

AGENDA 8a-3
DATE 10-3-2017

DEPARTMENT OF PUBLIC WORKS

CITY OF NORTON SHORES



FISCAL YEAR END REPORT – 2017
July 2016 – June 2017

The Department of Public Works respectfully submits this report to the City Council as an overall review of various activities handled by the Department during FY-2017 under the direction of Gerald A. Bartoszek. Administrative Assistant, Sarah Romine, is responsible for initial customer assistance and all department clerical duties.

The report will highlight activities deemed significant to the function of the Department and its role within the City organization. The report also recognizes the superintendents and supervisors within the Department and includes Supplemental Reports for each Division within the Department.

During FY-2017 the Public Works Department responded to 166 after hour calls/emergency calls, primarily consisting of 77 sewer lift station calls, followed by 38 water main and water service calls, and two sewer calls. Other calls included 21 in the street system, 20 Emergency Miss Dig requests, and eight miscellaneous calls.

The Public Works Department is comprised of the following Divisions:

WATER & SEWER

Personnel - Matthew Anderson, Superintendent
Scott Houghtaling, Supervisor
Tara Smith, Administrative Assistant
Andrea Twining, Part Time Clerical
Nine Utility Workers

The Water & Sewer Division of the Department of Public Works has been in existence prior to the founding of the City. The Division is responsible for the operation and maintenance of the water distribution system and the sewage collection system, as well as utility billing. This report will relate to activities conducted by the Water & Sewer Division, including field operations and office functions. Matthew Anderson serves as Water & Sewer Superintendent for the Division; Scott Houghtaling is the Water & Sewer Supervisor. Administrative Assistant, Tara Smith, is responsible for water and sewer billing, scheduling appointments, and all other clerical activities in the Division.

STREETS AND DRAINAGE

Personnel - Terry Sladick, Superintendent
Bryan DeGroot, Supervisor
Donna Holmberg, Administrative Assistant
Stacy Stehouwer, Part Time Clerical
Nine Streets and Drainage Maintenance Workers

Activities handled by this Division provide for the maintenance of streets and drains within the jurisdiction of the City. Specific areas of responsibility include street surfaces, roadside areas, bridges, traffic signs, and traffic signal maintenance. In addition, the drainage system involves storm sewer, sub-drain and off-road outlet maintenance.

EQUIPMENT SERVICES

Personnel - Terry Sladick, Superintendent
Charles Borgman, Chief Mechanic
Two Mechanics

This activity provides for the maintenance of all equipment in the Equipment Fund. City personnel are responsible for preventive maintenance, as well as routine maintenance. Major repair work at times is contracted to specialists. Equipment Services recommends the specifications to be used to purchase new and replacement vehicles and other equipment, as well as preparation of the new equipment for use in the operations. This Division also decommissions the equipment being replaced and conducts the sale of the used equipment.

BUILDINGS AND GROUNDS

Personnel - Scott Ellison, Facilities Supervisor
Two Maintenance Workers

Maintenance and custodial responsibilities in City Hall and at the Library are the primary activity of this Division. Custodial duties of the DPW facility office area are also performed. Building and Grounds personnel also take care of various duties in support of the City Clerk's Office during elections. They maintain the heating and air conditioning systems in City Hall, the Library, and the Public Works facility on Mt. Garfield Road.

Another duty of Building and Grounds personnel is the care and grooming of the cemetery on Airport Road. Grass cutting, leaf removal, and general overall clean up and care to keep the property presentable at all times are primary activities. Additional duties dealing with the cemetery include the sale of grave sites as well as the preparation of graves for burial and the closure and restoration afterwards.

ENGINEERING SERVICES

Personnel - James R. Murphy, City Engineer

The City Engineer coordinates and oversees the development and construction of all of the City's major infrastructure improvements. Engineering Services provides the capability to respond to capital improvement requirements in our City, covering all aspects of growth in the public streets, drainage, water, and sewer systems. In addition, the division aids in the oversight of traffic signal and traffic control. Engineering Services also works towards the procurement of outside funding resources through grant application submission for public infrastructure projects. The Engineering Division also provides support to the site plan review process required by the Zoning Ordinance for all non-residential projects, subdivisions, and site condominiums.

PLANNING

Personnel - Robert W. Bilkie, City Planner/Zoning Administrator

The City Planner/Zoning Administrator is responsible for ordinance enforcement and site plan approval, as well as communications with the Michigan Department of Environmental

Quality related to critical dune issues. He also is staff representative to the Planning Commission and Zoning Board of Appeals.

WATER & SEWER DIVISION FY-2017 REVIEW

The following are activities conducted by the Water & Sewer Division, both in field operations and office functions:

Water Supply

The City purchases its water supply from the West Michigan Regional Water Authority, which in turn purchases water on behalf of the City and Fruitport Charter Township from the City of Muskegon's Water Filtration Plant. Three large high service pumps, several miles of large transmission main, a booster station, and two water towers facilitate the delivery to the City's system.

Water Services

During FY-2017, Water & Sewer crews installed 62 water services ranging in size from 1" to 2". Service installations require the water main in the road right-of-way to be tapped under pressure and a copper service placed to the homeowner's property line, in addition to setting a water meter. Please see Attachment A for installation statistics since 2004. Repairs to 118 existing water services were also completed.

Sewer Connections

The Water & Sewer Supervisor approved the connections of 41 sewer services to the sanitary collection system. Inspections detail approved types of pipe, pipe size, connection fittings, grade, depth and pressure testing.

Water Meter Program

During FY-2017, Water & Sewer personnel also conducted the meter change-out program with new meters being set. Throughout the city, a total of 480 residential and/or commercial meters were replaced or set. The City has 9,859 meters in the replacement program and 328 in the testing and repairing program.

Additional meters for irrigation have been set for homeowners and businesses to eliminate sewer charges on irrigation water. A total of 38 additional meters were set in FY-2017.

Water Main Breaks

During FY-2017, crews responded to a total of 10 water main breaks throughout the distribution system. Repairs were made during regular hours and as after-hours emergencies.

Valve Maintenance

Once each year, all 1,502 mainline distribution valves are operated, recorded as being operable or inoperable, and repaired if necessary. The program has eliminated time consuming efforts to isolate portions of the distribution system during water main breaks, thus minimizing disruption of service to residents and businesses. Five valves were replaced in FY-2017. During FY-2017, all of the mainline water main valves were exercised, and repairs to 64 valves were completed.

Large Meter Testing and Replacement

All large (1½” to 6”) meters are periodically tested in place for accuracy depending on gallonage used per year, and size and age of the meter. No new large meters were set in FY-2017, and crews completed 52 large meter tests. There are a total of 328 large meters in the system.

Meter Reading

The City of Norton Shores’ metering structure consists of 10,187 water meters. Meters are read on a quarterly basis, within three billing districts, or reading one district each month, for a total of 40,748 readings per year. In addition, a total of 3,357 work orders for final readings, meter leaks, etc., were processed and completed in FY-2017.

Senior Citizen Discount

This program offers a 25% discount off quarterly water usage to eligible senior residents. Eligibility requires the senior resident to own and occupy the residence, be at least 62 years old, and have a total annual household income of less than \$22,949.

Breakdown of senior discounts per billing district:

McCracken	26	Total gallonage 1,411,000
East Broadway	34	Total gallonage 1,679,000
Henry	44	Total gallonage 2,175,000

Lift Station Maintenance

Daily operations include scheduled preventative maintenance on a weekly rotational basis of all 43 sanitary sewer lift stations and one dewatering station. Each station is checked for normal operations weekly which include electrical readings, pump hour

readings, and complete assessment for any abnormalities. Semi-annually, all lift station wet wells are cleaned, and sludge is removed by the sewer vactor truck. Pumps are then pulled and washed, oil is changed, and tolerances are checked for impeller clearance.

All lift station electrical usage is monitored for performance evaluation and weekly energy usage. See Attachment B.

City of Norton Shores Sewer Lift Stations by Address:

4316 Armstrong Road	2217 Lincoln Park Drive
874 Bradley Avenue	5395 Martin Road
3798 Brentwood Street	2117 Maryland Boulevard
1204 E. Broadway Avenue	3112 McCracken Street
1978 Channel Road	4049 Nob Hill Drive
1130 Edinborough Drive	2218 Norcrest Drive
351 Eric Avenue	2203 Norman Street
1070 Forest Park Road	3746 Norton Hills Drive
1310 Forest Park Road	3571 Peninsula Drive
1616 Forest Park Road	2369 Pleasant Hill
6239 Grand Haven Road	89 Pontaluna Road
6239-1/2 Grand Haven Road**	2195 Reneer Avenue
4341 Hackley Point Lane	4781 Rood Road
4162 Harbor Point Drive	1175 Seminole Road
3180 Henry Street	1797 Seminole Road
4210 Henry Street	2939 Sheffield Street
4993 Henry Street	1411 Sunbury Avenue
701 Lake Forest Drive	3797 Taylor Street
4461 Lake Harbor Road	4171 Treeline Drive
6260 Lake Harbor Road	3006 Valk Street
396 Lakshore Boulevard	418 Wellesley Drive
2830 Lincoln Street	861 Winslow Court

(**dewatering)

Consumer Confidence Reports

The annual drinking water Consumer Confidence Report was prepared and made available to all system customers. The Department of Environmental Quality and the Environmental Protection Agency require this report be made available to all water customers to provide information as to the quality of water they drink. A copy of this report is attached as Attachment G.

Infrastructure Locating

One of the responsibilities the City has in owning and operating utilities is that of locating water and sewer lines for contractors or homeowners that intend to dig within

the city. The City is required to be a member of the Miss Dig System for organizing locating requests. Water & Sewer Division completed approximately 2,235 such requests during the 2017 fiscal year.

Mainline Sewer Cleaning

The mainline sewer cleaning program for FY-2017 consisted of cleaning approximately 113,806 ft. of pipe ranging in size from 6" to 21". The sewer vactor truck cleans debris out of the sewer including sand, grease, roots and, occasionally, stones in an effort to eliminate sewage backups in the sewage collection system.

Bacteriological and Lead/Copper Sampling/System Review

This program, done once a week, includes collecting a total of eight water quality samples throughout the water distribution system. Samples are analyzed for chlorine and fluoride residuals and taken to the Muskegon Water Treatment Plant for coliform bacteria testing.

Sampling is also performed on new construction of water mains before they are put into service using the same sampling procedure. Sixty nine construction samples were taken in FY-2017.

The City has been on a reduced Lead and Copper Sampling schedule since 1996 that required testing every three years. The City's 2016 Annual Water Sampling requirement notification stated that due to the City's change in water suppliers, the MDEQ has now imposing two Lead and Copper Sampling periods during the 2016 calendar year; part of FY-2017. The sampling periods were outlined as January 1st through June 30th and July 1st through December 31st. The second sampling period results identified the majority of homes had less than the maximum for copper and 30 of the 31 sites tested below the action level for lead. One site tested above the action threshold and assistance was given to the property owner to locate the source of the lead.

Fire Hydrant Maintenance

This program maintains the reliability of fire hydrants throughout the water distribution area. Fire hydrants are operated annually to clean tuberculation from the water mains and to check for proper operation of the hydrants. The hydrants are then repaired, if necessary, and winterized for winter weather. During summer months, hydrants are sand blasted and painted. A total of 1,632 City owned and 58 private hydrants were serviced during FY-2017, and 350 were painted.

Cross Connection Control

This program is continuous throughout the year. It consists of inspecting all non-residential users (i.e., commercial, industrial, churches, schools and government users) connected to a City water supply for the possibility of internal plumbing cross connections. The severity of the cross connection may require backflow devices to

protect the City's water distribution system from contamination. Testing of these devices is required annually and/or every three years depending on device type. Re-inspection of high hazard facilities are completed annually and the low hazard facilities every three years. The City has a total of 322 high hazard accounts and 470 low hazard accounts. The MDEQ also monitors this inspection process. See Attachment C.

Sewer Discharge Accountability

This program occurs monthly to monitor all billings from the Muskegon County Wastewater facility. The program is analyzed for extraordinary usages due to ground water infiltration or storm water discharge by City sewer customers. There have been incidents of users illegally discharging storm water to the sanitary sewer, thus raising monthly monitoring gallonage. These illegal connections are promptly removed. Please see Attachment D.

Water System Accountability

This program is done on a monthly basis to determine annual purchases and sales of water to Norton Shores customers. It also gives an indication of reliability for the water loss survey along with annual usages indicating growth in the community. Please see Attachments E, F and H.

Lift Station Telemetry

All lift stations are monitored through a telemetry Supervisory Control and Data Acquisition (SCADA) system. The unit is located at 1174 E. Mt. Garfield Road (Norton Shores garage), and after hours monitoring is located at 3228 Glade Street. The system checks all 44 stations within 90 seconds to determine the status of alarm conditions that may exist. The system is evaluated twice a year by simulating alarm conditions at the lift stations to test for reliability.

Office Billings

The following billing functions have been accomplished from July, 2016 through June, 2017.

- Processing of 3,357 work orders dealing with final readings, re-reads, turn-ons, turn-offs, leaks, frozen meters or services, high bills and new meter sets.
- Set up of 60 new accounts in the utility billing system.
- Mailing of 42,928 billings to customers, including past due notices, final billings and regular quarterly billings.

Michigan Department of Environmental Quality Certifications

Following is a list of Water & Sewer employees who are certified as Water Distribution System Operators. The Michigan Department of Environmental Quality (MDEQ)

recertifies operators every three years. In order to be recertified, a certain number of training credit hours must be completed within the three year period. Certified, competent and professional operators are very important to the delivery of safe drinking water to Norton Shores residents. These employees and the certification level are:

Matt Anderson	Certified S-1	May 2016-Jan. 2018
Scott Houghtaling	Certified S-1	Jan. 2015-Jan. 2018
Craig Lehan	Certified S-1	Dec. 2016-Jan. 2020
Tim Draft	Certified S-3	Nov. 2016-Jul. 2020
Scott Hannahs	Certified S-4	Jan. 2015-Jan. 2018
Eric Mattson	Certified S-4	Jan. 2014-Apr. 2020
Eric Beishuizen	Certified S-4	May 2017-Jul. 2020
Josh Connell	Certified S-4	May 2017-Jul. 2020
Brandon Wilburn	Certified S-4	May 2017-Jul. 2020

Classification of distribution systems:

Rule 1902: The following four classifications are assigned to distribution systems for type I public water supplies:

Class S-1: Distribution systems for type I public water supplies serving a population greater than 20,000.

Class S-2: Distribution systems for type I public water supplies serving a population from 4,000 to 20,000.

Class S-3: Distribution systems for type I public water supplies serving a population from 1,000 to 4,000.

Class S-4: Distribution systems for type I public water supplies serving a population of less than 1,000.

STREETS & DRAINAGE DIVISION FY-2017 REVIEW

Streets & Drainage Division personnel are kept busy throughout the year with a wide scope of tasks.

Street sweeping begins early in the spring and continues until the snow begins to fall. Road repair work is continuous throughout the year and includes pavement crack sealing, repairs to asphalt shoulders and utility cuts, and in areas where water main breaks have occurred. In the fall, equipment is readied for inclement weather when, from November through April, crews spend many hours clearing City roadways of ice and snow.

The de-icing system continues to work well, utilizing a pre-wet system, which activates the road salt with liquid calcium chloride. This method de-ices to lower temperatures, begins to work more quickly, and sticks to the roadway reducing waste that occurs when dry salt bounces

off the road. As this method de-ices to lower temperatures, sand is rarely used which, in turn, keeps our roads and drainage systems cleaner.

Tree branches are routinely trimmed or removed to avoid obstructed vision at intersecting roads. Dead or damaged trees are removed from the right-of-way; many are replaced by the Streets Division, as well.

Gravel roadways are graded on a regular basis and three brining applications are completed through the summer on roads that have property owner participation.

Streets personnel also maintain many major and local street right-of-way areas with scheduled mowing. City drains and drainage ditches are monitored continuously and kept clean of debris.

The Streets Division provides attendant service at the Wood Road leaf site seven days a week in the spring and fall and on weekends through the summer months.

Traffic control devices, i.e., signs, barricades, etc. are provided by the Streets Division for special events including the Ross Park Arts and Drafts Festival and the Motorcycle Hill Climb. Additionally, the City’s many street signs are maintained throughout the year with damaged signs being repaired or replaced.

The Director of Public Works and the Streets & Drainage Superintendent continue to be active in the Muskegon Area Municipal Storm Water Committee. This committee is working cooperatively on a regional basis to address the Environmental Protection Agency’s Storm Water requirements. This past year the focus has primarily been working on the development of a storm water ordinance to serve all member jurisdictions of the storm water group. The ordinance will provide measures to handle storm water on newly developed property.

The Streets & Drainage Division continues to be a vital part of the City’s service program.

STREET SIGNS

Street sign maintenance including installation, repair, and replacement is a continual task for the Streets Division. During this reporting period, a total of 376 signs were replaced, repaired, or installed by the Department of Public Works.

FUEL DISPENSATION FY-2017

Following is an itemization of the fuel dispensation for FY-2017:

Administration	233.3 gallons
Building & Grounds	940.0 gallons
Community Development	210.7 gallons
Fire	14,048.6 gallons
Police	21,620.1 gallons
Recreation	2,704.3 gallons
Streets & Drainage	25,129.4 gallons

Water & Sewer 11,672.1 gallons

Total Gallons Dispensed 76,558.5 gallons

MISS DIG MICHIGAN UTILITIES DAMAGE PREVENTION ASSOCIATION

The Department of Public Works logged 2,235 staking requests during the FY 2017. These staking requests were submitted by contractors as well as DTE Energy, Consumers Energy, Frontier, Comcast Cable, and residential homeowners. The Divisions of Streets and Drainage, and Water and Sewer placed 120 orders for city utility installation and maintenance.

The City receives Miss Dig requests via computer and then distributes the information to Water & Sewer personnel to physically locate and mark all water & sewer utilities and storm drain infrastructures. Blue flags signify water; brown flags denote sanitary sewer, and green flags represent storm water. After staking, the clerical staff is notified, and the information is recorded as a completed order. Various flag colors represent the following utilities:

Yellow	Oil and Gas
Orange	Telephone and CATV
Red	Electric
Blue	Water
Green	Storm Drain
Brown	Sewer
Pink	Surveying

WOOD ROAD AND ROSS PARK LEAF DISPOSAL SITES

Great Lakes Nursery Soils, Inc. removed a total of 2,809 yards of yard waste from the Wood Road and Ross Park leaf sites.

The following number of vehicles, by classification, was monitored at the Wood Road site:

Cars	3,527
Trailers	5,899
Pick-up trucks	<u>7,329</u>
Total	16,755

The total of all vehicles visiting Wood Road during FY 2017 was 16,755; the total counted during fiscal year 2016 was 16,779.

No vehicle counts were recorded for the Ross Park site.

EQUIPMENT/MECHANICS DIVISION

The total number of vehicle services and repairs in FY 2017 was 1,021.

Following is a list of equipment purchased.

- 1-International Plow Truck
- 1-Caterpillar Backhoe Loader
- 2-Honda Portable Generators
- 4-Ford Police Interceptors
- 1-John Deere Mower
- 1-Wacker Neusen mini excavator
- 3-Chevrolet Silverados

As a result of the City purchasing equipment at State and Oakland County pricing, used equipment has been successfully liquidated through internet resources.

Following is a list of equipment sold:

1-2013 Ford Taurus	\$ 7,957.00
1-2008 John Deere Front Mower	\$ 4,936.05
1-2011 Ford Crown Victoria	\$ 2,690.10
1-2013 Ford Taurus	\$ 6,930.00
1-2013 Ford Taurus	\$ 8,505.00
1-2013 Ford Taurus	\$ 7,036.06
1-2006 Chevrolet C-8500 Dump Truck	\$50,075.00

TOTAL \$88,129.21

FY-2017 GRAND TOTALS

Miles of streets maintained	149
Number of times local streets/sidewalks were plowed during FY-2017	7/4
Tons of salt usage for FY-2017	1,622
Gallons of liquid calcium chloride (de-icer) applied	10,799
Tons of winter mix asphalt patch used	35
Tons of bituminous hot mix used	146

Miles of streets swept		334
Debris collected from sweeping operation (cu. yd.)		425
Number of times gravel-surfaced roads graded		27
Tons of road gravel leveled & used to maintain surface		62
Gallons of 38% calcium chloride (brine) applied		24,636
Number of trees removed		28
Number of trees planted		22
Residential use of County Landfill:	Cars	376
	Trucks/Trailers	<u>287</u>
	Total Vehicles	663
Storm drain/under drain footage cleaned		6,216
Pounds of crack sealant dispensed		12,860
Square feet of sidewalk replaced		1,600
Acreage mowed along off-road drainage courses & along road right-of-way		285
Fuel dispensed (gallons)		76,559
Vehicle services		1,021
Gravel Road Improvements: Tons of Gravel/Miles		3,885/.86

**BUILDINGS & GROUNDS MAINTENANCE DIVISION
FY-2017 REVIEW**

Following is a listing of the Buildings and Grounds Maintenance Division activity beyond normal daily routines.

CITY BUILDING

- Moved fax line in DPW office
- Fixed three broken sprinkler heads

- Remodeled men's restroom.
- Adjusted sprinkler heads.
- Removed interrogation room window in P.D.
- Painted wall from window removal.
- Painted Detective's office.
- Mounted three new TV's in Fire Prevention.
- Northside HVAC installed 2 new roof top units(#1 &2)
- Northside HVAC installed 2 new Mini-Split units in Assessing
- Repaired lock on Finance Director's window.
- Painted the dryvit on City Hall Building.
- Replaced south light on flag pole.
- Tared cracks for Parks and Rec garage roof.
- Pulled old window A/C units from Assessing.
- Replaced broken door latch from outside Admin door to City Hall.
- Installed automatic light switch for P.D. Evidence room.
- Installed dry erase board in P.D. Evidence room.
- Repaired berm lights, installed compact fluorescent bulbs.
- Delivered, set up, and picked up voting equipment.
- Scanned building prints to server.
- Cleaned weight room equipment.

- Winterized irrigation system.
- Moved bulletin boards for Fire Prevention.
- Replaced P.D. entrance soffit.
- Replaced relay for P.D. exhaust fan.
- Plowed parking lot as needed.
- Hallway carpet installed at City Hall.
- Milled 6 wood doors for new carpet clearance.
- Hung two TVs in the E.O.C. room.
- Repaired west overhead door in P.D. garage.
- Repaired electronic door access button in Finance.
- Replaced old TV's in large conference room with one 70" LED.
- Repaired wall from old TV's in conference room.
- Adjusted door closer at employee entrance by P.D.
- Hung dry erase board in Building Dept. for Building Inspector.
- Contractor renovated old DPW garage.
- Remodeled P.D. break room.
- Constructed a nursing room in City Hall.
- Repaired leaking roof top drain in P.D. men's locker room.
- Collected all voting equipment and bring to City Hall to be exchanged for new.
- Got estimate on having lights in City Hall replaced with LED's.

- Load tested City Hall generator.
- Repaired irrigation system as needed.
- Replaced two door closers.
- Removed half of coat rack in hall by large conference room to make room for new snack machine.

LIBRARY

- Northside HVAC installed new fan motor and blade on Community Room condenser.
- Had Community Room carpet cleaned.
- Cleaned City Council chairs.
- Power washed Library entrances.
- Assembled large rolling magnetic board for children's area.
- Assembled rolling aluminum hanging rack for children's area.
- Removed broken sidewalk light at West entrance and replace it with one of the three from the North entrance.
- Replaced bad spot lights in Community Room.
- Replaced pressure switch for heating system.
- Replaced bad bearing, housing and impeller on circulating pump for heat to main Library.
- Installed two DVD racks.
- Cleaned boiler room.
- Repaired main entrance door ADA opener (broken arm on opener).

- Installed one LED light in parking lot to test for future replacement of all outside lights.
- Changed roof to filters (spring schedule).
- Community Room carpet cleaned.
- Checked A/C condenser weekly for garbage/leaves collecting around them.
- N.E. corner of property cleared of brush and lower limbs.
- Replaced one door closer.

CEMETERY

- Graves sold: 41
- Cremain Garden lot's sold: 1
- Full Body Burials: 30
- Cremain Burials: 9
- Pre Paid Burials: 2
- Pre-Paid Cremain burial: 1
- Foundations installed: 30
- Dis-internment: 1
- City buy back graves: 4
- Repaired bad irrigation zone valve.
- Removed old Cemetery fence and have new fencing installed.
- BS&A Cemetery Management installed and running.
- Removed old planter box at Cemetery entrance getting area ready for New Cemetery Sign.

- Restored winter burial sites.
- New Mini Excavator was purchased.
- Moved water meter out of vault in driveway and located by P.V.B.
- New Cemetery Sign was blasted and painted.

DPW Garage

- Replaced both water heaters.
- Put new valves in all toilets.
- Repaired back door as needed.

**ENGINEERING
FY-2017 REVIEW**

2016 Sidewalk Project

Limits: Henry Street, Seminole Road to Forest Park Road; Harvey Street, Sternberg Road to Mt. Garfield Road

Description: Place concrete sidewalk along proposed route

Consultant: Moore & Bruggink, Grand Rapids, MI

Contractor: Accurate Excavators, LLC, Muskegon, MI (Harvey Street)
WMRA, Inc., Grandville, MI (Henry Street)

Year’s Work: Sidewalk was installed along Harvey Street south of Sternberg Road to Mount Garfield Road and Henry Street between Seminole Road and Forest Park Road. Work included improvements and updating of pedestrian signals and ADA Ramps along with the improvements/updating of the Forest Park/Henry traffic signals.

Funding: MDOT Safety Grant, TIFA Funds, and Capital Improvement Funds

Start Date: Harvey Street: May 9, 2016
Henry Street: June 27, 2016

Finish Date: Harvey Street: June 10, 2016
Henry Street: July 21, 2016

FY-2017 Local Streets Hot-in-Place/HMA Pavement Work

Limits: Various streets throughout city

Description: The Hot-in-Place (HIP) pavement recycling with HMA Overlay of the milling and re-pavement of selected streets throughout the city.

Consultant: In-house

Inspector: Westshore Consulting, Muskegon, MI
HIP Contractor: Gallagher Asphalt, Thornton, IL
HMA Contractor: Asphalt Paving Inc., Muskegon, MI
Year's Work: Milling of roadways and either Hot-in-Place recycled or full depth replacement completed after bad castings replaced and aggregate base tested and repaired.
Funding: TIFA, Municipal Road, and Capital Improvement Funds
Start Date: July 19, 2016
Finish Date: September 30, 2016

Harvey Street Reconstruction

Limits: Ellis Road to Hile Road
Description: Reconstruction and widening of existing roadway along the proposed route.
Consultant: Prein&Newhof, Grand Rapids, MI
Year's Work: City staff worked with the Little River Band of Ottawa Indians and secured a cost share agreement for the additional cost of engineering and construction to comply with the consultant's recommendation for a casino. City staff obtained all required easements. The Consultant completed the design and assisted in obtaining all necessary permits. The project was let through the MDOT and work started in June, 2017.
Funding: STIP with local match
Start Date: June 14, 2017
Estimated Finish: August, 2017

Hendrick Road/Norton Hills Reconstruction

Limits: Norton Hills Road – Norcrest Drive to Applewood Lane
Hendrick Road/Stanwood Street – Henry Street to Churchill Drive
Description: Reconstruction of Norton Hills Road, Hendrick Road, and Stanwood Street along with upsizing and replacement of cast iron water mains.
Consultant: ENG, Lansing, MI
Contractor: Kamminga & Roodvoets, Grand Rapids, MI
Year's Work: The City obtained required State and MDEQ permits and released the plans for bid. Work on the sanitary sewer repairs, water main replacement, storm drainage improvements and placement of reconstructed roadways were completed.
Funding: Municipal Road Fund, Water Fund
Start Date: August 29, 2016 (Hendrick/Stanwood), September 26, 2016 (Norton Hills)
Finish Date: November 15, 2016 for both projects

HMA Milling and Pavement Project 2017

Limits: Selected Streets
Description: Milling, aggregate base repair and HMA pavement placement of existing asphalt pavements.
Consultant: Westshore Consulting; Muskegon, MI
Contractor: Michigan Pavement and Materials, Grand Rapids, Michigan
Year's Work: Final design work and specifications were completed the project was bid and awarded. Work started on the pavement milling, aggregate base testing and repairs and replacement of bad castings. Pavement leveling and top course placed on several of the selected roadways with the remaining work to be completed in FY18.
Funding: Municipal Road and Capital Improvement Funds
Start Date: June 19, 2017
Estimated Finish: September, 2017

MDOT Bridge Inspections

Limits: City Owned Bridges
Description: Per MDOT requirements, the City owned bridges require inspection every two years and the findings reported to the State. The City owned bridges are located at Wood Road, Black Lake Road, Lake Harbor Road, Henry Street and Airline Road.
Consultant: Brechting Bridge, Spring Lake, MI
Year's Work: Brechting Bridge was hired and perform the necessary inspection and reporting to the State.
Funding: Street Fund
Start Date: April 10, 2017
Finish Date: June 1, 2017

Mona Kai Water Main

Limits: Mona Kai Development, south of Eastowne
Description: Replacement of existing water main with ductile iron water main.
Consultant: Fleis&VandenBrink, Muskegon, MI
Contractor: Accurate Excavators,
Year's Work: Consultant completed design work and secured the necessary permits and City Staff obtained the necessary easements for construction. Contractor installed new water main and abandoned the old main in place.
Funding: Water Funds
Start Date: September 26, 2016
Finish Date: November 11, 2016

Speed Studies

Limits:	City wide
Description:	Perform speed study and establish speed limits per State Law and accepted methods.
Consultants:	In House
Year's Work:	Work on a number of speed studies to start getting speed limits on compliance with the new State law and results were presented to Council for their review and actions as they are completed. These roadways include: <ul style="list-style-type: none">• Norton Avenue from Roosevelt Road to Lincoln Street• Broadway Avenue from Getty Street to US-31• McCracken Street from Sherman Boulevard to Seminole Road• Porter Road from Martin Road to Henry Street• Airport Road from Wellesly Drive to Airline Road• Airline Road from US-31 to Norton Avenue

Stormwater, Asset Management and Wastewater (SAW) Program

Limits:	City wide
Description:	Perform and establish asset management plans and practices for City storm and sanitary sewers.
Consultants:	In house Staff and Prein & Newhof, Grand Rapids, MI
Year's Work:	This fiscal year's work involved the creation of the frame work of the asset management plan for the City's storm water and sanitary sewer system, establishing schedules, costs, work and summary of rehabilitation/replacement plans and deliverable products. Also completed were the video and photographing of assets, capacity analysis, structural and conditional analysis, rating and criticality of failure analysis, mapping and modeling of both the sanitary sewer and storm sewer systems along with data entry on the GIS. The financial analysis of sanitary sewer system the revenue, rate and expense budget data that was reviewed and the City's current rate calculation methodology has been reviewed and accepted by the State. At the completion of the project, the Consults shall provide a sanitary sewer and storm sewer systems Asset Management Plan & Reports for the City's use. City staff was heavily involved with Prein & Newhof through all stages of the project.
Funding:	SAW Grant
Start Date:	July, 2014
Completion Date:	June, 2017

Traffic Signal & Multi-Way Stop Sign Warrant Studies

Limits: City wide
Description: Perform warrant study to determine if the installations of a traffic signal and/or multi-way stops are justified at a requested intersection.
Consultants: In House
Year's Work: Work on several warrant studies have been performed on requested roadways. These intersections are:

- Pontaluna Road and Henry Street
- Mount Garfield Road and Grand Haven Road

Water System Asset Management Plan:

Limits: City of Norton Shores
Description: Project consists of creating an Asset Management Plan and Program for the City of Norton Shores water supply system. The scope of this project is to create a foundational Asset Management Plan that will efficiently meet the current requirements on the Michigan Department of Environmental Quality (MDEQ) and allow the City to add data/functionality in the future.
Consultant: Prein&Newhof, Muskegon, MI
Year's Work: The consultant has started the collection of data necessary so that a Plan and Program may be submitted to the MDEQ and implemented by January 1, 2018 for all functionally and financially significant assets. This shall be completed in accordance with the State Safe Drinking Water Act as recently amended.
Funding: City Water Fund
Start Date: March 1, 2017
Proposed Finish: January 1, 2018

Major Private or Other Projects:

<u>Project:</u>	<u>Address:</u>	<u>Developer/Owner:</u>
MDOT – Railroad ADT	City RxR crossings	MDOT
Roosevelt Park Ground Water	Roosevelt Road	City of Roosevelt Park
Comerica Site Redevelopment	801 West Norton	GDK Construction
Tysman Mini Storage	1249 East Pontaluna	Tysman

**PLANNING
FY-2017 REVIEW**

PLANNING AND ZONING DIVISION

Analysis

The year FY-2017 saw continued growth in new residential development throughout the city with an additional 48 housing units constructed primarily in existing subdivisions throughout the community.

Growth continued at a steady pace in the commercial and industrial sectors as well. Major commercial and office site plans approved included a 12,000 square foot facility for St. John's Trucking on Grand Haven Road and the completion of the 7,000 square foot expansion to the Lakeshore Marketplace on Harvey Street to accommodate a new Home Goods facility. Additionally, Wendy's commenced construction on 2,600 square foot restaurant facility as part of the redevelopment of the former Comerica Bank site, and a new two-tenant commercial facility containing a Sleep Number store was approved and constructed on Harvey Street. A 9,000 square foot medical office facility was also approved on E. Farr Road. Major industrial projects for the year included the approval and construction of a 150,000 square foot facility for Robert Grooter's on E. Pontaluna Road and a major retrofit of the former Carpenter Brothers building on Norton Center Drive to allow for the continued expansion of the adjacent GE Aviation facilities. Cloverdale Equipment also commenced construction on a new 17,000 headquarters on Enterprise Drive to replace their current Airline Road facility. The City also saw the continued retrofit of the former St. Francis de Sales school on McCracken Street into a parish community center.

Staff also administratively approved numerous other commercial, office and industrial site plans of a scope that did not require Planning Commission or City Council review, as well as 375 other site plans for improvements requiring building permits. These included new houses, additions, accessory buildings, fences, signs etc.

Staff presented to the Planning Commission and City Council various Zoning Ordinance updates in 2017. These included an amendment to the Code of Ordinances to permit the raising of up to four chickens on certain residentially zoned parcels. The staff also prepared an amendment to the Zoning Ordinance regarding the permitted height of billboard signs and specific sign setbacks. On a related note, the City, in conjunction with the firm of Beckett and Raeder, completed work on the Seminole Road PlacePlan. This plan creates site-specific recommendations for key redevelopment parcels including the Eastowne Development and the former Kmart property on Henry Street while improving connectivity between sites and promoting walk-ability, bike-ability and the creation of public spaces. Finally, the staff began working with the United States Census Bureau on the preliminary stages of the 2020 Census survey.

Activity Summary	2015	2016	2017
Administrative Site Plans	20	20	22
Land Divisions	2	4	3
Residential Lots Developed	0	0	0

Residential Site Plans	357	409	375
Site Plans	8	8	11
Special Use Permits	7	6	7
Variances	8	5	5
Zoning Ordinance Amendments	7	6	7
Zoning Ordinance Violations	40	35	38

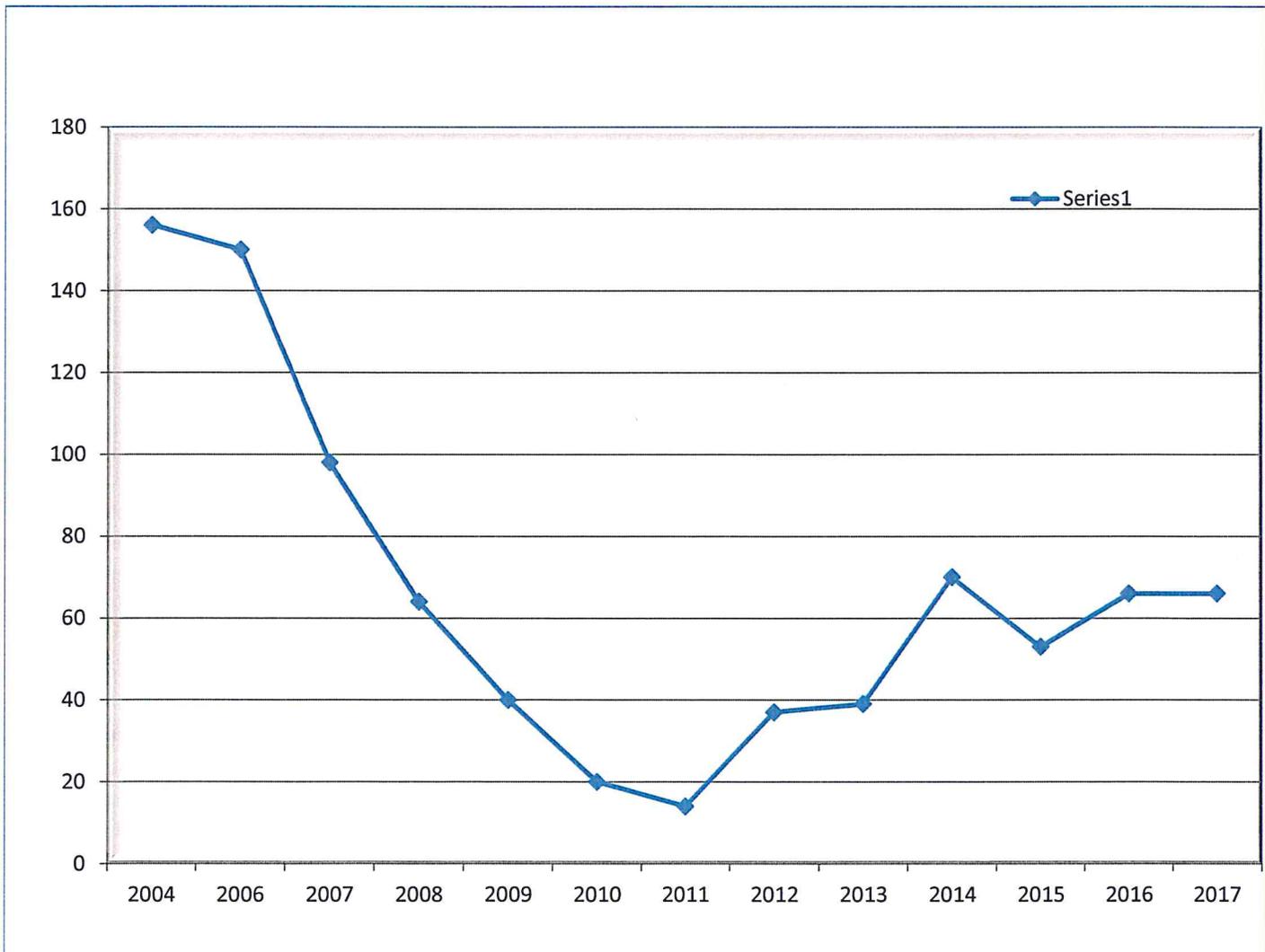
TABLE A

TOP TEN COMMERCIAL AND INDUSTRIAL PROJECTS

1. Grooter's New Industrial Facility	1224 E. Pontaluna Road	\$2,700,000
2. GE Aviation Industrial Addition	6120 Norton Center Drive	\$2,500,000
3. St. Francis Church Addition	2901 McCracken Street	\$1,700,000
4. Cloverdale Industrial Facility	7175 Enterprise Drive	\$1,700,000
5. Medical Office Facility	1455 E. Farr Road	\$1,180,744
6. Home Goods Addition	5133 Harvey Street	\$1,055,000
7. Spectrum Health Office Remodel	427 Seminole Road	\$1,000,000
8. Wendy's Restaurant	801 W. Norton Avenue	\$ 954,346
9. St. John's Trucking Facility	5903 Grand Haven Road	\$ 900,000
10. Sleep Number Retail Facility	5251 S. Harvey Street	\$ 718,000
TOTAL VALUE		\$14,408,090

NORTON SHORES ATTACHMENT A WATER SERVICE INSTALLATIONS

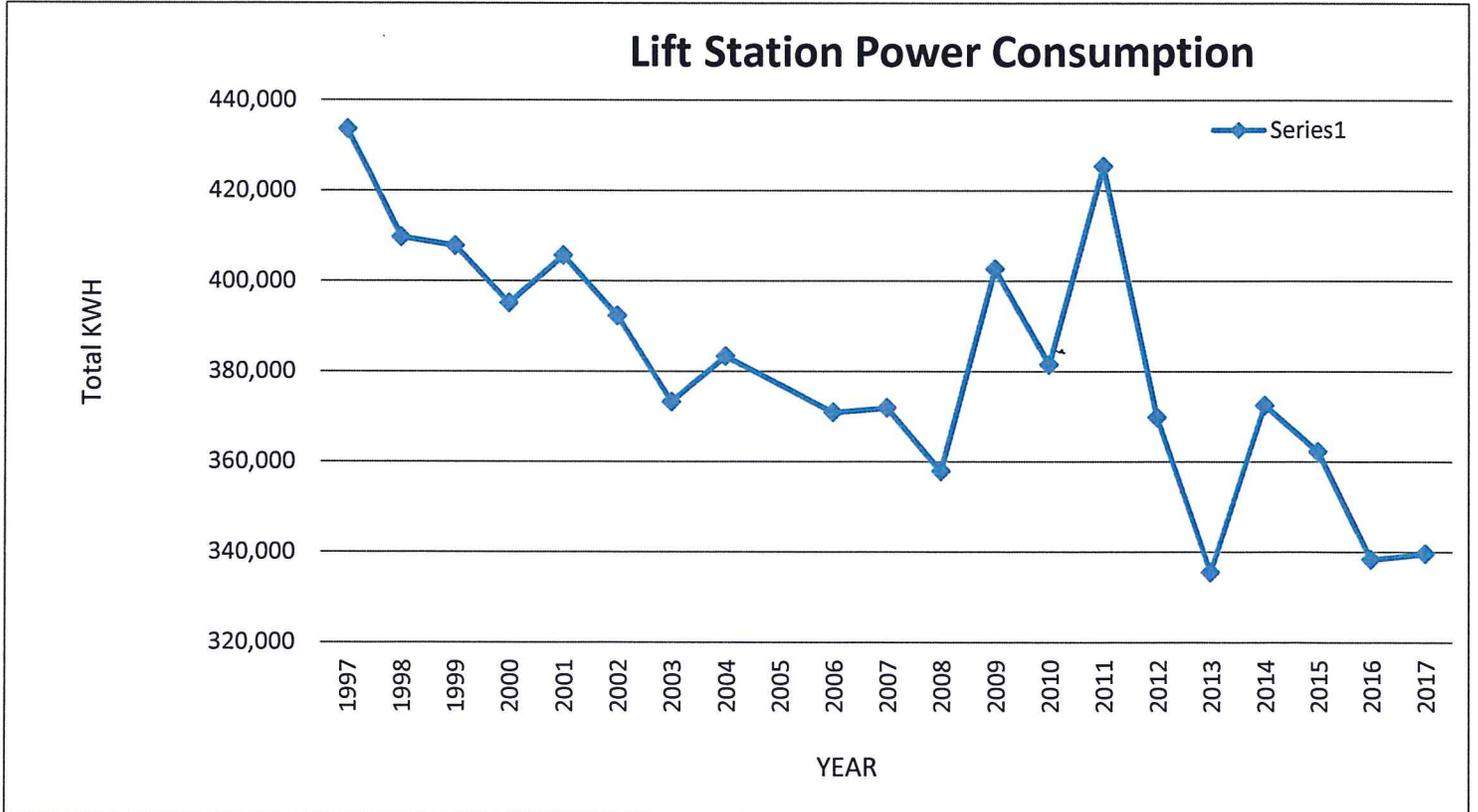
YEAR	TOTAL SERVICES
2004	156
2006	150
2007	98
2008	64
2009	40
2010	20
2011	14
2012	37
2013	39
2014	70
2015	53
2016	66
2017	66



Attachment B Lift Station Electrical FY 2017

1997	433,567
1998	409,671
1999	407,742
2000	395,087
2001	405,650
2002	392,279
2003	373,231
2004	383,311
2006	370,866
2007	371,866
2008	357,807
2009	402,557
2010	381,430
2011	425,306
2012	369,789
2013	335,445
2014	372,454
2015	362,201
2016	338,340
2017	339,603

* In KWH





MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

2016 WATER SUPPLY CROSS CONNECTION REPORT

*Issued under authority of 1976 PA 399, as amended, MCL 325.1001 et seq., and its administrative rules.
Failure to submit this form is a violation of the Act and may subject the water supply to enforcement actions.*

Return the completed form by March 31, 2017 to the appropriate Department of Environmental Quality (DEQ) district office to comply with administrative Rule R 325.11405 that states "a water utility shall report annually to the department on the status of the cross connection control program on a form provided by the department." For district office addresses, visit www.michigan.gov/deq and click on Locations.

WSSN: 4850

A. Name of water system: City of Norton Shores County: Muskegon

B. Year that the current written cross connection control program was approved by DEQ: 1981

C. Total number of industrial, commercial, institutional, ~~residential~~, and governmental accounts that must be routinely reinspected for cross connections: 792

Of this number,

- How many are High Hazard accounts: 322 Frequency of Reinspection: Once per: Year

- How many are Low Hazard accounts: 470 Frequency of Reinspection: Once per: 3 Years

D. Number of accounts from line "C" that received an initial inspection in 2016: 0

E. Total number of reinspections required and completed in 2016 based on degree of hazard:

- High hazard reinspections required: 288 High hazard reinspections completed: 288

- Low hazard reinspections required: 86 Low hazard reinspections completed: 86

F. Number of accounts where a cross connection(s) was found to exist during inspections or reinspections in 2016: 22

G. Number of accounts from line "F" where corrective actions have been completed: 16

H. Total number of accounts from line "C" which are now in compliance with the local cross connection control program; $H = C - (F - G)$: 786

I. Total number of backflow prevention devices in system requiring testing: 661

J. Number of backflow prevention devices tested in 2016: 541

Outline briefly any changes or significant findings since last reporting. Use additional sheets if necessary.

Narrative Description of Program:

See Attached Sheet

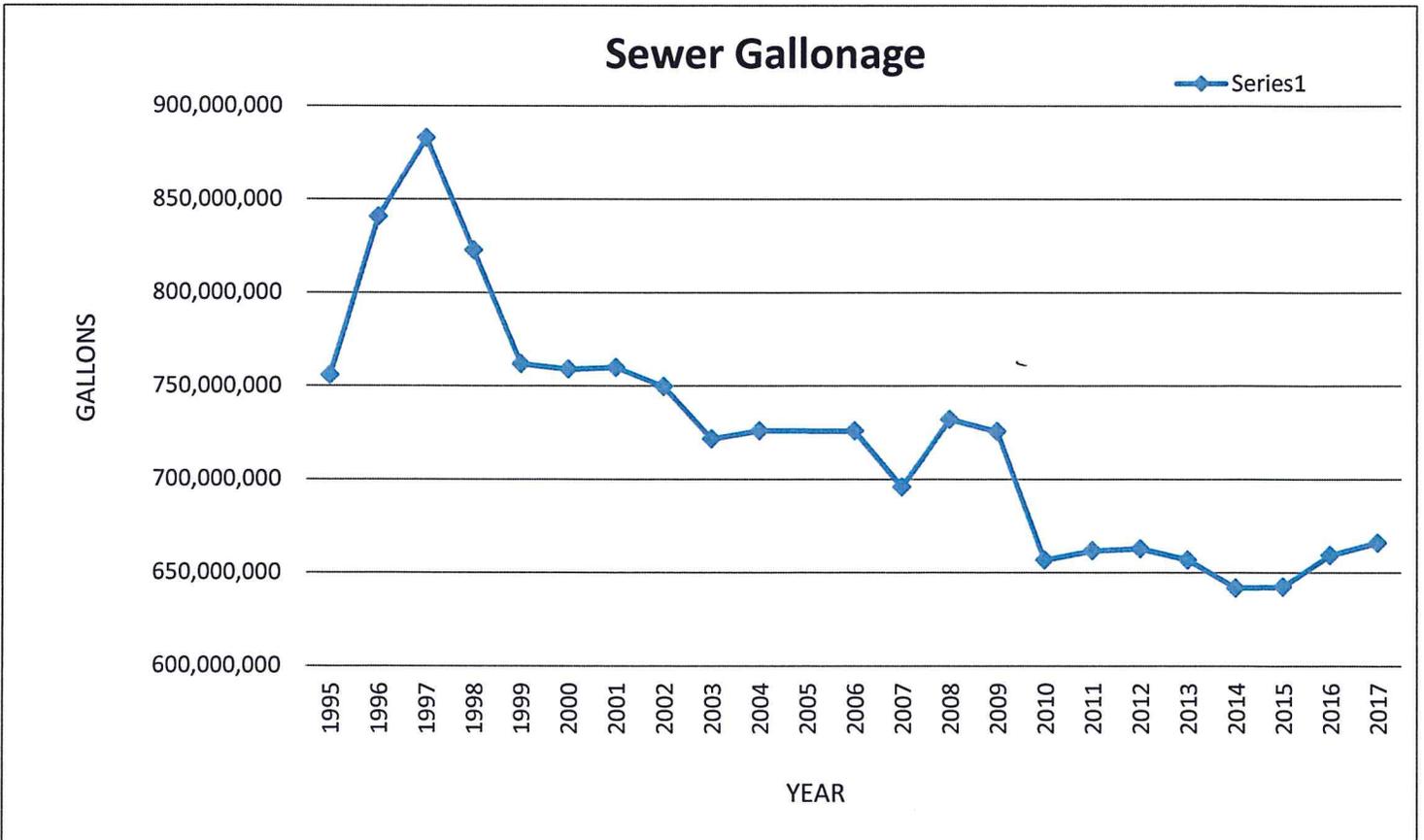
Name: Matt Anderson

Title: Water & Sewer Superintendent Date: 3-3-17

Attachment D Sewer Gallonage FY 2017

1995	755,820,000
1996	840,710,000
1997	882,740,000
1998	822,550,000
1999	761,760,000
2000	758,900,000
2001	759,752,000
2002	749,630,000
2003	721,550,000
2004	725,960,000
2006	725,890,000
2007	695,830,000
2008	732,130,000
2009	725,540,000
2010	656,730,000
2011	661,690,000
2012	662,750,000
2013	656,780,000
2014	641,690,000
2015	642,290,000
2016	659,160,000
2017	665,930,000

* In gallons



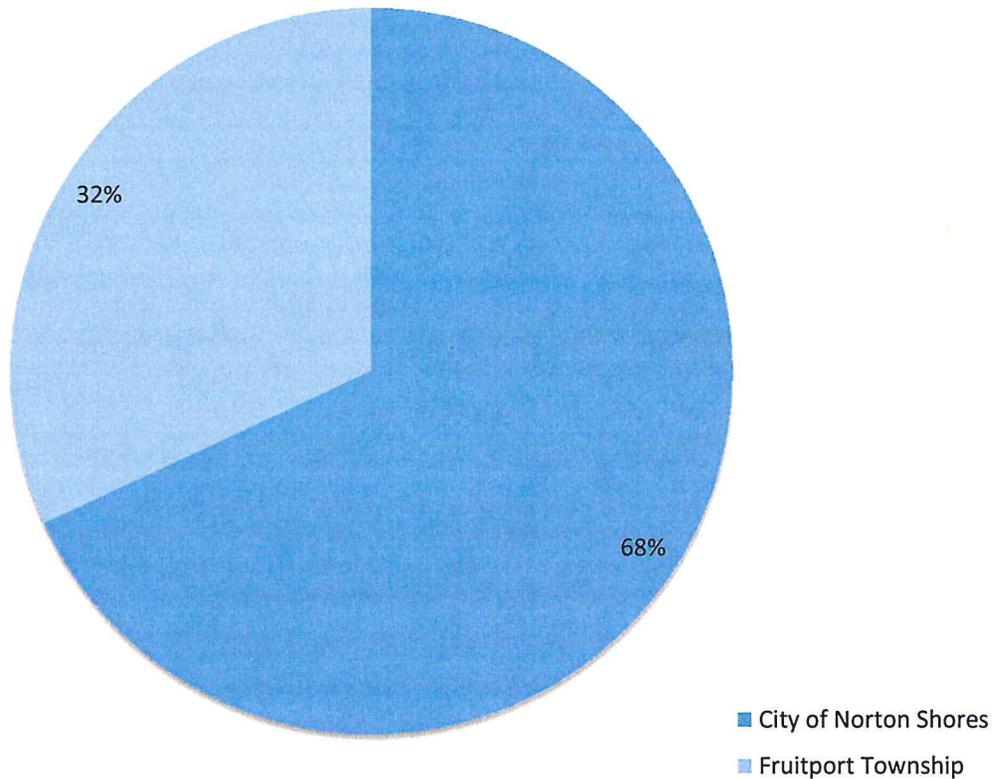
**Attachment E
Water Purchase
FY 2017**

City of Norton Shores
789,588,000

Fruitport Township
369,979,000

* In Gallons

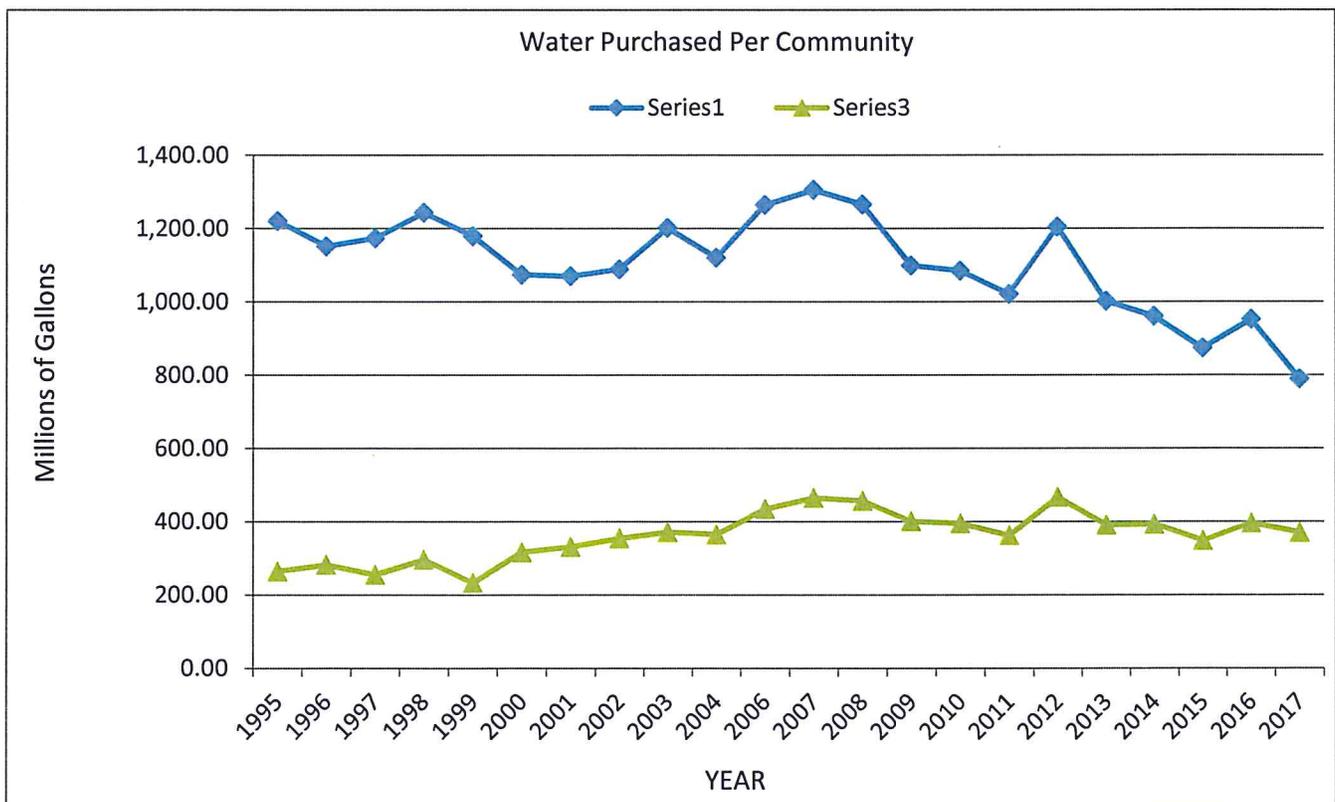
Water Purchased



ATTACHMENT F COMMUNITY WATER PURCHASED

<u>YEAR</u>	<u>NORTON SHORES</u>	<u>FRUITPORT TOWNSHIP</u>
1995	1,220.00	263.80
1996	1,151.39	281.61
1997	1,172.98	254.99
1998	1,243.17	295.91
1999	1,178.99	233.26
2000	1,073.80	316.18
2001	1,069.81	331.08
2002	1,088.87	353.89
2003	1,201.26	370.91
2004	1,120.12	364.98
2006	1,263.99	433.93
2007	1,304.73	464.49
2008	1,265.31	456.37
2009	1,098.47	400.23
2010	1,084.48	394.50
2011	1,020.83	362.00
2012	1,204.25	466.11
2013	1,001.61	390.35
2014	960.40	392.91
2015	873.22	347.89
2016	951.59	396.10
2017	789.59	369.98

*In Millions of Gallons





ANNUAL CONSUMER CONFIDENCE REPORT

DEPARTMENT OF PUBLIC WORKS
WATER AND SEWER DIVISION

Matt Anderson, Superintendent
2016 Report

We are pleased to present you with the Annual Drinking Water Quality Report. This report is designed to inform you about the quality of the water delivered to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. The Muskegon Water Filtration Plant treats water from one of the highest quality surface water sources in the world, Lake Michigan. The City of Norton Shores used over 953 million gallons of water in 2016.

Last year, as in years past, your tap water met all Environmental Protection Agency and State drinking water health standards. The Muskegon Filtration Plant and the Norton Shores Water Division vigilantly safeguards its water supply. We are pleased to report that our drinking water meets and exceeds Federal and State requirements.

This report is designed to give you detailed information which will assure you of the quality of your drinking water.

If you have any questions concerning this report or your water utility, please contact Water Superintendent, Matt Anderson, at (231) 799-6804. We want our valued customers to be informed about their water utility. If you want to learn more, please stop in our office, located at the Norton Shores City Hall, 4814 Henry Street.

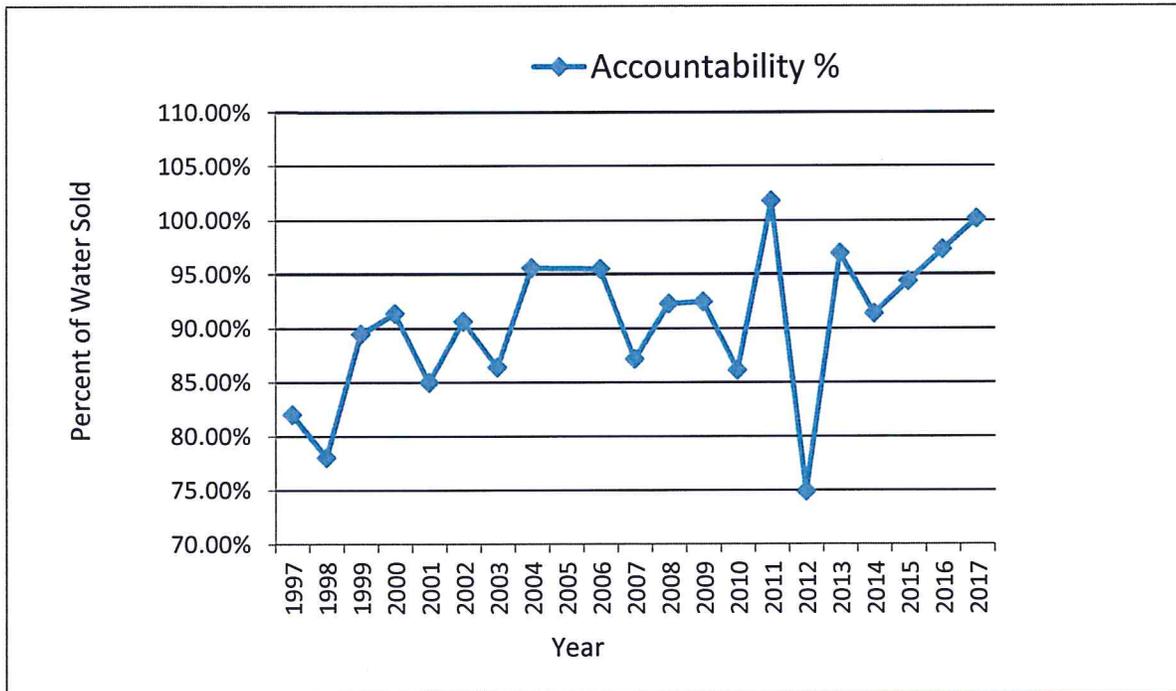
The Muskegon Filtration Plant and the Norton Shores Water Division routinely monitor for contaminants in your drinking water according to, and in excess of, Federal and State laws. The following table shows the results of our monitoring for the period of January 1, 2016 through December 31, 2016. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. It's important to remember that the presence of these contaminants does not necessarily pose a health risk. It is just as important to understand that a contaminant, as defined in this report, includes natural elements and compounds as well as man-made compounds manufactured every day, many of which we all use in our daily activities. Even distilled water is not "pure" water because most distilled water has very small quantities of "contaminants".

More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

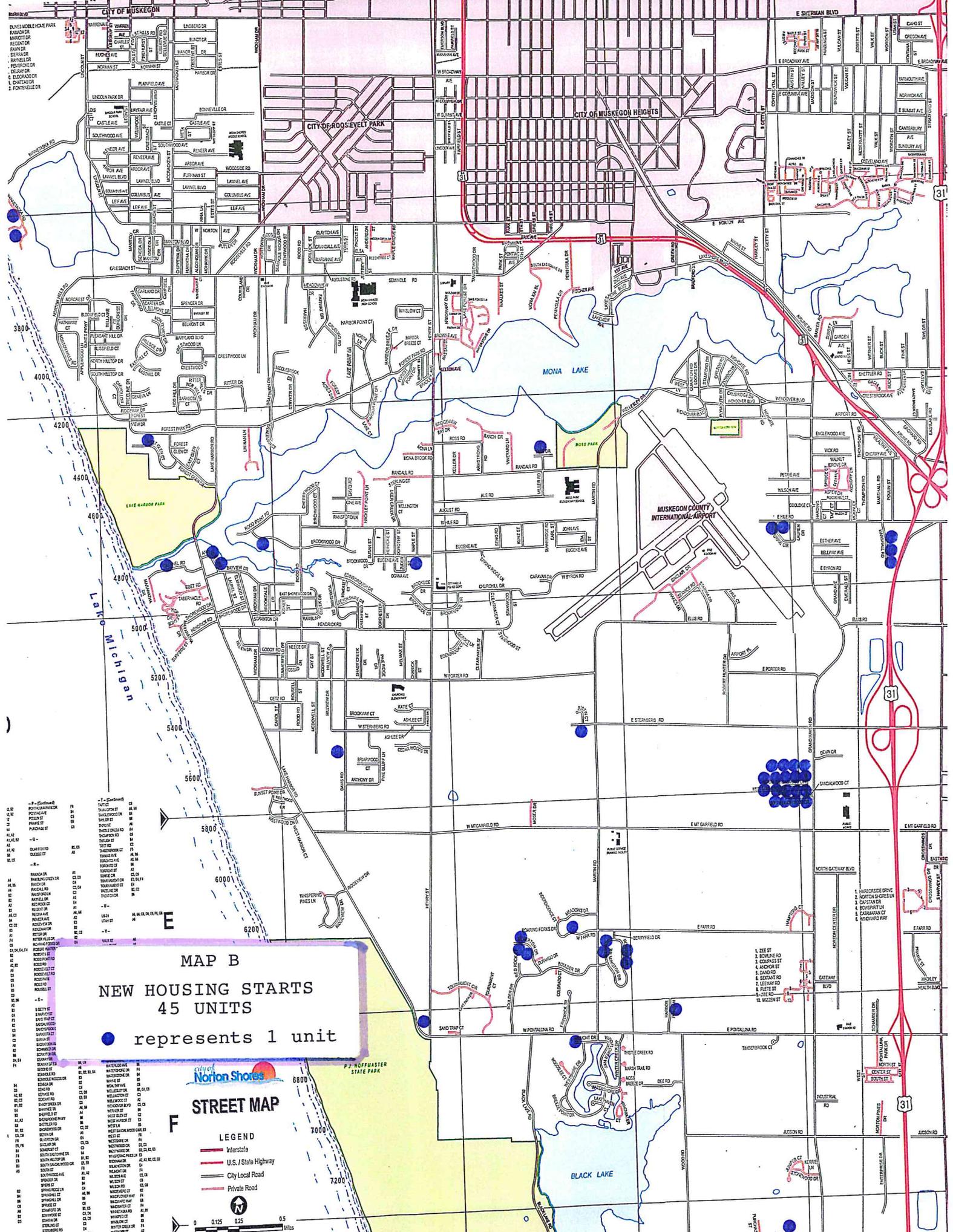
Attachement H Historical Water System Accountability

YEAR	Accountability %	Water Purchased	Water Sold
1997	81.97%	1,172,980,000.00	961,467,000
1998	78.00%	1,243,170,000.00	969,633,000
1999	89.41%	1,178,990,000.00	1,054,161,000
2000	91.32%	1,073,800,000.00	980,582,000
2001	84.93%	1,069,810,000.00	908,607,000
2002	90.60%	1,088,870,000.00	986,480,000
2003	86.33%	1,201,260,000.00	1,037,093,000
2004	95.55%	1,120,120,000.00	1,070,291,000
2006	95.47%	1,263,990,000.00	1,206,689,000
2007	87.10%	1,304,632,000	1,136,396,000
2008	92.24%	1,201,624,000	1,108,404,000
2009	92.42%	1,022,085,000	944,657,000
2010	86.09%	1,084,483,000	933,643,000
2011	101.74%	967,402,000	984,234,000
2012	74.86%	1,085,715,000	812,815,000
2013	96.92%	1,001,437,000	970,631,000
2014	91.34%	960,402,000	877,235,050
2015	94.31%	873,219,000	823,533,800
2016	97.26%	955,517,000	929,288,895
2017	100.09%	914,041,000	914,823,160

*In Gallons



American Water Works Association (A.W.W.A.) standard for acceptable water system loss is 10% or accountability of between 90% and 100%.



MAP B
NEW HOUSING STARTS
45 UNITS
 ● represents 1 unit

- P - (Partial)
 - G -
 - S -
 - T - (Continued)
 - U -
 - V -
 - W -
 - X -
 - Y -
 - Z -
 - AA -
 - AB -
 - AC -
 - AD -
 - AE -
 - AF -
 - AG -
 - AH -
 - AI -
 - AJ -
 - AK -
 - AL -
 - AM -
 - AN -
 - AO -
 - AP -
 - AQ -
 - AR -
 - AS -
 - AT -
 - AU -
 - AV -
 - AW -
 - AX -
 - AY -
 - AZ -
 - BA -
 - BB -
 - BC -
 - BD -
 - BE -
 - BF -
 - BG -
 - BH -
 - BI -
 - BJ -
 - BK -
 - BL -
 - BM -
 - BN -
 - BO -
 - BP -
 - BQ -
 - BR -
 - BS -
 - BT -
 - BU -
 - BV -
 - BW -
 - BX -
 - BY -
 - BZ -
 - CA -
 - CB -
 - CC -
 - CD -
 - CE -
 - CF -
 - CG -
 - CH -
 - CI -
 - CJ -
 - CK -
 - CL -
 - CM -
 - CN -
 - CO -
 - CP -
 - CQ -
 - CR -
 - CS -
 - CT -
 - CU -
 - CV -
 - CW -
 - CX -
 - CY -
 - CZ -
 - DA -
 - DB -
 - DC -
 - DD -
 - DE -
 - DF -
 - DG -
 - DH -
 - DI -
 - DJ -
 - DK -
 - DL -
 - DM -
 - DN -
 - DO -
 - DP -
 - DQ -
 - DR -
 - DS -
 - DT -
 - DU -
 - DV -
 - DW -
 - DX -
 - DY -
 - DZ -
 - EA -
 - EB -
 - EC -
 - ED -
 - EE -
 - EF -
 - EG -
 - EH -
 - EI -
 - EJ -
 - EK -
 - EL -
 - EM -
 - EN -
 - EO -
 - EP -
 - EQ -
 - ER -
 - ES -
 - ET -
 - EU -
 - EV -
 - EW -
 - EX -
 - EY -
 - EZ -
 - FA -
 - FB -
 - FC -
 - FD -
 - FE -
 - FF -
 - FG -
 - FH -
 - FI -
 - FJ -
 - FK -
 - FL -
 - FM -
 - FN -
 - FO -
 - FP -
 - FQ -
 - FR -
 - FS -
 - FT -
 - FU -
 - FV -
 - FW -
 - FX -
 - FY -
 - FZ -
 - GA -
 - GB -
 - GC -
 - GD -
 - GE -
 - GF -
 - GG -
 - GH -
 - GI -
 - GJ -
 - GK -
 - GL -
 - GM -
 - GN -
 - GO -
 - GP -
 - GQ -
 - GR -
 - GS -
 - GT -
 - GU -
 - GV -
 - GW -
 - GX -
 - GY -
 - GZ -
 - HA -
 - HB -
 - HC -
 - HD -
 - HE -
 - HF -
 - HG -
 - HH -
 - HI -
 - HJ -
 - HK -
 - HL -
 - HM -
 - HN -
 - HO -
 - HP -
 - HQ -
 - HR -
 - HS -
 - HT -
 - HU -
 - HV -
 - HW -
 - HX -
 - HY -
 - HZ -
 - IA -
 - IB -
 - IC -
 - ID -
 - IE -
 - IF -
 - IG -
 - IH -
 - II -
 - IJ -
 - IK -
 - IL -
 - IM -
 - IN -
 - IO -
 - IP -
 - IQ -
 - IR -
 - IS -
 - IT -
 - IU -
 - IV -
 - IW -
 - IX -
 - IY -
 - IZ -
 - JA -
 - JB -
 - JC -
 - JD -
 - JE -
 - JF -
 - JG -
 - JH -
 - JI -
 - JJ -
 - JK -
 - JL -
 - JM -
 - JN -
 - JO -
 - JP -
 - JQ -
 - JR -
 - JS -
 - JT -
 - JU -
 - JV -
 - JW -
 - JX -
 - JY -
 - JZ -
 - KA -
 - KB -
 - KC -
 - KD -
 - KE -
 - KF -
 - KG -
 - KH -
 - KI -
 - KJ -
 - KL -
 - KM -
 - KN -
 - KO -
 - KP -
 - KQ -
 - KR -
 - KS -
 - KT -
 - KU -
 - KV -
 - KW -
 - KX -
 - KY -
 - KZ -
 - LA -
 - LB -
 - LC -
 - LD -
 - LE -
 - LF -
 - LG -
 - LH -
 - LI -
 - LJ -
 - LK -
 - LL -
 - LM -
 - LN -
 - LO -
 - LP -
 - LQ -
 - LR -
 - LS -
 - LT -
 - LU -
 - LV -
 - LW -
 - LX -
 - LY -
 - LZ -
 - MA -
 - MB -
 - MC -
 - MD -
 - ME -
 - MF -
 - MG -
 - MH -
 - MI -
 - MJ -
 - MK -
 - ML -
 - MM -
 - MN -
 - MO -
 - MP -
 - MQ -
 - MR -
 - MS -
 - MT -
 - MU -
 - MV -
 - MW -
 - MX -
 - MY -
 - MZ -
 - NA -
 - NB -
 - NC -
 - ND -
 - NE -
 - NF -
 - NG -
 - NH -
 - NI -
 - NJ -
 - NK -
 - NL -
 - NM -
 - NN -
 - NO -
 - NP -
 - NQ -
 - NR -
 - NS -
 - NT -
 - NU -
 - NV -
 - NW -
 - NX -
 - NY -
 - NZ -
 - OA -
 - OB -
 - OC -
 - OD -
 - OE -
 - OF -
 - OG -
 - OH -
 - OI -
 - OJ -
 - OK -
 - OL -
 - OM -
 - ON -
 - OO -
 - OP -
 - OQ -
 - OR -
 - OS -
 - OT -
 - OU -
 - OV -
 - OW -
 - OX -
 - OY -
 - OZ -
 - PA -
 - PB -
 - PC -
 - PD -
 - PE -
 - PF -
 - PG -
 - PH -
 - PI -
 - PJ -
 - PK -
 - PL -
 - PM -
 - PN -
 - PO -
 - PP -
 - PQ -
 - PR -
 - PS -
 - PT -
 - PU -
 - PV -
 - PW -
 - PX -
 - PY -
 - PZ -
 - QA -
 - QB -
 - QC -
 - QD -
 - QE -
 - QF -
 - QG -
 - QH -
 - QI -
 - QJ -
 - QK -
 - QL -
 - QM -
 - QN -
 - QO -
 - QP -
 - QQ -
 - QR -
 - QS -
 - QT -
 - QU -
 - QV -
 - QW -
 - QX -
 - QY -
 - QZ -
 - RA -
 - RB -
 - RC -
 - RD -
 - RE -
 - RF -
 - RG -
 - RH -
 - RI -
 - RJ -
 - RK -
 - RL -
 - RM -
 - RN -
 - RO -
 - RP -
 - RQ -
 - RR -
 - RS -
 - RT -
 - RU -
 - RV -
 - RW -
 - RX -
 - RY -
 - RZ -
 - SA -
 - SB -
 - SC -
 - SD -
 - SE -
 - SF -
 - SG -
 - SH -
 - SI -
 - SJ -
 - SK -
 - SL -
 - SM -
 - SN -
 - SO -
 - SP -
 - SQ -
 - SR -
 - SS -
 - ST -
 - SU -
 - SV -
 - SW -
 - SX -
 - SY -
 - SZ -
 - TA -
 - TB -
 - TC -
 - TD -
 - TE -
 - TF -
 - TG -
 - TH -
 - TI -
 - TJ -
 - TK -
 - TL -
 - TM -
 - TN -
 - TO -
 - TP -
 - TQ -
 - TR -
 - TS -
 - TT -
 - TU -
 - TV -
 - TW -
 - TX -
 - TY -
 - TZ -
 - UA -
 - UB -
 - UC -
 - UD -
 - UE -
 - UF -
 - UG -
 - UH -
 - UI -
 - UJ -
 - UK -
 - UL -
 - UM -
 - UN -
 - UO -
 - UP -
 - UQ -
 - UR -
 - US -
 - UT -
 - UY -
 - UZ -
 - VA -
 - VB -
 - VC -
 - VD -
 - VE -
 - VF -
 - VG -
 - VH -
 - VI -
 - VJ -
 - VK -
 - VL -
 - VM -
 - VN -
 - VO -
 - VP -
 - VQ -
 - VR -
 - VS -
 - VT -
 - VU -
 - VV -
 - VW -
 - VX -
 - VY -
 - VZ -
 - WA -
 - WB -
 - WC -
 - WD -
 - WE -
 - WF -
 - WG -
 - WH -
 - WI -
 - WJ -
 - WK -
 - WL -
 - WM -
 - WN -
 - WO -
 - WP -
 - WQ -
 - WR -
 - WS -
 - WT -
 - WU -
 - WV -
 - WW -
 - WX -
 - WY -
 - WZ -
 - XA -
 - XB -
 - XC -
 - XD -
 - XE -
 - XF -
 - XG -
 - XH -
 - XI -
 - XJ -
 - XK -
 - XL -
 - XM -
 - XN -
 - XO -
 - XP -
 - XQ -
 - XR -
 - XS -
 - XT -
 - XU -
 - XV -
 - XW -
 - XX -
 - XY -
 - XZ -
 - YA -
 - YB -
 - YC -
 - YD -
 - YE -
 - YF -
 - YG -
 - YH -
 - YI -
 - YJ -
 - YK -
 - YL -
 - YM -
 - YN -
 - YO -
 - YP -
 - YQ -
 - YR -
 - YS -
 - YT -
 - YU -
 - YV -
 - YW -
 - YX -
 - YY -
 - YZ -
 - ZA -
 - ZB -
 - ZC -
 - ZD -
 - ZE -
 - ZF -
 - ZG -
 - ZH -
 - ZI -
 - ZJ -
 - ZK -
 - ZL -
 - ZM -
 - ZN -
 - ZO -
 - ZP -
 - ZQ -
 - ZR -
 - ZS -
 - ZT -
 - ZU -
 - ZV -
 - ZW -
 - ZX -
 - ZY -
 - ZZ

STREET MAP
LEGEND
 Interstate
 U.S./State Highway
 City Local Road
 Private Road
 0 0.125 0.25 0.5 Miles