5	Tornado	EF0	0	0	50.00K	0.00K
MASON	INGHAM CO.	MI	06/21/2011	20:20	EST-5	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
TOWAR GARDENS	INGHAM CO.	MI	07/18/2011	16:44	EST-5	Thunderstorm Wind	51 kts. MG	0	0	0.00K	0.00K
OAK GROVE	INGHAM CO.	MI	07/27/2011	23:30	EST-5	Flash Flood		0	0	5.000M	0.00K

INGHAM (ZONE)	INGHAM (ZONE)	MI	11/29/2011	17:00	EST-5	Winter Storm		0	0	1.000M	0.00K
MASON	INGHAM CO.	MI	05/03/2012	18:30	EST-5	Hail	1.25 in.	0	0	0.00K	0.00K
HOLT	INGHAM CO.	MI	05/03/2012	18:35	EST-5	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
STOCKBRIDGE	INGHAM CO.	MI	07/03/2012	16:07	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MASON	INGHAM CO.	MI	07/05/2012	02:50	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOPWOOD ACRES	INGHAM CO.	MI	07/05/2012	15:13	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BUNKER HILL CENTER	INGHAM CO.	MI	07/06/2012	19:50	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
LANSING	INGHAM CO.	MI	04/17/2013	16:00	EST-5	Flood		0	0	5.000M	0.00K
MASON	INGHAM CO.	MI	05/20/2013	17:20	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
WILLIAMSTON	INGHAM CO.	MI	05/20/2013	17:20	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
DANSVILLE	INGHAM CO.	MI	05/28/2013	16:56	EST-5	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
HOLT	INGHAM CO.	MI	06/12/2013	21:45	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
STOCKBRIDGE	INGHAM CO.	MI	09/11/2013	16:50	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
LANSING	INGHAM CO.	MI	11/17/2013	16:39	EST-5	Thunderstorm Wind	53 kts. MG	0	0	25.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	11/17/2013	19:00	EST-5	High Wind	61 kts. EG	0	0	100.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	12/21/2013	18:00	EST-5	Ice Storm		0	0	5.000M	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	01/04/2014	20:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	02/04/2014	22:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
INGHAM (ZONE)	INGHAM (ZONE)	MI	03/12/2014	01:00	EST-5	Heavy Snow		0	0	0.00K	0.00K
LESLIE	INGHAM CO.	MI	07/27/2014	14:38	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
LESLIE	INGHAM CO.	MI	07/27/2014	17:13	EST-5	Thunderstorm Wind	52 kts. EG	0	0	20.00K	0.00K
OKEMOS	INGHAM CO.	MI	08/26/2014	14:25	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
PACKARD	INGHAM CO.	MI	09/05/2014	17:57	EST-5	Thunderstorm Wind	56 kts. EG	0	0	50.00K	0.00K
Totals:								2	0	36.397M	320.00K

Regional Data

With LiDAR based-maps, contour maps and aerial photography, emergency management personnel can analyze natural and manmade environments with accuracy. All three types of maps were shared at public workshops of 2013 and were used to analyze hazards throughout the region, particularly flood-prone areas. The sample aerial photo below depicts the Frandor Shopping Center Area in Lansing. Aerial snapshots of the entire region are available on CD or on printed posters by request. Please contact the Tri-County Regional Planning Commission for more information.

Fig. 56 The Frandor Shopping Center and Environs



As a part of this plan update, the Tri-County Regional Planning Commission acquired software to utilize recently developed LiDAR (Light Detection and Ranging) data of the region. LiDAR is a remote sensing method that uses light in the form of pulsed radar to measure ranges to the earth. According to the National Oceanic and Atmospheric Administration, LiDAR uses these light pulses along with other data sets recorded by an airborne system to generate precise 3-D information about the shape of the earth and its surface characteristics.

The next three figures provide examples of LiDAR –based maps with building footprints and manmade structures. Hand drawings were incorporated onto these snapshots to accentuate landscaping and natural vs. man-made elements of the sites. Drawings of this type are available for the Sparrow Hospital area, Frandor area and Meridian Mall areas of northern Ingham County. The entire 22 mile corridor of Michigan Avenue and Grand River Avenue in northern Ingham County is available in building footprint maps. Please contact Tri-County Planning Commission for access to these mapping resources.

Fig. 57 & 58 The Meridian Mall/Meijer Store Area



Fig. 59 The Sparrow Hospital Area and Environs



Contour maps were also created and utilized as part of this plan update. Contour maps are available for the entire tri-county region. They are derived from LiDAR data and depict changes in ground elevations throughout each county. The images depicted below are contours within the City of Charlotte and in northern Eaton County. Due to the nature of the large data sets, local agencies who desire a customized contour map of an individual tile within a county may contact the Tri-County Regional Planning Commission. Three types of LiDAR based contour maps are depicted below, two of which are located in Eaton County and one is located in Clinton County.

Fig. 60 Northern Eaton County

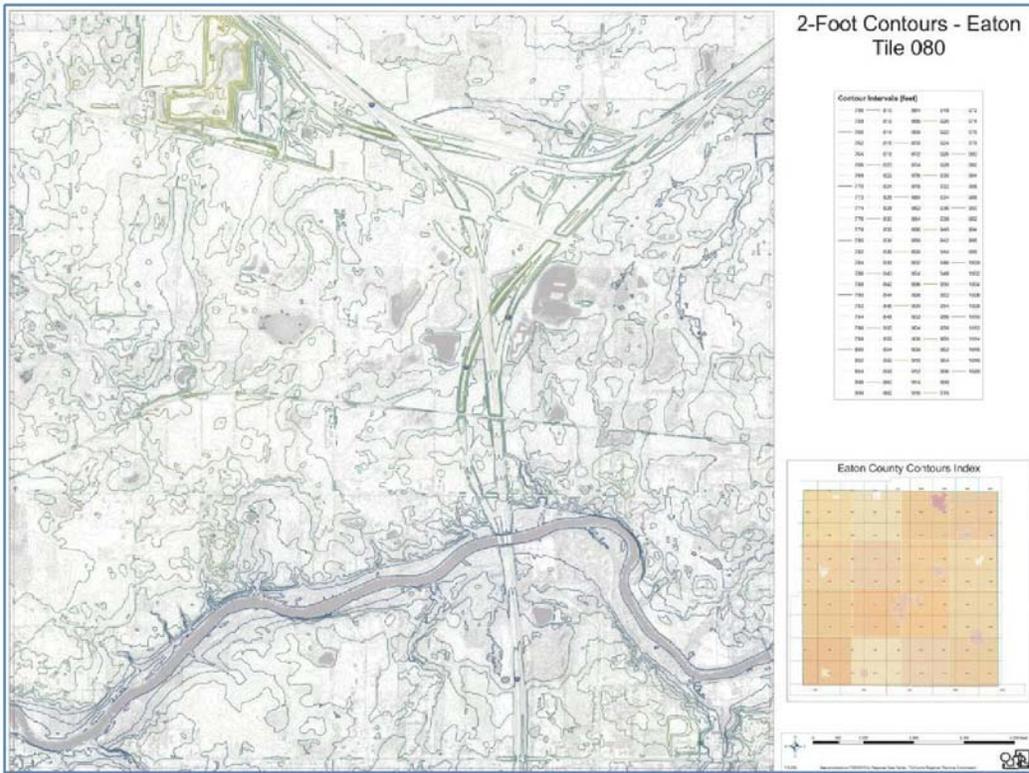


Fig. 61 City of Charlotte and Environs

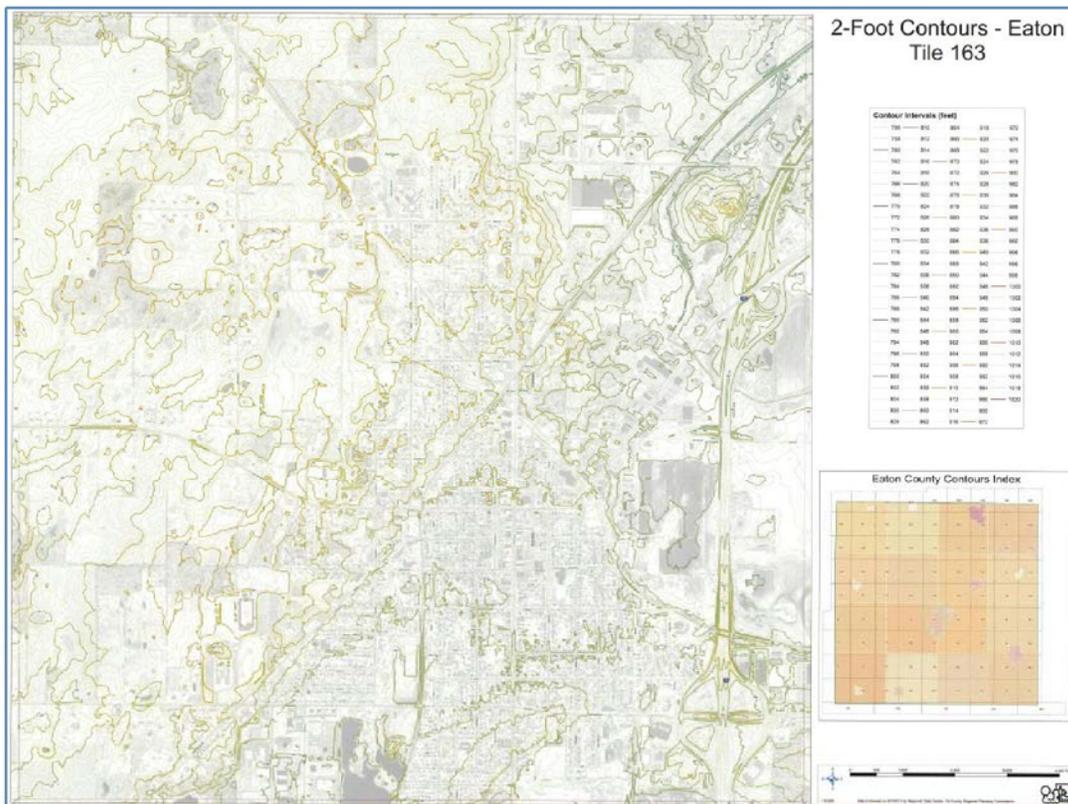
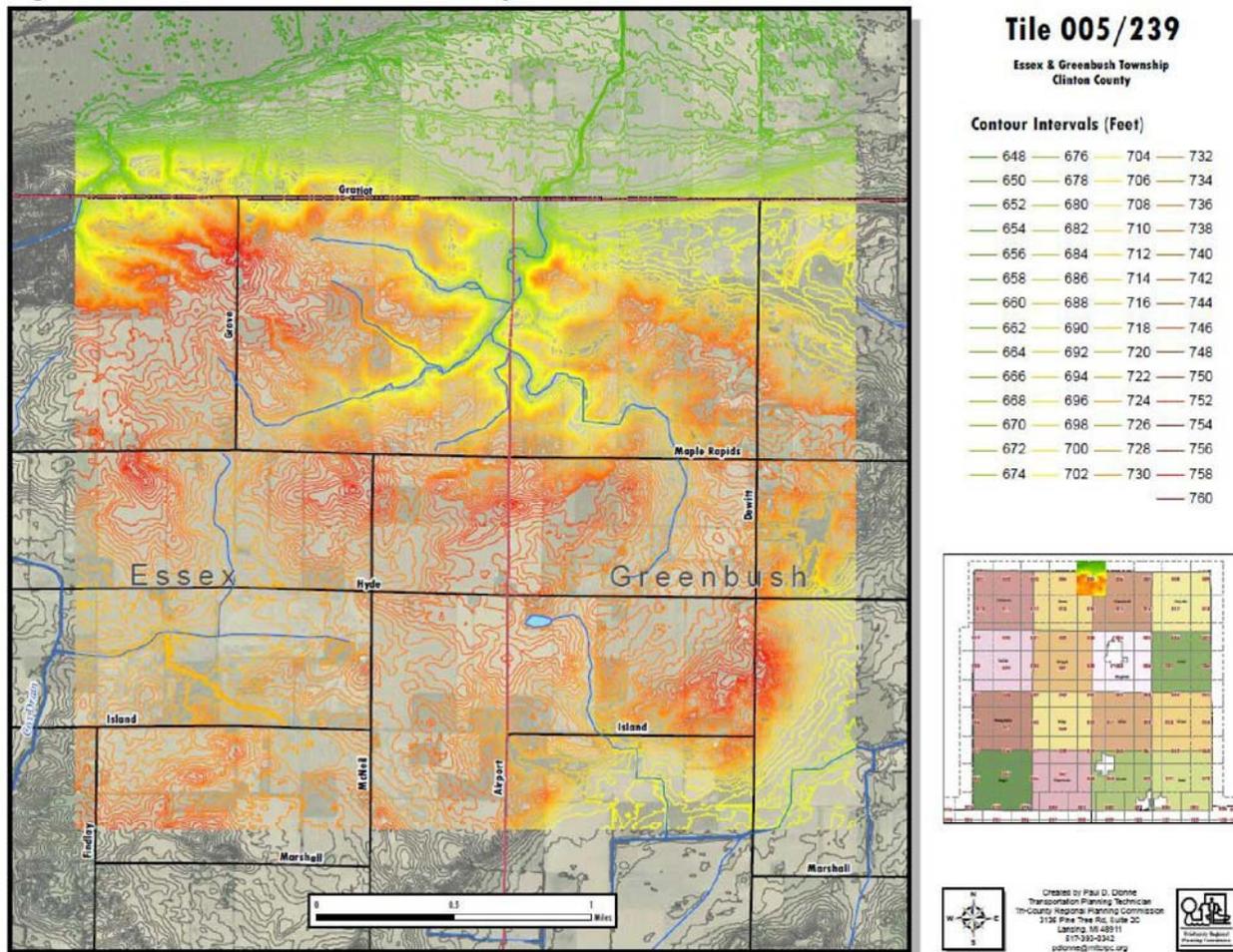


Fig. 62 North-Central Clinton County



Probability of Future Hazard Events

The probability of future hazard events within the tri-county region is calculated using storm event data provided by the National Climatic Data Center for Ingham, Clinton and Eaton Counties. Past events dating between January 1 of 2004 to August of 2014 were tallied and divided by the 10.5 years within that period. The Figure below depicts the probability of each event occurring per year in each county. Thunderstorms and Wind have the most probability of occurring the most during any given year throughout the region, followed by hail and winter storms.

Fig. 63 Probability of Future Hazard Events

	Heavy Snow	Winter Storm	Tornado	Flood	TStorm Wind	Hail	High Wind	Ice Storm	Blizzard	Funnel Cloud
Clinton	1	1.14	0.2	0.3	3.4	2.6	2	1		
Eaton	1	1.5	0.4	0.5	4	2	0.6	0.2	0.1	0.1
Ingham	0.1	1.5	0.4	0.4	5.5	2.1	0.7	0.1		

Past Disaster Declarations

Presidential and Governor Declarations between 2013 and 2003 are as follows for Clinton, Eaton, Ingham Counties and Delta Charter Township. Most recently, both Eaton and Ingham Counties were declared a major disaster in June of 2008 for thunderstorms and flooding. Notable declarations include flooding, Hurricane Katrina Evacuation declarations and Emerald Ash Borer declarations.

Fig. 64 Past Presidential & Governor's Disaster Declarations

Presidential Declarations		
Event/Date	Jurisdiction	Type
Thunderstorm/Flooding July 2008	Eaton & Ingham Counties	Major Disaster (4121)
Thunderstorm/Flooding May/June 2008	Eaton & Ingham Counties	Major Disaster (1527)
Hurricane Katrina Evacuation Area September 2005	All counties	Emergency (3225)
Electric Power Failure August 2003	Eaton & Ingham Counties	Emergency (3189)
Governor's Declarations		
Event/Date	Jurisdiction	Type
Thunderstorms/June 2008	Eaton County	Emergency
Hurricane Evacuation/ Sept 2004	All Counties	Disaster
Thunderstorms/Flooding June 2004	Ingham County	Disaster
Insect Infestation (Ash Borer) April 2004	Ingham County	Emergency

Source: 2014 MHMP

Vulnerabilities within Participating Jurisdictions

The seventeen participating jurisdictions were contacted and interviewed about the potential hazards facing their communities and special projects that they are planning or implementing. The following communities responded with their hazard priorities and mitigation ideas.

Clinton County

Dallas Township- The Clinton County Drain Commissioner is currently in receipt of a petition to address repetitive urban flooding concerns for homes and streets located along the Waltz and Sturgis Drain in the Village of Fowler, in Dallas Township, MI. A Board of Determination has been held as required under the Drain Code and a project was found necessary to address the identified flooding problems and assess the contributing drainage district.

Based on conversations with the local Director of Public Works and testimony given at the Board of Determination, 15 homes are affected by the multiple floods that have occurred in the last several years. The objective of any proposed projects is to mitigate flood damage and reduce vulnerability to existing roads and structures. The proposed strategy is implementation of storm water management practices such as construction detention basins and replacement of undersized culverts with the goal to reduce the depth, duration, and frequency of flooding along the Waltz and Sturgis Drain.

The project reduces physical damages and potential for injury/loss of life by attenuating peak runoff discharges and increasing the conveyance through undersized culverts along 6th Street, Maple Street, 5th Street, 4th Street, and Sorrell Street within the Village of Fowler. There will be a reduction in depth, duration, and frequency of flooding of homes and streets that are adjacent to and downstream of the Waltz & Sturgis Drain due to the detention provided in the upper watershed. The proposed project will also serve to collect deposited sediments carried from upstream which will improve water quality within the Waltz and Sturgis Drain downstream of the proposed improvements. Constructing the detention basin will also serve to repair and restore location of existing severe gully erosion that contribute excessive sediment downstream.

DeWitt and Bath Charter Townships

Residents in both DeWitt and Bath Charter Townships face tornado, high winds and localized flooding on a semi-regular basis. They are planning for public outreach/education related to these hazards.

City of St. Johns

According to City officials, St Johns' past experience with hazards have been with high winds, snow/thaw/rain events. The City instituted an aggressive plan to remove and trim any dangerous trees in the public right of way beginning six years ago. This action was initiated by a DNR grant to have all trees in the ROW cataloged to its condition therefore establishing an action plan which is still ongoing today. St Johns acquired a DEQ grant to study a specific area in the City prone to flooding and have initiated an action plan and committed \$500,000 for an engineered fix.

Eaton County

Cities of Charlotte and Eaton Rapids

According to City staff, the natural hazards most likely to pose the largest threat to life and property within these Cities would be severe weather in the form of winter snow and ice, as well as severe thunderstorms and tornadoes. Flooding is also an issue in Eaton Rapids. The new and future projects that might mitigate the impacts of these natural hazards include a newly-enacted sidewalk snow removal ordinance requiring all residents to clear walks of snow and ice, as well as a planned future upgrade to the city's tornado warning siren system and flood mitigation activities.

City of Grand Ledge

City officials report that they are most concerned with tornadoes, and that they are beginning to plan for education and mitigation efforts related to tornadoes.

Ingham County

City of Mason

According to City staff, natural hazards most likely to impact their residents would be tornadoes, ice storms and blizzards. Also heavy winds. The City is attempting to update their policies, training and identify equipment that would assist them to be sustaining for a level of self-sufficiency necessary to assist citizens during these types of events.

Village of Webberville

According to Village Officials, Tornadoes are a natural hazard that they do not have any plans to mitigate. Flooding is also an issue. The Village has turned local storm drains over to the Ingham County Drain Commissioner's Office and they are beginning a repair/replace project. They are in the planning stages now. The location of their industrial park on the outer edge of the populated area and the adjacent rail and highway interchange are well structured for emergency responses.

Village of Dansville

According to Village officials, the one square mile size of Dansville does not offer much in the way of hazards. The typical hazards that are identified within the plan for the entire Ingham County are those faced by Dansville. No special projects to mitigate hazards are underway currently.

Meridian Charter Township/Williamstown Township/Lansing Charter Township

According to staff, natural hazards most likely to impact their residents would be tornadoes, flooding, ice storms and blizzards and heavy winds. These jurisdictions are updating their policies, training and identify equipment that would assist them to be sustaining for a level of self-sufficiency necessary to assist citizens during these types of events.

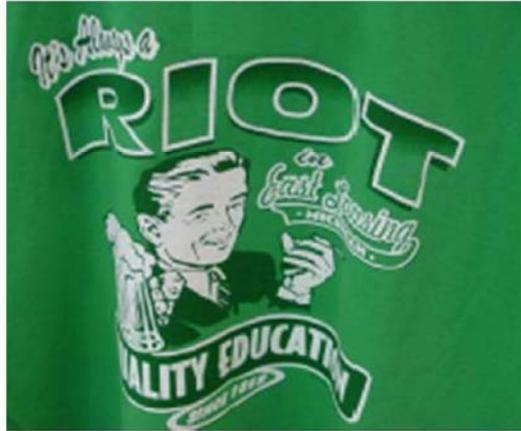
Civil Disturbances

Hazard Description - A public demonstration or gathering, or a prison uprising, that results in a disruption of essential functions, rioting, looting, arson or other unlawful behavior.

Large-scale civil disturbances rarely occur. But when they do, they are usually a result of one or more of the following events: 1) labor disputes where there is a high degree of animosity between the participating parties; 2) high profile/controversial judicial proceedings; 3) the implementation of controversial laws or other governmental actions;

4) resource shortages caused by a catastrophic event; 5) disagreements between special interest groups over a particular issue or cause; 6) a perceived unjust death or injury to a person held in high esteem or regard by a particular segment of society.

Fig. 65 T-Shirt Graphic



Source: TCRPC

Mid-Michigan has few large crime events. There have been no recent distinctive or notable changes in crime patterns region wide. There are relatively few serious crimes and no notable trends or changes in serious crime patterns region wide. There were notable civil disobedience events, particularly related to Michigan State University (MSU) sports events. In March of 1999, a melee following a national championship sports game lasted for several hours before it was stopped by a multi-jurisdictional police force in East Lansing. Property damage exceeded \$250,000 and over 130 people were arrested. Smaller types of these incidences occur most years during the college basketball and football seasons. But recent year incidents have been smaller and strongly controlled. Regional police and emergency services have worked with MSU to develop pro-active and effective approaches to reducing and mitigating the damage of such events with good success.

Hazardous Material Incidents

Fixed Site Hazardous Material Incidents (explosions and industrial accidents)

Hazard Description - An uncontrolled release of hazardous materials from a fixed site capable of posing a risk to life, health, safety, property or the environment. Hazardous materials are highly regulated by federal and state agencies to reduce risk to the public and the environment. Despite precautions taken to ensure careful handling during the manufacture, transport, storage, use and disposal of these materials, accidental releases do occur. Often, these releases can cause severe harm to people or the environment if proper mitigation action is not immediately taken. Most releases are the result of human error. Occasionally, releases are attributed to natural causes, such as a flood that washes away barrels of chemicals stored at a site. However, those situations are the exception rather than the rule.

Hazardous materials are materials or substances that, because of their chemical, physical, or biological nature, pose a potential risk to life, health, property, or the environment if they are released. Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers and dangerous gasses.

Industrial Accident

Hazard Description - A fire, explosion, or other severe accident involving hazardous materials at an industrial facility that results in serious property damage, injury, or loss of life. Industrial accidents differ from hazardous material incidents in the scope and magnitude of offsite impacts. Whereas hazardous material incidents typically involve an uncontrolled release of material into the surrounding community and environment that may necessitate evacuations or in-place sheltering of the affected population, the impacts from industrial accidents are often confined to the site or facility itself, with minimal physical outside impacts. Nonetheless, industrial accidents such as fires, explosions and excessive exposure to hazardous materials, may cause injury or loss of life to the workers at the facility, and significant property damage. In addition, industrial accidents can cause severe economic disruption to the facility and surrounding community, as well as significant, long-term impacts on the families of the workers injured or killed.

Hazardous Material Transportation Incidents

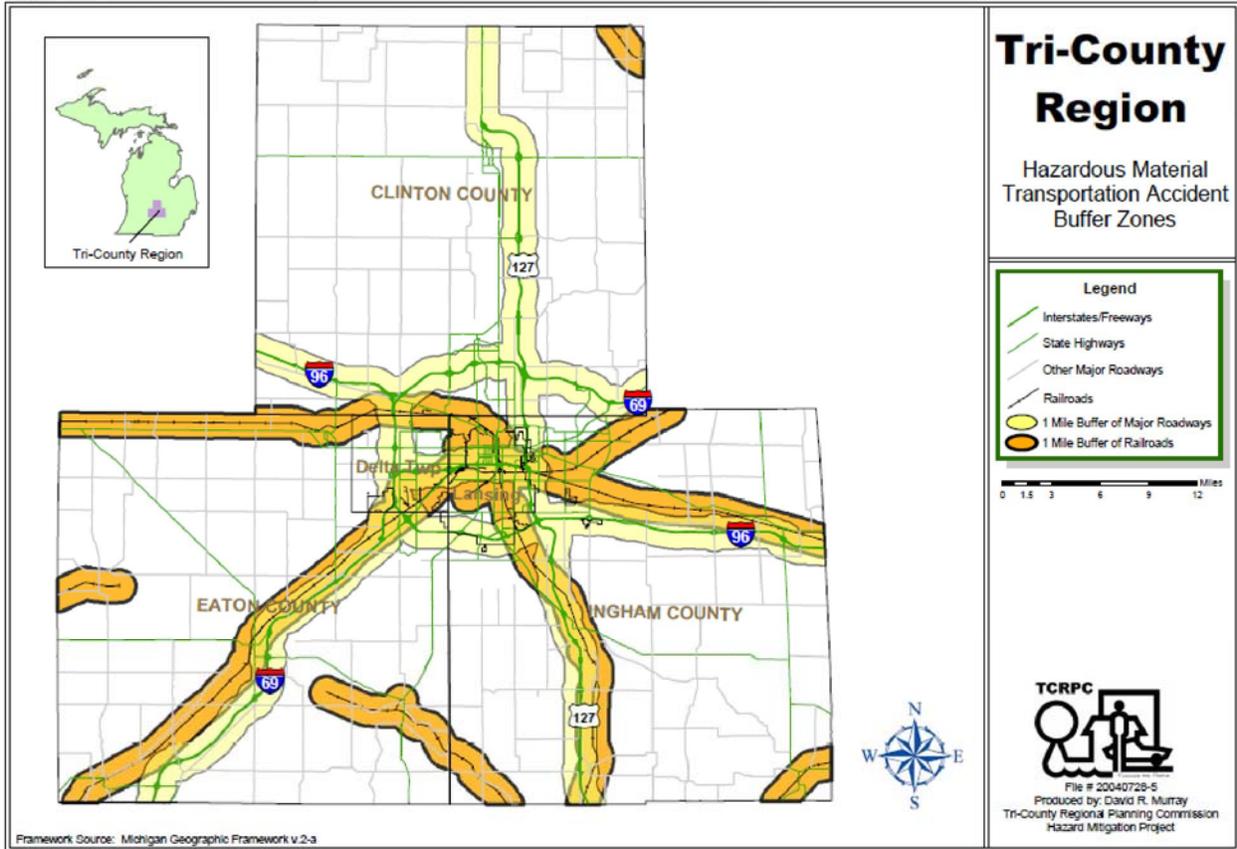
Hazard Description - An uncontrolled release of hazardous materials during transport capable of posing a risk to life, health, safety, property or the environment. Because of the extensive use of chemicals in our society, all modes of transportation – highway, rail, air, marine and pipeline – are carrying thousands of hazardous materials shipments on a daily basis through local communities. A transportation accident involving any one of those hazardous material shipments could cause a local emergency affecting many people. Note: Many of the programs and initiatives designed to mitigate, prepare for, respond to, and recover from fixed- site hazardous material incidents have the dual purpose of also protecting against hazardous material transportation incidents. Consequently, there is some overlap in the narrative programs and initiatives descriptions for each respective hazard.

Fig. 66 The Potterville Train Derailment, 2002, Source: MSP



Occasional events do happen in the tri-county region every few years, and require some expensive resources to respond to, even though the situations can usually be resolved within a few days. In 2002, a train derailment in the City of Potterville evacuated the residents for five consecutive days. This was the longest evacuation in Michigan history.

Fig. 67 Haz Mat Transportation Accident Buffer Zones



Oil and Natural Gas Well Accidents

Hazard Description - An uncontrolled release of oil or natural gas, or the poisonous by-product hydrogen sulfide, from production wells. Oil and natural gas are produced from fields scattered across 63 counties in the Lower Peninsula. Since 1925, over 44,000 oil and natural gas wells have been drilled in Michigan, of which roughly half have produced oil and gas. To date, Michigan wells have produced approximately 1.4 billion barrels of crude oil and 4 trillion cubic feet of gas.

Communities that may be affected by oil or natural gas well accidents should have adequate procedures in their Emergency Operations Plans to address the unique types of problems associated with this hazard, including rescue and evacuation. Affected communities must work closely with company officials and surrounding jurisdictions to ensure compatibility of procedures for a fast, coordinated response. Mitigation possibilities include the use of community zoning regulations to provide suitable 100 open, unoccupied "buffer" areas around refineries and compressor stations. Michigan

Department of Environmental Quality regulations provide for buffer zones around wells and treatment and storage facilities.

Infrastructure Failures

Hazard Description - An actual or potential shortage of electrical power, gasoline, natural gas, fuel oil, or propane of sufficient magnitude and duration to threaten public health and safety, and economic and social stabilization.

Michigan has had numerous widespread and severe electrical power outages, caused mostly by severe weather such as windstorms or ice and sleet storms. (Note: Refer to those sections for more information on specific events.) Michigan has had several power outages in recent years that left upwards of 500,000 people without power for several hours to several days at a time. Fortunately, most of those occurred in months when severe cold temperatures were not a problem. An adequate energy supply is critical to mid-Michigan's economic and social well-being. Our economy and lifestyle are dependent on a non-interrupted, reliable, and relatively inexpensive supply of energy that includes gasoline to fuel our vehicles, and electricity, natural gas, fuel oil and propane to operate our homes, businesses and public buildings. Energy emergencies became a serious national issue in the 1970s when two major "energy crises" exposed America's increasing vulnerability to long term energy disruptions.

To date, we have always dealt with short term energy disruptions caused by severe weather damage (i.e., downed power lines and poles), broken natural gas and fuel pipelines, and shortages caused by the inability of the energy market to adequately respond to consumer demand and meet required production. However, the Oil Embargo of 1973-74, the natural gas shortage of 1976-77, and the 1979 major price increases in oil resulting from the Iranian Revolution rendered the County highly vulnerable to energy disruptions. That vulnerability was again exposed during the Gulf War in 1991 (after Iraq invaded Kuwait and destroyed many of its oil fields) and in the aftermath of the September 11, 2001 terrorist attacks in the U.S.

The power outage of August 14, 2003 started affecting Michigan at 4:09 p.m. when power surges affected southern Ohio, west to Indiana, north to western Michigan, east to the Detroit area, and south to northern Ohio. By 4:15 p.m., the power outage was essentially complete, with 2.3 million customers of Consumers Energy, Lansing BWL, and Detroit Edison without power. The area affected in Michigan was all of the Detroit Edison service territory, Consumers Energy customers located near the Detroit Edison service territory, and the cities of Lansing and East Lansing and other areas served by the Lansing BWL. At 10:00 p.m., Consumers Energy reported that 118,400 customers were without power.

In November of 2013, wind storms across the tri-county region brought down trees and power lines, knocking out power to residents for up to 3 days. Then, when the debris was still being collected and managed, a huge winter ice storm the week before

Christmas, brought down trees and wires and caused long term, widespread power loss which lasted from days to more than a week.

Public Health Emergencies

Hazard Description - A widespread and/or severe epidemic, incident of contamination, or other situation that presents a danger to or otherwise negatively impacts the general health and well-being of the public. Public health emergencies can take many forms – disease epidemics, large-scale incidents of food or water contamination, extended periods without adequate water and sewer services, harmful exposure to chemical, radiological or biological agents, and large-scale infestations of disease-carrying insects or rodents – to name just a few. Public health emergencies can occur as primary events by themselves, or they may be secondary events to another disaster or emergency such as a flood, tornado or hazardous material incident. The common characteristic of most public health emergencies is that they adversely affect, or have the potential to adversely impact, a large number of people. Public health emergencies can be statewide, regional, or localized in scope and magnitude.

One of Michigan's most serious emergencies occurred in 1973 when a local farmer fed PBB laced feed to his dairy herd. Michigan Chemical Corporation had accidentally supplied the Michigan Farm Bureau Services with sacks of fire-proofing chemical PBB, which is known to cause cancer, genetic mutation, and birth defects -- and the PBB was inadvertently substituted for magnesium oxide (commonly used in antacid tablets used for human consumption) in a custom dairy feed # 402. During the crucial eight-month period between the farmer's first observations and the discovery of the accident, serious contamination had already occurred.

By 1975 the state had quarantined more than 500 farms. Condemned for slaughter were more than 17,000 cattle; 3,415 hogs; 1.5 million chickens and 4.8 million eggs. In the 1980s, the state health department confirmed that 95 percent of Michigan's population had PBB in their bodies from eating beef, drinking milk or consuming other products from contaminated farms. A cancer epidemic was feared. Although one has not occurred been diagnosed yet. Studies do show the most exposed families have increased breast and digestive cancer, and lymphoma. Among the effects observed in the exposed populations the daughters of the most highly exposed women began menstruation, on average, before they reached their twelfth birthdays.

The world's worst influenza pandemic – the “Spanish flu” of 1918-19 – resulted in 500,000-675,000 deaths in the United States and 20 to 40 million worldwide. More than 25 million Americans – nearly one quarter of the population at the time – fell ill. Scientists speculate that the virus that caused that pandemic may have percolated for several years within humans, or possibly pigs, until it grew strong enough to kill millions worldwide. The virus spread rapidly – moving around the world in a matter of a few months – in a time period in which there was much less movement of people than there is today. The virus reached Michigan in the fall of 1918. Over 8,000 of the 2.8 million state residents fell ill and half of those eventually succumbed to the disease. In retrospect, the spread of the illness was felt to be exacerbated by behavior of important

officials who had misguided concerns that the effects of “panic” might be more harmful than the disease itself—a notion that proved disastrous. The pandemic had an unusual aspect, however, in that many of those who died were persons who had been young and healthy, whereas the normal pattern for influenza deaths is to take a higher toll among those who are elderly or have compromised immune systems.

In December 2003, there were reports that Bovine spongiform encephalopathy (BSE), or "Mad Cow Disease" was struck the United States. BSE is linked to a similar form of the incurable and fatal brain-wasting disease in humans, called variant Creutzfeldt-Jakob Disease (VCDJ). There have been a small number of VCJD cases reported worldwide of people who ate BSE-contaminated meat. Within hours of the announcement, an official with Japan's agriculture ministry told CNN that his country would ban imports of U.S. beef. South Korea, Taiwan, Malaysia and Singapore, Mexico and others followed suit within hours of the announcement. News of an outbreak in mid-Michigan would likely cause great fear and panic and affect dairy farmers and milk producers as well as area beef cattle operators.

At least 144 adult patients were admitted to 10 academic and community hospitals in the greater Toronto, Ontario, area between March 7 and April 10, 2003. 1,700 students and staff at Father Michael McGivney Catholic Academy in Markham, a northern suburb of Toronto, were quarantined, where a student showed symptoms of SARS while going to classes for three days last week. Health officials closed the school until June 3. The majority of cases in the SARS outbreak in the greater Toronto area were related to hospital exposure.

The December 2003 reports that Michigan health officials were introduced to the emerging health threats posed by foot-and-mouth disease and the West Nile encephalitis virus caused widespread concern. Although foot-and-mouth disease is a highly contagious disease that only affects animals, a widespread outbreak such as occurred in parts of the United Kingdom in 2001 could have significant public health implications due to the potentially large numbers of dead animal carcasses to be disposed of. The West Nile encephalitis virus, which arrived in Michigan in August 2001, presents an equally challenging scenario for public health officials. Transmitted to humans by infected mosquitoes, the West Nile virus is common in Africa, Asia, and the Middle East. Health officials do not know how the virus was introduced to the United States. But in 1999 and 2000, it caused outbreaks of human encephalitis in New York raised fears across the country of a full-blown public health emergency. Fortunately that has not occurred, although the New York City outbreak did cause 62 persons to fall ill and resulted in 7 deaths. Real or perceived outbreaks of communicable diseases in or around the tri-county area would adversely affect trade, tourism, travel (e.g.: College/University students), and health.

Enough potential threats exist that some type of public health emergency tends to affect the county every couple of years (although some threats, such as influenza, occur annually) throughout the whole area. Medical impacts upon the county's population are usually significant, but in a serious pandemic event, could become catastrophic.

Chapter 4 - Mitigation Strategies and Plan Implementation

The following strategies are projects or processes that will lessen the community's vulnerability to hazards. Mitigation strategies result from a process that identifies actions intended to meet the objectives and goals that have been set for the community. Mitigation strategies must present actions that are equitable to the community, technically possible, that do not harm the environment and that are economically feasible.

The impacts of a hazard can produce significant economic losses besides property damage that are difficult to measure. Economic losses may take time to spread entirely through a community and linger long after the actual disaster event. Government and business alike can experience economic hardships that eventually impact residents and other government functions or businesses in the community. A simple example of these longer-term losses is the accumulated cost of a winter when above average snow and ice removal is required. The additional funding required to remove the snow is taken from other programs or budget items, resulting in a potential loss or reduction of a services, employees, or other benefit to the local community.

The alternatives and actions listed in this updated Plan are the outcomes of discussions with county emergency managers and community agency partners over the project period. The alternatives offered are based on the locally available resources, funding, and the capacity of personnel in our region. The actions are also based on changes to local land use changes over time. Finally, the mitigation alternatives for our region are very much the same now as they were in the previous adopted Plan. Various actions were completed since 2005, such as the distribution of weather radios to residents, the adoption of low -impact development regulations across the region, and public service announcements pertaining to emergency preparedness. The TCRPC made every effort to ensure that actions can be accomplished and that they will reduce vulnerability. The implementable or practical nature of these alternatives is largely determined by the financial and personnel commitment of area residents and officials, the commitments of other resources, and a function of the benefits provided to the community.

Mitigation Alternatives

Following guidance of the Michigan Hazard Mitigation Plan, this section lists an array of hazard mitigation alternatives. Some alternatives, such as zoning decisions, are more appropriate for local implementation. Other alternatives, such as legislation, are more appropriate for implementation by state government. Some alternatives may involve the participation of multiple actors at different levels (local, state, and federal; public, private, and non-profit). An example of such a hazard mitigation idea could be an improvement in a local community's drainage infrastructure that obtains federal grant funds administered by a state agency and makes use of matching funds from a local community foundation, while providing benefits to downstream areas in the watershed region as well. Actions are presented here in order of hazard type.

Weather Hazards

Thunderstorm Hazards (General)

- Increased coverage and use of NOAA Weather Radio.
- Public early warning systems and networks.
- Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)
- Buried/protected power and utility lines. (NOTE: Where appropriate. Burial may cause additional problems and costs in case of breakage, due to the increased difficulty in locating and repairing the problem.)

Hail-specific (in addition to the General Thunderstorm Hazards list)

- Moving vehicles into garages or other covered areas.
- Inclusion of safety strategies for severe weather events in driver education classes and materials.
- Purchase of insurance that includes coverage for hail damage.
- Using structural bracing, window shutters, laminated glass in window panes, and impact-resistant roof shingles to minimize damage to public and private structures.

Lightning-specific (in addition to the General Thunderstorm Hazards list)

- Using surge protectors on critical electronic equipment.
- Installing lightning protection devices on the community's communications infrastructure.

Severe Winds and Tornadoes (in addition to the General Thunderstorm Hazards)

- Using appropriate wind engineering measures and construction techniques (e.g. structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced entry and garage doors, window shutters, waterproof adhesive sealing strips, and interlocking roof shingles) to strengthen public and private structures against severe wind damage.
- Proper anchoring of manufactured homes and exterior structures such as carports and porches.
- Securing loose materials, yard, and patio items indoors or where winds cannot blow them about.
- Construction of concrete safe rooms in homes and shelter areas in mobile home parks, fairgrounds, shopping malls, or other vulnerable public areas.

Winter Weather Hazards (General)

- Increased coverage and use of NOAA Weather Radio.
- Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)

- Buried/protected power and utility lines, where appropriate.
- Establishing heating centers/shelters for vulnerable populations.

Ice and Sleet Storms (in addition to the General Winter Weather Hazards list)

- Home and public building design and maintenance to prevent roof and wall damage from "ice dams."

Snowstorms (in addition to the General Winter Weather Hazards list)

- Proper building/site design and code enforcement relating to snow loads, roof slope, snow removal and storage, etc.
- Agricultural activities to reduce impacts on crops and livestock.
- Pre-arranging for shelters for stranded motorists/travelers, and others.
- Using snow fences or "living snow fences" (rows of trees or vegetation) to limit blowing and drifting of snow over critical roadway segments.

Extreme Temperatures

- Organizing outreach to vulnerable populations during periods of extreme temperatures, including establishing and building awareness of accessible heating and/or cooling centers in the community, and other public information
- Campaigns about this hazard.
- Increased coverage and use of NOAA Weather Radio.

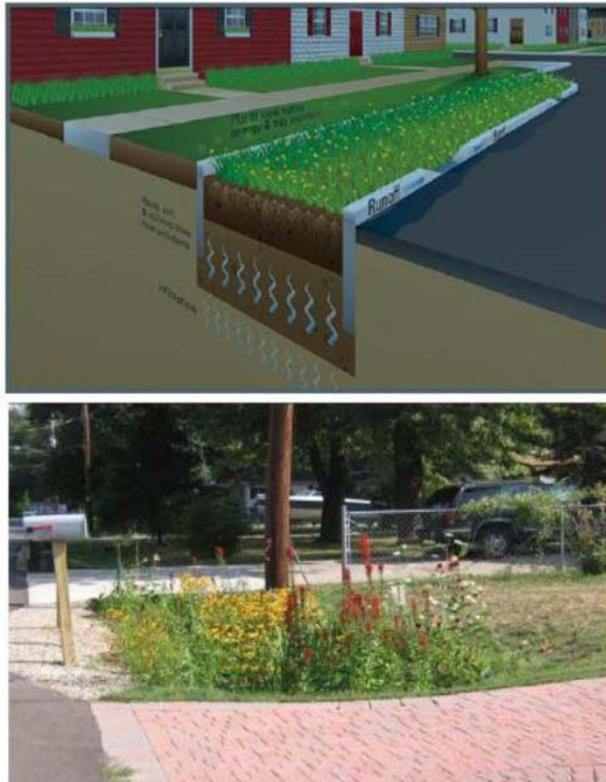
Hydrological Hazards

Riverine, Shoreline, and Urban Flooding

- Flood plain and coastal zone management – planning acceptable uses for areas prone to flooding (through comprehensive planning, code enforcement, zoning, open space requirements, subdivision regulations, land use and capital improvements planning) and involving drain commissioners, hydrologic studies, etc. in these analyses and decisions.
- Acceptable land use densities, coverage and planning for particular soil types and topography (decreasing amount of impermeable ground coverage in upland and drainage areas, zoning and open space requirements suited to the capacity of soils and drainage systems to absorb rainwater runoff, appropriate land use and capital improvements planning) and involving drain commissioners, hydrologic studies, etc. in these analyses and decisions.
- Dry flood proofing of structures within known flood areas (strengthening walls, sealing openings, use of waterproof compounds or plastic sheeting on walls).
- Wet flood proofing of structures (controlled flooding of structures to balance water forces and discourage structural collapse during floods).
- Elevation of flood-prone structures above the 100-year flood level.
- "Floating" architectural designs for structures in flood-prone areas
- Construction of elevated or alternative roads that are unaffected by flooding, or making roads more flood-resistant through better drainage and/or stabilization/armoring of vulnerable shoulders and embankments.

- Government acquisition, relocation, or condemnation of structures within floodplain or floodway areas.
- Employing techniques of erosion control within the watershed area (proper bank stabilization, techniques such as planting of vegetation on slopes, creation of terraces on hillsides, use of riprap boulders and geotextile fabric, etc.).
- Protection (or restoration) of wetlands and natural water retention areas.
- Obtaining insurance. (Requires community participation in the NFIP.)
- Joining the National Flood Insurance Program (NFIP).
- Participation in the Community Rating System (CRS).
- Structural projects to channel water away from people and property (dikes, levees, floodwalls) or to increase drainage or absorption capacities (spillways, water detention and retention basins, relief drains, drain widening/dredging or rerouting, debris detention basins, logjam and debris removal, extra culverts, bridge modification, dike setbacks, flood gates and pumps, wetlands protection and restoration).
- Higher engineering standards for drain and sewer capacity, or the expansion of infrastructure to higher capacity.
- Drainage easements (allowing the planned and regulated public use of privately owned land for temporary water retention and drainage).
- Installing (or re-routing or increasing the capacity of) storm drainage systems, including the separation of storm and sanitary sewage systems.
- Farmland and open space preservation.
- Elevating mechanical and utility devices above expected flood levels.
- Flood warning systems and the monitoring of water levels with stream gauges and trained monitors.
- Increased coverage and use of NOAA Weather Radio.
- Anchoring of manufactured homes to a permanent foundation in flood areas, but preferably these structures would be readily movable if necessary or else permanently relocated outside of flood-prone areas and erosion areas.
- Control and securing of debris, yard items, or stored objects (including oil, gasoline, and propane tanks, and paint and chemical barrels) in floodplains that may be swept away, damaged, or pose a hazard when flooding occurs.
- Back-up generators for pumping and lift stations in sanitary sewer systems, and other measures (alarms, meters, remote controls, switchgear upgrades) to ensure that drainage infrastructure is not impeded.
- Detection and prevention/discouragement of illegal discharges into storm-water sewer systems, from home footing drains, downspouts and sump pumps.
- Employing techniques of erosion control in the area (bank stabilization, planting of vegetation on slopes, creation of terraces on hillsides).

Fig 68 Stormwater Retention Techniques



Source: EPA

Fig. 69 Flood Preparation



Source; TCRPC

- Increasing the function and capacity of sewage lift stations and treatment plants (installation, expansion, and maintenance), including possible separation of combined storm/sanitary sewer systems, if appropriate.
- Purchase or transfer of development rights – to discourage development in floodplain areas.

- Stormwater management ordinances or amendments.
- Wetlands protection regulations and policies.
- Use of check valves, sump pumps and backflow preventers in homes and buildings.

Dam Failures

- Regular inspection and maintenance of dams.
- Garnering community support for a funding mechanism to assist dam owners in the removal or repair of dams in disrepair.
- Regulate development in the dam's hydraulic shadow (where flooding would occur if a severe dam failure occurred).
- Ensuring that dams meet or exceed the design criteria required by law.
- Public warning systems.
- Obtaining insurance.
- Increased coverage and use of NOAA Weather Radio
- Increased funding for dam inspections and enforcement of the Dam Safety Program (Part 315 of the Natural Resources and Environmental Protection Act) requirements and goals.
- Constructing emergency access roads to dams, where needed.
- Pump and flood gate installation/automation.

Drought

- Storage of water for use in drought events (especially for human needs during periods of extreme temperatures, and for responding to structural fire and wildfire events).
- Legislative acts, local ordinances, and other measures to prioritize or control water use.
- Encouragement of water-saving measures by consumers (including landscaping, irrigation, farming, and low priority lawn maintenance and non-essential auto washing).
- Anticipation of potential drought conditions, and the preparation of drought contingency plans.
- Designs, for recreational and other water-related structures and land uses, that take into account the full range of water levels (of lakes, streams, and groundwater).
- Designs and plans for water delivery systems that include a consideration of drought events.
- Obtaining agricultural insurance.

Invasive Species

- Restrictions on the import and transport of species carriers.
- Adjustments to hunting, fishing, and other policies and regulations related to wildlife populations.
- Use of barriers to prevent invasive species travel.
- Use of competing species or other population control techniques.

Geological Hazards

Earthquakes – The greatest threats of earthquakes in our region would be damage to pipelines, buildings that are poorly designed or constructed, the shelving, furniture, mirrors, gas cylinders, etc. within structures that could fall and cause injury or personal property damage)

- Adopt and enforce appropriate building codes.
- Use of safe interior designs and furniture arrangements.
- Obtain insurance.
- "Harden" critical infrastructure systems to meet seismic design standards for "lifelines."

Subsidence

- Identifying and mapping old mining areas and geologically unstable terrain, and limiting or preventing development in high-risk areas.
- Filling or buttressing subterranean open spaces (such as abandoned mines) to discourage their collapse.
- Hydrological monitoring of groundwater levels in subsidence-prone areas.
- Insurance coverage for subsidence hazards.
- Real estate disclosure laws.

Technological Hazards

Structural Fires

- Code existence and enforcement.
- Designs that include the use of firewalls and sprinkler systems (especially in tall buildings, dormitories, attached structures, and special facilities).
- Landlords and families can install and maintain smoke detectors and fire extinguishers. Install a smoke alarm on each level of homes (to be tested monthly, with the batteries changed twice each year). Family members and residents should know how to use a fire extinguisher.
- Proper installation and maintenance of heating systems (especially those requiring regular cleaning, those using hand-loaded fuels such as wood, or using concentrated fuels such as liquid propane).
- Safe use and maintenance/cleaning of fireplaces and chimneys (with the use of spark arresters and proper storage of flammable items). Residents should inspect chimneys at least twice a year and clean them at least once a year.
- Safe installation, maintenance, and use of electrical outlets and wiring.
- Measures to reduce urban blight and associated arson (possibly including Crime Prevention through Environmental Design).
- Defensible space around structures in fire-prone wildland areas.
- Proper maintenance of power lines, and efficient response to fallen power lines.
- Transportation planning that provides roads, overpasses, etc. to maximize access and improve emergency response times to all inhabited or developed areas of a community. (Not just planning for average traffic volumes in the community.)

- Discourage civil disturbances and criminal activities that could lead to arson.
- Enforced fireworks regulations.
- Elimination of clandestine methamphetamine laboratories through law enforcement and public education.
- Condominium-type associations for maintaining safety in attached housing/building units or multi-unit structures.
- Obtaining insurance.

Fixed Site Hazardous Material Incidents (including explosions and industrial accidents)

- Compliance with/enforcement of Resource Conservation and Recovery Act (RCRA) standards.
- Elimination of clandestine methamphetamine laboratories through law enforcement and public education.
- Identification of radioactive soils and high-radon areas
- Proper separation and buffering between industrial areas and other land uses.
- Location of industrial areas away from schools, nursing homes, etc.
- Public warning systems and networks for hazardous material releases.
- Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents).
- Compliance with all industrial, fire, and safety regulations.
- Insurance coverage.
- Enhanced security and anti-terrorist/sabotage/civil disturbance measures.

Hazardous Material Transportation Incidents

- Improved design, routing, and traffic control at problem roadway areas.
- Long-term planning that provides more connector roads for reduced congestion of arterial roads.
- Railroad inspections, maintenance and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).
- Proper planning, design, maintenance of, and enhancements to designated truck routes.
- Public warning systems and networks.
- Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents).
- Use of ITS (intelligent transportation systems) technology.
- Locating schools, nursing homes, and other special facilities away from major hazardous material transportation routes.

Pipeline Accidents (Petroleum and Natural Gas)

- Locating pipelines away from dense development, critical facilities, special needs populations, and environmentally vulnerable areas whenever possible.

- Increasing public awareness and widespread use of the "MISS DIG" utility damage prevention service (800-482-7171).
- Proper pipeline design, construction, maintenance and inspection.

Oil and Natural Gas Well Accidents

- Using buffer strips to segregate wells, storage tanks, and other production facilities from transportation routes and adjacent land uses, in accordance with state regulations, and consistent with the level of risk.
- Adherence to all regulations and best industry practices, especially for relatively new techniques of hydraulic fracturing, in order to preserve Michigan's environmental quality and public confidence in the industry.

Infrastructure Hazards

Infrastructure Failures

- Proper location, design, and maintenance of water and sewer systems (to include insulation of critical components to prevent damage from ground freeze).
- Burying electrical and phone lines, where beneficial and appropriate, to resist damage from severe winds, lightning, ice, and other hazards.
- Redundancies in utility and communications systems, especially "lifeline" systems; to increase resilience (even if at the cost of some efficiency).
- Separation and/or expansion of sewer system to handle anticipated stormwater volumes.
- Use of generators for backup power at critical facilities.
- "Rolling blackouts" in electrical systems that will otherwise fail completely due to overloading.
- Replacement or renovation of aging structures and equipment (to be made as hazard-resistant as economically possible).
- Physical protection of electrical and communications systems from lightning strikes.
- Tree-trimming programs to protect utility wires from falling branches. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of way.)
- Increasing public awareness and widespread use of the "MISS DIG" utility damage prevention service (800-482-7171).

Energy Emergencies

- Redundancies and alternatives in the energy supply system; provision of backup supply systems.
- The capacity to use more than one type of fuel to sustain necessary operations and functions.
- Use of alternative sources of energy (e.g. solar, wind sources) for key functions.
- Architectural designs that reduce the need for outside energy inputs.

Transportation Accidents

- Improved design, routing, and traffic control at problem roadway areas.

- Railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).
- Long-term planning that provides more connector roads for reduced congestion of arterial roads.
- Use of designated truck routes.
- Use of ITS (intelligent transportation systems) technology.
- Airport maintenance, security, and safety programs.

Human Related Hazards

Civil Disturbances (prison or institutional rebellions, disruptive political gatherings, violent labor disputes, urban protests or riots, or large-scale uncontrolled festivities)

- Some suggest that design, management, integration, and lowered density of poor or blighted areas will reduce vandalism, crime, and some types of riot events. Crime Prevention Through Environmental Design (CPTED) is a field of planning that deals with this.
- Structure and property insurance in risky areas, combined with anti-arson practices.
- Design requirements for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, etc. that take into consideration emergency and security needs.

Public Health Emergencies

- Immunization programs to vaccinate against communicable diseases.
- Improving ventilation techniques in areas, facilities, or vehicles that are prone to crowding, or that may involve exposure to contagion or noxious atmospheres.
- Radon detection and abatement activities, to reduce concentrations of radon in homes and buildings.
- Maintaining community water and sewer infrastructure at acceptable operating standards.
- Providing back-up generators for water and wastewater treatment facilities to maintain acceptable operating levels during power failures.
- Demolition and clearance of vacant condemned structures to prevent rodent infestations.
- Free or reduced-expense community clinics and school health services.
- Brownfield and urban blight clean-up activities.
- Proper location, installation, cleaning, monitoring, and maintenance of septic tanks.
- Separation of storm and sanitary sewer systems.

Terrorism and Similar Criminal Activities

- Using laminated glass and other hazard-resistant, durable construction techniques in public buildings and critical facilities.
- Establishing avenues of reporting (and rewards) for information preventing terrorist incidents and sabotage.
- Consistent use of computer data back-up systems and anti-virus software.

Implementation of 2004 Adopted Actions

In 2004, Clinton, Eaton Ingham Counties and Delta Charter Township adopted mitigation strategies to address their natural hazards. This section presents a review of mitigation activities completed since 2004 by each jurisdiction. In the 2015 Plan Update, many of these mitigation activities were review and revisited, and adjusted to reflect present-day hazard concerns. These now include protection of special needs populations, identification of gaps in response, protection from flooding, decrease infrastructure vulnerabilities, and protect against high wind damages.

Clinton County

In 2004, Clinton County identified flooding, population influx, power outages, ice storms, civil disturbances, school violence and “multi-hazards” as threats to their communities. The charts below list the proposed mitigation actions which should occur, ranging from building flood proof basements, to tree trimming, defensive architecture and the provision of disaster kits. County officials report that many of these items have been completed and /or promoted at various levels around the county including acquiring new aerial photography periodically; The four major festivals in our county plan with their respective public safety agencies; Both BWL and Consumers Energy engage in regular inspection and maintenance plans; The county supports and promotes the Do 1 Thing program which has information on preparing for power outages; Consumer’s Energy contracts out tree trimmers to maintain the safety of their lines; NOAA weather radio use is promoted via social media and other sources including Do 1 Thing; SKYWARN training is held annually; BTPD has done pre-planning for civil disturbance events; Regular EOC staff meetings, plan updates, public education, exercises, capability building and maintenance.

Flooding:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008					
		Modify The Hazard	Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches	Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?
FLD #1	Floodproof Basements				X				X			X			X					
FLD #2	Update FIRM Maps								X			X			X					
FLD #3	Replace to a Higher Standard				X				X			X			X					
FLD #4	Floodfighting Strategies								X		X				X					
FLD #5	ID of Repetitive Loss Structures			X					X	X		X			X					
FLD #6	AQ of Repetitive Loss Structures			X					X	X		X			X					
FLD #7	RL of Repetitive Loss Structures			X					X	X		X			X					
FLD #8	Temporary Flood Protection	X	X						X	X		X			X					
FLD #9	Public Education								X		X				X					
FLD #10	Stakeholder Education								X		X				X					
FLD #11	Flood Signs								X		X				X					
FLD #12	Floodplain Manager								X	X	X	X			X					
FLD #13	Watershed Management			X	X				X		X				X					
FLD #14	Urban Flood Reduction				X				X		X				X					
FLD #15	Urban Flood Reduction Solutions				X				X		X				X					
FLD #16	Acquire Aerial Photography								X		X				X					
FLD #17	Bridge Survey				X				X		X				X					
FLD #18	Bridge Modification				X				X		X				X					
FLD #19	ID Temp Flood Shelters								X		X				X					
FLD #20	ID Temp Storage Sites								X	X		X			X					
FLD #21	Raise Manholes				X				X		X				X					
FLD #22	Increase Pump Capacity								X		X				X					
FLD #23	Wastewater Plant Floodproofing				X				X		X				X					
FLD #24	Flood Warning Sensors					X	X		X	X		X			X					

Population Influx:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008						
		Modify The Hazard	Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches	Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?	If Yes, List Number of Impacts on the Community ?
POP #1	Event Planning for Safety		X		X	X			X	X	X		X				X				
POP #2	Public Safety Presence					X			X	X	X		X				X				
POP #3	Pre-Planning and Coordination								X			X			X			X			
POP #4	First Aid Stations								X		X		X				X				

Power Outage:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>					
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Short-Term	Medium Term	Long Term	High	Medium	Low
POW #1	Underground Utilities		X					X	X	X			X			X				
POW #2	Inspection and Maintenance				X						X			X						
POW #3	Tree Trimming					X						X				X				
POW #4	Public Education Re: Blackouts		X						X			X				X				

Ice/Sleet Storms:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>					
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Short-Term	Medium Term	Long Term	High	Medium	Low
ICE #1	Underground Utilities		X					X	X	X			X			X				
ICE #2	Tree Trimming				X				X	X		X				X				
ICE #3	NOAA Weather Radio			X						X		X				X				
ICE #4	Storm Warning Public Education		X						X			X				X				

School Violence:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>					
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Short-Term	Medium Term	Long Term	High	Medium	Low
SCH #1	Communication Systems		X					X	X	X		X			X					
SCH #2	On-Site Security		X					X	X	X		X			X					
SCH #3	Public Ed. Re: School Violence		X						X			X			X					
SCH #4	Oblique Aerial Photographs		X					X			X		X			X				

Civil Disturbance:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term
CIV #1	Defensive Architecture			X		X	X	X		X			X		
CIV #2	Crime Prevent Through Env Design			X		X	X	X		X		X			
CIV #3	Public Safety Presence				X	X	X	X		X	X		X		
CIV #4	Pre-Planning and Coordination				X	X				X			X		

Multi-Hazards:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term
MH #1	Adopt and Implement Plan				X	X	X	X	X	X			X		
MH #2	Incorporate into Local Plans				X	X	X	X	X	X		X			
MH #3	Maintain and Update Plan				X	X	X	X	X	X		X			
MH #4	Cost - Benefit Analysis				X						X		X		
MH #5	Evacuation Routes				X			X		X		X			
MH #6	Transportation Planning			X		X				X		X			
MH #7	NOAA All Hazards Radio				X			X		X		X			
MH #8	Enhance Data				X					X		X			
MH #9	Continue LEPC				X	X	X	X	X	X		X			
MH #10	Maintain EOC				X	X	X	X	X	X		X			
MH #11	Communication				X					X		X			
MH #12	Recordkeeping				X					X		X			
MH #13	Alternate Energy Sources			X		X				X		X			
MH #14	Special Needs Populations				X		X	X		X		X			
MH #15	Educational Outreach				X			X		X		X			
MH #16	"How To" Booth				X			X		X		X			
MH #17	School Mitigation Plan				X	X	X	X	X	X		X			
MH #18	Mitigation Curriculum				X	X	X	X	X	X		X			
MH #19	Public Service Announcements				X			X		X		X			
MH #20	Disaster Kit				X	X	X	X	X	X		X			

Delta Charter Township

Delta Charter Township identified flooding, hazardous materials, tornadoes, national security threats and “multi-hazards” as threats to their communities. The charts below list the proposed mitigation actions which should occur, ranging from building flood proof basements, to tree trimming, residential safe rooms and the provision of disaster kits. Township officials report that many of these items have been promoted or completed at various levels around the township.

Flooding:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>				
		Segregate the Hazard Modify The Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches Increase Public Awareness	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low
FLD #1	Floodproof Basements			X		X				X		X						
FLD #2	Update FIRM Maps				X	X				X			X					
FLD #3	Replace to a Higher Standard			X		X				X		X						
FLD #4	Floodfighting Strategies					X				X		X						
FLD #5	ID of Repetitive Loss Structures		X			X	X		X	X		X						
FLD #6	AQ of Repetitive Loss Structures		X			X	X		X	X		X						
FLD #7	RL of Repetitive Loss Structures		X			X	X		X	X		X						
FLD #8	Temporary Flood Protection	X	X			X	X		X	X		X						
FLD #9	Public Education				X			X		X			X					
FLD #10	Stakeholder Education				X			X		X			X					
FLD #11	Flood Signs				X			X		X					X			
FLD #12	Floodplain Manager					X	X	X	X	X		X				X		
FLD #13	Watershed Management		X	X		X			X	X		X						
FLD #14	Urban Flood Reduction			X		X				X			X					
FLD #15	Urban Flood Reduction Solutions			X		X				X		X						
FLD #16	Acquire Aerial Photography				X	X				X						X		
FLD #17	Bridge Survey			X		X				X			X					
FLD #18	Bridge Modification			X		X				X		X						
FLD #19	ID Temp Flood Shelters					X		X		X		X						
FLD #20	ID Temp Storage Sites						X			X		X						
FLD #21	Raise Manholes			X			X			X		X						
FLD #22	Increase Pump Capacity					X				X		X						
FLD #23	Wastewater Plant Floodproofing			X		X				X		X						
FLD #24	Flood Warning Sensors				X	X				X		X						

Hazardous Materials (Transportation –related)

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008				
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low
HMT #1	Pre-Response Training				X					X				X				
HMT #2	LEPC				X					X				X				
HMT #3	Oblique Aerial Photographs				X					X	X				X			
HMT #4	Land Use Buffers	X	X			X		X		X		X		X				

Tornadoes:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008				
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low
TRN #1	Residential Safe Rooms			X				X		X			X					
TRN #2	Institutional Safe Rooms / Spaces			X				X		X			X					
TRN #3	Free-Standing Safe Rooms			X				X		X			X					
TRN #4	Anchor Mobile / Temp Structures			X		X		X		X			X					
TRN #5	Bracing of Permanent Structures			X		X		X		X			X					
TRN #6	Wind Bracing For Signs			X		X		X		X	X				X			
TRN #7	Wind Bracing For Antennas			X		X		X		X	X				X			
TRN #8	Underground Utilities			X		X		X		X	X				X			
TRN #9	Tree Trimming				X	X	X	X		X					X			
TRN #10	Debris Management				X			X		X					X			
TRN #11	Early Warning Sirens		X			X		X		X	X				X			
TRN #12	Storm Spotters				X	X		X		X					X			
TRN #13	Storm Warning Public Education			X			X	X		X			X					
TRN #14	Severe Weather Awareness Week			X			X	X		X			X					
TRN #15	Public Storm Shelter Locations			X			X	X		X	X			X				
TRN #16	NOAA Weather Radio			X			X	X		X	X		X					

National Security Threat:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>			
		Other Mitigation Approaches Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Property Protection	Public Education	Injury / Casualty Prevention	Natural Resource Protection		Prevention / Risk Reduction	Short-Term	Medium Term		Long Term	High	Medium	Low
NST #1	Public Safety Presence				X	X	X	X		X				X				
NST #2	Defensive Architecture		X			X	X	X		X		X		X				
NST #3	Oblique Aerial Photographs				X	X				X		X			X			
NST #4	Public Education Related to WMD				X			X		X		X		X				

Ice/Sleet Storms:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation <i>Perform in 2008</i>			
		Other Mitigation Approaches Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Property Protection	Public Education	Injury / Casualty Prevention	Natural Resource Protection		Prevention / Risk Reduction	Short-Term	Medium Term		Long Term	High	Medium	Low
ICE #1	Underground Utilities		X			X	X	X		X		X		X				
ICE #2	Tree Trimming				X	X	X	X		X		X		X				
ICE #3	NOAA Weather Radio			X				X		X		X		X				
ICE #4	Storm Warning Public Education			X				X		X		X		X				

Multi-Hazards:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed					Project Type		Project Implementation			Project Priority			Project Evaluation <i>Perform in 2008</i>	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches Increase Public Awareness	Property Protection Prevention/Risk Reduction	Public Education	Injury / Casualty Prevention	Natural Resource Protection	New Project	Ongoing Project	Short-Term	Medium Term	Long Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?	If Yes, List Number of Impacts on the Community ?	
MH #1	Adopt and Implement Plan				X	X	X	X	X	X	X			X						
MH #2	Incorporate into Local Plans				X	X	X	X	X	X	X		X							
MH #3	Maintain and Update Plan				X	X	X	X	X	X	X			X						
MH #4	Cost - Benefit Analysis				X	X							X				X			
MH #5	Evacuation Routes				X			X				X					X			
MH #6	Transportation Planning			X		X								X			X			
MH #7	NOAA All Hazards Radio				X			X					X				X			
MH #8	Enhance Data				X							X					X			
MH #9	Continue LEPC				X	X	X	X	X	X	X		X				X			
MH #10	Maintain EOC				X	X	X	X	X	X	X		X				X			
MH #11	Communication				X								X				X			
MH #12	Recordkeeping				X								X				X			
MH #13	Alternate Energy Sources			X		X							X				X			
MH #14	Special Needs Populations				X			X	X				X				X			
MH #15	Educational Outreach				X			X					X				X			
MH #16	"How To" Booth				X			X					X				X			
MH #17	School Mitigation Plan				X	X	X	X	X	X	X		X				X			
MH #18	Mitigation Curriculum				X	X		X					X				X			
MH #19	Public Service Announcements				X			X					X				X			
MH #20	Disaster Kit				X	X		X	X				X				X			

Eaton County

Eaton County identified hazardous materials, dam failure, tornadoes, power outages, flooding, tornadoes and "multi-hazards" as threats to their communities. The charts below list the proposed mitigation actions which should occur, ranging from building flood proof basements, to tree trimming, bridge modifications and the provision of disaster kits. County officials report that many of these items have been promoted or completed at various levels around the County including the review of floodplain information for building permits obtained in 13 of the 16 townships and some cities and villages where the county administers the Building Code. Additionally, the Barry –Eaton District Health Department occasionally promotes disaster preparedness through their educational and marketing outreach.

For dam failures, the inspection and maintenance of dams in the county are ongoing by dam owners. A dam removal in Dimondale has addressed flooding issues in the Grand Pointe area. Power outages have been addressed by inspections and tree trimmings by

utilities and through ongoing public education with PSA's, workshops at churches, long term care and community centers. The Do1Thing program addresses this issue too. For the fixed sites and transportation of hazardous materials, the LEPC is active, responder trainings are ongoing, ortho photos were updated and assessments of materials that are moving through the county are ongoing. To address tornado hazards, a Debris Management Plan is in final form, storm spotter trainings are ongoing, early warning software is being used by school officials and responders, NOAA weather radios were provided to every school and governmental building in the county, along with day cares and senior centers. Preparedness campaigns and "Awareness Weeks" are ongoing.

Hazardous Materials (Fixed Site):

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Increase Public Awareness	Other Mitigation Approaches	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term
HMF #1	Enhance Pre-Planning				X					X			X		
HMF #2	Pre-Response Training				X					X			X		
HMF #3	LEPC				X					X			X		
HMF #4	Oblique Aerial Photographs				X					X	X			X	
HMF #5	Land Use Buffers	X	X					X		X		X		X	
HMF #6	Containment			X				X		X	X		X		

Dam failure:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Increase Public Awareness	Other Mitigation Approaches	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term
DAM #1	Replace to Higher Standard	X			X			X		X		X			
DAM #2	Inspection and Maintenance				X			X	X	X			X		
DAM #3	Dam Survey				X			X		X	X		X		
DAM #4	Dam Breach Sensors			X	X	X	X	X	X	X	X		X		

Power outage:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008				
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low
POW #1	Underground Utilities			X		X	X	X		X		X						
POW #2	Inspection and Maintenance				X	X				X			X					
POW #3	Tree Trimming					X	X	X		X	X			X				
POW #4	Public Education Re: Blackouts				X			X		X		X		X				

Flooding:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008				
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Prevention / Risk Reduction	Property Protection	Public Education		Injury / Casualty Prevention	Natural Resource Protection	Short-Term		Medium Term	Long Term	High	Medium	Low
FLD #1	Floodproof Basements			X		X			X		X			X				
FLD #2	Update FIRM Maps				X	X			X		X	X		X				
FLD #3	Replace to a Higher Standard			X		X			X		X	X		X				
FLD #4	Floodfighting Strategies					X			X		X			X				
FLD #5	ID of Repetitive Loss Structures			X		X	X		X		X	X		X				
FLD #6	AQ of Repetitive Loss Structures			X		X	X		X		X	X		X				
FLD #7	RL of Repetitive Loss Structures			X		X	X		X		X	X		X				
FLD #8	Temporary Flood Protection	X	X			X	X		X		X	X						
FLD #9	Public Education				X		X		X		X			X				
FLD #10	Stakeholder Education				X		X		X		X			X				
FLD #11	Flood Signs				X		X		X		X				X			
FLD #12	Floodplain Manager					X	X	X	X	X	X			X				
FLD #13	Watershed Management			X	X	X			X		X			X				
FLD #14	Urban Flood Reduction			X		X			X		X			X				
FLD #15	Urban Flood Reduction Solutions			X		X			X		X			X				
FLD #16	Acquire Aerial Photography					X			X		X					X		
FLD #17	Bridge Survey			X		X			X		X			X				
FLD #18	Bridge Modification			X		X			X		X			X				
FLD #19	ID Temp Flood Shelters					X		X	X		X			X				
FLD #20	ID Temp Storage Sites					X			X		X			X				
FLD #21	Raise Manholes			X		X			X		X			X				
FLD #22	Increase Pump Capacity					X			X		X			X				
FLD #23	Wastewater Plant Floodproofing			X		X			X		X			X				
FLD #24	Flood Warning Sensors				X	X			X		X			X				

Hazardous Materials (Transportation –related)

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008					
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Long Term	Medium Term	Short-Term	Low	Medium	High
HMT #1	Pre-Response Training																			
HMT #2	LEPC																			
HMT #3	Oblique Aerial Photographs																			
HMT #4	Land Use Buffers	X	X																	

Tornadoes:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed				Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008					
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Long Term	Medium Term	Short-Term	Low	Medium	High
TRN #1	Residential Safe Rooms			X																
TRN #2	Institutional Safe Rooms / Spaces			X																
TRN #3	Free-Standing Safe Rooms			X																
TRN #4	Anchor Mobile / Temp Structures			X				X												
TRN #5	Bracing of Permanent Structures			X				X												
TRN #6	Wind Bracing For Signs			X				X												
TRN #7	Wind Bracing For Antennas			X				X												
TRN #8	Underground Utilities			X				X												
TRN #9	Tree Trimming							X	X											
TRN #10	Debris Management																			
TRN #11	Early Warning Sirens							X		X										
TRN #12	Storm Spotters							X												
TRN #13	Storm Warning Public Education			X					X											
TRN #14	Severe Weather Awareness Week			X				X												
TRN #15	Public Storm Shelter Locations			X				X	X											
TRN #16	NOAA Weather Radio			X				X	X											

Multi-Hazards:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed					Project Type		Project Implementation			Project Priority			Project Evaluation <i>Perform in 2008</i>	
		Segregate the Hazard	Prevent or Limit Development	Alter Design or Construction	Other Mitigation Approaches Increase Public Awareness	Property Protection	Public Education	Injury / Casualty Prevention	Natural Resource Protection	Prevention / Risk Reduction	New Project	Ongoing Project	Short-Term	Medium Term	Long Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?	If Yes, List Number of Impacts on the Community ?
MH #1	Adopt and Implement Plan				X				X	X	X	X	X		X					
MH #2	Incorporate into Local Plans				X				X	X	X	X	X		X					
MH #3	Maintain and Update Plan				X				X	X	X	X	X		X					
MH #4	Cost - Benefit Analysis				X				X						X					
MH #5	Evacuation Routes				X						X				X					
MH #6	Transportation Planning			X					X						X					
MH #7	NOAA All Hazards Radio				X					X					X					
MH #8	Enhance Data				X						X				X					
MH #9	Continue LEPC				X				X	X	X	X	X		X					
MH #10	Maintain EOC				X				X	X	X	X	X		X					
MH #11	Communication				X						X				X					
MH #12	Recordkeeping				X						X				X					
MH #13	Alternate Energy Sources			X					X						X					
MH #14	Special Needs Populations				X						X				X					
MH #15	Educational Outreach			X							X				X					
MH #16	"How To" Booth			X							X				X					
MH #17	School Mitigation Plan				X				X	X	X	X	X		X					
MH #18	Mitigation Curriculum				X	X					X				X					
MH #19	Public Service Announcements				X						X				X					
MH #20	Disaster Kit				X	X					X				X					

Ingham County

Ingham County identified hazardous materials, chemicals, explosives, tornadoes, flooding, and "multi-hazards" as threats to their communities. The charts below list the proposed mitigation actions which should occur, ranging from building flood proof basements, to tree trimming, bridge modifications and the provision of disaster kits. County officials report that many of these items have been promoted or completed at various levels around the County.

Ingham County identified hazardous materials, chemicals, explosives, tornadoes, flooding, and "multi-hazards" as threats to their communities in 2004. The charts below list the proposed mitigation actions which should occur, ranging from building flood proof basements, to tree trimming, bridge modifications and the provision of disaster kits. County officials report that many of these items have been promoted or completed at various levels around the County including working with Do1Thing to improve citizen preparedness through education and providing disaster kits, expanding the outdoor warning siren alert system, and through giving NOAA All-Hazards Alert Radios to schools, hospitals, and county facilities. Debris removal has taken place in Delhi

Township to reduce flooding along the Sycamore Creek, and a 24/7 river gauge has been installed to provide better forecasts and alerts.

Hazardous Materials (Fixed Site):

Project #	Project Name	Mitigation Strategy Applied					Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008								
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Ongoing Project	New Project	Long Term	Medium Term	Short-Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?
HMF #1	Enhance Pre-Planning					X	X					X				X							
HMF #2	Pre-Response Training					X	X					X				X							
HMF #3	LEPC					X	X					X				X							
HMF #4	Oblique Aerial Photographs					X	X					X							X				
HMF #5	Land Use Buffers	X	X				X		X			X							X				
HMF #6	Containment			X			X			X		X				X			X				

Multi-Hazards:

Project #	Project Name	Mitigation Strategy Applied					Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008								
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection	Injury / Casualty Prevention		Public Education	Property Protection	Prevention / Risk Reduction		Ongoing Project	New Project	Long Term	Medium Term	Short-Term	High	Medium	Low	Has This Project Been Implemented (Yes / No) ?
MH #1	Adopt and Implement Plan					X	X	X	X	X		X				X							
MH #2	Incorporate into Local Plans					X	X	X	X	X		X		X		X							
MH #3	Maintain and Update Plan					X	X	X	X	X		X		X		X							
MH #4	Cost - Benefit Analysis					X	X					X		X		X							
MH #5	Evacuation Routes					X			X			X		X		X							
MH #6	Transportation Planning			X			X					X		X		X							
MH #7	NOAA All Hazards Radio			X				X				X		X		X							
MH #8	Enhance Data					X						X		X		X							
MH #9	Continue LEPC					X	X	X	X	X		X		X		X							
MH #10	Maintain EOC					X	X	X	X	X		X		X		X							
MH #11	Communication					X						X		X		X							
MH #12	Recordkeeping					X						X		X		X							
MH #13	Alternate Energy Sources			X			X					X		X		X							
MH #14	Special Needs Populations					X		X	X			X		X		X							
MH #15	Educational Outreach					X		X				X		X		X							
MH #16	"How To" Booth					X		X				X		X		X							
MH #17	School Mitigation Plan					X	X	X	X	X		X		X		X							
MH #18	Mitigation Curriculum					X	X		X			X		X		X							
MH #19	Public Service Announcements					X		X				X		X		X							
MH #20	Disaster Kit					X	X		X			X		X		X							

Chemicals:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008						
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection		Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Long Term	Medium Term	Short-Term	Low	Medium	High
CHM #1	Public Safety Presence							X												
CHM #2	Defensive Architecture			X																
CHM #3	Oblique Aerial Photographs																			
CHM #4	Public Education Related to WMD		X																	

Flooding:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008						
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection		Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Long Term	Medium Term	Short-Term	Low	Medium	High
FLD #1	Floodproof Basements			X																
FLD #2	Update FIRM Maps				X															
FLD #3	Replace to a Higher Standard			X																
FLD #4	Floodfighting Strategies																			
FLD #5	ID of Repetitive Loss Structures			X																
FLD #6	AQ of Repetitive Loss Structures			X																
FLD #7	RL of Repetitive Loss Structures			X																
FLD #8	Temporary Flood Protection	X	X																	
FLD #9	Public Education																			
FLD #10	Stakeholder Education																			
FLD #11	Flood Signs																			
FLD #12	Floodplain Manager																			
FLD #13	Watershed Management			X	X															
FLD #14	Urban Flood Reduction																			
FLD #15	Urban Flood Reduction Solutions																			
FLD #16	Acquire Aerial Photography																			
FLD #17	Bridge Survey																			
FLD #18	Bridge Modification																			
FLD #19	ID Temp Flood Shelters																			
FLD #20	ID Temp Storage Sites																			
FLD #21	Raise Manholes																			
FLD #22	Increase Pump Capacity																			
FLD #23	Wastewater Plant Floodproofing																			
FLD #24	Flood Warning Sensors																			

Explosives:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008						
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection		Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Long Term	Medium Term	Short-Term	Low	Medium	High
EXP #1	Public Safety Presence							X												
EXP #2	Defensive Architecture			X				X				X								
EXP #3	Oblique Aerial Photographs									X										
EXP #4	Public Education Related to WMD		X						X			X								

Tornadoes:

Project #	Project Name	Mitigation Strategy Applied				Project Goals Addressed			Project Type	Project Implementation			Project Priority	Project Evaluation Perform in 2008						
		Other Mitigation Approaches	Increase Public Awareness	Alter Design or Construction	Prevent or Limit Development	Segregate the Hazard	Modify The Hazard	Natural Resource Protection		Injury / Casualty Prevention	Public Education	Property Protection		Prevention / Risk Reduction	Long Term	Medium Term	Short-Term	Low	Medium	High
TRN #1	Residential Safe Rooms			X					X			X								
TRN #2	Institutional Safe Rooms / Spaces			X					X			X								
TRN #3	Free-Standing Safe Rooms			X					X			X								
TRN #4	Anchor Mobile / Temp Structures			X					X			X								
TRN #5	Bracing of Permanent Structures			X					X			X								
TRN #6	Wind Bracing For Signs			X					X			X								X
TRN #7	Wind Bracing For Antennas			X					X			X								X
TRN #8	Underground Utilities			X					X				X							
TRN #9	Tree Trimming						X		X			X								
TRN #10	Debris Management					X			X			X								
TRN #11	Early Warning Sirens			X					X			X								
TRN #12	Storm Spotters						X		X			X								X
TRN #13	Storm Warning Public Education			X					X			X								
TRN #14	Severe Weather Awareness Week			X					X			X								
TRN #15	Public Storm Shelter Locations			X					X			X								
TRN #16	NOAA Weather Radio			X					X			X								

Mitigation Goal Priorities

The mitigation goals and actions adopted and implemented as part of the 2004 Plans were a mix of actions for hazards that are not altogether deemed significant not on 2015. Early on in the planning process, the project team reviewed the 2004 hazards and agreed that the updated plan would address only natural hazards as required by FEMA. All strategies presented here will improve the health, safety and general welfare for citizens, business and government. There are, however, limitations to actionable items

in any plan. Two primary limitations for the mitigation strategies presented in this plan include funding opportunities and the general political processes that direct limited resources across expanding needs.

Consideration to these limitations is reflected in the selection of mitigation strategies, which seek to reduce vulnerability with actions that have been previously identified in an existing plan, that are volunteer based, that introduce manageable financial commitment from local government, or that provide a funding option from an external agency. Unfunded mitigation strategies have been estimated to provide a benefit over cost. The goals and activities listed here are in order of priority beginning with addressing the needs of vulnerable populations. Top priority items are critical to implement and address over the next 3 years. High priority items are critical to implement and address over the next 5 years.

Top Priority: Protect Special Needs Populations

- A. Mitigation Strategy:** Develop and promote contact list for local disaster planning and assistance organizations (Listening Ear, FIA, Commission on Aging, Red Cross) to be promoted to special needs populations.

Potential Lead Organization/Department: Emergency Operations Center, Red Cross, other community organizations

Potential Funding Sources: Local Government, State of Michigan, Community Organizations, Federal Government

- B. Mitigation Strategy:** Hold public seminar(s) on disaster planning and preparedness for special needs populations, caretakers planning officials and facilities caring for special needs populations.

Potential Lead Organization/Department: Emergency Operations Center, Red Cross, other community organizations

Potential Funding Sources: Local EOC, Local Government, Community Organizations

- C. Mitigation Strategy:** Seek funding for NOAA weather radios for facilities caring for special needs populations and special needs populations living independently.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government, SCT Two-percent Funding

- D. Mitigation Strategy:** Give disaster kits to caretakers of special needs populations, including hospice patients, and facilities caring for special needs populations.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government,

- E. Mitigation Strategy:** Mass mail all special needs facilities a brochure on facility disaster preparedness.

Potential Lead Organization/Department: Emergency Operations Center, Red Cross, other community organizations

Potential Funding Sources: Local EOC, Local Government, Community Organizations

- F. Mitigation Strategy:** Encourage each facility to conduct annual disaster drills.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA,

- G. Mitigation Strategy:** Develop internal facility emergency/disaster warning systems.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Private

High Priority: Identify gaps in community wide emergency response to hazards.

Objective: Conduct multi agency exercises for potential hazards to identify gaps and develop solutions.

- A. Mitigation Strategy:** Conduct annual orientations with each response agency regarding the counties disaster plans.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, Local Government

- B. Mitigation Strategy:** Conduct disaster drills with each response agency to exercise county disaster plan.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government,

- C. Mitigation Strategy:** Conduct a full scale disaster drill every third year with as many agencies as possible.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government, SCT Two-percent Funding

High Priority: Provide protective measures from severe wind, hail and tornadoes.

Objective: *Construct shelters and raise awareness to safe rooms and other construction methods that provide protective measures from wind/storm events.*

- A. Mitigation Strategy:** Encourage the construction of shelters at City and County Parks.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government.

- B. Mitigation Strategy:** Encourage the construction of shelters at mobile home/manufactures housing communities.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government, SCT two-percent funding.

- C. Mitigation Strategy:** Increase public awareness of safe rooms and enhanced construction methods in newly constructed homes through brochures, Internet and other literature to be made available from county and private entities.

Potential Lead Organization/Department: Emergency Operations Center, Community Development

Potential Funding Sources: Local EOC, FEMA, Local Government, Private

- D. Mitigation Strategy:** Ensure that all schools located in Clinton County are within the outdoor warning siren range and have indoor warning capabilities (indoor weather warning via NOAA Weather Radios).

Potential Lead Organization/Department: Emergency Operations Center, Clinton-Gratiot ISD, Local School Districts

Potential Funding Sources: Local EOC, FEMA, State of Michigan

Objective: *Raise public awareness of severe weather events and preventative actions.*

- A. Mitigation Strategy:** Increase attendance at National Weather Service Spotter classes through media (local weather stations, Internet, newspapers, etc.).

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, FEMA, NOAA,

- B. Mitigation Strategy:** Create public service announcements regarding severe weather events.

Potential Lead Organization/Department: Emergency Operations Center

Potential Funding Sources: Local EOC, FEMA, Local Government,

High Priority: Decrease vulnerability of county to infrastructure failures caused by natural events.

Objective: *Include policies developed in Comprehensive Plan that promote growth in areas that have existing infrastructure in hazard mitigation plan.*

- A. Mitigation Strategy:** Discourage unplanned sprawl conditions in area without exist infrastructure.

Potential Lead Organization/Department: Local Legislative Body, Community Development, Planning Boards

Potential Funding Sources: Local Government

Objective: *Rehabilitate infrastructure where applicable (storm water, water, sewerage, underground utilities etc.).*

- A. Mitigation Strategy:** Identify infrastructure that needs rehabilitation.

Potential Lead Organization/Department: Drain Commission, Public Works

Potential Funding Sources: Local Government, State of Michigan,

- B. Mitigation Strategy:** Suggest local governments find sources of funding (Michigan Hazard mitigation funding, local budgets, local grantors, etc...) to fund rehabilitation projects.

Potential Lead Organization/Department: Local Governing Body, Community Development, Local EOC

Potential Funding Sources: Local Government

- C. Mitigation Strategy:** Create a digital GIS layer displaying locations of generators throughout county.

Potential Lead Organization/Department: Local EOC

Potential Funding Sources: Local EOC, State EMD, FEMA, Local Government.

High Priority: Reduce the impacts of riverine/urban flooding.

Objective: *To preserve or improve the water quality of water resources, such Rivers, their tributaries, lakes, and wetlands.*

- A. Mitigation Strategy:** Create an overlay zoning district which can be applied to the lands abutting water resources to manage growth and development, ensure sufficient setback distances, and preserve natural features.

Potential Lead Organization/Department: Local Governing Body, Community Development, Planning Boards

Potential Funding Sources: Local Government, FEMA,

- B. Mitigation Strategy:** Work with the Department of Environmental Quality to enforce water quality regulations.

Potential Lead Organization/Department: Local Governing Body, Community Development

Potential Funding Sources: Local Government, Michigan DEQ

- C. Mitigation Strategy:** Consider the potential impacts of stormwater runoff on water quality.

Potential Lead Organization/Department: Community Development, MSU Extension, MDEQ

Potential Funding Sources: Local Government, Michigan DEQ, EPA, FEMA

Objective: *To preserve the natural character of adjacent lands along the rivers...*

- A. Mitigation Strategy:** Provide incentives to preserve frontage and vegetation along the river banks.

Potential Lead Organization/Department: Local Governing Body, Community Development, Planning Boards

Potential Funding Sources: Local Government, FEMA,

- B. Mitigation Strategy:** Create an overlay zoning district which can be applied to the lands along the river banks.

Potential Lead Organization/Department: Local Governing Body, Community Development, Planning Boards

Potential Funding Sources: Local Government, FEMA,

- C. Mitigation Strategy:** Consider the established federal flood plain boundaries as a part of any proposed regulations. All local jurisdictions should participate in the National Flood Insurance Program and Repetitive Loss Programs, planning and implementing` federally recognized mitigation efforts.

Potential Lead Organization/Department: Local Governing Body, Community Development, Planning Boards

Potential Funding Sources: Local Government, FEMA

- D. Mitigation Strategy:** Encourage cooperative and coordinated planning efforts among neighboring communities.

Potential Lead Organization/Department: Local Governing Body, Community Development, Planning Boards

Potential Funding Sources: Local Government

Plan Implementation

With the support of a FEMA grant through the Michigan State Police, the tri-County region of Ingham Eaton, and Clinton Counties and the Charter Township of Delta have conducted research, convened advisory group and steering group meetings, and integrated the work of updating the regional Hazard Mitigation Plan. Beginning with research, mapping and the development of elevations data (LiDAR) followed by an analyses of hazards and vulnerable areas, the Tri-County Regional Planning Commission has worked to create a new and complete revised library of geographic

information systems. The anticipated goal is to complete an update of the regional Hazard Mitigation Plan and submit it for County approvals in July 2015. On behalf of the region, TCRPC will seek adoption of a final plan, which requires a resolution of adoption of the final Plan by the County and Township boards. Formal adoption of this plan will make it active for a period of five years, in which time consideration should be given to updates for the next planning period. The Hazard Mitigation Plan will officially be transferred to the Emergency Management Agencies of Clinton, Eaton and Ingham Counties and Delta Charter Township, as will responsibilities for maintenance. The transfer will include all materials used to create the plan and a CD containing digital documentation and maps.

The Tri-County Regional Planning Commission provided planning work during the planning process. In large part, this was due to the availability of grant funding and a limitation of resources required in completing this plan. On transfer of deliverables, TCRPC will have completed its role in this planning process. The TCRPC will aid the counties and township during the transfer and adoption phase in any means possible. Any future involvement by TCRPC will depend on the availability of staff and funding.

TCRPC will maintain digital copies of all data and information used and produced for this plan, including GIS data and maps. Distribution of this data and information, including the plan, shall be directed to the Emergency Management Agencies. TCRPC will maintain contact with the County and Township Emergency Management Coordinators and provide assistance on a limited basis. All requests and questions regarding this plan shall be directed to the County and Township Emergency Operations Centers.

During the development of this plan key individuals came together, raised awareness and leveraged support for mitigation planning. While many of these individuals and agencies are integral components of the mitigation strategies, successful implementation will continue to require an engaged audience that extends beyond stakeholders.

Specific project implementation should consider what is most feasible in terms of resources, financial commitment and the ability to connect a project publicly to hazard mitigation. Successful implementation and reduction of vulnerabilities can leverage tremendous public and political support. Engaging in attainable projects first will facilitate further projects and support for future planning activities.

Using MSP's Condensed Hazard Mitigation Plan Review Sheets, this plan meets the requirements listed in Section 1, Items 1 through 5; Section 2, Items 6 through 9; Section 3, Items 10 through 14; and Section 4, Items 15 through 20. All grant agreement steps have been met in the development of this plan update such as review of the 2004 Plans, convening of workgroup meetings, hosting of public workshops, the creation of LiDAR based contour maps and building footprint maps, development of hazard analysis chapters and hazard mitigation actions.

Maintenance and Updates of the Hazard Mitigation Plan

A review report was provided by representatives of FEMA and the Michigan State Police on June 11, 2015 following their consideration of the final draft plan. The minor changes recommended were completed and this final Plan document has been produced and publicly posted at www.mitcrpc.org, the Tri-County Regional Planning Commission website. The final Tri-County Regional Hazard Mitigation Plan was also submitted for formal adoption by the three counties and Delta Charter Township in June-July, 2015.

The Hazard Mitigation Plan will be active for five years beyond the date of FEMA approval. During that time, the Tri-County region's agencies will continue to consider how to maintain and improve the Hazard Mitigation Planning processes and their implementation. The Emergency Managers in the region will continue to monitor, evaluate and update the 2015 Hazard Mitigation Plan through many means including public participation in the plan maintenance process with periodic presentations to community groups, in public meetings, through internet and social media postings, or by the use of questionnaires and surveys.

To remain active with the planning process, this Plan recommends that a regional workgroup continue to meet at least annually after the adoption of this plan to review its implementation and ongoing maintenance and development. The implementation meetings should focus primarily on changes in the community, such as population shifts, new development patterns and changes to local, state and federal priorities. Regional participating agencies should conduct routine maintenance quarterly regarding the review and evaluation of mitigation strategies to ensure connectivity to projects and their stakeholders. Additionally, the maintenance topic should be introduced and discussed, when possible, at other forums such as local emergency response meetings. Over the next five years, local participating communities should recognize and adopt this hazard mitigation plan into or as an amendment to their local master land use plans. And, a variety of hazard mitigation action items should also be considered and adopted into local capital improvement plans so that local funds can be allotted to the implementation of the local community's chosen hazard mitigation activities.

During year five of this plan, in 2020, it is recommended that the regional emergency management agencies, municipalities, and other affected agencies organize their efforts to create the next version of a Hazard Mitigation Plan that recognizes and updates this five year Regional Hazard Mitigation Plan. Future meetings should carefully consider changes to the community and improving information as foundations for updating this plan. Maintenance and updates to this plan are the responsibility of the County and Township Emergency Management Agencies.

APPENDIX A: LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan’s strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Clinton, Eaton, Ingham Counties, MI	Title of Plan: Tri-County Regional Hazard Mitigation Plan	Date of Plan: 2015
Local Point of Contact: Susan M. C. Pigg		Address: 3135 Pine Tree Rd, Suite 2C Lansing, MI 48911
Title: Executive Director		
Agency: Tri-County Regional Planning Commission		
Phone Number: (517) 393-0342		E-Mail: spigg@mitcrpc.org
State Reviewer: Mike Sobocinski	Title: Hazard Mitigation Planning Specialist	Date: 5/29/2015
FEMA Reviewer: Kirstin Kuenzi	Title: Community Planning Specialist	Date: 6/1/2015
Date Received in FEMA Region (insert #)	5/29/2015	
Plan Not Approved		
Plan Approvable Pending Adoption	XX- but please add additional text for the cities of Williamston, Eaton Rapids; the townships of Meridian Charter, Williamston, Lansing Charter, DeWitt Charter when adopting	

SECTION 1:

REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been ‘Met’ or ‘Not Met.’ The ‘Required Revisions’ summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is ‘Not Met.’ Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST	Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Plan Update Meetings, pp. 5. <i>Meetings were held in 2012, 2013, 2014, and 2015. An online survey was developed in 2015.</i>	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Figure 3: Plan Update Meetings, pp. 5. <i>Sheriff Departments, libraries, DOTs, and a representative from Michigan State University in Lansing participated in group meetings.</i>	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Plan Update Meetings, pp. 5. <i>Meetings were open to all (public forums) and an online survey was utilized.</i>	X	

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	<p>Process to Update the Tri-County Regional Plan, pp. 10-12. <i>Existing information such as the Regional Growth: Choice for our Future report, the Greening Mid-Michigan Report, the State HM Plan, and various maps were reviewed and data was compiled.</i></p>	X		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	<p>Maintenance and Updates, pp. 131. <i>“The Emergency Managers in the region will continue to monitor, evaluate and update the 2015 HM Plan through many means: Public participation in the plan maintenance process with periodic presentations to community groups or at public meetings, internet and social media postings, or the use of questionnaires and surveys”.</i></p>	X		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Maintenance and Updates, pp. 131. <i>"To remain active with the planning process it is recommended that the workgroup meet annually beginning one year from the adoption of this plan to consider its ongoing implementation".</i>	X		
ELEMENT A: REQUIRED REVISIONS <i>N/A</i>				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Hazard Analysis, pp. 48-98. <i>The ranking of hazards covered are, in order: tornado, flood, severe wind, snowstorm, hail, ice storm, drought, wildfire, lightning, extreme heat, extreme cold, and fog; manmade hazards covered are civil disturbance, hazmat, oil/natural gas accident, infrastructure failure, and public health emergency.</i>	X		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Hazard Analysis, pp. 48-98. <i>Previous occurrences are documented by disaster declarations as well as NCDC information; probability for each hazard event is also estimated by county.</i>	X		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Hazard Analysis, pp. 48-98. <i>Impact is well described.</i>	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Repetitive Loss Property Information in the Tri-County Region, pp. 74-75. <i>Clinton County has 1 rep loss property, Ingham County has 12 rep loss properties, and Eaton County has 12 rep loss properties.</i>	X		
ELEMENT B: REQUIRED REVISIONS <i>N/A</i>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Hazard Mitigation: Unlocking the Disaster Equation, pp. 5-9. <i>Existing policies and programs are covered in the introduction as well as through maps in the plan.</i>	X		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Figure 51: FEMA Community Status Chart, pp. 69. <i>The table quotes FEMA's Community Status Books for documenting jurisdictional participation in the NFIP.</i>	X		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Mitigation Goal Priorities, pp. 123-129. <i>Goals include the highest priorities to these communities: protecting the special needs populations, identifying gaps in community-wide emergency response to hazards, providing protective measures from severe wind, hail, and tornadoes, decreasing vulnerability of the counties to infrastructure failures caused by natural events, and reducing the impacts of riverine/urban flooding.</i>	X		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Mitigation Strategies and Plan Implementation, pp. 99-123. <i>Mitigation actions are comprehensive and specific to each hazard addressed.</i>	X		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Mitigation Strategies and Plan Implementation, pp. 99-123. <i>Action plan, by county, is prioritized in terms of high, medium, or low as well as project timeline.</i>	X		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Maintenance and Updates, pp. 131. <i>“Over the next five years, local participating communities should adopt this hazard mitigation plan as an amendment of their local mast plans. Various action items should also be considered and adopted into local capital improvement plans so that local funds can be allotted to the implementation of the local community’s chosen hazard mitigation activities”.</i>	X		
<u>ELEMENT C: REQUIRED REVISIONS</u>				
N/A				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Community Profiles, pp. 13-47. <i>Current and future land use is well-documented within the plan by both maps and descriptions.</i>	X		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Mitigation Strategies and Plan Implementation, pp. 99. <i>“The mitigation alternatives for our region are very much the same now as they were in the previous adopted Plan. Various actions were completed since 2005, such as the distribution of weather radios to residents, the adoption of low-impact development regulations across the region, and public service announcements pertaining to emergency preparedness. The TCRPC made every effort to ensure that actions can be accomplished and that they will reduce vulnerability”.</i>	X		

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Hazards Analysis, pp. 48. <i>Priorities have been updated. "In 2004, Clinton, Eaton and Ingham Counties and Delta Charter Township proposed floods, tornadoes and ice/sleet storms as their top three hazards. This is in keeping with the new 2015 Plan update. Also, the earthquakes and forest fires that were identified as a hazard in 2005 do not play a major role in the 2015 update as our region is not host to substantial forested areas, nor is it prone to earthquakes".</i>	X		
<u>ELEMENT D: REQUIRED REVISIONS</u>				
N/A				
<u>ELEMENT E. PLAN ADOPTION</u>				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	<i>Plan can be adopted post-FEMA approval.</i>			X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	<i>Plan can be adopted post-FEMA approval.</i>			X
<u>ELEMENT E: REQUIRED REVISIONS</u>				
N/A				
<u>ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)</u>				

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2:

PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Element B: Hazard Identification and Risk Assessment

Element C: Mitigation Strategy

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

B. Resources for Implementing Your Approved Plan

There are many different resources that can assist your community in plan implementation. FEMA sources of funding include the following:

HMGP: The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under the Presidential major disaster declaration, in the areas of the State requested by the Governor.

PDM: The Pre- Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian Tribal governments, and local communities to implement a sustained pre- disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future major disaster declarations.

****The following are only available if you are a participating community in the NFIP****

FMA: The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). The Repetitive Flood Claims (RFC) program has the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time.

SLR: The Severe Repetitive Loss (SRL) program is authorized by Section 1361A of the NFIA has the goal of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest amount of savings to the NFIF in the shortest period of time.

RFC: The Repetitive Flood Claims program is authorized by Section 1361A of the NFIA, 42 U.S.C. 4030 with the goal of reducing flood damages to individual properties for which one or more claim payment for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund in the shortest period of time.

SECTION 3:

MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

Ingham County; the cities of East Lansing, Williamston, Mason; the villages of Dansville, Webberville; the townships of Meridian Charter, Williamston, Dehli Charter, Lansing Charter.

Eaton County; the cities of Grand Ledge, Charlotte, Eaton Rapids; Delta Charter Township.

Clinton County; the cities of DeWitt, St. Johns, the townships of DeWitt Charter, Bath Charter, Dallas.

DELHI CHARTER TOWNSHIP

MEMORANDUM

TO: Delhi Township Board Members

FROM: John B. Elsinga, Township Manager

DATE: April 15, 2016

RE: Resolution No. 2016-004 – Authorizing the Issuance and Delegating the Sale of Charter Township of Delhi 2016 Refunding Bonds

Enclosed for your review and approval is Resolution No. 2016-004 which would authorize and delegate the sale of Delhi Charter Township 2016 Refunding Bonds.

These bonds would replace the Series 2011 Refunding of Series 2002 Bonds which were used to finance both sewage and water capital improvement projects in 2002.

The sole purpose of these 2016 refunding bonds is to save approximately \$80,000 on the interest payments through 2022. Therefore, I recommend the Board approve a resolution authorizing the issuance and delegating the sale of Charter Township of Delhi 2016 refunding bonds.

Recommended Motion:

To adopt Resolution No. 2016-004 authorizing the issuance and delegating the sale of Charter Township of Delhi 2016 Refunding Bonds.

DELHI CHARTER TOWNSHIP

2016 Refunding Bonds (Refunds 2011 LTGO)

Sources & Uses

Dated 06/09/2016 | Delivered 06/09/2016

Sources Of Funds

Par Amount of Bonds	\$2,505,000.00
Transfers from Prior Issue Debt Service Funds	38,822.50

Total Sources **\$2,543,822.50**

Uses Of Funds

Costs of Issuance	45,000.00
Deposit to Net Cash Escrow Fund	2,497,385.65
Rounding Amount	1,436.85

Total Uses **\$2,543,822.50**

DELHI CHARTER TOWNSHIP

2016 Refunding Bonds (Refunds 2011 LTGO)

Gross Debt Service Comparison

Date	Principal	Coupon	Interest	New D/S	OLD D/S	Savings
09/01/2016	-	-	-	-	38,822.50	38,822.50
09/01/2017	390,000.00	1.750%	53,822.71	443,822.71	457,645.00	13,822.29
09/01/2018	405,000.00	1.750%	37,012.50	442,012.50	458,335.00	16,322.50
09/01/2019	410,000.00	1.750%	29,925.00	439,925.00	452,415.00	12,490.00
09/01/2020	425,000.00	1.750%	22,750.00	447,750.00	460,170.00	12,420.00
09/01/2021	430,000.00	1.750%	15,312.50	445,312.50	461,475.00	16,162.50
09/01/2022	445,000.00	1.750%	7,787.50	452,787.50	466,425.00	13,637.50
Total	\$2,505,000.00	-	\$166,610.21	\$2,671,610.21	\$2,795,287.50	\$123,677.29

PV Analysis Summary (Gross to Gross)

Gross PV Debt Service Savings	118,731.13
Transfers from Prior Issue Debt Service Fund	(38,822.50)
Contingency or Rounding Amount	1,436.85
Net Present Value Benefit	\$81,345.48
Net PV Benefit / \$2,460,000 Refunded Principal	3.307%
Net PV Benefit / \$2,505,000 Refunding Principal	3.247%

Refunding Bond Information

Refunding Dated Date	6/09/2016
Refunding Delivery Date	6/09/2016

Resolution No. 2016-004

RESOLUTION AUTHORIZING THE ISSUANCE AND DELEGATING THE SALE OF CHARTER TOWNSHIP OF DELHI 2016 REFUNDING BONDS

Charter Township of Delhi, Ingham County, Michigan (the "Township" or "Issuer")

A regular meeting of the Township Board of Trustees (the "Board") of the Township was held in the Multipurpose Room of the Delhi Township Community Services Center, in the Township, on the on the 19th day of April, 2016, at 7:30 o'clock in the p.m.

The meeting was called to order by C.J. Davis, Township Supervisor.

Present:

Absent:

The following preamble and resolution were offered by Member _____
and supported by Board Member _____

WHEREAS:

1. Part VI of Act 34, Public Acts of Michigan, 2001, as amended, the Revised Municipal Finance Act (the "Act"), permits the Issuer to refund all or part of its bonded indebtedness; and

2. The Issuer has received a proposal from H.J. Umbaugh & Associates, Certified Public Accountants, LLP (the "Financial Advisor") to refund all or part of the portion of the outstanding 2011 Refunding Bonds of the Issuer, dated June 23, 2011, in the original amount of \$4,335,000, which are callable on or after September 1, 2016, and are due and payable September 1, 2017 through September 1, 2022, inclusive (the "Prior Bonds"); and

3. The Issuer may have the opportunity to directly or privately place ("Private Placement") its refunding bonds with a sophisticated investor or commercial bank (the "Purchaser") for the purpose of refunding all or part of the Prior Bonds; and

4. The Board determines that it is in the best interest of the Issuer to consider refunding the Prior Bonds; and

5. Prior to the issuance of its bonds, the Issuer achieved qualified status from the Michigan Department of Treasury (the "Department") pursuant to the Act.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. Bonds of the Issuer designated 2016 Refunding Bonds (the "Bonds") be issued in the aggregate principal amount of not to exceed \$2,505,000, as finally determined upon sale or Private Placement thereof, for the purpose of refunding all or a portion of the Prior Bonds. The Bonds shall be dated the date of delivery, or such other date as established at the time of sale or Private Placement; shall be numbered in the direct order of their maturities from 1 upwards; shall be fully registered Bonds as to principal and interest; shall bear interest at a rate or rates to be hereafter determined upon sale or Private Placement, payable on March 1, 2017, and semiannually thereafter on September 1 and March 1 in each year; and shall mature on September 1 in each year to be subsequently determined by the Issuer's Township Manager or the Township Supervisor, in the final principal amounts determined upon sale or Private Placement and may be subject to mandatory redemption in the amounts, times, in the manner and at the prices determined upon sale or Private Placement of the Bonds.

2. The Bonds may consist of serial or term Bonds or any combination thereof which may be issued in one or more series, all of which shall be determined upon sale or Private Placement of the Bonds.

3. The Bonds are issuable in minimum denominations of \$100,000, and integral multiples of \$5,000 over \$100,000, not exceeding the aggregate principal amount for each maturity.

4. The principal of the Bonds and the interest thereon shall be payable in lawful money of the United States of America at or by a bank or trust company to be designated by the Township Manager or the Township Supervisor at the time of sale or Private Placement (herein called the "Paying Agent"), which shall act as the paying agent and bond registrar or such successor paying agent-bond registrar as may be approved by the Issuer, on each semiannual interest payment date and the date of each principal maturity.

5. The interest on any one Bond shall be at one rate only, and all Bonds maturing in any one year must carry the same interest rate. No bid/offer will be considered for a price less than 99.75% of the par value. The maximum true interest cost of the Bonds shall not exceed four percent (4%) per annum.

6. Book Entry. At the request of the original Purchaser of the Bonds, the ownership of one fully registered bond for each maturity in the aggregate principal amount of such maturity, shall be registered in the name of Cede & Co., as nominee of The Depository Trust Company ("DTC"). So long as the Bonds are in the book entry form only, the Paying Agent shall comply with the terms of the Blanket Issuer Letter of Representations to be entered into between the Issuer and DTC, which provisions shall govern registration, notices and payment, among other things, and which provisions are incorporated herein with the same effect as if fully set forth herein. The Township Manager or the Township Supervisor are hereby authorized and directed to enter into the Blanket Issuer Letter of Representations with DTC in such form as determined by the Township Manager or the Township Supervisor, in consultation with bond counsel, to be necessary and appropriate. In the event the Issuer determines that the continuation of the system of book entry only transfer through DTC (or a successor securities depository) is not in the best interest of the DTC participants, beneficial owners of the Bonds, or the Issuer, the Issuer will notify the Paying Agent, whereupon the Paying Agent will notify DTC of the availability through

DTC of the bond certificates. In such event, the Issuer shall issue and the Paying Agent shall transfer and exchange Bonds as requested by DTC of like principal amount, series and maturity, in authorized denominations to the identifiable beneficial owners in replacement of the beneficial interest of such beneficial owners in the Bonds, as provided herein.

So long as the book-entry-only system remains in effect, in the event of a partial redemption the Paying Agent will give notice to Cede & Co., as nominee of DTC, only, and only Cede & Co. will be deemed to be a holder of the Bonds. DTC is expected to reduce the credit balances of the applicable DTC Participants in respect of the Bonds and in turn the DTC Participants are expected to select those Beneficial Owners whose ownership interests are to be extinguished or reduced by such partial redemptions, each by such method as DTC or such DTC Participants, as the case may be, deems fair and appropriate in its sole discretion.

7. In the event the Bonds are no longer in book entry form only, the following provisions would apply to the Bonds:

The Paying Agent shall keep or cause to be kept, at its principal office, sufficient books for the registration and transfer of the Bonds, which shall at all times be open to inspection by the Issuer; and, upon presentation for such purpose, the Paying Agent shall, under such reasonable regulations as it may prescribe, transfer or cause to be transferred on said books, Bonds as herein provided.

Any Bond may be transferred upon the books required to be kept pursuant to this section by the person in whose name it is registered, in person or by a duly authorized agent, upon surrender of the Bond for cancellation, accompanied by delivery of a duly executed written instrument of transfer in a form approved by the Paying Agent. Whenever any Bond or Bonds shall be surrendered for transfer, the Issuer shall furnish or cause to be furnished a sufficient number of manual or facsimile executed Bonds and the Paying Agent shall authenticate and deliver a new Bond or Bonds for like aggregate principal amount. The Paying Agent shall require the payment of any tax or other governmental charge required to be paid with respect to the transfer to be made by the bondholder requesting the transfer.

8. If any Bond shall become mutilated, the Issuer, at the expense of the holder of the Bonds, shall furnish or cause to be furnished, and the Paying Agent shall authenticate and deliver, a new Bond of like tenor in exchange and substitution of the mutilated Bond, upon surrender to the Paying Agent of the mutilated Bond. If any Bond issued under this resolution shall be lost, destroyed or stolen, evidence of the loss, destruction or theft and indemnity may be submitted to the Paying Agent, and if satisfactory to the Paying Agent and the Issuer, the Issuer at the expense of the owner, shall furnish or cause to be furnished, and the Paying Agent shall authenticate and deliver a new Bond of like tenor and bearing the statement required by Act 354, Public Acts of Michigan, 1972, as amended, being sections 129.131 to 129.134, inclusive, of the Michigan Compiled Laws, or any applicable law hereafter enacted, in lieu of and in substitution of the Bond so lost, destroyed or stolen. If any such Bond shall have matured or shall be about to mature, instead of issuing a substitute Bond, the Paying Agent may pay the same without surrender thereof.

9. The Township Supervisor and Township Clerk be, and they are hereby authorized to provide the Bonds in conformity with the specifications of this resolution by causing their

manual or facsimile signatures to be affixed thereto, and upon the manual execution by the authorized signatory of the Paying Agent, the Township Treasurer be and is hereby authorized and directed to cause said Bonds to be delivered to the original Purchaser upon receipt of the purchase price and accrued interest, if any.

Blank bonds with the manual or facsimile signatures of the Issuer's Township Supervisor and Township Clerk affixed thereto, shall, upon issuance and delivery and from time to time thereafter as necessary, be delivered to the Paying Agent for safekeeping to be used for registration and transfer of ownership.

10. There is hereby created a separate depository account to be kept with a bank located in the State of Michigan and insured by the Federal Deposit Insurance Corporation, previously approved as an authorized depository of funds of the Issuer, to be designated 2016 TOWNSHIP BOND DEBT RETIREMENT FUND (hereinafter referred to as the "DEBT RETIREMENT FUND"), all proceeds from taxes levied for the fund to be used for the purpose of paying the principal and interest on the Bonds authorized herein as they mature or are redeemed. DEBT RETIREMENT FUND moneys may be invested as authorized by law.

11. The Issuer hereby irrevocably pledges to make the annual principal and interest payments on the Bonds beginning with fiscal year 2016 and during each fiscal year for which a budget is adopted, the first budget obligation within its authorized millage and other available funds until such time as the principal and interest on the Bonds have been paid in full. There shall be levied upon the tax rolls of the Issuer in each year, commencing with the tax year 2016, for the purpose of the DEBT RETIREMENT FUND a sum not less than the amount estimated to be sufficient to pay the principal and interest on the Bonds as such principal and interest fall due, the probable delinquency in collections being taken into consideration in arriving at the estimate. The Issuer hereby pledges its limited tax full faith and credit for the payment of the principal and interest on the Bonds, payable from ad valorem taxes which will be levied within the authorized constitutional, statutory and charter tax limitations of the Issuer for such purposes and an irrevocable appropriation of a sufficient amount of taxes will be made each year from said millage rate for the payment of principal and interest on the Bonds as due, subordinate only to any first liens on said funds pledged for the payment of tax anticipation notes heretofore or hereafter issued. The Issuer not having the power to levy taxes for the payment of the Bonds in excess of its constitutional, statutory or charter tax rate limitation, the Bonds will be limited tax general obligations of the Issuer, and, if tax collections are insufficient to pay the principal of or interest on the Bonds when due, the Issuer pledges to use any and all other resources available for the payment of the Bonds.

12. The proceeds of the Bonds shall be used to pay the costs of issuance of the Bonds and to secure payment of the Prior Bonds. Upon receipt of the proceeds of sale or Private Placement of the Bonds, the accrued interest, if any, shall be deposited in the DEBT RETIREMENT FUND for the Bonds. From the proceeds of the Bonds there shall next be set aside a sum sufficient to pay the costs of issuance of the Bonds in a fund designated 2016 BOND ISSUANCE FUND. Moneys in the BOND ISSUANCE FUND shall be used solely to pay expenses of issuance of the Bonds. Any amounts remaining in the BOND ISSUANCE FUND after payment of issuance expenses shall be transferred to the DEBT RETIREMENT FUND for the Bonds.

13. The balance of the proceeds of the Bonds, together with any moneys transferred at the time of closing of the Bonds from the debt retirement fund for the Prior Bonds, shall be invested in direct obligations of the United States of America, or obligations, the principal and interest of which are unconditionally guaranteed by the United States of America; or other obligations the principal and interest of which are fully secured by the foregoing (the "Escrow Funds"), and used to pay principal, interest and redemption premiums on the Prior Bonds. The Escrow Funds shall be held by an escrow agent (the "Agent") in trust pursuant to an escrow agreement (the "Escrow Agreement") which shall irrevocably direct the Agent to take all necessary steps to call any Prior Bonds specified by the Township Manager or the Township Supervisor upon sale or Private Placement of the Bonds for redemption, including publication and mailing of redemption notices, on the earliest date specified by the Township Manager or the Township Supervisor that the respective series of Prior Bonds may be called for redemption. The investment held in the Escrow Funds shall be such that the principal and interest payments received thereon will be sufficient, without reinvestment, to pay the principal, interest and redemption premiums on the Prior Bonds as they become due pursuant to maturity or the call for redemption required by this paragraph. Following establishment of the Escrow Funds, any amounts remaining in the debt retirement fund for the Prior Bonds shall be transferred to the DEBT RETIREMENT FUND for the Bonds.

14. The Township Manager or the Township Supervisor is authorized to select an Escrow Agent to serve under the Escrow Agreement.

15. The Bonds shall be in substantially the form attached hereto and incorporated herein as Exhibit A.

16. The Township Manager or Township Supervisor is hereby authorized to circulate, or cause to be circulated, a Request for Proposals for the sale or Private Placement of the Bonds. In addition, the Township Manager or Township Supervisor is authorized to execute any agreements or documents necessary to retain a Placement Agreement, if recommended by the Financial Advisor. Further, the Township Manager or the Township Supervisor, or a designee thereof, is authorized to negotiate the sale or Private Placement of the bonds to a Purchaser, and, if necessary, to execute a Bond Purchase Agreement or Placement Agreement with a Purchaser, subject to the requirements of paragraph 19 below. Based upon information provided by the Financial Advisor, a negotiated sale or Private Placement allows flexibility in timing, sale and structure of the Bonds in response to changing market conditions and flexibility in sizing the defeasance escrow necessary to accomplish the refunding of the Prior Bonds.

17. If necessary, the Township Manager or the Township Supervisor is authorized to approve circulation of a Preliminary Official Statement, if any, describing the Bonds.

18. The Township Manager or the Township Supervisor, or a designee thereof, if permitted by law, is hereby authorized to:

a. File with the Department of Treasury (the "Department") an application for approval to issue the Bonds, if required, and to pay any applicable fee therefor and, further, within fifteen (15) business days after issuance of the Bonds, file any and all documentation required subsequent to the issuance of the Bonds, together with any statutorily required fee.

b. If deemed advisable by the Financial Advisor, request a waiver of the maturity limitations as set forth in the Application for Waiver and/or a waiver of the Department's requirement that ratings be obtained from a nationally recognized ratings agency.

c. If necessary, execute and deliver the Continuing Disclosure Agreement (the "Agreement") in substantially the same form as set forth in Exhibit B attached hereto, or with such changes therein as the individual executing the Agreement on behalf of the Issuer shall approve, his/her execution thereof to constitute conclusive evidence of his/her approval of such changes. When the Agreement is executed and delivered on behalf of the Issuer as herein provided, the Agreement will be binding on the Issuer and the officers, employees and agents of the Issuer, and the officers, employees and agents of the Issuer are hereby authorized, empowered and directed to do all such acts and things and to execute all such documents as may be necessary to carry out and comply with the provisions of the Agreement as executed, and the Agreement shall constitute, and hereby is made, a part of this Resolution, and copies of the Agreement shall be placed in the official records of the Issuer, and shall be available for public inspection at the office of the Issuer. Notwithstanding any other provision of this Resolution, the sole remedies for failure to comply with the Agreement shall be the ability of any Bondholder or beneficial owner to take such actions as may be necessary and appropriate, including seeking mandamus or specific performance by court order, to cause the Issuer to comply with its obligations under the Agreement.

19. The Township Manager's or the Township Supervisor's authorization to accept an offer from and, if necessary, execute a Bond Purchase Agreement or Placement Agreement with, a Purchaser is subject to the following parameters:

- a. the average true interest rate on the Bonds shall not exceed 4%;
- b. the present value savings from the refunding shall not be less than 1% of the par of the Prior Bonds;
- c. compliance with Section 5 above; and
- d. the receipt of express written recommendation of the Financial Advisor to accept the terms of the sale or Private Placement of the Bonds and a Bond Purchase Agreement, if any.

20. Upon the sale or Private Placement of the Bonds, the Township Manager or the Township Supervisor is further authorized and directed to (i) execute any and all other necessary documents required to complete the approval and sale of the Bonds to the Purchaser, including, if necessary, a Bond Purchase Agreement or Placement Agreement; (ii) appoint a paying agent for the Bonds; (iii) select a bond insurer, accept a commitment therefore and authorize payment of a bond insurance premium to insure any or all of the Bonds if recommended in writing by the Financial Advisor; (iv) if applicable, deem the Preliminary Official Statement for the Bonds final for purposes of SEC Rule 15c2-12(b)(1); and (v) if applicable, execute and deliver the final Official Statement on behalf of the Issuer.

21. The Township Supervisor, the Township Clerk, the Township Treasurer, the Township Manager and all other officers, agents and representatives of the Issuer and each of them shall execute, issue and deliver any certificates, statements, warranties, representations, or

documents necessary to effect the purposes of this resolution, the Bonds or the Bond Purchase Agreement or Placement Agreement, if any.

22. The officers, agents and employees of the Issuer are authorized to take all other actions necessary and convenient to facilitate the sale or Private Placement, and delivery, of the Bonds.

23. Thrun Law Firm, P.C., is hereby appointed as bond counsel for the Issuer with reference to the issuance of the Bonds authorized by this resolution. Further, Thrun Law Firm, P.C., has informed this Board that it represents no other party in the issuance of the Bonds.

24. The financial consulting firm of H.J. Umbaugh & Associates, Certified Public Accountants, LLP, is hereby appointed as financial advisor/consultants to the Issuer with reference to the issuance of the Bonds herein authorized.

25. The Township Manager or the Township Supervisor may designate the Bonds of this issue as "qualified tax-exempt obligations" for purposes of deduction of interest expense by financial institutions under the provisions of the Internal Revenue Code of 1986, as amended, if, in making said designation, the Township Manager or the Township Supervisor determines that the reasonably anticipated amount of tax-exempt obligations which will be issued by the Issuer or entities which issue obligations on behalf of the Issuer during calendar year 2016 will not exceed \$10,000,000, excluding only those tax-exempt obligations as permitted by Section 265(b)(3)(C)(ii) of the Code; provided, however, that to the extent the Prior Bonds were designated by the Issuer as a "qualified tax-exempt obligation," then only that portion of the par amount of the Bonds that exceeds the par amount of the Prior Bonds may be designated by the Township Manager or the Township Supervisor as "qualified tax-exempt obligations" under this paragraph and the remaining portion of the Bonds are deemed designated as "qualified tax-exempt obligations."

26. The Board covenants to comply with existing provisions of the Internal Revenue Code of 1986, as amended, necessary to maintain the exclusion of interest on the Bonds from gross income.

27. All resolutions and parts of resolutions insofar as they conflict with the provisions of this resolution be and the same hereby are rescinded.

Ayes:

Nays:

Resolution declared adopted.

Evan Hope, Township Clerk
Charter Township of Delhi

The undersigned duly qualified and acting Township Clerk of the Charter Township of Delhi, Ingham County, Michigan, hereby certifies that the foregoing is a true and complete copy of a resolution adopted by the Township Board of Trustees at a regular meeting held on April 19, 2016, the original of which resolution is a part of the Board's minutes, and further certifies that notice of the meeting was given to the public under the Open Meetings Act, 1976 PA 267, as amended.

Evan Hope, Township Clerk
Charter Township of Delhi

MDG/

EXHIBIT A

[No.]
UNITED STATES OF AMERICA
STATE OF MICHIGAN
COUNTY OF INGHAM
CHARTER TOWNSHIP OF DELHI
2016 REFUNDING BOND
(GENERAL OBLIGATION - LIMITED TAX)

Rate Maturity Date Date of Original Issue CUSIP No.

REGISTERED OWNER:
PRINCIPAL AMOUNT:

CHARTER TOWNSHIP OF DELHI, COUNTY OF INGHAM, STATE OF MICHIGAN (the "Issuer"), promises to pay to the Registered Owner, or registered assigns, the Principal Amount specified above in lawful money of the United States of America on the Maturity Date specified above, with interest from the Date of Original Issue until paid at the Rate specified above on the basis of a 360-day year, 30-day month, payable on _____ 1, 20__, and semiannually thereafter on the first day of _____ and _____ of each year (the "Bond" or "Bonds"). Principal on this Bond is payable at the _____ office of _____, MICHIGAN (the "Paying Agent"), upon presentation and surrender hereof. Interest is payable by check or draft mailed to the Registered Owner at the registered address shown on the registration books of the Issuer kept by the Paying Agent as of the close of business on the 15th day of the month preceding any interest payment date. The Issuer may hereafter designate a successor paying agent/bond registrar by notice mailed to the Registered Owner not less than sixty (60) days prior to any interest payment date.

This Bond is one of a series of Bonds of like date and tenor, except as to denomination, rate of interest and date of maturity, aggregating the principal amount of \$ _____ issued under and in pursuance of the provisions of Act 34, Public Acts of Michigan, 2001, as amended, and resolutions duly adopted by the Township Board of Trustees of the Issuer on April 19, 2016 and _____, 2016, for the purpose of refunding all or a portion of a certain prior bond issue of the Issuer.

The limited tax, full faith, credit and resources of the Issuer are hereby pledged for the payment of the principal and interest on the Bonds. The Bonds of this issue are payable primarily from ad valorem taxes, which will be levied within the authorized constitutional, statutory and charter tax limitations of the Issuer and an irrevocable appropriation of a sufficient amount of such taxes will be made each year as a first operating budget obligation for the payment of the principal of and interest on the Bonds as due, subordinate only to any first liens on said funds pledged for the payment of tax anticipation notes heretofore or hereafter issued and, if taxes are insufficient to pay the Bonds when due, the Issuer has pledged to use any and all other resources available for the payment of the Bonds. The Issuer does not have the power to levy taxes for the payment of the

Bonds in excess of its constitutional, statutory or charter tax rate limitations. The Issuer reserves the right to issue additional bonds of equal standing.

OPTIONAL REDEMPTION

The Bonds or portions of Bonds are not subject to redemption prior to maturity at the option of the Issuer.

MANDATORY REDEMPTION

The Bonds maturing on September 1, _____, are term Bonds subject to mandatory redemption, in part, by lot, on the redemption dates and in the principal amounts set forth below and at a redemption price equal to the principal amount thereof, without premium, together with accrued interest to the date fixed for redemption. When term Bonds are purchased by the Issuer and delivered to the Paying Agent for cancellation or are redeemed in a manner other than by mandatory redemption, the principal amount of the term Bonds affected shall be reduced by the principal amount of the Bonds so redeemed or purchased in the order determined by the Issuer.

<u>Redemption Dates</u>	<u>Principal Amounts</u>
September 1, _____	\$
September 1, _____	
September 1, _____	
September 1, _____ (maturity)	

Notice of redemption of any Bond shall be given not less than thirty (30) days and not more than sixty (60) days prior to the date fixed for redemption by mail to the Registered Owner at the registered address shown on the registration books kept by the Paying Agent. Bonds shall be called for redemption in multiples of \$5,000 and Bonds of denominations of more than \$5,000 shall be treated as representing the number of Bonds obtained by dividing the denomination of the Bond by \$5,000 and such Bonds may be redeemed in part. The notice of redemption for Bonds redeemed in part shall state that upon surrender of the Bond to be redeemed a new Bond or Bonds in an aggregate principal amount equal to the unredeemed portion of the Bond surrendered shall be issued to the Registered Owner thereof. No further interest payment on the Bonds or portions of Bonds called for redemption shall accrue after the date fixed for redemption, whether presented for redemption, provided funds are on hand with the Paying Agent to redeem the same.

If less than all of the Bonds of any maturity shall be called for redemption prior to maturity, unless otherwise provided, the particular Bonds or portions of Bonds to be redeemed shall be selected by the Paying Agent, in such manner as the Paying Agent in its discretion may deem proper, in the principal amounts designated by the Issuer. Upon presentation and surrender of such Bonds at the corporate trust office of the Paying Agent, such Bonds shall be paid and redeemed.

This Bond is registered as to principal and interest and is transferable as provided in the resolutions authorizing the Bonds only upon the books of the Issuer kept for that purpose by the Paying Agent, by the Registered Owner hereof in person or by an agent of the Registered Owner duly authorized in writing, upon the surrender of this Bond together with a written instrument of

transfer satisfactory to the Paying Agent duly executed by the Registered Owner or agent thereof and thereupon a new Bond or Bonds in the same aggregate principal amount and of the same maturity shall be issued to the transferee in exchange therefor as provided in the resolutions authorizing the Bonds, and upon payment of the charges, if any, therein provided. The Bonds are issuable in denominations of \$100,000, and integral multiples of \$5,000 in excess of \$100,000, or any integral multiple thereof not exceeding the aggregate principal amount for each maturity.

It is hereby certified and recited that all acts, conditions and things required to be done, to happen, and to be performed, precedent to and in the issuance of this Bond, have been done, have happened and have been performed in due time, form and manner, as required by law.

This Bond shall not be deemed a valid and binding obligation of the Issuer in the absence of authentication by manual execution hereof by the authorized signatory of the Paying Agent.

IN WITNESS WHEREOF, Charter Township of Delhi, County of Ingham, State of Michigan, by its Township Board of Trustees, has caused this Bond to be signed in the name of the Issuer by the manual or facsimile signature of its Township Supervisor and countersigned by the manual or facsimile signature of its Township Clerk, and its corporate seal or a facsimile thereof to be hereunto affixed, as of _____, 2016, and to be manually signed by the authorized signatory of the Paying Agent as of the date set forth below.

Countersigned:

CHARTER TOWNSHIP OF DELHI
COUNTY OF INGHAM
STATE OF MICHIGAN

Township Clerk

By _____
Township Supervisor

[SEAL]

CERTIFICATE OF AUTHENTICATION

Dated:

This Bond is one of the Bonds described herein.

(Name of Bank)
(City, State)
PAYING AGENT

By
Authorized Signatory

ASSIGNMENT

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto _____ the within Bond and does hereby irrevocably constitute and appoint _____ attorney to transfer the Bond on the books kept for registration of the within Bond, with full power of substitution in the premises.

Dated _____

NOTICE: The assignor's signature to this assignment must correspond with the name as it appears upon of the within Bond in every particular without alteration or any change whatever.

Signature Guaranteed:

Signature(s) must be guaranteed by an eligible guarantor institution participating in a Securities Transfer Association recognized signature guarantee program.

The Paying Agent will not effect transfer of this Bond unless the information concerning the transferee requested below is provided.

Name and Address: _____

(Include information for all joint owners if the Bond is held by joint account.)

PLEASE INSERT SOCIAL SECURITY NUMBER OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

(if held by joint account, insert number for first named transferee)

EXHIBIT B
FORM OF
CONTINUING DISCLOSURE AGREEMENT

§ _____
CHARTER TOWNSHIP OF DELHI
COUNTY OF INGHAM
STATE OF MICHIGAN
2016 REFUNDING BONDS
(GENERAL OBLIGATION - LIMITED TAX)

This Continuing Disclosure Agreement (the "Agreement") is executed and delivered by Charter Township of Delhi, County of Ingham, State of Michigan (the "Issuer"), in connection with the issuance of \$ _____ 2016 Refunding Bonds (General Obligation - Limited Tax) (the "Bonds"). The Bonds are being issued pursuant to resolutions adopted by the Township Board of Trustees of the Issuer on April 19, 2016 and _____, 2016 (the "Resolutions"). The Issuer covenants and agrees as follows:

SECTION 1. Purpose of the Disclosure Agreement. This Agreement is being executed and delivered by the Issuer for the benefit of the Bondholders and in order to assist the Participating Underwriters in complying with the Rule. The Issuer acknowledges that this Agreement does not address the scope of any application of Rule 10b-5 promulgated by the SEC pursuant to the 1934 Act to the Annual Reports or notices of the Listed Events provided or required to be provided by the Issuer pursuant to this Agreement.

SECTION 2. Definitions. In addition to the definitions set forth in the Resolutions, which apply to any capitalized term used in this Agreement unless otherwise defined in this Section, the following capitalized terms shall have the following meanings:

"Annual Report" shall mean any Annual Report provided by the Issuer pursuant to, and as described in, Sections 3 and 4 of this Agreement.

"Bondholder" means the registered owner of a Bond or any person which (a) has the power, directly or indirectly, to vote or consent with respect to, or to dispose of ownership of, any Bonds (including any person holding Bonds through nominees, depositories or other intermediaries), or (b) is treated as the owner of any Bond for federal income tax purposes.

"Dissemination Agent" means any agent designated as such in writing by the Issuer and which has filed with the Issuer a written acceptance of such designation, and such agent's successors and assigns.

"EMMA" shall mean the MSRB's Electronic Municipal Market Access which provides continuing disclosure services for the receipt and public availability of continuing disclosure documents and related information required by Rule 15c2-12 promulgated by the SEC.

"Listed Events" shall mean any of the events listed in Section 5(a) of this Agreement.

"MSRB" shall mean the Municipal Securities Rulemaking Board.

"1934 Act" shall mean the Securities Exchange Act of 1934, as amended.

"Official Statement" shall mean the final Official Statement for the Bonds dated _____, 2016.

"Participating Underwriter" shall mean any of the original underwriters of the Bonds required to comply with the Rule in connection with the offering of the Bonds.

"Resolution" shall mean the resolutions duly adopted by the Issuer authorizing the issuance, sale and delivery of the Bonds.

"Rule" shall mean Rule 15c2-12 promulgated by the SEC pursuant to the 1934 Act, as the same may be amended from time to time.

"SEC" shall mean the Securities and Exchange Commission.

"State" shall mean the State of Michigan.

"State Repository" shall mean any public or private repository or entity designated by the State as a state repository for the purpose of the Rule and recognized as such by the SEC. Currently, the following is the State Repository:

Municipal Advisory Council of Michigan
Buhl Building
535 Griswold, Suite 1850
Detroit, Michigan 48226
Tel: (313) 963-0420
Fax: (313) 963-0943
E-Mail: mac@macmi.com

SECTION 3. Provision of Annual Reports.

(a) Each year, the Issuer shall provide, or shall cause the Dissemination Agent to provide, on or prior to the 180th day after the end of the fiscal year of the Issuer commencing with the fiscal year ending December 31, 20____, to EMMA and the State Repository an Annual Report for the preceding fiscal year which is consistent with the requirements of Section 4 of this Agreement. Currently, the Issuer's fiscal year ends on June 30. In each case, the Annual Report may be submitted as a single document or as separate documents comprising a package, and may include by specific reference other information as provided in Section 4 of this Agreement; provided, however, that if the audited financial statements of the Issuer are not available by the deadline for filing the Annual Report, they shall be provided when and if available, and unaudited financial statements in a format similar to the financial statements contained in the Official Statement shall be included in the Annual Report.

(b) The Annual Report shall be submitted to EMMA either through a web-based electronic submission interface or through electronic computer-to-computer data connections with EMMA in accordance with the submission process, document format and configuration requirements established by the MSRB. The Annual Report shall also include all related information required by MSRB to accurately identify: (i) the category of information being provided; (ii) the period covered by the Annual Report; (iii) the issues or specific securities to which the Annual Report is related (including CUSIP number, Issuer name, state, issue description/securities name, dated date, maturity date, and/or coupon rate; (iv) the name of any obligated person other than the Issuer; (v) the name and date of the document; and (vi) contact information for the Dissemination Agent or the Issuer's submitter.

(c) If the Issuer is unable to provide to EMMA an Annual Report by the date required in subsection (a), the Issuer shall send a notice in a timely manner to the MSRB and to the State Repository in substantially the form attached as Appendix A.

(d) If the Issuer's fiscal year changes, the Issuer shall send a notice of such change to the MSRB and to the State Repository in substantially the form attached as Appendix B. If such change will result in the Issuer's fiscal year ending on a date later than the ending date prior to such change, the Issuer shall provide notice of such change to the MSRB and to the State Repository on or prior to the deadline for filing the Annual Report in effect when the Issuer operated under its prior fiscal year. Such notice may be provided to the MSRB and to the State Repository along with the Annual Report, provided that it is filed at or prior to the deadline described above.

SECTION 4. Content of Annual Reports. The Issuer's Annual Report shall contain or include by reference the following:

(a) audited financial statements of the Issuer prepared pursuant to State laws, administrative rules and guidelines and pursuant to accounting and reporting policies conforming in all material respects to generally accepted accounting principles as applicable to governmental units as such principles are prescribed, in part, by the Financial Accounting Standards Board and modified by the Government Accounting Standards Board and in effect from time to time; and

(b) additional annual financial information and operating data as set forth in the Official Statement under "CONTINUING DISCLOSURE".

Any or all of the items listed above may be included by specific reference to other documents, including official statements of debt issues of the Issuer or related public entities, which previously have been provided to each of the Repositories or filed with the SEC. If the document included by specific reference is a final official statement, it must be available from the MSRB. The Issuer shall clearly identify each such other document so included by reference.

SECTION 5. Reporting of Significant Events.

(a) The Issuer covenants to provide, or cause to be provided, notice in a timely manner not in excess of ten business days of the occurrence of any of the following events with respect to the Bonds in accordance with the Rule:

- (1) principal and interest payment delinquencies;
- (2) non-payment related defaults, if material;
- (3) unscheduled draws on debt service reserves reflecting financial difficulties;
- (4) unscheduled draws on credit enhancements reflecting financial difficulties;
- (5) substitution of credit or liquidity providers, or their failure to perform;
- (6) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security;
- (7) modifications to rights of security holders, if material;
- (8) bond calls, if material, and tender offers;
- (9) defeasances;
- (10) release, substitution, or sale of property securing repayment of the securities, if material;
- (11) rating changes;
- (12) bankruptcy, insolvency, receivership or similar event of the obligated person;
- (13) the consummation of a merger, consolidation, or acquisition involving an obligated person or the sale of all or substantially all of the assets of the obligated person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material;
- (14) appointment of a successor or additional trustee or the change of name of a trustee, if material.

(b) Whenever the Issuer obtains knowledge of the occurrence of a Listed Event, the Issuer shall as soon as possible determine if such event would constitute material information for the Bondholders, provided, that any event other than those listed under Section 5(a)(1), (3), (4), (5), (9), (11) (only with respect to any change in any rating on the Bonds) or (12) above will always be deemed to be material. Events listed under Section 5(a)(6) and (8) above will always be deemed to be material except with respect to that portion of those events which must be determined to be material.

(c) The Issuer shall promptly cause a notice of the occurrence of a Listed Event, determined to be material in accordance with the Rule, to be electronically filed with EMMA and with the State Repository together with a significant event notice cover sheet substantially in the form attached as Appendix C. In connection with providing a notice of the occurrence of a Listed Event described in Section 5(a)(9) above, the Issuer shall include in the notice explicit disclosure

as to whether the Bonds have been escrowed to maturity or escrowed to call, as well as appropriate disclosure of the timing of maturity or call.

(d) The Issuer acknowledges that the "rating changes" referred to above in Section 5(a)(11) of this Agreement may include, without limitation, any change in any rating on the Bonds or other indebtedness for which the Issuer is liable.

(e) The Issuer acknowledges that it is not required to provide a notice of a Listed Event with respect to credit enhancement when the credit enhancement is added after the primary offering of the Bonds, the Issuer does not apply for or participate in obtaining such credit enhancement, and such credit enhancement is not described in the Official Statement.

SECTION 6. Termination of Reporting Obligation.

(a) The Issuer's obligations under this Agreement shall terminate upon the legal defeasance of the Resolution or the prior redemption or payment in full of all of the Bonds.

(b) This Agreement, or any provision hereof, shall be null and void in the event that the Issuer (i) receives an opinion of nationally recognized bond counsel, addressed to the Issuer, to the effect that those portions of the Rule, which require such provisions of this Agreement, do not or no longer apply to the Bonds, whether because such portions of the Rule are invalid, have been repealed, amended or modified, or are otherwise deemed to be inapplicable to the Bonds, as shall be specified in such opinion, and (ii) delivers notice to such effect to the MSRB, and to the State Repository, if any.

SECTION 7. Dissemination Agent. The Issuer, from time to time, may appoint or engage a Dissemination Agent to assist it in carrying out its obligations under this Agreement, and may discharge any such Dissemination Agent, with or without appointing a successor Dissemination Agent.

SECTION 8. Amendment. Notwithstanding any other provision of this Agreement, this Agreement may be amended, and any provision of this Agreement may be waived to the effect that:

(a) such amendment or waiver is made in connection with a change in circumstances that arises from a change in legal requirements, a change in law or a change in the identity, nature or status of the Issuer, or the types of business in which the Issuer is engaged;

(b) this Agreement as so amended or taking into account such waiver, would have complied with the requirements of the Rule at the time of the primary offering of the Bonds, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances, in the opinion of independent legal counsel; and

(c) such amendment or waiver does not materially impair the interests of the Bondholders, in the opinion of independent legal counsel.

If the amendment or waiver results in a change to the annual financial information required to be included in the Annual Report pursuant to Section 4 of this Agreement, the first Annual

Report that contains the amended operating data or financial information shall explain, in narrative form, the reasons for the amendment and the impact of such change in the type of operating data or financial information being provided. If the amendment or waiver involves a change in the accounting principles to be followed in preparing financial statements, the Annual Report for the year in which the change is made shall present a comparison between the financial statements or information prepared based on the new accounting principles and those prepared based on the former accounting principles. The comparison should include a qualitative discussion of such differences and the impact of the changes on the presentation of the financial information. To the extent reasonably feasible, the comparison should also be quantitative. A notice of the change in the accounting principles should be sent by the Issuer to the MSRB and to the State Repository. Further, if the annual financial information required to be provided in the Annual Report can no longer be generated because the operations to which it related have been materially changed or discontinued, a statement to that effect shall be included in the first Annual Report that does not include such information.

SECTION 9. Additional Information. Nothing in this Agreement shall be deemed to prevent the Issuer from disseminating any other information, using the means of dissemination set forth in this Agreement or any other means of communication, or including any other information in any Annual Report or notice of occurrence of a Listed Event, in addition to that which is required by this Agreement. If the Issuer chooses to include any information in any Annual Report or notice of occurrence of a Listed Event in addition to that which is specifically required by this Agreement, the Issuer shall have no obligation under this Agreement to update such information or include it in any future Annual Report or notice of occurrence of a Listed Event.

SECTION 10. Default. In the event of a failure of the Issuer to comply with any provision of this Agreement, any Bondholder may take such actions as may be necessary and appropriate, including seeking mandamus or specific performance by court order, to cause the Issuer to comply with its obligations under this Agreement. A default under this Agreement shall not be deemed an Event of Default under the Resolution or the Bonds, and the sole remedy under this Agreement in the event of any failure of the Issuer to comply with the Agreement shall be an action to compel performance.

SECTION 11. Duties of Dissemination Agent. The Dissemination Agent shall have only such duties as are specifically set forth in this Agreement.

SECTION 12. Beneficiaries. This Agreement shall inure solely to the benefit of the Issuer, the Dissemination Agent, the Participating Underwriters, and the Bondholders and shall create no rights in any other person or entity.

SECTION 13. Governing Law. This Agreement shall be construed and interpreted in accordance with the laws of the State, and any suits and actions arising out of this Agreement shall be instituted in a court of competent jurisdiction in the State. Notwithstanding the foregoing, to the extent this Agreement addresses matters of federal securities laws, including the Rule, this Agreement shall be construed and interpreted in accordance with such federal securities laws and official interpretations thereof.

CHARTER TOWNSHIP OF DELHI
COUNTY OF INGHAM
STATE OF MICHIGAN

By: _____
Its: Township Manager

Dated: _____, 2016

APPENDIX A

NOTICE TO THE MSRB AND TO THE STATE REPOSITORY
OF FAILURE TO FILE ANNUAL REPORT

Name of Issuer: Charter Township of Delhi, Ingham County, Michigan

Name of Bond Issue: 2016 Refunding Bonds (General Obligation - Limited Tax)

Date of Bonds: _____, 2016

NOTICE IS HEREBY GIVEN that the Issuer has not provided an Annual Report with respect to the above-named Bonds as required by Section 3 of its Continuing Disclosure Agreement with respect to the Bonds. The Issuer anticipates that the Annual Report will be filed by _____.

CHARTER TOWNSHIP OF DELHI
COUNTY OF INGHAM
STATE OF MICHIGAN

By: _____
Its: Township Manager

Dated: _____, 2016

APPENDIX B

NOTICE TO THE MSRB AND THE STATE REPOSITORY
OF CHANGE IN ISSUER'S FISCAL YEAR

Name of Issuer: Charter Township of Delhi, Ingham County, Michigan

Name of Bond Issue: 2016 Refunding Bonds (General Obligation - Limited Tax)

Date of Bonds: _____, 2016

NOTICE IS HEREBY GIVEN that the Issuer's fiscal year has changed. Previously, the Issuer's fiscal year ended on _____. It now ends on _____.

CHARTER TOWNSHIP OF DELHI
COUNTY OF INGHAM
STATE OF MICHIGAN

By: _____
Its: Township Manager

Dated: _____, 2016

APPENDIX C

SIGNIFICANT EVENT NOTICE COVER SHEET

This cover sheet and significant event notice should be provided in an electronic format to the Municipal Securities Rulemaking Board and the State Repository pursuant to Securities and Exchange Commission Rule 15c2-12(b)(5)(i)(C) and (D).

Issuer's and/or other Obligated Person's Name: _____

Issuer's Six-Digit CUSIP Number(s): _____

or Nine-Digit CUSIP Number(s) to which this significant event notice relates: _____

Number of pages of attached significant event notice: _____

Description of Significant Events Notice (Check One):

- 1. _____ Principal and interest payment delinquencies
- 2. _____ Non-payment related defaults
- 3. _____ Unscheduled draws on debt service reserves reflecting financial difficulties
- 4. _____ Unscheduled draws on credit enhancements reflecting financial difficulties
- 5. _____ Substitution of credit or liquidity providers, or their failure to perform
- 6. _____ Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security
- 7. _____ Modifications to rights of security holders
- 8. _____ Bond calls
- 9. _____ Tender offers
- 10. _____ Defeasances
- 11. _____ Release, substitution, or sale of property securing repayment of the securities
- 12. _____ Rating changes
- 13. _____ Bankruptcy, insolvency, receivership or similar event of the obligated person
- 14. _____ The consummation of a merger, consolidation, or acquisition involving an obligated person or the sale of all or substantially all of the assets of the obligated person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms
- 15. _____ Appointment of a successor or additional trustee or the change of name of a trustee
- 16. _____ Other significant event notice (specify) _____

I hereby represent that I am authorized by the issuer or its agent to distribute this information publicly:

Signature: _____

Name: _____ Title: _____

Employer: _____

Address: _____

City, State, Zip Code: _____

Voice Telephone Number (_____) _____

The MSRB Gateway is www.msrb.org or through the EMMA portal at emma.msrb.org/submission/Submission_Portal.aspx. Contact the MSRB at (703) 797-6600 with questions regarding this form or the dissemination of this notice. The cover sheet and notice may also be faxed to the MAC at (313) 963-0943.

DELHI CHARTER TOWNSHIP

MEMORANDUM

TO: Delhi Township Board Members

FROM: John B. Elsinga, Township Manager

DATE: April 14, 2016

RE: Farm Land Property Lease between Delhi Charter Township and Michael Webb - 2016

Enclosed for your review and approval is a Property Lease between Delhi Charter Township and Michael Webb for the lease of 86.5 acres of farm land on the Publicly Owned Treatment Works (POTW) site for one year (2016). The lease this year is 6 acres less than previous years due to the alfalfa portion of the field that needs to be rotated and will not be usable. Because of this, we offered Mr. Webb a one year lease for 86.5 acres in lieu of the typical four year lease and in 2017 will begin a new four year lease for the full 92.5 acres.

For over twenty years, the Township has had a lease agreement for most of this land owned by the township in which the land is crop farmed by a local farmer and the Publicly Owned Treatment Works (POTW) is permitted to apply biosolids to the land. This relationship provides good use of this agricultural land along with some revenue to the Township's POTW.

Mr. Webb has asked to farm this property again and the lease is at fair market value. Mr. Webb has been accommodating to the Township's requirements and a pleasure to work with and, therefore, I recommend approval of this lease. Subsequent to approval of this agreement, the Board will be asked to approve a new four year lease (2017-2020) which will then include the full 92.5 acres.

Recommended Motion:

To approve the Property Lease between Delhi Charter Township and Michael Webb for a one year term commencing upon execution and expiring December 31, 2016.

INTEROFFICE MEMORANDUM

TO: JOHN ELSINGA, TOWNSHIP MANAGER
FROM: SANDRA DIORKA, DIRECTOR OF PUBLIC SERVICES 
SUBJECT: LAND LEASE FOR AGRICULTURAL OPERATIONS
DATE: APRIL 13, 2016
COPY TO: JEFF RANES, NICK NEEB, FILE

Delhi Charter Township (Delhi) has contracted with Michael Webb to lease farm land on the Publicly Owned Treatment Works (POTW) site since 2008. Mr. Webb leased the land at a price of \$100 per acre from 2008–2012; for 2012-2015 the price per acre was increased to \$115.00. Mr. Webb also works with Delhi to cut and bale the township alfalfa field that is used for the sheep located at the Publicly Owned Treatment Works pond area.

Mr. Webb has proven to be an excellent lessee by demonstrating superior cooperation with the land application providers as well as Delhi employees, resulting in ease of scheduling and overall operation. For more than a decade, Mr. Webb has made his fields available for Delhi's land application process. Previous lessees have chosen to use commercial fertilizers thus limiting the fields available to Delhi for land application.

The average agricultural land rent per acre for Michigan, Southern Lower Peninsula and District 8 per the 2015 Michigan Land Value and Leasing Rates compiled by Michigan State University Department of Agricultural, Food, and Resource Economics Report No. 642 is as follows.

Region	Field Crop Tiled/Acre	Field Crop Non-Tiled/Acre
Michigan	\$141	\$101
Southern Lower Peninsula	\$154	\$112
District 8 (<i>Delhi Region</i>)	\$141	\$113

Delhi's tillable property would be categorized "Field Crop Non-Tiled", as the limited amount of tile that is located on the property is outdated and provides insufficient quality drainage.

Mr. Webb will also continue to assist with planting and harvesting the township alfalfa crop that is adjacent to the leased farm land. The alfalfa crop needs to be rotated this year; therefore, in 2016 the acreage available for lease will be less to accommodate the required rotation. Mr. Webb will harvest and bale the alfalfa, keeping 1/3 of the harvested alfalfa as stipulated in the property lease.

Due to past experiences, cooperation with the land application program and a willingness to increase the rental price to \$125 per acre, which is greater than the "Field Crop Non-Tiled" average price in District 8, I respectfully request that you recommend to the Board at its next meeting on April 19, 2016 a motion to approve a new one-year (2016) contract with 86.5 township acres available for lease; to be followed by a four-year (2017 – 2020) contract with 92.5 acres available to lease with Michael Webb.

PROPERTY LEASE

DELHI CHARTER TOWNSHIP, a Michigan municipal corporation, whose address is 2074 Aurelius Road, Holt, Michigan 48842 (hereinafter "Lessor") and **MICHAEL WEBB**, whose address is 5351 West Columbia Road, Mason, Michigan 48854 (hereinafter "Lessee") enter into this Lease subject to the following terms and conditions:

1. **PREMISES.** Lessor leases 86.5 acres ("Leased Property") of property owned by Lessor to Lessee, said property being more particularly described in Exhibit A and incorporated by reference.

2. **TERM OF LEASE.** The term of this Lease shall commence upon execution and said lease shall expire and terminate on December 31, 2016, subject to the provisions of Paragraph 8. In the event that inclement weather prevents crop harvest by the end of the Lease, Lessee will be permitted to harvest without additional rent through the end of February following Lease expiration.

3. **RENT.** Rent for the Leased Property shall be in the total amount of Ten Thousand, Eight Hundred, and Twelve and 50/100 Dollars (\$10,812.50) for the term of the lease (\$125.00 per acre), and shall be paid on or before December 31, 2016.

4. **HARVEST.** Lessee shall harvest and bale alfalfa on the Leased Property and may keep 1/3 of the harvested alfalfa and Lessee shall convey to Lessor 2/3 of the harvested alfalfa from the Leased Property. Lessor reserves the right to inspect the alfalfa on the Leased Property prior to harvest and during harvest and take immediate possession of its share.

5. **USE OF THE LEASED PROPERTY.** Lessee's use of the leased property shall be limited solely to the growing of crops, which shall be accomplished through generally accepted agricultural practices and in compliance with all rules and regulations of the Farm Service Agency. Any proceeds payable by the Farm Service Agency shall belong to Lessee. Lessee will make fields available for biosolids application, contracted by Lessor, and will abide by the attached Best Management Practices and Restrictions as described in Exhibit B. Application of fertilizer or soil amendment to the leased property is prohibited without prior notification and approval from Lessor.

6. **DAMAGE TO CROPS CAUSED BY LESSOR.** In the event Lessee's crops are destroyed by activities of Lessor, Lessee's damages shall be limited to recovery of Lessee's costs and expenses in said crop(s) at the time of destruction or damage.

7. **INSURANCE AND INDEMNIFICATION.** Lessee shall carry liability insurance and such other insurance as may be required by law pertaining to any and all of Lessee's activities on the premises described above. In addition, Lessee shall indemnify and hold Lessor harmless regarding any liability, damage, claim or cost (including actual attorney fees) incurred by Lessor as a result of Lessee's activities and the activities of Lessee's employees, agents and servants pertaining to Lessee's use of said property.

8. **EARLY LEASE TERMINATION.** Lessor shall have the right to terminate this Lease without cost or penalty upon providing Lessee at least thirty (30) days advanced written notice of the date Lessor intends to terminate the Lease.

9. **NON-DISCRIMINATION.** Lessee agrees not to discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status, sexual orientation, or any legally protected status. It is understood that a breach of this covenant may be regarded as a material breach of this Lease.

10. **NON-EMPLOYEE/CONTRACTOR.** Neither Lessee nor any of Lessee's employees, agents, contractors, or persons under Lessee's control, or subject to Lessee's authority, is, nor shall be regarded as, or determined to be, under the employ or control of Lessor, during the term of this lease, while providing service on said property or elsewhere, nor shall Lessee nor any of Lessee's employees, agents, contractors, or persons under Lessee's control, or subject to Lessee's authority, be entitled to any Lessor benefit, wage, compensation, or remuneration of any kind, or any benefit that Lessor may provide to its employees.

11. **APPLICATION OF BIOSOLIDS/SITE RESTRICTIONS.** Lessee agrees to permit application of biosolids by Gawne Trucking, Inc. or such other agent of Lessor as Lessor may deem appropriate and site restrictions resulting therefrom.

12. **ASSIGNMENT OR TRANSFER.** Lessee covenants that it will not assign or transfer this Agreement or sub-let said Leased Property, or any part thereof, without the written consent of the Lessor.

13. **COMPLIANCE WITH LAW.** The parties shall promptly comply with all applicable laws, orders, regulations, and ordinances of all municipal, county, and state authorities affecting the Leased Property and relating to its cleanliness, safety, occupation, and

use. A party's failure to comply with such requirements shall be a permissible basis to immediately terminate this Lease.

14. **ENTIRE AGREEMENT; AMENDMENT.** This Agreement constitutes the entire agreement between the parties, and this Agreement may not be amended, except in writing and signed by the duly authorized representatives of the parties hereto.

15. **AUTHORITY TO SIGN.** The parties signing this Agreement provide that they have the authority to act in the capacity for the Lessor and Lessee and further provide that they have met any requirements of corporation minutes to act in the said capacity.

LESSOR:

**DELHI CHARTER TOWNSHIP,
a Michigan municipal corporation,**

Dated: _____

By: _____

CJ Davis

Its: Supervisor

Dated: _____

And: _____

Evan Hope

Its: Clerk

LESSEE:

Dated: _____

By: _____

Michael Webb

Instrument Prepared By:
David M. Revore (P68929)
THRUN LAW FIRM, P.C.
2900 West Road, Suite 400
East Lansing, Michigan 48823
(517) 484-8000

EXHIBIT A

The premises to be leased are comprised of approximately 86.5 acres, from the area and formerly known as the Kahres, Kenmore and Ralph Hart Farms, and legally described as follows:

Beginning at the West $\frac{1}{4}$ post of Section 29, Town 3 North, Range 2 West, Delhi Township, Ingham County, Michigan; thence N $89^{\circ}54'23''$ E 2647.55 feet along the East and West $\frac{1}{4}$ line to the center of said Section 29; thence N $00^{\circ}01'52''$ W 1314.75 feet along the North and South $\frac{1}{4}$ line; thence S $89^{\circ}55'53''$ W 2446.82 feet, South 132.00 feet; thence S $89^{\circ}55'53''$ W 200.00 feet to the West line of said Section 29, South 695.10 feet, along the West line of said Section 29; thence N $88^{\circ}29'30''$ E 230.00 feet, South 323.00 feet; thence S $88^{\circ}29'30''$ W 230.00 feet to the West line of said Section 29, South 165.81 feet along the West line of said Section 9 to the point of beginning. (for 2004: 0.1667 acre parcel split from 29-100-011 and combined with 29-100-003 to create 29-100-012 and remainder 29-100-013) Permanent Parcel Numbers 33-25-05-29-100-013.

And:

The North $\frac{1}{2}$ of the Northwest $\frac{1}{4}$, except beginning on the West section line at a point 1084.98 feet South of the Northwest corner of Section 29, thence N $89^{\circ}55'53''$ E parallel with the South line of North $\frac{1}{2}$ of the Northwest $\frac{1}{4}$ of Section 255 feet; thence South parallel to the West line 231 feet to a point on said South line; thence S $89^{\circ}55'53''$ W to the West section line, thence North along said Section line to the point of beginning. Also except beginning at the Northwest corner of Section thence South 280 feet to the center of the ditch, S $75^{\circ}40'$ E 559 feet along the centerline of the ditch, easterly 184.7 feet on the centerline of the ditch, North 432 feet to the Section line, West 724.7 feet to the beginning, Section 29, Town 3 North, Range 2 West, Delhi Township, Ingham County, Michigan. (for 2004: 0.1667 acre parcel split from 29-100-011 and combined with 29-100-003 to create 29-100-012 and remainder 29-100-013) Permanent Parcel Numbers 33-25-05-29-100-013.

And:

Beginning at the Southwest corner of Section 20, thence N $0^{\circ}6'55''$ W on West Section line 659.82 feet, thence N $89^{\circ}50'47''$ E 1319.77 feet, thence S $0^{\circ}06'55''$ E 660.41 feet, thence S $89^{\circ}52'20''$ W 1319.77 feet on South Section line to point of beginning, Section 20 Town 3 North, Range 2 West 20 acres plus or minus, Delhi Township, Ingham County, Michigan (Split From 33-25-05-20-300-005 for 2002 Roll). Permanent Parcel Numbers 33-25-05-20-300-007.

EXHIBIT B

Best Management Practices and Restrictions

- A person shall not apply bulk biosolids to the land if it is likely to adversely affect a threatened or endangered species listed under section 36503 of the act or its designated critical habitat.
- A person shall not apply bulk biosolids to agricultural land, a forest, a public contact site, or a reclamation site that is flooded, saturated with water, frozen, or snow-covered so that the bulk biosolids enter a wetland or other waters of the state.
- A person may subsurface inject bulk biosolids on frozen or snow-covered ground as long as there is substantial soil coverage of the applied biosolids. A person shall not surface apply bulk biosolids, other than exceptional quality biosolids, on frozen or snow-covered ground unless otherwise approved by the department.
- A person shall not apply bulk biosolids on lands having a slope of more than 6% for surface application or more than 12% for subsurface injected biosolids, unless the person uses the bulk biosolids in accordance with a department-approved site management plan.
- A person shall apply bulk biosolids to agricultural land, a forest, a public contact site, or a reclamation site at an application rate that is equal to, or less than, the agronomic rate, unless the person that applies bulk biosolids in accordance with a department-approved site management plan.
- A person that applies biosolids shall perform soil fertility tests on soils sampled from each application site before initial biosolids application. The person shall resample and test on a regular basis so that the last soil fertility test is not more than 2 years old at the time of the next biosolids application.
- For agricultural land, a person shall apply biosolids in accordance with agronomic rates. If the Bray P1 soil test level exceeds 300 pounds (P) per acre (150 ppm), or if the Mehlich 3 soil test level exceeds 340 pounds (P) per acre (170 ppm) in site soils, then the person shall not apply biosolids until the soil P test level decreases to less than 1 of these values.
- A person shall apply biosolids in a manner that would maintain, at a minimum, a 30-inch separation distance between the soil surface and the groundwater at the time of biosolids application.

DELHI CHARTER TOWNSHIP

MEMORANDUM

TO: Delhi Township Board Members

FROM: John B. Elsinga, Township Manager

DATE: April 14, 2016

RE: Farm Land Property Lease between Delhi Charter Township and Michael Webb – 2017-2020

Enclosed for your review and approval is a Property Lease between Delhi Charter Township and Michael Webb for the lease of 92.5 acres of farm land on the Publicly Owned Treatment Works (POTW) site for four years (2017-2020). This lease is subsequent to the one year lease for less acreage presented to the Board for consideration earlier on the agenda.

Subsequent to approval of the one year lease for 2016, I recommend the Board also approve this four year property lease (2017-2020) with Mr. Webb.

Recommended Motion:

To approve the Property Lease between Delhi Charter Township and Michael Webb for a four year term commencing January 1, 2017 and expiring December 31, 2020.

INTEROFFICE MEMORANDUM

TO: JOHN ELSINGA, TOWNSHIP MANAGER
FROM: SANDRA DIORKA, DIRECTOR OF PUBLIC SERVICES 
SUBJECT: LAND LEASE FOR AGRICULTURAL OPERATIONS
DATE: APRIL 13, 2016
COPY TO: JEFF RANES, NICK NEEB, FILE

Delhi Charter Township (Delhi) has contracted with Michael Webb to lease farm land on the Publicly Owned Treatment Works (POTW) site since 2008. Mr. Webb leased the land at a price of \$100 per acre from 2008–2012; for 2012-2015 the price per acre was increased to \$115.00. Mr. Webb also works with Delhi to cut and bale the township alfalfa field that is used for the sheep located at the Publicly Owned Treatment Works pond area.

Mr. Webb has proven to be an excellent lessee by demonstrating superior cooperation with the land application providers as well as Delhi employees, resulting in ease of scheduling and overall operation. For more than a decade, Mr. Webb has made his fields available for Delhi's land application process. Previous lessees have chosen to use commercial fertilizers thus limiting the fields available to Delhi for land application.

The average agricultural land rent per acre for Michigan, Southern Lower Peninsula and District 8 per the 2015 Michigan Land Value and Leasing Rates compiled by Michigan State University Department of Agricultural, Food, and Resource Economics Report No. 642 is as follows.

Region	Field Crop Tiled/Acre	Field Crop Non-Tiled/Acre
Michigan	\$141	\$101
Southern Lower Peninsula	\$154	\$112
District 8 (<i>Delhi Region</i>)	\$141	\$113

Delhi's tillable property would be categorized "Field Crop Non-Tiled", as the limited amount of tile that is located on the property is outdated and provides insufficient quality drainage.

Mr. Webb will also continue to assist with planting and harvesting the township alfalfa crop that is adjacent to the leased farm land. The alfalfa crop needs to be rotated this year; therefore, in 2016 the acreage available for lease will be less to accommodate the required rotation. Mr. Webb will harvest and bale the alfalfa, keeping 1/3 of the harvested alfalfa as stipulated in the property lease.

Due to past experiences, cooperation with the land application program and a willingness to increase the rental price to \$125 per acre, which is greater than the "Field Crop Non-Tiled" average price in District 8, I respectfully request that you recommend to the Board at its next meeting on April 19, 2016 a motion to approve a new one-year (2016) contract with 86.5 township acres available for lease; to be followed by a four-year (2017 – 2020) contract with 92.5 acres available to lease with Michael Webb.

PROPERTY LEASE

DELHI CHARTER TOWNSHIP, a Michigan municipal corporation, whose address is 2074 Aurelius Road, Holt, Michigan 48842 (hereinafter "Lessor") and **MICHAEL WEBB**, whose address is 5351 West Columbia Road, Mason, Michigan 48854 (hereinafter "Lessee") enter into this Lease subject to the following terms and conditions:

1. **PREMISES.** Lessor leases 92.5 acres ("Leased Property") of property owned by Lessor to Lessee, said property being more particularly described in Exhibit A and incorporated by reference.

2. **TERM OF LEASE.** The term of this Lease shall commence on January 1, 2017 and said lease shall expire and terminate on December 31, 2020, subject to the provisions of Paragraph 8. In the event that inclement weather prevents crop harvest by the end of the Lease, Lessee will be permitted to harvest without additional rent through the end of February following Lease expiration.

3. **RENT.** Rent for the Leased Property shall be in the annual amount of Eleven Thousand, Five Hundred, and Sixty-two and 50/100 Dollars (\$11,562.50) (\$125.00 per acre) for each year for the term of the lease, and the first year of said amount shall be paid on or before December 31, 2017, and said annual amount shall be paid on or before December 31 of each subsequent year.

4. **HARVEST.** Lessee shall harvest and bale alfalfa on the Leased Property and may keep 1/3 of the harvested alfalfa and Lessee shall convey to Lessor 2/3 of the harvested alfalfa from the Leased Property. Lessor reserves the right to inspect the alfalfa on the Leased Property prior to harvest and during harvest and take immediate possession of its share.

5. **USE OF THE LEASED PROPERTY.** Lessee's use of the leased property shall be limited solely to the growing of crops, which shall be accomplished through generally accepted agricultural practices and in compliance with all rules and regulations of the Farm Service Agency. Any proceeds payable by the Farm Service Agency shall belong to Lessee. Lessee will make fields available for biosolids application, contracted by Lessor, and will abide by the attached Best Management Practices and Restrictions as described in Exhibit B. Application of fertilizer or soil amendment to the leased property is prohibited without prior notification and approval from Lessor.

6. **DAMAGE TO CROPS CAUSED BY LESSOR.** In the event Lessee's crops are destroyed by activities of Lessor, Lessee's damages shall be limited to recovery of Lessee's costs and expenses in said crop(s) at the time of destruction or damage.

7. **INSURANCE AND INDEMNIFICATION.** Lessee shall carry liability insurance and such other insurance as may be required by law pertaining to any and all of Lessee's activities on the premises described above. In addition, Lessee shall indemnify and hold Lessor harmless regarding any liability, damage, claim or cost (including actual attorney fees) incurred by Lessor as a result of Lessee's activities and the activities of Lessee's employees, agents and servants pertaining to Lessee's use of said property.

8. **EARLY LEASE TERMINATION.** Lessor shall have the right to terminate this Lease without cost or penalty upon providing Lessee at least thirty (30) days advanced written notice of the date Lessor intends to terminate the Lease. Rent shall be prorated from the time of Lease termination and vacation of the Property.

9. **NON-DISCRIMINATION.** Lessee agrees not to discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status, sexual orientation, or any legally protected status. It is understood that a breach of this covenant may be regarded as a material breach of this Lease.

10. **NON-EMPLOYEE/CONTRACTOR.** Neither Lessee nor any of Lessee's employees, agents, contractors, or persons under Lessee's control, or subject to Lessee's authority, is, nor shall be regarded as, or determined to be, under the employ or control of Lessor, during the term of this lease, while providing service on said property or elsewhere, nor shall Lessee nor any of Lessee's employees, agents, contractors, or persons under Lessee's control, or subject to Lessee's authority entitled to any Lessor benefit, wage, compensation, or remuneration of any kind, or any benefit that Lessor may provide to its employees.

11. **APPLICATION OF BIOSOLIDS/SITE RESTRICTIONS.** Lessee agrees to permit application of biosolids by Gawne Trucking, Inc. or such other agent of Lessor as Lessor may deem appropriate and site restrictions resulting therefrom.

12. **ASSIGNMENT OR TRANSFER.** Lessee covenants that it will not assign or transfer this Agreement or sub-let said Leased Property, or any part thereof, without the written consent of the Lessor.

13. **COMPLIANCE WITH LAW.** The parties shall promptly comply with all applicable laws, orders, regulations, and ordinances of all municipal, county, and state authorities affecting the Leased Property and relating to its cleanliness, safety, occupation, and use. A party's failure to comply with such requirements shall be a permissible basis to immediately terminate this Lease.

14. **ENTIRE AGREEMENT; AMENDMENT.** This Agreement constitutes the entire agreement between the parties, and this Agreement may not be amended, except in writing and signed by the duly authorized representatives of the parties hereto.

15. **AUTHORITY TO SIGN.** The parties signing this Agreement provide that they have the authority to act in the capacity for the Lessor and Lessee and further provide that they have met any requirements of corporation minutes to act in the said capacity.

LESSOR:

**DELHI CHARTER TOWNSHIP,
a Michigan municipal corporation,**

Dated: _____

By: _____

CJ Davis

Its: Supervisor

Dated: _____

And: _____

Evan Hope

Its: Clerk

LESSEE:

Dated: _____

By: _____

Michael Webb

Instrument Prepared By:
David M. Revore (P68929)
THRUN LAW FIRM, P.C.
2900 West Road, Suite 400
East Lansing, Michigan 48823
(517) 484-8000

EXHIBIT A

The premises to be leased are comprised of approximately 92.5 acres, from the area and formerly known as the Kahres, Kenmore and Ralph Hart Farms, and legally described as follows:

Beginning at the West $\frac{1}{4}$ post of Section 29, Town 3 North, Range 2 West, Delhi Township, Ingham County, Michigan; thence N $89^{\circ}54'23''$ E 2647.55 feet along the East and West $\frac{1}{4}$ line to the center of said Section 29; thence N $00^{\circ}01'52''$ W 1314.75 feet along the North and South $\frac{1}{4}$ line; thence S $89^{\circ}55'53''$ W 2446.82 feet, South 132.00 feet; thence S $89^{\circ}55'53''$ W 200.00 feet to the West line of said Section 29, South 695.10 feet, along the West line of said Section 29; thence N $88^{\circ}29'30''$ E 230.00 feet, South 323.00 feet; thence S $88^{\circ}29'30''$ W 230.00 feet to the West line of said Section 29, South 165.81 feet along the West line of said Section 9 to the point of beginning. (for 2004: 0.1667 acre parcel split from 29-100-011 and combined with 29-100-003 to create 29-100-012 and remainder 29-100-013) Permanent Parcel Numbers 33-25-05-29-100-013.

And:

The North $\frac{1}{2}$ of the Northwest $\frac{1}{4}$, except beginning on the West section line at a point 1084.98 feet South of the Northwest corner of Section 29, thence N $89^{\circ}55'53''$ E parallel with the South line of North $\frac{1}{2}$ of the Northwest $\frac{1}{4}$ of Section 255 feet; thence South parallel to the West line 231 feet to a point on said South line; thence S $89^{\circ}55'53''$ W to the West section line, thence North along said Section line to the point of beginning. Also except beginning at the Northwest corner of Section thence South 280 feet to the center of the ditch, S $75^{\circ}40'$ E 559 feet along the centerline of the ditch, easterly 184.7 feet on the centerline of the ditch, North 432 feet to the Section line, West 724.7 feet to the beginning, Section 29, Town 3 North, Range 2 West, Delhi Township, Ingham County, Michigan. (for 2004: 0.1667 acre parcel split from 29-100-011 and combined with 29-100-003 to create 29-100-012 and remainder 29-100-013) Permanent Parcel Numbers 33-25-05-29-100-013.

And:

Beginning at the Southwest corner of Section 20, thence N $0^{\circ}6'55''$ W on West Section line 659.82 feet, thence N $89^{\circ}50'47''$ E 1319.77 feet, thence S $0^{\circ}06'55''$ E 660.41 feet, thence S $89^{\circ}52'20''$ W 1319.77 feet on South Section line to point of beginning, Section 20 Town 3 North, Range 2 West 20 acres plus or minus, Delhi Township, Ingham County, Michigan (Split From 33-25-05-20-300-005 for 2002 Roll). Permanent Parcel Numbers 33-25-05-20-300-007.

EXHIBIT B

Best Management Practices and Restrictions

- A person shall not apply bulk biosolids to the land if it is likely to adversely affect a threatened or endangered species listed under section 36503 of the act or its designated critical habitat.
- A person shall not apply bulk biosolids to agricultural land, a forest, a public contact site, or a reclamation site that is flooded, saturated with water, frozen, or snow-covered so that the bulk biosolids enter a wetland or other waters of the state.
- A person may subsurface inject bulk biosolids on frozen or snow-covered ground as long as there is substantial soil coverage of the applied biosolids. A person shall not surface apply bulk biosolids, other than exceptional quality biosolids, on frozen or snow-covered ground unless otherwise approved by the department.
- A person shall not apply bulk biosolids on lands having a slope of more than 6% for surface application or more than 12% for subsurface injected biosolids, unless the person uses the bulk biosolids in accordance with a department-approved site management plan.
- A person shall apply bulk biosolids to agricultural land, a forest, a public contact site, or a reclamation site at an application rate that is equal to, or less than, the agronomic rate, unless the person that applies bulk biosolids in accordance with a department-approved site management plan.
- A person that applies biosolids shall perform soil fertility tests on soils sampled from each application site before initial biosolids application. The person shall resample and test on a regular basis so that the last soil fertility test is not more than 2 years old at the time of the next biosolids application.
- For agricultural land, a person shall apply biosolids in accordance with agronomic rates. If the Bray P1 soil test level exceeds 300 pounds (P) per acre (150 ppm), or if the Mehlich 3 soil test level exceeds 340 pounds (P) per acre (170 ppm) in site soils, then the person shall not apply biosolids until the soil P test level decreases to less than 1 of these values.
- A person shall apply biosolids in a manner that would maintain, at a minimum, a 30-inch separation distance between the soil surface and the groundwater at the time of biosolids application.

Roy W. Sweet
Treasurer
2074 Aurelius Road
Holt, Mi 48842
517-694-0333 X3014

Delhi Charter Township

April 11, 2016

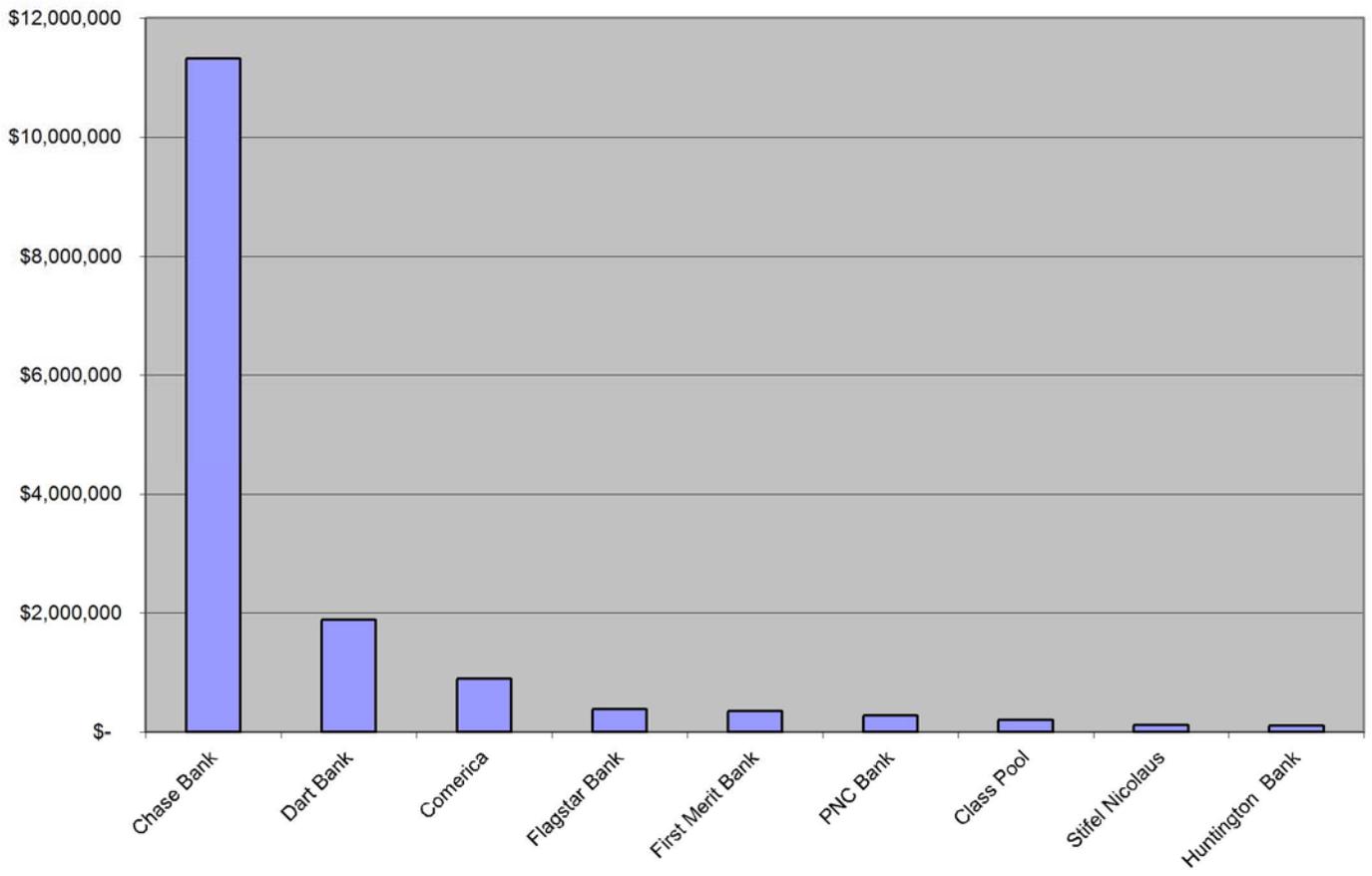
To: Delhi Charter Township Board of Trustees

From: Roy W. Sweet, Treasurer

Subject: 1st Quarter Investment Report

Please see the attached report. If you have any questions or comments please contact me at my office.

Excellence in Customer Service is our Goal



DELHI CHARTER TOWNSHIP CASH AND INVESTMENTS
First Quarter Report 2016
March 31, 2016

INSTITUTION	Code	NAME OF ACCOUNT	3/31/2016 G.L. Balance	INTEREST RATE, MATURITY, ETC.
General Fund (101):				
Chase Bank	1	General Fund Pooled Account	\$ 6,510,403	Checking/Investment Acct. No interest earned in Mar.
Stifel Nicolaus	3	General Fund Investment	108,412	Bond due 5/2/16
Dart Bank	4	General Fund I.T. Account	3,500	Non-interest bearing account
PNC Bank	8	General Fund	276,946	Mar. Annual % Yield Earned = 0.25%
Flagstar Bank	6	General Fund CD	100,608	0.65%, due 10/4/16
Huntington Bank	9	General Fund CD	100,000	0.3%, due 8/12/16
First Merit Bank	5	General Fund CD	100,405	0.4%, due 8/2/16
Dart Bank	4	General Fund CD	250,000	1.925%, due 1/17/17
Comerica Securities	7	General Fund Securities	668,802	0.9%, 75%, 2%, 4%, 1.73%, 1.948%, 1.49%; Matures 6/23/17, 6/28/17, 11/01/19, 5/01/16, 10/1/18, 5/1/19, 5/1/18
		TOTAL		\$8,119,076

Fire Fund (206):

Chase Bank	1	Fire Fund Pooled Account	\$ 905,763	Checking/Investment Acct. No interest earned in Mar.
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Police Fund (207):

Chase Bank	1	Police Fund Pooled Account	\$ 780,143	Checking/Investment Acct. No interest earned in Mar.
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Fire Equipment Fund (211):

Chase Bank	1	Fire Equipment Pooled Account	\$ 259,573	Checking/Investment Acct. No interest earned in Mar.
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Water Improvement (225):

Chase Bank	1	Water Improvemt Pooled Acct	\$ 116,253	Checking/Investment Acct. No interest earned in Mar.
Class Pool	2	Water Impr Class Pool Investment	202,972	0.45% Mar. Average Yield
		TOTAL		\$319,225

Sycamore Trail Construction Fund

Chase Bank	1	Sycamore Trail Construction	\$ 179,030	Checking/Investment Acct. No interest earned in Mar.
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Sewer Fund (590):

Chase Bank	1	Sewer Receiving Account	\$ 2,060,708	Checking/Investment Acct. No interest earned in Mar.
First Merit Bank	5	Combined Sewer Investment	251,806	0.19% Mar. annual % Yield
Dart Bank	4	Sewer Replacemt CD 's	460,850	0.40%, due 3/10/17; 0.35%, due 5/04/16
Flagstar Bank	6	Sewer Replacemt CD	203,661	0.65%, due 10/4/16
Dart Bank	4	Combined Sewer Savings	1,170,591	Muni Money Market Pooled for Sewer Replacement, Surplus, and Bond Pymt. 3/31 Annual % Yield - 0.30%
Comerica Securities	7	Sewer Fund Securities	228,902	1.0%, 2.155%, Matures 9/27/17, 5/01/19
		TOTAL		\$4,376,518

Local Site Remediation Fund (643)

Chase Bank	1	LSR Pooled Account	\$ 374,302	Checking/Investment Acct. No interest earned in Mar.
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Trust and Agency Fund (701):

Chase Bank	1	Trust & Agency Pooled Account	\$ 7,957	Checking/Investment Acct. No interest earned in Mar.
Chase Bank	1	Delinquent PP Tax Account	16,253	Checking/Investment Acct. No interest earned in Mar.
Chase Bank	1	Employee Flex Spending (Includes Twp. deposit of \$9000)	8,394	Non-interest bearing account
		TOTAL		\$32,604

Current Tax (703):

Chase Bank	1	Current Tax Savings	\$ 98,668	Checking/Investment Acct. No interest earned in Mar.
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Falk Cemetery Trust Fund (765):

Flagstar Bank	6	Falk Cemetery Trust CD	\$ 70,768	0.8%, due 1/20/2017
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Total Delhi Township Cash & Investments **\$ 15,515,670**

DELHI CHARTER TOWNSHIP CASH AND INVESTMENTS
Fourth Quarter Report - Institution Summary
March 31, 2016

<u>INSTITUTION</u>	<u>TYPE OF ACCOUNT</u>	<u>TOTAL CASH/INVESTMENTS</u> <u>at March 31, 2016</u>	
Chase Bank	Checking and Investment	\$	11,317,447
Dart Bank	Hi-Fi Money Market & CD's		1,884,941
Comerica	Certificates of Deposit, Securities		897,704
Flagstar Bank	Certificate of Deposit		375,037
First Merit Bank	Investment Savings		352,211
PNC Bank	Money Market		276,946
Class Pool	Investment Savings		202,972
Stifel Nicolaus	Securities, Money Fund		108,412
Huntington Bank	Certificate of Deposit		100,000
	Total Delhi Township	\$	15,515,670

Delhi Downtown Development Authority Cash & Investments

<u>INSTITUTION</u>	<u>TYPE OF ACCOUNT</u>	<u>TOTAL CASH/INVESTMENTS</u> <u>at March 31, 2016</u>	
Chase Bank	Checking and Investment		2,801,394
Dart Bank	Hi-Fi Savings/Checking	\$	1,374,830
Flagstar Bank	Investment		756,709
	Total Downtown Development Authority	\$	4,932,933

Delhi Charter Township Investments as of 3/31/16

