

# TOWN OF THOMPSON, NY

SULLIVAN COUNTY, NEW YORK

## KIAMESHA LAKE WASTEWATER TREATMENT PLANT UPGRADE MAP, PLAN, & REPORT

PREPARED FOR:

**TOWN OF THOMPSON, NY**

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MONTICELLO, NY 12701

PREPARED BY:



**DELAWARE ENGINEERING, D.P.C.**

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ONEONTA, NEW YORK 13820  
607-432-8073

**JULY 1, 2020**





## 1.0 Introduction

This Map, Plan, and Report (MPR) has been prepared as required by, and in accordance with New York State Town Law 202b, and is intended to assist Town officials and residents in evaluating the public benefit of a project that will upgrade the wastewater treatment plant (WWTP) serving the Kiamesha Lake Sewer District. Completion of the MPR is required whenever a town resolves to undertake a project to improve or reconstruct existing facilities and appurtenances on behalf of a sewer district.

A comprehensive upgrade of the 65 year-old facility is necessary to meet recently updated water quality standards, to improve and expand bio-solids processing capacity, and to ensure the plant's long-term viability.

In February 2020, the Town was informed by the New York State Environmental Facilities Corporation (NYSEFC) that this upgrade project is eligible for interest-free ("hardship") financing for a term of up to 30 years through the Clean Water State Revolving Fund (CWSRF).

The Town intends to seek additional financial support for this upgrade through other funding programs. However, since funding from those sources has not yet been secured, this MPR assumes that the CWSRF will be the sole source of funding.

### 1.1 Background

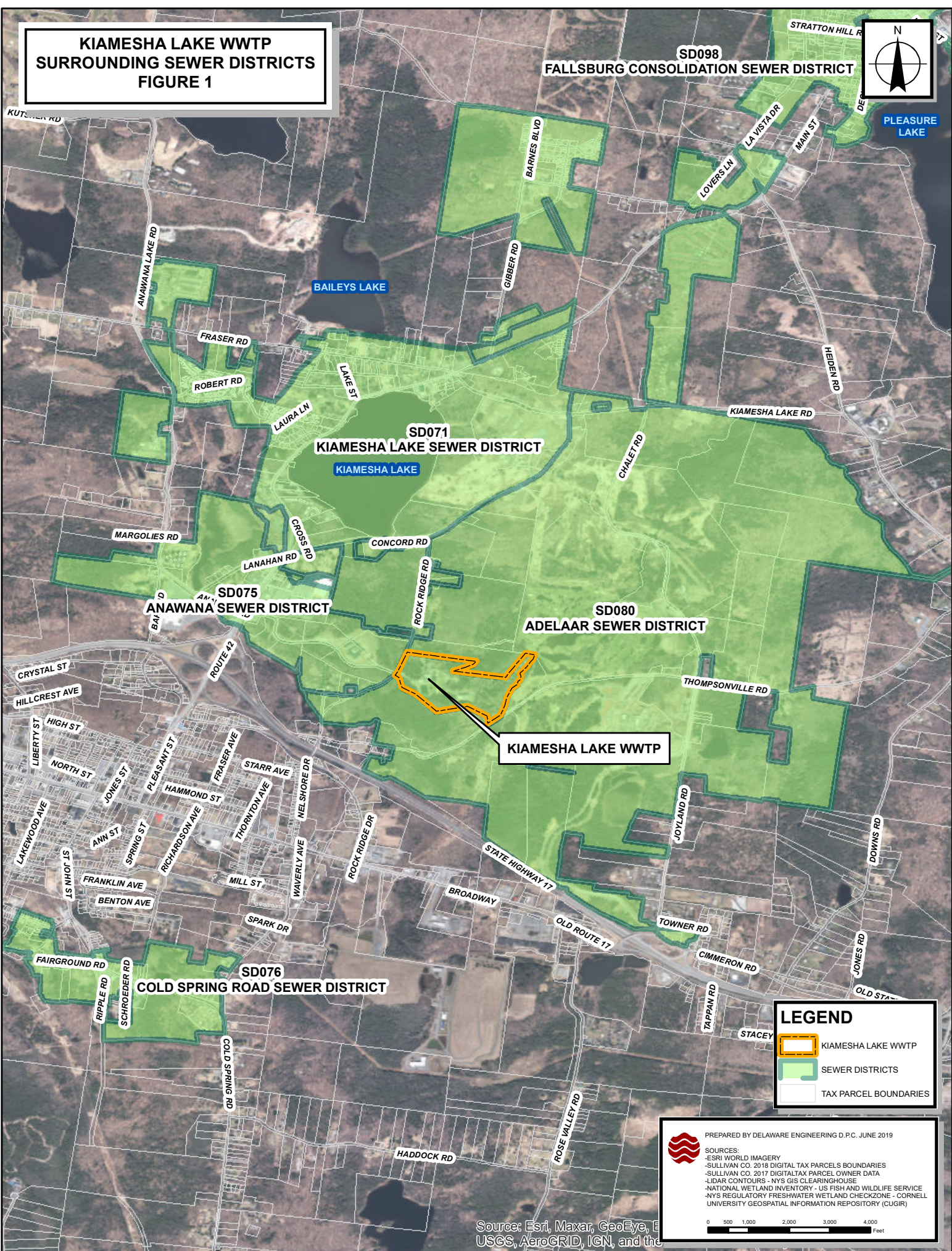
The Town of Thompson, Sullivan County, is located in the foothills of New York State's Catskill Mountain region. The Town owns and operates the Kiamesha Lake wastewater treatment plant (WWTP) which is located on a 48.3-acre parcel along Rock Ridge Road, northeast of the NYS Route 17/42 interchange. A map identifying the Kiamesha Lake WWTP site and sewer district boundaries is included as **Figure 1 – Location Map**.

The WWTP serves residents and businesses in the hamlet of Kiamesha Lake which has a full-time population of approximately 1,100 residents. The Kiamesha Lake sewer district has 378 service accounts of which 287 ( $\pm$  75%) are single-family dwellings. While there are no large industrial users connected to the system, wastewater from the Adelaar Resort complex and the Route 42 commercial corridor is treated at the Kiamesha Lake WWTP.

The WWTP is regulated by the New York State Department of Environmental Conservation (NYSDEC) under the State Pollutant Discharge Elimination System (SPDES) Permit program and operates under SPDES Permit No. NY 003 0724. The SPDES permit regulates the volume (capacity) and quality of water (effluent) permitted to be discharged from the facility, and details the daily and monthly water quality monitoring requirements.



**KIAMESHA LAKE WWTP  
SURROUNDING SEWER DISTRICTS  
FIGURE 1**



Source: Esri, Maxar, GeoEye, Earthstar, CNES, Airbus, GeoEye, USDA, USGS, AeroGRID, IGN, and the



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The SPDES permit allows for the plant to discharge up to 2.0 million gallons per day (MGD), although the plant typically operates at approximately 50% capacity. Outflows from the plant are received by an unnamed tributary of the Kiamesha Creek. In 2017, the SPDES permit was modified to include discharge limits for fecal coliform and chlorine residual. To meet the updated permit limits, the Town will install ultra-violet (UV) disinfection facilities as part of the planned facility upgrade.

## 1.2 Reasons for the Project

- 1) The Kiamesha Lake WWTP has been in service for nearly 65 years and while the equipment, systems and processes have been maintained throughout the intervening years, the plant is approaching the end of its design life expectancy, typically 35-40 years. In addition, the plant employs older technologies that are costly to repair and maintain due to the difficulties in obtaining replacement parts.
- 2) In order to maintain SPDES permit compliance, the Town is required to install disinfection facilities by May 2022. Effluent disinfection is required to meet the permit limits for fecal coliform (since the Town intends to employ UV disinfection, chlorine residual limits will not be a factor). The plant does not currently have any disinfection facilities to address the modified permit limits. Without this upgrade, the plant will be out of compliance with permit discharge limits after May of 2022.
- 3) In addition to the Kiamesha Lake WWTP, the Town of Thompson owns and operates four additional wastewater treatment facilities. Kiamesha Lake is the only plant with functional sludge handling and processing equipment. Consequently, sludge from the other Town plants is sent to the Kiamesha facility for processing. Processing the additional sludge strains the plant's aging equipment, making upgrades to the existing system both necessary and prudent. Additionally, new technologies will reduce the overall sludge volume thereby lowering disposal costs.

To address these conditions, the Town is proposing a comprehensive WWTP upgrade with an estimated capital project cost of **\$27,00,000**. The proposed project will upgrade the existing plant and provide new treatment facilities that will ensure continued compliance with SPDES permit requirements for the near term, as well as for the estimated loading conditions at 2.0 MGD.

## 2.0 District Boundary Description

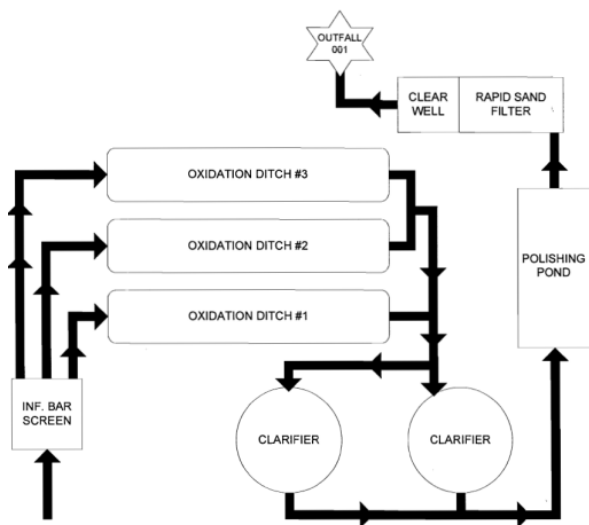
The Town of Thompson owns, operates and maintains multiple sanitary sewer districts. As shown in **Figure 1**, The following four sewer districts convey sanitary sewage to the town-owned Kiamesha Lake wastewater treatment plant (WWTP):

- Adelaar Resort Sewer District
- Anawana Sewer District
- Harris Woods Sewer District
- Kiamesha Lake Sewer District

There will be no immediate expansion of the existing district boundaries resulting from this project and all properties currently included in the district will remain in the district.

## 3.0 Description of Existing WWTP Facilities

The Kiamesha Lake WWTP is an extended aeration, oxidation ditch style, activated sludge treatment plant that achieves biological ammonia removal through nitrification. The secondary treatment process includes two clarification tanks, while tertiary treatment uses sand filtration units to meet discharge permit levels.



Process Diagram from SPDES permit

Influent enters the facility through the influent channel structure where it passes through a mechanically cleaned bar screen, Parshall flume, grit chamber, and flow splitter box. At the flow splitter box, the incoming sewage is divided and conveyed to the three oxidation ditches.

Effluent from the oxidation ditch flows to the secondary clarifiers and then to the sand filter units for tertiary treatment. Tertiary effluent passes through the post aeration tank prior to discharge to an unnamed tributary of the Kiamesha Creek.

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## 4.0 General Plan of Improvements

The following is a summary of the principal proposed upgrades and improvements necessary to adequately treat current demands and provide for future needs. The current proposed layout of these facilities is shown on the site plan (see **Figure 2 – Upgrade Site Plan**).

The comprehensive facility upgrades and improvements will encompass plant buildings, equipment, systems, and site conditions. Significant improvements include installation of a new UV disinfection system, Autothermal Thermophilic Aerobic Digestion (ATAD) system and sludge press, and construction of a new Maintenance and Shop building.

The upgrade will occur within the current property limits and within previously disturbed areas.

The following is a detailed list of proposed improvements to the Kiamesha Lake WWTP

- Influent Channel and Flow Splitter Box Improvements
- Grit Removal Improvements
- Oxidation Ditch Improvements
- Process Air Supply Blower Improvements
- Sand Filter Improvements
- Post Aeration Improvements
- New UV Disinfection System & Building
- Sludge Holding Tank Improvements
- RAS/WAS Pump Improvements
- Aerobic Sludge Digestion Improvements (new ATAD system)
- Sludge Press Improvements
- Sludge Drying Bed Improvements
- Pump Station Process Improvements
- Control Building Improvements
- Grit Removal Building Improvements
- Filter Building Improvements
- Storage Building Improvements
- Blower Building Improvements
- New Work Shop and Maintenance Building
- New emergency generator
- Yard Piping Improvements
- Site Work Improvements
- SCADA Improvements
- Instrumentation Improvements



UPGRADE SITE PLAN

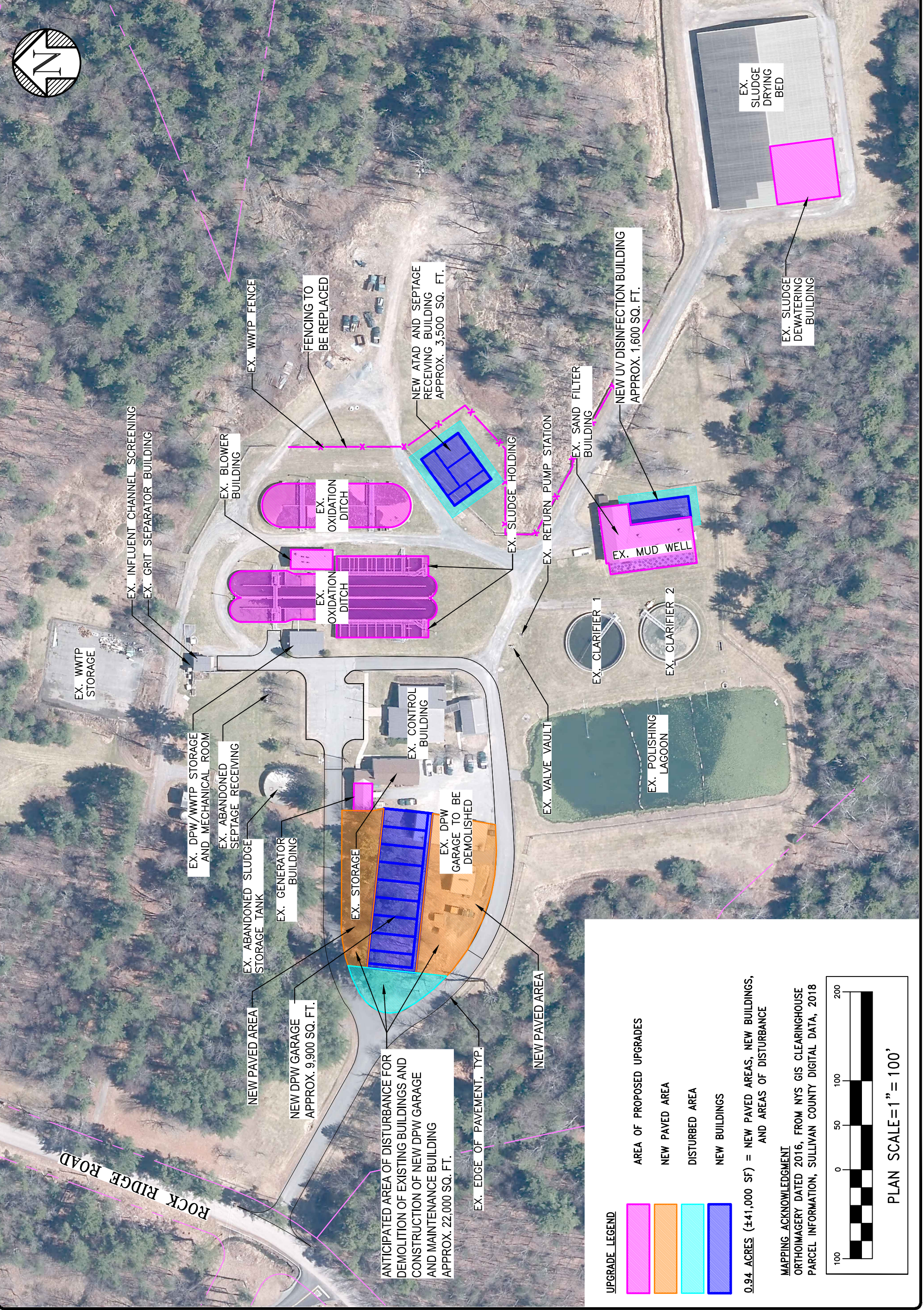
KIAMESHKA LAKE  
TOWN OF THOMPSON  
SULLIVAN COUNTY, NY

NO.	DATE	DESCRIPTION

**DELAWARE ENGINEERING, D.P.C.**  
CIVIL AND ENVIRONMENTAL ENGINEERING

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31 N. MAIN STREET, LIBERTY, NY 12754 - 845.747.9952  
16 EAST MARKET STREET, RED HOOK, NY 12571 - 518.452.1290

DATE: 8/30/19  
DRAWN BY: MO  
SCALE: 1"=100'  
REVIEWED BY: DRD  
PROJECT NO.:  
FILE:



**UPGRADE LEGEND**

- AREA OF PROPOSED UPGRADES
- NEW PAVED AREA
- DISTURBED AREA
- NEW BUILDINGS

0.94 ACRES (±41,000 SF) = NEW PAVED AREAS, NEW BUILDINGS, AND AREAS OF DISTURBANCE

MAPPING ACKNOWLEDGMENT  
ORTHOIMAGERY DATED 2016, FROM NYS GIS CLEARINGHOUSE  
PARCEL INFORMATION, SULLIVAN COUNTY DIGITAL DATA, 2018

100 0 50 100 200  
PLAN SCALE=1"=100'





## **5.0 Proposed District Operations**

The Town of Thompson Water and Sewer Department oversees day-to-day operations, maintenance and administration of all four of the Towns' wastewater treatment facilities. The department is managed by the superintendent and assistant superintendent with support by a foreman and account clerk. Additionally, the Kiamesha plant employs a dedicated staff of one 3a-certified licensed operator and three 2a-certified operators.

It is anticipated that additional personnel will not be required to operate or maintain the upgraded facilities, and staffing is anticipated to remain at current levels.

## **6.0 Statement of Regulatory Review and Approvals Required Prior to Construction**

Regulatory review and approvals of the engineering report and design documents are anticipated to be conducted by the NYS Department of Environmental Conservation and the NYS Environmental Facilities Corporation.

Plans will also be submitted to the Delaware River Basin Commission (DRBC), a regional water resource management consortium made up of four states and the US Army Corps of Engineers. The DRBC coordinates with states and local governments on water and wastewater projects throughout the Delaware River Basin region. The WWTP is located in an area identified by the DRBC as "special protection waters" and DRBC review is required for any new treatment facility or expansion of an existing facility with an average daily discharge rate of 10,000 gallons a day or more during any consecutive 30-day period.

Because this action will require the discretionary approval of multiple governmental and quasi-governmental agencies, NYS requires the completion of a State Environmental Quality Review (SEQR) coordinated with all involved, and potentially involved agencies. The SEQR process was initiated at the May 19, 2020 meeting of the Thompson Town Board, at which time the Board declared their intent to serve as lead agency for the Unlisted action.

## **7.0 Maximum Amount to be Expended**

The maximum amount that is planned to be expended is \$27 Million.



## 8.0 Cost of Hook-Up Fees Charged by District, If any

The Town intends to continue with its current policy regarding hook-up fees and reserves the right to modify this in the future.

## 9.0 Detailed Explanation of Costs (How Costs are Computed)

The schedule of rates for capital improvements and operation and maintenance expenses for properties included in the Kiamesha Lake Sewer District and extension thereof are computed based on the number of rent points assigned to each property. Rent points are determined based on property use and codified in *§194-46 Schedule of Rates* of the Town Code. Single family dwellings are assigned 7.5 rent points each for capital improvements and 7.5 rent points for operations and maintenance costs.

Costs to the typical user are calculated based on the total operations and maintenance (O&M) costs plus a unit share of any debt service owed by the sewer district. Only those properties within the district that are connected to public sewer system are responsible for a share of the O&M costs. However, all properties owners -- including vacant land not connected to the sewer system -- are and will continue to be charged for a share of the debt service.

Costs associated with the planned upgrade will be presented based on the anticipated receipt of interest-free (0%) financing through the NYSEFC, for a term of 30-years, for the capital improvements that would apply to current debt service rates.

Operation and maintenance (O&M) costs are anticipated to increase slightly as a result of this project due primarily to increased energy usage. Costs for debt service and O&M are described below and will be based on the current number of rent points (i.e., no additional users).

### 9.1 Operations and Maintenance (O&M)

The planned upgrade primarily entails the replacement of existing equipment for continued operation and the addition of two processes – UV disinfection and Autothermal Thermophilic Aerobic Digestion (ATAD). Additional O&M costs are associated with the anticipated increase in energy use and periodic UV bulb replacement.

In 2019, users in the Kiamesha Lake Sewer District were charged **\$80.07** per point for operations & maintenance of the system. A single family home is assigned 7.5 points, resulting in an annual O&M charge of **\$600.53**. The annual O&M budget is expected increase by approximately 3.5% after the proposed upgrade due primarily to an increase in energy usage.



## 9.2 Debt Service

Sewer Unit shares for debt service are calculated in accordance with Part 2, Article IX of the Thompson Town Code. Each property located in the sewer district is assigned a debt points value in accordance with §194-46 – *Schedule of Rates*. In 2019, property owners in the Kiamesha Lake Sewer District were charged \$6.26 per point for debt service. A single family home is assigned 7.5 debt points, resulting in an annual debt service charge of **\$46.95**.

The estimated project cost to be financed is approximately \$27 million and it is anticipated that the town will receive hardship financing from NYSEFC at 0% interest for a 30-year period. Annual debt service is estimated at \$900,000 or \$45.73 per point. Therefore, a single-family home in the Kiamesha Sewer District would pay an additional annual debt service charge of approximately **\$342.98**.

## 10.0 Cost to a Typical Single-Family Residential Property

The estimated rate impact to a typical sewer user, assuming a typical single-family home (SFH) in the Kiamesha Lake Sewer District is projected to be as follows:

2019 Sewer Rates		
	Per Point	Typical User (7.5 points)
Annual O&M Cost	\$80.07	\$600.53
Annual Debt Service	\$6.26	\$46.95
<b>Total:</b>	<b>\$86.33</b>	<b>\$647.48</b>

Estimated Future Sewer Rates		
	Per Point	Typical User (7.5 points)
Annual O&M Cost	\$82.87	\$621.53
Annual Debt Service	\$51.99	\$389.93
<b>Total:</b>	<b>\$134.86</b>	<b>\$1,011.46</b>

The above costs and rate impacts are based on current district users, 2019 Sewer Rates and 0% financing from NYSEFC. Rates would be reduced if more development occurs within the district and/or if the town is able to secure grant funding for the proposed improvements. The Town is also in the process of consolidating and restructuring rates for all of the sewer districts, which may impact future rates in the Kiamesha Lake Sewer District.



## **11.0 Method of Finance**

At this time, the Town has a commitment from NYSEFC to provide 0% short and long-term financing for the project for a term of 30 years term through the CWSRF Program. Additional subsidized grant financing through NYSEFC's Water Infrastructure Improvement Act (WIIA) and NYSDEC's Water Quality Improvement Program (WQIP) are anticipated to be sought to reduce financial impact of the project to system users.

## **12.0 Statement as to Benefit Assessment**

At this time, the costs associated with the debt service from the bond that is planned to be secured to finance the facility upgrades, and associated increases in O&M costs, will be charged on a benefit basis. Each holder of real property within the sewer district that will benefit from the project, as well as any out of district users, will be levied a share of those costs in accordance with the current Town Code and/or sewer use agreements/contracts.