TOWN OF CARMEL
TOWN HALL

60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 • Fax (845) 628-6836
www.carmelny.org

TOWN BOARD WORK SESSION
Wednesday, June 10, 2020 7:00pm

PLEDGE OF ALLEGIANCE - MOMENT OF SILENCE

PUBLIC HEARING #1- On the Proposed Amended Increase and Improvement of the Facilities of Carmel Sewer District #1 WWTP

1. Res: Public Interest Order in the Matter of the Increase and Improvement of Facilities of Consolidated Sewer District #1 in the Town of Carmel, Putnam County, New York (Additional Costs)

2. Res: Authorizing the Issuance of an Additional $291,536 Bonds of the Town of Carmel, Putnam County, New York, to Pay Part of the Cost of the Increase and Improvement of the Facilities of Consolidated Sewer District #1 in and for said Town

3. Res: Order Calling Public Hearing in the Matter of the Increase and Improvement of the Facilities of Carmel Water Districts Nos. 2,9 and 14 in the Town of Carmel, Putnam County, New York (Additional Costs) (July 1, 2020)

- **Public Comment (Three (3) Minutes on Agenda Items Only)**

Town Board Work Session:

- Review of Town Board Minutes, May 27, and June 3, 2020

1. Supervisor Kenneth Schmitt – Making Permanent Appointment of Senior Office Assistant in the Supervisor's Office – Joanna Terilli

2. Mary Ann Maxwell, Town Comptroller – Consider Request to award electric supply bids for facilities and street lights for 24 month period commencing November 1, 2020 – October 31, 2022 through joint purchasing bid with Putnam County and other surrounding Towns

3. Lake Casse Park District Advisory Board – Consider Request to Authorize Distribution of Quarterly Newsletter

4. Michael Simone, Highway Superintendent – Consider Request to Declare Equipment/Machinery Old and Obsolete and Authorize Disposal

5. Michael Simone, Highway Superintendent – Consider Request to Authorize Purchase of Bulk Diesel NYS OGS Contract PC68456 (revision to Contract # 23094 9/19/2018)

6. James Gilchrist, Director of Recreation & Parks – Consider Request to Authorize Additional Costs for Engineering Services – Airport Park Phase II ($5,200)

7. James Gilchrist, Director of Recreation & Parks – Consider Request to Authorize Purchase of Soccer and Lacrosse Equipment – Airport Park

8. James Gilchrist, Director of Recreation & Parks – Consider Request to Authorize Payment for the Purchase and Installation of Bathroom Fixtures – McDonough Park

9. Richard Franzetti, PE, Town Engineer – Consider Request to Authorize Awarding of Bid for CSD#1 Main Extension

10. Richard Franzetti, PE, Town Engineer – Consider Request to Refund of Application Fee – Carmel Fire Department

11. Richard Franzetti, PE, Town Engineer- Hazen & Sawyer - Presentation of CWD#2 Water Treatment Plant Upgrade

- **Public Comment (Three (3) Minutes on Agenda Items Only)**
- **Town Board Member Comments**

Open Forum:

- **Public Comments on New Town Related Business (Three (3) Minutes Maximum for Town Residents, Property Owners & Business Owners Only)**
- **Town Board Member Comments**
- **Adjournment**

Public Hearing #1 (6/10/2020)

NOTICE OF PUBLIC HEARING
TOWN OF CARMEL SEWER DISTRICT NO. 1

NOTICE IS HEREBY GIVEN that the Town Board of the Town of Carmel, Putnam County, New York, will conduct a public hearing virtually through the Zoom platform on the 10th day of June, 2020, at 7:00 o'clock PM Prevailing Time, for the purpose of conducting a public hearing upon a certain map, plan and report including an amended estimate of cost prepared in relation to the proposed increase and improvement of the facilities of Carmel Sewer District No. 1 in the Town of Carmel, Putnam County, New York, consisting of the purchase and installation of approximately 450 linear feet of 8 inch sewer line, including three (3) manholes, two (2) service laterals and restoration of NYSDOT right of way, including original furnishings, equipment, machinery, apparatus, appurtenances and incidental improvements and expenses. The new maximum estimated cost of the aforesaid increase and improvement of the facilities of Carmel Sewer District No. 1 in the Town is $461,536, consisting of an increase of $291,536 for such improvements.

Public participation will be afforded through Zoom. The particulars will be provided on the Town of Carmel's website (ci.carmel.ny.us) and bulletin board in advance of the meeting, and email comments may be directed to the Town Board at: TownBoard@ci.carmel.ny.us.

The capital project described above has been determined to be a "Type II Action" pursuant to the regulations promulgated under the State Environmental Quality Review Act ("SEQRA") which such regulations provide will not result in any significant environmental adverse impacts. The map, plan and report are available in the office of the Town Clerk, where they may be inspected during regular office hours.

At said public hearing said Town Board will hear all persons interested in the subject matter thereof.

Dated: Mahopac, New York
May 21, 2020

BY ORDER OF THE TOWN BOARD OF THE TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK

ANN SPOFFORD
TOWN CLERK

RESOLUTION #1

PUBLIC INTEREST ORDER IN THE MATTER OF THE INCREASE AND IMPROVEMENT OF FACILITIES OF CONSOLIDATED SEWER DISTRICT NO. 1 IN THE TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK (ADDITIONAL COSTS)

WHEREAS, by Orders heretofore adopted, the Town Board of the Town of Carmel, Putnam County, New York, authorized an increase and improvement of the facilities of Consolidated Sewer District No. 1, consisting of the purchase and installation of approximately 450 linear feet of 8 inch sewer line, including three (3) manholes, two (2) service laterals and restoration of NYSDOT right of way, including original furnishings, equipment, machinery, apparatus, appurtenances and incidental improvements and expenses in connection therewith, at a maximum estimated cost of $170,000; and

WHEREAS, by Order dated May 13, 2020, said Town Board called a public hearing on the question of the increase in the maximum estimated cost of said capital project from $170,000 to $461,536 an increase of $291,536; and

WHEREAS, notice of said public hearing was duly published and posted in the manner and within the time provided by law and such public hearing was duly held at the time and place specified in said notice at which all persons interested in the subject matter thereof were duly heard; and

WHEREAS, said Town Board has duly considered the evidence given at said public hearing; NOW, THEREFORE, BE IT

ORDERED, by the Town Board of the Town of Carmel, Putnam County, New York, as follows:

Section 1. Upon the evidence given at the aforesaid public hearing, it is hereby found and determined that it is necessary and in the public interest to increase and

improve the facilities of Consolidated Sewer District No. 1, in the Town of Carmel, Putnam County, New York, in the manner described in the preambles hereof, at a new maximum estimated cost of $461,536 and said increase and improvement is hereby authorized and approved..

Section 2. This Order shall take effect immediately.

Resolution

Offered by: _____

Seconded by:_____

Roll Call Vote	YES	NO
Robert Schanil	___	___
Michael Barile	___	___
Frank Lombardi	___	___
Suzanne McDonough	___	___
Kenneth Schmitt	___	___

RESOLUTION #2

A RESOLUTION AUTHORIZING THE ISSUANCE OF AN ADDITIONAL $291,536 BONDS OF THE TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK, TO PAY PART OF THE COST OF THE INCREASE AND IMPROVEMENT OF THE FACILITIES OF CONSOLIDATED SEWER DISTRICT NO. 1 IN AND FOR SAID TOWN.

WHEREAS, the Town Board of the Town of Carmel, Putnam County, New York, on August 15, 2018, duly adopted a bond resolution authorizing the issuance of $170,000 serial bonds of said Town to pay the cost of the increase and improvement of Consolidated Sewer District No. 1, in and for the Town of Carmel, Putnam County, New York, consisting of the purchase and installation of approximately 450 linear feet of 8 inch sewer line, including three (3) manholes, two (2) service laterals and restoration of NYSDOT right of way, including original furnishings, equipment, machinery, apparatus, appurtenances and incidental improvements and expenses in connection therewith, and

WHEREAS, said project has been determined to be a "Type II Action" pursuant to the regulations of the New York State Department of Environmental Conservation promulgated pursuant to the State Environmental Quality Review Act ("SEQRA"), the implementation of which as proposed, such regulations provide will not result in any significant adverse environmental impacts; and

WHEREAS, it has now been determined that the maximum estimated cost of such class of objects or purposes is $461,536, an increase of $291,536 over that previously authorized; and

WHEREAS, it is now desired to authorize the issuance of an additional $291,536 bonds of said Town for such specific object or purpose to pay a portion of the cost thereof; NOW, THEREFORE,

BE IT RESOLVED, by the affirmative vote of not less than two-thirds of the total voting strength of the Town Board of the Town of Carmel, Putnam County, New York, as follows:

Section 1. For the specific object or purpose of paying additional costs of the increase and improvement of Consolidated Sewer District No. 1, in and for said Town of Carmel, Putnam County, New York, consisting of the purchase and installation of

approximately 450 linear feet of 8 inch sewer line, including three (3) manholes, two (2) service laterals and restoration of NYSDOT right of way, including original furnishings, equipment, machinery, apparatus, appurtenances and incidental improvements and expenses in connection therewith, there are hereby authorized to be issued an additional $291,536 bonds of the Town of Carmel, Putnam County, New York, pursuant to the provisions of the Local Finance Law.

Section 2. It is hereby determined that the maximum estimated cost of such specific object or purpose is now determined to be $461,536, which specific object or purpose is hereby authorized at said maximum estimated cost, and that the plan for the financing thereof is as follows:

a) by the issuance of the $170,000 bonds of said Town authorized to be issued pursuant to bond resolution dated and duly adopted August 15, 2018; and
b) by the issuance of the additional $291,536 bonds of said Town authorized to be issued pursuant to this bond resolution.

Section 3. It is hereby determined that the period of probable usefulness of the aforesaid specific object or purpose is forty years, pursuant to subdivision 4 of paragraph a of Section 11.00 of the Local Finance Law, calculated from the date of issuance of the first obligations for said specific object or purpose. It is hereby further determined that the maximum maturity of said bonds shall exceed five years.

Section 4. The faith and credit of said Town of Carmel, Putnam County, New York, are hereby irrevocably pledged to the payment of the principal of and interest on such obligations as the same respectively become due and payable. An annual appropriation shall be made in each year sufficient to pay the principal of and interest on such obligations becoming due and payable in such year. To the extent not paid from monies raised from said Consolidated Sewer District No. 1 in the manner provided by law, there shall annually be levied on all the taxable real property in said Town a tax sufficient to pay the principal of and interest on such obligations as the same become due and payable.

Section 5. Subject to the provisions of the Local Finance Law, the power to authorize the issuance of and to sell bond anticipation notes in anticipation of the issuance and sale of the serial bonds herein authorized, including renewals of such notes, is hereby delegated to the Supervisor. Such notes shall be of such terms, form and contents, and

shall be sold in such manner, as may be prescribed by said Supervisor, consistent with the provisions of the Local Finance Law.

Section 6. The powers and duties of advertising such bonds for sale, conducting the sale and awarding the bonds, are hereby delegated to the Supervisor, who shall advertise such bonds for sale, conduct the sale, and award the bonds in such manner as he shall deem best for the interests of said Town; including, but not limited to, the power to sell said bonds to the New York State Environmental Facilities Corporation; provided, however, that in the exercise of these delegated powers, he shall comply fully with the provisions of the Local Finance Law and any order or rule of the State Comptroller applicable to the sale of municipal bonds. The receipt of the Supervisor shall be a full acquittance to the purchaser of such bonds, who shall not be obliged to see to the application of the purchase money.

Section 7. All other matters except as provided herein relating to the serial bonds herein authorized including the dale, denominations, maturities and interest payment dates, within the limitations prescribed herein and the manner of execution of the same, including the consolidation with other issues, and also the ability to issue serial bonds with substantially level or declining annual debt service, shall be determined by the Supervisor, the chief fiscal officer of such Town. Such bonds shall contain substantially the recital of validity clause provided for in Section 52.00 of the Local Finance law, and shall otherwise be in such form and contain such recitals, in addition to those required by Section 51.00 of the Local Finance Law, as the Supervisor shall determine consistent with the provisions of the Local Finance Law.

Section 8. The Supervisor is hereby further authorized, in such officer's discretion, to execute a project finance and/or loan agreement, and any other agreements with the New York State Department of Environmental Conservation and/or the New York State Environmental Facilities Corporation, including amendments thereto, and including any instruments (or amendments thereto) in the effectuation thereof, in order to effect the financing or refinancing of the class of objects or purposes described in Section 1 hereof, or a portion thereof, by a bond, and/or note issue of said Town in the event of the sale of same to the New York State Environmental Facilities Corporation.

Section 9. The power to issue and sell notes to the New York State Environmental Facilities Corporation pursuant to Section 169.00 of the Local Finance Law is hereby delegated to the Supervisor. Such notes shall be of such terms, form and contents as may be prescribed by said Supervisor consistent with the provisions of the Local Finance Law.

Section 10. The validity of such bonds and bond anticipation notes may be contested only if:

1) Such obligations are authorized for an object or purpose for which said Town is not authorized to expend money, or

2) The provisions of law which should be complied with at the date of publication of this resolution are not substantially complied with, and an action, suit or proceeding contesting such validity is commenced within twenty days after the date of such publication, or

3) Such obligations are authorized in violation of the provisions of the Constitution.

Section 11. This resolution shall constitute a statement of official intent for purposes of Treasury Regulations Section 1.150 - 2. Other than as specified in this resolution, no monies are, or are reasonably expected to be, reserved, allocated on a long-term basis, or otherwise set aside with respect to the permanent funding of the object or purpose described herein.

Section 12. This resolution, which takes effect immediately, shall be published in summary form in the official newspaper, together with a notice of the Town Clerk in substantially the form provided in Section 81.00 of Local Finance Law.

Resolution

Offered by: _____

Seconded by:_____

Roll Call Vote	YES	NO
Robert Schanil	___	___
Michael Barile	___	___
Frank Lombardi	___	___
Suzanne McDonough	___	___
Kenneth Schmitt	___	___

RESOLUTION #3

ORDER CALLING PUBLIC HEARING IN THE MATTER OF THE INCREASE AND IMPROVEMENT OF THE FACILITIES OF CARMEL WATER DISTRICTS NOS. 2, 9 AND 14 IN THE TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK (ADDITIONAL COSTS)

WHEREAS, the Town Board of the Town of Carmel, Putnam County, New York, has heretofore caused to be prepared a map, plan and report, including an estimate of cost, pursuant to Section 202-b of the Town Law, relating to the increase and improvement of the facilities of Carmel Water Districts Nos. 1, 2, 3, 8, 9, 10, 13 and 14 in the Town of Carmel, Putnam County, New York, being in each such district, the construction of improvements to the district water tank or shared water tank and related equipment and site improvements, including original furnishings, equipment, machinery, apparatus, appurtenances, and incidental improvements and expenses in connection therewith, at a maximum estimated cost of $25,315 to Carmel Water District No. 1, $1,562,615 to Carmel Water District No. 2, $282,538 to Carmel Water District No. 3, $360,296 to Carmel Water District No. 8, $17,684 to Carmel Water District No. 9, $53,658 to Carmel Water District No. 10, $35,221 to Carmel Water District No. 13, and $391,063 to Carmel Water District No. 14; and

WHEREAS, all conditions precedent to the financing of the capital projects hereinafter described, including compliance with the provisions of the State Environmental Quality Review Act ("SEQRA"), have been performed, it having been determined that said capital projects are each a Type II Action as to which the SEQRA regulations provide that there is no significant adverse impact pursuant to 6 NYCRR Part 617.5(c)(2); and

WHEREAS, it is now determined that the maximum estimated cost to Carmel Water District No. 2 is $2,762,615, an increase of $1,200,000 over that previously estimated; and

WHEREAS, it has now been determined that the maximum estimated cost to Carmel Water District No. 9 is $40,184, an increase of $22,500 over that previously estimated; and

WHEREAS, it has now been determined that the maximum estimated cost to Carmel Water District No. 14 is $431,063, an increase of $40,000 over that previously estimated;

WHEREAS, it is now desired to call a respective public hearing on the question of the increase and improvement of the facilities of said Carmel Water District Nos. 2, 9 and 14 in the matter described above, and to hear all persons interested in the subject thereof, concerning the same, in accordance with the provisions of Section 202-b of the Town Law;

NOW, THEREFORE, IT IS HEREBY ORDERED, by the Town Board of the Town of Carmel, Putnam County, New York, as follows:

Section 1. A public hearing will be held at the Town Hall, in Mahopac, New York, in said Town, on July 1, 2020, at 7:00 o'clock P.M., Prevailing Time, on the question of the increase and improvement of the facilities of Carmel Water Districts Nos. 2, 9 and 14 in the Town of Carmel, Putnam County, New York, in the manner described in the preambles hereof, and to hear all persons interested in the subject thereof, concerning the same, and to take such action thereon as is required or authorized by law.

Section 2. The Town Clerk is hereby authorized and directed to cause a copy of the Notice of Public Hearing hereinafter provided to be published once in the official newspapers, and also to cause a copy thereof to be posted on the sign board of the Town, such publication and posting to be made not less than ten, nor more than twenty, days before the date designated for the hearing.

Section 3. The notice of public hearing shall be in substantially the form attached hereto as Exhibit A and hereby made a part hereof.

Section 4. This Order shall take effect immediately.

Resolution

Offered by: _____

Seconded by:_____

Roll Call Vote	YES	NO
Robert Schanil	___	___
Michael Barile	___	___
Frank Lombardi	___	___
Suzanne McDonough	___	___
Kenneth Schmitt	___	___

CERTIFICATION FORM

STATE OF NEW YORK)
) ss.:
COUNTY OF PUTNAM)

I, the undersigned Clerk of the Town of Carmel, Putnam County, New York (the "Issuer"), DO HEREBY CERTIFY:

1. That a meeting of the Issuer was duly called, held and conducted on the 10th day of June, 2020.
2. That such meeting was a **special regular (**circle one) meeting.
3. That attached hereto is a proceeding of the Issuer which was duly adopted at such meeting by the Board of the Issuer.
4. That such attachment constitutes a true and correct copy of the entirety of such proceeding as so adopted by said Board.
5. That all members of the Board of the Issuer had due notice of said meeting.
6. That said meeting was open to the general public in accordance with Section 103 of the Public Officers Law, commonly referred to as the "Open Meetings Law".
7. That notice of said meeting ***(the meeting at which the proceeding was adopted)*** was caused to be given **PRIOR THERETO** in the following manner:

PUBLICATION (here insert newspaper(s) and date(s) of publication - should be a date or dates falling prior to the date set forth above in item 1)

POSTING (here insert place(s) and date(s) of posting- should be a date or dates falling prior to the date set forth above in item 1)

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Issuer this _____ day of June, 2020.

_____
Town Clerk

(CORPORATE SEAL)

Exhibit A

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the Town Board of the Town of Carmel, Putnam County, New York, will have a virtual meeting at the Town Hall, 60 McAlpin Avenue, in Mahopac, New York, on July ___, 2020, at _____ o'clock P.M., Prevailing Time, for the purpose of conducting a respective public hearing upon a certain map, plan and report, including a revised estimate of cost, in relation to the proposed increase and improvement of the facilities of Carmel Water Districts Nos. 2, 9 and 14 in said Town, consisting in each district of the construction of improvements to the district water tank or shared water tank and related equipment and site improvements, including original furnishings, equipment, machinery, apparatus, appurtenances, and incidental improvements and expenses in connection therewith, at a revised maximum estimated cost of $2,762,615 to Carmel Water District No. 2, (an increase of $1,200,000), $40,184 to Carmel Water District No. 9, (an increase of $22,500), and $431,063 to Carmel Water District No. 14, (an increase of $40,000).

Said capital projects have been determined to be a Type II Action pursuant to the regulations of the New York State Department of Environmental Conservation promulgated pursuant to the State Environmental Quality Review Act ("SEQRA"), the implementation of which as proposed, said regulations provide will not result in any significant adverse environmental impacts.

Public participation at the virtual public hearing will be as follows:

_____and e-mail comments may be directed to the Town Board at: _____.

At said public hearing said Town Board will hear all persons interested in the subject matter thereof.

Dated: Mahopac, New York,

_____, 2020.

BY ORDER OF THE TOWN BOARD OF THE TOWN OF CARMEL, PUTNAM COUNTY, NEW YORK

Ann Spofford
Town Clerk

TOWN OF CARMEL
TOWN HALL
60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 • Fax (845) 628-6836
www.carmelny.org

MEMORANDUM

To: **Town Board**

Date: **June 8, 2020**

From: **Kenneth Schmitt, Town Supervisor**

RE: **Joanna Terilli, Sr. Office Assistant – Permanent Status**

June 10th will complete the one-year probationary status for Joanna Terilli, Senior Office Assistant in the Supervisor's Office.

Joanna is an exemplary employee. Her performance and job skills go above and beyond the scope of her job duties. She handles all calls, and communicates with co-workers and residents in professional, courteous manner.

I am happy to recommend permanent status for Joanna Terilli.

Maxwell,Mary Ann

From: Alessandro Mazzotta <Alessandro.Mazzotta@putnamcountyny.gov>
Sent: Wednesday, May 27, 2020 8:39 AM
To: mchiudina@brewstervillage-ny.gov; Maxwell,Mary Ann; Tony Hay; Steven Lauria
Cc: Christopher Schiller (cschiller@resolutionenergygroup.com); Breana Fitzpatrick
Subject: FW: Putnam County Cooperative Electricity Bid Award Recommendation

Good Morning,

We opened our electricity bids last Wednesday. Below is the award recommendation from our consultants, Resolution Energy. In a nutshell, we can lock in rates at $.0588 for 24 months; current contract price is $.06497.

I will proceed with awarding this contract as long as there are no objections.

Thank you.

Alex

From: Breana Fitzpatrick <bfitzpatrick@resolutionenergygroup.com>
Sent: Tuesday, May 26, 2020 5:24 PM
To: Alessandro Mazzotta <Alessandro.Mazzotta@putnamcountyny.gov>
Cc: Leyla Khabilova <lkhabilova@resolutionenergygroup.com>; Chris Schiller <cschiller@resolutionenergygroup.com>
Subject: Putnam County Cooperative Electricity Bid Award Recommendation

Good afternoon Alex,

After considering the current market conditions, please see below for the recommendations:

1) **Facilities (all non-street lighting accounts):** We recommend the County awards a 24 month fixed rate to Energy Cooperative of America for $0.0588 per kWh. The recommended rate includes dual billing, which means you will receive one invoice from the supplier and one from the Utility each month. The current contract is dual billing with the same supplier. However, if an agency prefers consolidated billing (only pay one bill through the Utility each month), Energy Cooperative of America's 24 mo. fixed rate offer is $0.06026 per kWh. The current contract rate for the facilities is $0.06497 per kWh. The recommended fixed rate is approximately 9-10% less than the current contract rate.

2) **Streetlights:** We recommend the County awards a 24 month fixed rate contract to Energy Cooperative of America for $0.03825 per kWh (dual billing). If consolidated billing is preferred, the supplier's 24 month fixed rate offer is $0.0392 per kWh. The current contract rate for the municipal streetlights is $0.04748 per kWh. The recommended fixed rate estimates an annual savings of 19-20% compared to the current contracted rate.

By locking in fixed rates, all agencies will continue to have budget certainty and price protection for the next two years. Please us know if you have any questions. If the County approves the recommendation, please send us a copy of the Award Letter.

Regards,

Breana

Breana Fitzpatrick
Director of Client Services
Resolution Energy Group
520 White Plains Rd.|Suite 500|Tarrytown, NY 10591
Phone:917-621-5415|Fax: 914-470-3595

PURCHASING AND CENTRAL SERVICES
Telephone No.: (845) 808-1088

Contract Award Notification

Title:	**FIRM ELECTRIC SUPPLY**
Contract Period:	**November 1, 2020 - October 31, 2022**
Bid Opening Date:	**May 20, 2020**
BID No:	**RFB-20-20**
Authorized User:	**County of Putnam & Political Subdivisions**
Description:	**ELECTRIC SUPPLY**
Contractor Information:	**FACILITIES AWARD** **ENERGY COOPERATIVE OF AMERICA** **1408 Sweet Home Road, Suite 8** **Amherst, NY 14228** **STREET LIGHTS AWARD** **ENERGY COOPERATIVE OF AMERICA** **1408 Sweet Home Road, Suite 8** **Amherst, NY 14228**

PURCHASING AGENT: Alex Mazzotta **DATE:** 5/27/2020

COUNTY EXECUTIVE: MaryEllen Odell **DATE:** 5.27.20

Putnam County RFB 20-20
FIRM ELECTRIC SUPPLY

Energy Cooperative of America, Inc.
1408 Sweet Home Road, Suite 8
Amherst, NY 14228

#	Items	Unit Price	Total Cost
1	**FIXED ELECTRIC RATE OFFER (INCLUDES CAPACITY)**		
#1-1	12 MONTH TERM - DUAL	$ 0.05748	$ 0.05748
#1-2	12 MONTH TERM - POR	$ 0.05891	$ 0.05891
#1-3	**24 MONTH TERM - DUAL**	**$ 0.0588**	**$ 0.0588**
#1-4	24 MONTH TERM - POR	$ 0.06026	$ 0.06026
#1-5	36 MONTH TERM - DUAL	No Bid	No Bid
#1-6	36 MONTH TERM - POR	No Bid	No Bid
2	**FIXED ELECTRIC RATE OFFER (CAPACITY PASS-THROUGH)**		
#2-1	12 MONTH TERM - DUAL	$ 0.04185	$ 0.04185
#2-2	12 MONTH TERM - POR	No Bid	No Bid
#2-3	24 MONTH TERM - DUAL	$ 0.04204	$ 0.04204
#2-4	24 MONTH TERM - POR	No Bid	No Bid
#2-5	36 MONTH TERM - DUAL	No Bid	No Bid
#2-6	36 MONTH TERM - POR	No Bid	No Bid
3	**FIXED ELECTRIC RATE OFFER - STREET LIGHTS**		
#3-1	12 MONTH TERM - DUAL	$ 0.03805	$ 0.03805
#3-2	12 MONTH TERM - POR	$ 0.039	$ 0.039
#3-3	**24 MONTH TERM - DUAL**	**$ 0.03825**	**$ 0.03825**
#3-4	24 MONTH TERM - POR	$ 0.0392	$ 0.0392
#3-5	36 MONTH TERM - DUAL	No Bid	No Bid
#3-6	36 MONTH TERM - POR	No Bid	No Bid

Energy Cooperative of America

The Energy Cooperative of America, Inc.
1408 Sweet Home Road, Suite 8
Amherst, New York 14228
Tel: (716) 580-3506
Fax: (716) 932-7337
www.ecamerica.org

Customer Disclosure Statement

	Commodity Type	
	Electricity	Natural Gas
Price		
Variable Price	Weighted average NYISO commodity price, plus an administrative fee of $0.0012 per kWh, and any applicable taxes and/or agent fees.	Weighted average NYMEX commodity price, plus an administrative fee of $0.11 per mcf, and any applicable taxes and/or agent fees.
Fixed Price	Fixed price inclusive of the commodity price, administrative fee and any applicable taxes and/or agent fees.	Fixed price inclusive of the commodity price, administrative fee and any applicable taxes and/or agent fees.
Length of Contract		
Variable Price	Month-to-month commencing on the first meter read date.	Month-to-month commencing on the first meter read date.
Fixed Price	Fixed term as indicated in an Addendum signed by the parties.	Fixed term as indicated in an Addendum signed by the parties.
Terms of Renewal		
Variable Price	Month-to-month until terminated upon 30 days prior notice.	Month-to-month until terminated upon 30 days prior notice.
Fixed Price	Month-to-month after conclusion of fixed term.	Month-to-month after conclusion of fixed term.
Process Customer May Rescind Agreement without Penalty	Residential customers have right to cancel within three business days of receipt of the utility switch letter.	
Termination Fees		
Variable Price	None	None
Fixed Price	The account usage for the remainder of the fixed term multiplied by the fixed price as per the Addendum.	The account usage for the remainder of the fixed term multiplied by the fixed price as per the Addendum.
Late Payment Fees		
Variable Price	1.5% of any unpaid amount, including latest charges, any prior past due balances and outstanding late fees.	1.5% of any unpaid amount, including latest charges, any prior past due balances and outstanding late fees.
Fixed Price	Same as Variable Price terms.	Same as Variable Price terms.
Savings Calculation		
Variable Price	While not guaranteed, a report will be provided each month that shows ECA's commodity price compared to the utility's rate.	While not guaranteed, a report will be provided each month that shows ECA's commodity price compared to the utility's rate.
Fixed Price	Not applicable.	Not applicable

ENERGY SUPPLY DISCLOSURE STATEMENT

This Disclosure Statement has important information you need to know before you commit to electric and/or natural gas service from the Energy Cooperative of America, Inc. (ECA). ECA is a Not-for-Profit corporation whose members include a variety of electricity and natural gas end users. ECA's purpose is to provide to its members the lowest cost alternative for reliable supplies of electricity and natural gas. This is accomplished by purchasing wholesale energy supplies and services and then disaggregating those supplies and services to ECA members, with the only added cost being its administrative fee to cover its overhead. ECA welcomes new members upon credit qualification and acceptance by its Board of Directors. New members will be required to sign a Membership Form and Billing/Payment History Form. You may terminate your membership by providing thirty (30) days' written notice (this is effectively a month-to-month contract), unless you have entered into an Addendum with a fixed contract term. ECA will provide electricity and/or natural gas to your facilities on a monthly basis. ECA's energy supplies will be delivered to your facilities via the local electric utility's wires or the local natural gas utility's pipelines.

Service Arrangements

Electricity

Electricity supply will be provided to your facilities by ECA on a cost per KWh basis. This price shall be ECA's weighted average commodity price for a given month plus an administrative fee of $0.0012 per Kwh together with any applicable taxes or agent fees, if any. In the alternative, negotiated rates may be set forth in the attached Addendum A (these are considered fixed term contracts). The local electric utility will provide transmission and distribution of that electricity at rates approved by the New York State Public Service Commission and any other applicable state governing body. The local electrical utility is also required by law to serve as provider of last resort for commercial electricity supply use, and respond to service calls as set forth hereafter. The provisions of the Home Energy Fair Practices Act protect residential electric members. ECA is required to provide Environmental Disclosure Label information to its electric customers twice a year inserted in their supply bills.

Natural Gas

Natural gas supply will be provided to your facilities by ECA on a cost per Mcf basis. This price shall be ECA's weighted average commodity price for a given month plus an administrative fee of $0.11 per Mcf together with any applicable taxes or agent fees, if any. In the alternative, negotiated rates may be set forth in the attached Addendum A (these are considered fixed term contracts). The local natural gas utility will provide transportation of that natural gas at rates approved by the New York State Public Service Commission any any other applicable state governing body. The local natural gas utility is also required by law to serve as provider of last resort for commercial natural gas supply use, and respond to service calls as set forth hereafter. The provisions of the Home Energy Fair Practices Act protect residential natural gas members.

Policies

Office Locations and Hours

ECA's offices are located at 1408 Sweet Home Road Suite 8 Amherst, New York 14228, and are open from 8:00 AM to 4:30 PM Monday through Friday. ECA can be reached by telephone at (716) 580-3506. Telephone service hours are from 8:00 AM to 4:30 PM Monday through Friday, and a voice mail directory is in operation at all times.

Bill Payment Process

For electricity: ECA will bill directly for electricity supply and the local electric utility will bill directly for its delivery services. ECA bills will be issued monthly and the local electric utility's bills will be issued per their normal practice, with the exception of those utilities that offer a single bill option, which currently includes National Grid, NYSEG and Rochester Gas & Electric.

For natural gas: ECA will bill for both natural gas supply and the local natural gas utility's delivery services, with the exception of the NYSEG, RG&E, National Grid and National Fuel Residential programs. ECA bills will be issued monthly and payment is due as indicated on the bill.

The local electric and/or natural gas utility will read your electric/gas meter monthly to calculate your monthly usage. The utility will then assess charges to your account based upon those usages and ECA will use the usages to calculate your monthly charges for energy supply. Should the utility's usage information not be available in a timely fashion, ECA reserves the right to issue a prebill (in lieu of a security deposit) based on estimated usages each month and then adjust a subsequent bill to correct for actual usage shown by meter readings. ECA reserves the right to charge a late payment fee of 1.5% of the amount due for payments along with any past due balances and unpaid late payment fees not made by their due date. Returned checks and failed ACH payments will be assessed a $25.00 returned check/failed ACH payment charge. If the member defaults, to the extent permitted by law, ECA will pursue formal collection of any balance owed, together with the expenses of enforcement and collection of said balance, including, without limitation, reasonable attorney's fees and related costs associated with the formal collection of any balance due.

Complaint and Dispute Resolution

If you have any complaints regarding your electric or natural gas service or your monthly bill, please contact us at (716) 580-3506. If ECA's staff cannot resolve your dispute, you will have the opportunity to present your dispute to ECA's Board of Directors at their next scheduled Board meeting. In the mean time, you are obligated to pay any disputed invoice in full, with the exception of any obvious errors, until said dispute can be resolved to the satisfaction of yourself and ECA. If the dispute cannot be resolved within forty-five (45) days, the dispute shall be submitted to binding arbitration conducted pursuant to the rules, regulations and procedures of the American Arbitration Association.

Amendment, Cancellation or Expiration of Agreement

ECA's Membership Agreement may be amended from time to time upon approval of the ECA Board of Directors. Any amendment does not take effect until thirty (30) days after its approval by the Board of Directors. As set forth hereafter, membership in ECA may be terminated upon thirty (30) days' prior written notice, at which time the member may choose another provider of electricity and/or natural gas, or return to the local utility for its commodity supply. ECA will similarly give the member, as well as the applicable local electric or natural gas utility, a minimum of thirty (30) days' advance written notice prior to a termination of membership in ECA. ECA will follow the New York State Department of Public Service rules and the Home Energy Fair Practices Act to terminate Residential members from the cooperative.

Financial Obligations of the Cooperative

In the event of a default by a cooperative member, the existing members shall not assume any obligation of the cooperative either to the surety that provides any bond or bonds to the cooperative or the supplier of the commodity and/or services. The cooperative would take appropriate action to recover the amount from the defaulting member and return any amount recovered to the reserves of cooperative.

Allocation of Partial Payments

If a member does not pay its monthly bill in full, ECA will first credit the amount received to the outstanding balance, including any late fees, and then apply any remainder to current charges. Delinquencies of thirty (30) days or more are cause for termination of membership in ECA upon thirty (30) days' prior written notice. There is no preset termination fee for cancellation of this contract.

Historic Billing Information

ECA will consider a member's billing information to be confidential. If a member wishes for the billing information to be provided to the member or to be released to a third party, the member must notify ECA in writing.

Calls for Service Problems

If a member becomes aware of an electrical or gas emergency condition, experiences an unanticipated loss of electricity or gas service or experiences poor power quality, the member should contact its electric or natural gas utility at:

National Fuel Gas Corporation 1-800-444-3130
New York State Electric & Gas 1-800-572-1131
National Grid Power Corporation 1-800-932-0301
Rochester Gas & Electric 1-716-546-1100
Consolidated Edison Corp. 1-800-752-6633

Credit Checks

We may verify a member's credit history with either the utility or a credit reporting company upon the member's application for membership in ECA. Determination of credit worthiness will be at ECA's sole discretion in accordance with generally accepted business practices.

Customers' Rights and Obligations

Amendment of Agreement or Change of Electricity Providers

If a member wishes to terminate its membership in ECA and change electricity or natural gas providers, it must provide ECA with thirty (30) days' prior written notice. ECA will notify the local utility of the change of electricity or natural gas supplier. Any such change of energy supplier must take place at a scheduled meter reading date; otherwise there will be a meter reading charge as determined by the local utility. If ECA terminates the membership, the electricity or natural gas supply will automatically be provided by the local utility under its standard tariff, unless or until the former member chooses another supplier. Residential customers have right to cancel within three business days of receipt of the utility switch letter. Electricity or natural gas may only be shut off by the local utility under procedures approved by the Public Service Commission.

Third Party Notification
A member may direct that its bills be sent to a third party. Such requests must be provided in writing to ECA.

Department of Public Service Complaint Number

You may contact the NYSDPS at its toll-free number (1-888-697-7728) for information about, or questions regarding, energy service providers (ESCOs/Marketers) and the competitive energy market. The Department of Public Service is monitoring complaints against energy service companies. It will not resolve complaints, but an excessive number of complaints may result in an energy supply company no longer being allowed to supply electricity or natural gas. The Department of Public Service toll-free telephone number *for residential complaints* is 1-800-342-3377. Non-residential (or residential, should they so choose) customers may write the Department of Public Service at: Office of Consumer Services, Delmar Annex, Three Empire State Plaza, Albany, NY 12223-1350 or contact them by e-mail at http://www.dps.state.ny.us.

Addendum A to ECA Disclosure Statement
Transaction Confirmation and Supplement
to the
ELECTRIC BASE AGREEMENT

Between Seller and Buyer

Dated June 2, 2020

Seller:	Energy Cooperative of America	Buyer: Town of Carmel
Address:	1408 Sweet Home Road Ste 8 Amherst, New York 14228 Telephone: (716) 580-3506 Fax: (716) 932-7337	Address: 60 McAlpin Avenue Mahopac, New York 10541 Telephone: 845-628-1500 Fax:

Type of Service:	Full Requirements
Term:	Starting on November 2020 meter reads thru 2022 meter reads
Price:	24- Month Fixed Price: $0.05880/kWh & Street Lights Price $0.03825/kWh Per Electricity Supply Bid RFB-20-20 Opened May 20, 2020 Dual Billed
Tax Exempt %	Yes
Quantities:	Bandwidth / Tolerance is +/- 25%
Special Conditions:	**(a)Buyer agrees to notify seller of any material changes in its electric requirements, such as plant shut downs or scaling back of business operations, within five (5) days of the time that such changes are known by Buyer.**

Appropriation Clause: This Agreement shall be deemed executory to the extent that the monies are appropriated in Buyer's current budget for the purposes of this Agreement. This Agreement is not a general obligation of the Buyer. Neither the full faith or credit, nor the taxing power of Buyer is pledged to the payment of any amount due, or to become due, under this Agreement. This Agreement shall be effective to the extent that the monies to be paid hereunder are appropriated in Buyer's Budget. Buyer represents and warrants that it has sufficient monies appropriated and budgeted to meet its financial and contractual obligations for the Term of November 1, 2020 through December 31, 2020 and that it will take all appropriate steps to ensure it appropriates and budgets sufficient monies to meet its future financial and contractual obligations under this Agreement.

Account Information*: Please see the attached list

ENERGY COOPERATIVE OF AMERICA ("SELLER")	**TOWN OF CARMEL ("BUYER")**
By: _____	By: _____
Title: Executive Director	Title: _____
Date: 6/2/20	Date: _____

Group	utility	account	group_name
Electricity	New York State Electric & Gas	N01000000052126	Town of Carmel
Electricity	New York State Electric & Gas	N01000000089003	Town of Carmel
Electricity	New York State Electric & Gas	N01000000092254	Town of Carmel
Electricity	New York State Electric & Gas	N01000000122804	Town of Carmel
Electricity	New York State Electric & Gas	N01000000124362	Town of Carmel
Electricity	New York State Electric & Gas	N01000000142372	Town of Carmel
Electricity	New York State Electric & Gas	N01000000156778	Town of Carmel
Electricity	New York State Electric & Gas	N01000000188540	Town of Carmel
Electricity	New York State Electric & Gas	N01000000189811	Town of Carmel
Electricity	New York State Electric & Gas	N01000000220525	Town of Carmel
Electricity	New York State Electric & Gas	N01000000248005	Town of Carmel
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Electricity	New York State Electric & Gas	N01000000438796	Town of Carmel
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Electricity	New York State Electric & Gas	N01000000489989	Town of Carmel
Electricity	New York State Electric & Gas	N01000000499632	Town of Carmel
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Electricity	New York State Electric & Gas	N01000000575183	Town of Carmel
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Electricity	New York State Electric & Gas	N01000000676981	Town of Carmel
Electricity	New York State Electric & Gas	N01000000694455	Town of Carmel
Electricity	New York State Electric & Gas	N01000000694604	Town of Carmel
Electricity	New York State Electric & Gas	N01000000736280	Town of Carmel
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Electricity	New York State Electric & Gas	N01000000992370	Town of Carmel
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Electricity	New York State Electric & Gas	N01000001001551	Town of Carmel
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Electricity	New York State Electric & Gas	N01000001252154	Town of Carmel
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Electricity	New York State Electric & Gas	N01000001299833	Town of Carmel
Electricity	New York State Electric & Gas	N01000001306513	Town of Carmel
Electricity	New York State Electric & Gas	N01000001375807	Town of Carmel
Electricity	New York State Electric & Gas	N01000001418656	Town of Carmel

Electricity	New York State Electric & Gas	N01000001432434	Town of Carmel
Electricity	New York State Electric & Gas	N01000001436377	Town of Carmel
Electricity	New York State Electric & Gas	N01000001504117	Town of Carmel
Electricity	New York State Electric & Gas	N01000001546324	Town of Carmel
Electricity	New York State Electric & Gas	N01000001587732	Town of Carmel
Electricity	New York State Electric & Gas	N01000001596089	Town of Carmel
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Electricity	New York State Electric & Gas	N01000061372058	Town of Carmel
Lighting	New York State Electric & Gas	N01000000192112	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000224170	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000256552	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000272807	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000289090	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000305201	Town of Carmel - B
Lighting	New York State Electric & Gas	N01000000240424	Town of Carmel - C

Lake Casse Park District

June 2020 Newsletter

Advisory Board Members:
John Aquina, Teresa DePace, Stacey Kelly, Kim Kugler, Bill Siclar, Scott Sterbens
Property Manager: Terry Kelly

6/10/2020 Work Session Agenda Item #3

Hello Lake Casse Residents,

We hope this letter finds you all safe and well. As we plan for the summer season at Lake Casse we are focused on the safety and well being of our residents. Due to COVID-19 and the current state mandates, there will be some changes down at the lake. We will be following the guidance of the Putnam County Dept of Health to ensure everyone's safety. The following safety guidelines have been put in place and we kindly ask all residents and their guests for their support in adhering to them while visiting the lake property.

- *Lake Casse Park District will operate at 50% capacity, a max of 30 people at a time.*
- *Each person must wear a face mask upon entering Lake Casse Park District.*
- *Please practice social distancing by staying 6 feet apart from non-family members.*
- *If the 6 feet social distancing rule can not be adhered to please wear your mask.*
- *Bathrooms/Clubhouse access will be closed to all residents. (for Lifeguard use only)*
- *Gate Guards will be checking resident passes and ID's.*
- *Please respect your neighbors and fellow residents space.*
- *Any persons disregarding these guidelines will be asked to leave.*
- *Life Guards and Gate Guards will be enforcing social distancing and mask requirements. They are teenagers doing their job please do not give them a hard time!*

We encourage residents to follow and check our Facebook page regularly for the most recent updates and status of the Lake Casse park district. https://www.facebook.com/LakeCasseCommunity/ We highly recommend residents joining our email list to receive community updates. Please email us at lakecasse@gmail.com with your full name address and a contact phone.

Thank you and Be safe,
Lake Casse Advisory Board

BEACH PASSES

Enclosed you will find your **(2) two 2020 Lake Casse Park District Beach Passes**. Each beach pass allows up to 4 guests per pass. Keep them safe and write your family name on them. These are not transferable and can only be used by a park district resident. Please present your beach pass and ID to the gate guard to access the Lake Casse Park District..

Community Announcements

MEETING UPDATE

Our next **Community Meeting is TBA** - we are tentatively hoping for September but will keep you posted via Facebook with updates.

***Open Advisory Board Member Seat ***

The Lake Casse Advisory Board currently has an open seat. Residents who are interested in serving please email your resume and letter of interest to lakecasse@gmail.com.

LAKE WATER CONDITION UPDATE

We have already seen the presence of blue-green algae in the cove by the beach area prior to Memorial Day. We are diligently working with the PCDOH reporting any suspicious odors or water seepage from the roads or properties leading into the lake. Dumping of chemicals or debris in storm drains on the roads is forbidden. Please monitor the regulations of fertilizer use on your lawns even if you do not live on the lakefront. Everything runs down hill and into storm drains. If you see or smell something please report it immediately to the PCDOH at 845-808-1390. We need everyone to take part in staying vigilant on the health of our lake. The lake water level is still rising and is filling up. The water level was lowered through the winter as we normally do; however, this year it remained lowered longer than normal for dam maintenance observation. This observation was halted due to COVID, and so we have resumed the filling of the lake.. The lake will continue to be monitored regularly by the health department.

Please monitor Facebook, email and bulletin boards for Lake Casse status updates.

CLUBHOUSE RENTALS

The clubhouse is currently CLOSED for rentals until further notice.

The cubhouse is only available to Lake Casse residents. The cost is $250 + $150 refundable security deposit. Any questions regarding rentals contact Terry Kelly (845) 628-6200 and leave a message or email lakecasse@gmail.com

EVENTS & ACTIVITIES

At this time ALL Summer events and activities have been postponed.
Any updates will be announced via Facebook and email.

(4) Committee Coordinator (volunteer) positions available

If you are a fun creative planner interested in heading up an event/activity for the community, please email LakeCasse@gmail.com for more detail and let us know which committee you are interested in. The following committees are currently open: **Summer Events Committee, Halloween Committee, Holiday Committee, New Years Eve Committee.** To help make these events a success please consider volunteering.

Contact us: lakecasse@gmail.com to join our email list to receive community updates.
Visit us: https://www.facebook.com/LakeCasseCommunity/

6/10/2020 Work Session Agenda Item #4

TOWN OF CARMEL HIGHWAY DEPARTMENT

Carmel Highway Department
55 McAlpin Avenue
Mahopac, NY 10541

MICHAEL SIMONE
Superintendent of Highways

845.628.7474
FAX 845.628.1471
MSimone@bestweb.net

FROM THE DESK OF: *Michael Simone*

TO: SUPERVISOR KENNETH SCHMITT
TOWN BOARD

DATE: JUNE 1, 2020

RE: REQUEST TO DISPOSE OF EQUIPMENT

I am requesting the authorization to dispose of the following equipment:

1989 Dresser Loader VIN 3390139C004539
2007 Ford Explorer XLT SUV 1FMEU73E17UB77293
9' Snow Plow #5
Highlander Jr. Stainless Steel Sander
Western Stainless Steel Sander
Fisher Poly Caster Sander
9' Snow Plow #19
9' Snow Plow #19
9' American Snow Plow #19
9' Snow Plow #25
Highlander Jr. Stainless Steel Sander
11' Plow & 2 Wings w/ Frame
O'Brien Sewer King Machine
Steel Snow Spreader Grills

6/10/2020 Work Session Agenda Item #5

TOWN OF CARMEL HIGHWAY DEPARTMENT

Carmel Highway Department
55 McAlpin Avenue
Mahopac, NY 10541
MICHAEL SIMONE
Superintendent of Highways
845.628.7474
FAX 845.628.1471
MSimone@bestweb.net

FROM THE DESK OF: *Michael Simone*

TO: SUPERVISOR KENNETH SCHMITT
TOWN BOARD

DATE: JUNE 1, 2020

RE: REQUEST TO PURCHASE BULK DIESEL NYS OGS CONTRACT PC68456

I am requesting authorization to purchase bulk-diesel fuel from Global Montello Group Corp., contract PC68456, per NYS OGS Group #5602, Award #23092, period 8/31/18 –12/17/2020.

NOTE: This is a 2/11/20 revision to Contract #23094
– see Town Board Resolution 9/19/18

cc Comptroller MaryAnn Maxwell
Town Clerk Ann Spofford

NEW YORK STATE OF OPPORTUNITY. | Office of General Services | Procurement Services

Corning Tower, Empire State Plaza, Albany, NY 12242 | http://nyspro.ogs.ny.gov | customer.services@ogs.ny.gov | 518-474-6717

Contract Award Notification

Title	:	**Group 05600 – Gasoline & E-85 (Statewide)** **Classification Code(s): 15**
Award Number	:	**23092 (Replaces Awards 22782 and 22951)**
Contract Period	:	**December 19, 2018 – December 17, 2020**
Bid Opening Date	:	**September 19, 2018**
Date of Issue	:	**December 13, 2018 (Revised February 11, 2020)**
Specification Reference	:	**As Incorporated Herein**
Contractor Information	:	**Appears on Page 2 of this Award**

Address Inquiries To:

State Agencies & Vendors	Political Subdivisions & Others
Name : Bryant Kirk Title : Contract Management Specialist 2 Phone : 518-402-3021 E-mail : bryant.kirk@ogs.ny.gov	**Procurement Services Customer Services** Phone : 518-474-6717 E-mail : customer.services@ogs.ny.gov

Procurement Services values your input.
Complete and return "Contract Performance Report" at end of document.

Description

The purpose of this Award is to provide Authorized Users with a means of acquiring various grades of Gasoline and E-85 by bulk delivery to an Authorized User's storage facility for use in the Authorized User's own pumps. The product shall be Contractor furnished, delivered and unloaded as specified herein.
For current contract prices, please go to the Pricing Information link on the Award page.

Links to the base contract, current prices, updates, and delivery schedules are located on the Award page at: http://www.ogs.ny.gov/purchase/spg/awards/0560223092CAN.HTM

(continued)

NOTE: See individual contract items to determine actual awardees.

CONTRACT Number	CONTRACTOR & ADDRESS	CONTACT INFORMATION	FEIN / NYS VENDOR ID
PC68456	**Global Montello Group Corp.** 800 South Street Waltham, MA 02454	Kevin Young V.P. Municipal and Commercial Bids Phone: 781-398-4003 Email:. Bids@globalp.com **Customer Service Contact for NYS Contract Orders (24/7/365):** Dispatch Department Toll Free: 800-826-5686 Email: smartbuydispatch@globalp.com **Contact to Escalate Contract Orders:** Dispatch Department Toll Free: 800-826-5686 Email: smartbuydispatch@globalp.com **Contact for After Hours, Weekend, and/or Holiday Emergency:** Dispatch Department Toll Free: 800-826-5686 Email: smartbuydispatch@globalp.com **Contacts for NYS Declared Emergencies or Disasters:** Kevin Young V.P. Municipal and Commercial Bids Phone: 781-398-4259 Email: kyoung@globalp.com Kevin Bowe (Back-up) Dispatch Manager Phone: 781-398-4059 Email: kbowe@globalp.com **Contact for Billing Issues:** Bid Department Phone: 781-398-4003 Email: bids@globalp.com	04-3443028 1100005467

PC68457	**Mirabito Holdings, Inc. d/b/a Mirabito Energy Products** The Metrocenter – 49 Court Street, P.O. Box 5306 Binghamton, NY 13902	Joe D'Esti Pricing and Bid Administrator Phone: 607-352-2958 Email: joe.desti@mirabito.com **Customer Service Contact for NYS Contract Orders (Mon-Fri 8am-5pm):** Paul Gunther CSR Manager Phone: 607-352-2800 Toll Free: 800-934-9480 Email: paul.gunther@mirabito.com **Contact to Escalate Contract Orders:** Jason Mirabito V.P. Wholesale Fuels Phone: 607-352-2930 Email: jason.mirabito@mirabito.com **Contact for After Hours, Weekend, or Holiday Emergency, and NYS Declared Emergencies or Disasters:** Gene Fuller Operations Manager Phone: 607-561-2735 Toll Free: 800-934-9480 Email: gene.fuller@mirabito.com **Backup Contact for NYS Declared Emergencies or Disasters:** Jason Mirabito V.P. Wholesale Fuels Phone: 607-352-2930 Toll Free: 800-934-9480 Email: jason.mirabito@mirabito.com **Contact for Billing Issues:** Paul Gunther (M-F, 8am-5pm) CSR Manager Phone: 607-352-2800 Toll Free: 800-934-9480 Email: paul.gunther@mirabito.com	15-0552668 1000007358
PC68458 **SB-47**	**MX Petroleum Corp.** 22 Center Street Massena, NY 13662	Jeanine Caron Controller Phone: 315-769-9500 Email: j.caron@mxfuels.com **Customer Service Contact for NYS Contract Orders:** Dispatcher (M-F, 830am-5pm) Phone: 315-769-9500 Toll Free: 800-840-0645 Website: mxfuels.com **Contact to Escalate Contract Orders:** Gus Miller General Manager Phone: 315-769-9500	16-1352970 1000015801

		Toll Free: 800-840-0645 Email: g.miller@mxfuels.com **Contact for After Hours, Weekend, and/or Holiday Emergency:** Answer Service Dispatcher Phone: 315-769-9500 Toll Free: 800-840-0645 Email: g.miller@mxfuels.com **Contacts for NYS Declared Emergencies or Disasters:** Mickey Miller Manager Operations Phone: 315-769-9500 Toll Free: 800-840-0645 Email: m.miller@mxfuels.com Gus Miller (Back-up) General Manager Phone: 315-769-9500 Email: g.miller@mxfuels.com **Contact for Billing Issues:** Jeanine Caron (M-F, 830am-5pm) Controller Phone: 315-769-9500 Toll Free: 800-840-0645 E-mail: j.caron@mxfuels.com	
PC68459	**NOCO Energy Corp.** 2440 Sheridan Drive Tonawanda, NY 14150	Tom Spitznogle Fuel Supply Manager Phone: 716-614-1230 Email: tspitznogle@noco.com **Customer Service Contact for NYS Contract Orders (Mon-Fri 730am-500pm):** Customer Fuel Order Desk Fuel Order Consultant Phone: 800-601-6626 Email: fuelorder@noco.com **Contact to Escalate Contract Orders:** Alice Lineberger Customer Service Manager Phone: 716-614-1148 / 716-341-9722 Email: alineberger@noco.com **Contact for After Hours, Weekend, Holiday Emergency, and NYS Declared Emergencies or Disasters:** Kevin Galas Transportation Director Phone: 716-504-3308 / 716-435-7309 Email: kgalas@noco.com **Backup Contact for NYS Declared Emergencies or Disasters:** Joe Gross	160727383 1000007468

		Director of Sales Phone: 716-614-1145 / 716-998-6870 Email: jgross@noco.com **Contact for Billing Issues:** Joe Gross (M-F, 730am-5pm) Director of Sales Phone: 716-614-1145 / 716-998-6870 Email: jgross@noco.com	
PC68460	**Sprague Operating Resources LLC** 185 International Drive Portsmouth, NH 03801	Jeanette Finley Manager, Bids & Contracts Phone: 914-328-6730 Toll-Free: 877-689-1880 Email: contractdesk@spragueenergy.com **Customer Service Contact for NYS Contract Orders (24/7/365):** Customer Care Team Toll Free: 800-880-6037 Email: orders@spragueenergy.com **Contact to Escalate Contract Orders:** Customer Care Team/Dispatch Toll Free: 800-880-6037 Email: orders@spragueenergy.com **Contact for After Hours, Weekend, and/or Holiday Emergency:** Customer Care Team/Dispatch Phone: 800-880-6037 Email: orders@spragueenergy.com **Contacts for NYS Declared Emergencies or Disasters:** Taylor Hudson Managing Director, Refined Sales Phone: 603-430-5397 Toll Free: 800-225-1560 Email: contractmgmt@spragueenergy.com Barry Panicola (Back-up) Director, Transportation Phone: 516-622-7091 Toll Free: 800-225-1560 Email: newyorktransportationmanagement@spragueenergy.com **Contact for Billing Issues:** Customer Care Team (8am-5pm) Toll Free: 800-880-6037 Email: contractmgmt@spragueenergy.com	02-0415440 1000005203

PC68461	**Sunoco LLC** 3801 West Chester Pike Newtown Square, PA 19073	Sean Grogan Phone: 585-537-3784 Email: Sean.Grogan@sunoco.com **Customer Service Contact for NYS Contract Orders:** Sunoco Dispatch Dispatch Group Toll-Free: 800-955-5992 E-mail: superiordispatch@sunoco.com **Contact to Escalate Contract Orders:** Sunoco Wholesale Toll Free: 800-724-2552 Email: wholesale@sunoco.com **Contact for After Hours, Weekend, or Holiday Emergency:** Sunoco Wholesale Toll-Free: 800-955-5992 E-mail: wholesale@sunoco.com **Contacts for NYS Declared Emergencies or Disasters:** Sunoco Dispatch Toll Free: 800-955-5992 E-mail: superiordispatch@sunoco.com Sunoco Wholesale (Back-up) Toll Free: 800-724-2552 E-mail: wholesale@sunoco.com **Contact for Billing Issues:** Sunoco Wholesale (M-F, 8am-5pm) Toll Free: 800-964-6321 option 2 E-mail: customersolutions.mailbox@sunoco.com	46-4151222 1100195900
PC68462	**United Metro Energy Corp.** 500 Kingsland Ave. Brooklyn, NY 11222	Robert Leavy VP Supply Chain Phone: 718-389-5800 x173 Email: robertleavy@umecny.com **Customer Services Contact for NYS Contract Orders:** Edward Abreu (7am-7pm) Manager Customer Service Phone: 718-389-5800 x152 Email: edwardabreu@umecny.com **Contact for After Hours, Weekend, and/or Holiday Emergency:** Scott Alnwick Transportation Manager Phone: 718-389-5800 x157 E-mail: scottalnwick@umecny.com	46-2112871 1100082712

		Contacts for NYS Declared Emergencies or Disasters: Robert Leavy VP Supply Chain Phone: 718-389-5800 x173 Email: robertleavy@umecny.com Scott Alnwick (Back-up) Transportation Manager Phone: 718-389-5800 x157 E-mail: scottalnwick@umecny.com	

Cash Discount, If Shown, Should be Given Special Attention.
INVOICES MUST BE SENT DIRECTLY TO THE ORDERING AGENCY FOR PAYMENT.
(See "Invoicing and Payment" in this document.)

AGENCIES SHOULD NOTIFY PROCUREMENT SERVICES PROMPTLY IF THE CONTRACTOR FAILS TO MEET DELIVERY OR OTHER TERMS OF THIS CONTRACT. PRODUCTS OR SERVICES WHICH DO NOT COMPLY WITH THE SPECIFICATIONS OR ARE OTHERWISE UNSATISFACTORY TO THE AGENCY SHOULD ALSO BE REPORTED TO PROCUREMENT SERVICES.

SMALL, MINORITY AND WOMEN-OWNED BUSINESSES:
The letters SB listed under the Contract Number indicate the contractor is a NYS small business. Additionally, the letters MBE and WBE indicate the contractor is a Minority-owned Business Enterprise and/or Woman-owned Business Enterprise.

AWARDS BY COUNTY

The pricing included in this section is the original pricing bid by the contractors. Current contract pricing is found in the "Pricing Information" link on the Award page.

County	Fuel Type	Bid Price Per Gallon	Volume Discounts	Awarded Vendor
Albany	Flex Fuel (E-85)	$ 1.8374		Global Montello Group
Albany	Gas Regular	$ 2.1418		Global Montello Group
Albany	Gas Mid Range	$ 2.2106		Global Montello Group
Albany	Gas Premium	$ 2.3493		Global Montello Group
Allegany	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Allegany	Gas Regular	$ 2.6261	$ 0.1000	Sunoco LLC
Allegany	Gas Mid Range	$ 2.6829		Sunoco LLC
Bronx	OPRG(E) Gas Regular	$ 2.1799		United Metro Energy Corp.
Broome	Gas Regular	$ 2.1761		Mirabito Energy Products
Broome	Gas Mid Range	$ 2.2329		Mirabito Energy Products
Cattaraugus	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Cattaraugus	Gas Regular	$ 2.2046		NOCO Energy Corp.
Cattaraugus	Gas Mid Range	$ 2.3219		NOCO Energy Corp.
Cayuga	Gas Regular	$ 2.5206		Mirabito Energy Products
Chautauqua	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Chautauqua	Gas Regular	$ 2.2681		NOCO Energy Corp.
Chautauqua	Gas Mid Range	$ 2.3219		NOCO Energy Corp.
Chautauqua	Gas Premium	$ 2.4073		NOCO Energy Corp.
Chemung	Flex Fuel (E-85)	$ 2.5833		Sunoco LLC
Chemung	Gas Regular	$ 2.3261		Sunoco LLC
Chemung	Gas Mid Range	$ 2.6329		Sunoco LLC
Chemung	Gas Premium	$ 2.7183		Sunoco LLC
Chenango	Gas Regular	$ 2.5506		Mirabito Energy Products
Clinton	Gas Regular	$ 2.2513	$ 0.1200	MX Petroleum Corp.
Clinton	Gas Mid Range	$ 2.3529	$ 0.1200	MX Petroleum Corp.
Columbia	Gas Regular	$ 2.2542		Global Montello Group
Cortland	Gas Regular	$ 2.5816		Mirabito Energy Products
Cortland	Gas Premium	$ 2.7238		Mirabito Energy Products
Delaware	Gas Regular	$ 2.5816		Mirabito Energy Products
Dutchess	OPRG(E) Gas Regular	$ 2.2772		Global Montello Group
Dutchess	OPRG(E) Gas Premium	$ 2.4109		Global Montello Group
Dutchess	OPRG(E) Gas Mid Range	$ 2.3221		Global Montello Group
Erie	Flex Fuel (E-85)	$ 2.2833		Sunoco LLC
Erie	Gas Regular	$ 2.1261	$ 0.0100	NOCO Energy Corp.
Erie	Gas Mid Range	$ 2.3289		NOCO Energy Corp.
Erie	Gas Premium	$ 2.4143		NOCO Energy Corp.

County	Fuel Type	Bid Price Per Gallon	Volume Discounts	Awarded Vendor
Essex	Gas Regular	$ 2.2216	$ 0.1200	MX Petroleum Corp.
Essex	Gas Mid Range	$ 2.3529	$ 0.1200	MX Petroleum Corp.
Franklin	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Franklin	Gas Regular	$ 2.2303	$ 0.1200	MX Petroleum Corp.
Fulton	Gas Regular	$ 2.2253		Global Montello Group
Fulton	Gas Mid Range	$ 2.2941		Global Montello Group
Fulton	Gas Premium	$ 2.4328		Global Montello Group
Genesee	Gas Regular	$ 2.3261	$ 0.1000	Sunoco LLC
Greene	Gas Regular	$ 2.2065		Global Montello Group
Hamilton	Gas Regular	$ 2.4761		Sunoco LLC
Herkimer	Gas Regular	$ 2.3761		Mirabito Energy Products
Herkimer	Gas Premium	$ 2.5183		Mirabito Energy Products
Jefferson	Gas Regular	$ 2.5011		Mirabito Energy Products
Jefferson	Gas Mid Range	$ 2.5579		Mirabito Energy Products
Kings	OPRG(E) Gas Premium	$ 2.1861		United Metro Energy Corp.
Kings	OPRG(E) Gas Regular	$ 2.1283		United Metro Energy Corp.
Lewis	Gas Regular	$ 2.6261		Sunoco LLC
Livingston	Gas Regular	$ 2.3061		Mirabito Energy Products
Livingston	Gas Mid Range	$ 2.4429		Mirabito Energy Products
Livingston	Gas Premium	$ 2.5683		Mirabito Energy Products
Madison	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Madison	Gas Regular	$ 2.3261	$ 0.0500	Sunoco LLC
Madison	Gas Mid Range	$ 2.6829	$ 0.0500	Sunoco LLC
Monroe	Flex Fuel (E-85)	$ 2.1833		Sunoco LLC
Monroe	Gas Regular	$ 2.2011	$ 0.0800	Sunoco LLC
Monroe	Gas Mid Range	$ 2.3329	$ 0.0800	Sunoco LLC
Monroe	Gas Premium	$ 2.4183	$ 0.0800	Sunoco LLC
Montgomery	Gas Regular	$ 2.1939		Global Montello Group
Montgomery	Gas Mid Range	$ 2.2627		Global Montello Group
Nassau	Flex Fuel (E-85)	$ 1.7720		Sprague Operating Resources
Nassau	OPRG(E) Gas Regular	$ 2.0913		Sprague Operating Resources
Nassau	OPRG(E) Gas Mid Range	$ 2.1563		Sprague Operating Resources
Nassau	OPRG(E) Gas Premium	$ 2.2215		Sprague Operating Resources
New York	OPRG(E) Gas Regular	$ 2.0942		United Metro Energy Corp.
New York	OPRG(E) Gas Premium	$ 2.2012		United Metro Energy Corp.
Niagara	Gas Regular	$ 2.1596	$ 0.0100	NOCO Energy Corp.
Niagara	Gas Mid Range	$ 2.3219		NOCO Energy Corp.
Niagara	Gas Premium	$ 2.4073		NOCO Energy Corp.
Oneida	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Oneida	Gas Regular	$ 2.5066		Mirabito Energy Products
Oneida	Gas Mid Range	$ 2.5634		Mirabito Energy Products

County	Fuel Type	Bid Price Per Gallon	Volume Discounts	Awarded Vendor
Onondaga	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Onondaga	Gas Regular	$ 2.5066		Mirabito Energy Products
Ontario	Gas Regular	$ 2.1060		Sunoco LLC
Ontario	Gas Mid Range	$ 2.3328		Sunoco LLC
Ontario	Gas Premium	$ 2.4182		Sunoco LLC
Orange	Flex Fuel (E-85)	$ 1.8675		Global Montello Group
Orange	OPRG(E) Gas Mid Range	$ 2.3244		Global Montello Group
Orange	OPRG(E) Gas Premium	$ 2.3732		Global Montello Group
Orange	OPRG(E) Gas Regular	$ 2.2695		Global Montello Group
Orleans	Flex Fuel (E-85)	$ 2.5833		Sunoco LLC
Orleans	Gas Regular	$ 2.1911	$ 0.0500	Sunoco LLC
Orleans	Gas Mid Range	$ 2.3329	$ 0.0500	Sunoco LLC
Oswego	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Oswego	Gas Regular	$ 2.3761		Mirabito Energy Products
Oswego	Gas Mid Range	$ 2.4329		Mirabito Energy Products
Otsego	Gas Regular	$ 2.3751		Mirabito Energy Products
Putnam	OPRG(E) Gas Mid Range	$ 2.2690		Global Montello Group
Putnam	OPRG(E) Gas Premium	$ 2.3578		Global Montello Group
Putnam	OPRG(E) Gas Regular	$ 2.2141		Global Montello Group
Queens	OPRG(E) Gas Mid Range	$ 2.0995		United Metro Energy Corp.
Queens	OPRG(E) Gas Premium	$ 2.1636		United Metro Energy Corp.
Queens	OPRG(E) Gas Regular	$ 2.0932		United Metro Energy Corp.
Rensselaer	Flex Fuel (E-85)	$ 1.8353		Global Montello Group
Rensselaer	Gas Regular	$ 2.1397		Global Montello Group
Rensselaer	Gas Mid Range	$ 2.2085		Global Montello Group
Rockland	Flex Fuel (E-85)	$ 1.8068		Global Montello Group
Rockland	OPRG(E) Gas Mid Range	$ 2.2537		Global Montello Group
Rockland	OPRG(E) Gas Premium	$ 2.3425		Global Montello Group
Rockland	OPRG(E) Gas Regular	$ 2.2088		Global Montello Group
Saratoga	Gas Regular	$ 2.2019		Global Montello Group
Saratoga	Gas Mid Range	$ 2.2707		Global Montello Group
Saratoga	Gas Premium	$ 2.4094		Global Montello Group
Schenectady	Gas Regular	$ 2.1749		Global Montello Group
Schenectady	Gas Mid Range	$ 2.2237		Global Montello Group
Schoharie	Gas Regular	$ 2.2075		Global Montello Group
Schuyler	Gas Regular	$ 2.2511		Sunoco LLC
Seneca	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
Seneca	Gas Regular	$ 2.6260		Sunoco LLC
Seneca	Gas Mid Range	$ 2.6829		Sunoco LLC
Seneca	Gas Premium	$ 2.7683		Sunoco LLC

County	Fuel Type	Bid Price Per Gallon	Volume Discounts	Awarded Vendor
St. Lawrence	Flex Fuel (E-85)	$ 2.8333		Sunoco LLC
St. Lawrence	Gas Regular	$ 2.2766	$ 0.1200	MX Petroleum Corp.
St. Lawrence	Gas Mid Range	$ 2.3529	$ 0.1200	MX Petroleum Corp.
Steuben	Gas Regular	$ 2.3060		Sunoco LLC
Steuben	Gas Mid Range	$ 2.3628		Sunoco LLC
Steuben	Gas Premium	$ 2.3628		Sunoco LLC
Suffolk	Flex Fuel (E-85)	$ 1.6300		Sprague Operating Resources
Suffolk	OPRG(E) Gas Mid Range	$ 2.1609		Sprague Operating Resources
Suffolk	OPRG(E) Gas Premium	$ 2.2262		Sprague Operating Resources
Suffolk	OPRG(E) Gas Regular	$ 2.0958		Sprague Operating Resources
Sullivan	Gas Regular	$ 2.1555		Global Montello Group
Tioga	Gas Regular	$ 2.5316		Mirabito Energy Products
Tompkins	Gas Regular	$ 2.3561		Sunoco LLC
Tompkins	Gas Mid Range	$ 2.6329	$ 0.0500	Sunoco LLC
Ulster	Gas Regular	$ 2.1971		Global Montello Group
Ulster	Gas Mid Range	$ 2.2659		Global Montello Group
Ulster	Gas Premium	$ 2.3646		Global Montello Group
Warren	Gas Regular	$ 2.1872		Global Montello Group
Warren	Gas Mid Range	$ 2.2560		Global Montello Group
Washington	Gas Regular	$ 2.2161		Global Montello Group
Washington	Gas Mid Range	$ 2.2849		Global Montello Group
Washington	Gas Premium	$ 2.3936		Global Montello Group
Wayne	Flex Fuel (E-85)	$ 2.8333	$ 0.0500	Sunoco LLC
Wayne	Gas Regular	$ 2.2961	$ 0.0500	Sunoco LLC
Wayne	Gas Mid Range	$ 2.6329	$ 0.0500	Sunoco LLC
Westchester	Flex Fuel (E-85)	$ 1.6448		Sprague Operating Resources
Westchester	OPRG(E) Gas Mid Range	$ 2.1380		United Metro Energy Corp.
Westchester	OPRG(E) Gas Premium	$ 2.2046		United Metro Energy Corp.
Westchester	OPRG(E) Gas Regular	$ 2.1320		United Metro Energy Corp.
Wyoming	Gas Regular	$ 2.2681		NOCO Energy Corp.
Yates	Gas Regular	$ 2.2869		Sunoco LLC
Yates	Gas Mid Range	$ 2.4589		Sunoco LLC

NEW ACCOUNTS:

All new accounts must follow the procedure outlined in the Delivery Schedules section of this award. Contractor may ask State Agencies and other Authorized Users to provide information in order to facilitate the opening of a customer account, including documentation of eligibility to use New York State Contracts, agency code, name, address, and contact person. State Agencies shall not be required to provide credit references.

Contractors must notify OGS Procurement Services of any new business created from Authorized Users' requests for delivery, so that OGS Procurement Services can make adjustments to the Delivery Schedules to capture these new accounts. All cases shall require Contractors to notify both contract user

and OGS Procurement Services of any locations not originally on the Delivery Schedules, within thirty (30) days after the first delivery is made.

NOTE TO AUTHORIZED USERS:

When placing purchase orders under the contract(s), the authorized user should be familiar with and follow the terms and conditions governing its use which usually appears at the end of this document. The authorized user is accountable and responsible for compliance with the requirements of public procurement processes. The authorized user must periodically sample the results of its procurements to determine its compliance. In sampling its procurements, an authorized user should test for reasonableness of results to ensure that such results can withstand public scrutiny.

The authorized user, when purchasing from OGS contracts, should hold the contractor accountable for contract compliance and meeting the contract terms, conditions, specifications, and other requirements. Also, in recognition of market fluctuations over time, authorized users are encouraged to seek improved pricing whenever possible.

Authorized users have the responsibility to document purchases, particularly when using OGS multiple award contracts for the same or similar product(s)/service(s), which should include:

- a statement of need and associated requirements,
- a summary of the contract alternatives considered for the purchase,
- the reason(s) supporting the resulting purchase (e.g., show the basis for the selection among multiple contracts at the time of purchase was the most practical and economical alternative and was in the best interests of the State).

NON-STATE AGENCIES PARTICIPATION IN CENTRALIZED CONTRACTS:

New York State political subdivisions and others authorized by New York State law may participate in Centralized Contracts. These include, but are not limited to, local governments, public authorities, public school and fire districts, public and nonprofit libraries, and certain other nonpublic/nonprofit organizations. See Appendix B, Participation in Centralized Contracts. For Purchase Orders issued by the Port Authority of New York and New Jersey (or any other authorized entity that may have delivery locations adjacent to New York State), the terms of the Price clause shall be modified to include delivery to locations adjacent to New York State.

Upon request, all eligible non-State agencies must furnish Contractors with the proper tax exemption certificates and documentation certifying eligibility to use State contracts. A list of categories of eligible entities is available on the OGS web site (https://www.ogs.ny.gov/purchase/snt/othersuse.asp). Questions regarding an organization's eligibility to purchase from New York State Contracts may also be directed to NYS Procurement Services Customer Services at 518-474-6717.

EXTENSION OF USE:

This Contract may be extended to additional States or governmental jurisdictions upon mutual written agreement between New York State and the Contractor. Political subdivisions and other authorized entities within each participating state or governmental jurisdiction may also participate in any resultant Contract if such state normally allows participation by such entities. New York State reserves the right to negotiate additional discounts based on any increased volume generated by such extensions.

ESTIMATED QUANTITIES:

This Contract is an estimated quantity Contract. The estimated quantities are based on requirements submitted to OGS by Authorized Users to purchase from this Contract. These Authorized Users have agreed not to enter into any other contracts for the Gasoline and E-85 that they filed for during the Contract period, and will purchase all their Gasoline and E-85 requirement needs from awarded contracts. No specific quantities are represented or guaranteed and the State provides no guarantee of individual Authorized User participation. The Contractor must furnish all quantities actually ordered at or below the Contract prices. The individual value of this Contract is indeterminate. OGS makes no

guarantee as to how much fuel will actually be ordered and/or delivered. See Section 2.28, Delivery Schedules.

PRICE:

Prices quoted shall be billed net per gallon, F.O.B. agency storage tanks. Prices quoted shall include all applicable customs, taxes, including LUST, license and research fees (e.g. NORA), and surcharges.

Pricing for Contract purchases shall be based on the pricing in effect at the time the Authorized User places the order (Prompt Will-call). Authorized Users that are on automatic delivery shall be priced on the day of delivery, unless the Authorized User requests a delivery. The price shall then reflect the day of the order.

Pricing shall reflect the day of delivery for orders placed by the Authorized User that go beyond the guaranteed delivery timeframe of 24 (twenty-four) hours. For example, the Authorized User orders 500 gallons of gasoline on Wednesday, and requests that the delivery be made on the following Tuesday.

It shall be the Contractor's responsibility to satisfy Authorized User requirements by furnishing blended product when called for during the time period indicated in this Contract.

NOTE: The State of New York and its political subdivisions are exempt from New York State and local sales taxes and federal excise taxes.

ORDERING:

Purchase Orders shall be made in accordance with the terms set forth in Appendix B, Purchase Orders. Authorized Users may submit orders over the phone, and, if available, may submit orders electronically via web-based ordering, e-mail, or facsimile at any time. Orders submitted shall be deemed received by Contractor on the date submitted.

All orders shall reference Contract number, requisition, and/or Purchase Order number (if applicable). Upon Contractor's receipt of an order, confirmation is to be provided to the Authorized User electronically or via facsimile. Order confirmation should be sufficiently detailed, and include, at a minimum, purchase price, date of order, delivery information (if applicable), Authorized User name, and sales representative (if applicable).

MINIMUM ORDER:

Minimum delivery shall be 500 gallons to each tank at each delivery location (site) as determined by the Delivery Schedule. Minimum order for Motor Transport deliveries shall be 5,500 gallons. Deliveries under 500 gallons are at the Contractor's option, except for tank top-offs for testing.

All deliveries requested by an Authorized User of less than the minimum order size, including tank top-offs for tank testing, shall qualify for contract pricing. In addition, the following tiered schedule of surcharges may be utilized by the Contractor (except for automatic replenishment):

Determination for total gross tank capacity shall include all manifold tanks. All locations granted a request from the Contractor for "automatic replenishment", per the *Automatic Replenishment* clause of this Contract, shall be exempt from minimum order requirements, including other factors out of the control of Authorized Users (e.g., short filling, mechanical issues, inadequate fuel supply). In no case shall a surcharge be applied to a location while on "automatic replenishment".

Tank Capacity (in gallons)	Amount Delivered (in gallons)	Optional Surcharge
1000 or more	Under 500 to 250	$50.00

	Under 250	$75.00
Less than 1000	Under 500 to 250	$25.00
	Under 250	$50.00

Upon written direction by OGS, an Authorized User shall have one (1) delivery per tank per contract year for tank top-off testing that is exempt from any minimum order surcharge.

If delivering to same property, but to separate tanks, minimum delivery charge will only be applicable if total delivery to property is less than minimum order size.

PURCHASING CARD ORDERS

If the Contractor accepts orders using the State's Purchasing Card (see Appendix B, Purchasing Card), also referred to as the Procurement Card, the Contractor shall not charge or bill the Authorized User for any additional charges related to the use of the Purchasing Card, including but not limited to processing charges, surcharges or other fees.

INVOICING AND PAYMENT:

Invoicing and payment shall be made in accordance with the terms set forth in Appendix B, *Contract Invoicing*. The Contractor is required to provide the Authorized User with one invoice for each Purchase Order at the time of delivery. The invoice must include detailed line item information to allow Authorized Users to verify that pricing at point of receipt matches the Contract price on the original date of order. At a minimum, the following fields must be included on each invoice:

- Contractor Name
- Contractor Billing Address
- Contractor Federal ID Number
- NYS Vendor ID Number
- Account Number
- NYS Contract Number
- Name of Authorized User indicated on the Purchase Order
- NYS Agency Unit ID (if applicable)
- Customer Delivery Location ID number as shown on Delivery Schedule (if applicable)
- Authorized User's Purchase Order Number
- Order Date
- Invoice Date
- Invoice Number
- Invoice Amount
- Product Descriptions
- Unit Price
- Quantity
- Unit of Measure
- Dates of Service/Delivery (if applicable)

Cost centers or branch offices within an Authorized User may require separate invoicing as specified by each Authorized User. The Contractor's billing system shall be flexible enough to meet the needs of varying ordering systems in use by different Authorized Users. Visit the following link for further guidance for vendors on invoicing: https://bsc.ogs.ny.gov/content/vendor-information.

SHIPPING CHARGES:

Prices for all Items include all customs duties and charges for delivery, and are net FOB destination for delivery to any location designated by the Authorized User within a given County in New York State. In addition, upon mutual agreement, delivery locations may be expanded per the *Extension of Use* clause.

PRODUCT DELIVERY:

Delivery of all Contract Products shall be made in accordance with Appendix B, *Product Delivery* and *Shipping/Receipt of Product*. Delivery shall be made as specified and in accordance with instructions furnished with each order, unless otherwise directed in writing. Contractor must be prepared, at all times, to make prompt delivery. Every bid states what the maximum time a delivery will take from the moment of order, but the time shall never exceed 24 hours. In State declared emergencies, fuel must be delivered within eight (8) to twelve (12) hours of notification. Should there be a State declared emergency, an after-hours or weekend emergency, or should an agency run out of fuel at any time creating an emergency situation, the Contractor shall be required to provide product within eight (8) to twelve (12) hours of a telephone call from the agency.

Delivery shall be made in accordance with instructions on the Purchase Order from each Authorized User. If there is a discrepancy between the Purchase Order and what is listed on the Contract, it is the Contractor's obligation to seek clarification from the ordering Authorized User and, if applicable, from OGS, Procurement Services. On occasion, to prevent fuel run outs during storms or other emergency situations, the Contractor must allow Authorized Users the flexibility to manually schedule deliveries to top-off tank inventories. Normal deliveries are considered to take place Monday through Friday (8:00 am - 5:00 pm). Saturday/Sunday deliveries are not standard and are to be made on an emergency basis (and not a regular basis) ONLY, or if a run out is imminent before the next normal delivery day. Delivery of fuel should give first priority to "Human Needs Customers."

Failure to make prompt delivery may result in an Authorized User's submission of a Contract Performance Report to OGS. In addition to any available remedies per Appendix B, Section 48 Remedies for Breach, (a), (d) and (e), the Authorized User shall have the right to purchase sufficient Gasoline and E-85 on the open market to fill such tank or tanks and to charge any increase in price paid over the current contract price to the account of the Contractor

Authorized Users shall be responsible for insuring that tanks are accessible to the Contractor. Authorized Users should also make certain that receiving personnel are available at time of delivery. Failure of the Authorized User to make appropriate delivery arrangements, which prevents the delivery of product upon Contractor's arrival at delivery site, may result in a charge to the Authorized User for the Contractor's transportation costs. The Contractor must notify the Authorized User of the attempted delivery prior to charging for any future delivery attempts for the same circumstance. The Contractor must state the amount that would be charged for the direct cost of this subsequent delivery attempt, and provide supporting documentation that substantiates the direct cost for the failed delivery at the fault of the Authorized User. The Authorized User must agree in writing to any such costs for subsequent delivery attempts, prior to the Contractor making the subsequent delivery. At no time should a charge be applied to an Authorized User for an attempted delivery that failed at no fault of their own.

AUTOMATIC REPLENISHMENT:

Requests for automatic replenishment are preferred in WRITING from an Authorized User, and may be required by the Contractor. Subsequent WRITTEN notification back from the Contractor, will establish automatic replenishment for tanks equal to or larger than 1,000 gallons.
Automatic replenishment for tank capacities less than 1,000 gallons will be at the Contractor's option. If an Authorized User has not received written notification for automatic replenishment from the Contractor, a minimum order charge may apply (see Minimum Order).

Determination for total gross tank capacity shall include all manifolded tanks.

If the Contractor, after having accepted the request from an Authorized User and provided written notification back to the Authorized User for automatic replenishment, permits the level of the fuel to fall below the percentages of the total capacity of the purchaser's tank or tanks indicated in the following table, the purchaser shall have the right to purchase sufficient fuel on the open market to fill such tank or

tanks and to charge any increase in price paid over the current contract price to the account of the Contractor.

MINIMUM LEVEL	TOTAL - TANK CAPACITY/GALS
10%	Under 5500
15%	5,500 and over

The minimum order size of 500 gallons stipulated in Section MINIMUM ORDER shall not apply to deliveries being made to Authorized Users on an automatic delivery schedule as the Contractor controls the frequency, delivery dates, and quantities of the deliveries being made.

METHOD OF DELIVERY

TW: Delivery by tank wagon into storage tanks of less than 5,500 gallons

MT: Minimum delivery of 5,500 gallons to one or more tanks from one fixed location of the delivery vehicle. All such deliveries shall first be recorded directly into the transporting vehicle.

DELIVERY SCHEDULES:

The delivery schedules, based on Authorized Users' requirements submitted to Procurement Services by Requirement Letter RL205, are available as a guide to indicate proposed delivery points and estimated annual quantities. Delivery schedules may be revised or clarified as necessary. This information is available to clarify delivery conditions, where possible. Any specific questions regarding the site conditions should be directed to the end-user via any communication available, as shown on the Delivery Schedule. The delivery schedules are available on the OGS website.

Contractors shall be obligated to deliver under the resulting contract to any State Agency which places a purchase order under this Contract, whether or not such delivery location is identified in the delivery schedules. Any political subdivision or other non-State entity which has not filed a requirement with OGS as of the date of the bid opening for this award, shall be eligible to receive deliveries and/or be added to the Delivery Schedule at Contractor's option. This will be done upon placement of a valid purchase order (or other ordering mechanism between the Contractor and the ordering entity) to the Contractor's address as indicated in the award. Contractors must notify OGS of any new business created from Authorized Users' requests for delivery so that OGS Procurement Services can make adjustments to the delivery schedules to capture these new accounts. All cases shall require Contractors to notify both Contract user and OGS of any locations not identified on the Delivery Schedules within thirty (30) days after the first delivery is made. See Section New Accounts.

At any time during the Contract term, Contractor may be advised in writing by OGS regarding political subdivisions or other Non-State entities which have filed on a timely basis but do not appear, through no fault of their own, on the delivery schedules.
Filed requirements and delivery schedules may be updated by OGS for any mutually agreed upon extension.

NOTE: On occasion, entities may appear on the wrong delivery schedule as entities self-report. For example, a non- State entity may appear on the Agency schedule on occasion or vice versa. OGS does review and seek clarification of information on the delivery schedules, but does not catch all errors.

FILL AND VENT REQUIREMENTS:

Authorized Users must ensure that fill and vent equipment adequately meet NYS Standards. Contractors have the responsibility of reporting faulty equipment to the end users and the appropriate NYS regulatory agencies.

Authorized Users should also refer to CL-804, dated July 7, 2014, as they are responsible for the implementation of monitoring programs to insure compliance by supplier with these specification requirements.

PETROLEUM TRANSFER REQUIREMENTS:

Contractor's delivery trucks SHALL BE EQUIPPED WITH METERS, with the exception of motor transports, to accurately measure quantities delivered. Metered deliveries must be accompanied by a delivery ticket showing brand or grade and number of gallons delivered.

PRODUCT RETURN AND EXCHANGES:

In addition to the provisions of Appendix B, Sections 34 through 36, *Title and Risk of Loss, Product Substitution*, and *Rejected Product*, Products returned or exchanged due to quality problems, duplicated shipments, outdated Product, incorrect Product shipped, Contractor errors otherwise not specified, or Products returned or exchanged due to Authorized User errors, shall be replaced with specified Products or the Authorized User shall be credited or refunded for the full purchase price.

Products shall be replaced within ten (10) business days of written notification to the Contractor of the Authorized User's intent to return or exchange the Product. Contractor can charge only a restocking fee for Product returned or exchanged due to Authorized User error that is determined not to be suitable for resale; the restocking fee cannot exceed the net price of the returned or exchanged Product.

Any credit or refund shall be applied against the next bill/invoice submitted by the Contractor to the Authorized User. If no credit or refund, or only a partial credit or refund, is made in such fashion, the Contractor shall pay to the Authorized User the amount of such credit or refund or portion thereof still outstanding, within 30 calendar days of demand.

GUARANTEE:

The Contractor guarantees to furnish adequate protection from damage to Authorized User's buildings, grounds and/or equipment occurring on account of or in connection with, or occasioned by, or resulting from the furnishing and delivering of fuel under the Contract and shall be liable for any damages for which he or his employees are responsible.

This liability includes but is not limited to oil spills occurring during delivery. The Contractor shall provide constant surveillance during delivery by having a person in attendance at all times at the point of transfer. Oil spills of any size shall be immediately reported to the agency Business Office to effect contact with a representative of the Department of Environmental Conservation. More information can be viewed at: http://www.dec.ny.gov/chemical/8428.html

A call can be placed twenty-four hours a day with the New York State Spill Hotline at 1-800-457-7362.

ENGINEERING SERVICE:

Contractor must be prepared at all times to furnish engineering service when so requested and/or to investigate a complaint and report to the Authorized User and OGS on any complaint that might arise in connection with the use of Contractor's Fuel in State equipment. This engineering service will include but not be limited to the diagnosis of fuel related engine problems in the Authorized User's equipment utilizing the Contractor's fuel.

POOR PERFORMANCE:

Authorized Users should notify Procurement Services promptly if the Contractor fails to meet the requirements of this Contract. Performance which does not comply with requirements or is otherwise unsatisfactory to the Authorized User should also be reported to Procurement Services.

State of New York
Office of General Services
PROCUREMENT SERVICES
Contract Performance Report

Please take a moment to let us know how this contract award has measured up to your expectations. If reporting on more than one contractor or product, please make copies as needed. This office will use the information to improve our contract award, where appropriate. **Comments should include those of the product's end user.**

Contract No.:_____ **Contractor.**_____

Describe Product* Provided (Include Item No., if available):_____

***Note**: "**Product**" is defined as a deliverable under any Bid or Contract, which may include commodities (including printing), services and/or technology. The term "Product" includes Licensed Software.

	Excellent	Good	Acceptable	Unacceptable
• Product meets your needs				
• Product meets contract specifications				
• Pricing				

CONTRACTOR

	Excellent	Good	Acceptable	Unacceptable
• Timeliness of delivery				
• Completeness of order (fill rate)				
• Responsiveness to inquiries				
• Employee courtesy				
• Problem resolution				

Comments:_____

_____

_____(over)

Agency:_____ Prepared by:_____

Address:_____ Title:_____

_____ Date:_____

_____ Phone:_____

_____ E-mail:_____

Please return this form via e-mail to OGS.sm.ps_CM_FleetFuelRoads@ogs.ny.gov **or mail to:**

Attn: Bryant Kirk
NYS Office of General Services, Procurement Services
Corning Tower, 38th Floor
Empire State Plaza
Albany, New York 12242

* * * * *

NEW YORK STATE OF OPPORTUNITY. | Office of General Services | Procurement Services

Corning Tower, Empire State Plaza, Albany, NY 12242 | https://ogs.ny.gov/procurement | customer.services@ogs.ny.gov | 518-474-6717

Contract Award Notification Update

Subject: Revision to Weekly Pricing List Dated 3/20/2020

DATE: March 30, 2020 **AWARD #:** 23092 **GROUP #:** 05600

AWARD DESCRIPTION: Gasoline & E-85 (Statewide)

CONTRACT PERIOD: December 19, 2018 – December 17, 2020

CONTACT: Bryant Kirk | 518-402-3021 | bryant.kirk@ogs.ny.gov

CONTRACT NO.:	**CONTRACTOR:**
PC68456	Global Montello Group Corp.
PC68460	Sprague Operating Resources LLC
PC68461	Sunoco LLC
PC68462	United Metro Energy Corp.

Due to a pricing revision in the OPIS Weekly Publication, the weekly pricing list dated 3/20/2020 for Gasoline & E-85 contracts is revised from the original posting. The Spot Market New York Ethanol price of $1.1370 is revised to $1.1310. The correction only applies to Flex Fuel (E-85) and all OPRG(E) fuel types. It is expected that Contract Users and Contractors will work on corrected invoices and credits as applicable.

The revised calculated pricing for each of the affected counties and price types is as follows:

County	Fuel Type	Original Price	Revised Price	Contractor
Albany	Flex Fuel (E-85)	$ 1.3260	$ 1.3209	Global Montello
Allegany	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Bronx	OPRG (E) Gas Regular	$ 0.8702	$ 0.8696	United Metro
Cattaraugus	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Chautauqua	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Chemung	Flex Fuel (E-85)	$ 2.0719	$ 2.0668	Sunoco LLC
Dutchess	OPRG (E) Gas Regular	$ 0.9675	$ 0.9669	Global Montello
Dutchess	OPRG (E) Gas Mid Range	$ 1.0144	$ 1.0138	Global Montello
Dutchess	OPRG (E) Gas Premium	$ 1.1051	$ 1.1045	Global Montello
Erie	Flex Fuel (E-85)	$ 1.7719	$ 1.7668	Sunoco LLC
Franklin	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Kings	OPRG (E) Gas Regular	$ 0.8186	$ 0.8180	United Metro
Kings	OPRG (E) Gas Premium	$ 0.8803	$ 0.8797	United Metro
Madison	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Monroe	Flex Fuel (E-85)	$ 1.6719	$ 1.6668	Sunoco LLC
Nassau	OPRG (E) Gas Regular	$ 0.7816	$ 0.7810	Sprague Operating Resources
Nassau	OPRG (E) Gas Mid Range	$ 0.8486	$ 0.8480	Sprague Operating Resources
Nassau	OPRG (E) Gas Premium	$ 0.9157	$ 0.9151	Sprague Operating Resources
Nassau	Flex Fuel (E-85)	$ 1.2606	$ 1.2555	Sprague Operating Resources

New York	OPRG (E) Gas Regular	$ 0.7845	$ 0.7839	United Metro
New York	OPRG (E) Gas Premium	$ 0.8954	$ 0.8948	United Metro
Oneida	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Onondaga	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Orange	OPRG (E) Gas Regular	$ 0.9598	$ 0.9592	Global Montello
Orange	OPRG (E) Gas Mid Range	$ 1.0167	$ 1.0161	Global Montello
Orange	OPRG (E) Gas Premium	$ 1.0674	$ 1.0668	Global Montello
Orange	Flex Fuel (E-85)	$ 1.3561	$ 1.3510	Global Montello
Orleans	Flex Fuel (E-85)	$ 2.0719	$ 2.0668	Sunoco LLC
Oswego	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Putnam	OPRG (E) Gas Regular	$ 0.9044	$ 0.9038	Global Montello
Putnam	OPRG (E) Gas Mid Range	$ 0.9613	$ 0.9607	Global Montello
Putnam	OPRG (E) Gas Premium	$ 1.0520	$ 1.0514	Global Montello
Queens	OPRG (E) Gas Regular	$ 0.7835	$ 0.7829	United Metro
Queens	OPRG (E) Gas Mid Range	$ 0.7918	$ 0.7912	United Metro
Queens	OPRG (E) Gas Premium	$ 0.8578	$ 0.8572	United Metro
Rensselaer	Flex Fuel (E-85)	$ 1.3239	$ 1.3188	Global Montello
Rockland	OPRG (E) Gas Regular	$ 0.8991	$ 0.8985	Global Montello
Rockland	OPRG (E) Gas Mid Range	$ 0.9460	$ 0.9454	Global Montello
Rockland	OPRG (E) Gas Premium	$ 1.0367	$ 1.0361	Global Montello
Rockland	Flex Fuel (E-85)	$ 1.2954	$ 1.2903	Global Montello
Seneca	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
St Lawrence	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Suffolk	OPRG (E) Gas Regular	$ 0.7861	$ 0.7855	Sprague Operating Resources
Suffolk	OPRG (E) Gas Mid Range	$ 0.8532	$ 0.8526	Sprague Operating Resources
Suffolk	OPRG (E) Gas Premium	$ 0.9204	$ 0.9198	Sprague Operating Resources
Suffolk	Flex Fuel (E-85)	$ 1.1186	$ 1.1135	Sprague Operating Resources
Wayne	Flex Fuel (E-85)	$ 2.3219	$ 2.3168	Sunoco LLC
Westchester	OPRG (E) Gas Regular	$ 0.8223	$ 0.8217	United Metro
Westchester	OPRG (E) Gas Mid Range	$ 0.8303	$ 0.8297	United Metro
Westchester	OPRG (E) Gas Premium	$ 0.8988	$ 0.8982	United Metro
Westchester	Flex Fuel (E-85)	$ 1.1334	$ 1.1283	Sprague Operating Resources

All other terms and conditions remain the same.

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Contract Award Notification Update

Subject: Revision to Weekly Pricing List Dated 2/14/2020

DATE: February 18, 2020 **AWARD #:** 23092 **GROUP #:** 05600

AWARD DESCRIPTION: Gasoline & E-85 (Statewide)

CONTRACT PERIOD: December 19, 2018 – December 17, 2020

CONTACT: Bryant Kirk | 518-402-3021 | bryant.kirk@ogs.ny.gov

CONTRACT NO.: All **CONTRACTOR:** All

The weekly pricing list dated 2/14/2020 for the Gasoline & E-85 contracts contained an error in the NY Harbor Barge PreRBOB price calculations. The correct price is $167.1620 cents per gallon.

The above-mentioned error was corrected, and the revised price list for 2/14/2020 – 2/20/2020 will be posted to the NYS OGS website at https://online.ogs.ny.gov/purchase/FuelsPricingDefault.htm.

All other terms and conditions remain the same.

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Corning Tower, Empire State Plaza, Albany, NY 12242 | https://ogs.ny.gov/procurement | customer.services@ogs.ny.gov | 518-474-6717

Contract Award Notification Update

Subject: Updates to Contractor Contact Information

DATE: February 11, 2020 **AWARD #:** 23092 **GROUP #:** 05600

AWARD DESCRIPTION: Gasoline & E-85 (Statewide)

CONTRACT PERIOD: December 19, 2018 – December 17, 2020

CONTACT: Bryant Kirk | 518-402-3021 | bryant.kirk@ogs.ny.gov

CONTRACT NO.: PC68461 **CONTRACTOR:** Sunoco LLC

Please be advised that the following revision was made to the contractor information in the Contract Award Notification:

1. Updated Contact, phone number and email address:
   - Sean Grogan
   - Phone: 585-537-3784
   - Email Sean.Grogan@sunoco.com

The revised Contract Award Notification will be posted at:
https://online.ogs.ny.gov/purchase/spg/awards/0560023092CAN.HTM

Please mark your records accordingly.

All other terms and conditions of the contract remain the same.

NEW YORK STATE OF OPPORTUNITY. | Office of General Services | Procurement Services

Corning Tower, Empire State Plaza, Albany, NY 12242 | www.nyspro.ogs.ny.gov | customer.services@ogs.ny.gov | 518-474-6717

Contract Award Notification Update

Subject: Revised Contract Award Notification – Updates to Contractor Contact Information

DATE: December 19, 2018 **AWARD #:** 23092 **GROUP #:** 05600

AWARD DESCRIPTION: Gasoline & E-85 (Statewide)

CONTRACT PERIOD: December 19, 2018 – December 17, 2020

CONTACT: Bryant Kirk | 518-402-3021 | bryant.kirk@ogs.ny.gov

CONTRACT NO.:	CONTRACTOR:
PC68456	Global Montello Group Corp.

Please be advised that the following revision was made to the contractor information in the Contract Award Notification:

1. Updated phone number and email address:
   - Global Montello Group Corp.

The revised Contract Award Notification will be posted at:
https://www.ogs.ny.gov/purchase/spg/awards/0560023092CAN.HTM

Please mark your records accordingly.

All other terms and conditions of the contract remain the same.

6/10/2020 Work Session Agenda Item #6

TOWN OF CARMEL RECREATION & PARKS DEPARTMENT
SYCAMORE PARK, 790 LONG POND ROAD
MAHOPAC, NEW YORK 10541

JAMES R. GILCHRIST, CPRP, DIRECTOR

TELEPHONE: (845) 628-7888 FAX: (845) 628-2820
EMAIL: carmelrecreation@ci.carmel.ny.us
WEB: http://www.carmelny.org

DATE: June 3, 2020

TO: Carmel Town Board
Carmel Town Hall

FROM: James R. Gilchrist, CPRP
Director, Recreation and Parks

SUBJECT: Phase 2 Field Construction – Additional Budget Request

As you know, substantial completion of the subject phase at Airport Park has been achieved. Insite Engineering was authorized for a fee for services totaling $42,300.00 for this phase based on a 12-week active construction period. This period extended well beyond this amount of time, and additional design and construction tasks were encountered but not included in the original budget agreement. Insite Engineering is requesting an additional budget of $5,200.00 to cover these services. I have attached the request from Insite Engineering for your review.

Please add this to the Town Board Work Session agenda on June 10, 2020, and contact me with any questions.

/ns
Attachment

INSITE
ENGINEERING, SURVEYING &
LANDSCAPE ARCHITECTURE, P.C.

May 29, 2020

Mr. Jim Gilchrist
Recreation Director, Town of Carmel
Sycamore Park
790 Long Pond Road
Mahopac, NY 10541

via email: jrg@ci.carmel.ny.us

RE: Airport Park
Phase 2 Field Construction

Dear Mr. Gilchrist:

As you know, we have achieved substantial completion of the subject phase of the Airport Park project. Our office was authorized for a fee for services totaling $42,300.00 for this phase of work based on a 12-week active construction period. As you know, the construction period extended well beyond this amount of time. Additionally, we have encountered additional design and construction oversight relating to the following:

- Perimeter fencing change order.
- Temporary water supply support.
- Master planning for other park improvements.
- Erosion control inspection based on building disturbance.

These unanticipated tasks were not budgeted in our current agreement and we would request an additional budget of $5,200.00 (40 manhours) to cover these services.

Should you have any questions or comments regarding this information, please feel free to contact our office.

Very truly yours,

INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

By: _____
Jeffrey J. Contelmo, P.E.
Senior Principal Engineer

JJC/amk

Insite File No. 18192.101

6/10/2020 Work Session Agenda Item #7

TOWN OF CARMEL RECREATION & PARKS DEPARTMENT
SYCAMORE PARK, 790 LONG POND ROAD
MAHOPAC, NEW YORK 10541

JAMES R. GILCHRIST, CPRP, DIRECTOR

TELEPHONE: (845) 628-7888 FAX: (845) 628-2820
EMAIL: carmelrecreation@ci.carmel.ny.us
WEB: http://www.carmelny.org

DATE: June 3, 2020

TO: Carmel Town Board
Carmel Town Hall

FROM: James R. Gilchrist, CPRP
Director, Recreation and Parks

SUBJECT: Airport Park Soccer and Lacrosse Equipment

We will be purchasing soccer equipment and (5) pair of lacrosse goals for the Airport Park. There are sufficient funds in the 2020 Budget, line 7115.0020, to cover the cost.

Quotes for the new soccer equipment were submitted by three vendors, Soccer Source ($26,374.73), Your Soccer Store ($29,998.70) and Pevo Sports Co. ($29,995.00) which are all included in this packet.

Quotes for the lacrosse goals were submitted by three vendors, BSN Sports ($2,749.95), CrankShooter.com ($4,090.00) and LAX.com ($5,130.00) which are all included in this packet as well.

I have reviewed these quotes and recommend we purchase the soccer equipment from Soccer Source in the amount of $26,374.73, and BSN Sports for the lacrosse goals in the amount of $2,749.95.

Please add this to the June 10, 2020 Town Board Work Session agenda, and contact me with any questions.

/ns
Attachments

TOWN OF CARMEL RECREATION & PARKS DEPARTMENT
SYCAMORE PARK, 790 LONG POND ROAD
MAHOPAC, NEW YORK 10541

JAMES R. GILCHRIST, CPRP, DIRECTOR

TELEPHONE: (845) 628-7888 FAX: (845) 628-2820
EMAIL: carmelrecreation@ci.carmel.ny.us
WEB: http://www.carmelny.org

Soccer Equipment for Airport Park

Please provide a price quote for all items delivered to Airport Park- 161-165 Hill Street Mahopac, NY 10541. If you can please price out all items individually as well as a together and add shipping costs to the quote. We would like to receive this quote back by 5/11/2020.

Item	Quantity
Pevo Supreme Series 8 x 24 with wheels (include heavy duty nets and tamper resistant clips)	2 Sets (4) goals
Pevo Supreme Series 7 x 21 with wheels (include heavy duty nets and tamper resistant clips)	1 set (2) goals
Pevo Supreme Series 6.5 x 18.5 (include heavy duty nets and tamper resistant clips)	2 Sets (4) goals
Pevo 3 row bench – 21' long	6
Pevo covered bench- 21' long	2
Pevo team benches with back- 21' long	8

soccer source
WWW.SOCCERSOURCE.COM

Soccer Source USA Inc
101 East Gay Street
Suite 427
West Chester, PA 19380

Quote

Date	Quote #
5/8/2020	1335

Name / Address
Town of Carmel Rec & Parks Department ATTN: James Gilchrist Airport Park 161-165 Hill Street Mahopac, NY 10541

Rep	Project
GC	

Description	Qty	Total
PEVO 8x24 Supreme (pair)	2	6,573.98
Flat rate discount		-1,111.00
PEVO Permanant Wheel Set (supreme, park, economy)	4	663.96
Flat rate discount		-112.21
PEVO 7x21Supreme (pair)	1	3,058.99
Flat rate discount		-517.14
PEVO Permanant Wheel Set (supreme, park, economy)	2	331.98
Flat rate discount		-56.10
PEVO 6.5x18.5 Supreme (pair)	2	5,623.98
Flat rate discount		-950.45
PEVO 3-Row Bleacher	6	8,033.94
Flat rate discount		-1,387.65
PEVO 21' Team Soccer Bench Shelter (canopy color TBD)	2	2,831.98
Flat rate discount		-478.60
PEVO 21' Team Soccer Bench (w/back)	8	4,655.92
Flat rate discount		-786.85

Quote assumes payment via check. Credit card payment accepted for additional 3% charge.

Total $26,374.73

Your Soccer Store

Quality Soccer
Products for Less!

Quote

Your Soccer Store
Contact: Joe Brisindi
732-735-1784
info@yoursoccerstore.com

INVOICE NO. 1178
DATE 5/4/2020

Vendor
Your Soccer Store

Ship To
Airport Soccer
Mahopac, NY 10541

JOB/COMMENTS

All Goals include Nets, Clips, and Ground Anchors

PAYMENT TERMS

DESCRIPTION	QUANTITY	AMOUNT	TOTAL
Pevo 8x24 Supreme Goal with 4mm net and wheels	4	$1,649.95	**$6,599.80**
Pevo 7x21 Supreme Goal with 4mm net and wheels	2	$1,599.95	**$3,199.90**
Pevo 6x18 Supreme Goal with 4mm net and wheels	4	$1,499.95	**$5,999.80**
Pevo 3 Row Bleacher 21'	6	$1,224.95	**$7,349.70**
Pevo Covered Bench 21'	2	$1,324.95	**$2,649.90**
Pevo Bench with Back 21'	8	$524.95	**$4,199.60**
		Subtotal	**$29,998.70**
		Shipping	**$0.00**
		TOTAL DUE	**$29,998.70**

Make all checks payable to ***Your Soccer Store***

THANK YOU FOR YOUR BUSINESS!

PEVO Sports Co.
1417 Regatta Dr
Wilmington, NC 28405
United States

Voice: (910) 397-9388
Fax: (910) 397-9389

QUOTATION

Quote Number: 20CRP0505
Quote Date: May 5, 2020
Page: 1

Quoted To:

Town of Carmel Rec & Parks
790 Long Pond Road
Mahopac, NY 10541

Customer ID	Good Thru	Payment Terms	Sales Rep
Carmel Rec & Parks	6/4/20	Net 30 Days	

Quantity	Item	Description	Unit Price	Amount
4.00	E-SGM-8x24SB	Soccer Goal - 8' x 24' - Supreme - With 4mm Nets and Tamper resistant clips	1,505.00	6,020.00
4.00	E-SGA-503	Permanent Wheel Assemblies (2) - one left, one right - 3" Angle	120.00	480.00
2.00	E-SGM-7x21SB	Soccer Goal - 7' x 21' - Supreme - With 4mm Nets and Tamper resistant clips	1,400.00	2,800.00
2.00	E-SGA-503	Permanent Wheel Assemblies (2) - one left, one right - 3" Angle	120.00	240.00
4.00	E-SGM-6x18SB	Soccer Goal - 6.5' x 18.5' - Supreme - with 4mm Nets and tamper resistant clips	1,285.00	5,140.00
4.00	E-SGA-503	Permanent Wheel Assemblies (2) - one left, one right - 3" Angle	120.00	480.00
6.00	E-TBL-3-21	3-row Bleacher - 21'	1,200.00	7,200.00
2.00	E-TBC-21	Covered Team Bench - 21'	1,270.00	2,540.00
8.00	E-TBN-21B	Team Bench with Back - 21'	520.00	4,160.00

Subtotal	29,060.00
Sales Tax	
Freight	935.00
TOTAL	**29,995.00**

BSN SPORTS

PO Box 660176
Dallas, Tx 75266-0176
Phone: 800-527-7510 Fax: 800-899-0149
Visit us at www.bsnsports.com

Quote

Quote #: 21207305
Purchase Order #: QT - Jim - Goals
Cart Name:
Quote Date: 05/29/2020
Quote Valid-to: 06/24/2020
Payment Terms: NT30
Ship Via:
Ordered By: Jim

ontact Your Rep
nthony Nathe Email:**anathe@bsnsports.com** | Phone:

old to
905290
OWN OF CARMEL
'ARKS & RECREATION
90 LONG POND RD
IAHOPAC NY 10541-3337

Ship To
1905290
TOWN OF CARMEL
PARKS & RECREATION
790 LONG POND RD
MAHOPAC NY 10541-3337

Payer
1905290
TOWN OF CARMEL
PARKS & RECREATION
790 LONG POND RD
MAHOPAC NY 10541-3337

em Description	Qty	Unit Price	Total
)FFICIAL LACROSSE GOAL/NET em # - LACOFFGL	5 PR	$ 549.99	$ 2,749.95

Subtotal:	$2,749.95
Other:	$0.00
Freight:	$0.00
Sales Tax:	$0.00
Order Total:	$2,749.95
Payment/Credit Applied:	$0.00
Order Total:	$2,749.95

Check your quote at www.bsnsports.com/?&ProgramID=21207305&zip=10541-3337

OFFICIAL LACROSSE GOALS

SKU# LACOFFGL

Zoom

SKU# LACOFFGL

In Stock Ships Truck

> be the first to review this product

Qty Flyer ?

Contact Us

DETAILS

Set up the lacrosse field for a college-level tournament or game with these Official Lacrosse Goals. Whether players are firing balls at the net during practice or goalies are defending the posts during a big game, these goals make a great addition to lacrosse fields at universities and high schools. Coaches and officials want to make sure nets are up to league standards for their games, and these NCAA® specified goals are designed in an official size for collegiate play.

- Official-size lacrosse net is NCAA® specified for collegiate play
- Powder coated 13-gauge steel tubing and flat steel ground supports withstand tough play and impacts with the ball and players
- Braided knotless net is made of 6mm nylon for durability
- Lacing rods on the inside front, rear ground supports and uprights securely attach the net to the frame using the included lacing cord
- Heavy-duty ground anchors ensure the net stays in place throughout games and practices

Specifications:

- Activity: Lacrosse
- Color: Orange, White
- Color Family: Orange
- Product Height: 6 ft.
- Product Length: 7 ft.
- Product Width: 6 ft.

- 6'H x 6'W x 7'D official size NCAA® specified goal
- Constructed of 13-gauge, orange powder coated, 1.9" O.D. steel tubing and 3"W flat steel ground supports
- Lacing rods on inside front, uprights and rear ground supports
- Includes 6mm knotless nylon net, lacing cord and heavy-duty ground anchors

ADDITIONAL INFORMATION

WARRANTY

REVIEWS

TAGS

COMPANY

ORDER INFO

HELP

Contact Us

Kallmeyer,Nina

From: CrankShooter.com <Sales@CrankShooter.com>
Sent: Monday, June 1, 2020 4:03 PM
To: Kallmeyer,Nina
Subject: Invoice #D1677

CrankShooter.com

INVOICE #D1677

Complete your purchase

For schools: To purchase with a Purchase Order, please email Purchase Order to Sales@CrankShooter.com. Purchase Order must be on your School's letterhead in order to be processed.

Complete your purchase

or Visit our store

Order summary

Lacrosse Goal High School/College Game Goal 6'x6'x7' by CrankShooter® 118 lbs. Heavy 6mm or 7mm Black Net Included - Free Shipping × 10 — **$4,090.00**

Black 6mm Net-HS/Coll.

Subtotal	**$4,090.00**
Shipping	**$0.00**
Total	**$4,090.00 USD**

June 2, 2020

LAX.COM
WHERE PLAYERS GET THEIR GEAR

Quote # PROJ13976
SCHOOL PO #:

Bill to:
Town of Carmel Parks and Rec
790 Long Pond Rd
Mahopac, NY 10541

Ordered By	Ship To	Return Address
Nina Kallmeyer Town of Carmel Parks and Rec	Nina Kallmeyer Town of Carmel Parks and Rec 790 Long Pond Rd Mahopac, NY 10541 US	LAX.com 345 Wilson Avenue Norwalk, CT 06854 855-255-5294 sales@lax.com

Item	Item Code	Unit Price	QTY	Total
Brine Collegiate Goal orange	Brine Collegiate Goal-OR	$360.00	10	$3,600.00
Brine Pro 6.0 mm Net white	Brine Pro 6.0 mm Net-WH	$103.00	10	$1,030.00

Subtotal:	$5,130.00
Shipping:	$0.00
Total:	$5,130.00

Terms: Due Upon Receipt

6/10/2020 Work Session Agenda Item #8

TOWN OF CARMEL RECREATION & PARKS DEPARTMENT
SYCAMORE PARK, 790 LONG POND ROAD
MAHOPAC, NEW YORK 10541

JAMES R. GILCHRIST, CPRP, DIRECTOR

TELEPHONE: (845) 628-7888 FAX: (845) 628-2820
EMAIL: carmelrecreation@ci.carmel.ny.us
WEB: http://www.carmelny.org

DATE: June 3, 2020

TO: Carmel Town Board
Carmel Town Hall

FROM: James R. Gilchrist, CPRP
Director, Recreation and Parks

SUBJECT: Request for Authorization to Pay Installation of Bathroom Fixtures at McDonough Park

I am requesting authorization to pay the labor invoice for the installation of the new bathroom fixtures at McDonough Park. I have attached the invoice from Bee & Jay Plumbing in the amount of $10,244.50 along with the Town of Carmel Vendor Claim Form. All labor was performed at the NYS prevailing wage rate and I have attached the contractor's US Dept. of Labor payroll sheets for your review.

There are sufficient funds in the 2020 Budget; line 7112.45 General Fund, McDonough Fields Contract Exp.

This purchase requires a Resolution. Please add this to the June 10, 2020 Town Board Work Session agenda and contact me with any questions.

/ns
Attachments

BEE & JAY
P.O. Box 78 - 719 Route 6 - Mahopac, NY 10541
p: 845.628.3924 f: 845.628.4062
e: service@beeandjay.com

INVOICE

DATE	INVOICE #
5/28/2020	94742

www.BEEANDJAY.com

BILL TO:

Carmel Recreation & Parks Commission
790 Long Pond Rd.
Sycamore Park
Mahopac, NY 10541

SERVICE LOCATION:

McDonough Park
20 Dixon Road
Mahopac, NY

PROFESSIONAL SERVICE 56 YEARS 1964-2020

Master Plumbers Lic.#s W.C. 556 P.C. 363

CUSTOMER #	TERMS	MECHANIC	SERVICE DATE	WORK ORDER #
845-628-7888	Due Upon Receipt	EK	4/24/2020	

ITEM	QTY/HRS	DESCRIPTION	RATE	AMOUNT
Description		Supplied and installed all material and labor to install town of Carmel park department stainless steel bath fixtures at mens and ladies room bathrooms at Jimmy McDonough Park.		
Labor TOC Mech	8	1- Mech April 24, 2020	175.00	1,400.00
Labor TOC Tech	8	1- Tech April 24,2020	185.00	1,480.00
Labor TOC Mech	6	1- Mech April 27, 2020	175.00	1,050.00
Labor TOC Tech	6	1- Tech April 27, 2020	185.00	1,110.00
Labor TOC Mech	4	1- Mech April 28, 2020	175.00	700.00
Labor TOC Tech	4	1- Tech April 28, 2020	185.00	740.00
Labor TOC Mech	4	1- Mech May 5, 2020	175.00	700.00
Labor TOC Tech	4	1- Tech May 5, 2020	185.00	740.00
Labor TOC Mech	4	1- Mech May 8, 2020	175.00	700.00
Labor TOC Tech	4	1- Tech May 8, 2020	185.00	740.00
Material		10 feet 1-1/2" DWV Copper Pipe	80.00	80.00
Material		10 feet 2" DWV Copper Pipe	100.00	100.00
Material		2- 2x1-1/2x1-1/2 Copper Tee's	55.00	55.00
Material		11- 2" DWV Ells Copper	214.50	214.50
Material		4- 2" ST Ells DWV Copper	78.00	78.00
Material		4- 1/2x3/8 Angle Stops	80.00	80.00
Material		2- 1-1/2 Brass Traps	55.00	55.00
Material		2- 1-1/2" Brass Tailpiece Flanged	36.00	36.00

Total Due

BEE & JAY
P.O. Box 78 - 719 Route 6 - Mahopac, NY 10541
p: 845.628.3924 f: 845.628.4062
e: service@beeandjay.com

INVOICE

DATE	INVOICE #
5/28/2020	94742

www.BEEANDJAY.com

BILL TO:

Carmel Recreation & Parks Commission
790 Long Pond Rd.
Sycamore Park
Mahopac, NY 10541

SERVICE LOCATION:

McDonough Park
20 Dixon Road
Mahopac, NY

PROFESSIONAL SERVICE 56 YEARS 1964-2020

Master Plumbers Lic.#s W.C. 556 P.C. 363

CUSTOMER #	TERMS	MECHANIC	SERVICE DATE	WORK ORDER #
845-628-7888	Due Upon Receipt	EK	4/24/2020	

ITEM	QTY/HRS	DESCRIPTION	RATE	AMOUNT
Material		2- 1-1/2" Brass Desanko	44.00	44.00
Material		4- 1/2" Stainless Laundry Supplies	60.00	60.00
Material		10 - 1/2" Ells	50.00	50.00
Material		4- 1/2" Male Adapters	32.00	32.00

** Invoices not paid when due will be subjected to a finance charge of 1.5% per month

Total Due $10,244.50

WE ACCEPT ALL MAJOR CREDIT CARDS !!

CARD TYPE: VISA MASTERCARD AMERICAN EXPRESS DISCOVER DINER'S CLUB OTHER _____

CARDHOLDER/NAME:_____ SIGNATURE: _____

CARD#_____ EXP. DATE: _____ CID #_____

VENDOR CLAIM FORM

TOWN OF CARMEL
60 McALPIN AVENUE
MAHOPAC, NY 10541

RECREATION DEPARTMENT

VENDOR # #0476

CLAIMANT'S NAME AND ADDRESS

Bee& Jay Plumbing
719 Route 6 P.O. Box 78
Mahopac, NY 10541

VOUCHER NO.	
PURCHASE ORDER NO.	25358
Date Voucher Received	
P.O.# - APPROPRIATION NO.	AMOUNT
7118.40	10,244.50
TOTAL	10,244.50
Abstract No.	

VENDOR TAX ID # 476
TAX EXEMPT No. A-158985

Date	Invoice Number	Description of Materials or Services	Unit Price	Amount
05/28/20	94742	**McDonough Park Bathroom Install**	**10,244.50**	**10,244.50**
		Total		

VENDOR'S/CLAIMANT'S CERTIFICATION

I, Kimberley Ferguson, certify that the above account in the amount of $ 10,244.50 is true and correct; that the items, services and disbursements charged were rendered to or for the municipality on the dates stated; that no part has been paid or satisfied; that taxes, from which the municipality is exempt, are not included; and that the amount claimed is actually due.

5/28/2020
Date

Kimberley Ferguson
Signature

Office Administrator
Title

(Space below for Municipal Use)

TOWN DEPARTMENT APPROVAL

The above services or materials were rendered or furnished to the municipality on the date stated and the charges are correct.

6/3/20
Date

Authorized Official

APPROVAL FOR PAYMENT

The claim is approved and ordered paid from the appropriations indicated above.

Authorized Official's Signatures

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division
Rev. Dec. 2008

OMB No.:1235-0008
Expires: 04/30/2021

NAME OF CONTRACTOR ☒ OR SUBCONTRACTOR ☐: Bee & Jay Plumbing & Heating Corp

ADDRESS: 719 RT. 6 Mahopac NY

PROJECT AND LOCATION: Town of Carmel Rec. Dept. Jimmy McDonough Park Baths

PAYROLL NO.:

FOR WEEK ENDING: 5/9/20

PROJECT OR CONTRACT NO.:

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITHHOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
Eugenia Kulgion 152 Hillside Ave Rd Wappingers Falls NY		Plumbing Apprentice	O											
			S	4 4	8	56.46 16.42	587.30							
Danny Kuczera 152 Hillside Ave Rd Wappingers Falls NY		Carpenter	O											
			S	4 4	8	41.53 23.32	518.80							
			O											
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			S											
			O											
			S											

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. §5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date 5/27/20

I, Theodore Kugler Party
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by
Bee + Jay Plb + Htg Corp.
(Contractor or Subcontractor) on the
McDonough Park Baths
(Building or Work); that during the payroll period commencing on the
5 day of May, 2020 and ending the 8 day of May, 2020
all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said
Bee + Jay Plb + Htg Corp.
(Contractor or Subcontractor) from the full

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☑ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE
Theodore Kugler Pres	

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

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U.S. Wage and Hour Division
Rev. Dec. 2008

OMB No.:1235-0008
Expires: 04/30/2021

NAME OF CONTRACTOR ☒ OR SUBCONTRACTOR ☐: Bee & Jay Plumbing & Heating Corp

ADDRESS: 719 RT. 6 Mahopac NY

PAYROLL NO.:

FOR WEEK ENDING: 5/2/20

PROJECT AND LOCATION: Town of Carmel Rec Dept. McDonough Park Baseball

PROJECT OR CONTRACT NO.:

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITHHOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
Theodore Rugier 19 Country Hollow Dr Amawalk, NY		Planning Mech	O											
			S	6 4	10	56.96 / 76.44	732.20							
Joseph Scollan 8 Storm Lane Mahopac, NY		Planning Mech	O											
			S	6 4	10	56.96 / 76.44	732.20							
			O											
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date 5/27/20

I, Theodore Hughes Pres.
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by Bee + Jay Plg + Htg Comp. (Contractor or Subcontractor) on the McDonough Park Baths (Building or Work); that during the payroll period commencing on the 27 day of Apr, 2020, and ending the 28 day of Apr, 2020, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said Bee + Jay Plg + Htg Corp. (Contractor or Subcontractor) from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☒ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE
Theodore Hughes Pres.	

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See instructions at www.dol.gov/whd/forms/wh347instr.htm)

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U.S. Wage and Hour Division
Rev. Dec. 2008

OMB No.: 1235-0008
Expires: 04/30/2021

NAME OF CONTRACTOR ☑ OR SUBCONTRACTOR ☐	ADDRESS	PROJECT OR CONTRACT NO.
Bee & Jay Plumbing & Heating Corp	719 RT. 6 Mahopac NY	
PAYROLL NO.	FOR WEEK ENDING 4/25/20	PROJECT AND LOCATION Town of Carmel Rec Dept. Jimmy McDonough Park Carmel

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION		(4) DAY AND DATE — HOURS WORKED EACH DAY (S 4/19, M, T, W, T, F 4/24, S 4/25)	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
Eugene Kubler 152 Hortonia Lake Rd Wappingers Falls NY		Plumber Mech	O											
			S	8	8	56.96 16.00	587.36							
Danny Kubler 152 Hortonia Lake Rd Wappingers Falls NY		Carpenter	O			41.55 23.32								
			S	8	8	"	518.80							
			O											
			S											
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date 5/27/22

I, Theodore Hughes Pres.
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by Bee + Jay Plg + Htg Comp. on the
(Contractor or Subcontractor)

McDonough Park Baths ; that during the payroll period commencing on the
(Building or Work)

24 day of Apr, 2020 and ending the 24 day of Apr, 2020,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

Bee + Jay Plg + Htg Corp. from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE
Theodore Hughes Pres	

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

TOWN OF CARMEL

60 MCALPIN AVE
MAHOPAC, NY 10541

PO Number : **25358**
Date : 04/13/2020
Page: 1 of 1

Purchase Order

Vendor : 0000000476
BEE & JAY CORP.
PLUMBING AND HEATING
719 RT6-PO BOX 78
MAHOPAC, NY 10541

Ship To:
TOWN OF CARMEL
COMPTROLLER OFFICE
60 MCALPIN AVENUE
MAHOPAC, NY 10541

Bill To:
TOWN OF CARMEL
COMPTROLLER OFFICE
60 MCALPIN AVENUE
MAHOPAC, NY 10541

Description: REPAIRS AT MCDONOUGH PARK - PER ATTACHED EMAIL FROM JIM

Qty.	Unit	Description	Unit Price	Amount
		REPAIRS AT MCDONOUGH PARK 100.7112.0040 (GENERAL FUND.MCDONOUGH FIELDS.MCDONOUGH FIELDS CONTRACT EXP)		1,300.00
			Total:	$1,300.00

Ordered By: MICHELLET Req. Date: 04/10/2020 Req. No: 21585 Approved By/Date:

Authorized Official

Date

Spano,Carmela

From: Tenefrancia,Michelle
Sent: Monday, April 13, 2020 9:15 AM
To: Gilchrist, Jim
Cc: Spano,Carmela
Subject: RE: McDonough Park po
Attachments: PO 25358 Recreation Bee and Jay.pdf

Good morning
I have attached the PO for Bee & Jay work at McDonough Park
~ Michelle ~

From: Gilchrist, Jim
Sent: Friday, April 10, 2020 9:25 AM
To: Tenefrancia,Michelle <mt@ci.carmel.ny.us>
Subject: McDonough Park po

Michelle,

I am having difficulty entering a req. for B&J plumbing $1,300 (7112.0040) for repairs at McDonough Park. Can you enter for me?

Thanks,

James R. Gilchrist, CPRP, Director
Sycamore Park
790 Long Pond Road
Mahopac, NY 10541
Office – 845.628.7888
Mobile – 845.519.0770
Email – jrg@ci.carmel.ny.us

6/10/2020 Work Session Agenda Item #9

Richard J.Franzetti, P.E.
Town Engineer

(845) 628-1500
(845) 628-2087
Fax (845) 628-7085

Office of the Town Engineer
60 McAlpin Avenue
Mahopac, New York 10541

MEMORANDUM

To: Carmel Town Board

From: Richard J. Franzetti P.E. Town Engineer RJF

Date: June 3, 2020

Re: C 251- Carmel Sewer District No. 1 Main Extension

Bids were received and opened by the Town Clerk, for the referenced project on April 23, 2020 at 11:00 AM. A copy of the bid opening results is attached, indicating eight (8) bids received.

All bids have been tabulated and one (1) irregularity was identified in the bid received from Joken Development Corp. (see attached bid summary). Specifically, the total amount bid as presented was $345,507.50, however when the bid was tabulated the sum was $342,507.50. In accordance with the bid specifications, “Discrepancies between addition and the sum shall be resolved in favor of the correct sum of the addition operation” (ITB-19.5). Therefore, the correct amount bid is $342.507.50.

Joken Development Corp is the low bidder at $342,507.50. We interviewed references provided, including the Town Engineer of the Town of Mount Pleasant. Based upon our interviews, we are satisfied that Joken is qualified for the project.

Based upon the above, we recommend that the project be awarded to Joken Development Corp. for $342,507.50. This recommendation is subject to the approval of increased bonding which is currently pending before the Board.

I respectfully request that this matter be placed on the next available work session for discussion.

C-251 2020 Carmel Sewer District #1 Sewer Main Extension

Bid Opening: April 23, 2020 @ 11:00 AM

	Bidder #1	Bidder #2	Bidder #3	Bidder #4	Bidder #5
Bid Security Attached Bond/Check	Bond ✓	Bond ✓	Bond ✓	Bond ✓	Bond ✓
Cert Copy of Res of Board of Directors (if corporation)	✓	✓	✓	✓	✓
Bidder's Qualification Statement	✓	✓	✓	✓	✓
Non-Collusion Affidavit	✓	✓	✓	✓	✓
Certification Re: Equal Employment Opportunity	✓	✓	✓	✓	✓
Certification of Non Segregated Facilities	✓	✓	✓	✓	✓
Site Visitation Statement	✓	✓	✓	✓	✓
Receipt of Addendum Acknowledged	✓	✓	✓	✓	✓
Total Bid Price	447,580.	428,500.	516,235.	384,613.50	453,942.15

C-251 2020 Carmel Sewer District #1 Sewer Main Extension
Bid Opening: April 23, 2020 @ 11:00 AM

Bidder Name / Address:

1. Legacy Supply LLC
   14 Railroad Avenue, Valhalla, NY 10595
2. Papitto Construction Co, Inc.
   867 Fair Street, Carmel, NY 10512
3. Gianfia Corp.
   179 Brady Avenue, Hawthorne, NY 10532
4. AMAXX, Inc
   124 Rte 22, Pawling, NY 12564
5. Yonkers Excavating Corp
   553 Croton Falls Road, Carmel, NY 10512

C-251 2020 Carmel Sewer District #1 Sewer Main Extension

Bid Opening: April 23, 2020 @ 11:00 AM

	Bidder #6	Bidder #7	Bidder #8	Bidder #9	Bidder #10
Bid Security Attached Bond/Check	Copy Bond ✓	Bond ✓	Bond ✓		
Cert Copy of Res of Board of Directors (if corporation)	✓	✓	✓		
Bidder's Qualification Statement	✓	✓	✓		
Non-Collusion Affidavit	✓	✓	✓		
Certification Re: Equal Employment Opportunity	✓	✓	✓		
Certification of Non Segregated Facilities	✓	✓	✓		
Site Visitation Statement	✓	✓	✓		
Receipt of Addendum Acknowledged	No	✓	✓		
Total Bid Price	436,728.01	498,000.	345,509.50		

C-251 2020 Carmel Sewer District #1 Sewer Main Extension
Bid Opening: April 23, 2020 @ 11:00 AM

Bidder Name / Address:

6. Scavo Contracting Corp
P.O Box 520, Patterson, NY 12563

7. TAM Enterprises Inc
114 Hartley Road Goshen, NY 10924

8. Joken Development Corp
9 Belway Place, White Plains, NY 10601

9.

10.

C-251 Carmel Sewer District 1 Sewer Main Extension Bid Results

***Please note:

Bid submission total ***incorrect*** at $345,507.50

Summary

Joken	342,507.50
Amaxx	384,613.50
Papitto	428,500.00
Scavo	436,731.31
Legacy	447,580.00
Yonkers	453,942.15
TAM	498,000.00
Gianfina	516,235.00

			Legacy		Papitto Construction		Gianfina		Amaxx		Yonkers Excavating		Scavo Contracting		TAM		Joken	
Item	Payment Item	Est Qty	Unit Price	Total	Unit Price	Total	Unit Price	Total	Unit Price	Total	Unit Price	Total	Unit Price	Total	Unit Price	Total	Unit Price	Total
1	Buried Piping																	
1A	8" DIA. SDR 35 PVC	420 L.F.	550	231,000.00	200	84,000.00	251	105,420.00	77.77	32,663.40	277.42	116,516.40	237.52	99,758.40	270.00	113,400.00	400.00	168,000.00
1B	4" DIA. SDR 35 PVC	40 L.F.	250	10,000.00	550	22,000.00	190	7,600.00	68.56	2,742.40	426.00	17,040.00	137.76	5,510.40	921.00	36,840.00	220.00	8,800.00
2	Rock Excavation			-		-		-		-		-		-		-		-
2A	Rock Excavation	300 C.Y.	25	7,500.00	200	60,000.00	325	97,500.00	225.00	67,500.00	191.76	57,528.00	138.34	41,502.00	232.00	69,600.00	75.00	22,500.00
3	Timber Or Steel Sheeting			-		-		-		-		-		-		-		-
3A	Timber Or Steel Sheeting	3050 S.F.	3	9,150.00	3	9,150.00	20	61,000.00	15.00	45,750.00	4.73	14,426.50	19.69	60,054.50	5.00	15,250.00	1.00	3,050.00
4	Precast Concrete Manholes			-		-		-		-		-		-		-		-
4A	Precast Concrete Manholes 60 in		12,000	48,000.00	12,400	49,600.00	7,000	28,000.00	4,377.00	17,508.00	9,036.00	36,144.00	13,255.24	53,020.96	17,261.00	69,044.00	8,100.00	32,400.00
5	Asphalt Concrete Pavement Restoration			-		-		-		-		-		-		-		-
5A	2½" Asphalt Concrete Binder Course	10 S.Y.	150	1,500.00	195	1,950.00	125	1,250.00	510.37	5,103.70	521.45	5,214.50	338.42	3,384.20	764.00	7,640.00	21.00	210.00
5B	4" Asphalt Concrete Binder Course	200 S.Y.	110	22,000.00	75	15,000.00	125	25,000.00	104.60	20,920.00	54.03	10,806.00	59.23	11,846.00	98.00	19,600.00	34.00	6,800.00
5C	1" Asphalt Cincrete Type 7 Top Course	200 S.Y.	20	4,000.00	30	6,000.00	125	25,000.00	36.72	7,344.00	59.94	11,988.00	49.69	9,938.00	82.00	16,400.00	8.30	1,660.00
5D	1 ½" Asphalt Cconcrete Tyoe 7 Top Course	10 S.Y.	100	1,000.00	200	2,000.00	125	1,250.00	631.70	6,317.00	600.42	6,004.20	348.95	3,489.50	764.00	7,640.00	15.00	150.00
6	Concrete			-		-		-		-		-		-		-		-
6A	8" Reinforced Concrete Pavement, CLASS A	200 S.Y.	150	30,000.00	115	23,000.00	230	46,000.00	218.85	43,770.00	198.20	39,640.00	392.03	78,406.00	106.00	21,200.00	143.00	28,600.00
6B	4" Reinforced Concrete Sidewalks	25 S.Y.	105	2,625.00	360	9,000.00	225	5,625.00	405.00	10,125.00	228.41	5,710.25	543.85	13,596.25	420.00	10,500.00	219.50	5,487.50
6C	Concrete Curb	160 L.F.	55	8,800.00	140	22,400.00	100	16,000.00	47.00	7,520.00	39.58	6,332.80	80.05	12,808.00	67.00	10,720.00	47.50	7,600.00
6D	K-CRETE Backfill	50 C.Y.	140	7,000.00	160	8,000.00	250	12,500.00	425.00	21,250.00	205.25	10,262.50	135.13	6,756.50	452.00	22,600.00	230.00	11,500.00
7	Subbase Material NYSDOT Type			-		-		-		-		-		-		-		-
7A	Subbase Material NYSDOT Type	100 C.Y.	70	7,000.00	115	11,500.00	100	10,000.00	315.00	31,500.00	96.14	9,614.00	81.25	8,125.00	169.00	16,900.00	89.00	8,900.00
8	Vegetated Surface Restoration			-		-		-		-		-		-		-		-
8A	Vegetated Surface Restoration		1	105.00	60	6,300.00	10	1,050.00	80.95	8,499.75	54.92	5,766.60	72.10	7,570.50	122.00	12,810.00	14.00	1,470.00
9	Maintenance and Proection of Traffic			-		-		-		-		-		-		-		-
9A	Maintenance and Proection of Traffic	L.S.	30,000	30,000.00	62,000	62,000.00	50,000	50,000.00	28,500.00	28,500.00	61,500.00	61,500.00	1,762.50	1,762.50	13,686.00	13,686.00	13,000.00	13,000.00
10	Extra Select Backfill			-		-		-		-		-		-		-		-
10A	Extra Select Backfill	20 C.Y.	40	800.00	95	1,900.00	52	1,040.00	65.00	1,300.00	163.57	3,271.40	75.00	1,500.00	58.00	1,160.00	94.00	1,880.00
11	Extra K-CRETE			-		-		-		-		-		-		-		-
11A	Extra K-CRETE	20 C.Y.	105	2,100.00	175	3,500.00	250	5,000.00	465.00	9,300.00	248.85	4,977.00	135.13	2,702.60	174.00	3,480.00	230.00	4,600.00
12	Utility Poles			-		-		-		-		-		-		-		-
12A	Utility Pole Removal/Restoration	2 Poles	10,000	20,000.00	8,800	17,600.00	4,500	9,000.00	6,500.00	13,000.00	10,000.00	20,000.00	6,000.00	12,000.00	11,116.00	22,232.00	4,950.00	9,900.00
12B	Utility Pole Support	2 Poles	2,500	5,000.00	6,800	13,600.00	4,000	8,000.00	2,000.00	4,000.00	5,600.00	11,200.00	1,500.00	3,000.00	3,649.00	7,298.00	3,000.00	6,000.00
	GRAND TOTAL			447,580.00		428,500.00		516,235.00		384,613.25		453,942.15		436,731.31		498,000.00		342,507.50

INTERVIEW INTAKE FORM- CSD# 1 ex. South

C 251

TOWN OF CARMEL

SUBJECT:	Sewer line extension- Joken Construction
NAME OF PERSON INTERVIEWED:	David Smyth, P.E., Town Engineer
NAME OF MUNICIPALITY/BUSINESS	Town of Mount Pleasant
DATE INTERVIEW CONDUCTED:	June 2, 2020
PERSON CONDUCTING INVTERVIEW:	RV

Performance:

1. What work did they perform for you? 8 Million dollar water main project. 400 foot emergency water main installation.

2. How long have you used them? Since he has been with Mount Pleasant which is about 5 years.

3. Were you satisfied with work performed? Yes

4. Do you currently use them or use them again in the future? He is not involved anymore with these matters.

Pretty good contractor. Happy with the work. He would use them again in the future. No problems with performance or paperwork.

INTERVIEW INTAKE FORM- CSD# 1 ex. South

C 251

TOWN OF CARMEL

SUBJECT:	Sewer line extension- Joken Construction
NAME OF PERSON INTERVIEWED:	Steve Trindad. Charles A. Manganaro Consulting Eng. Working for Town of Mount Pleasant.
NAME OF MUNICIPALITY/BUSINESS	Representing Town of Mount Pleasant.
DATE INTERVIEW CONDUCTED:	May 21, 2020
PERSON CONDUCTING INVTERVIEW:	RV

Performance:

1. What work did they perform for you? 6.7 Million Dollar Water main project in two phases
2. How long have you used them? Twenty plus years
3. Were you satisfied with work performed? Yes
4. Do you currently use them or use them again in the future? He is not involved anymore with these matters.

Yes he would use them in the future. Good contractor, no complaints. Good with paperwork and submittals. Finished ahead of schedule. So satisfied with performance that Town of Mount Pleasant issued a 1.5 million dollar change order for extra work.

6/10/2020 Work Session Agenda Item #10

TOWN OF CARMEL
PLANNING BOARD

60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 – Ext.190
www.ci.carmel.ny.us

MEMORANDUM

To: Supervisor, Kenneth Schmitt
Town Board

From: Rose Trombetta, Planning Department

Date: May 27, 2020

Re: Refund – Carmel Fire Department - 95 Gleneida Ave – TM - 44.14-1-24

Please be advised a lot line adjustment application fee of $3,500.00 was collected from the above-mentioned applicant and was received by the Receiver of Taxes on March 2, 2020. Subsequently, a resolution was passed on March 18, 2020 from the Town Board waiving all site plan related fees.

I, respectfully, request that the Town Board return the fee of $3,500.00 to:

Carmel Fire Department
c/o Michael Hengel
94 Gleneida Ave
Carmel, NY 10512

RESOLUTION WAIVING PLANNING AND ZONING REVIEW FEES
CARMEL VOLUNTEER FIRE DEPARTMENT

RESOLVED that the Town Board of the Town of Carmel hereby authorizes the waiver of all Planning Board, Zoning Board and related other site plan-related review fees otherwise required under the Town Code of the Town of Carmel, including but not limited to Chapter 131 and Chapter 156 in connection with the site plan application for the Carmel Volunteer Fire Department at 94 Gleneida Avenue, Town of Carmel.

Resolution
Offered by: Councilman Lombardi
Seconded by: Councilman Barile

Roll Call Vote	YES	NO	
Robert Schanil	X		
Michael Barile	X		
Frank Lombardi	X		
Suzanne McDonough			Absent
Kenneth Schmitt	X		

S E A L

I, Alice Daly, Deputy Town Clerk of the Town of Carmel, Putnam County, New York, do hereby certify that the foregoing resolution is a true and exact copy of the original on file in my office which was adopted by the Town Board of said Town at a duly called and held meeting on the **18th** day of **March, 2020;** and of the whole thereof.

May 19, 2020
Dated

Alice Daly
Alice Daly, Deputy Town Clerk

TOWN OF Carmel NEW YORK

Water District No. 2
Water Treatment Plant Upgrade

June 10, 2020

Agenda

Current Treatment System

Projected Future Demand

Safe Yield

Treatment Evaluation

Conceptual Facility Cost

Next Steps

Current Treatment System

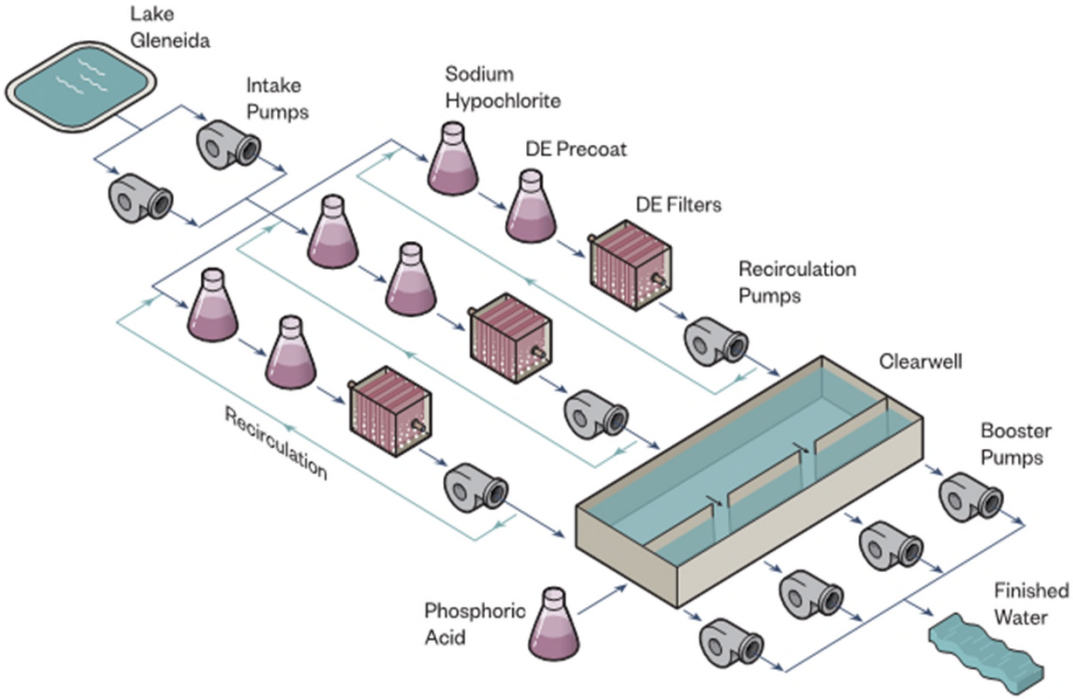

Existing Aerial View
INTAKE PUMP STATION AND METER PIT
LAKE GLENEIDA
44.18-1-38
44.18-1-39
44.18-1-40
44.18-1-29
55.6-1-17
55.6-1-18
55.6-1-27
55.6-1-29
55.6-1-26
55.6-1-19
PARENT PARCEL (55.6-1-28)
EXISTING WATER TREATMENT PLANT SITE (1744 US ROUTE 6)
55.6-1-10
55.6-1-24
55.6-1-31
55.6-1-20
55.6-1-11
55.6-1-21
55.6-1-22
55.6-1-23
55.6-1-12
1732
1736
1740
1741
1747
1717
1707

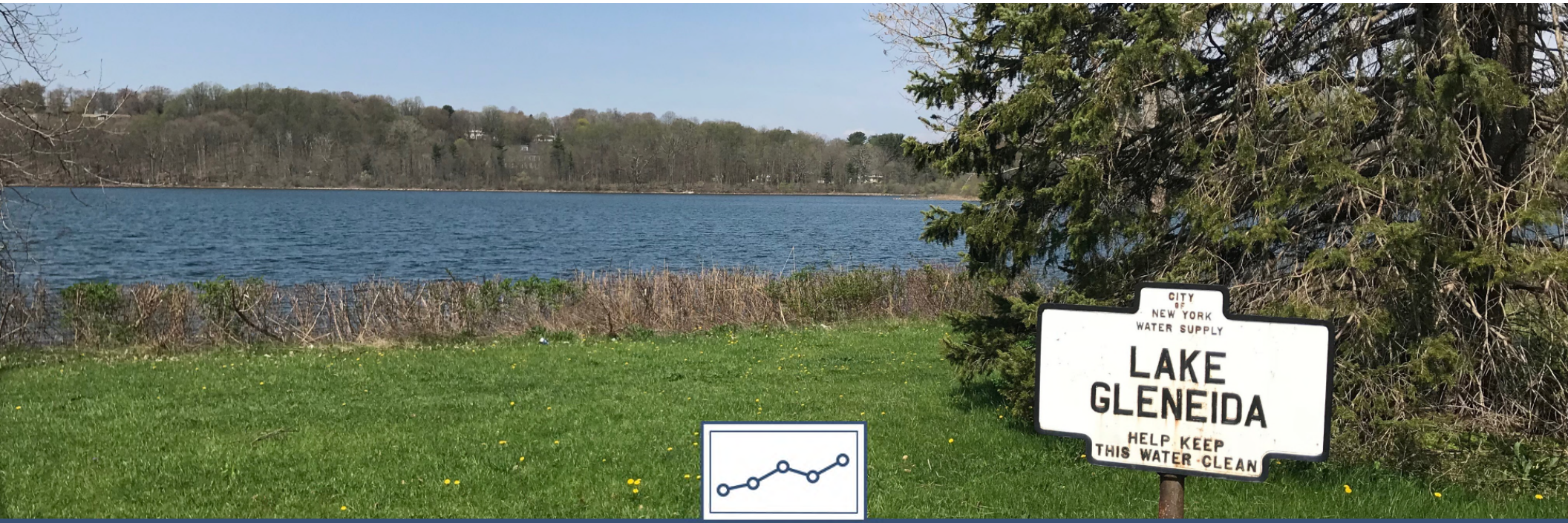
Existing Plant

- Built Circa 1976
- Constrained Site
- Permitted Daily Capacity 1.0 MGD
- Treatment Process 3 Diatomaceous Earth (DE) Filters
- Reported Issues
  - **Aging Equipment**
  - **Carry over of DE to Distribution System**
  - **High Amount of Wasted Backwash Water (up to 12%)**
  - **Impact on CSD2 Plant**
  - **High Operations Cost**

Existing Plant

Existing Process Schematics

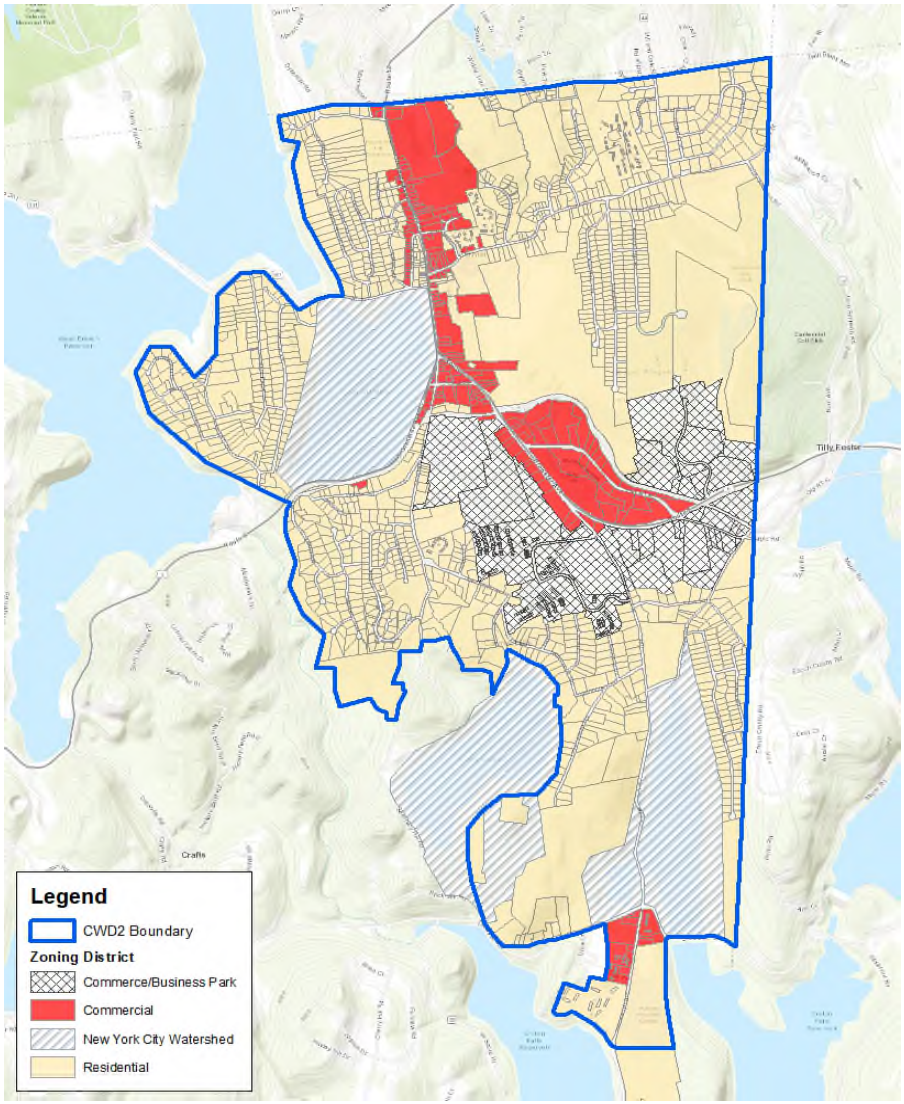




Future Demand

Current Zoning

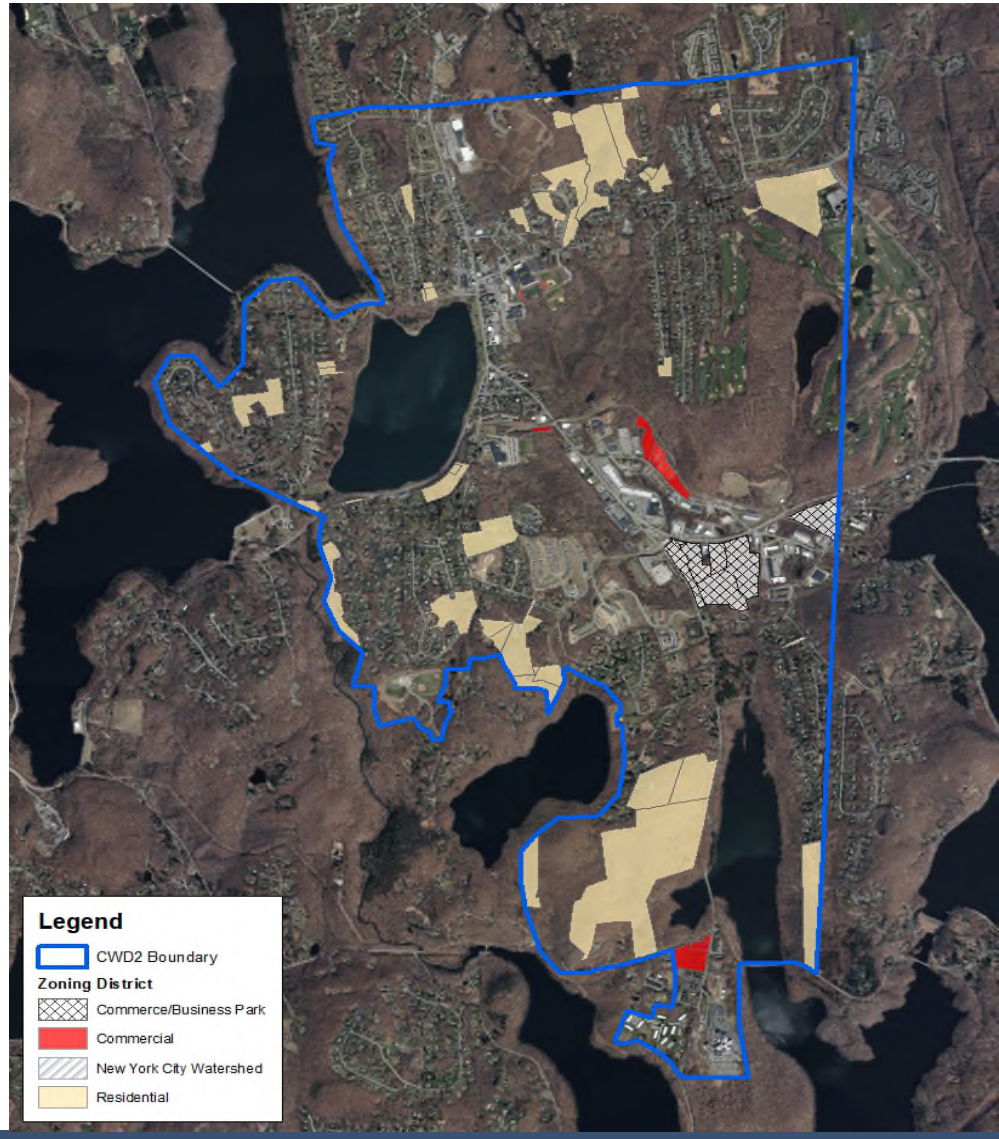
	Acreage	Percent of Total Acreage
Residential	1,765	40.9%
Commercial	521	12.1%
Commerce/Business Park	762	17.6%
New York City Watershed	1,268	29.3%
Recreation/Trailways	6	0.1%



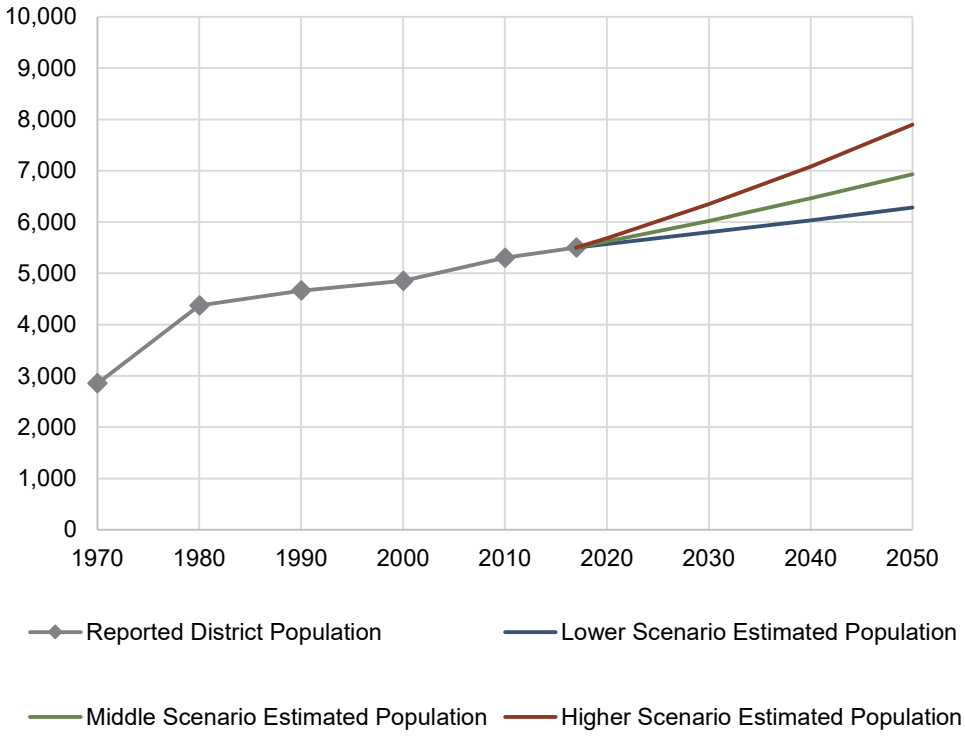
Planned Developments and Vacant Parcels over 1 Acre

	Development Name	Zoning Type	Estimated Indoor Water Demand (gpd)
1	Hillcrest Commons	Residential	33,400
2	Fairway Townhouses	Residential	33,400
3	Gateway Summit	Commerce/Business Park	80,230
4	Alexandrion Group Distillery	Commercial	161,055
5	The Hamlet at Carmel	Residential	13,200
6	RPK Precision Homes	Residential	5,675
7	The Retreat at Carmel	Residential	3,850
8	Hillside Court	Residential	510
9	Tompkins Recycling	Commercial	375
		Total:	**331,695**

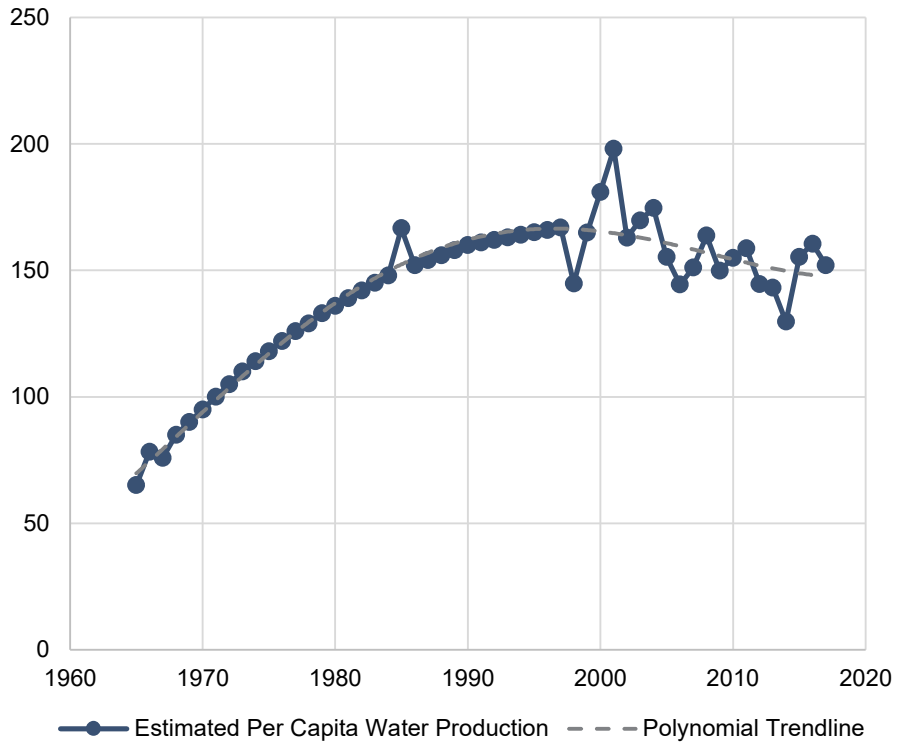
Vacant	Estimated Total Acreage of Vacant Land	Estimated Useable Acreage of Vacant Land
Residential	335	208
Commercial	20	16
Commerce/Business Park	52	47



District Population
(Total Population)



Demand per Capita
(Gallons per Day per Person)



Average Daily Demand (MGD)

Year	Lower Scenario Estimated Water Demand	Middle Scenario Estimated Water Demand	Higher Scenario Estimated Water Demand
2030	0.75	0.90	1.08
2040	0.78	0.97	1.20
2050	0.82	1.04	1.34

Raw Water Supply

Maximum Daily Demand (MGD)

Year	Lower Scenario Estimated Water Demand	Middle Scenario Estimated Water Demand	Higher Scenario Estimated Water Demand
2030	1.21	1.44	1.73
2040	1.25	1.55	1.93
2050	1.31	1.66	2.15

Treatment Plant Capacity

- Recommended Planning for Year 2050 and High End Scenario.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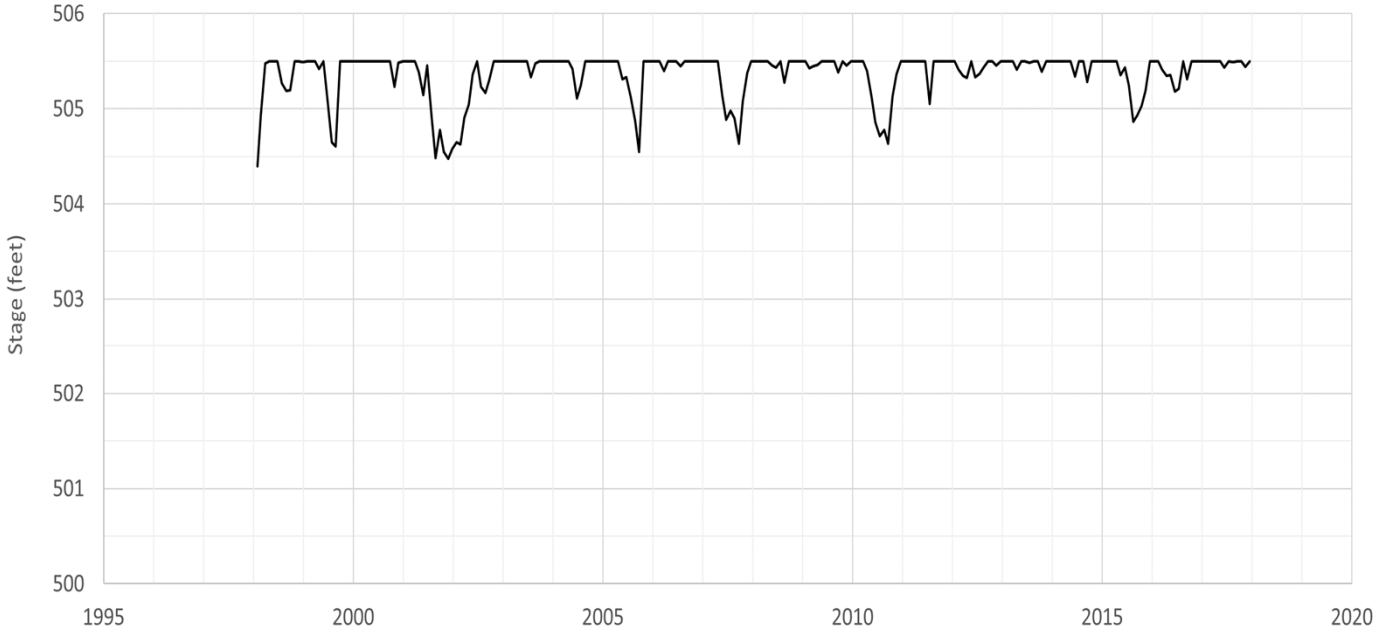
Safe Yield

Lake Gleneida

- Relatively Small Tributary Area
- Groundwater Recharge
- Simulation ran 1957 to 2017



Simulated WSEL 0.54 MGD GW and 0.4 MGD Surface Runoff

Safe Yield Analyzed Options (MGD)

Water Sources	**Option 1** Lake Gleneida Supply Only	**Option 2** Combined Lake Gleneida and West Branch Reservoir Supplies
Lake Gleneida	0.6 – 1.0	0.6 – 1.0
West Branch Reservoir	0.0	2.0
Lake Mahopac	0.0	0.0
Total Safe Yield	**0.6 – 1.0**	**2.6 – 3.0**
2050 ADD	1.34	

Treatment Evaluation

Current Finished Water Quality Rules

- Surface Water Treatment
- Lead and Copper
- Radionuclide
- Disinfectant and Byproducts
- NYS Sanitary Code Part 5

Potential Future Regulations/Concerns

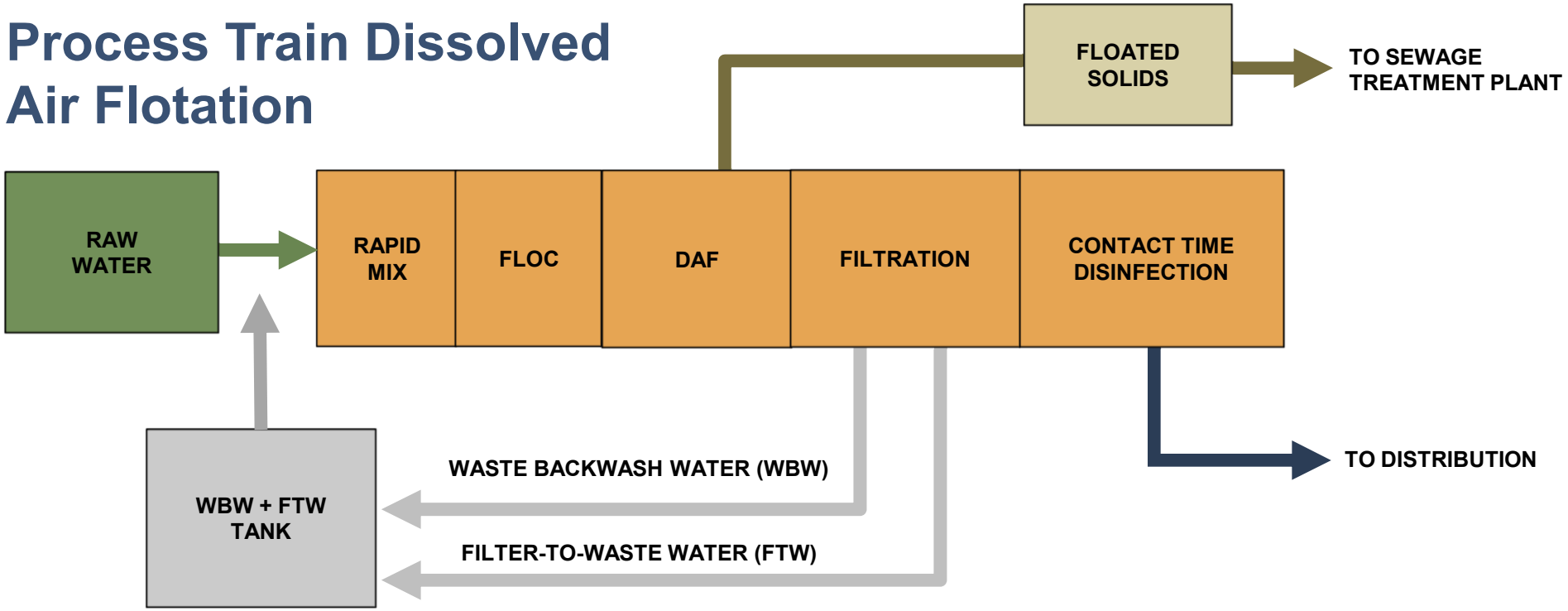
- Revised Lead and Copper
- Perchlorate
- Harmful Algal Blooms
- Disinfection Byproducts
- Per-and Poly-Fluoroalkyl Substances (PFAS)

Alternative Process Schemes

Qualitative Comparison Categories	Diatomaceous Earth Filtration	Direct Rapid Rate Gravity Filtration	Conventional Sedimentation with Rapid Rate Gravity Filtration	Inclined Plate Settling with Rapid Rate Gravity Filtration	Dissolved Air Flotation with Rapid Rate Gravity Filtration	Direct Membrane Filtration	Membrane Filtration with Pre-Treatment
Facility Size and Capital Cost	+	+	-	-	o	o	o
Operations and Maintenance	-	+	o	o	+	o	o
Treatment Flexibility	-	-	o	o	+	o	+
Energy and Chemical Usage	-	o	o	o	o	-	-
Residuals Handling	-	+	o	o	+	o	o
Overall	**- - -**	**+ +**	**-**	**-**	**+ + +**	**-**	**o**

- Negative | o Neutral | + Positive

Selected Treatment Process Train Dissolved Air Flotation



- Reduces Discharge to Sewer
- Flexible for Change in Raw Water

Conceptual Facility Cost

Conceptual Cost Opinion

Item No.	Description	Total Cost Range Low	High
1	General Conditions, Bonds and Insurances	$1,726,000	$2,101,000
2	Site Work	$1,481,000	$1,802,000
3	Substructure	$1,696,000	$2,064,000
4	Superstructure	$2,095,000	$2,551,000
5	Treatment Equipment	$2,377,000	$2,893,000
6	MEP Fitout	$2,598,000	$3,162,000
7	Intake Pump Modifications	$1,257,000	$1,530,000
ESTIMATED CONSTRUCTION BASE COST		**$13,230,000**	**$16,103,000**
8	Land Acquisition and Easements	$600,000	$1,000,000
9	Engineering Design and Construction Oversight	$2,400,000	
10	Legal	$250,000	
ESTIMATED NON-CONSTRUCTION COST		**$3,250,000**	**$3,650,000**
ESTIMATED PROJECT TOTAL COST		**$16,480,000**	**$19,753,000**

Debt Analysis Table ($)

	15 Years		20 Years		30 Years	
Fund	**Low**	**High**	**Low**	**High**	**Low**	**High**
Cost of Capital Project	16,480,000	19,753,000	16,480,000	19,753,000	16,480,000	19,753,000
Interest	1,742,070	2,088,510	2,758,605	3,304,847	5,075,013	6,085,024
Total Debt Service Cost	18,222,070	21,841,510	19,238,605	23,057,847	21,555,013	25,838,024
Estimated Annual Debt Service Cost (15, 20, 30 year Bond)	**1,214,805**	**1,456,101**	**961,930**	**1,152,892**	**718,500**	**861,267**
Total District Assessed Value	973,481,823	973,481,823	973,481,823	973,481,823	973,481,823	973,481,823
# of parcels	2,346	2,346	2,346	2,346	2,346	2,346
Average Assessed Value	414,954	414,954	414,954	414,954	414,954	414,954
Rate per thousand	0.00125	0.00150	0.00099	0.00118	0.00074	0.00088
Estimated Annual Debt Service Per Taxpayer	**517.82**	**620.67**	**410.03**	**491.43**	**306.27**	**367.12**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Next Steps

Next Steps

- Initiate Land Acquisition Process
- Execute Engineering Contract for Design of DAF Plant
  - **Submit Report to Putnam County DOH**
  - **Geotechnical Evaluation**
  - **Evaluate Reduced Residual Flow on CSD 2 Treatment Plant**
- Engage NYCDEP in Discussions

Hazen and Sawyer
1 North Lexington Ave, Suite 01525
White Plains, NY 10601 • 914.269.0255

Town of Carmel Water District No. 2 Water Treatment Plant Upgrade

DRAFT Preliminary Engineering Report

Town of Carmel Contract No. R2018-001
Hazen Project No. 90342-000
March 2020

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List of Acronyms

Abbreviation	Definition
AC	Asbestos cement OR alternating current
ACH	Air changes per hour
ADD	Average daily demand
AFF	Above finished floor
Alum	Aluminum sulfate
AST	Above ground storage tank
BFE	Base flood elevation
BMP	Best management practice
CASBW	Combined air scour backwash
CEC	Contaminant of emerging concern
cfm	Cubic feet per minute

Abbreviation	Definition
CI	Cast iron
CIP	Clean-in-place
CSD2	Carmel Sewer District No. 2
CSMR	Chloride to sulfate mass ratio
CT	Contact time
CWD2	Carmel Water District No. 2
DAF	Dissolved air flotation
DB	Dry bulb
DBP	Disinfection byproduct
DE	Diatomaceous earth
DI	Ductile iron
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DT	Detention time
EPA, USEPA	United States Environmental Protection Agency
FBRR	Filter Backwash Recycling Rule
FTW	Filter to waste
gpd	Gallons per day
gph	Gallons per hour
gpm	Gallons per minute
GWUDISW	Groundwater under the direct influence of surface water
HAA	Haloacetic acid
HAB	Harmful algal bloom
HMI	Human machine interface
Hz	Hertz
IESWTR	Interim Enhanced Surface Water Treatment Rule
IPS	Inclined plate settling

Abbreviation	Definition
IPST	Inclined plate settling thickeners
ISO	Insurance Services Office
LCR	Lead and Copper Rule
LRAA	Locational running annual average
LT1ESWTR	Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
MDD	Maximum day demand
MF	Microfiltration
mgd	Million gallons per day
MS4	Municipal separate storm sewer system
MSL	Mean sea level
N/A	Not applicable
NAVD 88	North American Vertical Datum of 1988
NF	Nanofiltration
NGVD29	National Geodetic Vertical Datum of 1929
NOM	Natural organic matter
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSEG	New York State Electric and Gas Corporation
OIT	Operator interface terminal
O&M	Operations and maintenance
PAC	Powder activated Carbon
PACl	Polyaluminum chloride
PCDOH	Putnam County Department of Health
PFAS	Per- and poly-fluoroalkyl substances

Abbreviation	Definition
PFHxA	Perfluorohexanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PLC	Programmable logic controller
ppb, µg/L	Parts per billion, micrograms per liter
ppm, mg/L	Parts per million, milligrams per liter
ppq	Parts per quadrillion
ppt, ng/L	Parts per trillion, nanograms per liter
psi	Pounds per square inch
PVC	Polyvinyl chloride
PWS	Public water system
RO	Reverse osmosis
SSM	Single sample maximum
SWPPP	Stormwater pollution prevention plan
SWTR	Surface Water Treatment Rule
THM	Trihalomethanes
TOC	Total organic carbon
TTHMs	Total trihalomethanes
UCMR	Unregulated Contaminant Monitoring Rule
UF	Ultrafiltration
UPS	Universal power supply
UST	Underground storage tank
UV	Ultraviolet
VOC	Volatile organic compounds
WB	Wet bulb
WBW	Waste backwash water
WTP	Water treatment plant

Executive Summary

The existing Town of Carmel Water District No. 2 water treatment plant was originally constructed circa 1976 with a capacity of 1.0 million gallons per day (mgd). The facility is reaching the end of its useful life and is in need of replacement. The existing treatment process may not be able to meet future water quality regulations, particularly as it relates to organics removal for reduction of disinfection byproducts. Due to the constrained existing plant site, a new property must be obtained to accommodate new treatment facilities.

The current water source, Lake Gleneida, has an estimated safe yield of approximately 0.6 to 1.0 mgd, based upon the drought of record. The average daily demand projected in 2050 is 1.34 mgd according to a future water demand assessment. The Town should initiate planning for a new raw water pump station to withdraw additional water from West Branch Reservoir and provide supplemental water supply to the proposed treatment plant to meet future demands. The existing intake pump station also must be upgraded to increase flow capacity to meet future demands.

A comprehensive review of raw water quality conditions as well as current and potential future drinking water regulations are presented in this report. This information is then used to set finished water quality goals for the proposed water treatment plant. Various water treatment processes are evaluated in this report to determine the recommended treatment train to meet the finished water quality goals and other criteria. The selected treatment train is coagulation, flocculation, dissolved air flotation (DAF), rapid rate gravity filtration, and disinfection by chlorination, referred to as conventional treatment with DAF.

In accordance with the 2018 *Recommended Standards for Water Works*, this report presents a conceptual design for the proposed treatment plant, including a wide-ranging assessment from engineering disciplines. The conceptual design can be refined during the detailed design phase of this project. Based on the conceptual design, the total project cost is estimated to range between approximately $16,480,000 and $19,753,000, which includes construction as well as non-construction costs such as estimated engineering and construction oversight, legal fees, and land acquisition and easement costs. A preliminary schedule is provided which indicates the proposed plant can be in service in approximately 4 years. Recommendations for next steps to proceed with the project after acceptance of this report are also provided.

1. Introduction

The Town of Carmel Water District No. 2 (referred to as CWD2 or the District herein) water treatment plant (WTP) is reaching the end of its useful life and requires capital investment. Furthermore, the current treatment process is not likely to be able to meet future drinking water regulations without significant upgrades. This project consists of the replacement of the WTP to meet the current and future needs.

1.1 Background

The District was formed by resolution of the Town Board on December 31, 1935. It was later extended by resolution of the Town Board on December 29, 1998. The Town is located on the southern edge of Putnam County, abutting Westchester County. The District, depicted in **Figure 1-1**, is located in the northeast corner of the Town, bordered by the Town of Kent to the north, the Town of Southeast to the east, and West Branch Reservoir to the west. The southern border extends to the Putnam County Hospital Center. The District covers an area of approximately 6 square miles and supplies water to a portion of the Town of Carmel with approximately 5,500 residents and 1,762 service connections.

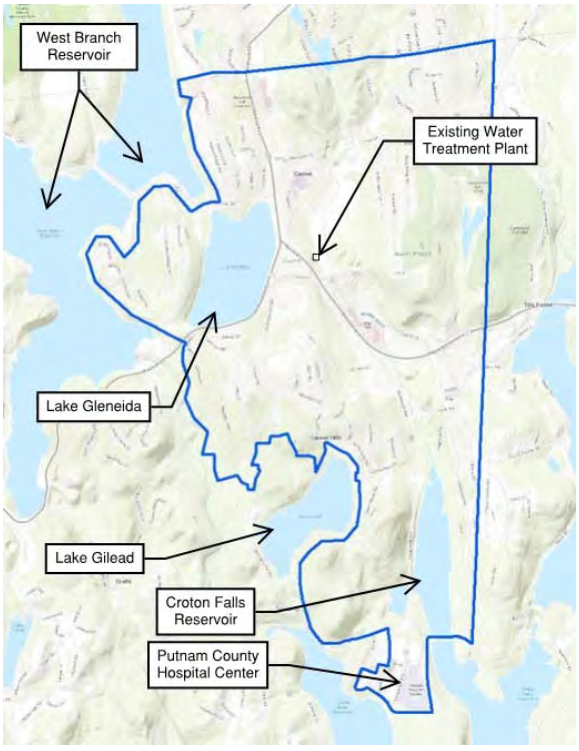

Figure 1-1: Carmel Water District No. 2 Service Area[1]

Lake Gleneida, which is owned by the City of New York (NYC), is the sole source of supply for CWD2. Water is purchased by the Town of Carmel on a per capita rate consumption basis. The water rate is set

[1] Folchetti and Associates, "Carmel Water District No. 2 Water Mains Engineering Report", December 2017.

each year by the City and includes an excess charge when the District's per capita consumption is higher than that of the City. A water meter installed and maintained by New York City Department of Environmental Protection (NYCDEP) is used to measure the water withdrawn from Lake Gleneida. The meter is calibrated on a yearly basis and is redundant to the District's production meter.

The water from Lake Gleneida is pumped from the lake and treated at a WTP with a capacity of 1.0 mgd. The plant was constructed circa 1976 and is located at 1744 Route 6, approximately 850 feet east of the intake pump station. The treatment process uses three diatomaceous earth (DE) filters, each with a capacity of 350-400 gallons per minute (gpm). The rated firm capacity of the plant is 1.0 mgd. However, if all three filters are operating simultaneously, the plant can produce up to 1.5 mgd. It has been estimated that the plant currently uses approximately 6 to 12% of the water it produces to wash the DE filters. This waste washwater is discharged directly to the Town's local sewer system.

After filtration and chemical treatment, the water is then pumped out of a below grade clearwell to the District's 52-mile distribution system. The most extreme high and low elevations in the District differ by approximately 400 feet. However, almost the entire customer service area is within an elevation difference of approximately 200 feet. The District maintains three water storage tanks with a total capacity of approximately 1,100,000 gallons, which provide pressure equalization and additional capacity for fire protection and other emergencies.

Average production in 2018 was approximately 734,000 gallons per day (gpd) and total water produced was 267,875,200 gallons for the year. Over the past decade, production has averaged approximately 800,000 gpd (0.8 mgd). These water production numbers include water used for flushing mains, fighting fires as well as washing of the treatment plant filters (non-revenue water) and other unaccounted for water such as leaks.

A safe yield analysis of Lake Gleneida[2] and a future water demand assessment[3] were recently completed. Based upon the projected 2050 average daily demand being approximately 0.3 mgd more than the safe yield, a supplemental water source will need to be incorporated into the system in the future. In parallel, an evaluation of various water supply options[4] was conducted. It is recommended that the Town pursue a new pump station to withdraw water from West Branch Reservoir, also owned by NYC, to supplement the Lake Gleneida water supply.

1.2 Purpose

The purpose of this report is to establish treatment goals and evaluate various treatment process options available to the Town for upgrading the existing WTP and present a recommendation and conceptual design to move forward with into detailed design and construction. This requires review of water quality information, regulations, and available treatment processes. Upon selection of the optimal treatment process, this report addresses all conceptual-level engineering assessment requirements of the 2018 "*Recommended Standards for Water Works*", also known as the "*Ten States Standards*".

[2] Hazen and Sawyer, "Safe Yield Analysis for Lake Gleneida", April 19, 2019.
[3] Hazen and Sawyer, "Future Water Demand Assessment", April 3, 2019.
[4] Hazen and Sawyer, "Summary of Water Supply Options", October 23, 2019.

2. Existing Conditions

This section of the report provides the existing conditions of all water system components which have a role in this project, from source to tap, current and future.

2.1 Source Water

Lake Gleneida is the current source water for CWD2. However, in the future, the West Branch Reservoir may provide supplemental water supply to meet future demands. The focus of this report is primarily on Lake Gleneida, as it will, in the near term, be the sole water source for CWD2, as well as remain the primary source once West Branch water is available. A more detailed analysis of the West Branch supply is recommended to be performed during the evaluation process for the proposed supplemental water supply pump station in the future.

2.1.1 Lake Gleneida Watershed

Lake Gleneida is classified as a "controlled lake" as part of NYC's protected watershed area. As such, NYC assists with watershed security and water quality monitoring for the lake. Watershed management practices include control of land use, stormwater runoff, industrial discharges, fertilization, soil grading, farming practices, pesticide/herbicide use, etc. These measures assist with protecting public health and maintaining low overall water treatment costs.

The normal water pool elevation of Lake Gleneida is 505.5 feet above mean sea level (MSL). According to record documents, the high-water mark is 506.4 feet MSL and the low water level or the maximum drawdown level is 500.5 feet MSL. Note that elevations referenced as MSL in this report are assumed to be based on the National Geodetic Vertical Datum of 1929 (NGVD29), unless otherwise noted. All elevations must be verified with an updated survey prior to design and construction of new facilities.

2.1.2 Lake Gleneida Safe Yield Analysis

A safe yield analysis[5] was performed on Lake Gleneida to understand the maximum water withdrawal rate feasible. It should be noted that the safe yield, according to the *Recommended Standards for Water Works*, is based on the drought of record and considered multiple-year droughts. For this system, the drought of record occurred during the 1960s although CWD2 water demand was significantly lower at the time. Based on available information, the safe yield analysis of Lake Gleneida under drought conditions is approximately 0.46 mgd in the absence of any groundwater inflow. This analysis did not quantify groundwater flux, which is likely a significant component of the lake's hydrologic budget. Understanding that Lake Gleneida's water level has not historically fluctuated noticeably, a long-term analysis was performed. This analysis determined that the actual safe yield may be between 0.6 and 1.0 mgd, which incorporates likely groundwater flux to the extent possible, without undertaking a detailed groundwater flow monitoring program.

[5] Hazen and Sawyer, "Safe Yield Analysis for Lake Gleneida", April 19, 2019.

It is entirely possible for greater volumes of water to be withdrawn in other years when a drought it not occurring. Note that a lower safe yield does not conflict with CWD2's average withdrawal rate of approximately 0.8 mgd over the past several years, because conditions over the past several years have not been as dry as during the 1960s drought. Therefore, Lake Gleneida can continue to be used as the sole water supply for CWD2 while pursuing with NYCDEP having West Branch be a supplemental source.

An analysis was conducted to determine the theoretical cut-off point at which a supplemental supply would be necessary. The main factors for this analysis are production, inflow, and water level. However, water levels have not been consistently monitored in the past (though it has remained relatively constant over time) and groundwater flux is difficult to quantify. Inflow was calculated on an annual and biennial basis based solely on precipitation, then linear trendlines were generated assuming either 0.14 mgd or 0.54 mgd groundwater inflow. This groundwater inflow corresponds to the safe yield analysis range of 0.6 to 1.0 mgd. This was then graphed in **Figure 2-1** and **Figure 2-2** along with historical annual or biennial production and precipitation for the past two decades for comparison. These graphs can be used as a tool to indicate if the safe yield is being exceeded by pumpage and/or a drought condition is occurring by plotting annual or biennial production and precipitation on these graphs to see if it is above the red line. It can be interpreted that in an average precipitation year of approximately 50-55 inches, an average demand exceeding approximately 1.2 mgd for 2 or more consecutive years with evidence of lowering water levels in the lake is the critical condition requiring implementation of a supplemental water supply.

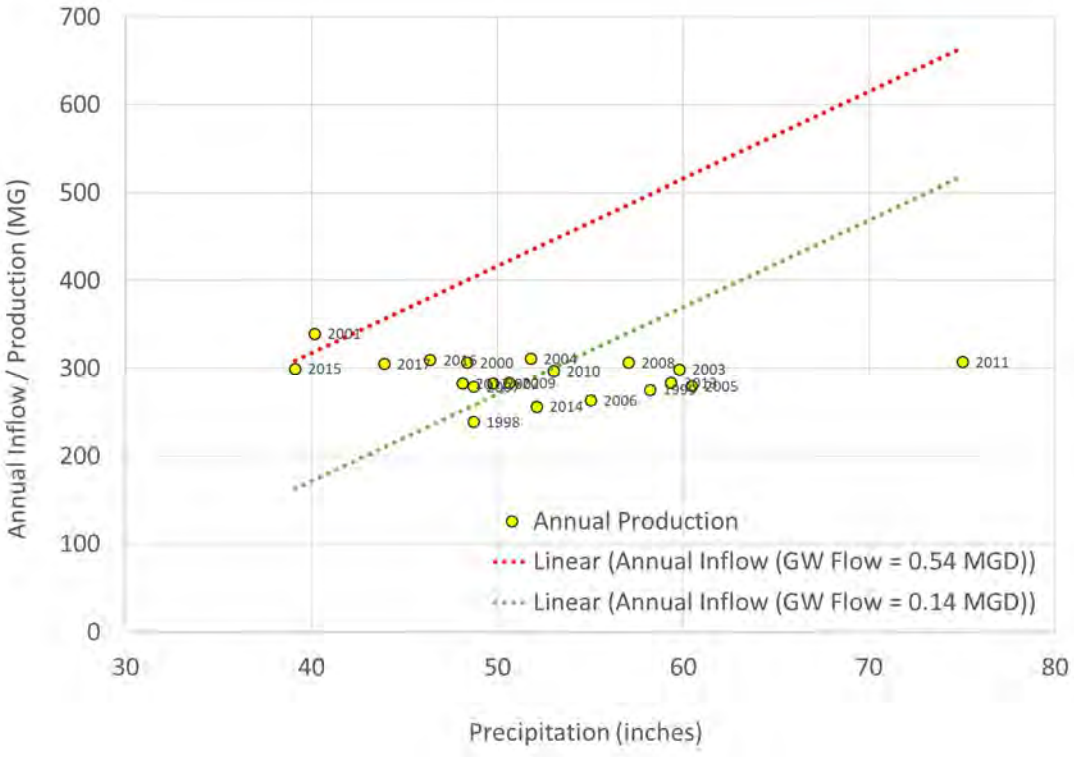

Figure 2-1: Annual Production versus Precipitation

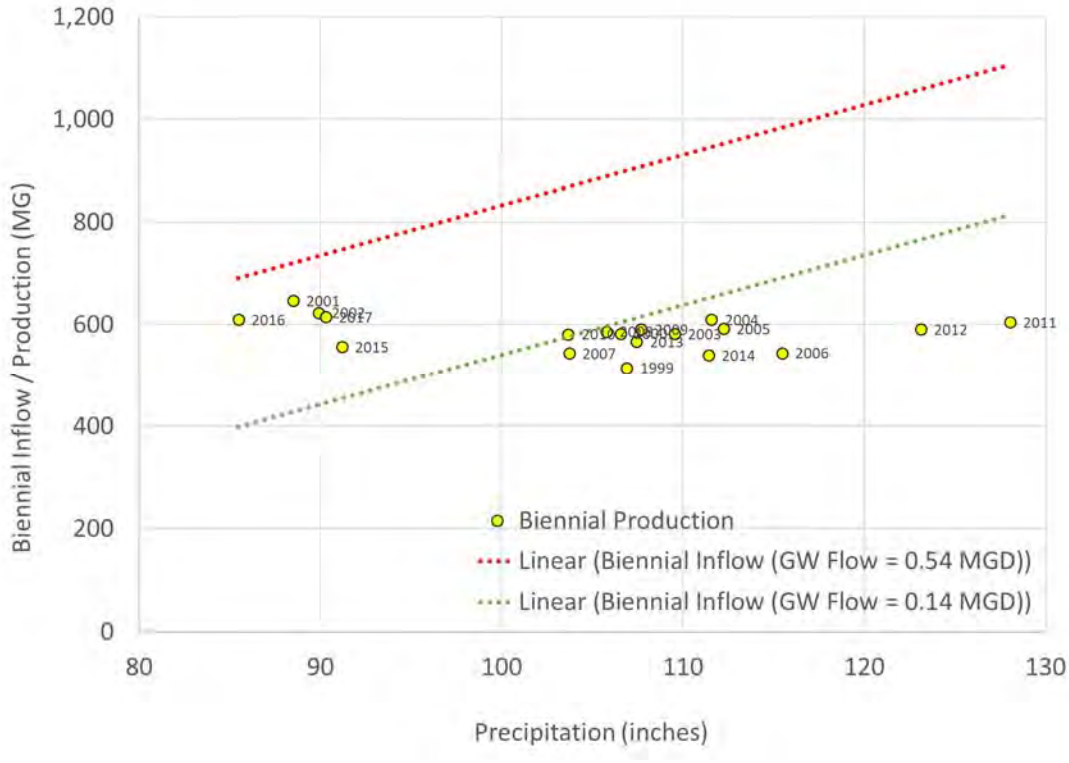

Figure 2-2: Biennial Production versus Precipitation

2.1.3 Lake Gleneida Water Quality

Sound process selection and treatment plant design is primarily based on raw water quality, particularly turbidity and natural organic matter (NOM). In addition to being a surrogate for pathogens, raw water turbidity affects the type of pretreatment process used, filter design and required residuals facilities. The levels of turbidity and NOM govern the performance of each treatment process. CWD2 raw water quality is presented in this section.

Appendix A includes a compilation of all water quality data made available for this report. A summary of CWD2 water quality is presented in **Table 2-1** and in **Table 2-2**. The data in **Table 2-1** reflects samples that were collected at the CWD2 treatment plant raw water tap while the data in **Table 2-2** reflects samples collected by NYCDEP directly in Lake Gleneida. Although the NYCDEP samples were collected at different depths, the selected data is a compilation of samples collected at a depth range of 3 to 6 meters to more accurately reflect the quality of the water at the depth of the intake. The raw water samples collected at the plant validate the depth-based data provided by NYCDEP and also to provide additional water quality parameters not typically measured by NYCDEP. The 95th and 5th percentile data are included in the summary tables and in figures below, to provide more representative maximum and minimum water quality values. The water quality data analyzed was collected between 2013 and 2019.

Typically, the lake undergoes two periods of turnover: one during the fall and one during the spring. Due to groundwater influence, the lake tends to turn over later in the fall as well as freeze over later in the winter

compared to other water bodies in the area. During these turnover periods, each of the existing filters must be washed up to twice a day.

Table 2-1: CWD2 Raw Water Quality Data from the Raw Water Tap

Parameters	Data Period	Average	Range	Percentile		# of
			(Min- Max)	5th	95th	Data
Temperature (°C)	2016 - 2019	17.8	3.6 - 30.7	6.6	27.0	1414
pH	2016 - 2019	8.1	6.8 - 9.0	7.5	8.8	1421
Alkalinity (mg/L)	2018	64.8	-	-	-	1
Color	2018 - 2019	5.6	0.0 - 15	0.0	13.0	14
Turbidity (NTU)	2013 - 2019	1.0	0.3 - 10.8	0.5	1.7	1406
Dissolved Organic Carbon (mg/L)	2019	1.6	1.6 - 1.7	1.6	1.7	2
Total Organic Carbon (mg/L)	2018-2019	1.9	1.7 – 2.2	1.7	2.2	9
UV_{254} Absorbance (cm^{-1})	2018 - 2019	0.042	0.036 - 0.049	0.037	0.048	9
Conductivity (µS/cm)	2018 - 2019	328	245 - 462	245	446	9
Iron (mg/L)	2018 - 2019	0.03	0.00 – 0.28	0.00	0.20	9
Manganese (mg/L)	2018 - 2019	0.02	0.01 – 0.06	0.01	0.05	8

Table 2-2: NYCDEP Raw Water Quality Data from Lake Gleneida

Parameters	Data Period	Average	Range	Percentile		# of
			(Min- Max)	5th	95th	Data
Temperature (°C)	2013 - 2019	16.6	5.2 - 27.8	6.4	26.3	64
pH	2013 - 2019	8.5	7.6 - 8.9	8.1	8.9	25
Alkalinity (mg/L)	2013 -2019	65.6	61.5 - 69.5	62.1	68.9	24
Color	2013 -2017	10.1	4 – 13	7.4	13.0	18
Turbidity (NTU)	2013 - 2019	1.0	0.6 - 2.0	0.6	1.8	25
Dissolved Organic Carbon (mg/L)	2013 - 2019	3.0	2.6 - 3.4	2.7	3.4	23
Dissolved Oxygen (mg/L)	2013 - 2019	11.1	8.6 - 17.6	8.9	15.0	16
Calculated Hardness (mg/L)	2013 - 2017	102.9	97 - 110	97.5	108.6	16
Chloride (mg/L)	2013 - 2019	106.0	42 – 115	100	113	24
Sulfate (mg/L)	2013 - 2019	7.0	6.5 – 8.3	6.6	8.0	24

Water temperature affects chemical reaction rates and impacts process design. For example, colder water, can require longer flocculation time and chlorine contact time resulting in larger tank sizes for these processes. Additionally, lower loading rates are recommended for the settling processes such as sedimentation.

True color and UV_{254} are surrogate measurements for the presence of NOM in water. Color is an aesthetic parameter affecting the appearance of the water, while UV_{254} helps to define the nature of the organic compounds in the water. Color and UV_{254} can be correlated to disinfection byproduct formation and are useful for process monitoring purposes.

pH can affect the efficiency of the treatment process (coagulation, filtration, disinfection, etc.) as well as corrosion in the distribution system. Dissolved oxygen (DO) reflects the amount of oxygen present in the water. In water bodies with sufficient DO, dissolved metals such as iron and manganese exist mostly in particulate form, though dissolved iron-NOM complexes can also be present. High DO can also contribute to pipe corrosion. However, note that low DO negatively impacts bubble formation in the dissolved air flotation treatment process.

Parameters with seasonal trends and a large number of sample points are presented in **Figure 2-3**, **Figure 2-4**, **Figure 2-5** and **Figure 2-6**. These figures illustrate the temperature, turbidity, DO and pH trends of Lake Gleneida raw water for the period of January 2016 to November 2019. The 5th and 95th percentiles of these data are represented by the orange and grey lines. Lake Gleneida experiences raw water temperatures as low as 3.6°C in the winter and as high as 30.7°C in the summer months. The turbidity is relatively low (average 1.0 NTU). Although one sample reached 10.8 NTU, it was considered an anomaly and was removed from the graphed data set to display a more accurate trend. Aside from this outlier, during the spring to early fall seasons, the raw water turbidity peaks, reaching a high of 4.53 NTU on one occasion in May 2016. Seasonal fluctuations in pH may be related to multiple interrelated factors including DO and lake turnover.

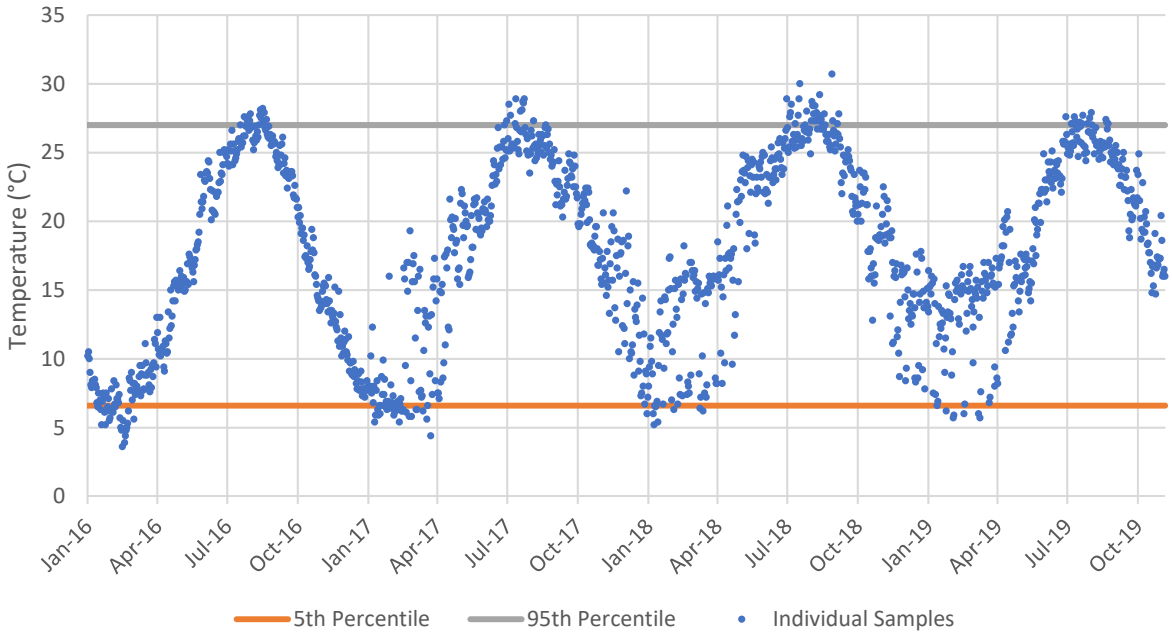

Figure 2-3: CWD2 Raw Water Tap Temperature Measurements (2016 – 2019)

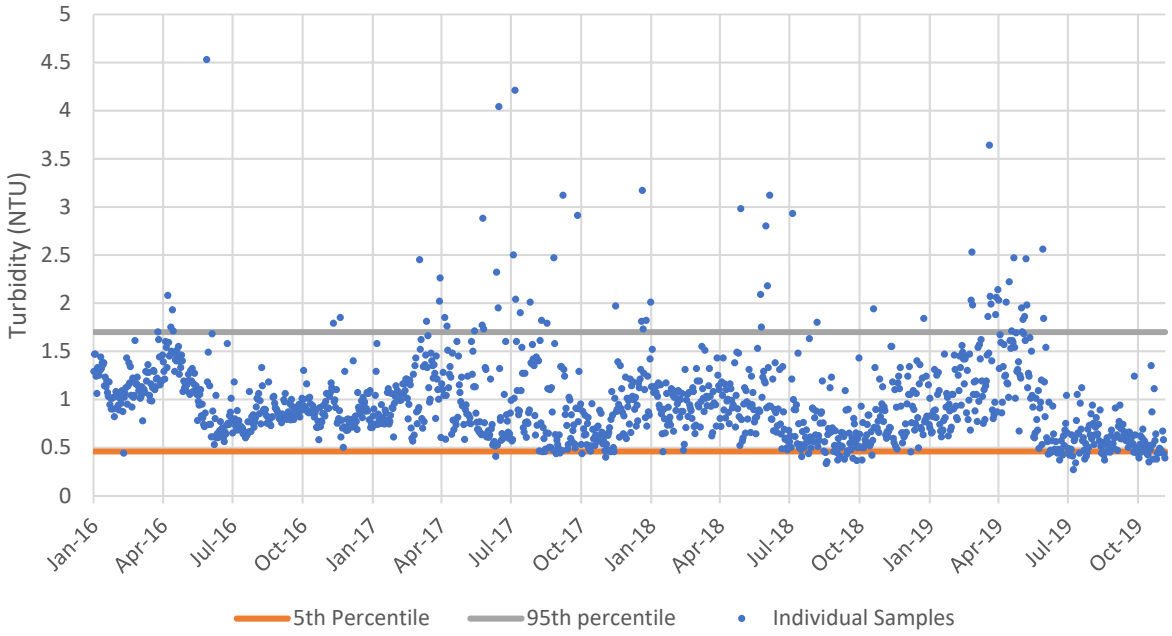

Figure 2-4: CWD2 Raw Water Tap Turbidity Measurements (2016 – 2019)

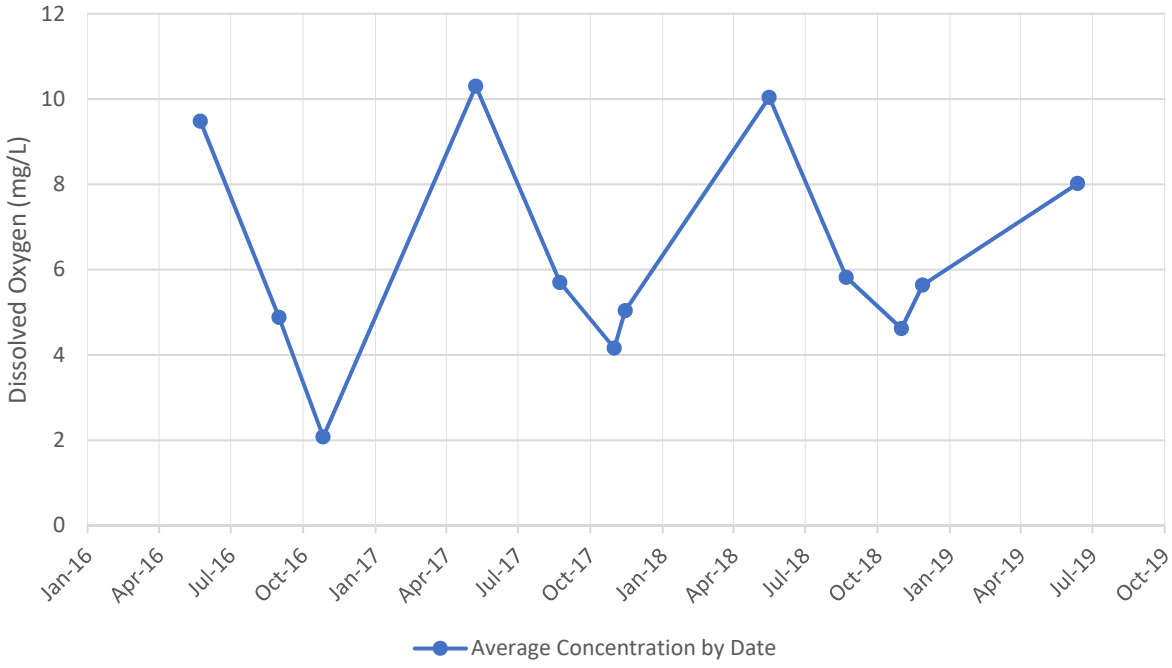

Figure 2-5: Lake Gleneida Average DO Measurements at 3-6 meters depth (2016 – 2019)

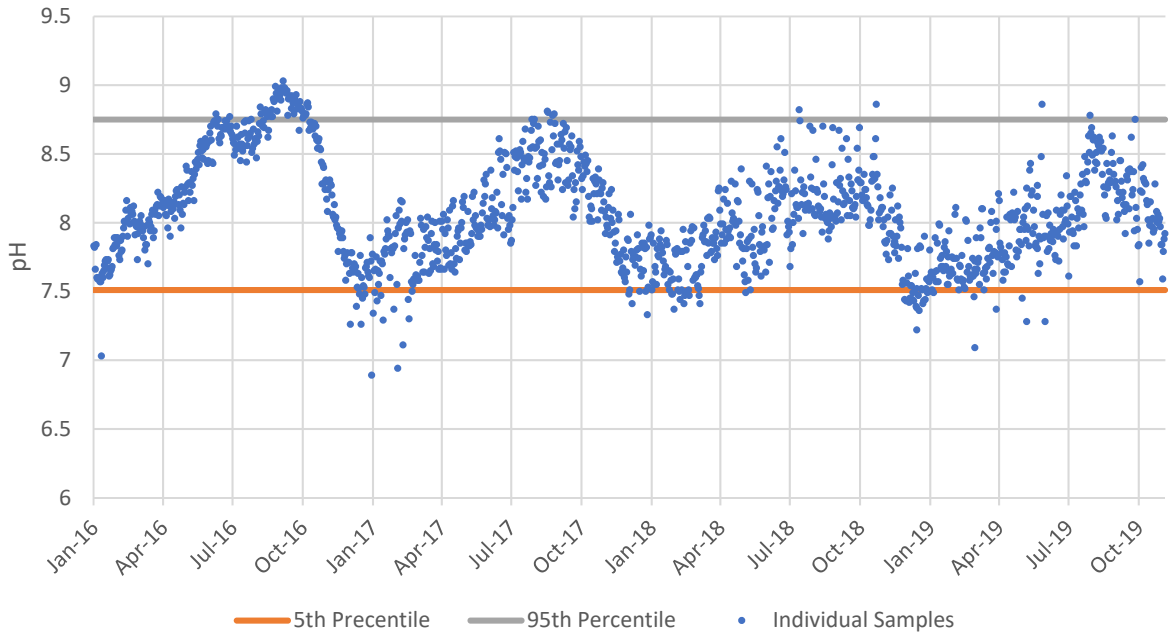

Figure 2-6: CWD2 Raw Water Tap pH Measurements (2016 – 2019)

2.1.3.1 Existing and Potential Sources of Contamination

Lake Gleneida is susceptible to contamination from point and non-point sources located in the Lake Gleneida watershed and potentially along the rock fracture that extends north of Lake Gleneida. There are a variety of land covers and potential point sources that are found within Lake Gleneida source surface water and groundwater areas. After reviewing existing and potential land use and sources of contamination, the environmental database search report provided in **Appendix B**, and the CWD2 Annual Drinking Water Quality Report, contaminants of concern in the source water were grouped into categories as shown in **Table 2-3**.

Table 2-3: Categories of Contamination Sources

Contaminant Category		Contaminant Sources
Inorganic Contaminants	Sediments/Turbidity	Soil Runoff
	Nitrates	Runoff from fertilizer use Leaching from septic systems Sewage Erosion of natural deposits
	Phosphates	Natural deposits Leaching from septic systems Sewage
Organic Contaminants	Microbials - Protozoa, enteric bacteria, enteric viruses, cyanobacteria	Naturally present in the environment Human and animal fecal wastes
	Volatile Organic Compounds (VOCs) - Petroleum products, halogenated solvents, other industrial organics	Spills/leaks from storage tanks, traffic accidents Gasoline facilities Commercial and industrial facilities

In general, surface water sources are primarily at risk of contamination from sediment/turbidity, microbials (protozoa, bacteria, viruses), and nutrient runoff. These may occur seasonally, after specific weather events, or as a result of land use and management practices. Surface waters can also be susceptible to direct contamination from spilled or intentionally released chemicals.

Sampling indicates no presence of VOCs, pesticides, herbicides, and other organic chemicals. Nitrogen and phosphorus levels are low or non-detect. Inorganics such as iron, manganese, arsenic, aluminum, fluoride, asbestos, etc. are well below the MCLs as well. However, chloride levels are noted to be elevated compared to West Branch Reservoir and other nearby water supplies. Chloride levels also appear to be trending slightly upwards over time as shown in **Figure 2-7**, which is a trend that has also been observed in other small reservoirs in Westchester County. It is possible that road salting or salt storage practices are having a detrimental effect on the groundwater supply that partially feeds Lake Gleneida.

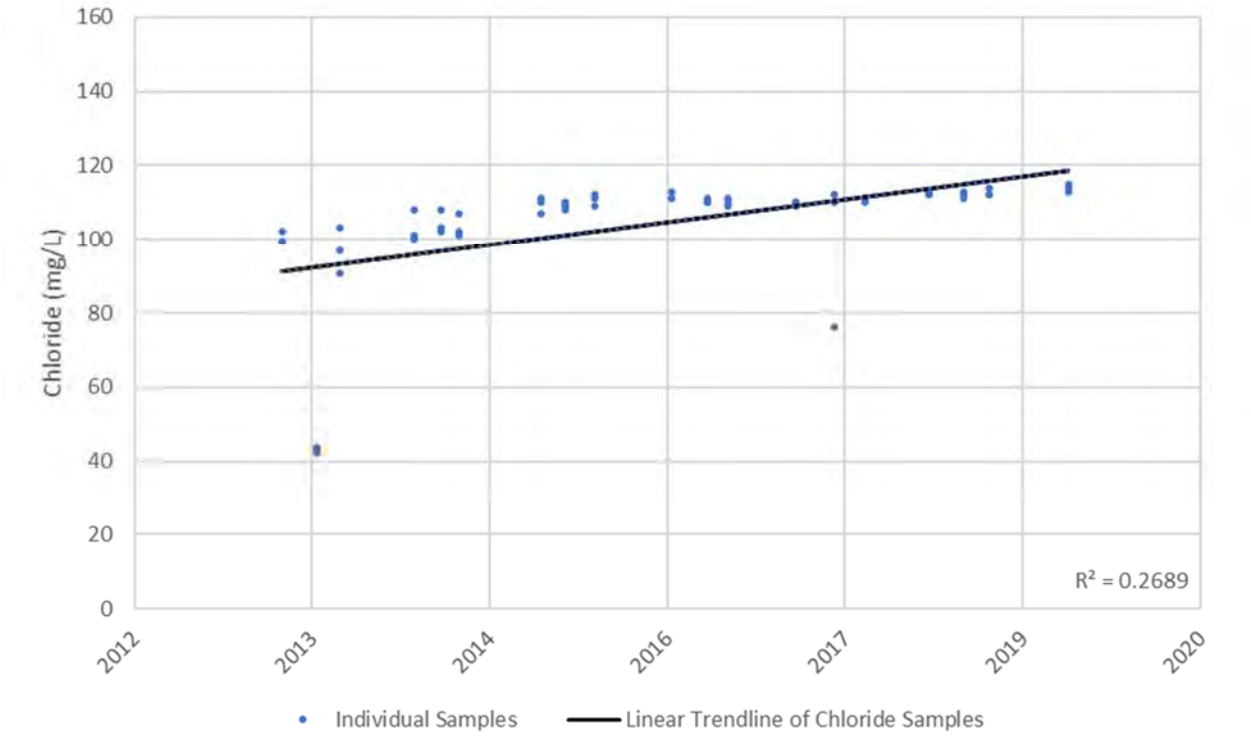

Figure 2-7: Lake Gleneida Raw Water Chloride Measurements (2013 – 2019)

Cyanobacteria, cyanotoxins and harmful algal blooms (HABs) are described in more detail in **Section 4.1.2.4**. To date, there have not been any significant HAB events in Lake Gleneida, though continued source water monitoring and appropriate treatment is required to avoid harmful contamination and public health impacts. Lake treatment techniques are available to mitigate algae growth such as chemical application or ultrasonic technology.

Zebra mussels are an invasive species that can cause ecological and water quality problems in water bodies as well as clog intakes. They are not known to be present in Lake Gleneida or any NYC reservoir, though they have recently been found in nearby Lake Mahopac, which is not a controlled lake. It is critical to maintain access control to prevent the spread of zebra mussels between water bodies.

The presence of petroleum underground storage tanks (USTs) and above ground storage tanks (ASTs), gas stations, petroleum storage facilities, spills from car crashes, and spills from utility transformers present a contamination risk in the watershed. The reports in **Appendix B** indicate several petroleum storage facilities in the watershed and document past petroleum releases to the environment. Many of the documented sites were mitigated before contamination occurred, and others were or are being contained, remediated, and/or monitored. However, all sites of petroleum storage and use are potential sources of contamination in the event of a leak, spill, or release. No major chemical bulk storage facilities or industries were identified in the watershed.

Lastly, it should be noted that low-levels of per- and poly-fluoroalkyl substances (PFAS) were detected in the Lake Gleneida raw water during recent due diligence sampling. PFAS are a class of synthetic chemicals used in various commonly used products, though their potential negative health effects have only recently come to light. Note that the detection levels were found to be well below the current EPA health advisory levels and less than half of the more stringent proposed MCLs in NYS. The detections may be the result of cross-contamination from Teflon tape used in the raw water sampling tap piping. In reviewing the watershed, the only two facilities identified that may be possible sources of the PFAS are the Carmel Fire Department and Lake Carmel Fire Department. PFAS were commonly used in fire-fighting foams and training with these products was often performed at fire department facilities in the past. Therefore, the potential past use of fire-fighting foams at these facilities may present a contamination risk and should be investigated further. It is recommended that PFAS levels in the raw water supply be monitored over time to observe any fluctuations or trends. This will likely be required in the near future with impending regulations from NYS and EPA.

2.1.4 West Branch Reservoir Water Supply and Quality

In service since 1895, West Branch Reservoir is one of several reservoirs in NYC's Delaware water supply system. It was formed by impounding the upper reaches of the West Branch of the Croton River. It has a normal pool elevation of approximately 502 feet, a volume of up to 8 billion gallons and a normal operating range of approximately 1-2 feet, though it has an average depth of 29 feet and maximum depth of 52 feet. It receives water primarily from the Rondout Reservoir via the Delaware Aqueduct, as well as from the Boyds Corner reservoir. It also receives water from Lake Gleneida on an as needed basis or when Lake Gleneida overflows through a channel. The overall watershed area for West Branch Reservoir is 20 square miles. Access to the reservoir is tightly controlled by NYCDEP with watershed access permits.

West Branch Reservoir acts as a supplementary settling basin for the water which arrives from Rondout Reservoir. During drought periods, West Branch Reservoir can also receive water from the Hudson River via the City's Chelsea Pumping Station in Dutchess County, as was necessary in the 1960s and 1980s. Water withdrawn from the reservoir flows via the Delaware Aqueduct into Kensico Reservoir.

The proposed West Branch Reservoir pump station would most likely be located near the south side of Lake Gleneida at Belden Road. The pump station intake could be located within the reservoir or connected to the reservoir release-works. Water could be pumped into Lake Gleneida or directly to the proposed WTP via a proposed raw water transmission main. The former option would require significantly less capital investment. However, evaporation losses would need to be factored into the design capacity of the pump station and overall economic analysis as well as potential environmental impacts.

A preliminary review of the water quality data of West Branch Reservoir[6] compared to that of Lake Gleneida (**Table 2-4**) found that there is no significant difference between the two water bodies except that Lake Gleneida water has higher hardness and alkalinity possibly due to groundwater influence. Phosphorus, sodium and chloride levels are also higher in Lake Gleneida compared to West Branch Reservoir. However, a more detailed review is recommended as part of the evaluation of the proposed pump station in the future. Although some data is not available in the report, the percent of samples above the Simple Sample Maximum (SSM) is available and can be used to compare the quality of Lake Gleneida and West Branch.

Table 2-4: Comparison of West Branch Reservoir and Lake Gleneida Water Quality Data

Analyte	Number of Samples		2018 Average		Percent Exceeding SSM	
	Lake Gleneida	West Branch	Lake Gleneida	West Branch	Lake Gleneida	West Branch
Alkalinity (mg/L CaCO3)	9	15	66.0	27	N/A	N/A
Chloride (mg/L)	9	15	112.3	34.7	100	100
Chlorophyll a (µg/L)	3	32	3.5	5.4	0	3
Color (Pt-Co units)	0	9	10.1	N/A		100
Dissolved organic carbon (mg/L)[2]	9	72	2.8	2.7	0	1
Fecal coliforms (coliform per l00mL)	40	72	0.5	N/A	0	8
Nitrate+Nitrite—N (mg/L)	9	72	<0.02	0.06	0	0
pH (units)	20	72	8.5	N/A	5	7
Sodium (mg/L)	9	15	60.8	19.2	100	100
Soluble reactive phosphorus (µg/L)	9	72	0.1	N/A	11	1
Sulfate (mg/L)	9	15	6.7	5.8	0	0
Total ammonia-N (mg/L)	9	72	0.1	0.02	22	4
Total dissolved phosphorus (µg/L)	9	72	3.8	N/A	22	1
Total dissolved solids (mg/L)	9	72	332	124	100	100
Total phosphorus (µg/L)	9	72	12.4	N/A	56	18
Total phytoplankton (ASU per mL)	3	32	N/A	N/A	0	0
Primary genus (ASU per mL)	3	32	N/A	N/A	0	0
Secondary genus (ASU per mL)	3	32	N/A	N/A	0	0
Total suspended solids (mg/L)	9	9	0.9	1.6	0	0
Turbidity (NTU)	9	72	1	N/A	0	0

2.2 Water System Facilities

Water is pumped from Lake Gleneida and treated at a 1.0 mgd WTP. The plant was built circa 1976 and contains diatomaceous earth (DE) filters, chemical addition systems, a clearwell and a set of booster pumps which pump finished water into the distribution system, as depicted schematically in **Figure 2-8**. The

[6] NYCDEP, "2018 Watershed Water Quality Annual Report" Appendix F, July 2019.

following sections of this report describe the individual components of the water system in greater detail. **Appendix C** contains available record drawings for the existing facilities.

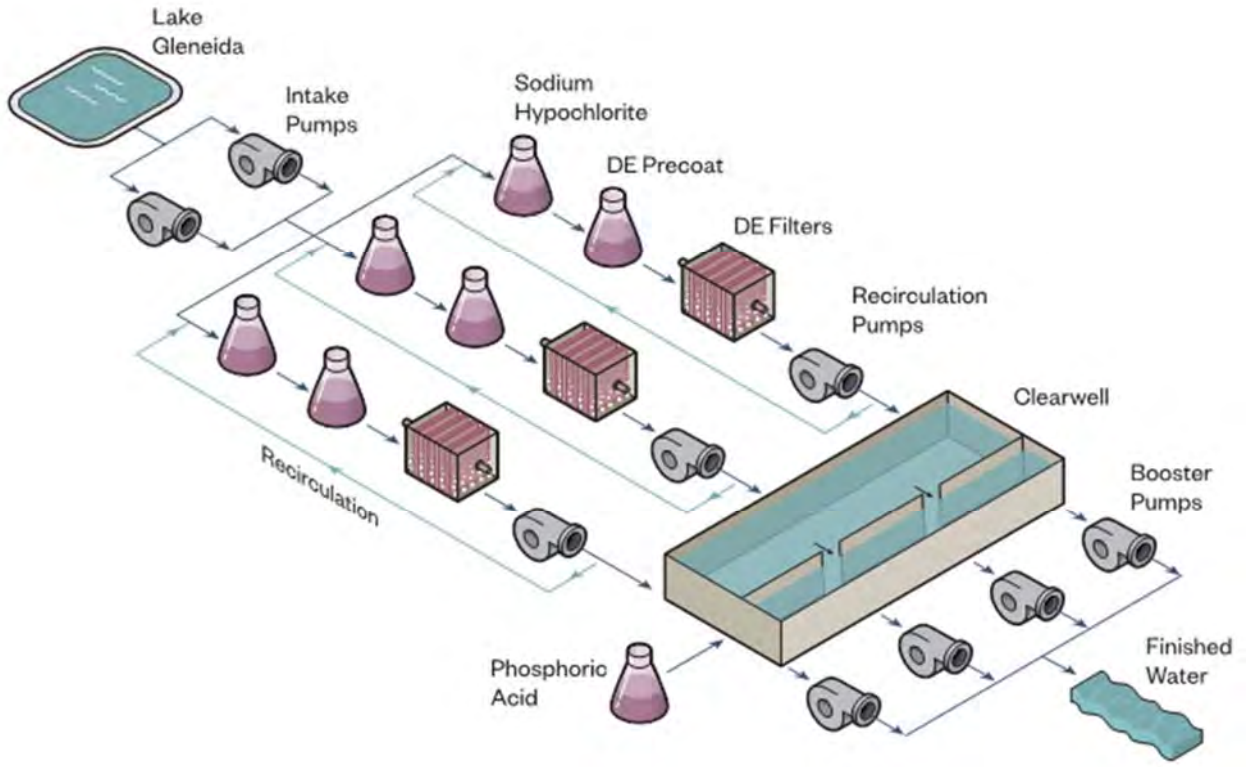

Figure 2-8: DE Filtration Process Schematic

2.2.1 Intake Facility

The raw water intake facilities are located on the east side of Lake Gleneida and were constructed circa 1976. According to record documents provided by the Town, the intake consists of two sets of two 16-inch outer diameter, 2-foot tall, #100 slot stainless steel drum screens. One set of screens is located at elevation 485 feet MSL and the other set is located at 490 feet MSL. Each set is mounted on a concrete foundation where the screens tee together into 16-inch ball joint ductile iron piping leading to the intake pump station, located on the lake shore and at a pipe centerline elevation of approximately 494.5 feet MSL. The pump station is a below-grade concrete vault structure containing two 15 HP fixed speed vertical end suction pumps (1 duty and 1 standby) each with a capacity of 1,140 gpm (1.64 mgd) at 38 feet total dynamic head, as detailed in **Table 2-5**. Though the original pump curves are not available, the manufacturer provided a generic pump curve for an equivalent model as shown in **Figure 2-9**.

The pumps discharge into an 8-inch ductile iron header that leads into a meter vault. This meter vault contains an 8-inch venturi meter with an 8-inch bypass mag meter, both owned and maintained by NYCDEP and used as the pay meters for water withdrawn from Lake Gleneida. The 8-inch meter vault piping then increases in size to an 18-inch bell and spigot ductile iron pipe that leads across the intersection of Seminary Hill Road, Brewster Road and Gleneida Avenue to the existing water treatment plant approximately 850 feet east-southeast along Brewster Road. Butterfly valves on the inlet of each DE filter are used to throttle

the raw water flow at the plant based on pressure differential in the filters as they become clogged with particles. The finished floor elevation of the existing plant is 479.22 feet MSL.

Table 2-5: Existing Raw Water Intake Pump and Motor Data

	Intake Pump #1	Intake Pump #2
Motor Information		
Manufacturer	Weg NEMA Premium	Marathon Electric
Model Number	015120T3E284JP	PVC284TTFNA14090AAL
Horsepower (HP) / kW	15 / 11	15 / 11.2
Frequency (Hz) / Phase	60 / 3	60 / 3
Volts	230/460	230/460
RPM	1,180	1,175
Efficiency (%)	91.7	90.2
Pump Information		
Manufacturer	Pentair Aurora Centrifugal Pump	Pentair Aurora Centrifugal Pump
Model Number	93-14163	15-2446756
Size	6x6x12	6x6x12B
Type	Single Stage End Suction Vertical Close Series 300 (362A BF)	Single Stage End Suction Vertical Close Series 300 (362A BF)
Flow Rate (gpm / mgd)	1,140 / 1.64	1,140 / 1.64
Total Dynamic Head (ft)	38	38
RPM	1,150	1,150

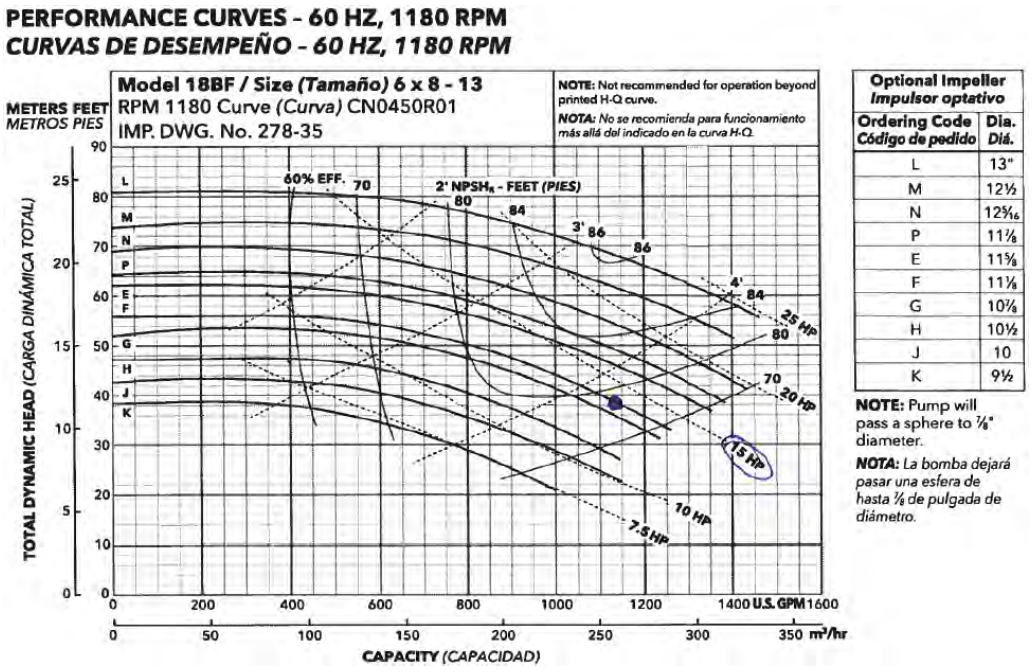

Figure 2-9: Intake Pump Curve for Goulds Model 18BF with Design Point

2.2.2 Treatment Plant

The existing treatment plant comprises a butler building on a concrete foundation with a buried concrete clearwell below the building foundation. The main process room includes the filters, motor control center, and booster pumps. A chemical room adjacent to the process room contains sodium hypochlorite, orthophosphoric acid, and DE media storage along with mixers and pumps. There is also a work room, lab space, restroom and storage room. The following sections describe the existing plant in greater detail.

2.2.2.1 Plant Site

The existing plant site is located on a small parcel of land approximately ¼-acre in size within a larger privately-owned parcel. The plant site includes the existing WTP, driveway, generator, load bank, chemical fill station, storage container and storage shed. There is practically no space available for expansion or for a temporary packaged water treatment system during construction on the existing site.

2.2.2.2 Diatomaceous Earth Filtration

DE filters, also called "precoat filters", are constructed of a mesh screen on to which DE filter media is deposited during initial startup. The DE is a powdered media made of almost pure silica manufactured from diatoms, which are the fossilized skeletons of fresh water, unicellular algae. During the filtration process, the filter medium and the filtrated solids form a filter bed which works as a combined strainer to collect finer contaminants. The medium may filter by adsorption and by mechanical means. A small amount of DE is fed upstream of the filters as a slurry, called a body feed, to maintain the porosity of the precoat during filtration. When maximum headloss is reached, the filter cake is removed from the mesh screen through a backwash process. The DE is flushed and wasted at the end of each filter run and must be reapplied.

There are three main types of DE filters: vacuum, pressure and horizontal plate filters. The existing treatment plant uses DE filters with a vacuum type system, as it is capable of higher capacity than the other types and disposal of the waste is by gravity drainage. A pump is located on the effluent of each filter, which generates a vacuum on the mesh screen, holding the DE onto the screen.

Based on the *Recommended Standards for Water Works*, these types of filters may be used for surface waters with low turbidity and low bacterial contamination, but is not recommended for the following:

- Bacterial removal
- Color or dissolved organics removal
- Turbidity removal for high turbidity or turbidity with poor filterability.
- Water with high algae count

Effluent water quality of DE filtration is highly dependent on influent water quality and the quality or grade of DE used. Coagulant and filter aid may be required to improve filtrate quality. DE filters typically require lower capital costs and less space compared to conventional filtration, and they are simple to operate. However, their operation is more labor-intensive than conventional filters and DE filters are not well-suited to handling wide variations in influent water quality. The volume of waste washwater generated is also higher than other treatment processes (approximately 6 to 12% of the water produced).

2.2.2.3 Sodium Hypochlorite Disinfection

A 15% trade solution of sodium hypochlorite is dosed in the raw water prior to entering each DE filter. This application location of disinfectant provides additional contact time, reduces bacteriological formation in the open filter basins and oxidizes dissolved iron and manganese prior to filtration. However, this feed location may contribute to increased DBPs in the finished water due to chlorine contact with unfiltered water containing organic matter and other precursors of DBPs.

2.2.2.4 Phosphoric Acid Corrosion Control

CWD2 uses phosphoric acid (H_3PO_4) (also referred to as orthophosphoric acid herein) with a solution strength of 75% to reduce corrosion in the distribution system. It is dosed directly into the clearwell, resulting in a finished water entry point concentration of approximately 0.7 to 1.0 mg/L as PO_4. At these levels, phosphate reacts with lead, copper and hardness ions (calcium and/or magnesium) to form an insoluble coating on the internal surfaces of the distribution system. Once this coating is formed and maintained, lead and copper levels in the drinking water system can be maintained below threshold levels.

As shown in **Figure 2-6**, the raw water pH fluctuates naturally between 7.5 and 8.8 for most of the year. Therefore, with the current treatment scheme, pH adjustment is not required as it would have minimal effect on improving corrosion control.

2.2.2.5 Clearwell and Booster Pumps

A clearwell is located underneath the existing plant, which provides flow equalization as well as contact time for disinfection. The clearwell is approximately 50 feet long by 32 feet wide and 13 feet high, with a high-water level of 10 feet and approximate useable capacity of 90,000 gallons. A dividing wall with connecting pipes separates the tank into a clearwell area and a wet well area. Water is pumped out of the wet well by four vertical turbine booster pumps as detailed in **Table 2-6**, which are controlled by the PLC accordingly to maintain distribution pressure and storage tank levels.

Table 2-6: Existing Booster Pump Data

	Booster Pump #1	Booster Pump #2	Booster Pump #3	Booster Pump #4
Motor Horsepower (HP)	75	40	75	100
Flow Rate (gpm)	760	250	250	700
Frequency (Hz) / Phase	60 / 3	60 / 3	60 / 3	60 / 3
Volts	460	460	460	460
RPM	1,800	1,800	1,800	1,800

2.2.2.6 Controls and Telemetry

Controls are centralized at a human machine interface (HMI) located in the work room of the existing plant. The system operates the plant automatically, activating and deactivating pumps, filters, actuated valves, and other equipment. Operators are able to override the automatic controls and operate components manually. Washing of the DE filters is a manual process and requires an operator to take a filter offline for draining, washing with a garden hose, and resupplying precoat, which occurs generally at least once a day per filter.

Radio telemetry is used to obtain the levels of the distribution storage tanks. The control system is connected via a direct connection through overhead utility lines to the intake pump station located off-site, calling for the pumps as needed. The system is programmed to maintain pressure based on the plant entry point pressure transmitter and storage tank levels.

A computer is also located in the plant which stores the data and allows for viewing graphs of various parameters over time such as tank levels and plant flow.

2.2.2.7 Laboratory

The plant contains a small area with laboratory facilities typical of small surface water treatment plants, including portable water quality analyzing equipment (pH, temperature, chlorine residual, PO_4 residual), a lab sink, miscellaneous cabinets and record documents.

2.2.2.8 Sanitary and Sewer Facilities

A restroom with toilet, sink, shower and lockers is located in the existing plant. A hot water boiler is also located within the restroom which provides hot water for the entire plant.

A sewer manhole is located on the north side of the existing plant which receives wastewater from the restroom, lab sink, floor drains, and DE filter drains. This manhole then discharges to an 8-inch asbestos cement sewer pipe which runs northeast down the hill. This pipe then connects into a sewer trunk line that leads to the Carmel Sewer District No. 2 (CSD2) wastewater treatment plant located at 11 Old Route 6 close to the intersection of Stoneleigh Avenue. The sewer plant has a design capacity of 1.1 mgd and currently operates between 0.6 to 0.9 mgd typically.

2.2.2.9 Generator and Electrical Facilities

The existing plant is served by a three-phase primary electrical service that originates from the overhead distribution system. The utility service supplies an existing transformer, which provides 480-volt, three-phase, 60 Hertz (Hz) power to the plant. A 400 KW diesel generator is located at the existing plant. A portable 100 KW diesel generator is available to provide backup power to the intake pumps at Lake Gleneida.

2.2.3 Distribution System

Finished water is pumped through the District's 52-mile distribution system operated as a single pressure zone. The most extreme high and low elevations in the District differ by approximately 400 feet. However, almost the entire customer service area is within an elevation difference of approximately 200 feet.

The distribution system consists of a variety of pipe sizes ranging from 4 to 18 inches and pipe materials including asbestos cement (AC, also commonly referred to as "transite"), unlined cast iron (CI), unlined and cement-lined ductile iron (DI), and polyvinyl chloride (PVC) pipe. The variety is mainly due to several decades of development using the most economical pipe materials of the time.

Unlined CI and DI pipe have been exhibiting significant tuberculation. Tuberculation is the development of mounds of corrosion products, called tubercles, on the inside of iron pipes, an example of which is shown in **Figure 2-10**. This commonly leads to water quality problems for customers such as discolored water. In severe cases, the tubercles can be large enough to restrict flow in the piping, resulting in lower pressures during high demand periods. The Town is currently in the process of replacing or lining unlined mains to increase the flow in areas of the system and mitigate water quality issues.

Figure 2-10: Coupon of Tuberculated Pipe on Seminary Hill Road[7]

2.2.4 Water Storage Facilities

The District maintains three water storage tanks, as listed in **Table 2-7**, with a total capacity of approximately 1,100,000 gallons. These tanks provide pressure equalization and additional capacity for fire protection and other emergencies. The datum of the overflow elevations is assumed to be NGVD29, but they should be verified prior to finalizing design of any pumping systems to distribution. Note that the tanks are currently being assessed and are planned to be rehabilitated in the near future.

Table 2-7: Existing Water Storage Tank Data

Criteria	Everett Road Tank	Clapboard Ridge Road Tank	Lindy Drive Tank
Storage Capacity (gallons)	300,000	500,000	300,000
Material / Style	Steel / Standpipe	Steel / Standpipe	Steel / Standpipe
Installation Year	1976	1963	1936
Overall Dimensions (feet)	32 x 41Ø	40 x 46Ø	32 x 41Ø
Elevation at Grade (feet NGVD29)	730±	730±	731±
Elevation at Overflow (feet NGVD29)	762±	775±	763±
Normal Operating Level (feet)	30.6	26.6	29.2

[7] Folchetti and Associates, "Carmel Water District No. 2 Distribution System Facility Plan", February 2019.

3. Future Water Demand

The District provides year-round service to customers in Carmel Hamlet and its vicinity. Water use is predominantly residential. Some shops and offices are situated in the center of the hamlet. A few additional commercial and light use industrial/institutional consumers exist in other parts of the District. The hamlet is also the County Seat of Putnam County and various County buildings including the jail are served.

For the past several years, the average daily demand (ADD) has been approximately 0.8 mgd and the maximum day demand (MDD) has been 1.5 mgd. Average production in 2018 was approximately 734,000 gpd and total water produced was 267,875,200 gallons for the year. These water production numbers include water used for flushing mains, fighting fires as well as washing of the treatment plant filters (non-revenue water) and other unaccounted for water such as leaks.

A future water demand assessment[8] was completed to assist with developing the maximum design capacity for the proposed WTP. Based on estimated population growth, proposed developments, and available land for further development, water demand projections for the next 30 years were developed as summarized in **Table 3-1**. Based on currently available data, the results of the analysis suggest average day demand in 2050 of 0.82 to 1.48 mgd and a future maximum day demand in 2050 of 1.31 to 2.15 mgd. However, the analysis is sensitive to the population growth and future development within the CWD2. The analysis assumes the District geographic boundary does not change nor are outside users served, except for one proposed development south of Putnam County Hospital Center. Unaccounted for water and water loss in general were not explicitly factored into this analysis, but they are described in this assessment based on available information.

Table 3-1: Average daily and maximum day water demand projections, in mgd

Year	Average Daily Demand	Maximum Day Demand
Current	0.80	1.50
2030	0.75 – 1.08	1.21 – 1.73
2040	0.78 – 1.20	1.25 – 1.93
2050	0.82 – 1.34	1.31 – 2.15

In reviewing the future water demand assessment, it is recommended that the proposed WTP be designed with a capacity to meet the highest projected maximum day demand of 2.15 mgd, in accordance with *Ten States Standards*.

Based on the safe yield discussed in **Section 2.1.2**, Lake Gleneida alone and the water treatment plant are insufficient to meet projected water demand for CWD2. A review of various available water supplies in the vicinity was performed.[9] In summary, groundwater sources in the vicinity would not provide sufficient yield to be viable, most nearby lakes are either too small or impractical for use, and nearby NYC reservoirs such as Middle Branch Reservoir and Croton Falls Reservoir cannot be relied upon in a drought scenario

[8] Hazen and Sawyer, "Future Water Demand Assessment", April 3, 2019.
[9] Hazen and Sawyer, "Summary of Water Supply Options", October 23, 2019.

as they will be drained to supply water to NYC. Lake Mahopac, approximately 3 miles southwest of Lake Gleneida, was also considered as a supplemental source, but it was recognized that this would require a significant capital investment, including either an additional new WTP or a pump station and long raw water transmission main from Lake Mahopac to the new WTP near Lake Gleneida. It should also be noted that Lake Mahopac has a safe yield of approximately 1.3 mgd[11], which is only marginally higher than that of Lake Gleneida and also does not take into account water withdrawn by CWD8 and a nearby golf course. Therefore, Lake Mahopac is not being considered as a potential water supply for CWD2.

It is recommended that the Town pursue a new connection to NYC's West Branch Reservoir to provide supplemental water as there is abundant water available, it is within close proximity to Lake Gleneida requiring minimal capital investment, and the water quality is similar. NYC's drought management plan also indicates it would only be lowered a few feet during a drought, meaning it can be relied upon by CWD2 during a drought. A new agreement for withdrawal of water would need to be executed. The Town should pursue the West Branch Reservoir connection separately from this proposed WTP project.

[11] Hazen and Sawyer, "Safe Yield Analysis for Lake Mahopac", May 17, 2019.

4. Water Treatment Process Evaluation

Various treatment processes are presented and evaluated in this section for applicability to the proposed WTP based on the finished water quality goals of the Town.

4.1 Finished Water Quality Goals

The goal of treating water for public consumption is to obtain water from the best available source and to process it in such a way that it becomes safe for human consumption. For water to be safe, it must be free of pathogens and other contaminants that can be harmful to human health. It is also necessary for the treated water to be aesthetically acceptable for consumption. Aesthetically acceptable water would be clear, odorless, colorless and pleasant to taste. Since water sources differ from one another, their quality differs and requires different approaches to treatment. Treatment plants are designed to treat specific water sources so that a high-quality water can be provided to consumers.

4.1.1 Regulatory Requirements

Regulations on drinking water can be traced back to 1893 and have evolved over the years. Drinking water regulations are issued by a regulatory agency under the authority of federal, state, and/or local law. Drinking water regulations established by United States Environmental Protection Agency (USEPA or EPA) typically require water utilities to meet specified water quality standards. Regulations also require that certain monitoring be conducted, that specified treatment be applied, and that the supplier submit reports to document that the regulations are being met. The proposed WTP will be designed to follow the regulatory requirements described in the following sections. The treatment goals of this project are detailed further in **Section 4.1.3**. These summary descriptions are not intended to encompass or address all aspects, only to indicate that consideration was given to each as part of the proposed treatment process selection.

4.1.1.1 Surface Water Treatment Rule

The Surface Water Treatment Rule (SWTR) and its amendments are a set of requirements that aim to reduce pathogen-born illnesses in potable water such as *Giardia lamblia, Cryptosporidium*, and viruses. In accordance with the SWTR, surface water sources must be filtered and disinfected. Below lists applicability of the SWTR and its subsequent amendments:

- SWTR, 1989 – Applies to all public water systems (PWSs) using surface water, or groundwater under the direct influence of surface water (GWUDISW), that serve 10,000 or more persons
- Interim Enhanced Surface Water Treatment Rule (IESWTR, 1998) – Applies to all PWSs using conventional or direct filtration to treat surface water, or GWUDISW, regardless of size
- Filter Backwash Recycling Rule (FBRR, 2001) – Applies to all PWSs using conventional or direct filtration to treat surface water, or GWUDISW, regardless of size
- Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR, 2002) – Applies to all PWSs using surface water, or GWUDISW, serving fewer than 10,000 persons

- Long term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR, 2006) – Applies to all PWSs that use surface water or GWUDISW

The proposed water treatment plant must be designed to provide full treatment of the raw water supply prior to the entry point to the distribution system, particularly for these target organisms. The SWTR and the LT2ESWTR specify that surface waters or groundwaters under the direct influence of surface water must receive sufficient treatment to ensure 2-log removal/inactivation of *Cryptosporidium* oocysts, 3-log removal/inactivation of *Giardia* cysts, and 4-log removal/inactivation of viruses.

The LT2ESWTR classifies filtered systems into four possible "bins" based on raw water *Cryptosporidium* monitoring results as follows:

- Bin 1: Source water *Cryptosporidium* levels less than 0.075 oocysts/L – no additional treatment requirements.
- Bin 2: *Cryptosporidium* levels equal to or greater than 0.075 and less than 1.0 oocysts/L – overall treatment goal of 99.99% (4 logs) filtration and/or inactivation.
- Bin 3: *Cryptosporidium* levels equal to or greater than 1.0 and less than 3.0 oocysts/L – overall treatment goal of 99.999% (5 logs).
- Bin 4: *Cryptosporidium* levels greater than or equal to 3.0 oocysts/L – overall treatment goal of 99.99968% (5.5 logs).

For public water suppliers such as CWD2 serving populations less than 10,000 and providing filtration (Schedule 4 systems as defined by LT2ESWTR), initial monitoring was required to begin on October 1, 2008 and consisted of *E. Coli* sampling every two weeks for one year. The mean annual *E. Coli* concentration was less than 10 per 100 mL, therefore monitoring for *Cryptosporidium* was not required. A second round was required to begin by October 1, 2017 which resulted in the same outcome. Therefore, the CWD2 system is classified as Bin 1, requiring only 2-log removal/inactivation for *Cryptosporidium*. Recent sampling confirms that the *E. Coli* concentrations continue to be well below the threshold with no signs of changing in the future.

4.1.1.2 Lead and Copper Rule

The Lead and Copper Rule (LCR) is a regulation enacted in 1991 that limits the concentration of lead and copper in drinking water due to the serious illnesses and health problems that can be caused by exposure through ingestion. Lead and copper normally enter drinking water through corroding plumbing materials. Currently, if the 90th percentile of water samples collected have lead concentrations exceeding an action level of 15 parts per billion (ppb) or copper concentrations exceeding 1,300 ppb, the water supplier must undertake a number of additional actions to control corrosion including public notification.

Raw, entry point and distribution water samples indicate that levels of copper and lead are well below the current action levels, as shown in **Table 4-1**. Therefore, the current corrosion control treatment scheme of maintaining pH above 7.5 and dosing orthophosphoric acid appears to be operating satisfactorily to control lead levels.

Table 4-1: Concentration of Copper and Lead at Various Sampling Locations

Sample Location	Date	Copper (ppb)	Lead (ppb)
Action Level for 90th Percentile of Samples[12]		***1,300***	***15***
939 Stoneleigh Avenue	8/5/2016	117	5
18 Ridge Road	7/31/2016	114	4
2 Cross Road	7/31/2016	46	4
3 Cross Road	7/31/2016	83	1
4 Meadow Lane	7/31/2016	33	1
10 Kelly Ridge Road	7/14/2016	146	-
14 Collier Drive West	7/14/2016	115	-
2 Crosby Road	7/14/2016	107	1
22 Decolores Lane	7/14/2016	112	-
79 Hughson Road	7/14/2016	38	1
CWD2 Raw Water Tap	9/28/2018	7.1	0
CWD2 Entry Point	12/19/2018	47	0
CWD2 Entry Point	2/13/2018	31	0
CWD2 Entry Point	1/11/2017	22	1.3
CWD2 Entry Point	1/6/2016	27	0
CWD2 Entry Point	6/17/2015	11	0
CWD2 Entry Point	4/9/2014	22	0
CWD2 Entry Point	7/8/2013	18	0

4.1.1.3 Radionuclide Rule

The Radionuclide Rule is a regulation designed to minimize exposure to alpha, beta and gamma radiation that may be present in some water sources. Radionuclides can occur from natural erosion of deposits or may be from artificial sources such as certain hazardous waste sites. The contaminants regulated under this rule include beta/photon emitters, gross alpha particle activity, combined radium-226 and radium-228, and uranium. Beta/photon emitters are generally not monitored unless required by the state due to proximity to man-made nuclear facilities or hazardous waste sites.

CWD2 is required to sample for radionuclides every six years since levels are sometimes detectable, but below half the MCL. For example, entry point sampling in 2017 and 2018 indicates that gross alpha particle activity, radium-226, uranium and radon are all non-detect. Radium-228 was detected at a level of 1.1 pCi/L in 2017, but was non-detect in 2018. The MCL for combined radium is 5 pCi/L. Radium is known to exist in the natural geology of this region as it is commonly found in other nearby water sources and has been mapped in USGS reports[13]. Therefore, radionuclides are not a main concern for this water source and does not require special treatment.

[12] The current action level for copper and lead is 1,300 and 15 ppb, respectively. Water suppliers must monitor locations as specified in the rule. If more than the 10th percentile of tap water samples exceeds this action level, action must be taken.
[13] DeSimone, L.A., McMahon, P.B., and Rosen, M.R., 2014, The quality of our Nation's waters—Water quality in Principal Aquifers of the United States, 1991–2010: U.S. Geological Survey Circular 1360, 151 p., http://dx.doi.org/10.3133/cir1360.

4.1.1.4 Disinfectant and Disinfection Byproducts Rule

Chemical disinfectants, including chlorine, ozone, chloramines, and chlorine dioxide, are used to inactivate harmful pathogens and produce safe drinking water. However, these disinfectants are also powerful oxidants that can chemically react with NOM and with bromide or iodide that are naturally present in some source waters. These reactions can lead to the formation of disinfection byproducts (DBPs). The presence of DBPs in potable water is undesirable as they are suspected to be toxic, carcinogenic and mutagenic.[14] The EPA currently regulates 11 DBPs (four trihalomethanes (THMs), five haloacetic acids (HAAs), bromate and chlorite) under the Disinfectants and Disinfection Byproducts Rule.

This rule is designed to improve drinking water quality and is broken up into two stages. Briefly, stages 1 and 2, which apply to public water systems, aim at protecting public health by applying an MCL and tightening compliance monitoring requirements for the total of four THMs (chloroform, bromoform, bromodichloromethane, and dibromochloromethane), also referred to as Total trihalomethanes (TTHMs), and the total of five HAAs (monochloroacetic acid, monobromoacetic acid, dichloroacetic acid, trichloroacetic acid, and dibromoacetic acid), also referred to as HAA5. The MCLs are 80 ppb and 60 ppb for TTHMs and HAA5s, respectively. Furthermore, compliance is based on a locational running annual average (LRAA) of four quarterly samples, meaning compliance must be met at all sampling sites, but a single sample does not constitute a violation if the LRAA is below the MCL.

Various recent CWD2 distribution samples indicate that TTHMs and HAA5s are elevated. **Figure 4-1** and **Figure 4-2** present the average of quarterly samples and the annual average for all sample locations, for TTHMs and HAA5s, respectively. Individuals samples for TTHMs have at times exceeded the MCL, though the LRAA has not been exceeded, as shown in **Table 4-2** and **Table 4-3**. Elevated DBP concentrations may be due to chlorination practices, organic matter in the source water, on biofilms in the tuberculated distribution system, and/or high-water age in certain parts of the distribution system. It should be noted that the health risks from DBPs are much less than the risks from consuming water that has not been appropriately disinfected.

Since THMs and HAAs form primarily through reactions between chlorine and natural organic matter in water, methods for reduce their formation via treatment at the plant can include:

- Reducing the concentration of dissolved organic carbon prior to disinfection through processes such as enhanced coagulation, activated carbon, or nanofiltration;
- Using pathogen removal/inactivation processes that do not form, or form low concentrations of, THMs and HAAs. Such processes include disinfection via chloramines, ozone, chlorine dioxide, ultraviolet (UV) light, and the use of membranes.

[14] Water Research Foundation Project No. 4560. "GAC Control of Regulated and Emerging DBPs of Health Concern", 2019.

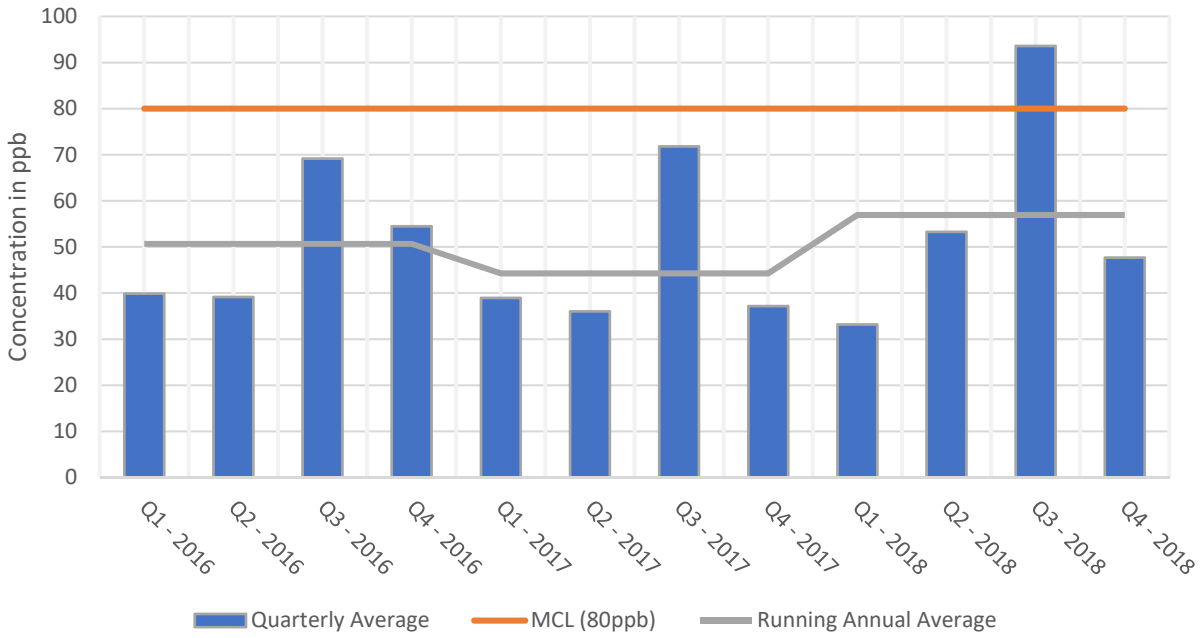

Figure 4-1: Quarterly and Annual Averages of TTHMs (2016 – 2018)

Table 4-2: Locational Running Annual Averages for TTHMs (2016 – 2018)

Site	Year	Q1 (ppb)	Q2 (ppb)	Q3 (ppb)	Q4 (ppb)	LRAA (ppb)
Cemetery Route 52	2016	60.5	53.9	71.5	63.3	62.3
	2017	53.2	51.1	71.8	43.5	54.9
	2018	38.9	64.4	91.7	59.4	63.6
County Building	2016	31.2	28.3	56.2	40.1	38.9
	2017	45.2	27.0	56.7	25.9	38.7
	2018	25.6	36.4	58.5	25.8	36.6
Putnam Hospital	2016	33.8	41.4	86.2	65.7	56.8
	2017	27.0	36.3	78.9	41.1	45.8
	2018	34.5	44.6	125.9	67.4	68.1
Putnam Jail	2016	34.0	32.9	62.8	48.9	44.7
	2017	30.3	29.6	64.7	38.3	40.7
	2018	33.8	67.7	98.2	38.2	59.5

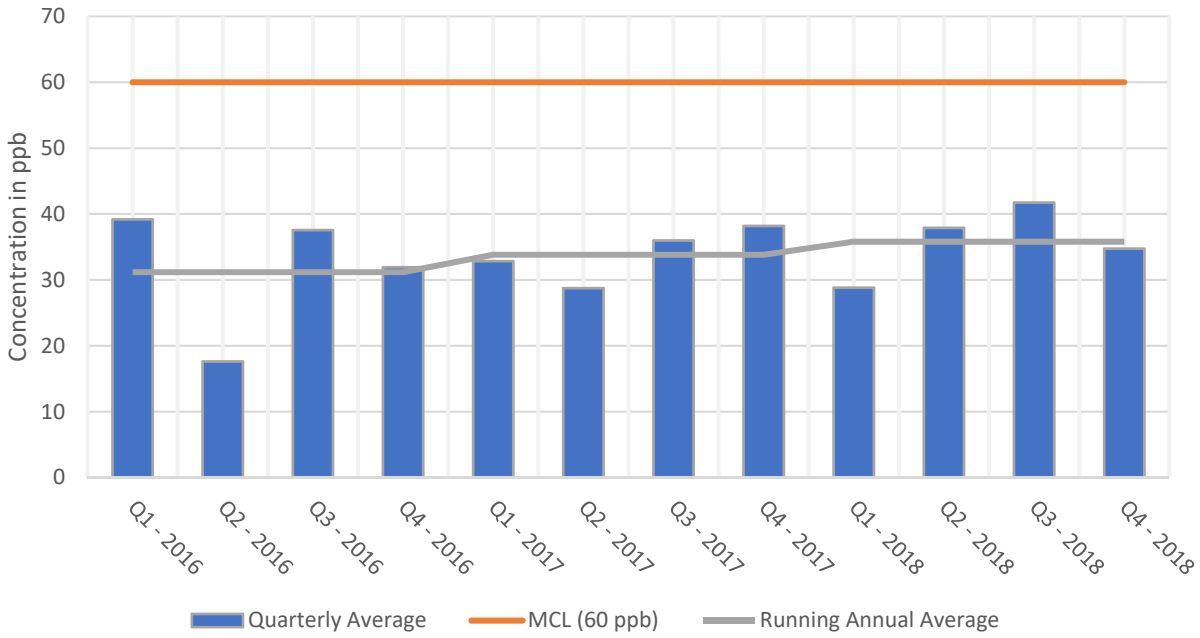

Figure 4-2: Quarterly and Annual Averages of HAA5s (2016 – 2018)

Table 4-3: Locational Running Annual Averages for HAA5s (2016 – 2018)

Site	Year	Q1 (ppb)	Q2 (ppb)	Q3 (ppb)	Q4 (ppb)	LRAA (ppb)
Cemetery Route 52	2016	56.0	23.4	N/A	21.4	33.6
	2017	37.0	40.0	34.0	43.0	38.5
	2018	33.8	42.5	19.7	40.0	34.0
County Building	2016	30.7	14.4	33.1	29.3	26.9
	2017	39.0	21.0	27.0	25.4	28.1
	2018	16.2	30.9	32.1	20.9	25.0
Putnam Hospital	2016	35.9	17.2	43.3	46.0	35.6
	2017	34.2	26.0	38.0	45.7	35.9
	2018	35.9	31.3	58.2	47.5	43.2
Putnam Jail	2016	34.1	15.5	36.3	31.0	29.2
	2017	21.2	28.0	35.9	38.7	30.9
	2018	29.4	46.9	56.9	30.6	40.9

4.1.1.5 NYS Sanitary Code Part 5, Subpart 5-1

NYS regulates all contaminants included in the EPA National Primary and Secondary Drinking Water Regulations, some more stringently than required by EPA. The tables provided in NYS Sanitary Code Subpart 5-1.52 list specific contaminants and their associated MCLs and monitoring requirements. For example, non-mandatory secondary standards set by the EPA for contaminants such as iron and manganese have mandatory MCLs under NYS code. NYS also regulates unspecified organic chemicals with an MCL of 50 ppb.

4.1.2 Future Regulations and Contaminant Concerns

Ensuring safe drinking water is a constantly evolving process based on new science and findings. Some contaminants that are treated for today were not known to exist or to be hazardous in the past. Future regulations are challenging to incorporate into WTP design, so the best available information must be leveraged. Several regulations that are known to be in development and may be implemented in the next several years as well as other contaminants of concern which may be regulated in the future are described in the next sections.

4.1.2.1 Long-Term Lead and Copper Rule Revisions

Recently proposed updates to the LCR aim to further reduce the potential for exposure with a new "trigger level" for lead at 10 ppb. Systems may also need to re-evaluate corrosion control treatment, develop a service line inventory, or implement a full lead service line replacement program.

Water samples indicate that levels of lead are well below the proposed trigger level, as shown in **Table 4-1**. It should be noted that there is minimal opportunity for improvements to be made at the treatment plant to further reduce lead levels by reducing corrosion except additional orthophosphoric acid dosage. Therefore, if the trigger or action level are exceeded in the future, CWD2 may be required to implement other strategies to reduce lead besides corrosion control treatment.

4.1.2.2 Perchlorate Rule

Perchlorate (ClO_4^-) is a naturally occurring and manufactured chemical anion that is commonly used as an oxidizer in rocket propellants, munitions, fireworks, and is known to be present in some fertilizers.

EPA determined that perchlorate meets the requirements for regulation as a contaminant in February 2011. In June 2019, the EPA published plans to regulate perchlorate at an MCL and MCLG of 56 mg/L. Three alternative regulatory options are also being considered:

- An MCL and MCLG for perchlorate set at 18 mg/L
- An MCL and MCLG for perchlorate set at 90 mg/L
- Withdrawal of the agency's 2011 determination to regulate perchlorate in drinking water

Perchlorate sample data is not available for CWD2, though perchlorate has not been an issue for other nearby water suppliers. However, sodium hypochlorite used for disinfection can also form low levels of perchlorate any point after manufacture and while being stored based on temperature, ionic strength, concentration, and presence of transition metal ions, even if compliant with NSF 60. Calculations can be

performed to estimate perchlorate formation, though it is generally advisable to store sodium hypochlorite at or below room temperature and preferably for no longer than 15 days to minimize formation.

4.1.2.3 Disinfection Byproducts (DBPs)

Over the last 30 years, significant research efforts have been directed toward increasing understanding of DBP formation, occurrence and health effects. More than 600 DBPs have now been reported in the scientific literature, though only 11 are currently regulated. It is suspected that the health effects observed in human epidemiologic studies are not caused by regulated DBPs, but are the result of exposure to mixtures of emerging, unregulated DBPs, which may be more toxic than the regulated DBPs.[15] Regulations may change in the future to address currently unregulated DBPs, including nitrogenous DBPs such as nitrosamines, haloacetamides, haloacetonitriles, halonitromethanes, carbonaceous DBPs such as haloacetaldehydes, haloketones, iodinated trihalomethanes, iodinated haloacetic acids, and all of the chlorinated and brominated haloacetic acids. Therefore, it is prudent to plan ahead with new treatment plants by incorporating or providing space for robust, enhanced treatment methods where feasible.

4.1.2.4 Harmful Algal Blooms (HABs)

Toxins from HABs have been contaminating some surface water supplies with increasing severity in recent years. Most algal growth occurs during the summer, though there are some harmful algae that can grow in cold water, even under ice. Water color may turn green, yellowish-brown or red when algal blooms occur. These are the result of blue-green algae, or cyanobacteria, which can produce cyanotoxins, such as microcystins, anatoxins, nodularin, and cylindrospermopsin. The cyanotoxins may be released normally by the cellular organisms (extracellular cyanotoxins) or they may be released once the cell body is damaged (intracellular cyanotoxins), such as when damage is caused by oxidation during certain treatment processes.

Under the Unregulated Contaminant Monitoring Rule (UCMR), sampling was recently required for cyanotoxins. No HABs have been documented to have occurred in Lake Gleneida. However, due diligence raw water sampling was performed by CWD2, which found low levels of certain microcystins. These levels were under the 10-day health advisory level of 0.3 ppb established by EPA in 2015.

Health effects of cyanotoxins are being studied, though exposure can result in a wide range of symptoms from abdominal pain and diarrhea to liver and kidney damage or nervous system effects. A secondary problem caused by HABs is increased organic matter (leading to increased DBPs) and reduced dissolved oxygen content, among other water quality effects, as well as ecological issues. Research is ongoing, though watershed management practices and treatment modifications are the two primary methods of addressing HABs in drinking water supplies. Conventional water treatment can generally remove intact cyanobacterial cells and low levels of cyanotoxins. However, severe HAB events may be more difficult to treat and require additional treatment such as GAC or PAC and treatment modification such as minimizing pre-chlorination or increasing post-chlorination. HAB events require immediate response, so it is recommended to have treatment strategies in place ready to be implemented at all times.

[15] Water Research Foundation Project No. 4560. "GAC Control of Regulated and Emerging DBPs of Health Concern", 2019.

4.1.2.5 Per- and Poly-fluoroalkyl Substances (PFAS)

As noted in Section 2.1.3.1, PFAS are a group of man-made fluorinated organic chemicals that include PFOA, PFOS, GenX and many other chemicals. Due to the pervasive use of these chemicals with various common products, most people have been exposed to PFAS. Furthermore, PFAS are persistent in the environment and can remain in the human body for long periods of time, resulting in bioaccumulation. The health effects of various PFAS compounds are being studied. EPA included sampling for several PFAS compounds in UCMR3, which led the EPA to issue a health advisory level of 70 parts per trillion (ppt) in 2016. Various states have implemented or plan to implement more stringent regulations. EPA has also proposed an action plan for further federal regulation of PFAS. In NYS, PFOA and PFOS have been proposed to be regulated at an MCL of 10 ppt each.

Treatment for PFAS compounds is challenging and typically includes either GAC, ion exchange, nanofiltration or reverse osmosis primarily dependent upon the specific PFAS compounds to be removed.

Since low levels (less than 5 ppt) of PFOA, PFOS and PFHxA were detected in Lake Gleneida during due diligence sampling as part of this report, it is recommended that further sampling be performed during detailed design at the entry point and directly from the lake to confirm its presence in the water supply or if the detections were due to cross-contamination from piping components in the raw water sampling tap.

4.1.2.6 Other Emerging Contaminants

Contaminants of emerging concern (CECs) include a variety of chemical compounds, industrial pollutants, and human byproducts that have entered waterways and are unregulated on the federal level and in most states. These CECs may be found in low concentrations in drinking water supplies that are difficult to detect at the ppb, ppt, or even parts per quadrillion (ppq) level. Risks to public health are being studied and are uncertain for the most part. Specialized treatment systems are usually required for removal from water, including advanced oxidation processes or reverse osmosis. Some of these contaminants which receive heightened attention are listed below, though many more exist.

- 1,4-dioxane
- Quinoline
- Pharmaceuticals
- Endocrine disruptors
- Microplastics

NYS Sanitary Code Subpart 5-1.52 Table 16 provides a list of additional contaminants not commonly monitored that must be reported when detected. Considering the strict control of the watershed, it is highly unlikely that any of these contaminants would be present in Lake Gleneida, though it is recommended that sampling be performed during detailed design to confirm this. Additionally, other contaminants currently regulated are undergoing further scrutiny due to reevaluation of health risks such as manganese, strontium, and chromium.

4.1.3 Treatment Goals

The plant is planned to be designed to meet current and anticipated water quality regulations and goals in accordance with the guidelines set forth in the *Recommended Standards for Water Works* (2018 edition) to meet the public water supply and public health needs of the Town of Carmel, and to comply with State and Federal drinking water standards and regulations. The recommended finished water treatment goals are summarized in **Table 4-4**. These goals meet or exceed State and Federal requirements. The primary goals for target organisms that any treatment train must achieve surface waters are 2-log, 3-log, and 4-log reduction of *Cryptosporidium*, *Giardia* and viruses, respectively. The other goals are generally met by using any of these acceptable treatment trains or with ancillary treatment systems.

Table 4-4: Key Finished Water Treatment Goals

Constituent	Goal
Microbiological	
Cryptosporidium parvum oocysts	≥99% removal and inactivation (2-log)
Giardia lamblia cysts	≥99.9% removal and inactivation (3-log)
Viruses	≥99.99% removal and inactivation (4-log)
Total and fecal coliform	Negative/absent from all finished water samples
Disinfection By-Products	
Trihalomethanes (total)	<80 µg/L (LRAA)
Haloacetic acids (HAA5)	<60 µg/L (LRAA)
Inorganics	
Iron	≤0.10 mg/L
Manganese	≤0.02 mg/L
Aluminum	≤0.05 mg/L
Other	
Turbidity	≤0.10 NTU for 95% of monthly measurements
Total organic carbon	>45% removal, or <2 mg/L in filtered water
True color	≤5 cu
Corrosion control	Maintain finished water pH of 7.5-8.5 and phosphate dose of 0.7-1.4 mg/L
Chlorine residual	Maintain >0.2 mg/L throughout distribution system

4.2 Treatment Process Identification

Treatment processes and their applicability to the Lake Gleneida water are presented in this section. Conventional treatment is the most commonly used surface water treatment approach and is appropriate for the Lake Gleneida water supply based on the raw water quality. It generally consists of coagulation, flocculation, clarification and filtration followed by disinfection. It is often preceded by pre-oxidation or oxidation takes place concurrently. Clarification may be eliminated in some cases or membrane processes may be incorporated.

Some plants also use other treatment processes to address particular source water characteristics. Various other treatment processes such as activated carbon, aeration, ion exchange, MIEX®, advanced oxidation, precipitative softening, pressure filtration, slow sand filtration, cartridge filters, reverse osmosis, electrodialysis, etc. have been eliminated from consideration for the proposed plant based on feasibility, raw water quality data, or current and anticipated future regulations.

4.2.1 Coagulation

Coagulation is a process by which coagulant chemicals are added and subsequently mixed rapidly (**Section 4.2.3**) to spread thoroughly throughout the water. This step promotes the formation of particulate agglomerates which will either settle or be filtered. Small particles present in surface waters are too small to be effectively separated from the water, so removal must involve aggregation of small particles into larger sized particles which can be effectively separated from the water.

The *Recommended Standards for Water Works* requires that a primary coagulant be used for surface water plants using direct or conventional filtration though it can be used as part of pre-treatment for membrane filtration.

Numerous coagulants are available, but the most common ones used are aluminum sulfate (alum), polyaluminum chloride (PACl), ferrous sulfate, ferric sulfate, and ferric chloride. Selection of a coagulant is made based on various factors including cost, availability, effectiveness, residual sludge disposal methods, chloride/sulfate contribution, concentration and quality of sludge produced. Optimum coagulation typically occurs in the pH range of 5 to 7, which commonly results in the need to add an acid such as sulfuric acid to the raw water to reduce pH below 7 prior to coagulation for many water supplies which naturally have high pH, such as Lake Gleneida.

For the purposes of this report, it is assumed that alum will be used as it is a commonly used coagulant in this region and will add sulfate instead of chloride to the water supply, which is preferable due to the elevated chloride level noted in **Section 2.1.3**. This would reduce the ratio of chlorides to sulfates, which should reduce the likelihood of any corrosion in the distribution system. Further evaluation of this assumption should be performed during the detailed design phase.

Aluminum-based coagulants neutralize negatively charged colloidal particles and allow positively charged particles to attract and form floc. As compared to other aluminum-based coagulants, such as PACl, alum produces more residual solids under stoichiometrically equivalent doses. Polymers used in addition to aluminum-based coagulants improve the coagulation efficiency by adsorbing insoluble metallic ions. The aluminum-based sludge is likely to be preferable if being disposed to the local sewer system based on the CSD2 wastewater treatment plant scheme, though CSD2 should be consulted prior to selection of a coagulant.

4.2.2 Pre-Oxidation

Depending on the raw water quality or treatment goals, oxidants may be injected at the head of the treatment plant. Common oxidants include chlorine, ozone, and permanganate. The oxidants may be used to convert metals such as iron and manganese into their insoluble form for filtration or they may be used to assist with taste and odor issues. Neither of these are currently a concern with the existing source water, but it is recommended to incorporate the ability to inject an oxidant in the future if needed. This is commonly performed using chlorine that is already used for post-chlorination disinfection by providing space for a separate pre-treatment chlorine dosing system. DBP formation is a concern when pre-chlorinating. However, DBP formation is not expected to be higher than current levels as pre-chlorination is currently performed with the existing treatment plant. Powder activated carbon (PAC) can also be considered to assist with reducing DBPs or taste and odor issues.

4.2.3 Rapid Mixing

Rapid mixing is required to disperse coagulant (and pre-oxidants in many cases) as quickly and evenly as possible in the raw water. Several mixing alternatives can be used to achieve this goal, including mechanical, hydraulic, static, and pump mixing using pressurized water jets. Mechanical, hydraulic, and static mixing were considered for the proposed plant and static mixing was preferred for this application.

Static mixing is described as any mixing procedure with no moving parts that uses the hydraulic energy of the water flow to intentionally create turbulent flow. The *Recommended Standards for Water Works* states that static mixing can be considered if flow is constant and high enough to maintain a turbulence that will complete the necessary chemical reaction. This is either done by adding excess fittings or by running the raw water past several angled baffles creating mixing eddies in the flow. Static mixing can either be in-line or in-channel. In-channel static mixing is performed by installing a "mixing box" into a raw water flow channel. In-line static mixing is a similar process performed in a closed raw water pipeline. Velocities can be kept high even at smaller design flows. Due to higher head loss associated with the enclosed turbulent flow, in-line static mixing requires more available head than in-channel static mixing. Although in-channel static mixing is a more favorable option with respect to process headloss, layout conditions may warrant an in-line static mixer. Both in-line and in-channel static mixing may be evaluated further in detailed design.

4.2.4 Flocculation

After the chemical application and rapid mixing stages, the process water passes through a flocculation stage in order to produce a floc that is amenable to clarification and filtration. Flocculation is designed to create collisions between particles aiding in the propagation of particle size.

Flocculation mixers are generally designed to meet a maximum "G-value", with the ability to turn down the speed to achieve lower values. The goal of flocculation is to maximize fluid motion while minimizing the shear forces that may lead to floc breakup.

The *Recommended Standards for Water Works* provides guidelines for a flocculation process:

- Minimizing short-circuiting and destruction of floc can be accomplished by:
    - Adequate inlet/outlet design
    - Series compartments
    - Ability to isolate individual basins
    - A drain and/or pumps shall be provided to handle dewatering and sludge removal.
- The detention time for floc formation should be at least 30 minutes with consideration to using tapered (i.e., diminishing velocity gradient) flocculation (note that reduced detention time of 5-10 minutes is more typical for flotation clarification).
- Flow-through velocity should be between 0.5 to 1.5 feet per minute.
- Agitators must be driven by variable speed drives with the peripheral speed of paddles ranging from 0.5 to 3.0 feet per second.
- External, non-submerged motors are preferred.
- Baffling may be used to provide for flocculation in small plants only after consultation with the reviewing authority. The design should be such that the velocities and flows noted above will be maintained.

- Flocculation and clarification basins should be as close together as possible.
- Velocity of flocculated water through pipes or conduits to clarification basins must be between 0.5 to 1.5 feet per second.
- If flow is split, it is recommended that a means of measuring and modifying the flow to each train or unit be provided.
- Consideration should be given to the need for additional chemical feed in the future.
- A pH meter, jar test equipment and titration equipment for hardness and alkalinity should be available for testing and confirming operation of coagulation and flocculation.

4.2.5 Clarification

The clarification step consists of reducing the concentration of suspended matter in water prior to filtration. Each clarification process presented in the following sections offers advantages when considering footprint, energy requirements, residuals solids handling, mechanical complexity, and hydraulic residence time.

As an initial screening process, the average and maximum turbidity, color and TOC for Lake Gleneida were plotted on **Figure 4-3** which is used as a guide to select an appropriate clarification process based on the raw water quality. These plots indicate that under average conditions, both DAF and direct filtration (no clarification) could be considered. However, under maximum (worst-case) water quality conditions, DAF is most appropriate for reservoirs while settling is more appropriate for rivers.

A more detailed review is performed for each clarification process in the following sections. The three main clarification methods that will be evaluated in this report are conventional sedimentation, inclined plate settling, and dissolved air flotation. Other types of clarification methods such as solids contact clarifiers are not evaluated as they are generally not applicable to CWD2's water supply and are not commonly used in this region.

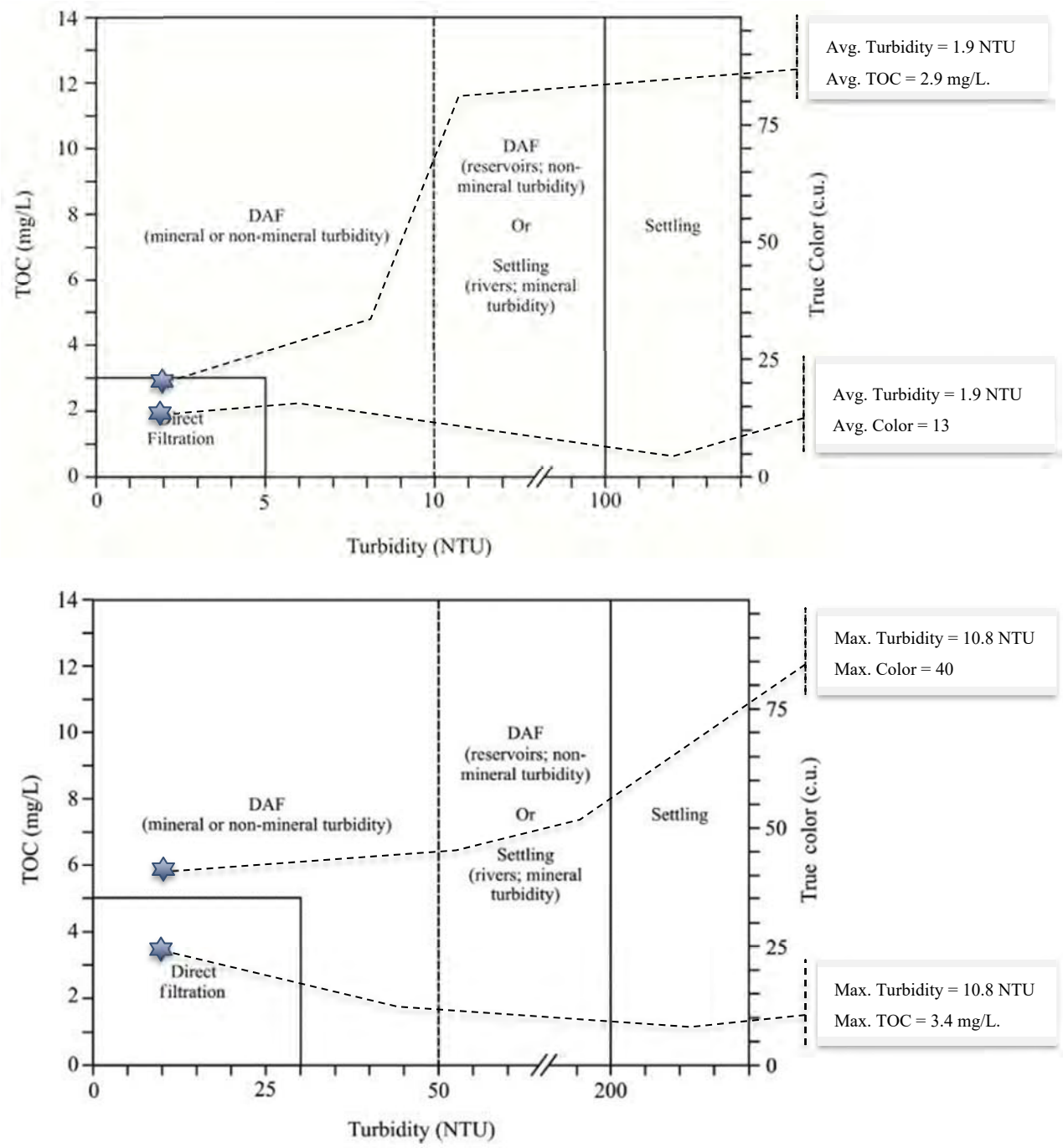

Figure 4-3: Lake Gleneida Average and Maximum Water Quality Plotted on "Water Quality Treatment Selection"[16]

[16] Valade et al., Journal of Water Supply: Research and Technology – Aqua; September 2009, 58 (6).

4.2.5.1 Conventional Sedimentation

The conventional sedimentation process functions by allowing gravity to settle particles. The efficiency of sedimentation basins is affected by the particle settling velocity, the surface area of the tank, and the flow rate.

Typical loading rates for conventional sedimentation range from 0.5 to 1.0 gpm/sf. The acceptable flow rates vary with the nature of the settled solids, water temperature, and hydraulic characteristics of the settling basin. The low loading rate results in long detention time (typically three to four hours for gravity settling), which allows an operator time to adjust to changes in raw water conditions (i.e. turbidity spike).

A solids removal efficiency of 90 to 95 percent can be achieved through an optimized sedimentation basin. Assuming proper pre-treatment, outlet turbidities from basins should range from 0.5 to 1.5 NTU, with a normal performance of about 0.8 to 1.0 NTU. The metal-salt coagulant residuals are usually less than 1 percent solids when drawing off from sedimentation basins without additional thickening.[17]

Sedimentation has the benefit of being low-energy, highly reliable, and robust, however, large basins are required resulting in a large footprint and capital cost. Additional disadvantages include:

- Basins in this region are typically required to be covered or installed indoors;
- Solids must be removed so they do not go anoxic or become re-suspended;
- Additional thickening is required to achieve solids concentrations greater than 1 percent;
- Uncovered basins can be susceptible to algal growth resulting in pH swings and taste and odor problems;
- They have difficulty removing algae or light floc; and
- Raw water treatment is critical to the efficiency of the process.

The *Recommended Standards for Water Works* provide additional criteria on sedimentation unit design.

4.2.5.2 Inclined Plate Settling (IPS)

This process, as with the conventional sedimentation process, depends on the formation of a "settleable" floc and gravity settling for particle removal. Plate settler units consist of many parallel rectangular plates typically set at a 55-degree angle. Flocculated water enters the bottom of the plates through entry ports that are large enough to maintain laminar flow. The water flows upwards between the plates and the clarified water exits through a collection weir or orifices. Solids removal occurs as particles settle downward, contact the plate surface, and then slide down to the collection zone, as shown in **Figure 4-4**. Like conventional sedimentation, continuous sludge collection equipment is required for residuals removal.

The typical overall basin loading rate to the plate settlers is higher than that of conventional sedimentation basins, resulting in a smaller footprint for a given plant capacity. Although the settling footprint is reduced when compared to conventional sedimentation, the total flocculation hydraulic detention time is still required to be 30 to 45 minutes. Typically, design loadings for plate settler clarifiers are around 0.25 to 0.35 gpm/ft^2 of effective plate area or 3 to 4 gpm/ft^2 of plan area (overall basin loading rate).

[17] AWWA/ASCE, "Water Treatment Plant Design", 5th Edition.

Solids removal efficiency via this method is comparable to conventional sedimentation at 90 to 95 percent. Assuming proper pretreatment, outlet turbidities from a plate settler should range from 0.5 to 1.5 NTU, with a normal performance of about 0.8 to 1.0 NTU.

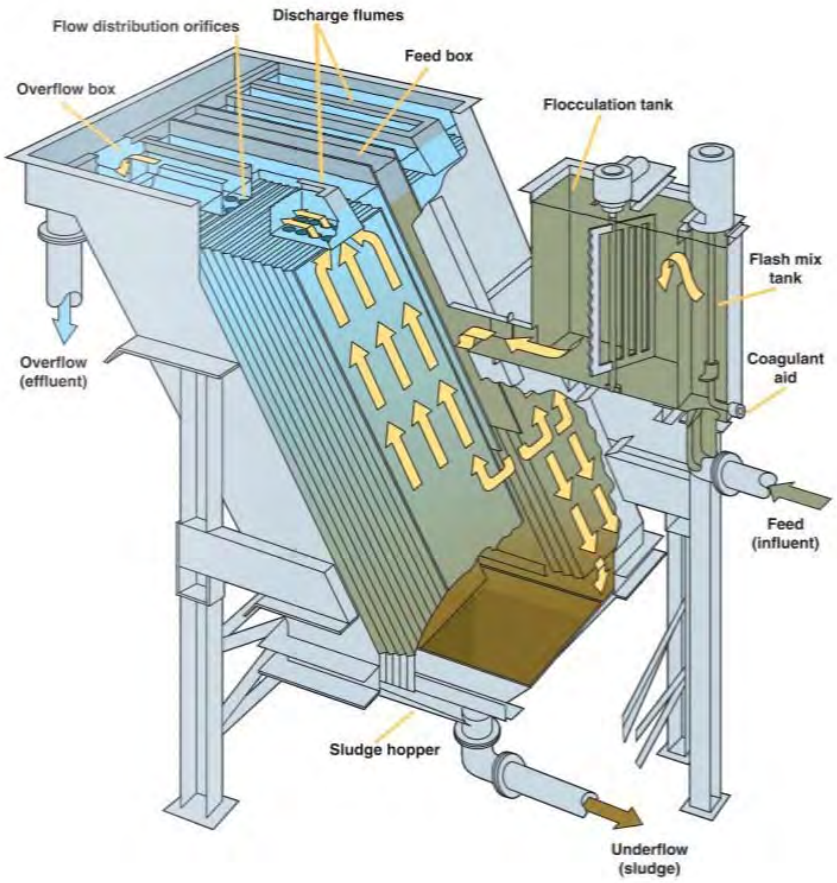

Figure 4-4: Example Inclined Plate Settler[18]

When designing plate settler units, thickeners can also be incorporated into the same basin footprint stacked below the plate settlers. This allows for both clarification and thickening to take place in one process unit. This combined process is often referred to as Inclined Plate Settler Thickeners (IPST). There are two streams generated by the inclined plate settler thickening unit, clarified water and thickened sludge. The thickener is typically sized using a maximum design underflow rate of 10 pounds/day/ft^2. After determining the plate area and thickening area required based on the above loading rates, the dimensions of the basins are determined using the controlling parameter or the parameter that requires the largest basin. Thickened sludge concentrations between 2 and 6 percent are anticipated from the thickeners.

IPST tanks are typically square tanks that transition to a circular tank in the area below the plates to facilitate thickening. Plate packs extend approximately ten feet below the water level and are located above a square-

[18] Parkson Co. Lamella EcoFlow Inclined Plate Settler Schematic.

to-circular transition zone. The lower circular portion of the tank functions as a solids collection tank ("thickener"), which has a conical bottom and mechanical scraper for sludge removal. The rotating scraper mechanism is driven by variable speed motor to assist in sludge thickening and discharge. The thickener mechanism is designed to slowly stir the solids to promote further flocculation and water separation. These mechanisms typically operate continuously.

Inclined plate settlers are widely used, reliable, and robust and have the added benefit of a reduced footprint when compared to conventional settling. However, similar to the sedimentation basins, inclined plate settler solids removal is maintenance intensive and plates have difficulty removing algae or light floc.

4.2.5.3 Dissolved Air Flotation

DAF is a relatively new clarification process compared to settling, though it has seen increasing use for the past few decades around the US, particularly the northeast region. It functions by separating floc particles from the water by floating them to the tank surface for removal. To achieve this, approximately 8 to 12 percent of the DAF process water is recycled from the DAF effluent and introduced to a high-pressure system where it becomes saturated with compressed air. This air-saturated water is then reintroduced into the process stream at the head of the DAF basins through specially designed injection nozzles. Upon depressurization, the dissolved air comes out of solution forming micro-bubbles (10-100 μm in diameter) that attach to the contaminants in the water and aid in floating them to the surface (**Figure 4-5**).

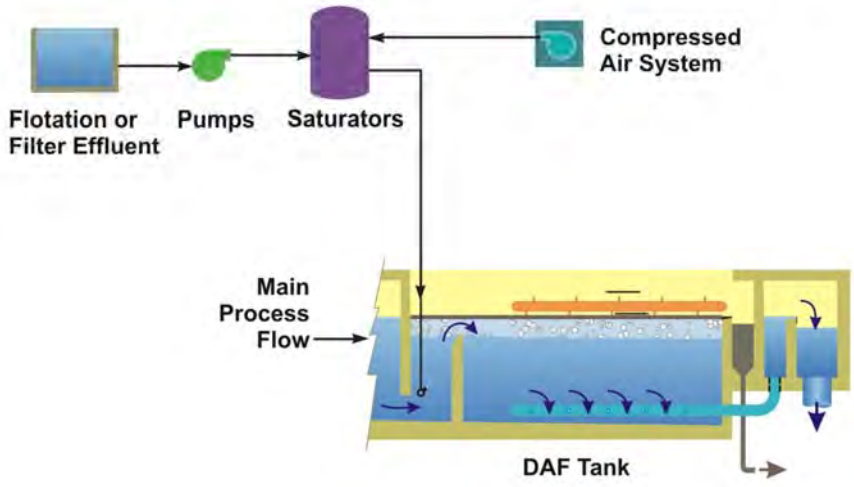

Figure 4-5: Dissolved Air Flotation Diagram

The DAF process is particularly well suited to impounded water sources, such as reservoirs and lakes, where the suspended particles are of low density (e.g. algae) and have high color and significant organic content. Flotation is more effective than settling in removing low-density particles which are difficult to settle, especially in colder water. A side benefit of DAF is that some taste-and-odor causing compounds can be readily stripped by the dissolved air in the water. It should also be noted that DAF can be combined with rapid rate gravity media filters in a single basin in what is referred to as a "stacked DAFF" basin, which can further reduce footprint requirements.

There are operating DAF/filtration plants within a 50-mile radius of Carmel with similar impounded reservoirs and raw water quality, including:

- Carmel Water District No. 8 WTP treating water from Lake Mahopac
- NYC's Croton WTP treating water from the Croton watershed
- Warner WTP in Fairfield, CT treating water from Hemlocks Reservoir
- Stamford WTP in Stamford, CT treating water from North Stamford Reservoir
- Peekskill WTP in Peekskill, NY treating water from the Campfield Reservoir
- Catskill Aqueduct WTP in Cortlandt Manor, NY treating water from the Catskill Aqueduct

Similar to these operating plants, Lake Gleneida water has a low turbidity and low to moderate TOC. Based on experience with similar waters in the region, DAF/filtration is applicable for the proposed WTP.

4.2.5.4 Comparison of clarification processes

Some advantages and disadvantages of the three clarification processes are listed for ease of comparison in **Table 4-5**.

Table 4-5: Clarification Alternatives Comparison

Clarification Method	Advantages	Disadvantages
No Clarification	• No building space required	• Minimal protection from variation in water quality • Future regulations or changes in water quality may require clarification
Conventional Sedimentation	• Low energy • Low mechanical complexity • Low headloss • Low operating costs • Effective for high turbidity events	• Long detention time • Largest footprint • Sludge thickening required
Inclined Plate Settling	• Smaller footprint than conventional settling with further gains by locating the thickener below the inclined plates • Low energy • Low mechanical complexity • Process is characterized by low headloss and operating costs • Effective for high turbidity events	• Larger footprint compared to DAF • Submerged mechanical equipment • Potential maintenance challenges • Sludge thickening required
Dissolved Air Flotation	• Smallest footprint with added space gains from reduced floc tanks and smaller clarification tanks • Effective at removal of low-density particles such as algae and NOM • No sludge thickening required • Taste and odor removal • Lower clarified turbidity resulting in longer filter runs than settling processes	• Highest energy consumption • More complex mechanical equipment • Potential difficulty treating high turbidity events

4.2.6 Filtration

Filtration systems employed at water treatment facilities function by having water pass through a porous medium that removes solids by physical and chemical means. In some filters, biological action plays a significant role as well. Filtration is a secondary barrier used for surface water that helps increase the efficiency of the disinfection process. Filtration preceded by coagulation, flocculation, and clarification is commonly referred to as conventional treatment. In direct filtration, the clarification step is omitted, and flocculation facilities are reduced in size or may be omitted as well. Different types of filtration systems can be used for different applications, since each has different removal capabilities (see **Figure 4-6**).

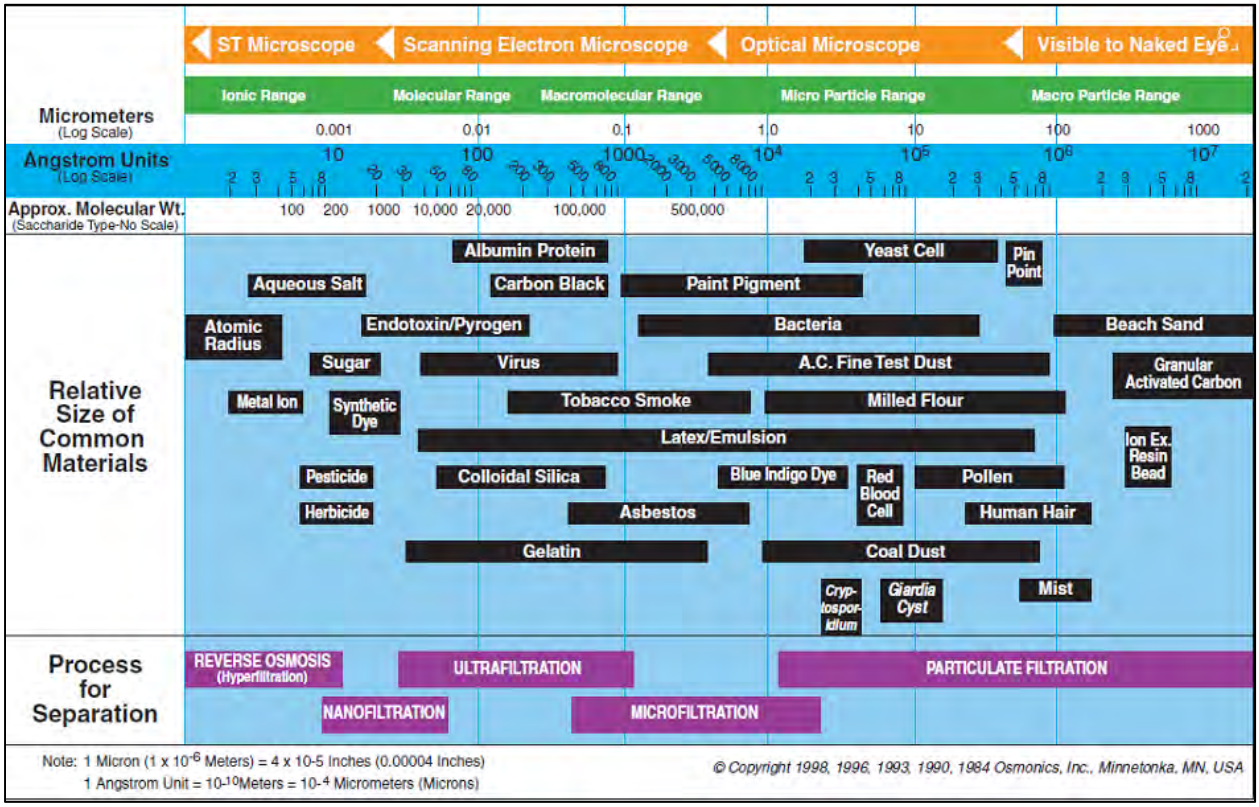

Figure 4-6: Filtration Treatment Spectrum

Filtration is the most important and final solids removal process in a treatment plant. Lowering turbidity is crucial in protecting public health. High filtered water turbidity can have two important consequences. First, pathogen (e.g., *Giardia* and *Cryptosporidium*) removal in filters is directly related to filtered water turbidity. Second, turbidity can interfere with the disinfection process because the suspended particles can shield microorganisms from the disinfectant. Therefore, lower turbidity results in increased pathogen removal and more effective disinfection and better public health protection. The SWTR requires combined filtered water turbidity be less than or equal to 0.3 NTU in 95% of the measurements taken. In addition, the AWWA Partnership for Safe Water and many utilities have a goal of less than 0.1 NTU.

4.2.6.1 Diatomaceous Earth Filtration

As mentioned in **Section 2.2.2.2**, DE filtration is currently being used at the existing WTP, a schematic of which is provided in **Figure 4-7**. This system is used for successful treatment of low-level turbidity in raw water. They find limited use in most modern WTPs due to hydraulic, sludge disposal, and other operational considerations. Future regulations and changing water quality conditions may also cause challenges with compliance, particularly with DBPs due to less efficient dissolved organics removal.

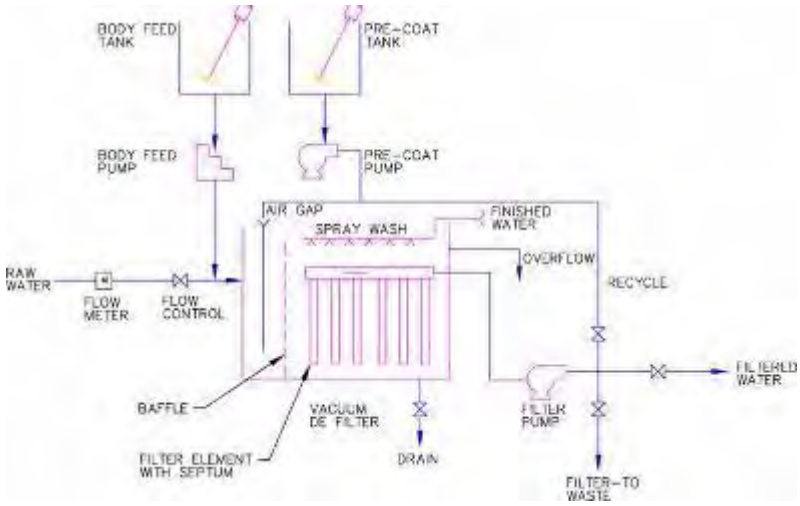

Figure 4-7: Typical DE Vacuum Filtration Process Schematic

4.2.6.2 Rapid-Rate Gravity Media Filtration

Gravity media filtration refers to the use of water level or pressure above one or more granular media layers to filter water. The filtration rate may vary from 2 to 10 gpm/ft^2 typically. However, NYSDOH generally limits the maximum filtration rate to 3-6 gpm/ft^2. Filtration performance is impacted by media type, effective size, uniformity coefficient, depth, and filtration loading rate. The filter media type and configuration are established during conceptual design, including the bed depth to allow for possible future biofiltration.

Filters require periodic backwashing for cleaning. A combination of water and air injection is used to remove particulate matter which has built up on the filter. The waste backwash water (WBW) produced through this process is to be transferred to the waste backwash water tank. Following filter backwash, the filter media "ripens" prior to placing the filter back on-line in filtration mode. After backwash, the filter-to-waste (FTW) system directs the initial "first-flow" of low-quality filtered water to be wasted to the waste backwash water tank. This combined WBW and FTW water can then be recycled to the head of the WTP prior to all other treatment processes as per the requirements of the Filter Backwash Recycle Rule.

4.2.6.3 Membrane Filtration

Membranes contain very fine pore openings that allow water to pass through and block the passage of any contaminant larger than the pore diameter. Membranes used in water treatment are classified by their pore diameter. Classifications, from largest pore diameters to smallest, are microfiltration (MF), ultrafiltration

(UF), nanofiltration (NF), and reverse osmosis (RO). MF and UF are used in water treatment for particle, sediment, algae, bacteria and virus removal. MF and UF are effective in the removal of Giardia and Cryptosporidium. While intuitively, UF should be capable of significantly higher level of removal capability, in the application of surface water filtration, both MF and UF are regarded as equivalent technologies in terms of final water quality. RO is typically used for desalination and demineralization applications and home drinking water units. NF and RO are used to remove dissolved organic carbon (DOC) and dissolved contaminants such as arsenic, nitrate, pesticides, radionuclides and PFAS as well as ions such as calcium, magnesium, sodium and chloride. Therefore, NF and RO are not being considered for the proposed WTP.

The type of membrane used depends on the constituents to be removed from the water source. During water treatment, water is typically pumped against the surface of the membrane, but may be pulled through the membrane by a vacuum (submerged/immersed membrane). The water pressure forces water through the membrane and the constituents that do not pass through form a waste stream or accumulate on the membrane and then are removed during backwash depending on the type of system utilized.

Membrane systems are provided by several vendors including Pall Corporation, Memcor (DuPont) and Nanostone, each with their own proprietary system. Pall and Memcor both utilize polymeric membranes, whereas Nanostone uses ceramic membranes, which is a more recent technology advancement.

The operation of membrane systems is typically almost fully automated. The operation of membranes includes monitoring and testing for membrane filtration rate and membrane integrity. This is accomplished by pressure decay testing and sonic testing. Broken or damaged membrane fibers must be repaired or replaced. Operators can usually troubleshoot basic problems with membrane systems, but more complicated issues can occur which may warrant the services of a membrane specialist or manufacturer’s service technician.

Backwash water can be discharged to waste or recycled to the head of the plant depending on the design. Backwashing may be by air or water, depending on the plant. Over time, the membranes require a more aggressive cleaning to remove accumulations and this is accomplished with the use of a proprietary chemical and caustic solution through a clean-in-place (CIP) process. This process results in the discharge of a waste stream that requires proper disposal.

Membrane fouling can occur depending on the constituents in the water being filtered such as particles, organics, iron/manganese, or microorganisms. Fouling can be in the form of cake formation or pore blockage and may be reversible or irreversible. Certain types of membranes can be damaged by chlorine.

MF and UF are effective treatment methods for high-quality, low-turbidity surface waters. Additional treatment is typically required to provide complete 4-log virus reduction. However, pre-treatment is sometimes warranted where water quality can suddenly change, for example, during lake turnover. Pre-treatment can consist of coagulation only or it can include flocculation and clarification in some cases. Operational experiences from numerous plants indicates that pre-treatment results are difficult to compare from one plant to another and are highly dependent on individual water qualities and process schemes. It is therefore generally recommended that bench- or pilot-scale testing be performed to determine treatment applicability and optimize performance of the system.

4.2.7 Disinfection

Treatment of surface water must include disinfection sufficient to meet all applicable surface water treatments rules as mentioned in **Section 4.1.3**. A disinfectant residual must also be maintained throughout the distribution system. Ozone is not considered for disinfection for this reason, though it can be used as an oxidant. CWD2 currently uses sodium hypochlorite for disinfection as discussed in **Section 2.2.2.3**.

4.2.7.1 Chlorination

Sodium hypochlorite, calcium hypochlorite, chlorine gas, chlorine dioxide are various methods of chlorinating water supplies. It is recommended to continue using sodium hypochlorite disinfection method with the proposed WTP. Chlorine gas would be stored at a higher purity, eliminating the concern of perchlorate production discussed in **Section 4.1.2.2**, though it would be present safety concerns and challenges with dosing at low flows. Calcium hypochlorite is simple, but would be more labor-intensive and the consistency of the solution strength can be a problem at times. Chlorine gas and calcium hypochlorite would likely require slightly less building space. However, neither of these options provide significant advantages over sodium hypochlorite.

Chlorine dioxide may assist with reducing DBP formation and is highly soluble in water, but it would be more complex and usually requires storage of other chemicals such as sodium chlorite, chlorine gas, hydrochloric acid, or a proprietary blend of chemicals used for generating chlorine dioxide on-site. Therefore, sodium hypochlorite is the preferred chlorination method for CWD2.

Each proposed treatment train option will require sodium hypochlorite for primary disinfection and is planned to provide the pathogen inactivation as shown in **Table 4-6** to **Table 4-8**. Sodium hypochlorite would be added downstream of the filters and upstream of the clearwell, sized to provide adequate contact time to provide the necessary log inactivation.

4.2.7.2 Ultraviolet Irradiation

UV disinfection cannot be used alone as it does not provide a disinfectant residual, but it may be included to provide a secondary disinfection barrier (in combination with chlorination). The benefit would be to exceed the most stringent requirements of LT2ESWTR, removing the requirement for continued source water monitoring. It would also mean chlorine contact time is only needed for virus inactivation, resulting in a significantly smaller clearwell. However, it is a costly method that is not required with the maintenance of source water monitoring. During detailed design, provisions may be incorporated for future installation of a UV system.

4.2.7.3 Chloramination

Chloramination is a disinfection method using chlorine in conjunction with ammonia to generate mono-, di-, and tri-chloramines. Chloramines are longer-lasting in the distribution system and can produce significantly lower THMs and HAAs, which has led to their use in recent years for complying with DBP regulations. However, chloramines can produce different types of DBPs compared to chlorination, such as nitrogenous DBPs. Nitrification can also occur, whereby the reduced nitrogen compounds (i.e. ammonia) is oxidized by certain microbes into nitrate and nitrite, which have harmful health effects at elevated levels.

It can also interfere with corrosion control practices or biofilms in distribution piping and storage tanks, as it changes the chemical properties of the finished water. Therefore, switching to chloramines is not recommended.

4.2.8 Corrosion Control

Corrosion control is a complex topic and numerous factors must be considered. Changing the treatment method necessitates re-evaluation of the corrosion control method to ensure no adverse effects will occur causing leaching of lead and copper into the distribution system. The proposed revisions to the LCR, may require bench-scale testing with pipe loops to determine optimal corrosion control techniques.

For the purposes of this report, it is assumed that the current corrosion control practice used by CWD2, involving dosing finished water with orthophosphoric acid and maintaining pH above 7.5, will be used with the proposed WTP. Depending on the treatment train, this likely requires the addition of a base, such as sodium hydroxide, to the finished water to raise the pH above 7.5 if the pH is lowered at the head of the plant for coagulation and filtration optimization.

Another consideration is the chloride (Cl^-) to sulfate (SO_4^-) mass ratio (CSMR). CSMR greater than 0.5 indicates a risk of corrosion in the distribution system.[19] The current raw water CSMR is well over 0.5, as evidenced by the water quality presented in **Table 2-2**. Therefore, efforts should be taken to reduce this ratio as much as possible. One method is to use sulfate-based treatment chemicals such as alum or sulfuric acid instead of chloride-based chemicals such as polyaluminum chloride or hydrochloric acid.

4.3 Treatment Train Options

As discussed in **Section 4.1.1.1**, the SWTR requires 2-log, 3-log, and 4-log reduction of *Cryptosporidium*, *Giardia*, and viruses, respectively. The SWTR provides specific log removal credits that can be applied for each type of treatment train. However, the SWTR does not mention DAF, so *Giardia* removal is based on direct filtration credit (2-log). Clarification processes such as DAF are regarded as conventional treatment for the purposes of awarding log removal treatment credit for *Cryptosporidium*, according to the LT2EWSTR. The Town can elect to provide the minimum of 5.5-log removal/inactivation of *Cryptosporidium* to exceed the most stringent requirements of LT2ESWTR, removing the requirement for continued source water monitoring. However, this would require additional contact time disinfection or a secondary disinfectant such as UV disinfection, which is more costly than continuing to perform source water monitoring for *E. Coli* only.

It should be noted that additional *Cryptosporidium* log reduction credits can be awarded by NYSDOH for well-operated plants by demonstrating consistent low-turbidity effluent from individual and combined filters, by meeting the requirements of a state-approved protocol, or if a state-approved watershed control program is utilized.

[19] Water Research Foundation Project No. 4088. "Chloride to Sulfate Mass Ratio (CSMR): Changes from Water Treatment and its Impact on Lead Leaching in Potable Water", 2019.

Based on the preceding information and review of potential treatment processes, the multitude of treatment trains available to CWD2 are reduced to the following options:

1. Diatomaceous Earth Filtration
2. Direct Rapid-Rate Gravity Media Filtration
3. Conventional Treatment
    - Sedimentation with Rapid-Rate Gravity Media Filtration
    - Inclined Plate Settling with Rapid-Rate Gravity Media Filtration
    - Dissolved Air Flotation with Rapid-Rate Gravity Media Filtration
4. Membrane Filtration
    - Direct Membrane Filtration
    - Membrane Filtration with Pre-Treatment (Coagulation and/or Clarification)

The following tables present the required and provided log removal/inactivation associated with each treatment train and the additional log inactivation necessary to be provided by disinfection. Generalized process schematic figures are provided on the following pages, and previously in **Figure 2-8** for DE filtration.

Table 4-6: Log Removal/Inactivation for DE Filtration

Target Organism	Required Log Removal/ Inactivation	Provided Log Removal/Inactivation		
		Diatomaceous Earth Filtration	Disinfection	Total
Cryptosporidium	**2.0**	3.0	0.0	**3.0**
Giardia	**3.0**	2.0	1.0	**3.0**
Viruses	**4.0**	1.0	3.0	**4.0**

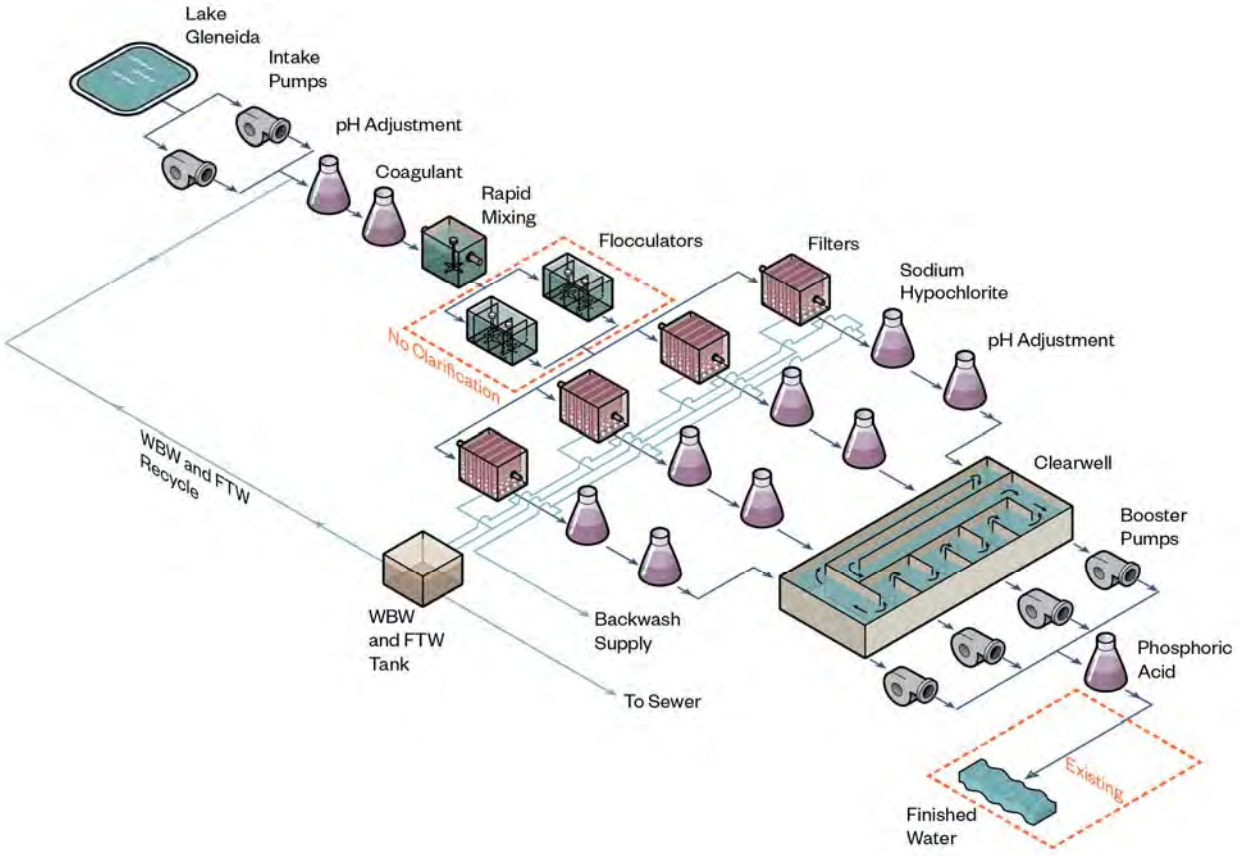

Figure 4-8: Direct Filtration Treatment Process Schematic

Table 4-7: Log Removal/Inactivation for Direct Filtration

Target Organism	Required Log Removal/ Inactivation	Provided Log Removal/Inactivation		
		Direct Filtration	Disinfection	Total
Cryptosporidium	**2.0**	2.5	0.0	**2.5**
Giardia	**3.0**	2.0	1.0	**3.0**
Viruses	**4.0**	2.0	2.0	**4.0**

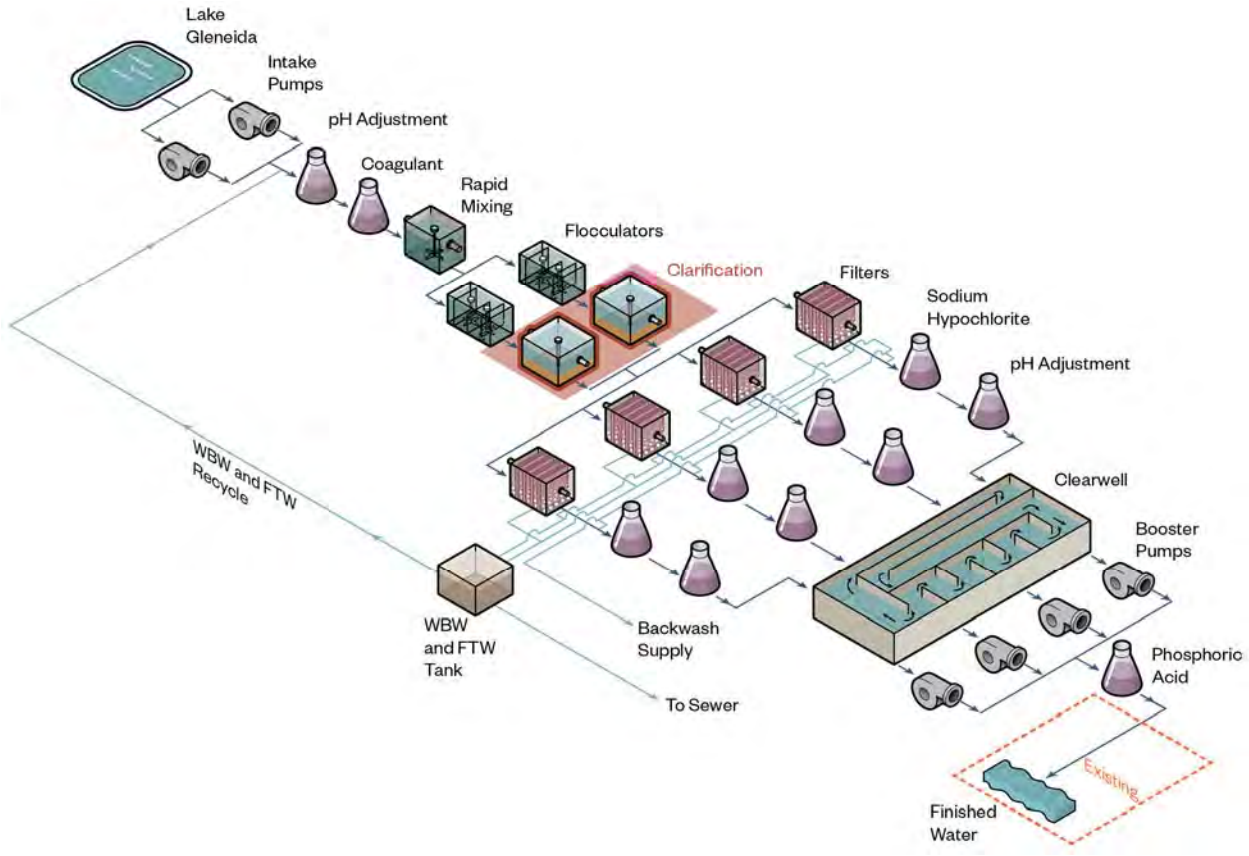

Figure 4-9: Conventional Treatment (Sedimentation or IPS) Process Schematic

Table 4-8: Log Removal/Inactivation for Conventional Treatment (Sedimentation or IPS)

Target Organism	Required Log Removal/ Inactivation	Provided Log Removal/Inactivation		
		Conventional Treatment (Sed or IPS)	Disinfection	Total
Cryptosporidium	**2.0**	3.0	0.0	**3.0**
Giardia	**3.0**	2.5	0.5	**3.0**
Viruses	**4.0**	2.0	2.0	**4.0**

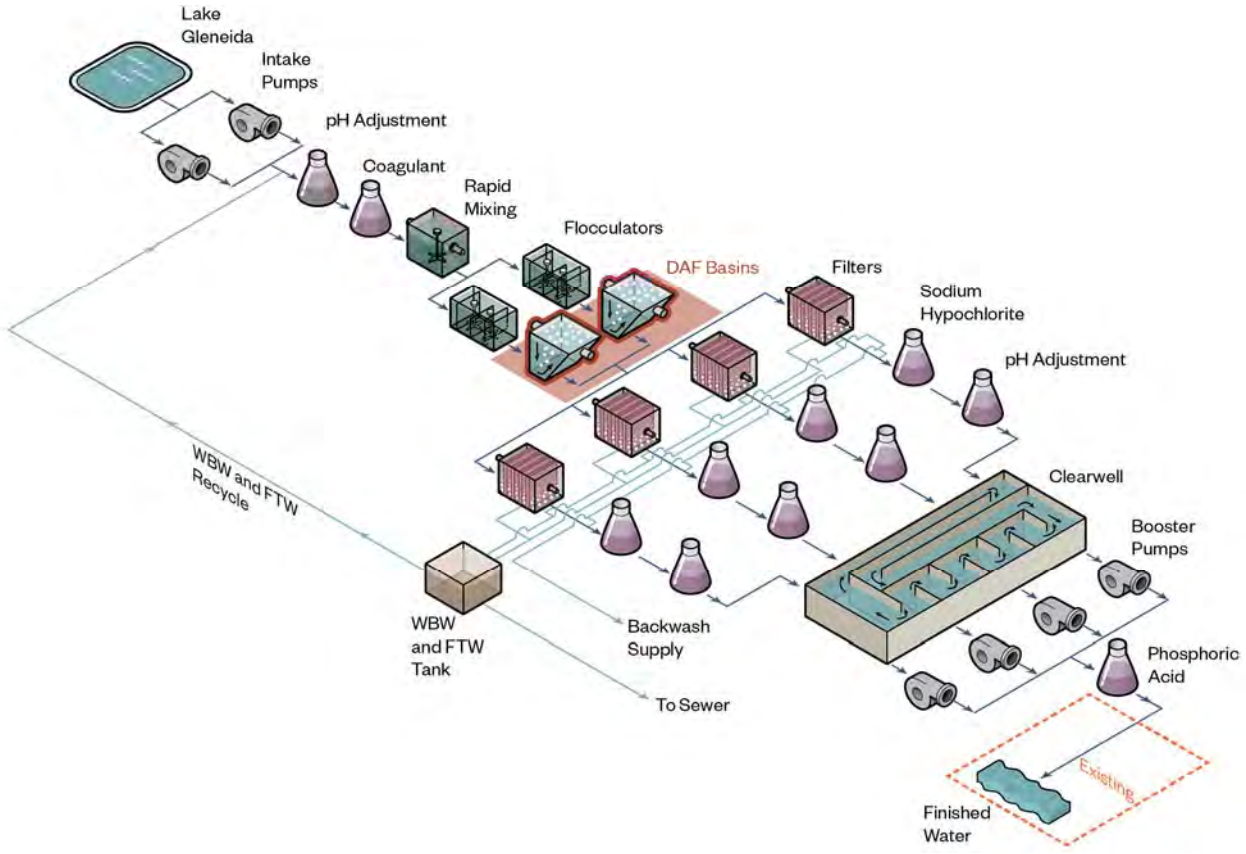

Figure 4-10: Conventional DAF Treatment Process Schematic

Table 4-9: Log Removal/Inactivation for Conventional DAF Treatment

Target Organism	Required Log Removal/ Inactivation	Provided Log Removal/Inactivation		
		Conventional DAF Treatment	Disinfection	Total
Cryptosporidium	**2.0**	3.0	0.0	**3.0**
Giardia	**3.0**	2.0	1.0	**3.0**
Viruses	**4.0**	2.0	2.0	**4.0**

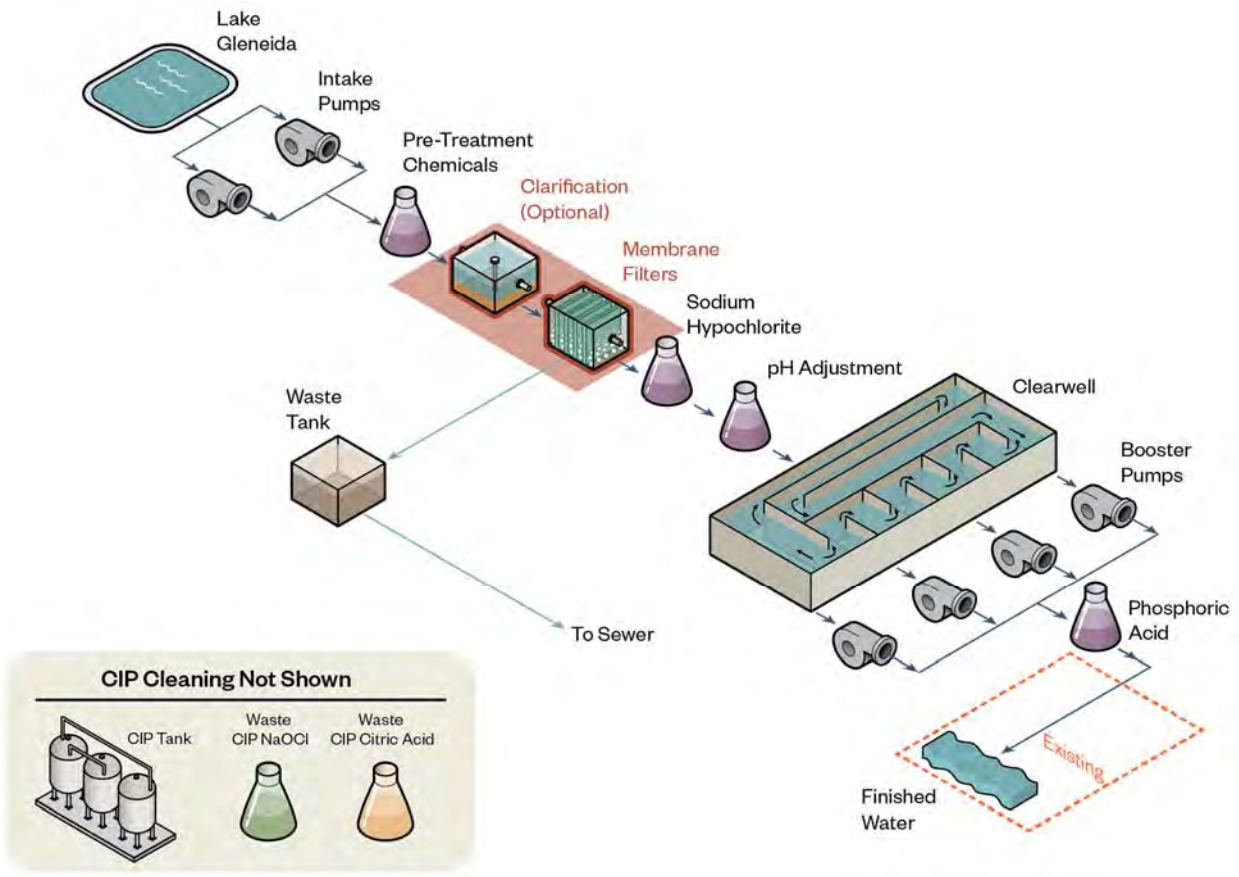

Figure 4-11: Membrane Filtration Treatment (MF or UF) Process Schematic

Table 4-10: Log Removal/Inactivation for Membrane Filtration (MF or UF)

Target Organism	Required Log Removal/ Inactivation	Provided Log Removal/Inactivation		
		MF or UF[20]	Disinfection	Total
Cryptosporidium	**2.0**	3.0	0.0	**3.0**
Giardia	**3.0**	3.0	0.0	**3.0**
Viruses	**4.0**	0.0	4.0	**4.0**

[20] The LT1ESWTR considers membranes to be an "alternative" filtration method and requires a demonstration to the State by pilot study or other means that the alternative filtration technology provides log removal or inactivation of viruses, *Cryptosporidium* or *Giardia*.

4.4 Qualitative Comparison of Treatment Process Alternatives

For the purposes of this preliminary engineering report, a qualitative comparison is used to compare and select the best treatment process train for the proposed WTP. The primary categories for evaluation include facility size and capital cost, operations and maintenance, treatment flexibility, energy and chemical use, and residuals handling.

4.4.1 Facility Size and Capital Cost

In general, capital cost is largely based on the overall dimensions of the plant, which is primarily dictated by the amount and size of treatment equipment necessary for conceptual purposes. Consideration is also given to relative excavation needs for each treatment process.

Additional land beyond that available at the existing WTP site is required regardless of the option selected. It is generally prudent to select a treatment system with the smallest economical footprint possible. From this perspective, a pressurized membrane treatment system could be considered the best choice as they are much more compact than the other treatment processes using gravity flow processes. A smaller clearwell would also be feasible with membrane treatment compared to the other treatment processes as it provides a minimum 3-log *Giardia* removal. However, any type of membrane system would require either higher capacity intake pumps or installing a second set of booster pumps or vacuum pumps in the case of submerged membranes, which results in higher capital and operating costs, particularly if pre-treatment is required. The mechanical and instrumentation and control complexity of membrane system also requires careful layout planning and design.

The next best treatment process in terms of footprint is direct filtration, then DAF, followed by inclined plate settling, and lastly conventional sedimentation which requires the largest footprint. DAF can also be designed in a "stacked" arrangement, with a DAF basin and a rapid rate gravity filter combined into a single basin, which further reduces footprint.

4.4.2 Operations and Maintenance

Each water treatment process has its advantages and disadvantages for operations and maintenance. Many of these aspects are discussed in **Section 4.2**. To summarize in generalities for the purposes of this report, most modern treatment systems are designed to have as little maintenance and operator involvement as possible. However, DE filtration requires the most operator involvement due to the need to manually handle the DE media and monitor the backwashing process. Membrane filtration processes require minimal operator involvement while operating, but if issues arise, they can be difficult to troubleshoot and process optimization can be more challenging without assistance from specialists or the manufacturer. Operating multiple skids at modulating flow rates, particularly low flows, and varying degrees of fouling in each skid can result in complicated controls design. DAF is more complex than sedimentation or inclined plate settling, but once it is operational, it usually requires minimal operator oversight and its satisfactory operation can be verified by observing the formation of the floated solids sludge blanket.

In NYS, any surface water treatment plant with a capacity of 2.5 mgd or less is required to have a designated operator-in-charge with a grade IIA certification. Since the existing treatment plant is in this same category, the District's contracted operator, Inframark, already maintains staff at CWD2 with this certification. Additional training is usually recommended for membrane systems, though Inframark staff are also responsible for the CSD2 wastewater plant which utilizes membrane treatment. CWD8 utilizes a packaged DAF treatment system, though it is operated by a different company.

4.4.3 Treatment Flexibility

DAF clarification is anticipated to provide the best treatment flexibility based on its applicability to the source water, whether used in conjunction with rapid-rate gravity filters or membrane filters. The other clarification processes are expected to meet the primary goals for reduction of target organisms, but DAF would also be best suited to meeting all other goals, particularly the DBP goals by reducing dissolved organics and other DBP precursors. Direct rapid rate filtration and DE filtration provide the least flexibility to manage potential fluctuations in raw water quality.

Raw, untreated water or waters that are coagulated with or without some form of clarification can be treated by ceramic membranes. It is also possible to have a chlorine residual in water being treated by ceramic membranes. Membrane filtration with pre-treatment can provide consistent treated water quality regardless of raw water quality. Removal of particulate iron and manganese requires adequate oxidation ahead of the membranes. Integrity testing methods can also validate the system up to 4-log removal of *Giardia* or *Cryptosporidium*. Membrane throughput is generally reduced wither colder temperature water.

Bench- or pilot-scale testing is not necessary for conventional treatment systems, as they are well proven surface water treatment methods and there are many similar systems in the region. However, long-term testing would be advisable for direct filtration and membrane filtration to confirm acceptability for the variable water quality, particularly during lake turnover or in combination with West Branch Reservoir water.

4.4.4 Energy and Chemical Usage

All conventional treatment processes use similar chemicals (coagulants, polymers, pH adjusters, oxidants as applicable). DAF generally produces a higher concentration sludge compared to sedimentation and inclined plate settlers. However, DAF is a more energy intensive process as it requires recycle pumps and compressors. DE filtration generally uses the least energy usage of all treatment processes, but DE media replacement is costly and frequent.

Membrane systems are periodically cleaned with high concentrations of chlorine or acids to control fouling. The frequency and concentration of aggressive chemicals combined with source water quality may create various corrosion, performance, and health and safety problems.

Membrane systems are also highly energy intensive compared to other treatment processes. The anticipated headloss for membrane systems will range from approximately 10-35 psi for pressurized systems and 10-20 psi for submerged systems. Headloss will vary with the degree of membrane fouling and there are differences in allowable headloss for various membrane products.

4.4.5 Residuals Handling

Residuals generated by the direct filtration process include coagulated solids (sludge) and spent backwash. The volume of residuals generated in direct filtration is significantly less than in conventional treatment. This is due to the lower coagulant doses that are used in direct filtration. DE filtration produces a high volume of wastewater during backwashing which cannot be recycled as it contains spent DE media. DAF produces floated solids which is relatively highly concentrated resulting in small discharge volume. Rapid rate gravity filters generate backwash waste which can be recycled to the head of the treatment plant.

Membrane systems require periodic backwashing and chemical cleaning (clean-in-place, CIP) as well as rinsing to maintain permeability, minimize the needed driving pressure, and prolong the useful life of the membranes. As an example, a typical system may backwash for 30 seconds with a 15-second air scour every 20 to 60 minutes. Some systems use chemically-enhanced backwash to maintain membrane permeability. Backwash water or concentrate from membrane systems may be clarified, producing a supernatant that can then be recycled to the head of the treatment plant. However, this may require pilot testing to demonstrate acceptable treated water quality with this configuration. Alternatively, a secondary membrane system could be used to treat the supernatant which then is recycled to the head of the plant, however, this is typically uneconomical. An additional UV disinfection step for the filtrate may also be required. Therefore, to minimize complexity and costs, membrane system waste streams are commonly disposed of to sewer. This waste stream is typically 3 to 5% of the total flow. This also assumes the chemicals used (commonly sodium hypochlorite, citric or hydrochloric acid, caustic soda, or a surfactant) are acceptable for sewer disposal at expected concentrations or pH levels. The waste stream for backwashing may be higher for immersed membrane systems compared to pressurized systems because of the need to fill up the entire tank in which the membranes are housed.

4.4.6 Qualitative Comparison

A qualitative comparison is used to select the most appropriate treatment process using the comparison categories described in the previous sections of this report. Each treatment train is given a relative rating for each comparison category as either positive (+), neutral (o), or negative (-). The ratings are then totaled and compared for each treatment train as shown in **Table 4-11**.

Table 4-11: Qualitative Comparison of Treatment Trains

Qualitative Comparison Categories	Diatomaceous Earth Filtration	Direct Rapid Rate Gravity Filtration	Conventional Sedimentation with Rapid Rate Gravity Filtration	Inclined Plate Settling with Rapid Rate Gravity Filtration	Dissolved Air Flotation with Rapid Rate Gravity Filtration	Direct Membrane Filtration	Membrane Filtration with Pre-Treatment
Facility Size and Capital Cost	+	+	-	-	o	o	o
Operations and Maintenance	-	+	o	o	+	o	o
Treatment Flexibility	-	-	o	o	+	o	+
Energy and Chemical Usage	-	o	o	o	o	-	-
Residuals Handling	-	+	o	o	+	o	o
Overall	**-**	**+**	**-**	**-**	**+**	**-**	**o**

+ = Positive o = Neutral - = Negative

In summary, "Direct Rapid Rate Gravity Filtration" and "DAF with Rapid Rate Gravity Filtration" are the two most suitable treatment trains. However, DAF is more robust as it provides an extra layer of protection from variable water quality with its additional clarification step, which may be necessary with future regulations or with the potential future use of the West Branch Reservoir supply. If direct filtration were implemented instead, it would be highly recommended that UV disinfection be provided as an additional treatment barrier and space be provided for clarification in the future for these reasons. DAF also assists with removing lighter particles such as algae, DOC and DBP precursors to a higher extent than other clarification processes, particularly at colder temperatures, which is ideal for the water quality of Lake Gleneida and should assist with reducing DBP levels in the distribution system. Furthermore, DAF is widely used in the northeast region and in NY, including Carmel Water District No. 8, which has a 0.25 mgd DAF plant built in the 1990s and treats water from Lake Mahopac. Therefore, "DAF with Rapid Rate Gravity Filtration" is the recommended treatment train.

5. Selected Treatment Process Conceptual Design

The following sections are organized to describe the conceptual design for the proposed WTP by engineering discipline. Conceptual design drawings are included in **Appendix D** for reference, which were developed based on preliminary design criteria which will need to be confirmed during the detailed design phase of this project.

5.1 Process Mechanical Design

The proposed treatment process consists of rapid mixing followed by flocculation, DAF clarification, rapid-rate gravity media filtration, and finally disinfection using chlorine. A block diagram of the proposed process flow is shown in **Figure 5-1** and a more detailed process schematic is provided in drawing D-01 in **Appendix D**. This proposed process train was selected to provide the Town with enough flexibility to ensure a long-term solution for meeting treatment goals and current regulations plus anticipated future regulations.

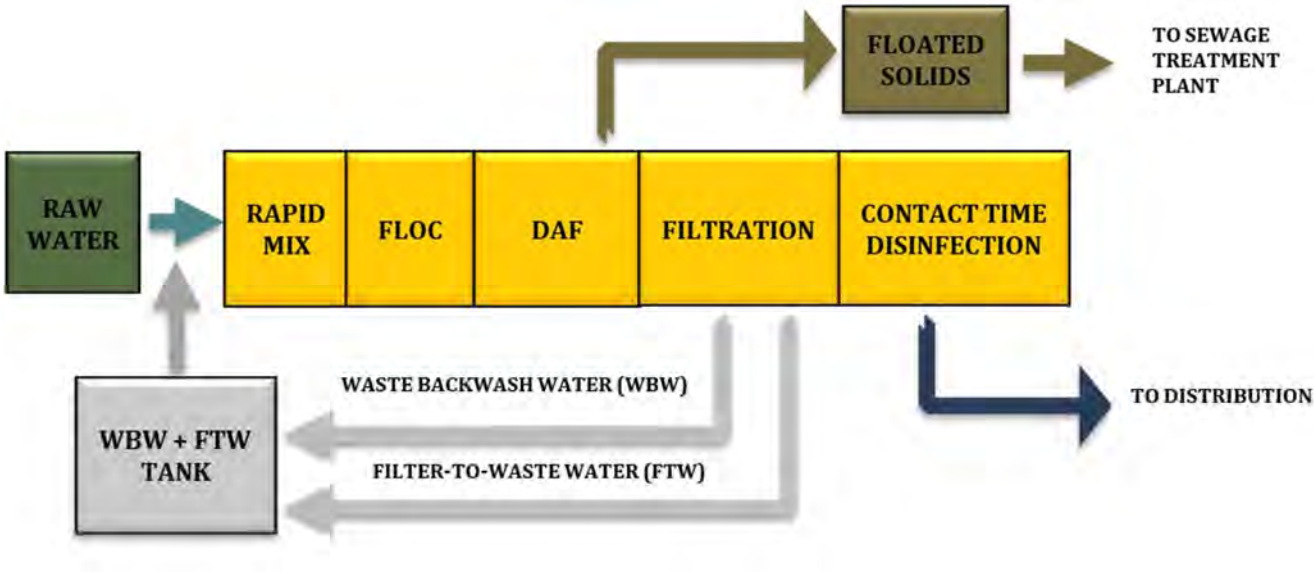

Figure 5-1: Proposed Process Train Block Diagram

The proposed conventional DAF/filtration treatment process is based upon the following minimum log removal credits to be confirmed by the Putnam County Department of Health (PCDOH):

- 3-log *Cryptosporidium* oocysts[21]
- 2-log *Giardia* cysts[22]
- 2-log virus

[21] National Primary Drinking Water Regulations: LT2ESWTR, Federal Register Vol. 71 No. 3 (January 5, 2006), pp. 678-681.
[22] Based on the Surface Water Treatment Rule, log removal/inactivation credit for *Giardia* via DAF/Filtration is 2.0 based on Direct Filtration, however, some jurisdictions permit 2.5 credit, consistent with conventional treatment.

Chlorine contact time (CT) disinfection is planned to achieve the remaining required 2-log virus and 1-log *Giardia* inactivation, for a total of 4-log virus and 3-log *Giardia* reduction, as per **Table 4-9**.

5.1.1 Raw Water Pumping and Conveyance

Based on a review of available information, the existing raw water intake screens, suction pipeline, and transmission main can be utilized without modifications. Each of the two raw water intake pumps have a capacity of approximately 1.64 mgd which is sufficient to meet current maximum day demands, but not projected future water demands. In order to meet projected maximum day demands in 2050, the Town must upgrade the pump station with two new 2.15 mgd pumps.

To perform this upgrade while maintaining water supply to the treatment plant, a temporary bypass pumping system would likely be necessary. This would allow for the existing vault to be expanded or reconstructed to accommodate higher capacity pumps. An upgraded electric service, new motor starters and instruments must be incorporated into the design. Variable frequency drives could also be considered.

The existing intake pumps each have a rated total dynamic head of approximately 38 feet according to the pump nameplate data provided by CWD2. Elevations and headlosses from the intake screens to the existing plant and the proposed new plant are presented in **Table 5-1**.

Table 5-1: Intake Pumping Design Conditions

Pumping Criteria	Existing Intake Pumping Conditions	Proposed Intake Pumping Conditions
Design full flow (gpm)	1,140	1,500
Low lake water elevation (feet NGVD29)	500.5±	500.5±
Plant process inlet elevation (feet NGVD29)	487±	515±
Elevation difference (feet)	-13.5	+14.5
Estimated friction and minor losses at full flow (feet)	17±	33.5±
Required total dynamic head at full flow (feet)	3.5	48
Motor nominal horsepower (HP)	15	30

5.1.2 Treatment Plant Layout

General principles used when laying out the conceptual floor plan for the treatment plant include the following recommendations, which can be refined during the detailed design phase:

- Where possible, utilize the slope of the site to reduce excavation for below grade structures and allow for gravity flow for all of the main treatment processes.
- Locate occupied work room space close to the filter basins to allow for visual observation of backwashing and other critical process components.
- Locate chemical storage systems as close to the point of application as possible.
- Use common walls and foundations between process basins and the building where feasible to reduce construction costs.
- Avoid creating single points of failure that are difficult to access for repairs.

- Provide space for potential future addition of advanced treatment processes if needed in the future such as filter aids, GAC, UV, etc.
- Address potential future regulations where feasible.

Due to the anticipated flow rates and scale of this facility, the Town may consider the use of packaged treatment systems for flocculation, DAF and filtration which use coated steel or marine-grade aluminum basins pre-engineered by the manufacturer with associated equipment. There are pros and cons to using packaged systems. However, for the purposes of this conceptual design, it is assumed that these treatment systems will not be packaged and will be custom-designed in concrete basins. The final selection will be made during the detailed design phase.

5.1.3 Process Equipment Redundancy

Since this proposed plant is intended to provide 100% of the water supply to CWD2, it is necessary to provide adequate redundancy to all critical treatment processes and equipment in accordance with *Ten States Standards* and NYS regulations. The proposed WTP design redundancy philosophy is described in **Table 5-2**, where "N" is the minimum required number of duty units, and "N + 1" denotes one standby unit is to be provided.

Table 5-2: Proposed Plant Design Redundancy

Equipment Redundancy	
Process train	N + 1
Treatment equipment	N + 1
Filters	N + 1
Clearwell	N + 1
Water pumps	N + 1
Chemical pumps	N + 1
Piping	N + 0

Furthermore, clarification is proposed to be sized to accommodate 75% of the maximum plant capacity with one train offline to allow maintenance during low demand periods without service interruption. The clearwell is proposed to be split into two equal-sized tanks sized for up to 50% of the maximum plant capacity to allow for maintenance and inspection. Each filter is also sized for 33% of the maximum plant capacity and four filters are provided, allowing one filter to be taken offline for maintenance or backwash while maintaining 100% of the maximum plant capacity. This also allows the existing clearwell to be used as the backwash supply tank based on the necessary flow needed for backwashing. The waste backwash storage tank will be sized to contain up to two full backwash cycles' worth of water.

5.1.4 Pre-Treatment Chemical Addition

Sulfuric acid would first be dosed to reduce the pH of the raw water to approximately 6.5 for optimal coagulation and filtration. Other acids could also be used, but sulfuric acid is the most commonly used acid for this purpose in this region. Sulfuric acid would also contribute additional sulfate ions to the water, reducing the ratio of chloride to sulfate and potentially reducing corrosion in the distribution system.

A coagulant such as alum would subsequently be injected to begin the coagulation process as the raw water enters the rapid mixing stage. The dosage rates for coagulant will be based on raw water quality parameters such as turbidity, total organic carbon (TOC) and color. Dosage would be controlled via rate of flow measurements and continuous analyzers.

Optionally, sodium hypochlorite could also be injected before the filters as a pre-oxidant. Dosage would be based on the level of oxidation needed. One goal would be to maintain a minimum of 0.5 mg/L exiting the filters to maintain a manganese dioxide coating on the filter sand, allowing any iron or manganese in the water to be removed more effectively.

It is not necessary to provide caustic soda to increase pH at the head of the plant as the raw water pH is consistently over 7.5. No other chemicals are proposed to be incorporated in the pre-treatment step at this time, though provisions will be made for potential future use of a polymer to further optimize the treatment process.

5.1.5 Rapid Mixing

The combined plant flow, consisting of flows from Lake Gleneida (and potentially West Branch Reservoir in the future), as well as flow from the combined waste backwash washwater and filter-to-waste water recycle tank, will enter the static mixers. In-line static mixers are proposed instead of in-channel mixers based on the preliminary plant layout, though this can be reconsidered during the detailed design phase. It should be noted that a flow control valve must be provided at the head of the new plant to throttle the flow entering the plant from the fixed speed intake pumps.

One mixers is proposed to be provided, which would have spargers for sulfuric acid and coagulant. A spare sparger could also be provided for future sodium hydroxide or cationic polymer application if needed.

The static mixers must be constructed of epoxy-coated steel or fiberglass-reinforced plastic to withstand chemical attack. The size and length of the mixers will be selected during the detailed design phase. Preliminary design criteria for conceptual design is provided in **Table 5-3**.

Table 5-3: Preliminary Design Criteria for Rapid Mixing

Parameter	Criterion
Number of mixers	1
Assumed type of mixer	In-Line Static Mixer
Expected Coefficient of Variance (CoV at 1-3 hydraulic diameters downstream from mixer discharge)	0.05
Recommended maximum headloss at 2.15 mgd per mixer (psi)	2
Number of spargers per mixer (duty / spare)	2 / 1

5.1.6 Flocculation

When producing floc for flotation the goal is to produce smaller pin-point flocs with sizes ranging from 30-50 μm (0.001-0.002 inches), which requires a higher degree of agitation and allows for shorter flocculation detention times than settleable floc. DAF flocculation G-values are usually between 70 and 100 sec^{-1}. Tanks would be sized to allow a minimum 5-minute hydraulic detention time per stage at maximum flow and

maximum velocity gradient of 100 sec^{-1}. Two stages of flocculation will be provided for a total minimum detention time of 10 minutes. Vertical turbine axial flow hydrofoil flocculators are proposed to be used for this application. Impeller diameters are typically between 30% and 45% of the flocculation tank dimensions to maximize fluid motion while minimizing shear forces. The impellers usually have three or four blades and are oriented to give a hydrofoil shape like a propeller. Preliminary design criteria for flocculation will is provided in **Table 5-4**.

Table 5-4: Preliminary Design Criteria for Flocculation

Parameter	Criterion
Recommended number of flocculators per stage	1
Recommended number of stages per train	2
Preliminary tank width, W (feet)	10
Preliminary tank length, L (feet)	10
Velocity gradient in each basin at 33°F (sec^{-1})	60 – 100
Assumed impeller type	Hydrofoil
Maximum impeller tip speed (fps)	8 – 12
Typical superficial velocity (fpm)	6
Minimum superficial velocity (fpm)	3
RPM	11 – 30
Hydraulic detention time per stage at 2.15 mgd (minutes)	5
Hydraulic detention time per train at 2.15 mgd (minutes)	10

5.1.7 Dissolved Air Flotation

Flotation is performed by injecting a pressurized air-saturated recycle stream into the process flow. Approximately 8 to 12% of the plant flow is saturated with air pressurized at 70 to 90 psig. This side stream is referred to as the DAF recycle stream.

The DAF recycle stream is injected in the DAF contact zone, and the pressure is suddenly reduced to near atmospheric levels using special DAF injection nozzles. As a result of the pressure drop, the recycle stream releases air in the form of micro-bubbles that attach to the flocculated particles and float them to the surface of the tank. This process forms a dense foam called “float” at the water surface. Periodically, this float is removed by skimming the water surface into a trough, discharged by gravity to a floated solids storage tank. Water following the DAF process, referred to as “floated” water, typically have turbidities less than 0.5 NTU.

DAF recycle water will be drawn from the floated water outlet channel prior to the filters. Air is compressed and driven into pressurized DAF recycle water inside of a saturator vessel containing packed media. Air-saturated water flows through piping manifolds located in the contact zone of the DAF basin. Special nozzles are mounted on the manifolds, where high pressure air-saturated water is released into near-atmospheric pressure unsaturated water. This sudden pressure reduction through the nozzle creates the micro-bubbles used for flotation.

Water exits the second stage flocculation basin over a baffle wall and enters the DAF basin. The height of the baffle wall is specified to ensure an even flow and an average velocity of less than 0.5 fps to minimize damage or separation of the floc particles.

The process water then flows under a baffle wall into the DAF contact zone. At this point, the DAF recycle water is injected near the bottom of the contact zone. This ensures adequate mixing and contact between the micro-bubbles and the flocculated water. The water then travels over another baffle wall, which is angled at the top to improve flotation hydraulics. The float rises to the surface and the clarified water passes underneath into collection pipes located just above the floor of tank.

After this point, the clarified water exits the collection pipes and passes over an automatically controlled weir into the floated water channel. Continuous turbidity analyzers will sample water from this point on each train to monitor turbidity levels.

The floated solids will be removed hydraulically rather than using skimmers that scrape the solids. This is to reduce the concentration of the floated solids in the collection trough and allow it to flow more easily to the sewer system directly by gravity. Low pressure spray bars will be located on the DAF tank sidewalls and in the trough to assist in the float removal by providing a lubricated surface between the tank walls and the float.

Although loading rates up to 16 gpm/ft^2 have been demonstrated successfully for high-rate applications, pilot tests in this region have only been performed for up to 6 gpm/ft^2 applications, which has been accepted by regulatory agencies on projects such as the New York City Croton WTP. See **Table 5-5** for additional preliminary design criteria.

Table 5-5: Preliminary Design Criteria for DAF

Parameter	Criterion
Dissolved Air Flotation Tanks	
Number of DAF trains	2
Preliminary tank length (feet)	18.75
Preliminary tank width (feet)	10
Preliminary tank depth (feet)	10
Preliminary tank area (ft^2)	187.5
Design loading rate at 75% of 2.15 mgd per train (gpm/ft^2)	6.0
Minimum design air content as mass/volume ratio of inflow at 25°C, saturator pressure 70 psi and recycle rate 8% (g/m^3)	9.0
Recycle Pumps	
DAF recycle range	8–12% (10% average)
Number of pumps (duty/standby)	2/1
Saturators	
Number of saturators (duty/standby)	(1/1)
Type of saturator	Packed Tower Vessel
Compressed Air System	
Number of compressors (duty/standby)	2/1
Type of compressor	Scroll

5.1.8 Filtration

Filtration is the final particle removal process in the treatment train and is optimized by designing a filter with the appropriate media configuration (media type and depth) and loading rate. The proposed filters will be designed for dual media (12 inches of sand and 24 inches of anthracite is standard practice in this region). Four single-cell filters will be provided, each designed for up to 33% of the maximum plant flow capacity. Ten States Standards recommends filter loading rates between 2 to 4 gpm/ft^2. However, filters in this region are commonly approved for operation up to and over 6 gpm/ft^2. The proposed filters are designed using a loading rate of 4.5 gpm/ft^2 at 2.15 mgd with all four filters in service and a maximum of 6.0 gpm/ft^2 at 2.15 mgd with one filter out of service, for preliminary purposes. At least 6 feet of positive driving head should be provided above the filter media. This is to allow for greater durations between backwash cycles and also provides some extra depth in case additional media needs to be added in the future such as granular activated carbon. The final media selection will be confirmed during the detailed design phase.

The filter underdrain is designed to evenly collect the filtrate and evenly distribute the air scour and backwash flows. In general, the following capabilities are required to be provided:

- Conduct stable combined air scour and backwash (CASBW).
- Achieve even air and backwash water distribution over a wide range of flows.
- Sustain a high differential pressure thrust in both up and down directions.

The water exiting the DAF tank enters the filter tanks and passes over a control weir. A modulating butterfly valve is provided before each filter tank to isolate flow during backwashes. The water passes through the media, through the underdrain system and exits the filter tank through a pipe nozzle. After exiting the filter tank, the water passes through a modulating flow control butterfly valve and passes through piping terminating at a filter control weir inside the clearwell.

By maintaining the water level in the filter tank, the flow rate can be maintained, since the flow rate is already controlled and evenly split between the two trains before entering the flocculation/DAF tank. Maintaining a constant water level in the filter tank also results in a steady water level in the DAF floated water channel. When the filters are clean and first activated, the modulating level control butterfly valve would be nearly closed to provide the necessary backpressure to maintain the appropriate water level. As the filter media becomes clogged with particles, the headloss through the filter increases, resulting in the butterfly valve gradually opening, allowing more flow to pass through the filter. Once the butterfly valve is open greater than a specified setpoint, the media must be backwashed.

The total driving head across the filters is planned to be no less than 10 to 12 feet, allowing an estimated typical runtime between backwashes of 24-48 hours based on similar installations. This driving head is also sufficient to overcome the following hydraulic losses:

- Clean bed headloss
- Nozzle and underdrain headloss
- Losses from the filter effluent piping and pipe fittings
- Control valve headloss
- Head over the filter control weir; and
- Losses due to particle buildup in the filter media.

The clean bed headloss and the underdrain losses vary with flow through the filter. The losses through the filter media (clean and dirty) are directly proportional to flow because the flow regime is laminar. This is determined during the detailed design phase. Conceptual-level design criteria is provided in **Table 5-6**.

Table 5-6: Preliminary Design Criteria for Filtration

Parameter	Criterion
Number of filters	4
Preliminary filter bed length x width (feet)	10.5 x 8
Length-to-width ratio	1.3
Maximum design flow (mgd)	2.15
Sand Filter Media	
Depth (inches)	12
Effective size (millimeters)	0.45 – 0.55
Uniformity coefficient	< 1.4
Specific gravity	2.60 – 2.70
Anthracite Filter Media	
Depth (inches)	24
Effective size (millimeters)	0.8 – 0.9
Uniformity coefficient	< 1.4
Specific gravity	1.6 – 1.7
Maximum surface loading rate with all four filters in service (gpm/ft^2)	4.5
Maximum surface loading rate with one filter out of service (gpm/ft^2)	6.0
Backwash rate range (gpm/ft^2)	15 – 23
Air scour rate range (scfm/ft^2)	1 – 1.5

5.1.9 Intermediate Chemical Addition

Sodium hypochlorite is proposed to be injected after the filters and before the clearwell for contact time disinfection. Sodium hydroxide may also be injected at this location or after the clearwell to increase the pH of finished water above 7.5.

5.1.10 Clearwell

A new clearwell is proposed to be provided for flow equalization as well as adequate contact time for disinfection at the maximum design flow. The existing 90,000-gallon clearwell cannot be reused for this purpose as it is not large enough for the proposed maximum plant capacity and does not provide redundancy for future maintenance in accordance with the *Recommended Standards for Water Works*. Filtered water will flow by gravity over the filter control weir into this clearwell. Water will be pumped out of the clearwell directly into distribution. A control weir must be provided after the filters to discharge into the clearwell. This weir serves the following purposes:

- Fix the discharge elevation from which the rest of the gravity-flow treatment train system is based for determining the overall hydraulic gradeline
- Define the maximum available driving head on the filters
- Provide a hydraulic break between the filter and booster pumps; and
- Ensure the filter media is always wet.

Required CT for a specific log inactivation is a function of the disinfectant type, disinfectant residual, pH, and temperature. Available CT is defined as the product of the residual disinfectant concentration, C (in mg/L) and T_{10}, the time for which at least 90% of the water has been in contact with the disinfectant (in minutes), incorporating a baffling factor when the tank does not simulate "plug flow" characteristics. Under worst-case design conditions consisting of a minimum chlorine residual of 1.0 mg/L winter water temperature of 5°C (less than the 5th percentile value of temperature measurements), and pH of 8, the resulting CT required is 87 mg-min/L. **Table 5-7** summarizes the CT requirements and preliminary clearwell design criteria. The clearwell is planned to be designed to achieve a baffling factor of 0.5. Adequate CT for 50% of the plant capacity is to be achieved in each clearwell.

Table 5-7: Preliminary Design Criteria for Clearwell

Parameter	Criterion
Minimum chlorine residual (mg/L)	1.0
Maximum pH (corresponding to low temperature periods)	8
Required log inactivation of viruses	2.0
Required log inactivation of *Giardia*	1.0
Maximum CT required (mg-min/L) at 5°C	87
Number of clearwells	2
50% of maximum plant flow rate per clearwell (mgd)	1.075
Assumed baffling factor	0.5
Required minimum volume for each clearwell (gallons)	130,000
Preliminary dimensions of each clearwell	
Length (feet)	50
Width (feet)	17.5
Height (feet)	26
Maximum operating height (feet)	24
Operating range (feet)	4
Provided minimum volume for each clearwell (gallons)	131,000

5.1.11 Finished Water Pumping

To provide redundancy and for simplified controls and operations, four (4) 500 gpm vertical turbine booster pumps will be provided to transmit water from the proposed clearwell to distribution. This provides a firm capacity of 1,500 gpm (2.15 mgd) to meet the projected maximum day demand in 2050 with one standby 500 gpm pump. Each of these pumps are to be designed for a total dynamic head of approximately 312 feet with variable frequency drives to allow modulation of flows to maintain a steady clearwell level and maintain system pressure. This is primarily based on the distribution storage overflow elevations indicated in **Table 2-7** and an assumed maximum headloss through distribution of approximately 20 psi, which is typical of distribution systems of this size and arrangement.

5.1.12 Post-Treatment Chemical Addition

Orthophosphoric acid is proposed to be injected after the clearwell and well before the entry point to distribution. Sodium hydroxide may also be injected at this location or before the clearwell to increase the pH of finished water above 7.5. Injecting sodium hydroxide after the clearwell would increase the efficiency

of chlorine contact time disinfection in the clearwell as chlorination generally works more effectively at pH between 5.5 and 7.5. However, if injected after the clearwell, sodium hydroxide may not mix into the finished water completely before leaving the plant without the use of a static mixer. The final selection for the location of sodium hydroxide injection will be made during the detailed design phase. These two chemicals provide the means for corrosion control in the distribution system after treatment. Water quality analyzers will be provided to ensure the finished water is in compliance on a continuous basis.

5.1.13 Chemical Treatment Systems

The sizing of chemical treatment systems would be determined during the detailed design phase. Based on the size of the plant and experience with similar plants, the sulfuric acid and orthophosphoric acid systems will likely require a drum-type chemical system, while coagulant, sodium hypochlorite and sodium hydroxide would utilize more traditional bulk storage setups. For the purposes of conceptual design, chemical rooms have been shown on drawing D-02 in **Appendix D** with approximate quantity and sizes of tanks and pump tables. These spaces and equipment will be refined during the detailed design phase. All chemical storage will need to be designed and operated in compliance with NYSDEC requirements as per 6NYCRR Parts 595-599. A chemical delivery truck containment station will also need to be provided outside of the plant to contain any spills during filling operations.

5.1.14 Residuals Handling

Three primary waste streams are generated from the proposed water treatment process:

- Floated Solids
- WBW
- FTW

A sludge (floated solids), containing an average solids concentration of 2-3 percent[23], forms on the surface of the tank. When removed hydraulically, referred to as hydraulic desludging, it dilutes to a concentration of approximately 0.5 percent. The floated solids stream is planned to flow by gravity directly to the local sanitary sewers. This is preferred for simplified operation and maintenance, if feasible based on site conditions and elevations, though alternative skimming and floated solids storage methods may be considered during detailed design. For the purposes of conservatively estimating floated solids residuals, it is assumed that alum will be used as the coagulant and no polymers will be used.

After the DAF clarifying process, clarified water (or floated water) passes through sand and anthracite media filters to capture additional solids not removed via the DAF process. Solids captured by the filters are removed from the filters during backwash cycles, when clean water and air are used to reverse the flow through the filters, agitate, and rinse solids from the media. The water and solids from the backwash waste stream are referred to as WBW.

After each backwash cycle, a FTW cycle is performed to allow the filter media to “ripen” and return it to its normal operating state. The resulting FTW waste stream along with the WBW waste stream flow by

[23] Dillon, Glenn, WRc Ref: TT016, “Application Guide to Waterworks Sludge Treatment and Disposal”, June 1997.

gravity to the combined FTW and WBW tank. From there, the water is recycled to the head of the plant upstream of the coagulation process. FTW water is generally of higher quality than the plant influent and it is assumed that the solids concentration is negligible. The residuals streams estimations are presented in **Table 5-8** based on four different scenarios as follows to provide a range of residuals rates:

- 0.75 mgd flow rate with low turbidity, color and organics in the raw water and long filter run length of 72 hours between backwashes (estimated best case scenario)
- 1.25 mgd flow rate with average turbidity, color and organics in the raw water and filter run time of 48 hours between backwashes (approximate average day scenario)
- 2.15 mgd flow rate with average turbidity, color and organics in the raw water and filter run time of 48 hours between backwashes (approximate max day scenario)
- 2.15 mgd flow rate with high turbidity, color and organics in the raw water and filter run time of 24 hours between backwashes (estimated worst case scenario)

Table 5-8: Preliminary Estimations of Treatment Process Residuals

Design Scenario Conditions				
Plant Flow with Recycle, mgd	0.75	1.25	2.15	2.15
Turbidity, Color, Organics in Raw Water	Low	Average	Average	High
Filter Run Length, hours	72	48	48	24
WBW and FTW Residual Streams				
WBW Flow, gpd	34,000	50,000	50,000	101,000
WBW Solid Loading, lb/day	0.2	1.3	2.2	4.1
FTW Flow, gpd	6,300	9,400	9,400	18,800
FTW Solid Loading, lb/day	0	0	0	0
Floated Solids Residual Stream				
Total Floated Solid Loading, lb/day	8.5	62	108	201
Floated Solids Flow (gpd)	260	1,860	3,240	6,000

5.1.15 Backwash Supply Tank

A backwash cycle is estimated to require approximately 30,000 gallons based on preliminary design criteria. Backwash supply water is typically stored in a separate storage tank. In some cases, backwash supply can be drawn from the distribution system, but this is generally not advisable if it will negatively impact the distribution system such as by causing scouring of the nearby mains due to high flow velocities. If feasible, the existing plant's 90,000-gallon clearwell tank is recommended to be repurposed as a backwash supply tank for the new WTP to eliminate the cost of constructing a new tank. A condition assessment of the existing clearwell is recommended to be performed to confirm acceptability for continued service into the future. Since the plant cannot be taken offline for extended periods and the clearwell cannot be drained, a remote-operated submersible vehicle could be used to visually ascertain the condition of the interior of the clearwell and associated wet well. If necessary, a diver could also potentially be utilized to perform the inspection. With either inspection method, the entire plant would need to be locked-out and tagged-out and the work would need to be performed during low-demand periods, possibly during night hours over the course of several nights.

Backwash supply water must be filtered, but does not need to be finished water. It is preferable to use unchlorinated filtered water particularly if the filters are to be used in a biological capacity in the future and to reduce waste of treatment chemicals. Provisions should be incorporated into the design to allow either filtered water or distribution water to fill the backwash supply tank for redundancy.

5.2 Civil & Site Design

5.2.1 Existing Site Conditions

The existing raw water intake facility and treatment plant locations are shown in **Figure 5-2**. The intake facility work described in **Section 5.1.1** would take place on the shore of Lake Gleneida which is NYC property, NYCDEP would need to be engaged during the design, permitting and construction process. Special precautions must be taken to prevent erosion and sediment from negatively impacting the water body.

The existing water treatment plant is located on a parcel of land (Tax Map #55.6-1-29) set back approximately 250 feet from US Route 6 and is accessed by a 350-foot driveway, which passes through a private property (Tax Map #55.6-1-28), the parent parcel to the plant site parcel. The address of the existing facility is 1744 Route 6 in Carmel Hamlet within the Town of Carmel, NY. The existing site slopes west to east towards Michael Brook. Slopes on-site vary, however a preliminary review of the 2-foot contours available through the NYS GIS Clearinghouse for the area show slopes exceeding 2.5:1 grade in some locations.

Due to the constrained plant site dimensions and limited Town-owned land in the vicinity of Lake Gleneida, the Town must pursue obtaining additional land for the new WTP. Reusing existing infrastructure, such as the existing raw water transmission main, finished water transmission mains, and clearwell, requires the new plant to be in close proximity to the existing plant site. Easements may also be required for utilities or driveways that may be required depending on the new site location. Based on the conceptual drawings in **Appendix D**, the new site must have a minimum estimated 3/4-acre useable area and must be in close proximity to the raw water transmission main and existing plant if possible.

Consideration must be given to stormwater management. Other major considerations include soil type, presence of rock formations, and depth to the water table. A comprehensive geotechnical report will be conducted as part of the design process, which will highlight any areas with visible rock outcroppings and steep slope protected areas.

Figure 5-2: Location of Existing Water Treatment Plant and Intake Facility

5.2.2 Wetlands

There are no wetlands located on the existing plant site. However, there is a freshwater wetland located east of the site and connected to Michael Brook which is a tributary of Croton Falls Reservoir. The site falls within the 500-foot NYS regulated wetland check zone as shown in **Figure 5-3**, though it is well outside the 100-foot regulated buffer area. Any site affected by the new WTP construction will need to be investigated by a professional environmental scientist to confirm the limits of the wetlands.

Figure 5-3: NYSDEC Regulated Wetland Map

5.2.3 Floodplains

According to FEMA map panel 36079C0141E, effective March 5, 2013, the 100-year and 500-year floodplains are also located to the east of the existing plant site and are associated with Michael Brook. The limits of the floodplains are not in the vicinity of the existing plant site. The base flood elevation (BFE) of the 100-year flood plain is approximately elevation 416 feet NAVD88. The existing site currently sits at approximately 480 feet NAVD88. The intake facility is also outside of the floodplain for Lake Gleneida as seen in **Figure 5-4**.

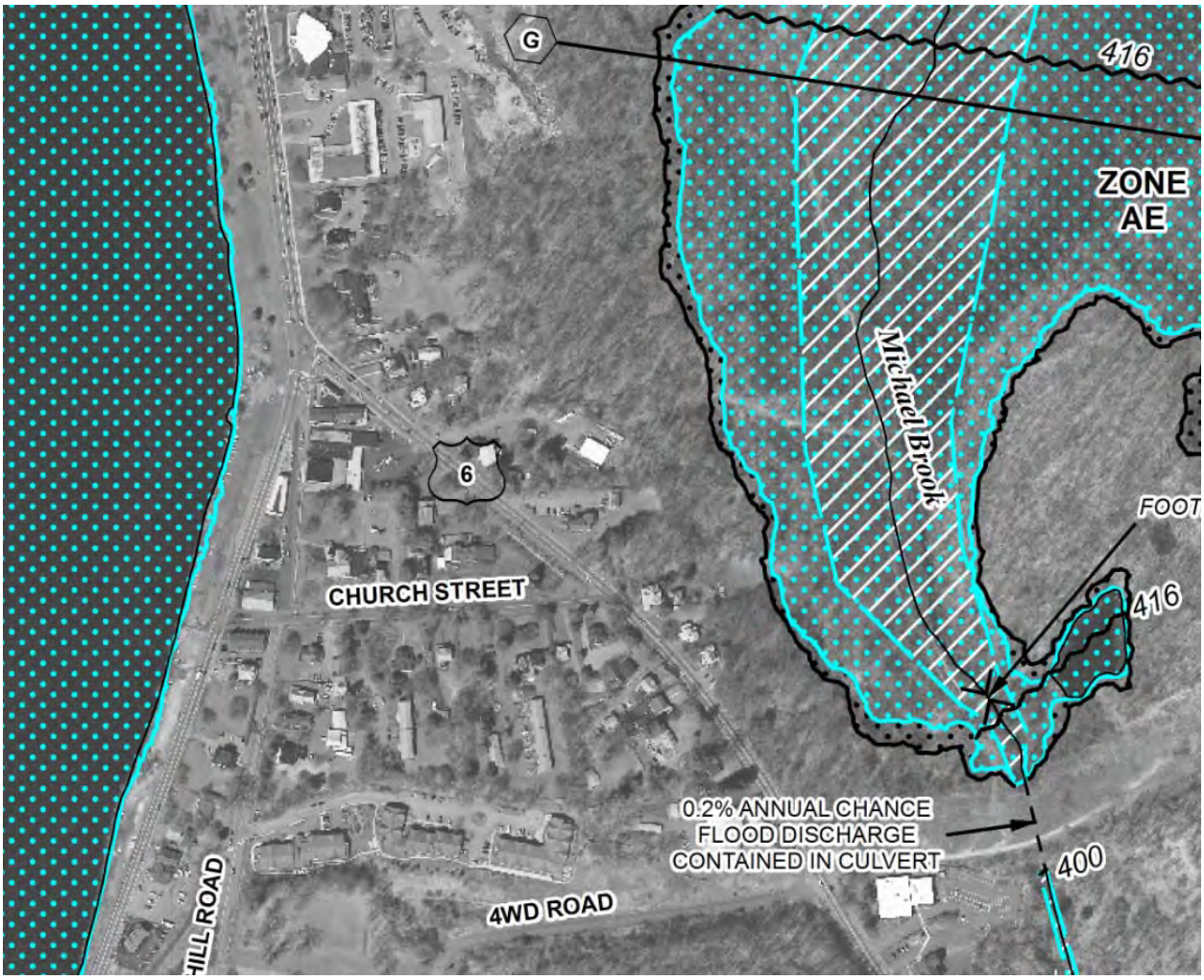

Figure 5-4: FEMA Floodplain Mapping

5.2.4 Proposed Site Work

5.2.4.1 Site Layout and Access

Construction of the new WTP may require removal of existing structures depending on the site along with partial clearing of the land. Consideration will be given to timing of tree removal if required, due to an endangered species (the Indiana bat) in the area. A chemical delivery truck containment area must also be provided in accordance with NYSDEC requirements. Consideration should also be given to parking space for at least four vehicles and any cranes needed for construction or future maintenance. The site should be surrounded by a perimeter fence with one or more access gate(s). The new treatment plant layout should take advantage of site slope to reduce excavation costs where possible.

5.2.4.2 Yard Piping

Once new land has been selected for the proposed WTP, consideration must be given to routing of various utilities, including water mains, sewers, drains, and electrical or communication conduits.

5.2.4.3 Stormwater Management

The anticipated increase of impervious cover due to the construction of the new plant and the total site disturbance exceeding 5,000 square feet will require the creation of a Stormwater Pollution Prevention Plan (SWPPP) that includes erosion and sediment controls to comply with New York State Department of Environmental Conservation (NYSDEC) and NYCDEP Watershed regulations.

5.3 Architectural & Structural Design

The general concept for the new water treatment plant is a steel-framed structure with concrete foundation and envelope to match and blend in with the neighborhood. The steel framing will most likely consist of coated/protected epoxy-coated or galvanized steel. The intention is to protect the framing members from the potentially corrosive environment. The framing system would be designed to resist wind and seismic loads in accordance with the latest codes.

Exterior walls are planned to be metal panel walls with an architectural finish. Steel horizontal members would be attached to the exterior of the superstructure framing to allow paneling to be installed along the outside of the building. The spacing of the steel members would be designed to resist wind and seismic loading. The interior side of the panels would be coated or covered with a protective layer to allow for washdowns and minimize potential corrosion.

The building's exterior finish is proposed to be horizontal clapboard style on top of the metal panels. The roof would be sloped gable style with a standing seam metal roofing system. Windows can be aluminum double-hung style with dividing muntins. All these features would allow the proposed building to blend in with the local residential buildings.

Interior walls, particularly those for the chemical rooms and the boiler room will have a cast-in-place concrete knee wall with CMU block on top. The ceiling level is planned to be approximately 20 feet above finished floor (AFF) level in the area of the treatment process basins and chemical areas. The chemical systems will have concrete hollow-core roof panels or concrete filled galvanized steel metal decking approximately 12-16 feet AFF. This provides fire protection, access above the rooms for piping and HVAC equipment, and the flexibility to modify the rooms in the future if desired. The containment curb and floor will be provided with a chemical-resistant coating system. CMU walls would be coated with epoxy paint where appropriate. A monorail would be provided for the booster pump area to aid with pump maintenance.

The overall footprint of the proposed plant would be approximately 55 feet wide in the north-south direction by 162 feet long in the east-west direction. The footprint of the proposed substructure will be approximately 95 feet long by 40 feet wide by 26 feet deep, consisting of two clearwells, a booster pump wet well, filter basins, and filter piping gallery. The clearwell structure would have approximately 12-inch thick reinforced concrete baffle walls and approximately 18-inch thick reinforced concrete outer walls, designed to resist saturated soil and groundwater pressure. A concrete mat foundation is expected for the clearwell portions

and concrete spread footings are expected for the building superstructure foundations. Over excavation of the soil layer may be required to reduce potential for differential settlement between building foundations and deeper clearwell foundations.

The existing plant would remain as is unless an assessment during detailed design recommends any minor renovations. The existing intake pump station is a buried concrete vault, which would be reconstructed to allow for larger pumps to be installed. Details of the reconstruction will be developed during the detailed design phase of this project.

5.3.1 Geotechnical Information

Detailed geotechnical information is not available for the existing plant site. However, a geotechnical investigation report for the Putnam County Courthouse located approximately 2,500 feet to the north was made available for preliminary evaluation. The report stated the region appears to consist of a sand fill 8 feet deep and sand/gravel from 8 to 13 feet deep. The geotechnical report also stated groundwater was measured at a depth of approximately 18 feet below ground surface. This information will only be used on a preliminary basis. Five or six borings will be required under the proposed building footprint to obtain relevant geotechnical data for this project.

5.4 HVAC & Plumbing Design

The overall HVAC system is based on design outdoor air conditions in accordance with ASHRAE 2017 weather data from the Dutchess County Airport weather station (WMO:725036) and is as follows:

- Cooling – 0.4% Design Day
  - 91.3°F Dry Bulb (DB) Temperature
  - 73.5°F Wet Bulb (WB) Temperature
- Heating – 99.6% Design Day
  - Outdoor Winter Design Temperature – 2.7°F

The more conservative 0.4% and 99.6% conditions are being used for the outside air conditions to minimize any freezing or overheating concerns for the spaces served even during the infrequent and short duration of temperatures outside of these conditions.

The facility will be provided with a pitched roof. Where feasible and as appropriate, ductwork will be routed under any trusses and ceilings for simplified installation and maintenance. Efforts will be taken to obscure exterior equipment from view. Additionally, no equipment is planned to be located on the roof.

The following sections describe conceptual-level information for the design of the HVAC and plumbing systems for the proposed WTP.

5.4.1 Process Area

The process area consists of a large single room that contains several different processes and equipment. The processes include open flocculation, DAF and filter tanks, as well as several pumps, blowers, compressors, motor controllers and other equipment.

Based on the definition of Occupiable Space in the NYS Mechanical Code, the process area is not considered an occupiable space because it is an equipment room intended to be occupied occasionally and for short periods of time. Because of this, the space is not required to be continuously ventilated. However, due to the nature of the space, it is recommended that the space be continuously ventilated at a minimum of 1.5 air changes per hour (ACH) to dissipate moisture from the open tanks and reduce condensation. Condensation in the space can lead to corrosion of carbon steel elements in the facility such as supports, fasteners, etc. Dehumidification of certain spaces may be considered during the detailed design phase.

During the summer months, 1.5 ACH is generally not sufficient to dissipate the heat from all of the equipment in the space. In order to keep the process area temperature below 104°F during the summer, the ventilation rate should be increased to 3 ACH (approximately 6500 cfm). This value is only a preliminary estimate and may be revised during detailed design to reflect the final equipment selections and heat rejection rates. The switchover from the low to high ventilation rate can occur automatically via the unit controller when heating of the outside air is no longer required.

The process area ventilation will be supplied by an HV unit located outside. The HV unit may be located outside to the east of the building, out of view of the public from the street. The HV unit would contain a filter bank, hot water coil and supply fan. The air in the space will be exhausted by exhaust fans at strategic locations to allow for optimal air flow and access for ease of maintenance. The exhaust can be located near the electrical area and booster pumps where there will be a high amount of heat rejection and/or in the area with the open tanks to facilitate removal of air with high moisture content.

The filter piping gallery and the area where the DAF recycle pumps, compressors, and saturators will be located should be provided with floor drains for equipment washdown and condensation capture. Hose bibs or hose reels should be located nearby these areas to assist with washdown. Since the booster pump area is located above the clearwell, it is generally not acceptable practice to provide floor drains. Therefore, the booster pump area floor may be sloped towards a sump or trench drain.

5.4.2 Chemical Rooms

The facility is planned to contain separate chemical rooms for coagulant, sulfuric acid, caustic soda, and sodium hypochlorite. The coagulant room should be ventilated at 1 cfm/ft^2 due to the low hazard of the chemical. The other three rooms should be ventilated at 1.5 cfm/ft^2 due to the higher hazard of the chemicals. Each chemical room should be continuously ventilated by an exhaust fan. The make-up air for each room will be taken from the process area via a motorized damper. Each room will be heated, most likely using electric washdown-rated unit heaters sized to maintain each of the chemicals above 50°F. Since caustic soda is planned to be stored at 25% concentration, this temperature is adequate to prevent freezing. However, if the design changes to incorporate 50% concentration, then the temperature must be maintained above 70°F to prevent freezing even when the outside air temperature is lower than the ASHRAE 99.6%

design day value. The sodium hypochlorite room is planned to be designed with air conditioning to keep the room below 72°F.

All fans, heaters, ducts, dampers and related components should be constructed of non-corrodible materials as applicable. Each chemical room will contain an emergency ventilation shutdown button on the exterior of each chemical room to shut down the ventilation system in the case of an emergency as per NYS Fire Code §5004.3.1. To washdown the chemical rooms, a hose reel or hose bib should be located outside of each room close to the doors. A frost-proof hose bib should also be provided outside near the chemical fill cabinets. The chemical rooms will not have floor drains. Each chemical room should also be provided with a sump area with space for a portable sump pump to be located to remove washdown water, condensation, or potential chemical spills. The sump would have a liquid level alarm to automatically indicate if a leak or spill has occurred. Emergency shower and eyewash stations are discussed in **Section 5.4.9**.

5.4.3 Boiler Room

The boiler room will house a boiler, hot water pump, tepid water heater, backflow preventer and other related equipment for the hot water heating system. This room will have a combustion air intake damper that will open and close in response to the boiler's operation. The room will also contain a wall-mounted exhaust fan that will be thermostatically controlled to ensure the room does not overheat in the summer months. The exhaust fan thermostat will be set for 80°F. The combustion air damper will also be interlocked with the exhaust fan to provide make-up air. The boiler room will have a hot water unit heater to provide heating and keep the space above 50°F.

The boiler room will have a floor drain in close proximity to the boiler and hot water equipment as well as a drain below the backflow preventer. A hose bib will also be provided for equipment and room washdown.

5.4.4 Work Room

The work room will serve as the primary occupied area of the facility. It will contain desks, a SCADA workstation for viewing process system controls, and portable lab equipment for water quality analysis. Because this space is normally occupied, it requires ventilation per the NYS Mechanical Code. However, since the room is planned to be small, the code allows the use of natural ventilation if there are operable openings equal to 4% of the floor area.

The cooling for the work room is planned to be handled with a split system AC unit. The indoor evaporator unit would provide cooling for the space and occupants to satisfy the remote room thermostat. The outdoor condensing unit would be located outside near the side entrance to the facility. The indoor evaporator unit would be mounted on the north exterior wall above the windows. Condensate would be gravity-drained through the exterior wall and discharged outside. The AC system can be sized to maintain the work room at 72°F. Heating of the work room can be provided by perimeter finned tube radiators sized to maintain the room at 70°F.

5.4.5 Restroom

The restroom should be intermittently ventilated at approximately 70 cfm per the NYS Mechanical Code. The restroom ventilation will be provide by an exhaust fan connected to the restroom light switch. The restroom can be equipped with a small hot water convection heater to provide heating to the restroom.

The restroom is planned to contain a single toilet, sink and shower. Hot water would be provided for the sink and shower. The sink, shower and toilets would drain to the facility's sanitary sewer connection.

5.4.6 HVAC Controls

All equipment in the facility will have standalone controls. There will be no monitoring of HVAC equipment through an HVAC network. Major pieces of equipment such as the HV unit serving the process area, and the boiler will send individual discrete fault alarms to the SCADA system to indicate equipment failures.

5.4.7 Hot Water System

Because the HV unit that serves the process area is located outside, the hot water system is planned to contain glycol to ensure that damage does not occur to the hot water coil in the HV unit or exterior piping should the hot water system fail, HV unit fail, or other failure that would expose the copper coil to freezing conditions. The glycol system will use food-grade propylene glycol, which is non-toxic and safe in case of spills or leaks. Because glycol has a higher viscosity than water, it will take slightly more power to pump the glycol solution. Once the glycol is heated to 180°F, the viscosity drops and is close to that of tepid water, so the amount of energy loss is negligible.

When determining what percentage of glycol is necessary, there are two types of protection that can be achieved: freeze protection and burst protection. Freeze protection uses a higher concentration of glycol to prevent the solution from beginning to freeze. A freeze-protected solution concentration will always remain in a fully liquid state. Burst protection uses a lower concentration of glycol in order to prevent the high expansion that happens during the phase change from liquid to solid. However, the solution may turn partially to a solid creating a slushy solution. Because of the lower concentration of glycol, the burst protection is expected to provide better thermal performance while the system is operating normally. Because this system is not supposed to be shut down normally, and should remain running and hot, the burst protection concentration of glycol will be used. Should the system shut down and the glycol cool down to 0°F, the system will be protected from damage, but may take some time to warm up. Placing temporary portable heaters in the HV unit to heat up the glycol in the coil would be recommended to speed up restarting the system. Because the ASHRAE outside air design temperature is 2.7°F, the percentage of glycol used will be 26%. This will provide burst protection of the system down to 0°F.

The glycol hot water system would have a single fuel oil boiler. The hot water system will have one single speed hot water recirculation pump to distribute the glycol hot water to the HV unit, perimeter finned-tubed radiators, and hot water unit heaters.

Because maintaining the concentration of glycol is critical, the glycol hot water system will not be connected to the potable water system as this would alter the glycol concentration. Instead, a glycol make-

up unit will be provided. The glycol make-up unit would contain a 100-gallon tank of pre-mixed glycol and would automatically activate an injection pump to inject glycol solution into the system when the system pressure drops. The tank has a low-level alarm to indicate when the tank requires refilling with more pre-mixed glycol solution. This alarm will be connected to the facility's SCADA system for remote alarming.

5.4.8 Fuel Oil System

The fuel oil system is planned to serve only the hot water boilers in the boiler room of the facility. The fuel oil system would consist of a fuel oil storage tank and fuel oil piping only. The boiler would contain a fuel oil pump and filter needed for oil transfer from tank to burner. Based on preliminary heating calculations, the estimated maximum fuel consumption for the facility is estimated to be 2.8 gallons per hour (gph). A storage volume of at least 500 gallons would allow for over 7 days of continuous peak usage before the tank would need to be refilled. Because this is a peak value and not a normal average, this size tank should provide adequate storage to operate the facility under normal usage and not require unusually high refill frequency.

To keep the tank accessible for inspection, maintenance and repair as well as to reduce building size, it is assumed to be located outdoors and aboveground. It will be designed to NFPA 31 per the NYS Fire Code. If during detailed design, space is available for the tank to be indoors, that could also be considered as the NYS Fire Code §603.3 allows indoor storage of fuel oil up to 660 gallons.

5.4.9 Emergency Shower & Eyewash Stations and Tepid Water System

Emergency shower and eyewash stations will be provided in each of the chemical rooms as well as one frost-proof station located outdoors by the chemical fill station. Each station will be equipped with flow switches to provide a SCADA alarm when they are activated.

Tepid water (60°F – 90°F) is planned to be provided for these stations according to the ANSI Z.3581-2014 standard. A tepid water heater is required to heat and store hot water and use a thermostatic mixing valve to achieve the tepid water setpoint. The tepid water heater is generally designed as a standalone unit capable of supplying up to 20 gpm of tepid water to an emergency shower and eyewash station for 15 minutes of continuous use. A recirculation pump could be used to ensure tepid water is provided to all of the stations at all times.

5.4.10 Potable Water and Sanitary Systems

The new building is planned to be connected to existing potable water and sanitary connections where feasible. A new backflow preventer would be provided in the boiler room for the facility's potable water. The potable water system would supply water to various fixtures and systems. The various floor drains and trench drains in the process area is intended to drain by gravity to the existing plant site's sewer system, which is at a lower elevation compared to the new plant site.

5.5 Electrical, Instrumentation & Controls Design

5.5.1 Electrical Load, Power Supply and Distribution

The electrical design will be based on safety, reliability, ease of operation, maintenance, and flexibility. The existing plant is served by a three-phase primary electrical service that originates from the overhead distribution system owned by New York State Electric and Gas Corporation (NYSEG). The utility service supplies an existing transformer, which provides 480-volt, three-phase, 60 Hertz (Hz) power to the plant. A 400 KW diesel generator is located at the existing plant. A portable 100 KW diesel generator is available to provide backup power to the intake pumps at Lake Gleneida. Additional details on the existing electrical system will be developed during the detailed design phase of this project.

Based on a preliminary load list and conservative estimates, the proposed plant is expected to have a connected load of approximately 475 KW and corresponding estimated operating load of 356 KW (estimated at approximately 75% of the connected load for conceptual design purposes). The existing plant is planned to be used in conjunction with the new plant as the backwash supply source. Construction phasing is necessary to keep the existing plant in operation. After all construction is completed, the final operating load at the existing plant is expected to be approximately 75 KW, comprising only two new backwash supply pumps, existing HVAC equipment and other loads that will remain in the existing plant. Note that according to 2019 monthly electric utility bills, the existing plant uses between approximately 100 to 150 KW, with peak usage occurring in the summer.

It is recommended that NYSEG be engaged early in the detailed design phase to decide on the best approach for providing electrical service to the new plant depending on its location. If the additional land is in close proximity to the existing plant, consideration could be given to combining the electrical service to both plants or keeping them separate. NYSEG may require separate electrical service lines to each plant site or they may allow the new electrical service to the new plant to supply the existing plant. This selection would guide decisions on various electrical design aspects including sizing of a new generator and transformer as well as potential reduction in size for the existing generator, and transformer if required by the utility. One option is to install a new smaller generator for the existing plant and relocate the existing generator to supply the new plant's critical loads only. However, for the purposes of conceptual design, it is assumed that a new electrical service (including transformer and generator) will be provided for the new plant and the existing electrical service will remain, but the existing transformer and generator can be downsized accordingly.

New manholes, handholes and ductbanks for utility power, communication and site power distribution would be installed as required. New power distribution equipment such as a switchboard and dry-type transformer will be provided in the electrical room. Motor controllers would include solids-state reduced voltage starters and variable frequency drives for pumps, flocculators, and fans.

5.5.2 Instrumentation and Controls

New instruments will be provided for all treatment process and plant equipment as appropriate, such as level/pressure sensors/switches, water quality analyzers, flow meters, etc. Backups for each instrument may be provided depending on criticality to the process or for safety reasons. Specific instruments will be determined during the detailed design phase.

The proposed WTP will be provided with a new SCADA system, which will be designed based on latest practices as well as CWD2's operator preferences. The system will need to communicate to the intake pump station and the distribution storage tanks in the same manner as is currently used. All process data will be recorded and be made accessible at a local SCADA workstation with redundant backup server located off-site if feasible.

A control panel will provide primary monitoring and control of all process systems. It will contain a programmable logic controller (PLC), operator interface terminal (OIT) with graphical controls and status display, surge protection, universal power supply (UPS), and various other components. The components should be designed and installed in a manner that allows simplified modification and reprogramming in the future by CWD2's controls system integrator.

Access control devices and cameras are recommended to be installed throughout the proposed WTP in accordance with the latest security standards. These would be selected and designed during the detailed design phase in accordance with CWD2's preferences.

5.6 Permitting

Based on the anticipated work, **Table 5-9** presents a list of permits, consultations, authorizations and approvals that may be required as part of this project.

Table 5-9: List of Anticipated Permits

Agency	Permit Name/Description	Estimated Agency Review Duration
United States Fish and Wildlife Service	Threatened and Endangered Species Consultation	30 days
New York State Department of Environmental Conservation	Environmental Assessment as per SEQRA requirements	90 days
	SPDES General Permit for Stormwater Discharges from Construction Activities	
	Waste Transporter Permit (for any demolished material)	
	Hazardous Waste Management Facilities Permit (as applicable for demolition)	
	Chemical and Petroleum Bulk Storage and Spill Prevention Reports	
	§401 Water Quality Certification	
	Water Supply Permit (for future West Branch Pump Station only)	
New York State National Heritage Program	Consultation	30 days
New York State Office of Parks, Recreation, and Historic Preservation	Consultation	30 days
Putnam County Department of Health	Water Supply Improvement	90 days
Town of Carmel	Planning Board Review	150 days
	Zoning Board Review	
	Dept. of Buildings Review	
	Architectural Review	
	MS4 SWPPP Acceptance	
Other Agencies	Roadway Permits (to support construction access and staging, as needed)	60 days

5.7 Capital and Operating Cost Estimate

A capital cost estimate has been prepared based on the conceptual design drawings and the information provided in this report as shown in **Table 5-10**. The estimate includes both construction and non-construction costs and is based on the following assumptions:

- Projected construction notice to proceed is mid-year 2022.

- Assumed construction duration is 24 months and midpoint of construction is mid-year 2023 for escalation purposes.
- 3% annual escalation assumed for materials.
- 3.5% annual escalation assumed for labor/equipment.
- Building superstructure cost is based on steel framed building with exterior envelope to match neighborhood architectural style.
- Selected treatment process is coagulation, flocculation, dissolved air flotation, rapid rate gravity media filtration, and chlorine disinfection. It is further assumed that floated solids will be discharged directly to sewer by hydraulic desludging and that the existing clearwell can be repurposed as a backwash supply tank. A change in this treatment process or related assumptions will impact the overall cost.
- Assumed concrete for substructure and tanks.
- Refer to previous sections of this preliminary engineering report and conceptual drawings in **Appendix D** for further details on design assumptions included in this cost estimate.
- Land acquisition and easement costs are based on the latest assessment information provided on the Putnam County eParcel website for properties within a 1,000-foot radius of the existing plant site with at minimum estimate 3/4-acre useable area.
- Survey, subsurface, geotechnical and hazardous materials investigations estimated costs are included and assumed to be performed as part of land acquisition and easements.
- No environmental remediation or hazardous materials abatement work is included in this cost estimate.
- Cost estimate assumes limited work associated with stormwater best management practices (BMPs).

Table 5-10: Conceptual Design Capital Cost Estimate

Item No.	Description	Total Cost Range	
1	General Conditions, Bonds and Insurances	$1,726,000	$2,101,000
2	Site Work	$1,481,000	$1,802,000
3	Substructure	$1,696,000	$2,064,000
4	Superstructure	$2,095,000	$2,551,000
5	Treatment Equipment	$2,377,000	$2,893,000
6	MEP Fitout	$2,598,000	$3,162,000
7	Intake Pump Modifications	$1,257,000	$1,530,000
ESTIMATED CONSTRUCTION BASE COST		**$13,230,000**	**$16,103,000**
8	Land Acquisition and Easements	$600,000	$1,000,000
9	Engineering Design and Construction Oversight	$2,400,000	
10	Legal	$250,000	
ESTIMATED NON-CONSTRUCTION COST		**$3,250,000**	**$3,650,000**
ESTIMATED PROJECT TOTAL COST		**$16,480,000**	**$19,753,000**

Operating and maintenance (O&M) costs for the existing and proposed plants were compared on a basis of operating at 0.8 mgd. O&M costs reviewed include chemical, electrical and heating costs.

The current annual CWD2 budget for chemicals is $80,000. DE media usage, which is the majority of the chemical budget, would be eliminated, but sulfuric acid, a coagulant, and sodium hydroxide would take its place. The total cost for these new chemicals over the course of a year is approximately the same as that of DE media. Sodium hypochlorite usage would reduce slightly if applied after filtration. Orthophosphoric acid usage would not change. Therefore, chemical costs are expected to be similar to current costs.

Electrical and heating costs are summarized together in the current CWD2 annual budget at $110,000. The proposed building will be designed in an energy-efficient manner, which would allow for relatively low electrical and heating cost despite the larger building size. Furthermore, the major electrical cost is associated with pumps, and in comparing at 0.8 mgd, both the existing and proposed WTPs would have similar electrical usage.

Current staffing levels and operator certifications are not anticipated to change with the proposed plant as discussed in **Section 4.4.2**. Likewise, NYC water usage charges are not expected to be impacted. However, initially after construction, the extent of equipment replacements and emergency repairs should decrease.

5.8 Anticipated Project Schedule

After submission of this report and a public meeting to review the project, the overall duration of subsequent tasks is noted in **Table 5-11**.

Table 5-11: Anticipated Overall Project Schedule

Task	Estimated Task Duration
Design services procurement	3 months
Plans, specifications and permitting	16 months
Bidding and award	3 months
Construction	24 months
Complete water quality testing and place plant into service	2 months
Demolish old treatment system	1 month

6. Conclusions and Action Items

Based on a review of a multitude of factors, conventional treatment using DAF clarification and rapid rate gravity media filters is the recommended water treatment process train for CWD2's proposed WTP. A conceptual design has been prepared including a cost estimate. Next steps are outlined as follows:

- Commission a topographic and boundary survey with utility markout and/or subsurface investigation with metes and bounds for land acquisition and easement purposes (confirm elevation of intake pump station and overflow elevation of storage tanks as part of the survey work)
- Perform a hazardous materials investigation at the proposed property to be acquired
- Acquire new land and easement(s) as required
- Evaluate impacts of proposed treatment residuals stream on CSD2 wastewater treatment plant
- Submit engineering report to Putnam County Department of Health for review
- Perform soil borings and geotechnical investigation
- Perform a wetland delineation
- Update current corrosion control plan
- Take additional water quality samples as discussed in this report (e.g. PFAS)
- Perform pump tests on booster pumps to confirm capacity and total dynamic head
- Obtain condition assessment of existing clearwell and building
- Engage NYCDEP in discussions for new West Branch Reservoir pump station

Appendix A: Compilation of Water Quality Data

Appendix B: Environmental Database Search Reports

Appendix C: Archive Record Drawings

Appendix D: Conceptual Design Drawings