

**CHARTER TOWNSHIP OF GARFIELD
TOWNSHIP BOARD MEETING**

Tuesday, May 23, 2023 at 6:00pm
Garfield Township Hall
3848 Veterans Drive
Traverse City, MI 49684
Ph: (231) 941-1620

AGENDA

ORDER OF BUSINESS

Call meeting to order

Pledge of Allegiance

Roll call of Board Members

1. Public Comment

Public Comment Guidelines:

Any person shall be permitted to address a meeting of The Township Board, which is required to be open to the public under the provision of the Michigan Open Meetings Act, as amended. (MCLA 15.261, et.seq.) Public Comment shall be carried out in accordance with the following Board Rules and Procedures: a.) any person wishing to address the Board is requested to state his or her name and address. b.) No person shall be allowed to speak more than once on the same matter, excluding time needed to answer Township Board Member's questions. Where constrained by available time the Chairperson may limit the amount of time each person will be allowed to speak to (3) minutes. 1.) The Chairperson may at his or her own discretion, extend the amount of time any person is allowed to speak. 2.) Whenever a Group wishes to address a Committee, the Chairperson may require that the Group designate a spokesperson; the Chairperson shall control the amount of time the spokesperson shall be allowed to speak when constrained by available time.

2. Review and approval of the Agenda - Conflict of Interest

3. Consent Calendar

The purpose of the Consent calendar is to expedite business by grouping non-controversial items together to be dealt with in one Board motion without discussion. Any member of the Board, staff or the public may ask that any item on the Consent Calendar be removed there from and placed elsewhere on the Agenda for full discussion. Such requests will be automatically respected. If any item is not removed from the Consent Calendar, the action noted in parentheses on the Agenda is approved by a single Board action adopting the Consent Calendar.

- a. Minutes – May 9, 2023 Regular Meeting
(Recommend Approval)

- b. Bills -
 General Fund \$127,124.74
(Recommend Approval)

- c. Investment Policy Annual Review (Recommend Approval)

- d. Motion to introduce and set public hearing for June 13, 2023 for the Hickory Properties Rezoning (Recommend Approval)

4. **Items removed from the Consent Calendar**

5. **Correspondence**

- a. Grand Traverse County Road Commission memo dated 5/17/23 regarding Record Eagle article on roadkill

6. **Reports**

- a. MMR Report
- b. GT County Commissioner's Report
- c. GT County Road Commission Report
- d. Supervisor's Report

7. **Unfinished Business**

8. **New Business**

- a. Presentation and Public Comment –
Consideration of Drinking Water Revolving Funds Project Plan and designation of an authorized project representative, Resolution 2023-15-T

9. **Public Comment**

10. **Other Business**

11. **Adjournment**

Lanie McManus, Clerk

The Garfield Township Board will provide necessary reasonable auxiliary aids and services, such as signers for hearing impaired and audio tapes of printed materials being considered at the meeting to individuals with disabilities upon the provision of reasonable advance notice to the Garfield Township Board. Individuals with disabilities requiring auxiliary aids or services should contact the Garfield Township Board by writing or calling Lanie McManus, Clerk, Ph: (231) 9411620.

CHARTER TOWNSHIP OF GARFIELD
TOWN BOARD MEETING
May 9, 2023

Supervisor Chuck Korn called the Town Board Meeting to order at the Garfield Township Hall on May 9, 2023 at 6:00p.m.

Pledge of Allegiance

Roll Call of Board Members

Present: Molly Agostinelli, Chris Barsheff, Steve Duell, Chuck Korn, Chloe Macomber, Lanie McManus and Denise Schmuckal

Staff Present: Planning Director John Sych

1. Public Comment (6:01)

None

2. Review and Approval of the Amended Agenda - Conflict of Interest (6:01)

Schmuckal moved and Agostinelli seconded to approve the amended agenda as presented.

Yeas: Schmuckal, Agostinelli, Duell, Barsheff, Macomber, McManus, Korn

Nays: None

3. Consent Calendar (6:02)

a. Minutes

April 11, 2023 Regular Board Meeting

May 2, 2023 Study Session

(Recommend Approval)

b. Bills:

(i)	General Fund	\$585,958.02
	(Recommend Approval)	

(ii)	Gourdie-Fraser	
	Developer's Escrow Fund – Storm Water	
	Reviews, Utility Plan Review, Oversight	
	& Closeout	\$ 9,562.35
	<u>General Utilities</u>	<u>22,060.00</u>
	Total	\$ 31,622.35
	(Recommend Approval)	

- c. **MTT Update (Receive and File)**
- d. **Consideration of Proposed New Road Name of Carriage View (Recommend Approval)**
- e. **Tax Collection Settlement History (Receive and File)**
- f. **TCAPS and Garfield Township Agreement for Collection of Summer Property Taxes – 2023 and 2024 (Recommend Approval)**
- g. **Consideration of application to apply for grant through the Township for the Salvation Army (Recommend Approval)**
- h. **Consideration of nominating John Racine to serve another 3-year term on the Grand Traverse Commons Joint Planning Commission (Recommend Approval)**
- i. **Consideration of Contractor’s Application for Payment No. 1 to Elmer’s for Cedar Run Water Main Extension (Recommend Approval)**
- j. **Consideration of Contractor’s Application for Payment No. 1 to Walton Contracting for River East Dog Park (Recommend Approval)**
- k. **Consideration of Resolution 2023-14-T to amend the budget for HRA amount (Recommend Approval)**
- l. **Consideration of Joint Rec Authority Proposed Annual Budget for Fiscal Year 2023/2024 (Recommend Approval)**
- m. **Consideration of a request from Project Feed the Kids for a Charitable Gaming License. Resolution 2023-16-T (Recommend Approval)**

Duell moved and Barsheff seconded to adopt the Consent Calendar as presented.

*Yeas: Duell, Barsheff, Agostinelli, Schmuckal, McManus, Macomber, Korn
Nays: None*

4. Items Removed from the Consent Calendar

None

5. Correspondence (6:04)

None

6. Reports**a. County Commissioner's Report (6:04)**

County Commissioner Lauren Flynn stated that the BOC recognized corrections officers this week with a ceremony and police officers will be recognized next week. The Probate Court is trying to get a juvenile justice facility in our region and she attended a Michigan Association of Counties conference which was fruitful. Flynn added that the Northern Lakes Community Mental health agreement has been passed by the county.

b. Construction Report (6:08)

Township Engineer Jennifer Graham reported that a revolving grant opportunity will be discussed at the next meeting. Graham added that the Cedar Run water main extension is going well but fiber optic cables are making it slow. Completion of that project is slated for the end of June. She added that the county ARPA reimbursement request has been processed and she continues to do stormwater and utility reviews.

c. Sheriff's Report (6:13)

Lt. Brinks cited criminal statistics for the month of April 2023 and added that the Drug Take back gained 100 pounds of unwanted prescription drugs in the county. Brinks stated that a fraud awareness presentations continue to be popular.

d. GT Metro Fire Report (6:16)

No report

d.1. Road Commission Report (6:17)

Joe Underwood reported that \$3.5 million has been approved for chip and seal programs in the area. The Road Commission is still working with the DNR for a resolution to the roadkill issue. GTRC board member Alisa Korn stated that any road complaints can be uploaded on the website and she urges the township to assist in the Municipal Planning Organization since it will mean more money for roads in our area. The Road Commission will staff a grant writer and is looking for a communications specialist. Board members asked questions regarding the report.

e. Planning Department Report for May 2023 (6:28)

Planner John Sych submitted his report in writing and added that the Planning Commission will review a new site condo – Birmley Meadows.

f. Parks and Rec Report (6:36)

Sean Kehoe, Parks Steward, submitted a report in writing and added that water has been turned on for the parks and a mountain biking work bee was held last Sunday. The River East Dog Park is being installed.

- g. Treasurer's Report (6:39)**
Macomber reported that she has been purchasing bonds.
- h. Clerk's Report (6:40)**
McManus submitted her report in writing and said that they are busy with the new uniform chart of accounts which is a long process.
- i. Supervisor's Report (6:42)**
Supervisor Korn stated that the MTA conference had some good presentations and he learned much from other township officials. He stated that there was a recent TTCI meeting to begin the process of setting up the MPO for the area and he sent a letter to the State House of Representatives regarding gravel pit legislation.
- 7. Unfinished Business (6:47)**
None
- 8. New Business**
- a. Consideration of Cass Road Drainage District Access Request for Branch Connections, Resolution 2023-13-T (6:47)**
Andy Smits, County Drain Commissioner, explained the request to board members. New drainage would be provided to the existing 1987 branch of the Cass Road drain. The resolution would grant the Cass Road Drainage District the right to traverse the lands owned by the township adjacent to the Traverse Cold Storage property to provide the additional drainage. Board members discussed the matter and asked questions.
- Schmuckal moved and Duell seconded to adopt Resolution 2023-13-T with corrections to two typos as discussed.*
- Yeas: Schmuckal, Duell, Barsheff, Agostinelli, McManus, Macomber, Korn*
Nays: None
- b. Consideration of Parks Special Event Application and Updated Fee Schedule 2023-12-T (7:06)**
Parks Steward Sean Kehoe stated that there have been many requests this year for large events to take place in the parks. Kehoe reviewed the user application with Trustees. Board members discussed the fee schedule and asked questions pertaining to the events.
- Schmuckal moved and Barsheff seconded THAT Resolution 2023-12-T, to amend the Charter Township of Garfield Fee Schedule, BE ADOPTED.*
- Yeas: Schmuckal, Barsheff, Duell, Agostinelli, Macomber, McManus, Korn*
Nays: None

9. **Public Comment: (7:34)**

Joe Underwood from GTRC answered a follow up question for traffic lights. Alisa Korn stated that since the sheriff's office will be fully staffed, a liaison for the schools could be discussed. She also recommended a parks specialist for the county as a resource for the proposed fee schedule.

10. **Other Business (7:40)**

Agostinelli brought up the Pines homeless camp at the Commons area.

11. **Adjournment**

Korn adjourned the meeting at 7:42pm.

Chuck Korn, Supervisor
Charter Township of Garfield
3848 Veterans Drive
Traverse City, MI 49686

Lanie McManus, Clerk
Charter Township of Garfield
3848 Veterans Drive
Traverse City, MI 49686

CHARTER TOWNSHIP OF GARFIELD
GRAND TRAVERSE COUNTY, MICHIGAN

RESOLUTION # 2023-12-T

RESOLUTION ADOPTING A REVISED FEE SCHEDULE COVERING VARIOUS PLANNING,
ZONING, LAND USE, MAPPING AND LICENSE FEES

WHEREAS, the Charter Township of Garfield has an adopted fee schedule; and

WHEREAS, the Charter Township of Garfield has reviewed the adopted Fee Schedule and has determined that a revised Fee Schedule is necessary and appropriate; and

WHEREAS, the Charter Township of Garfield has determined that it is in the best interests of the Township and its residents to adopt a revised Fee Schedule;

NOW, THEREFORE, BE IT RESOLVED:

1. THAT the revised Charter Township of Garfield Fee Schedule, attached hereto as Exhibit "A" and made a part of this resolution, is hereby adopted by the Charter Township of Garfield.
2. THAT the previous Charter Township of Garfield Fee Schedule, adopted by resolution 2023-03-T, is hereby repealed.
3. THAT this resolution and the Fee Schedule attached hereto shall be in full force and effect from and after its approval.

Moved: Denise Schmuckal

Supported: Chris Barsheff

Ayes: Schmuckal, Barsheff, Macomber, McManus, Duell, Agostinelli, Korn

Nays: None

Absent and Excused: None

By:



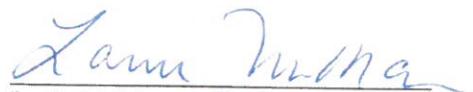
Lanie McManus, Clerk
Charter Township of Garfield

CERTIFICATE

I, Lanie McManus, Clerk of the Charter Township of Garfield, do hereby certify that the above is a true and correct copy of Resolution #2023-12-T which was adopted by the Township Board of the Charter Township of Garfield on the 9th day of May, 2023.

Dated:

5-10-2023



Lanie McManus, Clerk
Charter Township of Garfield

Charter Township of Garfield Fee Schedule

Adopted May 9, 2023

Exhibit A

PLANNING COMMISSION/DEPARTMENT APPLICATION FEES	
Site Plan Reviews	
Site Diagram	\$50*
Administrative Site Plan	\$400
Site Development Plan	\$400**
Special Use Permits (SUP), Planned Unit Developments (PUD), and Planned Unit Residential Developments (PURD)	
New Application	\$1,000
Major Amendment	\$800
Minor Amendment	\$600
Administrative Amendment	\$400
Request for Extension of Approval	\$100
Condominium Development / Site Condominium Subdivision / Platted Subdivision	
New Application or Major Amendment	\$1,000 + \$30 per lot/unit
Minor Amendment	\$400
Conceptual Reviews	
With no notice	\$100
With direct mail notice only	\$150
With full public notice	\$300
Petitions for Zoning Ordinance Amendments	
Map Amendment (Rezoning)	\$800
Text Amendment	\$1,200
Conditional Rezoning	\$1,200
Other Fees	
Completeness Review (after the first 2)	\$150
Petition for Master Plan Amendment	\$1,200
Medical Marihuana Cultivation	\$250
Child Care, Small Group Home (7-12) Review	\$200
Planned Development / C-P Sign Review	\$400
*waived when submitted with a Land Use Permit application	
**waived when submitted with a Special Use Permit application	

RESIDENTIAL LAND USE PERMITS	
Single Family Dwelling	\$50
Residential Additions	\$50
Residential Garages	\$50
Assessory Uses	\$50
Two Family (Duplex) Dwelling	\$50 per unit
Multi-Family Dwelling	\$50 + \$20 per unit / per structure
Manufactured Home Park	\$50 + \$20 per site

OTHER LAND USE PERMITS	
Agricultural Buildings	\$50
Structures up to 1,000 sf	\$50
1,001 to 5,000 sf	\$100
5,001 to 7,500 sf	\$150
7,501 to 10,000 sf	\$200
10,001 sf +	\$250
No structure yet uses that require a permit	\$50

PARK FACILITY RESERVATIONS		
Silver Lake Recreation Area	Resident	Non-Resident
Playground Pavilion - 4-Hour	\$15	\$20
Playground Pavilion - All Day	\$25	\$35
Dog Park Pavilion - 4 Hour	\$20	\$35
Dog Park Pavilion - All Day	\$40	\$50
Bill's Pavilion - 4-Hour	\$25	\$40
Bill's Pavilion - All Day	\$45	\$60
Multi-Purpose Fields - 4-Hour	\$50	\$65
Multi-Purpose Fields - All Day	\$85	\$100
River East Recreation Area Pavilion - 4-hour	\$20	\$35
River East Recreation Area Pavilion - All Day	\$40	\$50
Recurring Reservation	Board Approval	
Special Event	Event Fee	\$500
Special Event	Security Deposit	\$1,000
DOCUMENT FEES		
Zoning Verification Letter		\$50
Zoning Determination Letter		\$100

MARIJUANA SAFETY COMPLIANCE FACILITIES	
Initial License Application	\$2,500
Annual Renewal of License	\$500
TRANSITIONAL HOUSING FACILITIES	
Initial License Application	\$2,500
Annual Renewal of License	\$1,000

ZONING BOARD OF APPEALS	
Variance / appeal / interpretation requests	
Single-family residence & Accessory uses	\$400
Two-family residence & Accessory uses	\$400
Residential Developments	\$750
Non-residential	\$750

LAND DIVISIONS AND COMBINATIONS	
Land Divisions	
2 parcels created	\$150
3-4 parcels created	\$50/parcel
5-10 parcels created	\$40/parcel
11+ parcels created	\$30/parcel
Platted Lot Combinations	\$25/lot
Metes and Bounds Lot Combinations	
With a survey	\$25/parcel
Without a survey - 2-3 parcels	\$150
Without a survey - 4+ parcels (minimum fee, dependent on project complexity)	\$25/parcel
Boundary adjustment/property transfer	\$50
Conceptual land division review/parcel	\$35

PAYMENT IN LIEU OF TAXES	
Application Fee (non-refundable)	\$1,500

OUTDOOR SALES / EVENTS / SIGNS / GATHERING	
Temporary Outdoor Sales (per ord. regs)	\$40
Non-Profit Temporary Outdoor Event (1)	\$10
Sign Permit Application (per sign)	\$50
Outdoor Gathering License	\$50
(1) Events include food drives, clothes drives and similar uses	

SPECIAL MEETINGS	
Planning Commission	\$1,500
Zoning Board of Appeals	\$1,200
Township Board	\$1,500
All special meeting fees are in addition to application fees.	

MAPS AND GIS - SPECIALTY MAPS	
Minimum Fee	\$35
Maximum Fee	\$39.75/hour
Per Parcel Fee	\$0.50
Requests for digital formats (e.g., shapefiles) of Township GIS data shall be made through a Freedom of Information Act (FOIA) request. Township GIS data includes parcels, aerial imagery, topography, zoning, utilities, future land use, environmental data, etc.	

COPY REQUESTS		
Base Cost	\$26.49/hour	
Cost per Sheet	Black/White	Color
8 1/2" x 11" (Letter) or 8 1/2" x 14" (Legal)	\$0.10	\$0.15
11" x 17"	\$0.13	\$0.18
Plotter: up to 24" x 36"	\$5.00	\$20.00
Plotter: larger than 24" x 36" - custom quote based on size		

INDUSTRIAL FACILITY TAX ABATEMENTS	
New Facility & Speculative	\$750
Rehabilitation Facility	\$1,000

LATE FEES	
100% of application fee, or \$500.00, whichever is less	
Fees may be waived in whole or part by the Township Board	

CHARTER TOWNSHIP OF GARFIELD

**RESOLUTION 2023-13-T
REGARDING CASS ROAD DRAINAGE DISTRICT ACCESS
REQUEST FOR BRANCH CONNECTIONS**

Board member, Denise Schmuckal, made a motion to adopt the following Resolution:
supported by Board member, Steve Duell.

WHEREAS, the Charter Township of Garfield has historically supported the development of the Cass Road Drain and owns property (parcel: 28-05-022-009-40) within the Cass Road Drainage District through which the 1987 Branch of the Cass Road Drain runs.

WHEREAS, the Cass Road Drain Drainage District received a grant of easement on and over said parcel for construction and operation of the 1987 Branch of the Cass Road Drain recorded at liber 0729, page 856.

WHEREAS, the Grand Traverse County Drain Commissioner (Drain Commissioner) on behalf of the Cass Road Drain Drainage District has entered into an agreement with Traverse Cold Storage, pursuant to Section 425 of the Drain Code (Act 40 of 1956, being MCL 280.1, et seq.) to provide additional drainage to the Traverse Cold Storage property.

WHEREAS, Traverse Cold Storage is a Michigan Corporation operating at 2695 and 2699 Cass Road, in the Charter Township of Garfield and within the boundaries of the Cass Road Drainage District (parcels: 28-05-022-007-30 & 28-05-022-007-50).

WHEREAS, MCL 280.425 requires: "*...consent in writing by the owner or owners of the lands to be traversed by the proposed drain shall be obtained.*"

NOW, THEREFORE, BE IT RESOLVED THAT:

The Charter Township of Garfield consents to grant to the Cass Road Drainage District the right to traverse the lands owned by the township adjacent to the Traverse Cold Storage property for the purpose of providing additional drainage to the existing 1987 Branch of the Cass Road Drain pursuant to the Section 425 Agreement. The grant includes the right of access for the construction of the physical connection to provide the necessary drainage and for future operation and maintenance of the Section 425 Traverse Cold Storage Branch, pursuant to Orders issued by the Drain Commissioner in conjunction with its authority and responsibility under the Drain Code.

Upon roll call vote, the following voted:

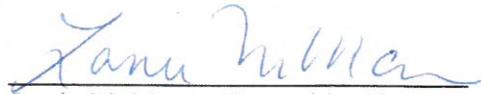
Yeas: Schmuckal, Duell, Agostinelli, Barsheff, McManus, Macomber, Korn

Nays: None

Abstain: None

Absent and Excused: None

The Chairman, Chuck Korn, declared the motion carried, and Resolution 2023-13-T duly adopted.


Lanie McManus, Township Clerk

CERTIFICATE

I, Lanie McManus, the duly appointed Township Clerk, hereby certify that the foregoing constitutes a true copy of a Resolution of the Township Board for the Charter Township of Garfield, adopted during a meeting of the Charter Township of Garfield Township Board, Grand Traverse County, Michigan, held on May 9, 2023, at which meeting (7) seven members were present as indicated in said Minutes and voted as therein set forth and that all signatures affix thereto are the genuine signatures of those so indicated, and that each signatory was duly authorized to affix his or her signature, that said meeting was held in accordance with the Open Meetings Act of the State of Michigan, and that due and proper notice of the meeting as required by law was given to the members of the Township Board, and that the Minutes of said Meeting were kept and will be and have been available as required by said Act.

Date: 5-10-2023


Lanie McManus, Township Clerk

CHECK DISBURSEMENT REPORT FOR CHARTER TOWNSHIP OF GARFIELD
 CHECK DATE FROM 05/04/2023 - 05/17/2023
 Banks: GEN

Check Date	Bank	Check #	Payee	Description	GL #	Amount
05/04/2023	GEN	41419	AMY DEHAAN	BOR LUNCH / MILEAGE	101-171-860.201	276.73
		41419		BOR LUNCH / MILEAGE	101-171-960.000	67.79
						<u>344.52</u>
05/04/2023	GEN	41420	CDM MOBILE SHREDDING, LLC	SHREDDING	101-101-805.000	487.00
05/04/2023	GEN	41421	STAPLES	STAPLES/PAPER/LABLELS/TISSUE	101-101-726.000	280.46
		41421		STAPLES/PAPER/LABLELS/TISSUE	101-171-726.000	7.12
						<u>287.58</u>
05/15/2023	GEN	41422	BURNHAM & FLOWER OF MICHIGAN	HRA	101-851-873.030	30,000.00
05/15/2023	GEN	41423	CONSUMERS ENERGY	100000311801	101-000-084.861	1,538.22
		41423		100000311801	101-448-920.005	3,836.12
						<u>5,374.34</u>
05/15/2023	GEN	41424	DTE ENERGY	910020833257	101-265-920.601	61.71
05/15/2023	GEN	41425	DTE ENERGY	910020833133	101-265-920.601	886.55
05/15/2023	GEN	41426	EAST BAY TOWNSHIP	EDUCATION	101-400-960.000	80.00
05/15/2023	GEN	41427	GARFIELD CHARTER TOWNSHIP	HSA	101-000-237.000	663.04
05/15/2023	GEN	41428	GFL ENVIRONMENTAL	002096164	308-000-805.000	493.11
05/15/2023	GEN	41429	GFL ENVIRONMENTAL	002114259	101-265-935.604	122.80
05/15/2023	GEN	41430	GRAND TRAVERSE COUNTY	MTT/BOR ADJUSTMENTS FOR FEBRUARY-MARCH	101-000-403.000	773.64
05/15/2023	GEN	41431	GRANITE TELECOMMUNICATIONS	POTS LINES	101-265-850.000	136.51
05/15/2023	GEN	41432	LAUTNER IRRIGATION INC	START-UP	101-265-935.602	807.65
05/15/2023	GEN	41433	LAUTNER IRRIGATION INC	SPRING START UP	308-000-805.000	971.34
05/15/2023	GEN	41434	SONDEE, RACINE, DOREN	AGAVE FOLLOW UP	101-253-801.000	610.50
05/15/2023	GEN	41435	SPECTRUM ENTERPRISE	INTERNET	101-258-935.016	159.98
05/15/2023	GEN	41436	STATE OF MICHIGAN	CR#S 13462 / 13750	101-000-403.000	99.88
05/15/2023	GEN	41437	SUMMIT COMPANIES	ANNUAL ALARM INSPECTION	101-265-935.608	450.00
05/15/2023	GEN	41438	TC TOWING & RECOVERY	TOWING	308-000-805.000	150.00
05/15/2023	GEN	41439	TRAVERSE CITY LIGHT & POWER	00104403-7	101-000-084.861	666.74
		41439		00104403-7	101-448-920.005	28.38
						<u>695.12</u>
05/15/2023	GEN	41440	UNITED WAY	UNITED WAY	101-000-238.000	90.00

3.b.

Check Date	Bank	Check #	Payee	Description	GL #	Amount
05/15/2023	GEN	41441	VOYA INSTITUTIONAL TRUST COMPANY	DEFERRED COMP VF3202	101-000-227.000	1,830.00
05/15/2023	GEN	41442	WALTON CONTRACTING, INC.	RIVER EAST DOG PARK PAYMENT #1		** VOIDED **
05/15/2023	GEN	41443	WALTON CONTRACTING, INC.	EAST DOG PARK PAYMENT #1	308-000-970.000	79,943.35
05/17/2023	GEN	41444	ALL TRAFFIC SOLUTIONS	TRAFFIC SUITE RENEWAL	101-747-880.007	1,500.00
05/17/2023	GEN	41445	GRAND TRAVERSE COUNTY REG DEED	JEOPARDY AGAVE	101-253-801.000	30.00
05/17/2023	GEN	41446	PRINTING SYSTEM	MASTER CARDS	101-191-726.000	76.12

--- GL TOTALS ---
 TOTAL - ALL FUNDS 127,124.74
 TOTAL OF 28 CHECKS (1 voided) 127,124.74

101-000-084.861	DUE FROM #861 STREET LIGHTS	2,204.96
101-000-227.000	DEFERRED COMP	1,830.00
101-000-237.000	HSA (FORMERLY FLEX)	663.04
101-000-238.000	UNITED WAY	90.00
101-000-403.000	CURRENT REAL PROPERTY TAXES	873.52
101-101-726.000	SUPPLIES	280.46
101-101-805.000	CONTRACTED AND OTHER SERVICES	487.00
101-171-726.000	SUPPLIES	7.12
101-171-860.201	MILEAGE - ASSESSOR	276.73
101-171-960.000	EDUCATION & TRAINING	67.79
101-191-726.000	SUPPLIES	76.12
101-253-801.000	LEGAL SERVICES	640.50
101-258-935.016	COMPUTER NETWORK	159.98
101-265-850.000	TELEPHONE	136.51
101-265-920.601	HEATING / GAS	948.26
101-265-935.602	LAWN MAINTENANCE	807.65
101-265-935.604	RUBBLISH REMOVAL	122.80
101-265-935.608	MAINTENANCE-OTHER	450.00
101-400-960.000	EDUCATION & TRAINING	80.00
101-448-920.005	STREET LIGHTS TOWNSHIP	3,864.50
101-747-880.007	COM. PROM. - COMMUNITY AWAREN	1,500.00
101-851-873.030	INSURANCE - EMPLOYEE HEALTH	30,000.00
308-000-805.000	CONTRACTED AND OTHER SERVICES	1,614.45
308-000-970.000	CAPITAL OUTLAY	79,943.35
	TOTAL	127,124.74

Karen Leaver

From: Chloe Macomber
Sent: Wednesday, May 10, 2023 10:42 AM
To: Karen Leaver
Subject: Investment Policy

Hello Karen,

The investment policy is supposed to be reviewed annually by the Board per the policy itself and I think we approved the new policy last April.

Do you think we could get it on the consent calendar? I have no changes to make – I would just like to make sure we are reviewing and approving it annually.

Thank you,

Chloe Macomber, MiCPT, CPFIM, MCAO
Treasurer
Charter Township of Garfield
3848 Veterans Drive,
Traverse City, MI 49684
PH: (231) 225-3043
Mon-Thurs 7:30-6:00

**CHARTER TOWNSHIP OF GARFIELD
GRAND TRAVERSE COUNTY, MICHIGAN**

RESOLUTION # 2022-03-T

RESOLUTION ADOPTING A REVISED INVESTMENT POLICY

WHEREAS, the Charter Township of Garfield Investment policy has been revised and updated with minor corrections for clarity and brought to the Charter Township of Garfield Board for review.

NOW, THEREFORE, BE IT RESOLVED:

1. **THAT** the revised Charter Township of Garfield Investment Policy, attached hereto as Exhibit "A" and made a part of this resolution, is hereby adopted by the Charter Township of Garfield.
2. **THAT** the previous Charter Township of Garfield Investment Policy, adopted by resolution 2006-1-T, is hereby repealed.
3. **THAT** this resolution and the Investment Policy attached hereto shall be in full force and effect from and after its approval.

Moved: Denise Schmuckal

Supported: Steve Duell

Ayes: Schmuckal, Duell, Macomber, Barsheff, Agostinelli, McManus and Korn

Nays: None

Absent and Excused: None

By:



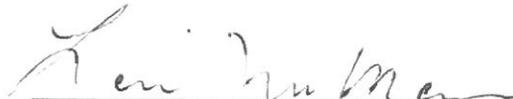
Lanie McManus, Clerk

Charter Township of Garfield

CERTIFICATE

I, Lanie McManus, Clerk of the Charter Township of Garfield, do hereby certify that the above is a true and correct copy of Resolution #2022-03-T which was adopted by the Township Board of the Charter Township of Garfield on the 12th day of April, 2022.

Dated: 4/13/2022



Lanie McManus, Clerk

Charter Township of Garfield

GARFIELD CHARTER TOWNSHIP
INVESTMENT POLICY

1.0 Policy:

It is the policy of GARFIELD CHARTER TOWNSHIP to invest public funds in a manner which will ensure the preservation of capital while providing the best investment return with the maximum security, meeting the daily cash flow demands of the Township, and conforming to all state and local statutes governing the investment of public funds.

2.0 Scope:

This investment policy applies to all financial assets of GARFIELD CHARTER TOWNSHIP. These funds are accounted for in the GARFIELD CHARTER TOWNSHIP **Comprehensive Annual Financial Report** and include:

2.1 Funds:

- 2.1.1 General Fund
- 2.1.2 Fire Fund
- 2.1.3 Trust and Agency
- 2.1.4 Receiving Funds
- 2.1.5 Special Revenue Funds
- 2.1.6 Capital Project Funds
- 2.1.7 Individual Retiree Health Benefits Funds
- 2.1.8 (Any new fund created by GARFIELD CHARTER TOWNSHIP'S LEGISLATIVE BODY, unless specifically exempted.)

Individual employee retirement funds and deferred compensation are excluded from this policy.

3.0 **Prudence:**

Investments shall be made with judgment and care- under circumstances then prevailing- which persons of prudence, discretion and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived.

3.1 The standard of prudence to be used by investment officials shall be the “**prudent person**” and/or “**prudent investor**” standard and shall be applied in the context of managing an overall portfolio. Investment officers acting in accordance with written procedures and the investment policy and exercising due diligence shall be relieved of personal responsibility for an individual security’s credit risk or market price changes, provided deviations from expectations are reported in a timely fashion and appropriate action is taken to control adverse developments.

4.0 **Objective:**

Funds of GARFIELD CHARTER TOWNSHIP will be invested in accordance with Act No. 20 of the Public Acts of Michigan of 1943, as amended by Act 196 of 1997; being Sections 129.91 through 129.93 of the Michigan Compiled Laws, Act No. 367 of the Public Acts of 1982 and in accordance with GARFIELD CHARTER TOWNSHIP’S RESOLUTIONS 98-9-T, 2006-1-T, 2022-03-T, and in accordance with the objectives and procedures set forth in the following order of importance:

4.1 **Safety:**

Safety of principal is the foremost objective of the investment program. Investments of GARFIELD CHARTER TOWNSHIP shall be undertaken in a manner that seeks to ensure the

preservation of capital in the overall portfolio. To attain this objective, diversification is required in order that potential losses on individual securities do not exceed the income generated from the remainder of the portfolio.

4.2 Liquidity:

GARFIELD CHARTER TOWNSHIP'S investment portfolio will remain sufficiently liquid to enable GARFIELD CHARTER TOWNSHIP to meet all operating requirements, which might be reasonably anticipated.

4.3 Return on Investments:

The GARFIELD CHARTER TOWNSHIP investment portfolio shall be designed with the objective of attaining a benchmark rate of return throughout budgetary and economic cycles, commensurate with GARFIELD CHARTER TOWNSHIP'S investment risk constraints and the cash flow characteristics of the portfolio.

4.4 Maintain Public Trust:

All participants in the investment process shall seek to act responsibly as custodians of the public trust. The Investment Officer (Township Treasurer) shall recognize the investment portfolio is subject to public review and evaluation. In addition, the overall investment program shall be designed and managed with a degree of professionalism worthy of public trust. The Investment Officer shall also avoid any transaction that might knowingly impair public confidence in GARFIELD CHARTER TOWNSHIP'S ability to govern effectively.

5.0 Delegation of Authority:

Authority to manage GARFIELD CHARTER TOWNSHIP'S Investment program is derived from Michigan Public Act No. 20 of the Public Acts of Michigan of 1973, as amended by Act No. 196 of 1997, being sections 129.91 through 129.93 of the Michigan Compiled Laws, Act No. 367 of the Public Acts of 1982; along with GARFIELD CHARTER TOWNSHIP'S Resolution # 98-9-T dated June 30, 1998, and Resolution #2022-03-T.

The Township Treasurer is designated as the INVESTMENT OFFICER of GARFIELD CHARTER TOWNSHIP and is responsible for investment decisions and activities. The Township Treasurer and Deputy Treasurer shall develop and maintain written administrative procedures for the daily operation of the investment program, consistent with the investment policy. In the absence of the Township Treasurer, the Deputy Treasurer will assume all related investment responsibilities. No Person may engage in investment transactions except as provided under the terms of this policy and the administrative procedures established by the GARFIELD CHARTER TOWNSHIP TREASURER.

5.1 Investment Procedures:

The Township Treasurer shall establish written investment policy procedures for the operation of the investment program consistent with this policy. The procedures should include reference to: safekeeping, wire transfer agreements, banking service contracts and collateral/depository agreements. Such procedures shall include explicit delegation of authority to persons responsible for investment transactions. No person may engage in an investment transaction except as provided under the terms of this policy and the procedures established by the Township Treasurer. In the absence and unavailability of the Township Treasurer, the Deputy Treasurer is authorized to conduct the daily business of the Township Treasurer's Office

under the established terms of the written investment policy procedures, rules and regulations as adopted by the Township Treasurer.

6.0 Ethics and Conflicts of Interest:

Officer and employees involved in the investment process shall refrain from personal business activity that could conflict with proper execution of the investment program, or which could impair their ability to make impartial investment decisions. Employees and investment officials shall disclose to the GARFIELD CHARTER TOWNSHIP BOARD any material financial interests in financial institutions that conduct business within their jurisdiction, and they shall further disclose any large personal financial/investment positions that could be related to the performance of GARFIELD CHARTER TOWNSHIP.

7.0 Authorized Financial Dealers and Institutions:

The Township Treasurer will maintain a list of financial institutions authorized to provide investment services. In addition, a list will also be maintained of approved security broker/dealers selected by credit worthiness who are authorized to provide investment services in the State of Michigan. These may include “**primary dealers**” or “**regional dealers**” that qualify under **Security & Exchange Commission Rule 15C3-1 (Uniform Net Capital Rule)**. No public deposit shall be made except in a qualified public depository as established by state laws.

All financial institutions and broker/dealers who desire to become qualified bidders for investment transactions must supply the Township Treasurer with the following: audited financial statements, proof of National Association of Security Dealers certification, trading resolution, proof of state registration, completed broker/dealer questionnaire and certification of having read the GARFIELD CHARTER TOWNSHIP investment policy and depository contracts.

7.1

An annual review of the financial condition and registrations of qualified bidders will be conducted by the Township Treasurer.

7.2

A current audited financial statement is required to be on file for each financial institution and broker/dealer in which GARFIELD CHARTER TOWNSHIP invests.

7.3

GARFIELD CHARTER TOWNSHIP shall only deal with “**primary dealers**” of the U.S. Treasury.

8.0 **Authorized & Suitable Investments:**

The Investment Officer (Township Treasurer) is empowered by Statute and Resolution to invest surplus funds of GARFIELD CHARTER TOWNSHIP in allowable investments pursuant to Public Act No. 20, as amended, as follows:

8.0(a) Bonds, securities, and other obligations of the United States, or an agency or instrumentality of the United States in which the principal and interest is fully guaranteed by the United States. This subdivision shall include securities issued or guaranteed by the government national mortgage association.

8.0(b) Certificates of deposit, certificate of deposit account registry services (CDARS), savings accounts, deposit accounts, insured cash sweep (ICS) accounts, or depository receipts of a financial institution which is eligible to be a depository of surplus funds belonging to the State under Sections 5 or 6 of Act No. 105 of the Public Acts of 1855, as amended, being sections 21.145 and 21.146 of the Michigan Compiled Laws. No maturity shall extend beyond five years.

8.0(c) Commercial paper rated at the time of purchase within the highest classification established by not less than two (2) standard rating services and which matures not more than two hundred seventy (270) days after the date of purchase.

8.0(d) In United States government of federal agency obligation repurchase agreements.

8.0(e) In Banker's Acceptances of United States banks.

8.0(f) Money Market Mutual funds registered under the Investment Company Act of 1940, Title 1 of Chapter 686, 54 Stat. 789, 15 USC 80a-1 to 80a-3 and 80a-4 to 80a-64, with the authority to purchase only investment vehicles by the Township. This authorization is limited to securities whose intention is to maintain a net asset value (NAV) of one (1) dollar per share. (Money Market Mutual Funds stay at \$1 NAV if invested in US Treasuries)

8.0(g)(1) Investment Pools composed of investment obligations described in subdivisions (a) through (g) of Act 20 PA 143, as amended through December 31, 1997, if purchased through an inter-local agreement under the Urban Cooperation Act of 1967, 1967 (Excess) PA 7, MCL 124.501 to 124.512.

(2) The policy authorizes investments in INVESTMENT POOLS organized under the Surplus Funds Investment Pool Act, 1982 PA 367, MCL 129.111 to 129.118 and under the Local Government Investment Pool Act, 1985 PA 121, MCL 129.141 to 129.150. A thorough investigation of the pool/fund is required prior to investing, and on a continual basis.

8.1 Master Repurchase Agreement

GARFIELD CHARTER TOWNSHIP has elected not to involve themselves with REPURCHASE AGREEMENTS.

8.2 Non-Allowable Investments

Description of Investments which **DO NOT** comply with the requirements of Public Act 20 of 1943, as amended (MCL 129.91) The following potential investments are not securities but are contractual agreements between a broker or dealer and an investor. They are not investments in the underlying securities. Repurchase agreements are contractual agreements specifically authorized by the ACT, while these contractual agreements are not mentioned in the ACT and are therefore specifically excluded.

- **CATS-** Certificates of Accrual on Treasury Securities were originated by Salomon Brothers in 1984
- **COUGRS-** Certificates on Government Receipts (“COUGRS”) were originated by A. G. Becker
- **ETRs-** Easy Growth Treasury Receipts (“EATERS”) were issued by Dean Witter
- **TBRs-** Treasury Bond Receipts (“Teddy Bears”) were originated by E. F. Hutton
- **TIGRs-** Treasury investment Growth Receipts (“TIGERS”) were issued by Merrill Lynch
- **TRs-** Treasury Receipts, the generic form of zero coupons were issued by a group of dealers. “TR’s” are also the generic term used to reference the family or “zoo” of Proprietary/ Government-Guaranteed Receipts
- **ZCTOs-** Zero Coupon Treasury Obligations (“ZITCOS”) were originated by Lehman Brothers
- **CMO’s-** Pools (not mutual funds) of GNMA’s packaged as a bond and are classical derivations per the October 14, 1994, edition of the Wall Street Journal, “those arcane securities, whose returns are based on or derived from some underlying asset or index”.

- **Brokered CDARS-** Some brokers and dealers have programs whereby \$250,000 federally insured, certificates of deposit from numerous institutions are packaged in million dollar multiples and sold on an average yield of all the institutions participating in the package. This type of arrangement does not fall under the authority for investment pools under the Urban Cooperation Act of 1967, 1967 (Ex Sess) PA 7, MCL 124.501 to 124.512, the Surplus Funds Investment Pool Act, 1982PA367, 129.111 to 129.118 or the Local Government Investment Pool Act, 1985PA 121, MCL 129.141 to 129.150 and is therefore NOT appropriate.

9.1 Investment Pools/Mutual Funds:

A thorough investigation and due diligence of the pool/fund is required prior to investing, and on a continual basis. There shall be a questionnaire developed which will answer the following general questions:

- A description of eligible investment securities, and a written statement of investment policy and objectives.
- A description of interest calculations and how it is distributed, and how gains and losses are treated.
- A description of how the securities are safeguarded (including the settlement process), and how often the securities are priced and the program audited.
- A description of who may invest in the program, how often, what size deposit and withdrawal are allowed.
- A schedule for receiving statement and portfolio listings.

- Are reserves, retained earnings, etc. utilized by the pool/fund?
- A fee schedule, and when and how it is assessed.
- Is the pool/fund eligible for bond proceeds and/or will it accept such proceeds?

10.0 Collateralization:

The State of Michigan does not require Collateralization. Non-negotiable, non-collateralized Certificates of Deposit, as is the law in the State of Michigan, shall be evidenced by a Safekeeping Receipt from the issuing bank. All securities purchased by GARFIELD CHARTER TOWNSHIP under this section shall be properly designated as an asset of the TOWNSHIP. Non-negotiable, non-collateralized Certificates of Deposits are allowable for Township investment provided that the Investment Officer has done creditworthiness work on the banking institution.

If collateral is required, it will always be held by an independent third party with whom GARFIELD CHARTER TOWNSHIP has a current written custodial agreement. A clearly marked evidence of ownership (safekeeping receipt) must be supplied and retained by GARFIELD CHARTER TOWNSHIP.

The right of collateral substitution is not granted.

11.0 Safekeeping and Custody:

All security transactions having a value greater than SIPC or other applicable insurance entered into by GARFIELD CHARTER TOWNSHIP shall be conducted on a **delivery-versus-payment (DVP)** basis. Securities will be held by a third party custodian, with a written custodial agreement, designated by the Township Treasurer and evinced by safekeeping receipt and proof of applicable insurance will be required (SAFEKEEPING RECEIPT).

12.0 Diversification:

GARFIELD CHARTER TOWNSHIP will diversify its investments by security type and institution. To ensure that GARFIELD CHARTER TOWNSHIP does not over concentrate in any one institution or investment, GARFIELD CHARTER TOWNSHIP shall, subject to the limitations imposed by the number of qualified local institutions within the immediate area, limit its investments to no more than 5% in any one issuer. With the exception of U.S. Treasury securities and authorized pools, will attempt not to have more than fifty (50) percent of GARFIELD CHARTER TOWNSHIP'S total investment portfolio vested in a single security type. It's the policy of GARFIELD CHARTER TOWNSHIP to diversify its investment portfolio. Assets held in common cash fund and other investment funds shall be diversified to eliminate the risk of loss resulting from over-concentration of assets in a specific maturity, individual financial institution(s) or a specific class of securities. Diversification strategies shall be determined and revised by the Township Treasurer from time to time to meet the diversification objectives (to reduce overall portfolio risks while attaining market average rates of return).

13.0 Maximum Maturities:

To the extent possible, GARFIELD CHARTER TOWNSHIP will attempt to match its investments with anticipated cash flow requirements. Unless matched to a specific cash flow, GARFIELD CHARTER TOWNSHIP will not directly invest in securities more than three (3) years from the date of purchase. However, GARFIELD CHARTER TOWNSHIP may collateralize its repurchase agreements using longer-dated investments not to exceed three (3) years to maturity.

Reserve funds may be invested in securities exceeding three (3) years if the maturity of such investments is made to coincide as nearly as practicable with the expected use of the funds.

14.0 Internal Control:

The Township Treasurer shall establish an annual process of independent review by an external auditor. This review will provide internal control by assuring compliance with policies and procedures.

15.0 Performance Standards:

The investment portfolio shall be designed with the objective of obtaining a rate of return throughout budgetary and economic cycles, commensurate with the investment risk constraints and cash flow needs.

15.1 Market Yield (Benchmark):

The GARFIELD CHARTER TOWNSHIP investment strategy is passive. Given this strategy, the basis used by the Township Treasurer to determine whether market yields are being achieved shall be to identify a comparable US Treasury instrument as the benchmark which matches the portfolio investment duration, i.e., 90-day U.S. Treasury Bill, 6-month U.S. Treasury Bill, Average Fed Funds Rate, etc.

16.0 Reporting:

The Township Treasurer shall provide the GARFIELD CHARTER TOWNSHIP BOARD quarterly investment reports, which provide a clear picture of the status of the current investment portfolio. The management report should include comments on the fixed income markets and economic conditions, discussions regarding restrictions on percentage of investment by categories that exceed 5%, possible changes in the portfolio structure going forward and thoughts on investment strategies. The GARFIELD CHARTER TOWNSHIP

BOARD may elect to reduce the foregoing reporting requirement so that the Township Treasurer shall submit a report less frequently, but in no event less than annually. The TOWNSHIP BOARD may request

additional information from time to time, when deemed necessary by the BOARD to remain sufficiently informed of the status of the TOWNSHIP'S investment portfolio.

Schedules in the quarterly report should include the following:

- A listing of individual securities held at the end of the reporting period by authorized investment category.
- Average life and final maturity of all investments listed.
- Coupon, discount or earning rate.
- Par Value, Amortized Book Value and Market Value.
- Percentage of the portfolio represented by each investment category.

17.0 Investment Policy Adoption:

The GARFIELD CHARTER TOWNSHIP investment policy shall be adopted by resolution of the GARFIELD CHARTER TOWNSHIP'S legislative authority (TOWNSHIP BOARD). The GARFIELD CHARTER TOWNSHIP TOWN BOARD shall review the policy annually and the GARFIELD CHARTER TOWNSHIP TOWN BOARD must approve modifications made thereto.

18.0 Glossary:

*Because this policy is to be available to the public as well as the governing body, it is important that a glossary of related terminology be part of the policy.

Agencies: Federal agency securities and/or Government-sponsored enterprises.

Asked: The price at which securities are offered.

Banker's Acceptance (BA): A draft or bill or exchange accepted by a bank or trust company. The accepting institution guarantees payment of the bill, as well as the issuer.

Benchmark: A comparative base for measuring the performance or risk tolerance of the investment portfolio. A benchmark should represent a close correlation to the level of risk and the average duration of the portfolio's investments.

Bid: The price offered by a buyer of securities. (When you are selling securities, you ask for a bid.) See Offer.

Broker: A broker brings buyers and sellers together for a commission.

Certificate of Deposit (CD): a time deposit with a specific maturity evidenced by a certificate. Large-denomination CD's are typically negotiable.

Certificate of Deposit Account Registry Service (CDARS): A service provided by a network of participating banks to provide full insurance coverage on large CD deposits. When an amount greater than the federally (FDIC) insured limit of \$250,000 is deposited with a participating bank, that amount is broken into smaller amounts, less than \$250,000 and placed into CD's issued by other banks in the network.

Collateral: Securities, evidence of deposit or other property, which a borrower pledges to secure repayment of a loan. Also refers to securities pledged by a bank to secure deposits of public money.

Comprehensive Annual Financial Report (CAFR): The official annual report for the CHARTER TOWNSHIP OF GARFIELD. It includes five (5) combined statements for each individual fund and account group prepared in conformity with GAAP. It also includes supporting schedules necessary to demonstrate compliance with finance-related legal and contractual provisions, extensive introductory material, and a detailed Statistical Section.

Coupon: (a) The annual rate of interest that a bond's issuer promises to pay the bondholder on the bond's face value. (b) A certificate attached to a bond evidencing interest due on a payment date.

Dealer: A dealer, as opposed to a broker, acts as a principal in all transactions, buying and selling for his own account.

Debenture: A bond secured only by the general credit of the issuer.

Delivery versus Payment (DVP): There are two methods of delivery of securities: (1) Delivery versus Payment and (2) Delivery versus receipt. Delivery versus payment is delivery of securities with an exchange of money for the securities. Delivery versus receipt is delivery of securities with exchange of a signed receipt for the securities.

Derivatives: (1) Financial instruments whose return profile is linked to, or deviated from, the movement of one or more underlying index or security, and may include a leveraging factor, or (2) Financial contracts based upon notional amounts whose value is derived from an underlying index or security (interest rates, foreign exchange rates, equities or commodities).

Discount: The difference between the cost price of a security and its maturity when quoted at lower than face value. A security selling below original offering price shortly after sale also is considered to be at a discount.

Discount Securities: Non-interest bearing money market instruments that are issued at a discount and redeemed at maturity for full face value, e.g., U.S. Treasury Bills.

Diversification: Dividing investment funds among a variety of securities offering independent returns.

Federal Credit Agencies: Agencies of the Federal government set up to supply credit to various classes of institutions and individuals, e.g., savings and loans, small business firms, students, farmers, farm cooperatives and exporters.

Federal Deposit Insurance Corporation (FDIC): A federal agency that insures bank deposits, currently up to \$250,000 per deposit.

Federal Funds Rate: The rate of interest at which Fed funds are traded. The Federal Reserve through open-market operations currently sets the rate.

Federal Home Loan Banks (FHLB): Government sponsored wholesale banks (currently 12 regional banks), which lend funds and provide correspondent banking services to member commercial banks, thrift institutions, credit unions and insurance companies. The mission of the FHLB's is to liquefy the housing related assets of its members who must purchase stock in the district bank.

Federal National Mortgage Association (FNMA): FNMA, like GNMA was chartered under the Federal National Mortgage Association Act in 1938. FNMA is a federal corporation working under auspices of the Department of Housing and Urban Development (HUD). It is the largest single provider of residential mortgage funds in the United States. Fannie Mae, as the corporation is called, is a private stockholder-owned corporation. The corporations purchased include a variety of adjustable mortgages and second loans, in addition to fixed-rate mortgages. FNMA's securities are also highly liquid and are widely accepted. FNMA assumes and guarantees that all security holders will receive timely payment of principal and interest.

Federal Open Market Committee (FOMC): Consists of seven members of the Federal Reserve Board and five of the twelve Federal Reserve Bank Presidents. The President of the New York Federal Reserve Bank is a permanent member, while the other Presidents serve on a rotating basis. The Committee periodically meets to set Federal Reserve guidelines regarding purchases and sales of Government Securities in the open market as a means of influencing the volume of bank credit and money.

Federal Reserve System: The central bank of the United States created by Congress and consisting of a seven member Board of Governors in Washington, D.C., 12 regional banks and about 5,700 commercial banks that are members of the system.

Government National Mortgage Association (GNMA or Ginnie Mae):

Securities influencing the volume of bank credit guaranteed by GNMA and issued by mortgage bankers, commercial banks, savings and loan associations and other institutions. Security holder is protected by full faith and credit of the U.S. Government. The FHA, VA, or FmHA mortgages back Ginnie Mae securities. The term “pass-through” is often used to describe Ginnie Mae’s.

Insured Cash Sweep (ICS): A service provided by a network of participating banks that allows for large deposits to be fully insured. When an amount greater than the federally (FDIC) insured limit of \$250,000 is deposited with a participating bank, that amount is broken into smaller amounts, less than \$250,000 and placed into other participating banks in the network.

Investment: Investments shall be defined as debt obligations and shall not include Certificates as Deposit which should be considered deposits. This is the same definition as used by GASB in the pronouncement number 40 for disclosure purposes.

Liquidity: A liquid asset is one that can be converted easily and rapidly into cash without a substantial loss of value. In the money market, a security is said to be liquid if the spread between bid and asked prices is narrow and reasonable size can be done at those quotes.

Local Government Investment Pool (LGIP): The aggregate of all funds from political subdivisions that are placed in the custody of the State Treasurer for investment and reinvestment.

Market Value: The price at which a security is trading and could presumably be purchased or sold.

Master Repurchase Agreement: A written contract covering all future transactions between the parties to repurchase-reverse purchase agreements that establish each party’s rights in the transactions. A master agreement will often specify, among other things, the right of the buyer-lender to liquidate the underlying securities in the event of default by the seller-borrower.

Maturity: The date upon which the principal or stated value of an investment becomes due and payable.

Money Market: The market in which short-term debt instruments (bills, commercial paper, bankers' acceptances, etc.) are issued and traded.

Offer: The price asked by a seller of securities. (When you are buying securities, you ask for an offer.) See Asked and Bid.

Open Market Operations: Purchases and sales of Government and certain other securities in the open market by the New York Federal Reserve Bank as directed by the FOMC in order to influence the volume of money and credit in the economy. Purchases inject reserves into the bank system and stimulate growth of money and credit; sales have the opposite effect. Open market operations are the Federal Reserve's most important and most flexible monetary policy tool.

Portfolio: Collection of securities held by an investor.

Primary Dealer: A group of government securities dealers who submit daily reports of market activity and positions and monthly financial statements to the Federal Reserve Bank of New York and are subject to its informed oversight. Primary dealers include Security and Exchange Commission (SEC)-registered securities broker-dealers, banks and a few unregulated firms.

Prudent Person Rule: An investment standard. In some states the law requires that a fiduciary, such as a trustee, may invest money only in a list of securities selected by the custody state- the so-called legal list. In other states the trustee may invest in a security if it is one, which a prudent person of discretion and intelligence who is seeking a reasonable income and preservation of capital would buy.

Qualified Public Depository: A financial institution that does not claim exemption from the payment of any sales or compensating use or ad valorem taxes under the laws of this state, which has segregated for the benefit of the commission eligible collateral having a value of not less than its maximum liability and which has been approved by the Public Deposit Protection Commission to hold public deposits.

Rate of Return: The yield obtainable on a security based on its purchase price or its current market price. This may be the amortized yield to maturity on a bond the current income return.

Repurchase Agreement (RP or REPO): A holder of securities sells these securities to an investor with an agreement to repurchase them at a fixed price on a fixed date. The security “buyer” in effect lends the “seller” money for the period of the agreement, and the terms of the agreement are structured to compensate him for this. Dealers use RP’s extensively to finance their positions. Exception: When the Fed is said to be doing RP, it is lending money, which is, increasing bank reserves.

Safekeeping: A service to customers rendered by banks for a fee whereby securities and valuables of all types and descriptions are held in the bank’s vaults for protection.

Secondary Market: A market made for the purchase and sale of outstanding issues following the initial distribution.

Securities and Exchange Commission: Agency created by Congress to protect investors in securities transactions by administering securities legislation.

See Rule 15c3-1: See Uniform Net Capital Rule.

Structured Notes: Notes issued by Government Sponsored Enterprises (FHLB, FNMA, SLMA, etc.) and corporations, which have imbedded options (e.g., call features, step-up coupons, floating rate coupons, and derivative-based returns) into their debt structure. Their market performance is impacted by the fluctuation of interest rates, the volatility of the imbedded options and shifts in the shape of the yield curve.

Treasury Bills: A non-interest bearing discount security by the U.S. Treasury to finance the national debt. Most bills are issued to mature in three months, six months or one year.

Treasury Bonds: Long-term coupon-bearing U.S. Treasury Securities issued as direct obligations of the U.S. Government and having initial maturities of more than ten years.

Treasury Notes: Medium-term coupon-bearing U.S. Treasury Securities issued as direct obligations of the U.S. Government and having initial maturities from two to ten years.

Uniform Net Capital Rule: Security and Exchange Commission requirement that member firms as well as non-member broker-dealers in securities maintain a maximum ratio of indebtedness to liquid capital of 15 to 1; also called net capital rule and net capital ratio. Indebtedness covers all money owed to a firm, including margin loans and commitment to purchase securities, one reason new public issues are spread among members of underwriting syndicates. Liquid capital includes cash and assets easily converted into cash.

Yield: The rate of annual income return on an investment, expressed as a percentage.

- (a) **Income yield** is obtained by dividing the current dollar income by the current market price for the security.
- (b) **Net yield or Yield to Maturity** is the current income yield minus any premium above par or plus any discount from par in purchase price, with adjustment spread over the period from the date of purchase to the date of maturity of the bond.

 Charter Township of Garfield Planning Department Report No. 2023-58			
Prepared:	May 16, 2023	Pages:	5
Meeting:	May 23, 2023 Township Board	Attachments:	<input checked="" type="checkbox"/>
Subject:	Hickory Properties P-R Rezoning – Introduction / Set Public Hearing		
File No.:	Z-2023-01		
Parcel No.:	#05-005-050-10, #05-004-003-60, #05-005-034-10, and #05-005-034-20		
Applicant:	City of Traverse City & Charter Township of Garfield Recreational Authority		
Agent:	Grand Traverse Regional Land Conservancy		
Owner:	Bercal Properties LLC		

PURPOSE OF APPLICATION:

The applicant requested rezoning the “Hickory Forest” parcel (#05-005-050-10) from the A-Agricultural district to the P-R Park and Recreation district via the Zoning Map Amendment process, without restriction. Upon review by Staff, it was suggested to include the three “Hickory Meadows” parcels to create consistent zoning of parkland in this area. These four parcels total 179.03 acres, and are listed below with their current zoning classifications:

Parcel No.	Current Use	Acres	Current Zoning
05-005-050-10	Hickory Forest	71.33	A-Agricultural
05-004-003-60	Hickory Meadows	69.79	R-1 One-Family Residential
05-005-034-10	Hickory Meadows	37.47	R-1 One-Family Residential
05-005-034-20	Hickory Meadows	0.44	R-1 One-Family Residential

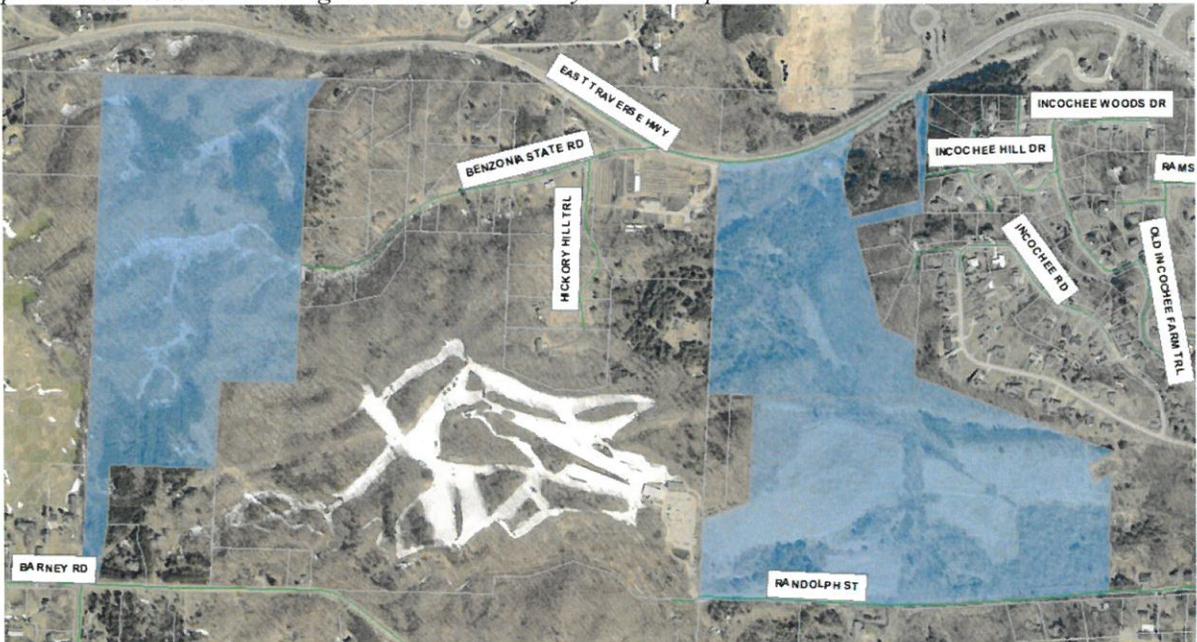
The application has been reviewed at the following meetings:

- March 8, 2023 Planning Commission – Introduction / Set Public Hearing
- April 12, 2023 Planning Commission – Public Hearing / Direct Staff to prepare Findings of Fact
- May 10, 2023 Planning Commission – Findings of Fact / Recommend approval to Township Board

Zoomed-out aerial view of the subject properties (highlighted in blue); the area to the left is the Hickory Forest parcel and the area to the right is the three Hickory Meadows parcels



Zoomed-in aerial view of the subject property (highlighted in blue); the area to the left is the Hickory Forest parcel and the area to the right is the three Hickory Meadows parcels



SUBJECT PROPERTIES:

Three of the subject parcels constitute the Hickory Meadows parkland, and one is the site of Hickory Forest, which is in the process of becoming parkland. All these parcels either are or will be managed by the City of Traverse City & Charter Township of Garfield Recreational Authority (Joint Recreational Authority).

FINDINGS OF FACT:

The Planning Commission adopted the following Findings of Fact at their May 10, 2023 regular meeting:

Section 421.E Approval Criteria of Zoning Map Amendment

In its review of an application for rezoning, the Township should consider, but is not necessarily limited to, the criteria as defined in § 421.E (1) Master Plan Consistency through § 421.E (8) Other Factors. No single factor is controlling; instead, each must be weighed in relation to the other standards.

The applicant shall have the burden of justifying the amendment, including identifying specific reasons warranting the amendment, and providing any supporting data and information to address the following:

1. Master Plan Consistency

Rezoning should be consistent with the intent and purpose of the adopted master plan.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- According to the Master Plan, the Future Land Use designation for the Hickory Meadows parcels is Recreational. The proposed zoning district of P-R Park-Recreation matches this designation.
- The Future Land Use designation for the Hickory Forest parcel is Agricultural / Rural Land. The proposed zoning district of P-R Park-Recreation does not match the Future Land Use designation for the site. However, the Master Plan includes additional information which may support the proposed rezoning application. As part of the Implementation section, the

Master Plan includes the following goals and objectives for “Natural Resources and Parks and Recreational Opportunities:”

- Continue to work closely with area environmental groups and other interested organizations to support environmental preservation and restoration efforts within the Township.
- Continue implementation of the Township’s Green Infrastructure Plan and consider updates to that plan to reflect natural resource management best practices and changing circumstances.
- Continue efforts to acquire additional property for parklands via grants, conservation easements, and open space preservation requirements in development approvals

2. ***Adverse Impacts on Neighboring Lands***

The Township shall consider the nature and degree of an adverse impact upon neighboring lands. Lots shall not be rezoned in a way that is substantially inconsistent with the uses of the surrounding area, whether more or less restrictive. The Township finds and determines that vast acreages of single-use zoning produces uniformity with adverse consequences, such as traffic congestion, air pollution, and social separation. Accordingly, rezoning may promote mixed uses subject to a high degree of design control.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- The proposed P-R zoning would be consistent with the adjacent P-R zoning on the Hickory Hills parcel and would represent an expansion of a contiguous parkland area.
- The P-R zoning and park and recreation land use is compatible with surrounding land uses, which are primarily agricultural and residential.

3. ***Suitability as Presently Zoned***

The Township shall consider the suitability or unsuitability of the tract for its use as presently zoned. This factor, like the others, must often be weighed in relation to the other standards, and instances can exist in which suitably zoned lands may be rezoned upon proof of a real public need, substantially changed conditions in the neighborhood, or to effectuate important goals, objectives, policies, and strategies of the master plan, specification, or this ordinance.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- The Hickory Meadows parcels are currently zoned as R-1 One-Family Residential, but the site is used as parkland and no residential development is anticipated on these parcels.
- The Hickory Forest site is currently zoned as A-Agricultural; the parcel is heavily forested and is unlikely to be used for farmland or farming operations.

4. ***Changed Conditions***

The Township shall consider whether any conditions have changed, since the zoning ordinance was adopted, that might justify the amendment.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- In November 2020, voters in Garfield Township and the City of Traverse City approved a 20-year operating millage for the Joint Recreational Authority to continue their operations

and to purchase and preserve the Hickory Forest site. This indicates an intent to continue to use the properties as parkland.

5. Health, Safety, and Welfare

The ordinance amendment must bear a substantial relationship to the public health, safety, or general welfare, or must protect and preserve historical and cultural places and areas. The rezoning ordinance may be justified, however, if a substantial public need or purpose exists.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- The only future improvements anticipated on these sites would be trails, trailheads, or other low impact uses which are not anticipated to negatively impact public health, safety, and welfare.
- There does not appear to be any nearby historical and cultural places and areas.

6. Public Policy

Certain public policies in favor of the rezoning may be considered. Examples include a need for affordable housing, economic development, mixed-use development, or sustainable environmental features, which are consistent with neighborhood, area, or specific plans.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- The Township's prior Parks and Recreation Master Plan, which was in place when voters approved the millage for the Joint Recreational Authority in November 2020, identified this parcel as a potential future park opportunity in the Green Infrastructure Plan.
- Some goals and objectives included in the Master Plan, as described above, offer support for the proposed rezoning application.

7. Size of Tract

The Township shall consider the size, shape, and characteristics of the tract in relation to the affected neighboring lands. Ordinance amendments shall generally not rezone a single lot when there have been no intervening changes or other saving characteristics. Proof that a small tract is unsuitable for use as zoned, or that there have been substantial changes in the immediate area, may justify an ordinance amendment.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- These four parcels total 179.03 acres.
- No issues relating to the size of the tracts are anticipated as part of this proposed rezoning.

8. Other Factors

The Township may consider any other factors relevant to a rezoning application under state law.

The Planning Commission may consider this standard to be **MET** based on the following reasons:

- No other additional factors, besides those mentioned above, are anticipated to impact this proposed rezoning.

ACTION REQUESTED:

The purpose of this item being placed on tonight's agenda is to introduce the application and schedule it for a public hearing. If the Board is prepared to accept this application and schedule the public hearing, the following motion is suggested:

MOTION THAT application Z-2023-01 BE SCHEDULED for a public hearing for the Garfield Township Board meeting to be held on June 13, 2023.

Any additional information deemed necessary by the Township Board should be added to the motion.

Memorandum



TO: Grand Traverse County Commissioners
Grand Traverse County Township Supervisors
Grand Traverse County Road Commission Board Members
Village of Kingsley
Village of Fife Lake

FROM: Jason Saksewski – GTCRC Director of Operations

DATE: 05/17/2023

SUBJECT: 5/17 Record Eagle Article Regarding Roadkill

The article this morning in the Record Eagle regarding the DNR, GTCRC, and roadkill contains inaccurate information and misquotes. The author has made uninformed interpretations of a boilerplate statement by the DNR and presented those interpretations as committing the GTCRC to resuming activities which would still present potential legal ramifications for this organization, our employees, waste management organizations, and property owners.

GTCRC has reached out to and engaged with multiple members of The Record Eagle staff on this matter. As of the writing of this memo, it is our understanding that The Record Eagle is removing the story from digital publications and are considering a response in print tomorrow. Unfortunately, regardless of the response by the Record Eagle, this article has already gone to print and had been posted online. The misinformation is going to be an issue which will undoubtedly impact all of our respective organizations.

Here is what is known to be true:

1. The DNR has authored language that says "...contractors and others have the authority and thus permission to transport road killed deer for proper disposal in landfills or other lands with permission of the landowner."
2. The DNR is interpreting the public road right-of-way as an easement where an adjacent property owner, public or private, can revoke permissions or otherwise obstruct road maintenance activities. Road maintenance authority within the public road right-of-way is codified in several MCLs.
3. This boilerplate statement by the DNR does not address the requirements set forth in the Natural Resources and Environmental Protection Act (Act 451 of 1994) or the DNR's Wildlife Conservation Order or exempt road agencies or their employees from the responsibilities thereto. Any DNR officer may interpret previously allowed road commission activities as a violation of either of these mandates and cite/fine the organization or employee.
4. This boilerplate statement by the DNR does not address the requirements of property owners, public or private, set forth by EGLE regarding surface and groundwater contamination by animal

carcasses. "Permission of the landowner" is not adequate to dispose of roadkill. Significant and additional operational and administrative burdens are incurred by all involved should the DNR's recommendation for using property outside of the road right-of-way be followed and EGLEs requirements be adhered to. Following the DNR's recommendation without consideration of EGLE requirements may result in the GTCRC, its employees, and accommodating property owner(s) being cited/fined.

5. This boilerplate statement by the DNR does not address the requirements of property owners set forth by the requirements of property owners, public or private, set forth in the Bodies of Dead Animals Act (BODA) regarding carcasses other than cervidae (deer). Deer are not the only large carcasses removed from the path of travel by the GTCRC. Following the DNR's recommendation without consideration of BODA requirements may result in the GTCRC, its employees, and accommodating property owners being cited/fined.

A significant misquote exists in the article. The article reads "It begin (sic) as matter of funding." The quote provided to The Record Eagle explained that this matter did not begin as a matter of funding. It should be noted, however, that if the DNR does not permit the road commission to return to old practices and infers that the GTCRC should incur new and additional administrative, operational, and cost burdens... funding will become an issue in short order.

Garfield Township Responses

April 2023

6.a.

Nature of Call	GT-Garfield	Total
10-Chest Pain (Non-Traumatic)	13	13
11-Choking	3	3
12-Convulsions/Seizures	10	10
13-Diabetic Problems	1	1
17-Falls	60	60
18-Headache	1	1
19-Heart Problems / A.I.C.D.	5	5
1-Abdominal Pain/Problems	8	8
21-Hemorrhage/Lacerations	11	11
23-Overdose / Poisoning (Ingestion)	5	5
24-Pregnancy/Childbirth/Miscarriage	1	1
25-Psychiatric/ Abnormal Behavior/Suicide At	5	5
26-Sick Person (Specific Diagnosis)	59	59
28-Stroke (CVA)	8	8
29-Traffic/Transportation/Accidents	18	18
2-Allergies (Reactions)/Envenomations (Sting:	2	2
30-Traumatic Injuries (Specific)	4	4
31-Unconscious/Fainting (Near)	13	13
32-Unknown Problem (Man Down)	8	8
4-Assault/Sexual Assault	2	2
5-Back Pain (Non-traumatic or Non Recent Tra	1	1
6-Breathing Problems	26	26
7-Burns (Scalds) /Explosion	2	2
9-Cardiac or Respiratory Arrest/Death	2	2
Total	268	268

Call Disposition	GT-Garfield	Total
Transport	185	185
Refusal	44	44
Cancelled	39	39
Total	268	268

Response Priority	GT-Garfield	Total
P-1 Emergency ALS	65	65
P-2 Emergency BLS	165	165
P-3 Non-Emergent	37	37
P-18 Stage	1	1
Total	268	268

Garfield Twp April 2023 RT

Priority 1				
Response Time Minutes	Call Count	Cumulative Call Count	Percentage	Cumulative Percentage
00:00:00 - 00:00:59	4	4	6.15%	6.15%
00:02:00 - 00:02:59	5	9	7.69%	13.85%
00:03:00 - 00:03:59	5	14	7.69%	21.54%
00:04:00 - 00:04:59	10	24	15.38%	36.92%
00:05:00 - 00:05:59	8	32	12.31%	49.23%
00:06:00 - 00:06:59	10	42	15.38%	64.62%
00:07:00 - 00:07:59	5	47	7.69%	72.31%
00:08:00 - 00:08:59	7	54	10.77%	83.08%
00:09:00 - 00:09:59	4	58	6.15%	89.23%
00:10:00 - 00:10:59	1	59	1.54%	90.77%
00:11:00 - 00:11:59	3	62	4.62%	95.38%
00:12:00 - 00:12:59	1	63	1.54%	96.92%
00:13:00 - 00:13:59	1	64	1.54%	98.46%
00:17:00 - 00:17:59	1	65	1.54%	100.00%

Priority 2				
Response Time Minutes	Call Count	Cumulative Call Count	Percentage	Cumulative Percentage
00:00:00 - 00:00:59	23	23	13.53%	13.53%
00:01:00 - 00:01:59	6	29	3.53%	17.06%
00:02:00 - 00:02:59	11	40	6.47%	23.53%
00:03:00 - 00:03:59	13	53	7.65%	31.18%
00:04:00 - 00:04:59	13	66	7.65%	38.82%
00:05:00 - 00:05:59	9	75	5.29%	44.12%
00:06:00 - 00:06:59	20	95	11.76%	55.88%
00:07:00 - 00:07:59	18	113	10.59%	66.47%
00:08:00 - 00:08:59	15	128	8.82%	75.29%
00:09:00 - 00:09:59	9	137	5.29%	80.59%
00:10:00 - 00:10:59	18	155	10.59%	91.18%
00:11:00 - 00:11:59	3	158	1.76%	92.94%
00:12:00 - 00:12:59	5	163	2.94%	95.88%
00:13:00 - 00:13:59	4	167	2.35%	98.24%
00:14:00 - 00:14:59	1	168	0.59%	98.82%
00:15:00 - 00:15:59	2	170	1.18%	100.00%

CHARTER TOWNSHIP OF GARFIELD
COUNTY OF GRAND TRAVERSE, MICHIGAN

RESOLUTION 2023-15-T

RESOLUTION ADOPTING A FINAL PROJECT PLANNING DOCUMENT FOR WATER SYSTEM
IMPROVEMENTS AND DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE

WHEREAS, the *Charter Township of Garfield* recognizes the need to make improvements to its existing water treatment and distribution system; and

WHEREAS, the *Charter Township of Garfield* authorized *Gourdie Fraser, Inc.* to prepare a Project Plan, which recommends the construction of upgrades to the Township water supply, storage and distribution including installation of a booster station, construction of groundwater storage tank, watermain extensions, upgrades to Pressure Reducing Stations and relocation of a water storage tank.; and

WHEREAS, said Project Plan was presented at a Public Meeting held on May 23rd 2023, and all public comments have been considered and addressed;

NOW THEREFORE BE IT RESOLVED, that the *Charter Township of Garfield* formally adopts said Project Plan and agrees to implement the selected alternatives (Alternatives No. 3) identified in the Project Plan.

BE IT FURTHER RESOLVED, that the *Township Supervisor*, a position currently held by *Chuck Korn*, is designated as the authorized representative for all activities associated with the project referenced above, including the submittal of said Project Plan as the first step in applying to the State of Michigan for a Drinking Water State Revolving Fund Loan to assist in the implementation of the selected alternative.

Moved:

Supported:

Ayes:

Nays:

Absent and Excused:

The Chairman, Chuck Korn, declared the motion carried and Resolution 2023-15-T adopted this 23rd day of May 2023.

Chuck Korn, Supervisor
Charter Township of Garfield

CERTIFICATE

I, Lanie McManus, Clerk of the Charter Township of Garfield, do hereby certify that the above is a true and correct copy of Resolution 2023-15-T which was adopted by the Township Board of the Charter Township of Garfield on the 23rd day of May 2023.

Dated: _____

Lanie McManus, Clerk
Charter Township of Garfield

Charter Township of Garfield, Michigan

DWSRF Project Plan Overview



The **CHARTER TOWNSHIP of GARFIELD**
Grand Traverse County, Michigan



Jennifer Graham, PE - Project Manager

Background

The Charter Township of Garfield as an owner and operator of municipal water system must adhere to the Michigan Safe Drinking Water Act (SDWA) Part 399 - enforced by the Michigan Department of Environment, Great Lakes and Energy (EGLE).

To comply the Township is required to regularly monitor, sample, and report to the State on essential items, including:

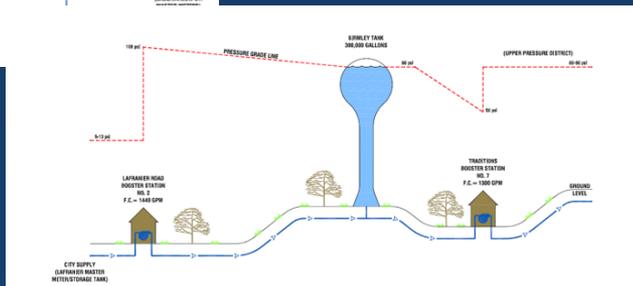
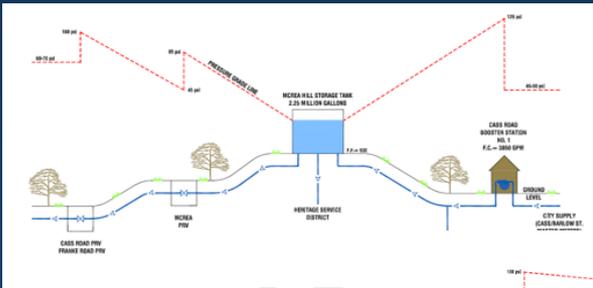
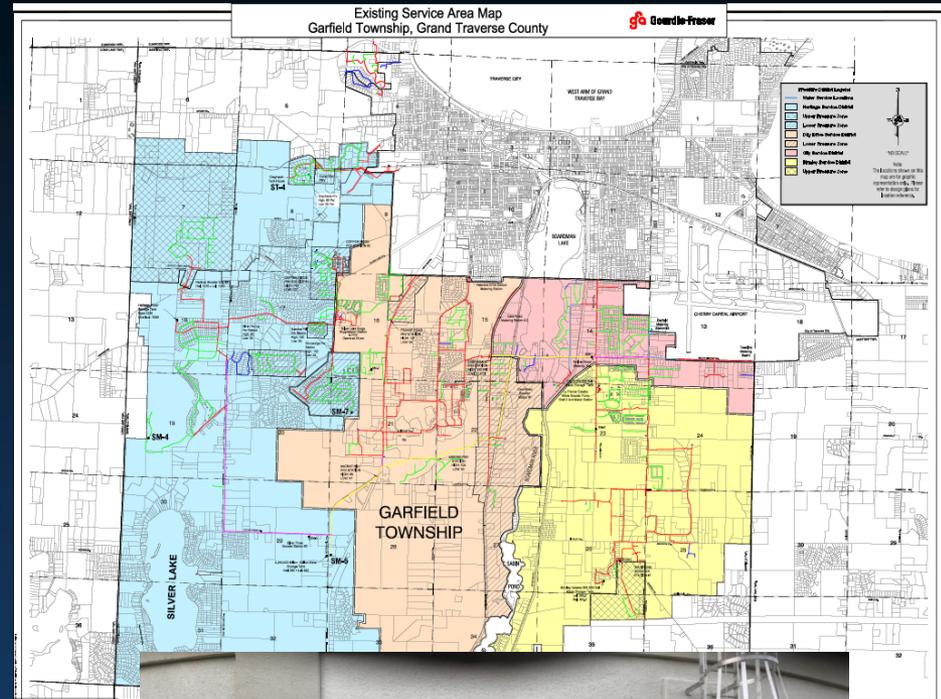
- Water Reliability Study and Capital Improvement Plan: a multi-year schedule of projects and funding to plan and track infrastructure needs. Due every 5 years.
 - ✓ Last updated by GFA in 2010, 2015 and 2020
- Asset Management and Rate Studies: Assessment of existing infrastructure conditions and evaluation of rates. Required for communities with 1,000+ population.
 - ✓ Completed by DPW Staff in January 2021
- Lead and Copper Rules: Implemented by the State of Michigan in June 2018 to protect public health by minimizing lead and copper levels in drinking water.
 - ✓ Inventory Completed by DPW Staff January 1, 2020
- Water Rate Analysis:
 - ✓ Completed and to be discussed at June 2023 Board Meeting



Infrastructure

The existing water system is separated into four (4) Service Districts consisting of three (3) water storage tanks, six (6) booster stations, thirteen (13) pressure reducing valve stations and a network of water distribution lines. Currently there are 3,125 customers (10,250 REUs) that are connected to the Township's water system. This infrastructure provides the domestic and fire water supply and pressures to the entire service area.

Water is distributed to users located within the four (4) Service Districts by infrastructure owned by the Township and operations / Maintenance contracted through the GTC DPW

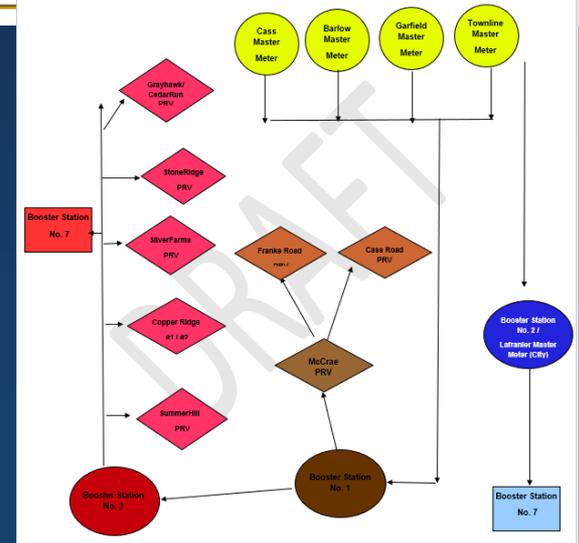


Supply, Storage, and Distribution

- **Supply:** The sole water source is supplied by the City of Traverse City through a Bulk Water Agreement regulated by the two (2) governmental entities allotting for a maximum day use of 5 MGD to Garfield Township. Supply is treated surface water with chlorine and fluoride addition.
- **Storage:** Total of three (3) storage tanks, one (1) below ground tank with 2.25 M gallon storage, one (1) elevated tank with 300,000 gallon of storage, and one (1) above ground storage tank with 1.1 M gallon storage.
- **Distribution:** This infrastructure is comprised of six (6) booster stations, twelve (12) reducing valve stations and approximately 76 miles of distribution piping. Booster stations pump water to outlying districts at higher elevations and water is fed back down towards the City of Traverse City to some extent through pressure reducing valves (PRVs). Most of the system piping is composed of ductile iron, PVC, or polyethylene typically ranging in size from 6-inch to 20-inch. The distributions system is comprised of roughly 73 miles of distribution

WATER INFRASTRUCTURE			
Wells			
N/A			
Water Booster Stations			
#1 Cass Rd.	BS #1	3201	2914 Cass Rd, Traverse City, MI 49684
#2 LaFranier Rd.	BS #2	3202	2932 LaFranier Rd, Traverse City, MI 49684
#3 Silver Pines Rd.	BS #3	3203	4351 Silver Pines Rd, Traverse City, MI 49684
#4 Red Drive - Abandoned	BS #4	3204	5067 Red Dr, Traverse City, MI 49684
#5 Herkner Rd.	BS #5	3205	5452 Eaglehurst Rd, Traverse City, MI 49685
#6 Greyhawk - Abandoned	BS #6	3206	4255 Cedar Run Rd, Traverse City, MI 49684
#7 Traditions	BS #7		1319 Alexander Dr, Traverse City, MI 49636
#8 Crown	BS #8		2400 East Crown Drive
Storage Tanks			
McCrea Ground Storage Tank		3301	1273 McCrae Hill Rd, Traverse City, MI 49685
Heritage Estates Standpipe - Abandoned		3303	5600 Heritage Way, Traverse City, MI 49685
Birmley Elevated Tank		3302	1130 Birmley Estates Dr, Traverse City, MI 49685
Cedar Run Storage Tank			5266 Cedar Run Road, Traverse City MI 49685
Pneumatic Tanks			
Herkner Pressure Tank			Herkner Rd, Traverse City, MI 49685
Grayhawk - Pressure Tank - Abandoned		3304	4766 Grayhawk Blvd #A, Traverse City, MI 49684
Red Drive Pressure Tank - Abandoned			5067 Red Dr, Traverse City, MI 49684
Pressure Reducing Stations			
Frankle Road PRV			Division St, Traverse City, MI 49684
Cass Road PRV			W South Airport Rd, Traverse City, MI 49684
McCrea PRV			McCrae Hill Rd, Traverse City, MI 49684
Arbors PRV			
StoneRidge PRV			
Copper Ridge PRV #1			Eastern Sky Dr, Traverse City, MI 49684
Copper Ridge PRV #2			Copper Ridge Dr, Traverse City, MI 49684
SilverLake PRV / Surge Suppression Station			3733 Silver Lake Road
SilverFarms PRV			Silver Farms Ln, Traverse City, MI 49684
SummerHill PRV			Wyatt Rd, Traverse City, MI 49684
Grayhawk PRV			Grayhawk Blvd, Traverse City, MI 49684
Master Meters			
Master Water Meter #1	MM #1	-	1567 S. Airport Rd, Traverse City, MI 49686
Master Water Meter #2	MM #2	-	2932 LaFranier Rd, Traverse City, MI 49684
Master Water Meter #3 (Bill Marsh)	MM #3	-	1653 S. Garfield, Traverse City, MI 49686
Master Water Meter #4 - Abandoned	MM #4	-	5067 Red Dr, Traverse City, MI 49684

Page 1



Customer Demands

DEMAND

The Townships' infrastructure is constantly evaluated to ensure it is capable to meet existing and future demands, both domestic and fire flow.

- The current average daily water demand is approximately 1,750,000 gallons per day / 200 gallons per customer day
- The current maximum daily water demand is approximately 4,862,500 gallons per day
- peaking factor or ratio maximum to average daily demand is 2.8
- Available fire flow for the community ranges from 1,000 to 4,000 GPM

CAPACITY

- The firm capacity is the amount of water the system can produce with the largest pump (booster) out of service.
- The supply are limited by each booster stations firm capacity in each Service District. Booster Station #1 and #3 will need upgrades in capacity in the next 10 years
- Day Drive and Birmley / West Side Upper Districts are the limiting factor with storage deficiencies and are at / near capacity in the next five (5) years.

Year	2017	2018	2019	2020	2021	2032*	2042*
Day Drive District	4,295	4,310	4,339	4,362	4,393	4,850	5,462
Birmley District	2,030	2,285	2,364	2,457	2,483	2,741	3,087
City District	1,744	1,748	1,749	1,750	1,757	1,802	1,857
West End District	1,519	1,532	1,574	1,591	1,615	1,863	2,098
Total REUs	9,588	9,875	10,027	10,160	10,248	12,503	14,930
% Annual Increase	2.99%	1.54%	1.33%	0.86%	1.97%	2.0%	2.0%

Service Area	Existing F.C. ² (gpm)	Existing F.C. (gpd)	MDD (gpd) ¹	PID (gpm) ³	PID (gpd)	Excess F.C. ⁴	Available REUs ⁵
West Side Service District							
BS #3 (includes BS #5)	2,150	3,086,000	2,040,000	490	705,600	1,056,000	793
Lower Pressure District (BS#3 Only)	N/A	N/A	1,846,000	330	474,480	N/A	N/A
Upper Pressure District (BS#5 Only)	750	1,080,000	255,000	161	231,120	825,000	382
Day Drive Service District							
BS #1 (includes BS#3 & Veterans MM)	3,850	5,544,000	3,424,092	N/A	N/A	2,119,908	3817
BS #1 (excludes BS#3 & Veterans MM)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Birmley Service District							
BS #2 (includes BS #7)	1,440	2,073,600	1,358,000	N/A	N/A	715,600	1759
Lower Pressure District (BS#2 Only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Upper Pressure District (BS#7 Only)	1,300	1,872,000	N/A	48	86,400	1,803,600	626
City Service District							
Cass, Garfield, Townline & Barlow MM (excludes BS#1)	=	N/A	1,095,004	N/A	N/A	N/A	N/A
City Supply							
	N/A	5,000,000	4,862,500	N/A	N/A	137,500	248



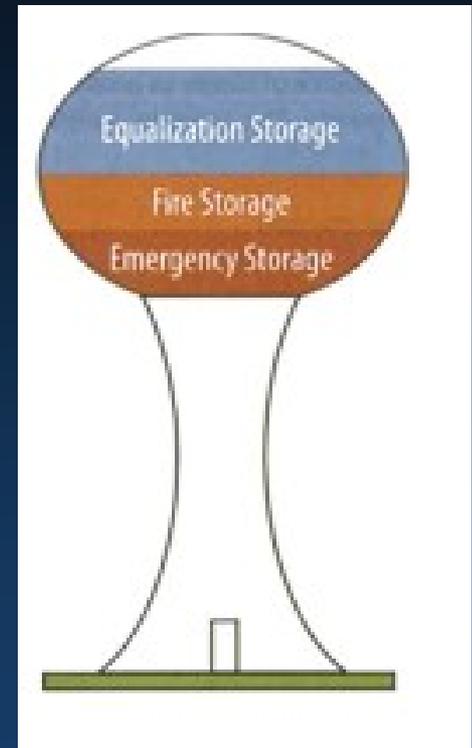
Infrastructure Evaluation

Water Storage is a requirement for all systems that service more than 150 units to meet peak hour, fire suppression, and emergency demands. This storage is typically provided by one of the following two methods:

- ✓ *Gravity Storage* – Elevated or ground-based tank in which the hydraulic grade line is controlled by gravity
- ✓ *Pumped Storage* – Booster pumps control the hydraulic grade line and receive water from a ground storage tank (suction side)

Supply is requirement for all system per the SDWA to ensure that the firm capacity of the system must be capable to meet the maximum demands, meaning the largest booster pump taken offline.

Distribution criteria for determining system problems include the need to accommodate peak hourly flows while maintaining pressures in excess of 35 psi, and the need to provide fire flows during maximum day water demands while maintaining at least 20 psi in the system.



DWSRF

The Michigan Drinking Water Revolving Fund is intended to help communities maintain compliance with the Safe Drinking Water Act and ensure that feasible alternatives to the project were properly evaluated. To initiate this process, the Township was required to submit an Engineering Project Plan for review and input by the Township, Local and State Officials, and the Public. The report as prepared by GFA addressed the following:

- Description and Need for the Project including impact to water quality
- Alternatives and recommended Alternative including costs
- Project financing and costs to users
- Any social and environmental impacts as a result of the project and measures to mitigate

Drinking Water State Revolving Fund (DWSRF) - Water

Water System Infrastructure

20 or 30 Years

20 Year: 1.875%

30 Year: 2.125%

- 49% of funds available for Grant
- Low interest loan
- Loan term repayment period options
- Subject to Davis Bacon, AIS, & BABA construction compliance
- Potential rate increases necessary

Notice of Intent Due for FY 2024
November 1, 2022



Water Funds Capital Improvement Plan

Garfield Township's critical infrastructure has continued to be well maintained by the DPW, though to ensure reliability and adequate capacity to accommodate existing and future growth demands, improvement projects are required. The following list of projects have been identified in the Capital Improvement Plans and are essential / critical water infrastructure upgrades to be funded by the Township.

Day Drive District

- Expansion of McCrae Tank (additional cell)
- Upgrades to increase capacity of Booster Station #1 and #3
- Connection to Horizon Outlet Creekside for redundancy

West Side Service District

- PRV Replacements (McCrae PRV and Stone Ridge PRV)
- Connection to Panorama for redundancy
- Booster Station at Cedar Run / Abandonment of BS#5

Birmley Service District

- Water Storage Tank / Infrastructure Expansion
 - Nearing 150 REUS at Traditions / Ashland

Overall System Reliability

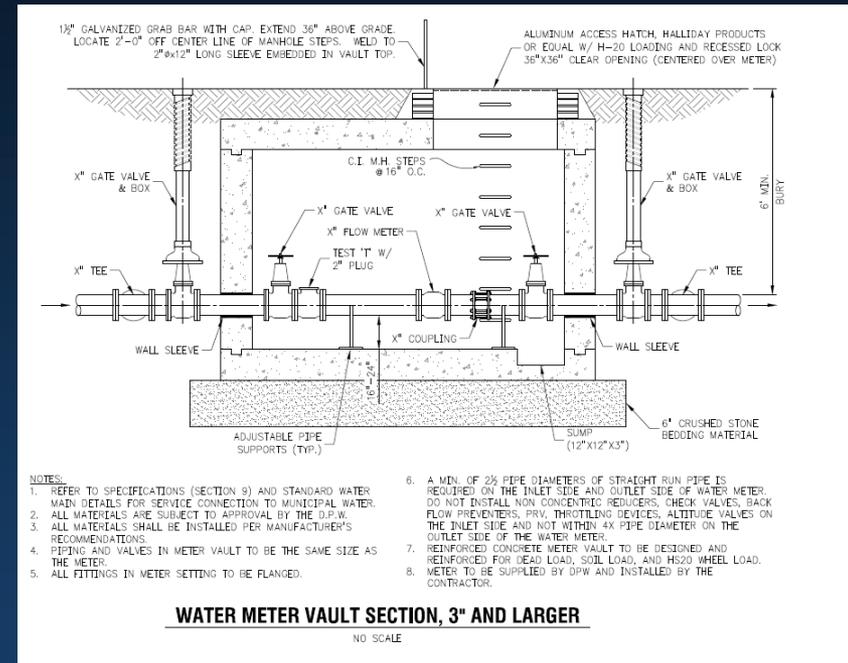
- Master Meter Upgrades with SCADA
- Water Reliability Study
- Water Tank Inspections



Water System - Supply

The Township water system is fully metered for all their customers and at all mutual connections between the Township and the City of Traverse City. These connection points where the Township received their entire water source is monitored by Master Meters and is the only mechanism in place that both entities use for measuring the amount of water Garfield Township consumes and the City Bills for.

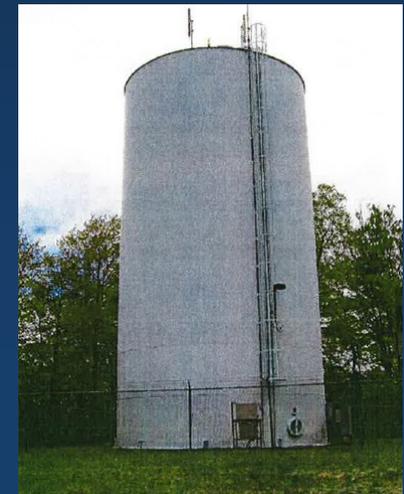
The Master Meters are read monthly providing average daily and maximum average daily readings only. An empirical multiplier, based upon observations of total water treated and supplied to all the City customers, is applied to these values to derive a maximum daily demand for Garfield Township and what they are billed for. To achieve more accurate water usage readings, upgrades are recommended to integrate these meters with the DPWs' regional SCADA system for instant/daily monitoring to provide more accurate readings and trending this has not been done to date due to excessive costs.



Water System - Storage

Increasing storage capacity will provide protection of the existing water source and ensure adequate capacity to meet existing and future customer demands. The Birmley and West Side Upper Pressure Districts currently are limited to 150 customers and need to provide storage. In addition, Day Drive District due to growth is nearing storage capacity to meet maximum day demands including emergency and fire. The following list of projects have been identified in the Capital Improvement Plans and are essential / critical water infrastructure upgrades to be funded by the Township.

- Addition of 2.25 Million Gallon Cell at McCrae
- Construction of Booster Station adjacent to Cedar Run Tank (final phase of consolidation project)
- Relocation of Heritage Tank near Booster Station #7 to provide temporary relief until 30" watermain is extended



Water System - Infrastructure Upgrades / Main

Watermain Extensions /Looping : The system is continually analyzed for existing and future conditions that can accommodate peak hourly flows while maintaining pressures in excess of 35 psi, and ability to provide fire flows during maximum day water demands while maintaining at least 20 psi in the system. To provide a completely redundant system there are various looping and connections points to achieve this. The following watermain extension projects would complete a continuous transmission main loop around the Township's four (4) Service Districts. The CIP identified the following:

Day Drive & West Side Districts:

- *Panorama Subdivision Watermain Loop*
- *Horizon Outlet Center Watermain Loop*
- *Grand Traverse Crossings Watermain Loop*
- *Veterans Drive to Lowe's Watermain Loop*

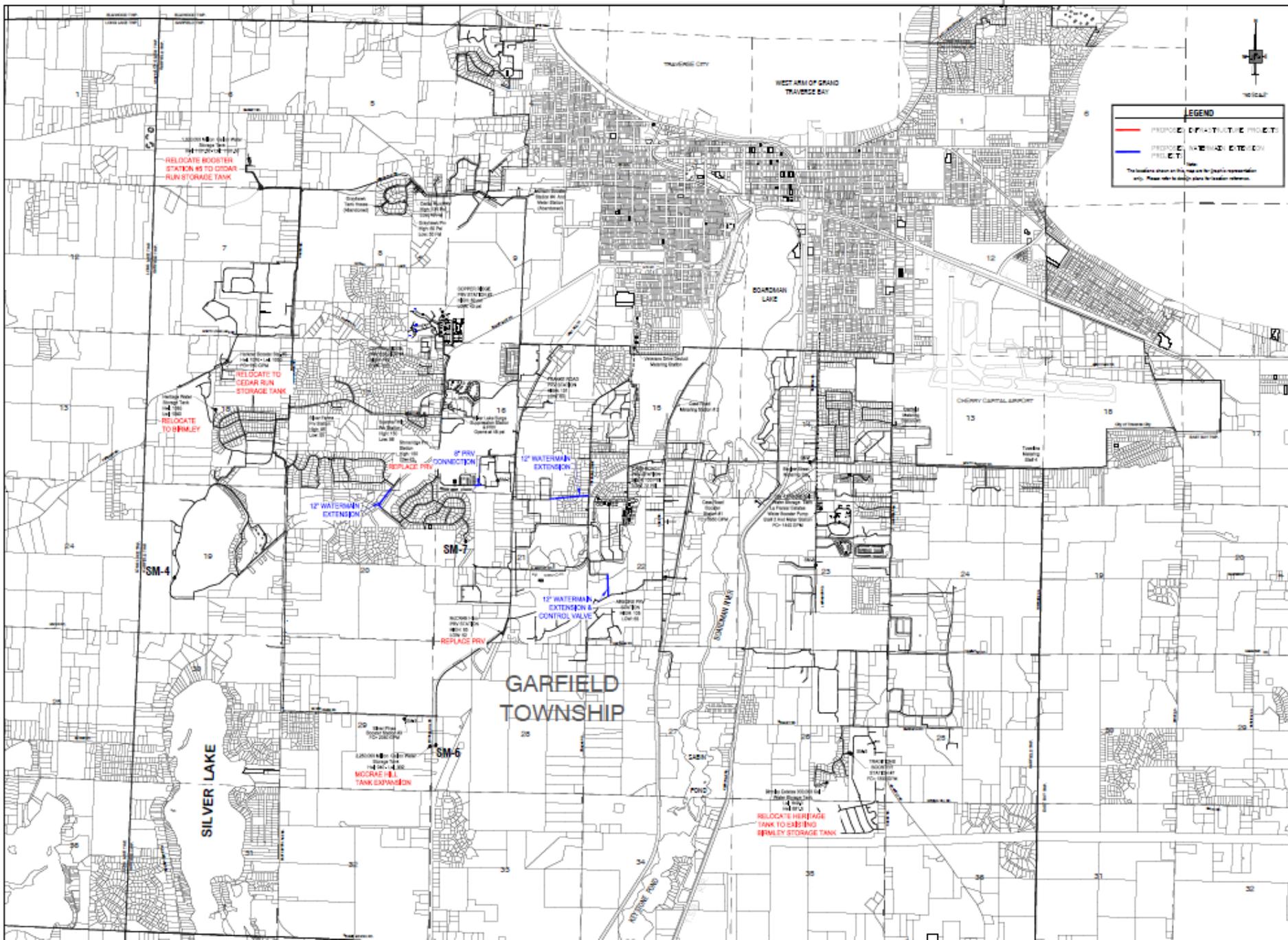
Infrastructure Upgrades: Some of the critical infrastructure in the system has been identified at / near its life expectancy and in need of replacement as they showing signs of deuteriation. Furthermore, adjustments to their operations are needed to provide better pressures and flows to the customers which can be achieved with newer technology. The CIP identified the following:

Day Drive & West Side Districts:

- *Mc Crae Hill PRV replacement*
- *Stone Ridge PRV replacement*



Proposed Garfield Township Water System



Need for the Project

Residential needs: The Township has committed to providing quality water service to its' customers for over 40 years. The upgrades are necessary to ensure continued reliable service to the customers. Upgrades to the storage tanks and booster station will avoid the potential for future water quality issues and meet state and federal regulations.

Overall municipal impact: The infrastructure identified to be replaced and/ or upgraded are to provide additional system capacity and improve redundancy in the system. This infrastructure is considered critical and are necessary to properly treat, store and distribute quality / quantity water to customers. Continued operation without the upgrades will place further dependency on pumping facilities thus increasing potential for wear/tear and operational costs, placement of additional demand on upstream storage facilities thus impacting those service areas, and most importantly lack of available water supply in the event of emergencies thus leaving the user vulnerable.

Overall environmental impact/water quality: The proposed projects will ensure continued compliance with drinking water standards and reduce the risk of any potential non-compliance to meet existing and future customer demands. Upgrades will ensure improved reliability and redundancy in the system.



Alternatives Evaluated – Supply

Three (3) alternatives were presented and Alternative No. 3 is recommended.

- Alternative No. 1: The “No Action” alternative would maintain current system operations with no improvements. There is a cost associated with the “No Action” alternative, although it is difficult to quantify. The "No Action" alternative would result in limitations on serving existing needs within the Township since the components of the system identified for improvements are both at, or near, available capacity and/or expected useful life
- Alternative No. 2: The existing water system is performing as well as it can and additional staffing, staff training, and operational changes are not likely to improve the performance of the system because the primary concerns are related to the capacity of the infrastructure. Therefore, this alternative was not considered further.
- Alternative No. 3, Option 1 is the most economical and effective to provide reliability and redundancy. It is preferred alternative to optimize existing facilities.

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Existing Infrastructure	N/A
Alternative 3	Master Meter / SCADA Upgrades	\$158,600.00



Alternatives Evaluated – Storage

Three (3) alternatives were presented and Alternative No. 3 is recommended.

- Alternative No. 1: The “No Action” alternative would maintain current system operations with no improvements. There is a cost associated with the “No Action” alternative, although it is difficult to quantify. The “No Action” alternative would result in limitations on serving existing needs within the Township since the components of the system identified for improvements are both at, or near, available capacity and/or expected useful life
- Alternative No. 2: The existing water system is performing as well as it can and additional staffing, staff training, and operational changes are not likely to improve the performance of the system because the primary concerns are related to the capacity of the infrastructure. Therefore, this alternative was not considered further.
- Alternative No. 3, Option 1 is the most economical and effective to provide reliability and redundancy. It is preferred alternative to optimize existing facilities.

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Facilities	N/A
Alternative 3	Storage Tank Expansion / Relocation & Booster Station	\$ 14,387,300.00



Alternatives Evaluated – Watermain / LSL

Three (3) alternatives were presented and Alternative No. 3 is recommended.

- Alternative No. 1: The “No Action” alternative would maintain current system operations with no improvements. There is a cost associated with the “No Action” alternative, although it is difficult to quantify. The "No Action" alternative would result in limitations on serving existing needs within the Township since the components of the system identified for improvements are both at, or near, available capacity and/or expected useful life
- Alternative No. 2: The existing water system is performing as well as it can and additional staffing, staff training, and operational changes are not likely to improve the performance of the system because the primary concerns are related to the capacity of the infrastructure. Therefore, this alternative was not considered further.
- Alternative No. 3 is the most economical and effective to provide reliability and redundancy. It is preferred alternative to optimize existing facilities.

No other viable alternatives were reviewed as they were not economically feasible due to existing piping and site configurations.

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Existing Facilities	N/A
Alternative 3	1: West Side & Day Drive PRV Replacements	\$3,333,000.00
	2: West Side & Day Drive Watermain Extensions	\$1,402,000.00
	Alternative 2 Project Total	\$4,735,000.00



Rate Structure

The rate structure needs to ensure an adequate revenue stream to maintain the system and cover expenses, including:

- ❖ Annual Operations & Maintenance – materials, chemicals, labor, admin, engineering, etc
- ❖ Short-Lived Asset Replacement - 25 years or less
- ❖ Outstanding Debt – vehicle / large equipment, loans, etc
- ❖ Capital Improvement Fund
- ❖ **NEW: State Regulation Changes – Lead Service Line Replacement Fund**

The Township has an established user rate (to include ready-to-serve) based upon REU and consumption (per 748 cft used).



Costs

- Project Costs: The table below indicates the total project costs for the recommended alternatives if implemented. This cost includes engineering, construction and contingencies.
- Financing: The Township is intending on working with the DWSRF to obtain a loan with possible grant for this project. The current terms available are 20 year @ 1.875% or 30 year @ 2.125%
- Costs to Users: The user charge system is currently in place and is designed to provide revenue to pay for O & M costs and debt retirement. This user charge is reflective of maintaining a current monthly charge of \$11.50. It is estimated that this project would add an additional \$4.10 increase in base charge per REU . Ultimately the debt incurred, along with the O & M costs expected under each alternative will dictate the annual cost to the system.

Project	Construction Cost	Contingency (25%)	Legal, Admin, Financial	Engineering Services	Total
Supply	\$105,000.00	\$26,300.00	\$6,300.00	\$21,000.00	\$158,600.00
Storage	\$7,486,500.00	\$1,871,600.00	\$449,200.00	\$1,497,300.00	\$11,304,600.00
Distribution #1	\$4,248,800.00	\$1,062,200.00	\$254,900.00	\$849,800.00	\$6,415,700.00
Distribution #2	\$928,500.00	\$232,100.00	\$55,700.00	\$185,700.00	\$1,402,000.00
Total	\$12,768,800.00	\$3,192,200.00	\$766,100.00	\$2,553,800.00	\$19,280,900.00



Project Impacts and Mitigation

Impacts:

Overall the impacts as a result of the project are negligible. There is a greater potential long term impact if they were NOT implemented.

- Environmental: Long term benefit to ensure reliable and quality supply of water. No impacts to public, endangered species, or environmental sensitive areas. All properties are within existing Township owned properties or public ROW
- Construction: Temporary and manageable.
- Operational: Temporary and manageable
- Social: Increase of user rates on customers.

Mitigation:

- Environmental: Long term to ensure reliable and quality water is provided to the customers
- Construction: Compliance and oversight to ensure compliance with regulatory agencies. SESC measures and construction oversight
- Operational: Staging and Coordination between Staff and Contractor



2024 Application Timeline

Below is a table of 2024 (Quarter 3 assumed) DWSRF Funding Requirements Timeline

	Application Item	Due Date
★	Intent to Apply	November 1, 2022
★	Pre-Application Meeting	February-March 2023
	Environmental Assessment Published	February 6, 2024
★	Part I and Part II Application (Engineering Project Plan)	June 1, 2023
	Final Plans & Specs Due (All Planning Documents)	March 7, 2024
	FNSI Clearance (Final Plans & Specs Approved) Bid Ad Posted no later than:	March 7, 2024
	Part III Application Bid Data Submittal (w/ Tentative Contract Award)	April 15, 2024
	EGLE Order of Approval Issued	May 15, 2024
	Borrowers Pre-Closing w/ MFA	May 28, 2024
	MFA Closing Notice to proceed issued no later than:	June 5, 2024 August 4, 2024



CHARTER TOWNSHIP OF GARFIELD, GRAND TRAVERSE COUNTY

DRINKING WATER REVOLVING FUNDS (SRF) PROJECT PLAN

GFA NO. 22280

DATE: MAY 8, 2023

CHARTER TOWNSHIP OF GARFIELD WATER SYSTEM IMPROVEMENTS



The CHARTER TOWNSHIP *of* GARFIELD
Grand Traverse County, Michigan

Submitted on behalf of the Charter Township of Garfield by:



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1 Executive Summary

The Charter Township of Garfield is seeking funding through the Drinking Water State Revolving Fund (DWSRF) for projects related to the Townships' water supply, storage, distribution, and treatment systems. The proposed projects include improvements to the Township's Master Meters to integrate into SCADA, McCrae Hill Storage Tank Expansion, Birmley Service District Additional Storage Tank, West Side Service District Consolidation Project (Booster Station), PRV Replacements, and construction of watermain loops for redundancy and reliability. The Township provides water services to its residents with a historical average daily demand of 1.75 million gallons per day (MGD). This project is being considered to provide necessary water supply, treatment, storage, and distribution capacity for the Charter Township of Garfield capable of meeting the next 20-30 year projected demands.

The Township is located in the northern part of Grand Traverse County, surrounding the City of Traverse City. The Township is the largest municipality in Northern Lower Michigan by population and was the first of two Townships of the County, organized in 1853.

The purpose of this *Project Plan* is to present the current issues and proposed solutions for the supply, treatment, storage, and distribution infrastructure.

2 Project Background

In an effort to meet various revised state regulatory requirements, improve system reliability, and address aging infrastructure that has reached the end of its useful life, the Charter Township of Garfield is proposing various projects within their Drinking Water System seeking financial assistance for this work through a low-interest rate loan offered by EGLE through the State Revolving Fund. The Project Plan identifies project that will include improvements to water supply, storage, and distribution system on a fiscal year basis.

The Townships' drinking water needs are based on comprehensive review of its water system and other planning information. This Project Plan was developed using the information presented in the following reports:

- Master Plan, 2018
- Water Reliability Studies, 2011, 2017 and 2018
- EGLE Asset Management Plan, June 2019
- Lead and Copper Inventory, DSMI, December 2019

2.1 Study and Service Areas

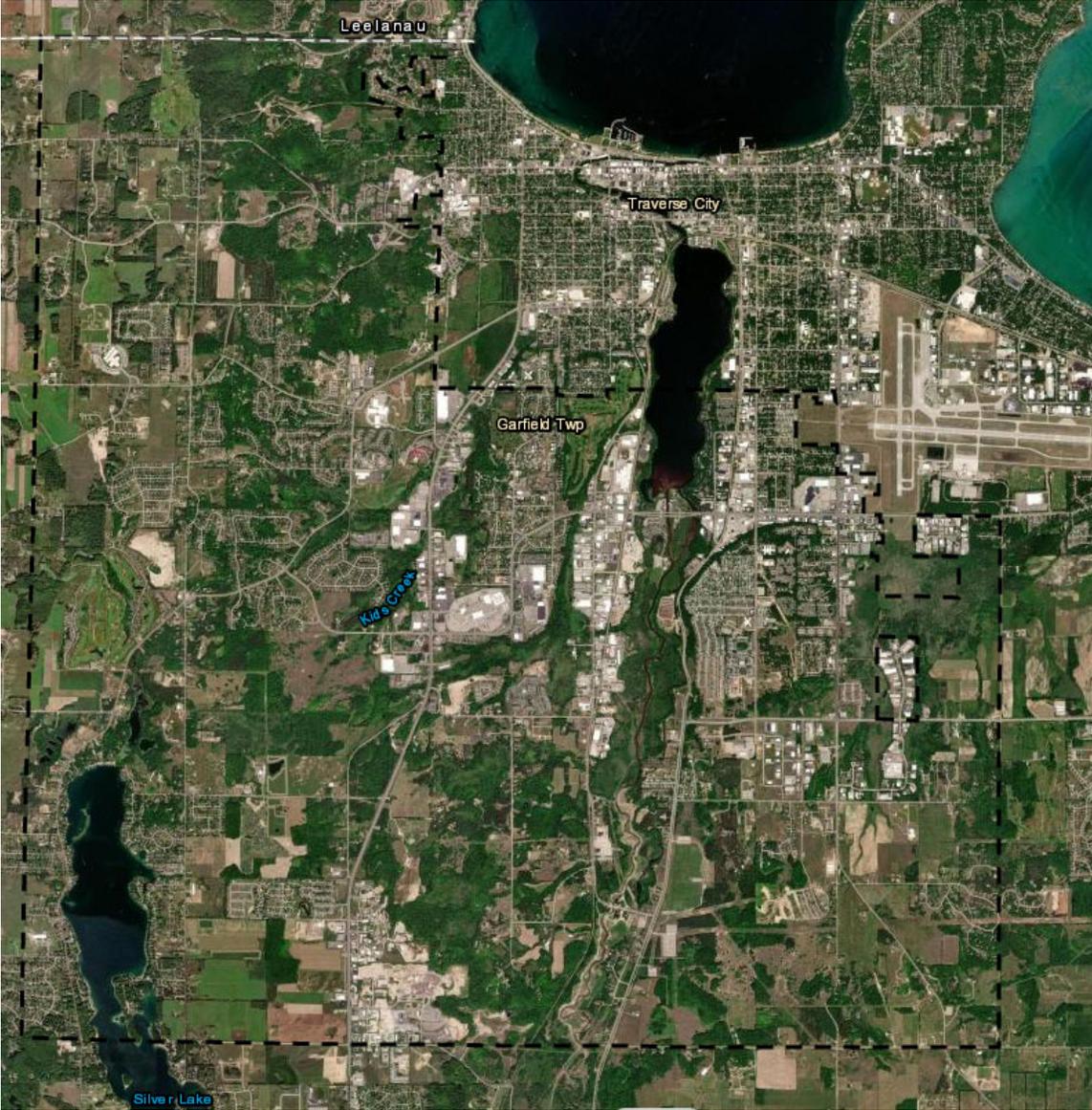
Garfield Township is in Grand Traverse County and includes all land within the township limits depicted in Figure 1 below. The Township is bound by the City of Traverse City, Blair Township, Long Lake Township, Elmwood Township and East Bay Township. The centralized location of Garfield Township in relation to the City of Traverse City has undoubtedly made the township a hub for development within the county.

The study area related to the water system is enclosed by the Township limits of Garfield Township as this is the extent of the Township's water distribution service area, currently. The entire water distribution system included in this *Project Plan* is located within the Township limits.

A detailed map of the study area of the water supply, storage, and distribution system components is included in components, population distribution, and other significant features are included in the Appendix.

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FIGURE 1 – TOWNSHIP BOUNDARY MAP



2.1.1 Land Use in the Study Area

Zoning maps for this area indicate land uses that include agricultural, rural residential, one and two family residential, low density residential, high density residential, mobile home residential, local commercial, office commercial, general commercial, highway commercial, planned shopping, general industrial, limited industrial, park/recreation, Grand Traverse Commons, and conditionally zoned areas. The land use of the study area is vast and covers most zoned land uses recognized by the Township.

2.1.2 Surface and Groundwaters

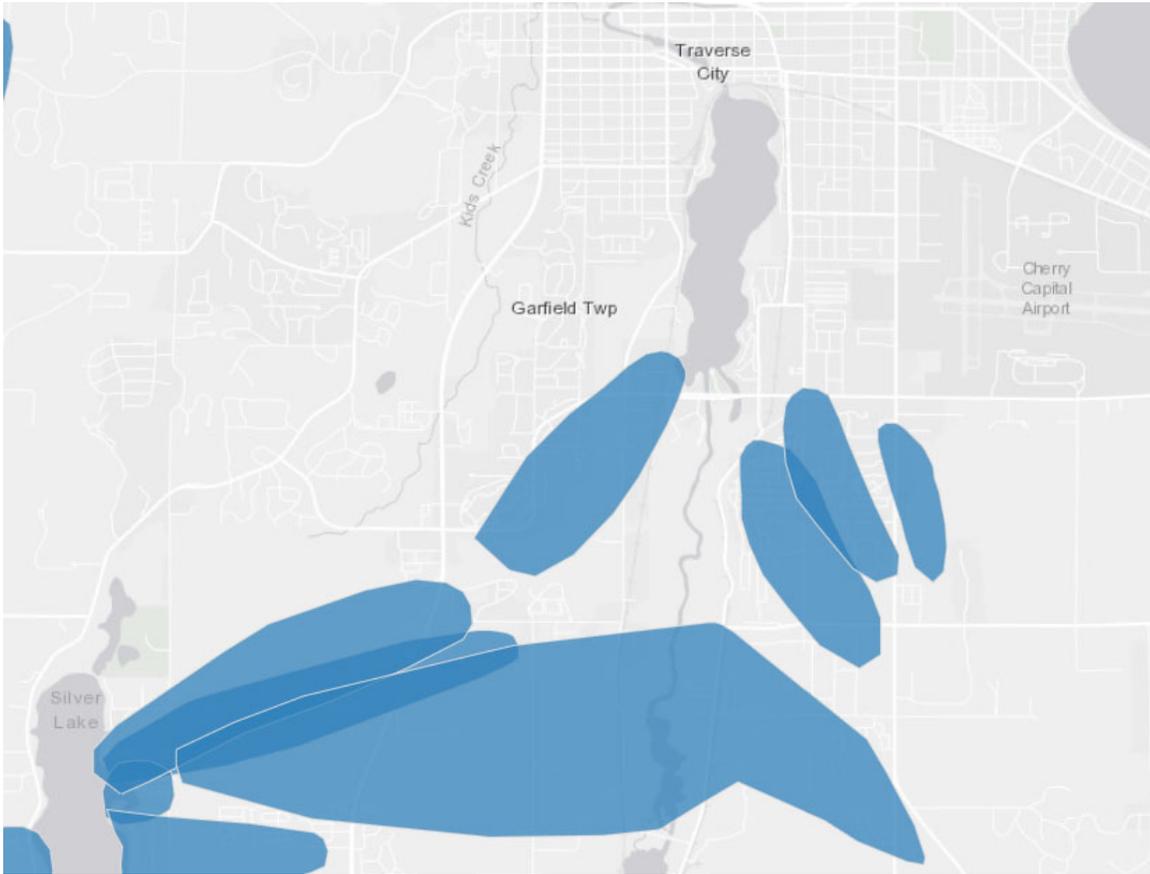
The Boardman River flows through the Township and is the major surface water feature in the Township. There are several smaller creeks and drainage ways that discharge to the Boardman River. The Boardman River originates to the south and is a major stream as it passes through Garfield Township and the City of Traverse City. It flows to the north and discharges to the Grand Traverse Bay in Lake Michigan. Figure 2 provides a map illustration of the surface waters in the Township.

Groundwater aquifers vary in the region. Upper groundwater levels can range from 20' of the ground surfaces to as deep as over 300' below surface, with some areas in the Township experiencing groundwater less than 5' from surface levels. County drains that service the Township maintain groundwater levels by out-letting discharges from drain tiles throughout the Township. The Charter Township of Garfield does not have an established Wellhead Protection Program as their water source is through the City of Traverse City and is surface water. The Township does have some existing WHPP within the Township limits as shown in Figure 3. These are for private Type I / II noncommunity water systems.

FIGURE 2 – SURFACE WATER MAP



FIGURE 3 – WELLHEAD PROTECTION AREA MAP



2.2 Population Data

2.2.1 Study Area Population

To assist in estimating the future water service needs for the Charter Township of Garfield, it is helpful to use population projections as a tool in evaluating initial intermediate and long-term water demands. The following table shows projections for the City Traverse City, Garfield Township, and Grand Traverse County.

FIGURE 4 – POPULATION TRENDS AND PROJECTIONS

	1980	1990	2000	2010	2020	2023	2028	2033	2043
Garfield Township	8,747	10,516	13,840	16,256	19,499	20,692	22,846	25,224	30,748
Annual Growth Rate, %	-	2.02%	3.16%	1.75%	1.99%	2.0%	2.0%	2.0%	2.0%
City of Traverse City	15,516	15,155	14,532	14,674	15,678	16,638	18,369	20,281	24,723
Annual Growth Rate, %	-	-0.23%	-0.41%	0.10%	0.68%	2.0%	2.0%	2.0%	2.0%
Grand Traverse County	54,899	64,273	77,654	86,986	95,238	101,067	111,586	123,201	150,181
Annual Growth Rate, %	-	1.71%	2.08%	1.20%	0.95%	2.0%	2.0%	2.0%	2.0%

The above populations trends detail continued and consistent growth within Garfield Township, with an average annual increase of 2.23% over the last 50 years. From 1980 to 2020 population increased by an annual rate of 1.75% to 3.16%. Comparatively, Grand Traverse County experienced a similar annual increase of around 0.95% to 2.08% from 1980 through 2020. The City of Traverse City showed a more variable growth trend ranging from -0.25% to 0.70% annual growth rate. To reflect historical growth trends and for purposes of predicting water usage for the future, a growth rate of 2.0% annually was assumed as a means to be conservative. The region has been experiencing substantial growth with substantial developments including hotels and apartments that cater to both transient and tourist activities. As of the 2020 U.S. Census, the Traverse City area has reached the population threshold required to become a metropolitan planning organization (MPO).

2.2.2 Residential Equivalent Units (REUs) Served by Water System

A portion of these projected growth trends account for the availability of public water service to existing development and/or parcels in addition to the new development growth. The Future Land Use Map illustrates several potential areas available for large scale development. With respect to time, undeveloped parcels will experience increased growth in direct proportion to the public water service that fronts them, i.e. the longer public water service is made available, the greater the potential for growth and consequently supply, distribution, and storage systems usage. Recently the Township was approached by a neighboring Township for access and connection to municipal water due to existing contamination in the underlying aquifer. The Township was successful in obtaining a C2R2 Grant from EGLE to fund the extension and is now able to provide water service to residents in Long Lake Township. This collaboration and emphasis on access to public infrastructure is reinforced in the Townships’ Master Plan. The Master Plan is located on the Townships’ Website:

http://www.garfield-twp.com/downloads/2018_adopted_garfield_township_master_plan_with_bgnp.pdf

While it is difficult to predict the future, for purposes of predicting water system usage for the future, a growth rate of 2.0% every year has been assumed to be conservative.

The following data in table below represents more detailed information presenting actual REU counts for the current year and applying the average historical growth.

FIGURE 5 – HISTORICAL AND PROJECTED REUs

Year	2017	2018	2019	2020	2021	2032*	2042*
Day Drive District	4,295	4,310	4,339	4,362	4,393	4,850	5,462
Birmley District	2,030	2,285	2,364	2,457	2,483	2,741	3,087
City District	1,744	1,748	1,749	1,750	1,757	1,802	1,857
West End District	1,519	1,532	1,574	1,591	1,615	1,863	2,098
Total REUs	9,588	9,875	10,027	10,160	10,248	12,503	14,930
% Annual Increase	2.99%	1.54%	1.33%	0.86%	1.97%	2.0%	2.0%

2.3 Existing Environment Evaluation

2.3.1 Cultural Resources

The Charter Township of Garfield surrounds several governmental and institutional entities including the City of Traverse City, and Northern Michigan College that are an integral part of the community fabric. As the Township continues to evolve into a regional service provider and shopping destination, it seeks to balance development pressures and accompanying utility expansion with agricultural and natural resource preservation.

From the National Register of Historic Places, there is one (1) historical listing located within the Charter Township of Garfield boundaries. The “Northern Michigan Asylum” or more commonly known as the Grand Traverse Commons is listed as a historical place that is located within the boundaries of both the Township and Traverse City. Seven (7) Historic Places were located within the City of Traverse City, including the Grand Traverse Commons. Due to location of historical facilities, none of these properties will be affected by this project proposal.

Per Michigan Department of Environment, Great Lakes, and Energy (EGLE), the Michigan State Historic Preservation Office (SHPO) and the Tribal Historic Preservation Office (THPO) are not required to be contacted by the Township regarding the proposed *Project Plan*.

The list of National Natural Landmarks in Michigan, from EGLE DWSRF forms and guidance webpage, was assessed and there are not any listed landmarks that could be impacted by this proposed project and construction.

The proposed project does involve elevated storage tanks, though the elevated tank or wildlife attractants in not in the vicinity of an airport. The Federal Aviation Administration, therefore, does not need to be consulted for this project.

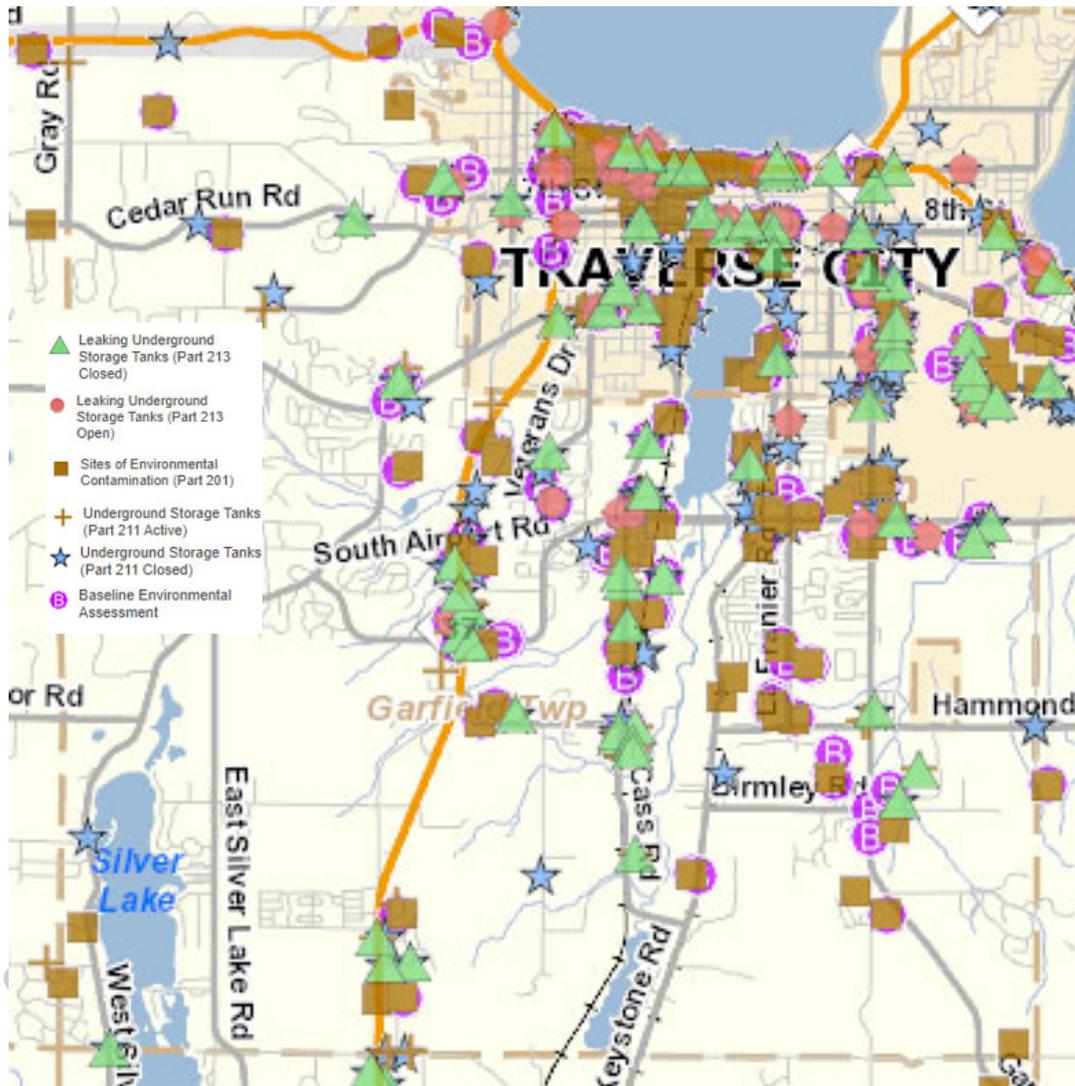
2.3.2 Air Quality

No changes in air quality stemming from primary or secondary development from this project are anticipated. Any air quality issues associated with this project will be temporary in nature and limited to the time of construction.

The proposed project will not impact the future air quality of the Township. The project will not contribute to direct residential or commercial growth that may be facilitated by the project. The planning area has no heavy industries and does not contribute any adverse elements to pollute or degrade air quality.

There are 43 leaking underground storage tanks, 13 Part 201 contaminated sites, and no U.S. EPA Superfund sites in the Water System Service Area, including those located in Garfield Township. An illustration of these locations is shown below, and the actual sites are provided in the Appendix.

FIGURE 6 – EGLE ENVIRONMENTAL SITE LOCATION MAP



2.3.3 Wetlands

There are wetlands within the service area for Garfield Township, especially along the County Drains and Rivers. The Wetlands Inventory Map is provided on the next page that shows the general locations. The proposed projects in this project plan do NOT encroach into wetland areas that are identified on the inventory map or were previously delineated.

FIGURE 7 – EGLE WETLAND INVENTORY MAP



2.3.4 Floodplains

No part of the project area is located within the Coastal Zone Management Area. The project is located within upland areas and no floodplain or floodways will be impacted with this proposed project.

2.3.5 Natural or Wild and Scenic Rivers

The Boardman River is not listed on the National Wild and Scenic River System List.

2.3.6 Major Surface Waters

The Boardman River is the major water source within the Township. Any contaminant entering the groundwater in Garfield Township could end up in the Boardman River, then ultimately within Grand Traverse Bay.

2.3.7 Topography

The topography throughout the Township is vastly different from one service district to the next. The topographic features of each service district are described in Section 3 of this *Project Plan*.

2.3.8 Geology / Soils

The glacial terrain of Garfield Township is characterized by eolian, lake and glacial deposits. The lake sand deposits make up the large portion of the Township. Areas surrounding the Boardman River and its tributaries, which are considered a glacial drainageway, are dominated by hydric soils. Bedrock underlying Garfield Township is predominantly the Ellsworth Shale, which consists of silty shale with minor amounts of siltstone and sandstone, and the Coldwater shale which consists of silty and sandy shale, siltstone, and fine-grained sandstones.

2.3.9 Agricultural Resources

The locations of the proposed project are sites with existing infrastructure and will not impede agricultural resources.

2.3.10 Flora and Fauna

An environmental review through Michigan Natural Features Inventory database (MNFI) identified 3 endangered species, no threatened species and 21 species of concern that exist within Grand Traverse County. There are no threatened or species of concern within the proposed project areas.

2.4 Existing Water System

The Charter Township of Garfield is located within Grand Traverse County near the West Arm of Grand Traverse Bay, encompassing land both south and west of the City of Traverse City. It is bounded on the north by the City of Traverse City and Leelanau County, on the west by Long Lake Township, on the east by East Bay Township and on the south by Blair Township.

The Charter Township of Garfield water distribution system construction began in the late 1970's and has expanded through the years with the growth in population. Water is supplied by the City of Traverse City through a Bulk Water Agreement regulated by the two (2) governmental entities allotting for a maximum day use of 5 MGD to Garfield Township. Several mutual connection points between the City and Township systems are monitored utilizing Master Meters that are recorded monthly by the GTC DPW for tracking and billing purposes. This water source is then distributed to users located within the five (5) Service Districts by infrastructure owned, operated, and maintained by the Township.

Water is distributed to users located within the four (4) Service Districts by infrastructure owned, operated and maintained by the Township. This infrastructure is comprised of six (6) booster stations, three (3) water storage tanks, twelve (12) reducing valve stations and approximately 76 miles of distribution piping. Booster stations pump water to outlying districts at higher elevations and water is fed back down towards the City of Traverse City to some extent through pressure reducing valves (PRVs). The operating pressures for each Service District are dictated by the gravity (ground or elevated) storage.

The Townships municipal water utilities are operated by the County Department of Public Works (DPW), providing quality water to the residents, businesses, and industries within the limits of the Township. Descriptions of each of the existing Service Districts are described below and their corresponding service limits illustrated on the Existing Water Service District Boundary Map located in the appendices. Figure 8 below shows a schematic of the Townships existing major infrastructure.

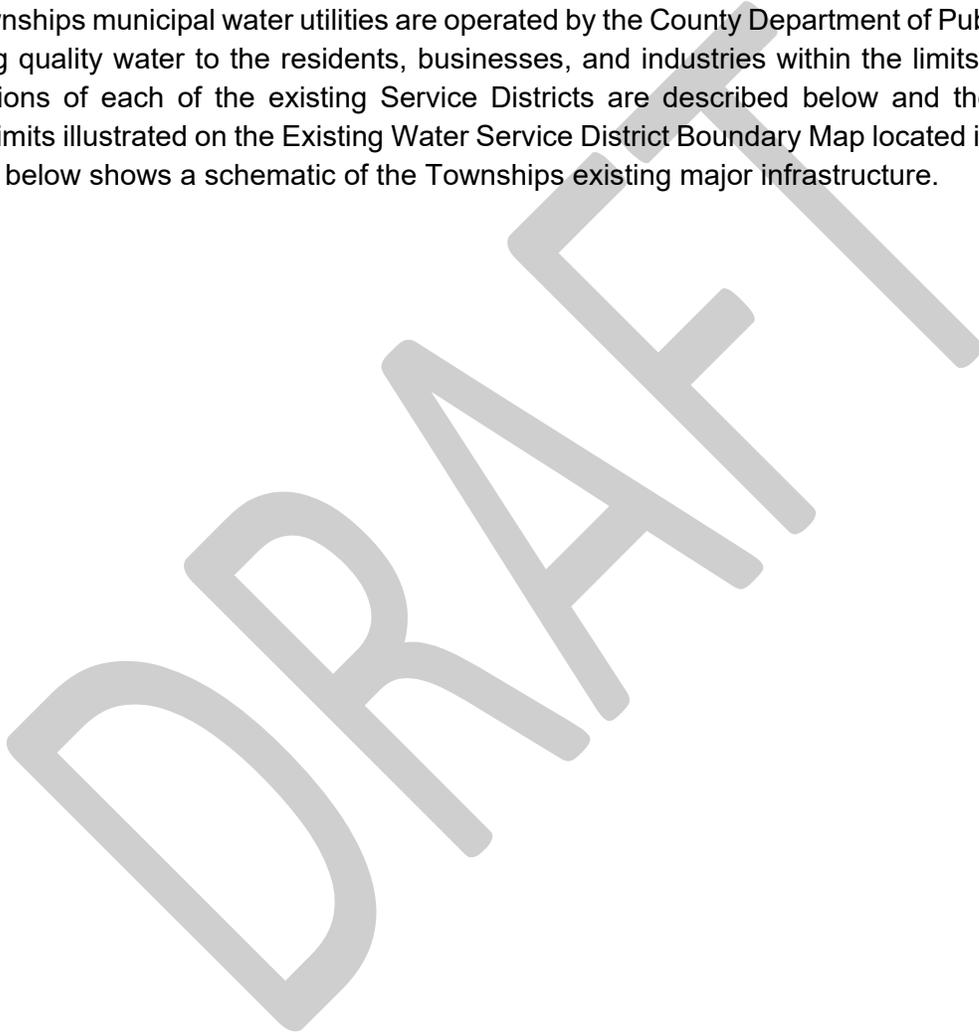
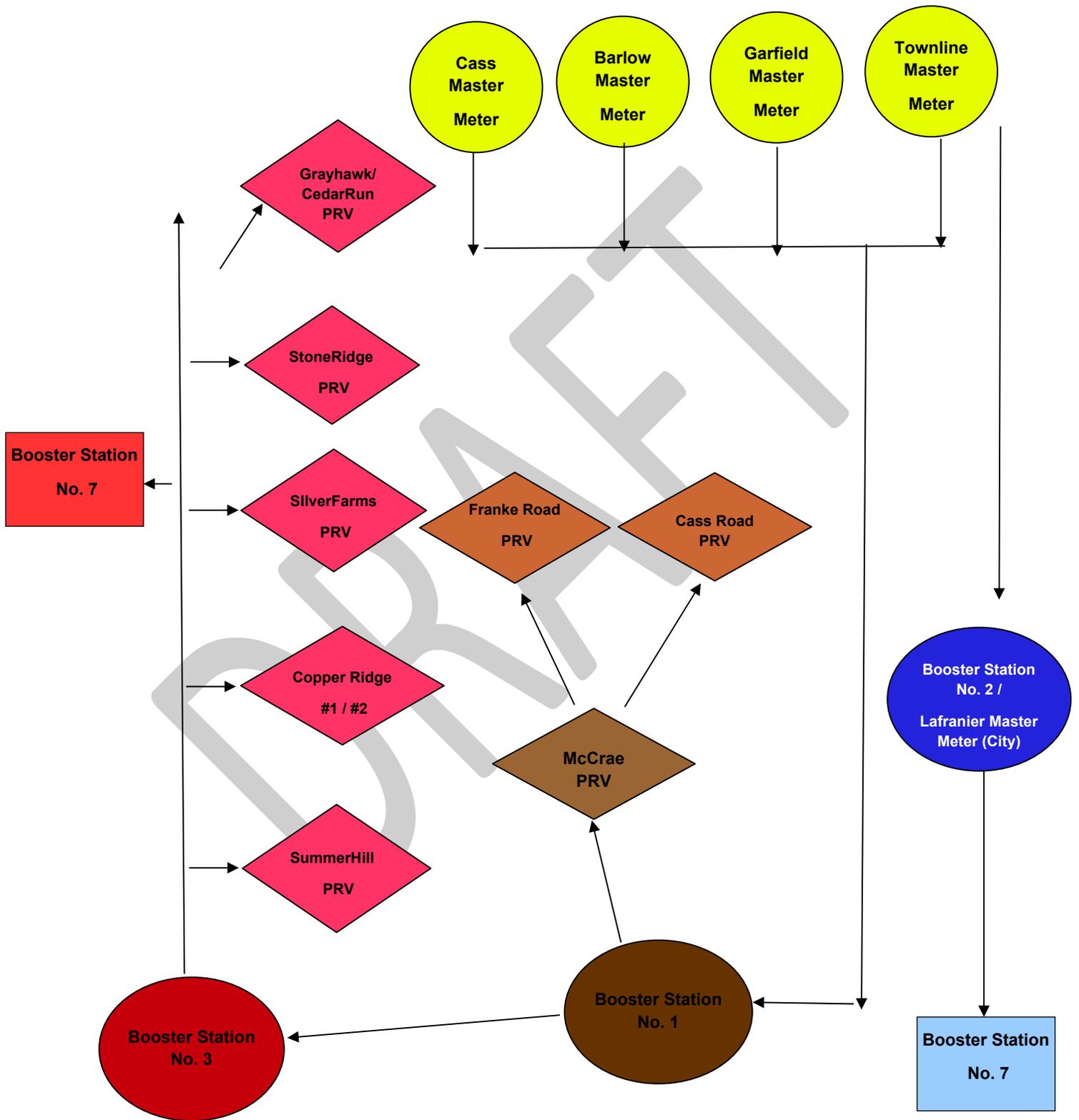


FIGURE 8 – GARFIELD TOWNSHIP INFRASTRUCTURE SCHEMATIC



2.4.1 Day Drive Service District

In 1977 the Day Drive District was the first to be built with the idea that other service districts would be created in the future. The initial service area only comprised South Airport Road and Veterans Drive. Over the past 40 years the district has grown substantially. To date this district services the most benefits providing both domestic and fire flow to approximately 4,261 benefits and in addition provides all the water supply to the West Side District.

As a stand-alone district, Day Drive infrastructure consists of one water booster station (Booster Station No.1) with a firm capacity of 3,850 gpm (5.54 MGD) located just southwest of the South Airport / Cass Road intersection and a 2,250,000 gallon ground based water storage tank located on McRae Hill Road just south of Silver Pines Road. The booster station receives its supply from the City District through two (2) main trunklines as monitored by two (2) master meters: (1) the primary feed is a 20-inch main that runs west along South Airport Road, monitored by the Barlow Master Meter and (2) a redundant 12-inch main that runs south along Cass Road, monitored by the Cass Road Master Meter. Garfield Booster Station No. 1 provides the entire supply to the McRae Hill storage tank through a dedicated 20-inch transmission feed with the exception of providing service to the Arbors development with the aid of a Pressure Reducing Valve (PRV). The storage tank services all the remaining users within the district by maintaining pressures and meeting their domestic and fire flow demands through the use of multiple PRVs. This tank also provides the entire water source for the West Side Service District.

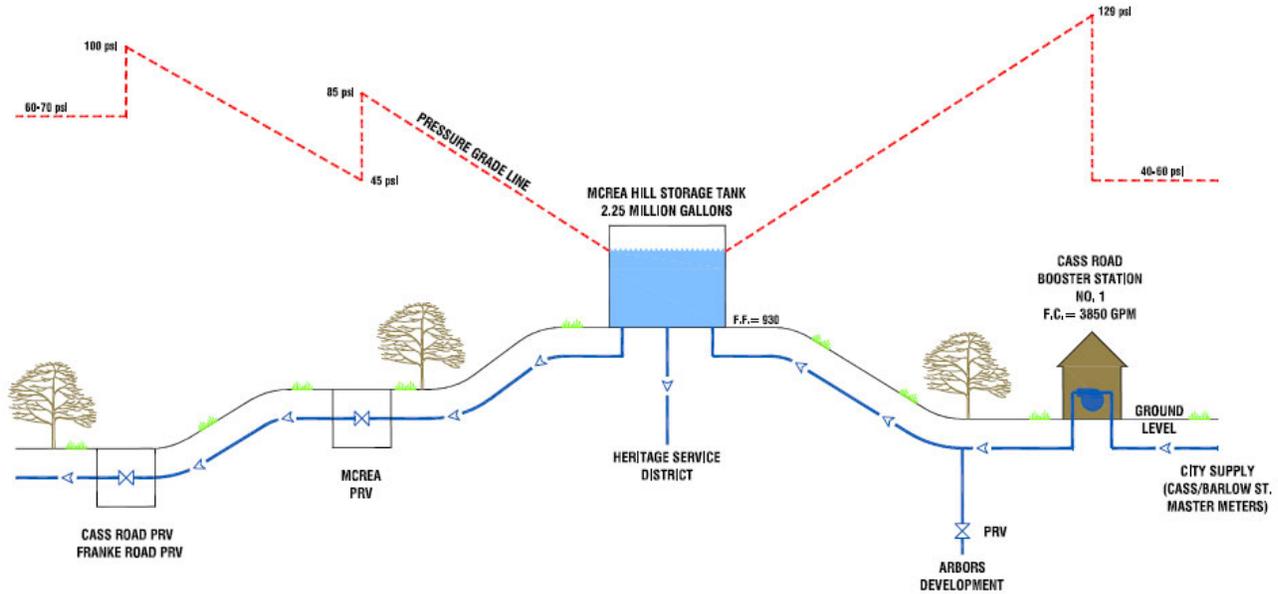
There are three (3) pressure zones within the system, controlled by the ground storage tank and two (2) pressure reducing valve stations (PRVs). The primary PRV is connected to the main transmission line that fills the storage tank located just north of Hartman Road serving the majority of the District with the exception of the two (2) secondary PRVs. The first is located at the intersection of South Airport Road and Cass Road (Cass Road PRV) which serves only the Cass Road area south of South Airport Road and provides a redundant connection back to the Day Drive District and the other is located immediately south of the Meijer store along US-31/M-37 (Franke Road PRV) and serves the US-31 area north to the limits of the City.

Reliability has also been built into the District which includes three (3) redundant connections to the adjoining West Side and City service districts: 1) Airport / Cass Road PRV opens to the City District along South Airport Road in event of low pressure, 2) Surge Suppression / PRV Station is located on Silver Lake Road north of Wyatt Road that opens to serve the West Side District in event of low pressure (45 psi) and 3) Master Meter connection to the City of Traverse City at Veterans Drive providing a continuous supply of water to their users for both domestic and fire flow demands.

Topography

The Day Drive Service District is the second largest of the four (4) districts and encompasses approximately 6.5 square miles of land area within the Township. The district is bordered on the north by the city limits of Traverse City, the east by Cass Road, the west by US-31 and the south by McRae Hill Road. The general topography of the area consists of elevations that range from approximately

850 (USGS) to 630 (USGS). The District is predominantly commercial with minimal industrial and some mixed residential users. A schematic of the existing Day Drive Service Districts is below.



2.4.2 West Side Service District

This district is a combination of what was previously known as the Heritage and West End Service Districts. Originally each district had their own independent supply and infrastructure and are now merged and provide improved pressures and reliability. The merger was initiated in 2016 based upon the growth and water respective water demands that continued to increase in this portion of the Township requiring additional storage capacity. The project began with the construction of a 1.0 Million Gallon Water storage tank located on Cedar Run Road to replace the undersized existing standpipe and then associated water infrastructure was installed thereafter.

The West Side District is comprised of two (2) pressure districts with multiple reduced pressure zones (PRVs) within each. The primary lower pressure zone receives water supply from the existing booster station located along Silver Pines Road (Booster Station No. 3) with a firm capacity of at 2,150 gpm (3.38 MGD) and 1.0 Million Gallon Ground Storage Tank. The secondary upper pressure district is serviced by booster station (#5) with a rated firm capacity of 750 gpm (domestic) / 750 GPM (fire).

Lower Pressure Zone

The lower pressure zone services most users within the district and provides the supply to Booster Station No. 5 (upper pressure zone). The limits of this zone are bound to 1020 as restricted by elevation constraints of the Cedar Run Storage tank. This station receives its water source from a 16-inch dedicated suction line to McCrea Storage Tank (Day Drive Service District) which then supplies the Cedar Run Storage Tank through a series of 12-inch and 8-inch distribution pipes. This storage tank

provides pressures and domestic and fire flow demands for those users in this zone with the aid of multiple PRVs.

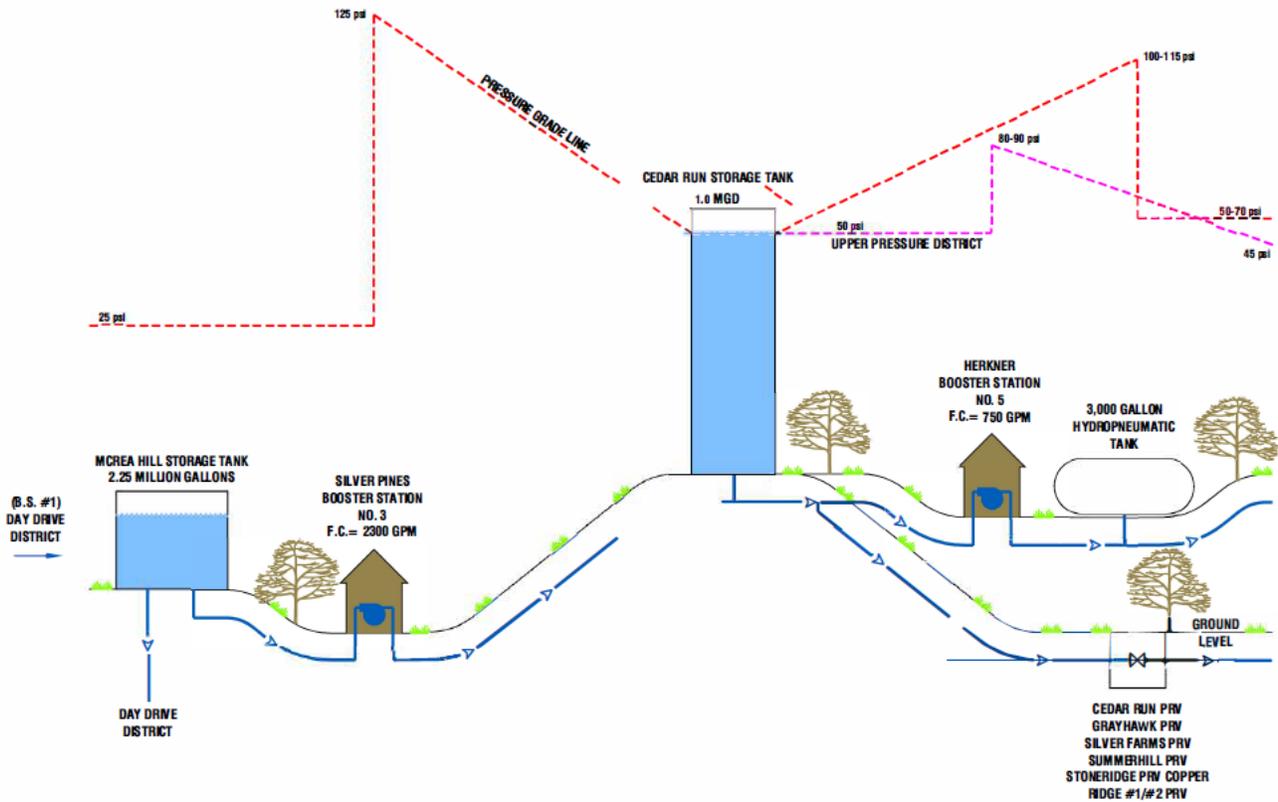
There are multiple pressure zones within the system, controlled by the ground storage tank and seven (7) pressure reducing valve stations (PRVs). The storage tank serves the majority of the pressure district and the seven (7) PRVs installed are to accommodate select developments at lower topography elevations (e.g. higher pressure) as their build-out dictated and are named as follows: 1) Copper Ridge PRV #1, 2) Copper Ridge PRV #2, 3) Stone Ridge PRV, 4) Silver Farms PRV 5) Summerhill PRV 6) Cedar Run PRV and 7) GrayHawk PRV. This district has an operating range of 50 to 110 psi.

Upper Pressure Zone

The upper pressure zone services approximately 310 benefits with its boundaries extending north of the lower pressure zone. The upper zone was originally created to service Traverse Area Public Schools (TCAPS)/West High School, the Montessori school and the Lonetree residential development. The Cedar Run Storage Tank is unable to service those users at the higher elevations at mandatory pressures (35 psi or greater) thus Booster Station No. 5 and the respective hydropneumatic tank are needed. This station receives its water source from the Cedar Run Storage Tank through 12-inch distribution pipe. The hydropneumatic tank only provides pressures and domestic demands for those users in this district and is a single pressure zone (no PRVs). However it does have pumping capabilities to meet some fire flow demands but future storage is needed to recognize this. This district has an operating range of 65 to 90 psi.

Topography

The West Side Service District is the largest of the four (4) districts and encompasses approximately 8.7 square miles which equates to 35% of the total land area within the Township. The district is bordered on the north by North Long Lake Road, the east near US-31, the west at the Long Lake / Garfield Township line and to the south at the Blair/Garfield Township line. The general topography of the area consists of elevations that range from 700 (USGS) to 1050 (USGS). The District is dominated by residential users with some commercial and negligible industrial. The unique usage in this Service District places a substantial demand on the Day Drive District since they solely rely on them for their water source. There is a large demand by both the residential and commercial users in this district as will be demonstrated in future sections of this report. In addition to the large volume of water usage for private irrigation, the type of commercial users are predominantly medical offices and outpatient surgery centers whom require large volumes of a reliable water supply. A schematic of the of the existing West Side Service Districts is below.



2.4.3 Birmley District

The Birmley District (originally named the LaFranier District) was constructed to supply the existing residential areas. This district was established in the late 1970's along with the Day Drive District. A 15,000-gallon hydro-pneumatic tank originally provided the pressures for this system and in the late 1980's was replaced with a 300,000-gallon elevated storage tank to supply serviceable pressures at higher elevations to accommodate the districts' growth. To date this district has expanded and serves approximately 2,571 benefits, providing both domestic and fire flow supply.

The Birmley District is comprised of two (2) pressure zones. The primary lower pressure zone contains one (1) booster station located along LaFranier Road (Booster Station No. 2) south of South Airport Road with a firm capacity of 1,440 gpm (2.07 MGD) and a 300,000-gallon elevated storage tank (Birmley Estates Storage Tank). The secondary upper pressure zone is a constant pressure system containing one (1) booster station (Booster Station No. 7) located off of South Garfield Road within the Ashland Park Development with a firm capacity of 1,135 gpm (1.63 MGD). Booster Station No. 7 operates on variable frequency driven pumps with pumped storage provided by the Birmley Estates Storage Tank. Both pressure zones receive their entire source of water from the Traverse City 4-million-gallon Ground Storage tank and a 2.0-million-gallon Ground Storage tank that was recently constructed adjacent to the existing tank located on LaFranier Road. The City tank is fed by a 20-inch transmission main which is also connected to the Township's water main located at the Barlow Street / South Airport Road

intersection that feeds the City District as monitored by the Barlow Street Master Meter. The supply received from the City, utilized by the Birmley District, is monitored by the LaFranier Master Meter located within the Booster Station No. 2 building. The descriptions of each zone are provided below.

Lower Pressure Zone

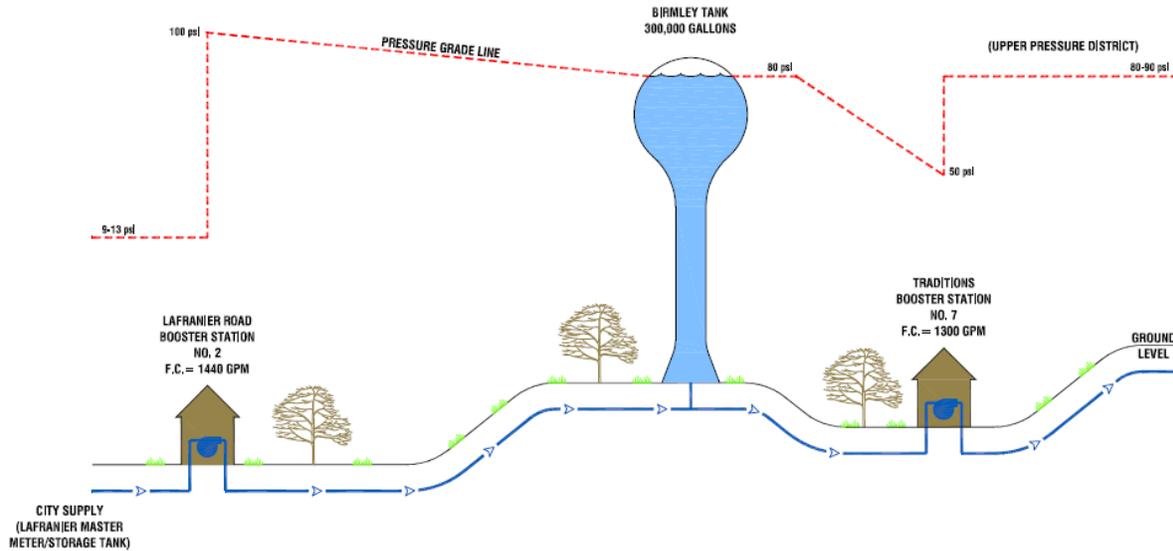
The lower pressure zone services the majority of users within the district and provides the supply to Booster Station No. 7 (upper pressure zone). The limits of this zone are restricted to an elevation of 770 feet based on the elevation constraints of the Birmley Storage tank. Booster Station No. 2 receives its water source from a 24-inch watermain that directly connects to the newly installed 2.0 Million Gallon Water Storage Tank which then supplies the Birmley Elevated Storage Tank through a series of 12-inch and 8-inch distribution pipes. The Birmley Elevated Storage Tank provides pressures and domestic and fire flow demands for the users within this district. The City recently implemented these upgrades in 2019 with intentions to assist with both their operations and the Townships. Booster Station #2 historically has restrictions on suction side of the pump station related to their water source which is the City's storage tank. Although improvements to eliminate the side connection and upsize in piping, these restrictions still remain unless adjustments to the operating levels in the tank are provided. Refer to memo that provided this evaluation that is included in the Appendix.

Upper Pressure District

The upper pressure zone services approximately 116 benefits with its boundaries extending south of the lower pressure zone. The upper zone was created in 2006 to service the Traditions development and a portion of Ashland Park development. The Birmley Storage Tank was unable to service users at the higher elevations with mandatory pressures; thus, the constant pressure Booster Station No. 7 was installed in 2005. Booster Station No. 7 receives its water source from the Birmley Elevated Storage tank through an 8-inch distribution pipe. The constant pressure system provides pressures and domestic demands for those users in this district. However, it does have pumping capabilities to meet their fire flow demands but future storage is needed to fully utilize this.

Topography

The Birmley Estates Service District is the third largest of the five (5) districts within the Garfield Township water system and encompasses approximately 4.7 square miles of land area. The district is bordered on the north by Knoll Crest, the east by Townline Road, the west by LaFranier Road and the south Rusch Road. The general topography of the area consists of elevations that range from 650 (USGS) to 800 (USGS). The District is predominantly residential with some commercial and minimal industrial users.



2.4.4 City District

The City District was originally constructed in the latter part of the 1970's in conjunction with the Day Drive District. This district originally served commercial areas with some residential users. This district contains the primary features that serve the Township. To date this district services 1,789 benefits providing both domestic and fire flow supply.

The City District infrastructure is limited only to water distribution piping and receives its supply directly from the City of Traverse City from four (4) connections monitored by Master Meters as follows:

- 1) Cass Road at the City Limits (Cass Road Master Meter)
- 2) Garfield Avenue at the City Limits (Garfield Avenue Master Meter)
- 3) Townline Road and S. Airport Road (Townline Master Meter)
- 4) Barlow Street and South Airport Road (Barlow Street Master Meter).

From these meters originate the transmission mains that also feed the Birmlay District and the Day Drive District. These transmission mains provide the supply to the City's 4 million gallon and 2 million gallon Ground Storage tank located on LaFranier Road south of South Airport Road. These storage tanks services all the users within the district by maintaining pressures and meeting their domestic and fire flow demands. The Township infrastructure only consists of distribution water main.

Topography

The City Service District is the fourth largest of the four (4) districts and encompasses approximately 1.6 square miles of land area. The district is bordered to the north by the city limits of Traverse City, to the east by the East Bay/Garfield Township line, to the west by Cass Road, and to the south by South Airport Road. The general topography of the area consists of elevations that range from 600 (USGS)

to 650 (USGS). The District is dominated by commercial use and minimal industrial with clusters of residential users mixed throughout.

2.4.5 Existing Water System Facilities

General

The Charter Township of Garfield water distribution system construction began in the late 1970's and has expanded through the years with the growth in population. The sole water source is supplied by the City of Traverse City through a Bulk Water Agreement regulated by the two (2) governmental entities allotting for a maximum day use of 5 MGD to Garfield Township. Several mutual connection points between the City and Township systems are monitored utilizing Master Meters that are recorded monthly by the GTC DPW for tracking and billing purposes. This water source is then distributed to users located within the four (4) Service Districts by infrastructure owned, operated, and maintained by the Township. This infrastructure comprises of six (6) booster stations, three (3) water storage tanks, and approximately 73 miles of distribution piping. The City District is the only district that operates on pressures supplied by city infrastructure and storage with infrastructure limited only to distribution piping. An overall summary of the critical infrastructure is listed in the following table:

DRAFT

FIGURE 9 – WATER DISTRIBUTION SYSTEM PIPING

WATER INFRASTRUCTURE			
Wells			
N/A			
Water Booster Stations			
#1 Cass Rd.	BS #1	3201	2914 Cass Rd, Traverse City, MI 49684
#2 LaFranier Rd.	BS #2	3202	2932 LaFranier Rd, Traverse City, MI 49684
#3 Silver Pines Rd.	BS #3	3203	4351 Silver Pines Rd, Traverse City, MI 49684
#4 Red Drive - Abandoned	BS #4	3204	5067 Red Dr, Traverse City, MI 49684
#5 Herkner Rd.	BS #5	3205	5452 Eaglehurst Rd, Traverse City, MI 49685
#6 GreyHawk - Abandoned	BS #6	3206	4255 Cedar Run Rd, Traverse City, MI 49684
#7 Traditions	BS #7		1319 Alexander Dr, Traverse City, MI 49696
#8 Crown	BS #8		2400 East Crown Drive
Storage Tanks			
McCrea Ground Storage Tank		3301	1273 McRae Hill Rd, Traverse City, MI 49685
Heritage Estates Standpipe - Abandoned		3303	5600 Heritage Way, Traverse City, MI 49685
Birmley Elevated Tank		3302	1130 Birmley Estates Dr, Traverse City, MI 49685
Cedar Run Storage Tank			5266 Cedar Run Road, Traverse City MI 49685
Pneumatic Tanks			
Herkner Pressure Tank			Herkner Rd, Traverse City, MI 49685
GrayHawk - Pressure Tank - Abandoned		3304	4766 Grayhawk Blvd #A, Traverse City, MI 49684
Red Drive Pressure Tank - Abandoned			5067 Red Dr, Traverse City, MI 49684
Pressure Reducing Stations			
Franke Road PRV			Division St, Traverse City, MI 49684
Cass Road PRV			W South Airport Rd, Traverse City, MI 49684
McCrea PRV			McRae Hill Rd, Traverse City, MI 49684
Arbors PRV			
StoneRidge PRV			
Copper Ridge PRV #1			Eastern Sky Dr, Traverse City, MI 49684
Copper Ridge PRV #2			Copper Ridge Dr, Traverse City, MI 49684
SilverLake PRV / SurgeSuppression Station			3733 Silver Lake Road
SilverFarms PRV			Silver Farms Ln, Traverse City, MI 49684
SummerHill PRV			Wyatt Rd, Traverse City, MI 49684
GrayHawk PRV			Grayhawk Blvd, Traverse City, MI 49684
Master Meters			
Master Water Meter #1	MM #1	-	1567 S. Airport Rd, Traverse City, MI 49686
Master Water Meter #2	MM #2	-	2932 LaFranier Rd, Traverse City, MI 49684
Master Water Meter #3 (Bill Marsh)	MM #3	-	1659 S. Garfield, Traverse City, MI 49686
Master Water Meter #4 - Abandoned	MM #4	-	5067 Red Dr, Traverse City, MI 49684

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2.4.5.1 SOURCE AND TREATMENT

The City of Traverse City Water Department provides the treatment and supply of water for the residents of the City, southeastern portion of Elmwood Township (Greilickville), Peninsula Township and Garfield Township. The City Water Treatment Facility has a capacity rating of 20 MGD and provides for direct filtration treatment of surface water received from Lake Michigan. The water is received from Lake Michigan and treated at the plant utilizing flocculation basins, clarifiers, and rapid sand filtration, with the chemical addition of 12.5% sodium hypochlorite for disinfection. The water distributed to the users within the Township limits receives no additional treatment with the exception of the 12.5 % liquid sodium hypochlorite (El-Chlor) addition as needed at the booster stations to maintain chlorine residual levels throughout the Service District distribution systems.

Garfield Township relies on their water source supply from the City of Traverse City through a bulk purchase agreement. The agreement was established in 2003, effective for 25 years under the terms to provide the Township with a maximum day demand of 5 MGD.

2.4.5.2 STORAGE

Water Storage is a requirement for all systems that service more than 150 units to meet peak hour, fire suppression, and emergency demands. This storage is typically provided by one of the following two methods:

- *Gravity Storage* – Elevated or ground-based tank in which the hydraulic grade line is controlled by gravity.
- *Pumped Storage* – Booster pumps control the hydraulic grade line and receive water from a ground storage tank (suction side)

Traditionally for Garfield Township, all the existing storage facilities in the service districts provide gravity storage to all their users, with the exception of the upper pressure zones within the Birmley and West Side Districts. These service areas operate as constant pressure systems utilizing hydropneumatic tanks, Variable Frequency Drives, circulation lines or combination thereof; they do not have adequate storage available and are regulated to provide water to less than 150 units until storage is provided. Although the primary service district storage is not recognized for providing equalization, fire and emergency volumes to these zones, it does provide supply to the stations that service them. The existing storage facilities are described below.



FIGURE 10 – WATER STORAGE TANK SUMMARY

	Day Drive	West Side		Birmley		City
	McCrae Hill	Cedar Run Tank (Lower Pressure)	Pressure Tank (Upper Pressure)	Birmley Tank (Lower Pressure)	VFD / Recirculation in BS#7 (Upper Pressure)	City Supply
Supply From	Cass Road Booster Station #1	Silver Pines Booster Station #3	Herkner Booster Station # 5	Lafranier Booster Station #2	Traditions Booster Station #7	N/A
Year Built	2002	2016	1997	1989		
Last Inspection Date	2008	2021	N/A	2010		
Type of Storage	Ground	Concrete Ground	Hydropneumatic	Elevated		
Available Volume of Storage, Gallons	2,250,000	1,000,000	3,000	300,000	N/A	
Ground Elevation	934	1100	963	780		
Normal Operating LWL / HWL	940 / 936.7	1110 / 1130	1,136 / 1,170	881.5 / 875		
Available Head Range, ft	6	25'	N/A	32.5		
Telemetry	GTC SCADA	GTC SCADA	GTC SCADA	GTC SCADA		

2.4.5.3 DISTRIBUTION

The table below summarizes the water main characteristics for each Service District. The majority of system piping is composed of either ductile iron, PVC, or polyethylene typically ranging in size from 6-inch to 20-inch. Majority of distribution piping is either 8-inch or 12-inch installed as development dictated requiring associated water main extensions. The largest water main diameter is a 30-inch pipe installed in 2009/2010 along Hammond Road from LaFranier Road to Keystone Road. Although not currently in use, it is intended to provide redundant feed to Booster Station No. 1 from Booster No. 2 in the future for reliability and pressurized flow to supplement the Birmley District from McCrae Water Storage Tank.

FIGURE 11 – WATER DISTRIBUTION SYSTEM PIPING

Service District	Length	Size	Material	% of System Total
Day Drive	10,000 LF	6-inch	Ductile Iron C900	33%
	36,400 LF	8-inch		
	40 LF	10-inch		
	68,200LF	12-inch		
	1,600LF	20-inch		
Birmley	260 LF	6-inch	Ductile Iron C900	21%
	26,350 LF	8-inch		
	1,520 LF	10-inch		
	51,750LF	12-inch		
	2,330 LF	16-inch		
City	1,200 LF	6-inch	Ductile Iron C900	17%
	31,050	8-inch		
	6,300 LF	10-inch		
	14,500 LF	12-inch		
	7,250 LF	16-inch		
	6,450 LF	20-inch		
West Side District	5,715 LF	6-inch	Ductile Iron C900	29%
	58,770 LF	8-inch		
	34,400 LF	12-inch		
	13,725 LF	16-inch		

Garfield Township receives its water supply from the City of Traverse City however this supply does not have the capability due to topography to provide the adequate pressures each Service District requires, with the exception of the City District. Township infrastructure is needed to provide these pressures therefore booster stations are used to supply each service district. Booster stations pump water to outlying districts at higher elevations and water is fed back down towards the City of Traverse City to some extent through pressure reducing valves (PRVs). The operating pressures for each Service District are dictated by the booster station in conjunction with gravity (ground or elevated) storage. In addition some districts have an upper and/or lower pressure zone as well. Pressure zones are established when the primary infrastructure supplying the water cannot provide the adequate range of pressures between 35 to 90 psi to the user. An upper pressure zone is created when water is required to be pumped to serve higher elevations to achieve pressures greater than 35 psi and similarly a lower pressure zone is created when water is to reduce in pressure to serve lower elevations to achieve pressures less than 90 psi. The table below summarizes each booster station and their respective characteristics.

FIGURE 12 – BOOSTER STATION SUMMARY

	Day Drive	West Side		Birmley		City
	BS #1 ¹	BS #3 (Lower Pressure)	BS #5 (Upper Pressure)	BS #2 ² (Lower Pressure)	BS #7 (Upper Pressure)	City Supply
Year Built	2003	2003	1997	2003	2006	N/A
Year Upgraded	N/A	N/A	2010	2003 & 2008	N/A	
No. Pumps / Type	(3) Centrifugal	(3) Centrifugal	(3) Centrifugal (2 domestic/1 fire)	(3) Centrifugal	(4) Centrifugal (3 domestic/1 Fire)	
Pump Motor Size/Type (EA)	250Hp VFD	125 Hp VFD	15 / 40 Hp	100 Hp VFD	20 / 60 Hp VFD	
Pump Capacity (EA)	2500 gpm	1350 gpm	375 / 780 gpm	1150 gpm	450 /1500 gpm	
Firm Capacity	3850 gpm	2150 gpm*	750 gpm	1440 gpm	1300 gpm	
Pump TDH (EA)	300'	282'	98' / 64'	240'	125'	
Backup Power Supply	Onsite Generator	Onsite Generator	Onsite Generator	Onsite Generator	Onsite Generator	
Telemetry	GTC & TC SCADA	GTC SCADA	GTC SCADA	GTC SCADA	GTC SCADA	

¹City of Traverse City Water Treatment Plant has communication / monitoring capability of Booster Station No.1 operations. Water Treatment Plant will run additional pumps at plant and/or initiate Booster Station No.1 to run to assist with their processes as necessary.

²Booster Station No. 2 operates based upon Birmley Tank levels and are initiated to run to maintain 25' in bowl to ensure suction pressure is available for users upstream of Booster Station No. 7. Booster Station #7 is limited in capacity due to upstream suction restrictions to 1,135 GPM.

*Loss of 200 GPM rated with capacity with new Cedar Run Tank / Higher Elevations

These upper zones operate as constant pressure systems utilizing Variable Frequency Drives, Hydropneumatics pressure tanks, recirculation lines or combinations thereof. Although the primary service district storage is not recognized for providing equalization, fire and emergency volumes to these zones, it does provide supply to the stations that service them.

2.4.5.4 LEAD SERVICE LINES

The Township has completed investigating lead service lines throughout the service area. Utilizing the Distribution System Materials Inventory (DSMI) the Township verified there are no service lines contain or suspected of containing lead.

2.4.5.5 WATER SERVICE METERS

The Township owns approximately 3,125 service meters that monitor each connections' water usage. Township meter reading services are currently being provided on a monthly basis using a combination touch read and radio read automated meter reading system. Meter reading functions are completed by

existing GTC DPW staff who visit each customer location to perform readings, final reads, and on/off readings for permanent and transient customers. These readings are then exported to the GTC DPWs' Utility Billing Software from the meter reading equipment for producing monthly billing statements.

2.4.5.6 WATER SYSTEM LOSSES

Water loss is calculated as unbilled water divided by the total water supplied or pumped. Water losses were calculated for 2021 to be negligible.

FIGURE 13 – SUMMARY OF UNACCOUNTED WATER FOR 2021

	2021
Total Water Treated (MGD)	623.43
Total Billings to Customers (MGD)	625.39
Percentage Unaccounted, %	-0.32%

2.5 Need for Project

The 2021 Annual Drinking Water Quality Report is in the Appendix. The Townships 2010 Water Reliability Study, the 2016 Supplementary Water Reliability Study (West Side Service District) and the 2019 Supplementary Water Reliability Study (Birmley Service District) are attached in the Appendix.

2.5.1 Compliance with Act 399

The Township water supply has remained in compliance with the standards defined in Act 399 and has not received any acute or non-acute violations. The Township annually tests water quality and it has historically been found to meet state and federal regulations. The proposed projects will ensure continued compliance with drinking water standards and reduce the risk of any potential non-compliance to meet firm capacity due to projected increased water supply demand within the existing service area. Specifically, the proposed projects intend to address the following:

- Complete the final phase of the consolidation of West and Heritage Service District (newly named West Side District) with the construction of a new booster station to provide protection of the existing water source and ensure adequate water supply (capacity and pressure) to meet customer demands.
- Extending / Looping watermains will improve pressures, particularly during emergency conditions, increase redundancy by reducing water main breaks, and improve water quality by reducing flushing operations to remove accumulated sediments and also reduce potential for lost water.
- Addition of water storage tank in the Day Drive and Birmley District to provide protection of the water source and ensure adequate water supply (capacity and pressure) to meet customer demands.
- Replacement of critical aged infrastructure that is at / near its' life expectancy.

2.5.2 Orders of Enforcement Actions

No court or enforcement order is currently against the water supplier for deficiencies or non-compliance with Act 399.

2.5.3 Drinking Water Quality Problems

There are currently no water quality issues experienced by the water supplier and the aesthetic quality of water distributed is free of color, odors, and taste.

2.6 Projected Future Needs

The historical REU data presented shows historical growth over the last 5 years and projections of users for the next 20 years utilizing the average growth rate of 2% annually. Figure 14 gives a summary of the average day water use records in each water district within the Township service area.

FIGURE 14 – REU / CUSTOMER DATA

Service District	2017	2018	2019	2020	2021	2026	2032	2042
Day Drive District								
No. of Benefits	4,295	4,310	4,339	4,362	4,393	4,850	5,462	6,658
Annual Benefit Increase	36	15	29	23	31	91	102	120
% Annual Increase		0.35%	0.68%	0.52%	0.70%	2.00%	2.00%	2.00%
Birmley District								
No. of Benefits	2,030	2,285	2,364	2,457	2,483	2,741	3,087	3,763
Annual Benefit Increase	49	255	80	93	25	52	58	68
% Annual Increase		12.53%	3.49%	3.93%	1.04%	2.00%	2.00%	2.00%
City District								
No. of Benefits	1,744	1,748	1,749	1,750	1,757	1,802	1,857	1,951
Annual Benefit Increase		4	1	1	7	9	9	9
% Annual Increase		0.23%	0.06%	0.06%	0.41%	0.50%	0.50%	0.50%
West Side District*								
No. of Benefits	1,519	1,532	1,574	1,591	1,615	1,863	2,098	2,557
Annual Benefit Increase		227	42	16	24	50	39	46
% Annual Increase		17.39%	2.74%	1.05%	1.53%	2.00%	2.00%	2.00%
TOTAL BENEFITS	9,588	9,875	10,027	10,160	10,248	11,256	12,503	14,930

*Includes Heritage Service District REUs and West End District REUs

The West End District is currently undergoing an expansion project that will provide infrastructure to service customers in Long Lake Township. For better understanding of growth projections in this district, the table below outlines the planned developments and anticipated REUs to be added to this district in within the initial planning period.

FIGURE 15 – WEST END DISTRICT REU / CUSTOMER DATA

West End District Development	Connected Users*	Allocated / Pending		Total**
		Permitted Users	Remaining to Connect	
<i>Upper Pressure Zone</i>				143.45
<i>Eaglehurst Subdivision</i>	4			4
<i>Church</i>	2.02			2.02
<i>Montessori</i>	16			16
<i>TC West High School</i>	49.87			49.87
<i>Dentist</i>	1.56			1.56
<i>Lone Tree Subdivision</i>	140	170	30	170
<i>Brookside</i>	47			47
<i>Black Bear Farms</i>		95	10	105
<i>Brook Valley Subdivision</i>			40	40
Total***	489.9		80	578.9

*Based upon values obtained from DPW

**Includes Existing, Permitted and Projected

***Includes only specific developments in the table above and does NOT include typical annual % growth

FIGURE 16 - EXISTING HISTORICAL FLOWS

	2017	2018	2019	2020	2021	
Service Area	MADD	MADD	MADD	MADD	MADD	Design Demand
Heritage Service District*						
<i>BS #3 (includes BS #5)</i>	1,010,000	1,360,000	1,010,000	1,280,000	1,320,000	1,360,000
<i>Lower Pressure District (BS#3 Only)</i>	880,000	1,190,000	870,000	1,190,000	1,230,000	1,230,000
<i>Upper Pressure District (BS#5 Only)</i>	130,000	170,000	140,000	90,000	90,000	170,000
Day Drive Service District						
<i>BS #1 (includes BS#3 & Veterans MM)</i>	2,244,194	2,481,226	2,027,355	1,759,516	2,158,290	2,481,226
<i>BS #1 (excludes BS#3 & Veterans MM)</i>	1,392,355	1,458,290	1,217,129	1,051,710	1,340,742	1,458,290
Birmley Service District						
<i>BS #2 (includes BS #7)</i>	590,000	830,000	970,000	970,000	800,000	970,000
<i>Lower Pressure District (BS#2 Only)</i>	510,000	810,000	770,000	940,000	760,000	940,000
<i>Upper Pressure District (BS#7 Only)</i>	80,000	20,000	60,000	30,000	40,000	40,000
City Service District						
<i>Cass, Garfield, Townline & Barlow MM (excludes BS#1)</i>	540,002	730,002	510,002	690,002	690,002	730,003
West End Service District*						
<i>BS #4 (includes BS #6)</i>	130,000	160,000	150,000	20,000	70,000	160,000
<i>Lower Pressure District (BS#4 Only)</i>	90,000	20,000	100,000	50,000	50,000	100,000
<i>Upper Pressure District (BS#6 Only)</i>	40,000	140,000	50,000	20,000	20,000	140,000

*Effective 2022 West End and Heritage District merged and BS#4 and #6 were abandoned. The new service district is now known as West Side District

2.6.1 Existing and Projected Water Supply

An analysis of water user demand for each Service District is performed to estimate future water demand for planning purposes. This is accomplished first by establishing a design demand per user value using the historical five (5) year benefit counts (Residential Equivalent Units - REUs) in conjunction the corresponding ADD and MADD measured demands described above.

These design values are derived by dividing the respective water usage by the REU served with a value expressed in unit gallons per day per REU (gpd/REU). The upper pressure zones in the Birmley and West End Districts illustrate a significant variance in their flow per user rates in comparison to the pressure district they are within as a whole. This is attributed to their small user size and specific use, whereas the lower pressure zones more closely correlate to their respective overall pressure district flow per user rates. This has been addressed in the tables below; where design values are selected that best represent the Service District to estimate its future Average, Maximum and Peak water demands. This is done because it is assumed new users added to the system will consume water at the same rate as current users. Water demand estimates for future years are determined by multiplying the current unit demand design values (gpd/REU) by the projected number of future users in the water system as seen below.

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FIGURE 17 – EXISTING FLOWS PER USER

Service Area	2017			2018			2019			2020			2021			Design Demand
	REU	ADD, GPD	GPD / REU	REU	ADD, GPD	GPD / REU	REU	ADD, GPD	GPD / REU	REU	ADD, GPD	GPD / REU	REU	ADD, GPD	GPD / REU	
Heritage Service District*																
BS #3 (includes BS #5)	1,305	420,000	321.8	1,532	480,000	313.3	1,574	410,000	260.5	1,591	470,000	295.5	1,615	490,000	303.4	298.9
<i>Lower Pressure District (BS#3 Only)</i>	1,290	360,000	279.0	1504.1	410,000	272.6	1546.072	340,000	219.9	1546.556	380,000	245.7	1557.9	400,000	256.8	254.8
<i>Upper Pressure District (BS#5 Only)</i>	15	60,000	4000.0	28	30,000	1071.4	28	70,000	2500.0	44	90,000	2045.5	57	90,000	1578.9	2239.2
Day Drive Service District																
BS #1 (includes BS#3 & excludes Veterans MM)	5,600	1,079,663	192.8	5,842	1,128,359	193.1	5,913	1,025,945	173.5	5,953	928,551	156.0	6,008	1,020,901	169.9	177.1
BS #1 (excludes BS#3 & Veterans MM)	4,295	692,510	161.2	4,310	696,937	161.7	4,339	653,616	150.6	4,362	589,986	135.3	4,393	657,592	149.7	151.7
Birmley Service District																
BS #2 (includes BS #7)	2,030	370,000	182.2	2,285	420,000	183.8	2,364	420,000	177.6	2,457	450,000	183.1	2,483	440,000	177.2	180.8
<i>Lower Pressure District (BS#2 Only)</i>	2,003	360,000	179.7	2,258	410,000	181.6	2,337	400,000	171.1	2,357	440,000	186.7	2,367	430,000	181.7	180.2
<i>Upper Pressure District (BS#7 Only)</i>	27	10,000	N/A	27	10,000	N/A	27	20,000	N/A	100	10,000	100.0	116	10,000	86.2	93.1
City Service District																
Cass, Garfield, Townline & Barlow MM (excludes BS#1)	1,744	1,100,001	630.7	1,748	1,140,002	652.1	1,749	920,000	526.0	1,750	1,000,000	571.4	1,757	1,034,001	588.4	593.7
West End Service District*																
BS #4 (includes BS #6)	214	70,000	327.1	227	70,000	308.4	269	60,000	223.0	286	70,000	244.8	310	70,000	225.8	265.8
<i>Lower Pressure District (BS#4 Only)</i>	200	50,000	250.0	213	40,000	187.8	255	40,000	156.9	272	50,000	183.8	296	50,000	168.9	189.5
<i>Upper Pressure District (BS#6 Only)</i>	14	20,000	1428.6	14	20,000	1428.6	44	20,000	454.5	44	20,000	454.5	54	20,000	370.4	827
TOTAL CITY SUPPLY	9,588	1,680,000	175.2	9,875	3,230,000	327.1	10,027	1,690,000	168.5	10,160	1,690,000	166.3	10,248	1,750,000	170.8	201.6

*Effective 2022 West End and Heritage District merged and BS#4 and #6 were abandoned. The new service district is now known as West Side District

FIGURE 18 – 2042 PROJECTED FLOWS PER USER

Service Area	REU	ADD (gpd)	MADD (gpd)	MDD (gpd)	PHD (gpd)	PID (gpm)	PID (gpd)
West Side Service District							
BS #3 (includes BS #5)	2,557	989,716	2,270,105	3,405,157	8,659,378	N/A	N/A
Lower Pressure District (BS#3 Only)	2,127	823,113	1,887,967	2,831,951	7,201,705	N/A	N/A
Upper Pressure District (BS#5 Only)	431	166,604	382,137	573,206	1,457,673	646	929,880
Day Drive Service District							
BS #1 (includes BS#3 &excludes Veterans MM)	9,215	1,631,755	3,913,822	5,870,733	10,201,238	N/A	N/A
BS #1 (excludes BS#3 & Veterans MM)	6,658	1,010,020	2,252,671	3,379,006	8,362,202	N/A	N/A
Birmley Service District							
BS #2 (includes BS #7)	3,763	680,412	1,093,593	1,640,390	3,525,982	N/A	N/A
Lower Pressure District (BS#2 Only)	3,606	652,097	1,048,083	1,572,125	3,379,248	N/A	N/A
Upper Pressure District (BS#7 Only)	157	28,315	45,510	68,265	146,734	274	394,632
City Service District							
Cass, Garfield, Townline & Barlow MM (excludes BS#1)	1,951	1,158,585	814,909	1,222,363	N/A	N/A	N/A
TOTAL CITY SUPPLY	14,930	2,926,224	6,613,863	9,920,795	N/A	N/A	N/A

2.6.2 Water System Pumped Capacity

The basis of evaluation for pumping capacities pertained only to the service areas each booster station supplied water to. For each Service District as a whole the primary booster station evaluated included all demands generated by the district which included upper/lower pressure zones and/or other districts, if applicable, whereas for stations only servicing an upper pressure zone (no storage), the demands accounted for only that area. For instance, Booster Station No.1 provides water to both the Day Drive and the West Side Service Districts therefore it must be evaluated with respect to the demands for both districts. For supply, Garfield Township currently has a contractual maximum daily demand limit of 5 MGD of water with the City of Traverse City that was also evaluated.

FIGURE 19 - EXISTING (2021) BOOSTER STATION CAPACITY

Service Area	Existing F.C. ² (gpm)	Existing F.C. (gpd)	MDD (gpd) ¹	PID (gpm) ³	PID (gpd)	Excess F.C. ⁴	Available REUs ⁵
West Side Service District							
BS #3 (includes BS #5)	2,150	3,096,000	2,040,000	490	705,600	1,056,000	793
Lower Pressure District (BS#3 Only)	N/A	N/A	1,845,000	330	474,480	N/A	N/A
Upper Pressure District (BS#5 Only)	750	1,080,000	255,000	161	231,120	825,000	382
Day Drive Service District							
BS #1 (includes BS#3 & Veterans MM)	3,850	5,544,000	3,424,092	N/A	N/A	2,119,908	3617
BS #1 (excludes BS#3 & Veterans MM)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Birmley Service District							
BS #2 (includes BS #7)	1,440	2,073,600	1,358,000	N/A	N/A	715,600	1759
Lower Pressure District (BS#2 Only)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Upper Pressure District (BS#7 Only)	1,300	1,872,000	N/A	48	68,400	1,803,600	626
City Service District							
Cass, Garfield, Townline & Barlow MM (excludes BS#1)	N/A	N/A	1,095,004	N/A	N/A	N/A	N/A
City Supply	N/A	5,000,000	4,862,500	N/A	N/A	137,500	248

FIGURE 20 – 2042 PROJECTED BOOSTER STATION CAPACITY

Service Area	Existing F.C. ² (gpm)	Existing F.C. (gpd)	MDD (gpd) ¹	PID (gpm) ³	PID (gpd)	Excess F.C. ⁴	Available REUs ⁵
West Side Service District							
BS #3 (includes BS #5)	2,150	3,096,000	3,405,157	N/A	N/A	(309,157)	(232)
Lower Pressure District (BS#3 Only)	N/A	N/A	2,831,951	N/A	N/A	N/A	N/A
Upper Pressure District (BS#5 Only)	750	1,080,000	573,206	646	929,880	150,120	70
Day Drive Service District							
BS #1 (includes BS#3 & excludes Veterans MM)	3,850	5,544,000	5,870,733	N/A	N/A	(326,733)	(513)
BS #1 (excludes BS#3 & Veterans MM)	N/A	N/A	3,379,006	N/A	N/A	N/A	N/A
Birmley Service District							
BS #2 (includes BS #7)	1,440	2,073,600	1,640,390	N/A	N/A	433,210	994
Lower Pressure District (BS#2 Only)	N/A	N/A	1,572,125	N/A	N/A	N/A	N/A
Upper Pressure District (BS#7 Only)	1,300	1,872,000	68,265	106	153,090	1,477,368	586
City Service District							
Cass, Garfield, Townline & Barlow MM(excludes BS#1)	N/A	N/A	1,222,363	N/A	N/A	N/A	N/A
City Supply	N/A	5,000,000	9,920,795	N/A	N/A	(4,920,795)	(8,886)

As seen above, the existing booster station capacity is adequate, but within the next 10 year planning period Booster Station #1 and #3 will need to significantly increase firm capacity to accommodate growth within the service district. Unfortunately the upper districts within the West Side and Birmley are currently at or nearing the number of units it can service due to lack of available storage. The Recommended Standards for Water Works recommends water storage shall be provided for all systems supplying more than 150 units. If growth trends continue as predicted and proposed developments connect, the benefit count will exceed 150 units and storage will be required.

2.6.3 Water System Storage Capacity

The Service Districts evaluated were those only with available water storage facilities, therefore the City and West End Districts are neglected from the analysis. The City Service District is dependent upon the City of Traverse City Lafranier Water Storage tank for mandating operating pressures and volume for both domestic, fire protection and emergencies.

The storage for these districts is recognized as gravity storage that provides pressures and volumes for domestic, fire protection and emergency to the users. With gravity storage there are zones that were created to allow for the overall Service Districts to expand to provide water to more users, with this situation particularly specific to the Birmley and West Side Service Districts. These upper zones operate as constant pressure systems utilizing Variable Frequency Drives, hydropneumatic pressure tanks,

recirculation lines or combinations thereof. Although the primary service district storage is not recognized for providing equalization, fire and emergency volumes to these zones, it does provide supply to the stations that service them. Therefore, similar to the booster station capacity assessment done above, the demands accounted for to analyze the capabilities of the current storage facilities to meet are reflective of the entire area that it provides water to, including upper and reduced pressure zones.

FIGURE 21 - EXISTING (2021) STORAGE CAPACITY

Service District	Existing Available Storage Capacity	Total Required Storage Capacity	Required Additional Storage
Day Drive	2,250,000	1,828,021	421,979
Birmley	300,000	320,917	(20,917)
West Side	1,100,000	700,171	399,829

FIGURE 22 – 2026 PROJECTED STORAGE CAPACITY

Service District	Existing Available Storage Capacity	Total Required Storage Capacity	Required Additional Storage
Day Drive	2,250,000	2,814,192	(564,192)
Birmley	300,000	941,516	(641,516)
West Side	1,100,000	803,001	296,999

FIGURE 23 – 2032 PROJECTED STORAGE CAPACITY

Service District	Existing Available Storage Capacity	Total Required Storage Capacity	Required Additional Storage
Day Drive	2,250,000	3,315,460	(1,065,460)
Birmley	300,000	1,055,506	(755,506)
West Side	1,100,000	1,058,083	41,917

FIGURE 24 – 2042 PROJECTED STORAGE CAPACITY

Service District	Existing Available Storage Capacity	Total Required Storage Capacity	Required Additional Storage
Day Drive	2,250,000	3,974,510	(1,724,510)
Birmley	300,000	1,278,334	(978,334)
West Side	1,100,000	1,235,888	(135,888)

As seen in the tables provided above, water storage will be a limiting factor in the Townships ability to provide adequate water supply to the existing and projected customers. It is anticipated that the Day Drive service district will be significantly insufficient within the next five (5) year planning period. The Birmley Service District currently has insufficient water storage capacity. Both service districts will require additional water storage capacity in the near future.

2.7 Infrastructure Needs

Upon review of the information above, it is apparent that storage capacity is the limiting component with respect to capability to meet the maximum daily demands for each service district including both lower pressure zones. Furthermore, requirements of the SDWA state that the firm capacity of the system must be capable of meeting the maximum demands, meaning the largest booster pump taken offline. Based upon the findings above, the existing capacity of the water supply (pumped) was identified as being currently sufficient. However after next 20 years with increased growth and demand upgrades to both Booster Station #3 and #1 are required to meet the projected demands for the system.

The water distribution system piping and storage network was analyzed using WaterCAD V7. The system was analyzed for existing and future conditions to determine where deficiencies exist as well as the optimal correction alternatives. Criteria for determining system problems include the need to accommodate peak hourly flows while maintaining pressures in excess of 35 psi, and the need to provide fire flows during maximum day water demands while maintaining at least 20 psi in the system. Deficiencies in pipe capacity such as inadequate pipe size and/or lack of sufficient looping (dead ends) create restrictions which prevent proper flow to fire hydrants or excessive pressure drops during peak demands.

2.7.1 Supply

2.7.1.1 MASTER METER IMPROVEMENTS

The Township water system is fully metered for all their customers and at all mutual connections between the Township and the City of Traverse City. These connection points where the township received their entire water source is monitored by Master Meters and is the only mechanism in place that both entities use for measuring the amount of water Garfield Township consumes and the City Bills for.

The Master Meters are read monthly providing average daily and maximum average daily readings only. An empirical multiplier, based upon observations of total water treated and supplied to all the City customers, is applied to these values to derive a maximum daily demand for Garfield Township and what they are billed for. Although this is the only method available at this time, it is not extremely accurate. To achieve more accurate water usage readings, Garfield Township needs to integrate these meters with the DPWs' regional SCADA system for instant/daily monitoring to provide accurate readings and trending this has not been done to date due to excessive costs.

2.7.2 Storage

2.7.2.1 WEST END BOOSTER STATION IMPROVEMENTS

With consolidation of the Heritage and West End Service Districts, there is no longer a need for Booster Station #5 to provide adequate pressures within the primary lower pressure zone service area. The existing booster station is proposed to be abandoned and relocated to the existing West Side Storage

Tank located off of Cedar Run Road. The booster station will service the as pumped storage for the secondary upper pressure district.

2.7.2.2 DAY DRIVE DISTRICT - MCCRAE HILL TANK EXPANSION

The existing McCrae Hill Storage Tank and Booster Station #3 supply water to the West Side District Ground Storage Tank. The existing capacity of the McCrae Hill Storage Tank has minimal adequate storage capacity to supplement the Day Drive and West Side Districts simultaneously at the current time as seen in Figure 21. To achieve long term 20 year planning projected water demands within the Day Drive and West Side Districts, an additional storage capacity of over one (1) million gallons is required, as seen in the above sections.

In addition to the water storage expansion at McCrae Hill, the existing 2,250,000 gallon storage tank was last inspected in 2008 and requires inspection to assure the tank is in good condition. The existing tank is over 20 years old, to ensure there are no internal or external concrete cracks, spalling, erosion, or any signs of deterioration. Due to ever changing regulations, inspection is required to assure that the existing storage tank meets all regulatory requirements and that the existing float system is performing accurately.

2.7.2.3 BIRMLEY DISTRICT – HERITAGE STORAGE TANK RELOCATION

Upon review of the information above, it is observed that the existing water storage facility for the Birmley Service District currently has inadequate capacity. This evaluation is based upon their 300,000-gallon available storage capacity. Continued operation without the upgrades will place further dependency on pumping facilities thus increasing potential for wear/tear and operational costs, placement of additional demand on upstream storage facilities thus impacting those service areas, and most importantly lack of available water supply in the event of emergencies thus leaving the user vulnerable. The district currently has minimal adequate storage capacity, however in the next 5 year initial planning period will be deficient. To achieve long term 20 year planning projected water demands within the Birmley District, a water storage tank is required. The Township is currently in the process of planning for the extension of the existing 30-inch watermain with a road transportation project that will provide water from McCrae Tank. This project is slated to be completed in the next 5 years and will accommodate the water storage deficiency.

In the short range, the existing customers within the Birmley Service District Upper Pressure District is nearing 150 units and additional storage capacity is required. Due to the consolidation of the West End and Heritage Service Districts, the 300,000 gallon Heritage water storage tank is abandoned and will be relocated to provide some additional storage for this district.

2.7.3 Distribution

2.7.3.1 PRESSURE REDUCING VALVE (PRV) REPLACEMENTS

West Side District - Stone Ridge PRV

The Stoneridge PRV is located in West Side Service District lower pressure zone and receives its water supply from a booster station located along Silver Pines Road (Booster Station No. 3) with a firm capacity of at 2,350 gpm (3.38 MGD) and 1 Million Gallon Water storage tank located on Cedar Run Road. The Stone Ridge PRV is one of the oldest in the system (constructed in 1994). The PRV is a concrete vault and subject to frequent flooding and ongoing maintenance as a result of this and age. The PRV has been listed in the Townships Capitol improvement Plans to be replaced with a newer fabricated vault with SCADA and alarms. The PRV currently shows significant signs of deterioration and requires improvements for reliability.

Day Drive District – McCrae Hill PRV

Overall the district, predominantly along the North US-31 South corridor has inadequate pressures to provide the required 3,500 gpm fire flow rating it has been designated due to the large amount of commercial users. This is a critical deficiency and is considered a priority for correction in the initial 1 – 5 year time period. The only option is to propose improved pressures for the District as a whole and to provide adjustments to the primary pressure zone as controlled by the McCrea PRV. This PRV is currently set to provide a reduction to 47 psi and it is suggested to increase this by 10 - 15 psi to provide the downstream users this benefit for both domestic and fire flow. However, doing this will affect the system users currently operating at or close to 90 psi (upstream of the Franke Road/Cass Road PRV) thus requiring those PRVs to be relocated. This proposed district pressure adjustment will alleviate a lot of complaints the Township has received over the years from the system users and fire department providing them with more adequate pressures during emergencies.

2.7.3.2 WATERMAIN EXTENSIONS AND LOOPING

The Township is dedicated to providing a reliable water distribution system to its users. Deficiencies in pipe capacity such as inadequate pipe size and/or lack of sufficient looping (dead ends) create restrictions which prevent proper flow to fire hydrants or excessive pressure drops during peak demands. To provide a completely redundant system there are various looping and connections points to achieve this. The following watermain extension projects would complete a continuous transmission main loop around the Township's four (4) Service Districts.

Panorama Watermain Loop – West Side District

The Panorama Subdivision off of Zimmerman Road is not currently served by Township water infrastructure. It is recommended for reliability, redundancy and growth projected within the area; a watermain extension be constructed to connect the subdivision to adjacent Stone Ridge and Siver Farms Subdivisions.

Horizon Watermain Loop – West Side District

The Horizon Outlet Center is currently served by the Day Drive District. In order to promote reliability and redundancy it would be beneficial for the township to construct a watermain loop from Stone Ridge Subdivision to the Horizon Outlet Center to connect the West Side District to Day Drive District. This connection will require a PRV to reduce pressure from the West Side Upper Pressure District.

Crossings Watermain Loop – Day Drive District

Grand Traverse Crossings is currently served by the Day Drive District. The existing district lacks a watermain loop between the Crossings and the Arbors to connect the Upper and Lower Pressure Districts. This watermain extension will require a control valve to alternate between pressure districts as demand requires.

Veterans to Lowes Watermain Loop – Day Drive District

A watermain loop between Veterans Dive and Lowe's Department Store would allow for a transmission main loop through the center of the Day Drive District. This district is heavily commercialized and additional redundancy and reliability is suggested.

2.7.4 Climate Resiliency

The Township plans to continue investigation and rehabilitation of the water system that is experiencing excessive water loss. The booster stations all have existing backup power generation with automatic transfer switches that are capable of operating all critical process equipment in the event of power failure. The infrastructure that is not determined to be critical are equipped with generator receptacles and the Township has adequate portable generators to operate the infrastructure in the case of failure.

3 Alternative Analysis

Garfield Township does not propose to construct new water supply well(s) with this project and therefore a new / increased water withdrawal is not applicable.

4 Alternative Analysis

4.1 Alternatives Considered

Each project was assessed to follow one of the following alternative classifications. Each upgrade or rehabilitation methods was chosen on a technical basis and cost comparisons are presented for each alternative analysis, where applicable. The overall locations of these projects are provided within the Appendix.

- Water Supply Improvements
 - Master Meter / SCADA Upgrades
- Water Storage Improvements
 - Day Drive District – McCrea Hill Tank Expansion
 - Birmley District – Heritage Tank Relocation
 - West End District – Booster Station
- Water Distribution Improvements
 - West End and Day Drive PRV Replacements
 - West End and Day Drive Watermain Expansion

4.2 Alternate 1: No Action

No action has been the selected alternative for the past several years. This option should not be considered as a practical principal alternative due to the non-compliance issues already existent. No-action in this case would result in possible enforcement action by the state to force compliance by the Township.

4.3 Alternative 2: Optimum Performance of Existing Facilities

The existing water system is performing as well as it can and additional staffing, staff training, and operational changes are not likely to improve the performance of the system because the primary concerns are related to the capacity of the infrastructure. Therefore, this alternative was not considered further.

4.4 Alternate 3: Construction Alternatives

4.4.1 Water Supply Improvements

4.4.1.1 MASTER METER / SCADA UPGRADES

The age and condition of all master meters indicate need for replacement and upgrades. The existing equipment has passed its expected useful life and risks failure if not replaced. The lost of mater meter readings, SCADA/Control Panel telemetry control can result in system failure and the inability to remotely monitor and maintain the system. These repairs are required to confirm reliability of the water system as a whole.

The following project noted in the table below are the proposed water supply improvements timeline under this project plan.

4.4.1.2 COST OF ALTERNATIVES

FIGURE 25 – SUPPLY ALTERNATIVES COST SUMMARY

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Existing Infrastructure	N/A
Alternative 3	Master Meter / SCADA Upgrades	\$158,600.00

4.4.2 Water Storage Improvements

4.4.2.1 DAY DRIVE DISTRICT – MCCRAE HILL TANK EXPANSION

The Day Drive District is served by Booster Station No. 1. This station does not have adequate capacity to supply the district with the max day demands of the service area. To ensure reliability of service to the district, additional supply will be needed, or additional storage capacity in the district. The proposed project would include the construction of an elevated storage tank at the existing McCrae Hill Storage Tank location. The Township currently owns the property intended to be used for additional storage.

To meet future demands of the system the McCrae Hill ground storage tank was designed in anticipation to expand. Within the 5 year planning period outlined in this report, it is anticipated that the storage tank will require expansion. It is proposed that the McCrae Hill storage tank be expanded to double its existing size and add an additional 2.25 million gallons of storage to the Day Drive low pressure district. This project is proposed to begin at the end of the 5 year planning period.

The existing 2,250,000 gallon McCrae Hill Storage Tank was constructed in 2002 and is over 20 years old, with the last inspection taking place in 2021. Due to age of the concrete tank, this project will include some minor corrective measures to address the items identified in the recent inspection and assure the tank meets all regulatory requirements.

4.4.2.2 BIRMLEY DISTRICT – HERITAGE STORAGE TANK RELOCATION

The proposed storage tank will supplement the existing Birmlay Elevated Storage Tank and provide the relocation of existing Heritage District 300,000 gallon ground based storage facility to the existing Birmlay Storage Tank location. The Heritage storage tank is proposed to be abandoned with the relocation of Booster Station #5 and is proposed to be utilized as short term supplemental storage for the Birmlay Service District. The repurposed tank will operate at the same elevations as the existing to provide adequate storage facilities for use by all the users in both Birmlay District pressure zones. The source of water can either remain from the City via LaFranier Booster Station No. 2.

The tank will be able to provide storage to system users in the upper pressure district. The upper zone will still remain; however a pumping facility will be required to be installed rated to provide peak instantaneous demand plus fire flow to those users. This scenario is recognized as pumped storage and therefore will no longer be subject to user limitations and capable of meeting 20 year demands for

upper zone. The existing Traditions Booster Station No. 7 will also remain online and draw from this tank to meet the storage capacity needs to allow for growth beyond 150 REUs.

The township is continuing investigations into the long term storage capacity issues presented within the Birmley District. Capital Improvement Projects will be evolving in the coming years as a reflection of growth and development.

4.4.2.3 WEST END DISTRICT – BOOSTER STATION

With the combination of Heritage and West End, both districts will now have adequate storage (gravity or pumped) to meet the existing and future domestic and fire flow needs. The West Side District will be comprised of two (2) pressure districts with multiple reduced pressure zones (PRVs) within each. The primary lower pressure zone will continue to receive water supply from the existing booster station located along Silver Pines Road (Booster Station No. 3) with a firm capacity of at 2,350 gpm (3.38 MGD) and a 1.1 Million Gallon Cedar Run Ground Storage Tank. The secondary upper pressure district will be a pumped storage system supplied by a newly construction booster station to be located on the suction side of the ground tank with a firm capacity of 650 gpm (domestic) / 2500 GPM (fire). Both pressure districts will continue to receive water from the McCrea Hill storage tank fed by Garfield Booster Station No. 1. The existing PRVs will remain and be adjusted accordingly to account for pressure modifications.

4.4.2.4 COST OF ALTERNATIVES

FIGURE 26 – STORAGE ALTERNATIVES COST SUMMARY

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Facilities	N/A
Alternative 3	Storage Tank Expansion / Relocation & Booster Station	\$ 14,387,300.00

4.4.3 Water Distribution Improvements

4.4.3.1 WEST SIDE & DAY DRIVE PRV REPLACEMENTS

The McCrae Hill and Stone Ridge PRVs are past their useful life and have shown signs of wear in recent years, causing concern of failure for the Township. To maintain reliability of the pressure reducing valves to service the low pressure districts in the Day Drive and West Side Service Districts, these valves need to be replaced and recalibrated to existing system conditions.

4.4.3.2 WEST SIDE & DAY DRIVE WATERMAIN EXTENSIONS

The evaluation of the existing water system capacity concludes that redundancy and reliability improvements are recommended to replace aged and undersized water mains, as well as extend water mains to serve a larger service area and future growth / developments.

- *Panorama Subdivision Watermain Loop*
- *Horizon Outlet Center Watermain Loop*
- *Grand Traverse Crossings Watermain Loop*
- *Veterans Drive to Lowe’s Watermain Loop*

4.4.3.3 COST OF ALTERNATIVES

FIGURE 27 – DISTRIBUTION ALTERNATIVES COST SUMMARY

Alternative	Project	Capital Cost
Alternative 1	No Action	N/A
Alternative 2	Optimize Existing Facilities	N/A
Alternative 3	1: West Side & Day Drive PRV Replacements	\$3,333,000.00
	2: West Side & Day Drive Watermain Extensions	\$1,402,000.00
	Alternative 2 Project Total	\$4,735,000.00

4.5 Regional Alternatives

Construct multiple Type I water wells and treatment facility within the Garfield Township limits to allow the Township to have reliability and give the City of Traverse City Water Supply System additional redundancy in the case of emergency or water loss as well as supplement future system demands. Water quality would be a concern regarding palatability and safety as the treatment system could require methane strippers, softeners, chlorinators, etc. The cost and manpower required to treat and maintain a Type I water treatment facility and distribution systems would be greatly beneficial to the Township by additional potential revenue sources from bulk water sales.

4.6 Monetary Evaluation

The minimizing of the long-term cost of the overall system, and that of the individual user, has been the focus of Garfield Township in providing service to their users. Therefore, in the past, an emphasis has been placed on developing an infrastructure that will produce an end cost to the user that is manageable, stable and supporting a well maintained system, well into the future.

4.6.1 Sunk Cost

Sunk costs associated with this project may include investments in the current Water System that will support the expanded future use, including piping systems, electrical systems, buildings, land cost, planning costs and supporting utility installation. Sunk cost also includes preparing the project plan and previous studies completed to research these issues.

4.6.2 Present Worth

Total present worth =

$$\text{Capitol cost} + \text{O\&M} + \text{Replacement} - (\text{present worth of salvage at end of 20 years})$$

Present Worth Analysis for the water supply, storage, and distribution systems can be found in the Appendix.

4.6.3 *Salvage Value*

Monetary evaluation period is 20 years

Salvage period is:

- Conveyance (pipes, etc) – 50 years
- Treatment, tanks, booster stations, well fields – 30 to 50 years
- Process Equipment – 20 years
- Auxiliary Equipment – 15 years

Detailed description of salvage value of all water system components can be found in the Appendix.

4.6.4 *Escalation*

Excessive growth is not anticipated, therefore land acquisition is not considered as selection criteria.

4.6.5 *Interest During Construction*

Interest during construction is anticipated to be less than four years. Interest costs during construction are tabulated and included in the Appendix for Reference.

4.6.6 *Mitigation Costs*

No alternatives provided should contain potential environmental impacts. For the purpose of this analysis, we assume there are no mitigation costs for any of the alternatives.

4.6.7 *User Costs*

Currently the Township provides water service to approximately 10,248 users. The current rate structure is being reviewed and will be adjusted if necessary. The debt incurred, along with the O & M costs expected under each alternative will dictate the annual cost to the system. That cost, along with the number of hook-ups and users will dictate the end cost to each user. To date, the Township has been able to keep the monthly user charges stable and supplement through hook-up fees. It is the goal of the Township to continue this method to fund project costs.

The user charge system is currently in place and is designed to provide revenue to pay for O & M costs and debt retirement. This user charge is currently inefficient to maintain existing system costs and requires increase. The current rate is reflective of maintaining monthly charge of \$11.50/month user charge and \$1.80 per cubic foot consumed, with the average customer paying \$20.50/month. The monthly user charge is for operation and maintenance system fees, as well as capital debt charges per user as of January 2020 and are insufficient. This project would add an additional 20%, equating to a \$4.10 increase in base charge per REU per month to capital debt charges per user for the system.

4.6.8 *Project Delivery Method*

The proposed project will follow traditional Design-Bid-Build mechanisms.

4.7 Environmental Evaluation

The environmental effects of the recommended community water system improvements are minimal, in regard to negative impacts. The environmental impacts to result from water storage and distribution will be temporary and construction related with used of proper soil erosion control measure. There will be no permanent environmental impacts with the storage and distribution aspects of this project.

4.8 Technical Considerations

4.8.1 *Sufficient Pumping Capacity*

Pumping capacity within the service districts is sufficient to meet the next 5 years of growth. Within the next 5 years Booster Station #3 will require capacity increase and within the next 20 years, Booster Stations #1 and #2 will also require capacity increase. It is recommended that the Township begin planning for upgrades to the booster station infrastructure should be a priority within the next 5 years.

4.8.2 *Standby Power*

Permanent standby generators and automatic transfer switches are located at each booster station within the Townships Water System. The Township also maintains additional portable generators to utilize with equipment failure.

4.8.3 *Supply (Booster Station)*

Each booster station providing water to the customers of the service area has at a minimum two (2) pumps provided for service district for redundancy and reliability purposes.

4.8.4 *Storage Volume*

Upon review, it is apparent that the storage capacity is the limiting component with respect to capability to meet the maximum day demands for the Birmley and Day Drive Service Districts. The storage capacity in these districts will not be able to meet existing and future demands based upon current projects and expansion is needed.

4.8.5 *High Volume Users*

The Townships highest water user is the Great Wolf Lodge Water Park and Hotel. With the proposed improvements in this project, there will be no anticipated effects on design flows and pressures due to this customer because of the system parameters already in place.

5 Selected Alternatives

- Alternative No. 3: Construction Alternatives

5.1 Water System Improvements

5.1.1 Supply

In an effort to better monitor flows and water use of the Township, integration of the Master Meters into the Township SCADA system is necessary. By completing this project the Township will be able to accurately monitor water demands and can assure costs being paid to the City of Traverse City are fair and reflective of precise meter readings.

5.1.2 Storage

5.1.2.1 DAY DRIVE DISTRICT – MCCRAE HILL TANK EXPANSION

With the existing infrastructure in place to double the capacity of the McCrae Hill Storage Tank, it is proposed the expansion be completed at this time to supplement the water system demands from the Day Drive and West Side Service Districts through the long term 20 year planning period. This project will also include corrective measures of the existing McCrae Hill Storage Tank as identified in the 2022 tank inspection report.

5.1.2.2 BIRMLEY DISTRICT – HERITAGE STORAGE TANK RELOCATION

The proposed project will relocate the existing 300,000 gallon storage tank located within the West Side Service District (Heritage Estates Subdivision). The Heritage storage tank is currently abandoned as part of the consolidation of the West End and Heritage Service Districts project. To supplement short term storage capacity needs in the Birmley Service District, the Heritage Storage tank will be relocated near Booster Station #7 to supplement storage (pumped storage) to accommodate the growth of this upper pressure zone.

5.1.2.3 WEST SIDE BOOSTER STATION

With the combination of Heritage and West End, both districts will now have adequate storage (gravity or pumped) to meet the existing and future domestic and fire flow needs without the dedication of Booster Station #5. It is proposed with this final district consolidation project that the existing Booster Station #5 be abandoned and new station be constructed adjacent to the existing Cedar Run Storage Tank to supplement the West Side Upper Pressure District.

5.1.3 Distribution

5.1.3.1 WEST SIDE & DAY DRIVE PRV REPLACEMENTS

This project proposes the replacement of the McCrae Hill and Stone Ridge PRVs due to age and increased maintenance, causing concern of failure for the Township. To maintain reliability of the

pressure reducing valves to service the low pressure districts in the Day Drive and West Side Service Districts it is proposed these PRVs be replaced.

5.1.3.2 WEST SIDE & DAY DRIVE WATERMAIN EXTENSIONS

The following watermain extension projects are proposed to create critical looping within the townships distribution system.

- *Panorama Subdivision Watermain Loop*
- *Horizon Outlet Center Watermain Loop*
- *Grand Traverse Crossings Watermain Loop*
- *Veterans Drive to Lowe's Watermain Loop*

With completion of the proposed projects, there will be a transmission main looping performed to connect all service districts within the Township's water system. This provides increased reliability and redundancy.

5.2 Design Parameters

The water system treatment processes are not proposed to change with this project. The Charter Township of Garfield Water System Improvements Map is included in the Appendix.

Water main sizes were analyzed using Water CAD. Sizes were selected that would supply the required flow and maintain minimum required pressures. All designs parameters will follow state guidelines and be constructed according to the Township's standardized Technical Specifications and compliant with 10 State Standards.

5.3 Useful Life

The useful life of the assets proposed with this project are estimated by manufacturer recommendations and are expected to exceed 20 years.

5.4 Water and Energy Efficiency

Meter Calibration: Accurate metering of water for each well and each treatment facility help to determine output, track user demands, monitor production, and is required for many functions for water treatment. Maintaining the meters accuracy ensures the data collected and used is reliable.

Annual Water Audit: The purpose of an annual water audit is to determine the overall input-output accountability of the system, monitor the usage levels of qualitatively different consumers, gauge the effectiveness of conservation measures already being implemented, and gather other system performance data. It is suggested that Garfield Township and the City of Traverse City partner to perform an audit on a regular or random basis. This may prove useful for the recognition of irregular usage patterns and may serve to identify leaks, malfunctions, or other system problems.

Public Participation: Based upon the historical records, there is significantly more water usage during the summer months attributed primarily to irrigation. In the short term, implementation of a system wide water ban and/or schedule for users could be put in place to limit the usage. In the long term, although it has proven to generate a substantial amount of revenue for the Township, there should be consideration to enforce large irrigation users to install a non-potable well in lieu of using the municipal water system. This may make a significant impact on the Townships' volume of water consumption peak usage months.

5.5 Schedule for Design & Construction

A tentative schedule is as follows:

Design	Preliminary – Final Design	Fall 2023 – Spring 2024
Bidding	Water Source / Treatment	March 2024
	Water Storage	March 2024
	Water Distribution	March 2024
Construction	Water Source / Treatment	May 2026
	Water Storage	May 2027
	Water Distribution	May 2028

5.6 Cost Summary

The cost of the construction of all alternatives is detailed in the table below.

FIGURE 28 – SELECTED ALTERNATIVES COST SUMMARY

Project	Construction Cost	Contingency (25%)	Legal, Admin, Financial	Engineering Services	Total
Supply	\$105,000.00	\$26,300.00	\$6,300.00	\$21,000.00	\$158,600.00
Storage	\$9,528,000.00	\$2,382,000.00	\$571,700.00	\$1,905,600.00	\$14,387,300.00
Distribution #1	\$2,207,300.00	\$551,800.00	\$132,400.00	\$441,500.00	\$3,333,000.00
Distribution #2	\$928,500.00	\$232,100.00	\$55,700.00	\$185,700.00	\$1,402,000.00
Total	\$12,768,800.00	\$3,192,200.00	\$766,100.00	\$2,553,800.00	\$19,280,900.00

5.6.1 Cost to Users

The user costs were developed using the construction cost estimate for the capital project cost. Costs were amortized for the loan period and were divided over the 30-year planning and loan period. These costs were then divided by the existing users (billed customers) on the Townships' system. The estimated monthly user cost for this project is \$4.10 (estimated 20 percent increase) and therefore it is expected the actual user costs will increase because the current user rates are insufficient.

5.6.2 Residential Water Usage

Figure 17 represents the overall water system usage projections for the next 20 years with residential flows of 201 gallons per day per REU based on historical usage, with an average household size of 2.16 the average flow per day per capita is 93 gallons per day.

5.6.3 *Capital Expenditures*

All water system capital expenditures and user fees are detailed in the Appendix.

5.6.4 *Operation & Maintenance*

The Operations and Maintenance costs are included in the Operating Budget, included in the Appendix.

5.6.5 *Repair & Replacement Budget*

The Repair and Replacement Budget is included in the Present Worth Analysis, refer to the Appendix.

5.7 Implementability

The Charter Township of Garfield has the legal authority, capability, and willingness to plan, finance, build, operate, and maintain the water system improvements, including the selected alternative discussed above. The Township will solely own, operate, and finance the facilities to be built as part of the proposed project.

5.8 Disadvantaged Community

A Disadvantaged Community Status Determination Worksheet was completed, and the Charter Township of Garfield was not determined to be a disadvantaged community.

6 Environmental & Public Health Impacts

The environmental effects of the recommended water supply, treatment, storage, and distribution are minimal in regard to negative impacts. The environmental impacts to result from implementing the proposed improvements will be temporary and construction related with use of proper soil erosion control measure. There will be no permanent environmental impacts with the selected alternative.

The “No Action” alternative could present negative environmental impacts that could lead to water system failure and public safety concerns. Implementing no improvements leaves the possibility of equipment failure and loss of supply water leading to a water emergency that would have negative impacts on social and economic factors of the community.

The environmental effects of the recommended water distribution system improvements are minimal, in regard to negative impacts. The environmental impacts to result from the selected alternative will be temporary and construction related with use of proper soil erosion control measure. There will be no permanent environmental impacts with the proposed project. There will however be positive environmental impacts such as improved reliability of supply and distribution reliability. As required by County and State regulations, a Soil Erosion and Sedimentation Control Permit will be acquired for the projects, if applicable. As with most utility related construction projects, it is expected that traffic will be rerouted to other streets during construction. The impact of traffic detours is expected to be minor. The construction dust and fumes will be minimized as much as possible

6.1 Direct Impacts

Direct impacts such as noise, dust control, and soil erosion control will be mitigated using general construction control measures during construction activities. Soil erosion control will be in accordance with the Michigan Soil Erosion and Sedimentation Control Act (Part 91, Act 451, P.A. 1994). Temporary erosion control measures will include the use of berms or ditches to divert stormwater runoff, where necessary, and the use of straw bales, filter fence, or sedimentation basins as needed to protect watercourses.

Dust control practices will include street sweeping as necessary on improved road surfaces, and the wetting of road surfaces if dust becomes a public nuisance. Noise control will consist of work restrictions during weekends, evening hours, and holidays. Because of the relative remoteness of the site, these restrictions may only apply to the (public) access roads and areas surrounding the site.

6.1.1 Construction Impacts

Construction is to occur in locations with existing infrastructure within publicly owned right-of-ways, easements, or Township owned property. The construction impacts will be minimal and limited to areas that have previously been cleared of trees and vegetation. No impacts to sensitive areas will be implemented through this project.

Construction method impacts: Construction activities include excavation on a 1:1 slope with the greatest trench depth being no more than 15 feet. There is anticipated to be potential for minimal local dewatering

with the proposed improvements. Groundwater depth in the areas of construction ranges from 15-30 feet below grade, due to the depth of construction in relation to groundwater table depth, there will be no adverse impacts resulting from dewatering.

Traffic disruption impacts are anticipated to be very minor and of a temporary duration. No portions of the project will require road shut down. Dust control practices will include street sweeping as necessary on improved road surfaces, and the wetting of road surfaces if dust becomes a public nuisance. Noise control will consist of work restrictions during weekends, evening hours, and holidays. Because of the relative remoteness of the site, these restrictions may only apply to the (public) access roads and areas surrounding the site.

Due to construction occurring in areas with existing infrastructure, the initial assumption is that there are no endangered, threatened, proposed, or candidate species, or critical habitat occurring within the proposed project areas.

6.1.2 *Operation Impacts*

The proposed project will not impact the operations of the facilities during construction. Operational impacts will be minimal. The selected alternative does not change the existing technology or processes of treatment. Operators are already well trained and have the capacity to manage the improvements.

Minor operational impact that will be associated with the project include noise for the surrounding residents, increased traffic, and dust. All these impacts will be minimized as much as possible throughout the project.

6.1.3 *Social Impacts*

Social impacts are largely reflected as user rates increase. This is a sensitive issue in any community. However, these increases will be evenly distributed and will affect all who are benefited by the system. The project will not include any social impacts on traffic, such as detours, relocation of businesses, employment changes, or lack of access to residences or places of business.

6.2 **Indirect Impact**

6.2.1 *Development / User Charge*

Indirect impacts are expected to be minor. Additional growth is likely in the service area, and development is consistent with the Township land use plan. The improvements will address the required improvements to maintain the existing users and allow availability for growth within the area.

6.2.2 *Land Use*

Land use is determined by the current zoning ordinance. It is not likely to significantly change in the future. The most significant change will be the availability and capacity to serve any additional development that comes to the Township.

6.2.3 *Air Quality*

No changes in Air Quality stemming from primary or secondary development from this project are anticipated. Any air quality issues associated with this project will be temporary in nature and limited to the time of construction.

6.2.4 Changes to Natural Setting

Preliminary assumptions would indicate that no threatened or endangered species exist within the project area and therefore will not be affected. These assumptions are based on the fact that construction is limited to sites with existing facilities.

6.2.5 Cultural / Human Impacts

Impacts on cultural, human, social, and economic resources are expected to be positive due to improved water supply and treatment systems. The only negative impact in this category would be increased user costs, which will be evenly distributed across the customer base being served by the system.

6.2.6 Resource Consumption

Resources consumption over the useful life of the treatment plant is not applicable for this project.

6.3 Cumulative Impacts

Cumulative impacts are expected to be minimal. Some development is expected, but any development falls within the Township's current land use plan and would most likely occur without the proposed project. Water quality degradation is not considered an issue; in fact, because of the facility's existence, water quality has most likely been improved by eliminating the possibility of system failure as capacity limits of the current system are reached. The Township will continue to work under the requirements of their operating permits and will stay in compliance with those requirements to assure this system will not adversely impact the environment. Construction impacts will be temporary in nature and of short duration. All disturbed areas will be restored at construction completion.

7 Mitigation

The environmental impacts, whether direct, indirect, or cumulative, are expected to be minimal. Structural mitigation measures are largely related to established soil erosion, noise, and dust control practices during construction activities, and discharge water quality during system operation. Nonstructural mitigation can be addressed by prudent planning and by participation in environmental studies with the objective of pollution prevention. Each of these mitigation issues are discussed in the section that follows.

7.1 Mitigation of Short Term Impacts

7.1.1 General Construction

On site mitigation measures will include established soil erosion, noise, and dust control practices during construction activities. Soil erosion control will be in accordance with the Michigan Soil Erosion and Sedimentation Control Act (Part 91, Act 451, P.A. 1994). Temporary erosion control measures will include the use of berms or ditches to divert stormwater runoff, where necessary, and the use of straw bales, filter fence, or sedimentation basins as needed to protect watercourses.

Dust control practices will include street sweeping as necessary on improved road surfaces, and the wetting of road surfaces if dust becomes a public nuisance. Noise control will consist of work restrictions during weekends, evening hours, and holidays. Because of the relative remoteness of the sites, these restrictions may only apply to the (public) access roads and areas surrounding the sites.

7.2 Mitigation of Long Term Impacts

One of the advantages of the selected alternative was the minimization of the potential for surface water contamination due to the production of a higher quality effluent. The long-term mitigation practices are discussed in this section.

7.2.1 General Construction

Construction activity in wetlands will be prohibited, this includes the disposal of spoils or driving vehicles within. No construction will be performed on property that contains wetlands. The use of silt fence or straw bales will be used as needed to contain sediment from construction disturbances.

Although it does not appear any construction will take place around wetlands or stream crossings, options to avoid disturbing these areas will be investigated, including directional drilling and bore and jack. There are no identified endangered/threatened species or habitats impacted through this project, though if encountered, appropriate mitigation and construction timing requirements will take effect.

7.2.2 Sitting Decisions

The protection of groundwater and surface water resources in the area will be paramount with this project.

7.2.3 Operational Impacts

The primary operational impact will be noise source from the mechanical treatment, which will be enclosed in buildings to minimize impacts

7.3 Mitigation of Indirect Impacts

7.3.1 Master Plan and Zoning

The Charter Township of Garfield 2020 Master Plan outlines Agricultural Preservation as a priority and specifies limiting sewer and water extensions to areas designated as such in order to control direct development or displacement of this land. The Master Plan also required vegetated buffers from all wetlands, streams, lakes, and rivers to protect water quality and prevent deterioration. The Master Plan includes protecting significant, sensitive natural amenities, coordinating utility expansion in a way that encourages development along existing arterial roadways and on vacant or underutilized sites first, and preserve areas suitable for farming and agriculture related uses.

The Township's building codes, performance standards, specific ordinances, or limitations on certain uses to address increased associated construction nuisances will be appropriately followed.

7.3.2 Ordinances

The Township currently oversees and enforces control of stormwater and NPS pollution where new construction is occurring. This is enforced through Ordinance 49 of 2007.

7.3.3 Staging of Construction

The staging of proposed construction activities will happen in two phases as follows:

- 1 Phase I – Supply System Improvements
 - a. Master Meter Improvements
- 2 Phase II – Storage System Improvements
 - a. Construction of McCrae Hill storage tank expansion
 - b. Relocation of Heritage Storage Tank to Birmley Existing Tank Site
 - c. West End District Booster Station
- 3 Phase III – Distribution System Improvements
 - a. West End & Day Drive PRV Replacements
 - b. West End & Day Drive Watermain Extensions

Phase I of the project will be bid out as one (1) contract that will consist of all work to be completed at the Mater Meter Locations.

Phase II of the project will be bid out as three (3) separate contracts that will consist of all work to be completed for the installation of the West End storage tank site, the McCrae Hill ground storage tank site and the existing Birmley storage tank location. The contractors awarded the project may determine if each project will occur simultaneously, or at different times.

Phase III of the project will be bid out as two (2) separate contracts that will consist of all work to be completed on the distribution system. The contractors awarded the project may determine if each project will occur simultaneously, or at different times.

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8 Public Participation

8.1 Public Meeting

A Public Notice was advertised on May 8th, 2023, for a Township Board Meeting to be held on May 23rd, 2023, for discussion and comment on the Notice of intent to apply to Michigan State Revolving Funds Drinking Water Grant Program for the proposed alternatives. This meeting included discussion and presentation on the alternatives provided through this Project Plan.

8.2 Public Meeting Advertisement

The Township held a public meeting related to the DWSRF loan on May 23rd, 2023, which was published 15 days prior to the meeting. The advertisement was published in the Morning Sun Newspaper, during this time of advertisement, the project plan was available for review by the community at the Township offices. A copy of the Advertisement and the Affidavit of publication can be found in Appendix.

8.3 Public Meeting Summary

A draft copy of the meeting minutes from the public meeting is provided in the Appendix. The following is noted:

- A PowerPoint Presentation was given, and a copy of the slides is included in the Appendix.
- List of all attendees is note in the meeting minutes however no public was present in person or via zoom.
- No specific concerns were raised during the meeting, only general questions and answers.
- No written comments were received during the public notice period.