NEW WATER TREATMENT PLANT

CONCEPTUAL DESIGN SUBMISSION

March 13, 2024
MJ Project #1075.11

PREPARED FOR:

TOWN OF WILLSBORO
ESSEX COUNTY, NEW YORK

PREPARED BY:

MJ Engineering and Land Surveying, P.C.

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1.0 EXECUTIVE SUMMARY

The Town of Willsboro's (Town) existing diatomaceous earth (DE) water treatment plant (WTP) was constructed in 1956, with additional filters installed in 1986. DE filters are very effective in treating waters with low turbidity, and in removing giardia and cryptosporidium cysts, however the treatment process cannot effectively remove organic material or viruses. As a result, elevated levels of disinfection by-products (DBPs) are continually being detected in the Town's water distribution system. Given the age of the WTP, constrictive site conditions, inability of the process in removing organic material, and need for flexibility in addressing future United States Environmental Protection Agency (EPA) and New York State Department of Health (NYSDOH) regulations, a new treatment process is proposed to replace the existing DE filtration process.

Based on population projections, it is expected that the wintertime population will increase to 2,400 residents by the year 2050, while the summertime population will increase to 5,400 people. The projected wintertime and summertime average daily demands are 321,000 gallons-per-day (GPD) and 437,000 GPD, respectively, with the maximum day demands increasing to 450,000 GPD and 702,000 GPD, respectively. Accordingly, the new WTP will be designed to treat a maximum flow of 800,000 GPD, which will provide for the projected future maximum day demand, as well as filter backwashing operations. Key features of the proposed WTP are as follows:

- A new WTP will be constructed on a vacant parcel owned by the Town along Farrell Road (Tax ID 21.17-1-47.200), approximately 1,100-feet northeast of the site of the existing WTP.

- The existing WTP will be converted into a raw water pump station to convey water from Lake Champlain to the new WTP. New raw water pumps will be installed to provide sufficient flow and pressure to the site of the new WTP, and through the new treatment process. The new raw water pumps will be controlled by a new supervisory control and data acquisition (SCADA) system and will activate based upon the water level in the finished water clearwell to be installed at the new WTP site.

- A new 12-inch ductile iron raw water transmission main will be installed to convey raw water from the pump station to the new WTP site.

- An approximately 8,260 square foot (SF) water treatment building, and 1,500 SF attached garage, will be constructed at the new site to accommodate three (3) WesTech Trident TR–210 filtration units and associated pumps, controls, chemical feed equipment, and appurtenances. An approximately 90,000-gallon clearwell will be located below the pump room floor for finished water storage, and to accommodate filter backwashing operations.

- An ultraviolet (UV) disinfection system will be installed in lieu of chlorination as the primary disinfectant. This is proposed to effectively reduce the level of DBPs in the distribution system by minimizing contact between organic material in the raw water and free chlorine. A secondary chlorination system will also be provided to inject a minimal dose of chlorine into the finished water to maintain a 0.2 mg/l residual in the distribution system (as prescribed by the NYSDOH).

- Two (2) new high-lift pumps will be provided to convey water from the finished water clearwell to the Town's water distribution system and water storage tanks. The pumps will be controlled by the new SCADA system and will be activated based upon the water level in the water storage tanks.

- A lagoon system will be provided to hold and treat backwash wastewater generated by the filter backwashing process. Two lagoons will be provided, each measuring approximately 170-feet by 40-feet. Each lagoon will be provided with filter sand overlying a gravel bed with underdrains. Filtered water from the lagoon system will be discharged through a 12-inch polyvinyl chloride lagoon effluent pipe and returned to the lake.

- The ROM cost of the proposed water system improvements based on the conceptual design is estimated at $15,363,000.

2.0 PROJECT OBJECTIVES

2.1 PROJECT GOALS

The existing DE filtration system, originally constructed in 1956, has provided reliable service to the Town in producing high quality potable drinking water. However, while being an effective treatment process in removing turbidity from the raw water, as well as effectively removing giardia and cryptosporidium cysts, the system cannot satisfactorily remove total organic carbon (TOC), leading to higher disinfection byproducts in the distribution system and potential violations to NYSDOH standards. The Town has recently reconditioned the existing filters, however with anticipated new and increasingly more stringent water quality standards, it is in the Town's best interests to replace the existing treatment process with one that can address current water treatment standards, as well as those that will be forthcoming.

To address this issue, four (4) alternative treatment processes were reviewed and evaluated by MJ to determine the process best suited for the community. After assessing the four treatment processes, it was recommended to install a new Trident filtration system, manufactured by WesTech, Inc. to replace the existing system. Analysis and recommendations were presented in an engineering report prepared by MJ Engineering and Land Surveying, P.C. (MJ) in July 2021. A pilot study was subsequently conducted during the Spring of 2023 that verified the effectiveness and the efficiency of the Trident filtration process in removing turbidity, metals, and TOC. The Trident filtration process also offers greater flexibility in addressing upsets in raw water quality, as well as the ability to meet both current and future NYSDOH regulations.

Due to severe site limitations, replacement of the existing WTP on the existing site is not practical. Accordingly, a new 800,000-GPD WTP will be constructed on an alternate site, located on Farrell Road (Tax ID 21.17-1-47.200), approximately 1,100-feet northeast from the exiting site. The new WTP will include a WesTech Trident filtration system, or approved equal, new chemical feed systems for poly-aluminum chloride, cationic polymer, orthophosphate, and sodium hypochlorite; UV reactors for disinfection; below-floor clearwell with high lift pumps; backwash pumps; a new SCADA system for control of all plant operations; and associated valves, piping, and appurtenances. Exterior piping modifications to connect the new facility to the existing water distribution system will be provided. Dual wastewater lagoons will also be installed to hold and treat wastewater from the new treatment process,

and a wastewater discharge line will be installed to convey the treated wastewater back to the lake under the Town's existing SPDES permit, which is to be modified.

Additionally, the existing WTP will be converted to a raw water pump station and will include the installation of two (2) new raw water pumps, sodium permanganate chemical feed system for raw water pre-oxidation, and controls. The new raw water pumps are proposed to be vertical turbine style pumps designed to minimize required submergence depth and mitigate vortex formation. Modifications to the existing wet well will be made as necessary to ensure optimal performance of the raw water pumps. Self-priming, in-line pumps will also be considered as an alternative to vertical turbine style pumps. A new 12-inch raw water transmission will be installed from the raw water pump station to the new WTP to convey raw water through the new treatment process.

In operation, water will be withdrawn from the lake through the existing 14" intake line. The raw water pumps will then convey the raw water to the new WTP through a new 12" transmission main. Sodium permanganate will be injected into the raw water prior to leaving the raw water pump station. Upon entering the new WTP, poly-aluminum chloride (PCH 182) and a cationic polymer (VC 201) will be injected into the water for coagulation of particulate material. After passing through a static mixer, the water will be directed through the filtration system. Following filtration, the water will be disinfected via UV disinfection and then conveyed directly to a below-floor finished water clearwell. Backwash pumps will be provided to draw water from the clearwell to backwash the filters. In addition, high-lift pumps will be provided to draw water from the clearwell and convey it into the distribution and storage system. Prior to leaving the WTP, the water will be chlorinated with a low dose of sodium hypochlorite to maintain a residual throughout the distribution system as required by the NYSDOH. Orthophosphate will also be injected into the finished water for corrosion control, as required.

2.2 PHASING

2.2.1 Project Phasing

Phasing the proposed project through multiple bids is not recommended for this project. To provide the best end-product and bid price, the entirety of the project will be completed by the same contractor within the same construction season. Multiple contracts will be let for each building trade in accordance with Wick's Law.

2.2.2 Construction Access

Construction access will be provided from Farrell Road and contractor staging and storage is anticipated to be on site. Contractor staging, storage and maintenance and protection of traffic plans will be developed in more detail upon consultation with the Town. Most construction activities are expected to allow for direct removal of spoils and direct installation of new materials. Items will be hauled in and directly placed, requiring little to no stockpiles.

3.0 FIELD STUDIES

3.1 SURVEY AND MAPPING

A topographic survey of the existing WTP site and proposed new WTP site was completed in April 2023 by MJ. This survey utilized the map references listed below:

- "Map of Survey-Portion of Property of Peter S. Paine, Jr." as prepared by WCT Surveyors, P.C. dated July 21, 2011.

- "Map of Survey showing certain lands of water district No. 2 of the Town of Willsboro" as prepared by John A Deming, dated July 26, 1988.

- "Map of Survey showing certain lands of Samuel M. & Cheryl A. Blanchard designated as Bay Terrace Subdivision" as prepared by John A Deming, dated May 13, 2016.

3.2 GEOTECHNICAL INVESTIGATION

Atlantic Testing Laboratories (ATL) performed a subsurface investigation for the project site during the period from May 5, 2023 to May 9, 2023. Eleven (11) borings were performed to determine soil properties. The soil boring location plan and boring logs are attached in Appendix A, however the full geotechnical report is currently being prepared by ATL and will be forwarded to the Town upon receipt.

3.3 WETLAND ASSESSMENT AND DELINEATION

On May 25, 2023, a wetland assessment and delineation was performed by Ambient Environmental, Inc. (Ambient) at the site of the existing WTP, located at 26 Pumphouse Lane, as well as the site of the proposed WTP located along Farrell Road (Tax ID 21.17-1-47.200). The purpose of the wetland assessment and delineation study was to identify existing wetlands within the proposed work areas which, if impacted by the proposed construction activities, will require further coordination and/or permitting through the jurisdictive authority. The study involved a cursory review of existing wetland mapping, topographical mapping, soils mapping, and Essex County GIS data, followed by an on-site inspection and assessment. The on-site inspection involved the identification of wetland plant species, culverts, and other areas of water inundation. Additionally, as part of the on-site assessment, three (3) test pits were advanced and in-situ soils were evaluated for color and other hydric indicators. Upon completion of the on-site assessment and inspection, existing wetlands were flagged and their locations documented via global positioning satellite (GPS) point collection.

Based on the results of the results of the wetland assessment, no wetland areas were identified at the site of the existing WTP. However, three (3) wetland areas were identified and flagged along the southern shoulder of Farrell Road, adjacent to the proposed WTP site. These areas appear to follow an existing drainage ditch running parallel to Farrell Road. As the three (3) delineated wetland areas meet the United States Army Corps of Engineers (USACE) criteria for freshwater wetlands, these areas are likely regulated by both the New York State Department of Environmental Conservation (NYSDEC) as well as the USACOE. Additionally, a documented, and federally regulated, Freshwater Riverine traverses the north-western corner of the proposed WTP site. A copy of the Wetland Delineation Report is provided in Appendix B.

3.4 HAZARDOUS MATERIALS ASSESSMENT

On April 20, 2023, a hazardous material survey was performed by Ambient on the existing water treatment building located at 26 Pumphouse Lane. The purpose of the survey was to identify the presence of asbestos containing material (ACM), lead-based paints (LBP), and polychlorinated biphenyls (PCB) on the building interior, exterior, and roofing systems in anticipation of the proposed building modifications. The survey included the identification of accessible suspect ACMs; quantification of ACMs, including material condition, and location; collection and analysis of bulk samples of suspect friable and non-friable ACMs; LBP inspection; and the collection and analysis of bulk samples of potential PCB containing window and door caulk.

Based on the results of the survey, the existing water treatment building was found to be free of LBPs and PCB containing caulking. However, non-friable ACM was identified on the building exterior foundation walls in the form of black foundation tar. Any modifications to the existing building foundation will require asbestos abatement and handling procedures in accordance with NYS Code Rule 56. A copy of the Hazardous Materials Survey Report is provided in Appendix C.

3.5 PILOT STUDY

A pilot study of the WesTech Trident treatment process was conducted by WesTech Engineering, LLC (WesTech) from March 24, 2023 to April 14, 2023 at the site of the Town's existing WTP. The principal objectives of the pilot study were to verify that the Trident treatment system can satisfactorily treat the raw water from Lake Champlain and meet the performance criteria established by the NYSDOH. Overall, the Trident treatment process proved to be highly effective and demonstrated acceptable performance in treating the Lake Champlain source water for the Town's new WTP. With the recommended chemical treatment scheme of poly-aluminum chloride as a coagulant, a cationic polymer as an adsorption clarifier (AC) flocculant aid and sodium permanganate as a pre-oxidant, it is expected that a full-scale Trident treatment system will consistently produce high quality finished water fully capable of meeting and exceeding present and future water quality standards. A copy of the Pilot Study Report is provided in Appendix C.

4.0 SCOPE OF WORK DESCRIPTION

4.1 WATER TREATMENT SYSTEMS

4.1.1 Raw Water Pump Station

The existing WTP will be converted to a raw water pump station following the construction and commissioning of the new WTP. The proposed modifications include the removal of the existing DE filters, piping, pumps, appurtenances and controls, as well as the existing chemical feed system and secondary containment basin. Following demolition of the existing equipment, new vertical turbine style raw water pumps will be installed along with new 8-inch flanged ductile iron pump discharge piping, valves, appurtenances, and controls. Modifications to the existing wet well will be performed, if necessary, to mitigate vortex formation during times of low lake levels and ensure optimal pump performance. As an alternative, direct suction pumps will be considered, however, with this option a vacuum primping system may be required, or a valve pit with double check valve assemblies, to prevent the reverse flow of water within the pump suction piping upon pump shutdown.

A new chemical feed system will also be provided at the raw water pump station for sodium permanganate ($NaMnO_4$) injection. It is proposed to locate the chemical feed equipment on the upper floor of the pump station in the existing chemical feed room. $NaMnO_4$ will be supplied either in five (5) gallon buckets, fifty-five (55) gallon drums, 275-gallon totes, or in bulk. A day tank and transfer pump will be provided, as required, based on the selected delivery method. Secondary containment basins will be provided under each chemical storage vessel in the event of leakage or a spill. 3/8-inch polyethylene tubing will convey the $NaMnO_4$ from the dosing pumps to the existing filter room where an injection quill will be installed in the raw water pump discharge piping prior to leaving the pump station. Sufficient room is available on the upper floor of the pump station to house the required chemical feed equipment and chemical storage vessels.

Additionally, a temporary pumping system will be provided at the raw water pump station to withdraw water from the existing wet well and convey it to the new WTP during construction. This temporary pumping system will be placed into service initially for testing and evaluation of the new treatment process and will continue in operation until the modifications to the existing WTP are complete. To facilitate the temporary pumping system, a temporary connection will be made to the new raw water transmission main.

4.1.2 Raw Water Transmission Main

A new 12-inch ductile iron (DI) raw water transmission main will be installed from the existing WTP (raw water pump station) to the new WTP. The transmission main will be sized at 12-inches to provide sufficient contact time for the NaMnO4 to adequately pre-oxidize the organics in the raw water and reduce TOC levels prior to filtration. At the existing WTP, the raw water transmission main will reduce to 8-inch diameter DI piping before entering the existing WTP building below grade and connecting to the new raw water pump discharge piping. The new raw water transmission main will be approximately 1,600-feet in length and will extend along Pump House Road and Farrell Road from the existing WTP (raw water pump station) to the new WTP.

4.1.3 Water Treatment Plant

A new WTP will be constructed on a vacant parcel (Tax ID 21.17-1-47.200) on the eastern side of Farrell Road, approximately 1,100-feet northeast of the exiting WTP site. The proposed WTP building footprint will be approximately 8,260 square feet (SF) and will include a 1,500 SF attached garage. The building measures approximately 135-feet in length by 65-feet at its widest point with a shed attached to the northern end. The building will include a filter gallery to accommodate three (3) Trident TR-210 filtration units and associated piping, valves, and appurtenances. In addition, the facility will include an office, laboratory, conference room, chemical feed room, chemical storage room, mechanical and electrical rooms, workshop, and a pump room. The pump room will house pumps for filter backwashing, as well as high-lift pumps to convey finished water to the distribution system and water storage tanks. The pump room will also house the UV disinfection system and provide additional area for storage and miscellaneous equipment. A clearwell with two (2) bays, each measuring 25-feet by 20-feet by 14-feet deep, will be constructed below the pump room floor. The clearwell will provide a total storage capacity of approximately 90,000-gallons.

Upon entering the WTP, the pre-treated water from the raw water pump station will be injected with poly-aluminum chloride and a cationic polymer and directed through a static mixer to be located upstream of the Trident units. The three (3) Trident filtration units are each 14’ – 6” in length by 8’ - 11” in width and 8’ – 5” in height. The filters will be positioned on concrete equipment pads, parallel to one another in the filter gallery. The filters will be installed approximately four (4) feet apart with an elevated catwalk between each filter for accessibility. Each filtration unit will consist of an upflow adsorption clarifier followed by a gravity mixed-media filter. The design flow for each filter train is 350 GPM, which corresponds to a loading rate of 5 gallons/SF of filter area. As the maximum design flow for the new Willsboro WTP is expected to be no more than 800,000 GPD, the filters will operate at a loading rate of no greater than 3.6 gallons/SF of filter area. At this rate and below, the run times for each filter will approach 42-hours prior to backwashing. It is expected that only two filters will run at any given time, with the third filter on standby.

The Trident packaged filter plant, provided by WesTech, also includes a programmable logic controller (PLC), influent and effluent valves, air scour system, and chemical feed systems. In addition, two (2) Xylem, Inc. VIT short set lineshaft turbine pumps will be provided for backwashing operations. The pumps will be set to operate at a low-flow rate of 350 GPM during the initial phase of the backwash sequence followed by 1,050 GPM for the high-flow phase of the backwash sequence. This will produce a flow of 5 GPM/SF of filter area during the initial phase and 15 GPM/SF for the final phase to ensure proper bed fluidization and adequate cleaning of the filter media.

Downstream of the static mixer, the chemically treated water will enter each filter unit near the bottom of the adsorption clarifier and will flow upward through a plastic media where an upflow treatment process will combine flocculation and clarification. The adsorption clarifier is designed to automatically initiate a flush cycle once an operator adjustable headloss setpoint is reached, indicating that cleaning is required. As treated water leaves the adsorption clarifier, it continues over a weir into a collection trough where it is distributed onto the mixed media filter bed. The mixed media will consist of layers of anthracite, silica sand, and garnet positioned over an underdrain system to collect the filtered water. Like the adsorption clarifier, the filter units are backwashed when the headloss reaches a preset level. Wastewater from both the clarifier and filter backwashing processes is discharged through waste piping leading to a lagoon system to be installed on site.

Following filtration, the filtered water will be directed through two (2) UV disinfection units followed by discharge into the clearwell. The clearwell will be designed to provide sufficient capacity for the operation of each backwash cycle as well as the high-lift pumps supplying the distribution system and storage tanks. Two (2) Xylem, Inc. VIT short set lineshaft turbine pumps will be provided to convey finished water from the clearwell to the water distribution system and storage tanks. The high-lift pumps will be programmed to operate at a maximum flow rate of 600 GPM. Prior to leaving the WTP, a minimal dose of sodium hypochlorite will be injected into the finished water, as required by the NYSDOH, to maintain a minimum residual of 0.2 mg/l of free chlorine throughout the distribution system. A small dose of orthophosphate will also be injected into the finished water for corrosion control prior to leaving the new WTP.

A supervisory control and data acquisition (SCADA) system will be provided to control the operation of the entire water treatment process. When the water level in the storage tanks drops to a preset level, the SCADA system will activate the high-lift pumps until water storage tank levels are replenished. Similarly, the SCADA system will activate the raw water pumps based on water level in the clearwell. The raw water pumps will remain in operation until the water level is restored in both the storage tanks and clearwell. All pumping systems will be equipped with variable frequency drives (VFD's) to regulate and control the operation of each pump and to optimize electrical efficiency.

4.1.4 Chemical Feed Systems

In addition to the NaMnO4 chemical feed system provided at the raw water pumping station, separate chemical feed systems will be provided at the WTP for poly-aluminum chloride (PCH 182), cationic polymer (VC 201), orthophosphate, and sodium hypochlorite. For redundancy, each system will be equipped with two (2) skid mounted chemical feed pumps. All chemical feed pumps will be flow meter-paced and will be equipped to accept a 4-20 mA signal originating from the WTP SCADA system. The operation of the PCH 182 and VC 201 systems will accept a signal from the raw water flow meter to be located at the raw water pump station. The sodium

hypochlorite and orthophosphate feed systems will operate based off a 4-20mA signal originating from a flow meter installed in the finished water piping leaving the WTP.

The chemical feed equipment for each system, as well as corresponding chemical storage, transfer pumps, and day tanks will be located in the chemical storage and chemical feed rooms. Each skid mounted chemical feed system will also include a pressure relief valve, flow indicator, calibration cylinder, valves, piping, and appurtenances. Each system will also be provided with automatic switchover controls in the event the lead operating pump fails. A fifty (50) gallon polyethylene day tank will be provided for the PCH 182 and thirty (30) gallon polyethylene day tanks will be provided for the VC 201, orthophosphate, and sodium hypochlorite systems. Treatment chemicals will be supplied either in five (5) gallon buckets, fifty-five (55) gallon drums, 275-gallon totes, or in bulk, except for the VC 201, which is shipped as a dry product. For the VC 201, a mixer will be provided with the new day tank. Secondary containment basins will be provided beneath all chemical storage vessels.

Chemical feed lines from both the PCH 182 and CV 210 feed pumps will be hard piped and connected through injection quills to the raw water piping ahead of the static mixer. The chemical feed line from the orthophosphate and sodium hypochlorite feed systems will be connected to the finished water piping downstream of the high lift pumps, prior to the water entering the distribution system.

4.1.5 Ultraviolet Disinfection System

A UV disinfection system will be provided as the primary means of disinfection. NYSDOH and USEPA regulations require that a combined water filtration and disinfection system provide 99.9% (3.0-log) removal, or inactivation, of giardia cysts and 99.99% (4.0-log) inactivation of viruses. The Trident filtration process is proven to provide 2.5 log removal of giardia cysts while providing 2.0-log removal of viruses. The proposed UV disinfection system will provide the remining log removals required by the USEPA and NYSDOH.

The proposed UV disinfection system will assist in mitigating ongoing disinfection byproduct issues throughout the distribution system. The dead-end lines within the distribution system, combined with the storage volume in the Town's water storage tanks results in significant contact time between the finished water and free chlorine. Although the new filtration process and pretreatment system (NaMnO4) will help to reduce the concentrations of total organic carbon, sufficient organic material will remain in the finished water that will react overtime with the free chlorine in the water, resulting in elevated levels of disinfection by-products. Utilizing UV disinfection in lieu of chlorination as the primary disinfectant will significantly reduce disinfection by-product formation, as only a small dose of sodium hypochlorite will be required to maintain necessary chlorine residuals within the distribution system.

Two (2) UV disinfection units, as manufactured by NUVONIC, Inc. (NUVONIC) will be provided at the new WTP. The NUVONIC units are compact units measuring only 30-inches in length and include two medium pressure UV lamps. Each UV unit will be validated to provide 2-log virus inactivation and will be capable of independently treating the entire system flow under maximum flow conditions.

4.1.6 Residuals Management

Residuals management will be achieved via wastewater lagoons. Two (2) wastewater lagoons will be constructed adjacent to the new WTP to hold and treat wastewater generated by the adsorption clarifiers and the mixed media filters during the backwashing process. The lagoons will each measure 170-feet by 40-feet with a total depth of 12-feet. Lagoon filter media will include 12-inches of sand placed above 12-inches of drainage stone. The sand layer will be encased in geotextile fabric. In operation, the sand layer will collect and filter out solids and particulate material from the wastewater stream. The filtered wastewater will then be collected by an underdrain system which will then be conveyed to the lagoon discharge piping. The lagoon discharge line will include approximately 1,600 LF of 12-inch diameter SDR sewer piping, and associated manhole structures, and will extend from the lagoons to the existing WTP site. At the existing WTP site, the wastewater piping will be connected to the existing backwash wastewater holding tank for discharge through the existing backwash waste piping network and ultimately back to the lake.

Only one lagoon will be in operation at a given time. Once the accumulated solids reach a performance limiting depth, the lagoon will be taken out of service for cleaning and the second lagoon will be placed in operation. The lagoons will each be constructed with an entry ramp to allow for light excavation equipment to remove the collected solids.

4.2 SITE IMPROVEMENTS

4.2.1 Grading

Grading is limited to the work required to accommodate the new WTP construction, associated parking areas, and driveways, stormwater management areas, and septic system. Due to the high ground water table at the project site, imported fill is expected to be required to raise stormwater management areas to provide the required separation from groundwater.

4.2.2 Parking and Access

Parking areas will be provided on all sides of the treatment plant where building access is required. A total of twenty-two (22) parking spaces are proposed for the building.

4.2.3 Accessibility

New accessible parking will be provided close to the main entrance of the building, as well as a compliant accessible route to the entrance.

4.2.4 Site Utilities

4.2.4.1 Potable Water

Potable water for the WTP will be drawn from the finished water high-lift pump discharge piping, therefore no separate water service will be required.

4.2.4.2 Sanitary Sewer

Domestic wastewater will be produced from one (1) public bathroom, two (2) employee bathrooms, with showers, in the staff locker room, and one (1) washing machine. The estimated hydraulic loading rate is 150 GPD. Since there is no municipal sanitary sewer system at the project site, an onsite wastewater treatment system (septic system) will be provided. The septic system will be a raised absorption trench field due to high groundwater. The field is anticipated to have a total basal area of 65-feet by 70-feet. The proposed septic system will include a 1,250-gallon septic tank, dosing tank and pump, and an equivalent 65-foot by 70-foot area to be reserved for potential replacement of the septic system in the future.

4.2.4.3 Electrical Service

A new 480V 3-phase electrical service entrance will be extended from the nearest pole on Farrell Road. It is anticipated that additional utility poles and overhead electrical cabling will be required along Farrell Road to extend 3-phase electrical service to the new WTP site.

4.2.4.4 Fuel/Gas

Heating fuel will be provided by liquid propane stored on site. Natural gas service is not available in the area.

4.2.5 Exterior Lighting

Site lighting will be implemented to provide safe navigation through the parking lot area while also contributing to the overall project site aesthetic. Light distribution will be consistent with the New York State Building Code, the Town's zoning code, and Adirondack Park Agency guidelines. All exterior light fixtures will be International Dark-Sky Association and EnergyStar compliant.

4.2.6 Perimeter Fencing

At this time, the need for perimeter fencing is not expected. However, fencing, or fall-protection guards, are likely required to protect public safety around the lagoons. This criteria will be further evaluated during detailed design.

4.3 STORMWATER MANAGEMENT

4.3.1 Water Quality and Quantity Treatment

The project disturbance area is approximately 2.5 acres, which will be subject to the requirements of the State Pollutant Discharge Elimination System (SPDES) General Permit GP 0-20-001. As a result, the project will be required to provide water quality and quantity controls. This project will be considered new development and will have to meet both the runoff reduction and water quality requirements per the NYSDEC Stormwater Design Manual.

To provide both runoff reduction and water quality treatment, the project proposes the use of a bioretention area to the west of the project site. Bioretention areas are designed to infiltrate

rainfall through the surface, thereby reducing stormwater runoff from the site and providing pollutant uptake in the underlying soils.

4.3.2 Erosion and Sediment Control

The contractor will be responsible for installing temporary and permanent erosion and sediment control structures, which will be outlined in the Contract Documents.

4.4 ARCHITECTURAL SYSTEMS

4.4.1 Building Massing

The proposed WTP building is traditional in form, designed to blend in with the surrounding landscape and vernacular architecture. The overall massing is comprised of three (3) gable roof structures intersected at key points informed by the programmatic requirements. The volume and height of the building is controlled to ensure that programmatic needs are met, and the overall height is kept to a minimum. The roof slopes are moderate and gradate from the central core space to the extents of the building. The overall intent of the massing is to remain contextually aware and residential in form.

4.4.2 Building Program

The programmatic needs of the Town and facility operators have been taken into consideration with the overall design and layout of the floor plan. The program is comprised of four (4) large primary spaces, eleven (11) smaller support spaces, and three (3) accessible restrooms. The overall layout is composed of three (3) sections from the South end of the building towards the North end starting with the support spaces at the South, the water treatment process spaces in the center, and the garage to the North. There are four (4) entrances informed by programmatic needs and egress requirements. All entrances are covered and adequately weather protected.

4.4.3 Exterior Envelope and Finishes

The exterior envelope of the building will be designed to meet the minimum energy performance requirements of the Energy Conservation Code of New York State (ECCNYS) for the building classification. The wall and roof assemblies will be comprised of metal framing, continuous insulation, and linear metal interlocking panels. The building fenestration will be comprised of thermally insulated glazing units with simulated internal divided lights, insulated flush and glazed man doors, and insulated overhead doors with integrated glazing.

The exterior finishes of the building will be utilitarian in nature. The colors and materials are intended to complement the rural Adirondak context of the building and will be of a hardwearing nature. There will be a mix of horizontal and vertical metal siding and include stone veneer at select locations along the base of the building. The siding material will be accented with wood timber features at select locations to provide a contextual impact.

4.4.4 Building Code Summary

The building occupancy is classified into three (3) categories; B – business, F-1 – moderate-hazard factory industrial, and S-1 commercial vehicle storage and repair. Classification B pertains to the administrative support spaces to include the office, laboratory and control room,

locker room, restrooms, conference room, and workshop. Classification F-1 pertains to the water processing spaces to include the electrical room, chemical feed and storage areas, process atrium, workshop, mechanical room, blower room, and clearwell area. Classification S-1 pertains to the 2-bay garage and associated workshop. The minimum fire resistance rating between the three (3) occupancies is three (3) hours. The fire rating requirements dictate the construction as Type II (111). An automatic sprinkler system is not required for these occupancy classifications given the size of the building. The maximum distance between exits based on the building occupancies is 200-feet. The building is designed to meet the requirements of the Americans with Disabilities Act (ADA).

4.5 STRUCTURAL SYSTEMS

4.5.1 Super Structure

The proposed building will be a single-story structure. The roof will be framed with structural steel wide flange shapes supporting an 18-guage fluted galvanized metal-roof-deck. The roof structure is organized into three interconnected gable roof structures. Roof A is an approximately 60-feet wide gable oriented perpendicular to Farrell Road. Roof B is an approximately 30-feet wide raised gable roof oriented parallel to Farrell Road constructed over the Filter Room. Roof C constructed over the support space is an asymmetric gable roof with the ridge oriented parallel to Farrell Road. The ridge of Roof C will be aligned with the west wall at Roof B. The steel structure's lateral force resistance system will incorporate moment connections and braced frames.

Roof A will be framed with W12x14 infill beams spaced at approximately 7-feet. The infill beams will span in the east-west direction between sloped W24x55 girders. The girders will be moment connected to W21x73 columns located at the ridge and eaves of the roof at approximately 18-feet on-center. The columns at the ridge will be coordinated with the interior wall separating the Garage space from the Pump Room/UV Treatment Area.

At Roof B, rigid frames constructed of W21x62 structural steel beams and columns will be spaced to coordinate with the proposed equipment. The rigid frames will clear span the approximately 34-feet wide Filter Room. W12x14 infill beams spaced at approximately 6-feet on center will be supported by the rigid frames.

Roof C will be framed with W12x22 infill beams spaced at approximately 7-feet. The infill beams will span a maximum of 20-feet. W16 girders spanning in the north-south direction will support the infill beams. W16x36 girders will typically be used to support the infill beams. These girders will be connected to the Roof B rigid frames at the interior portions of the roof, and W10 columns at the perimeter. Intermediate W16x67 girders will support the infill beams at the locker room and control room areas.

4.5.2 Foundations

The proposed structure will utilize reinforced cast-in-place concrete foundation elements including piers, foundation walls, mat foundation, footings, elevated slabs, and slabs-on-grade.

At the exterior of the building, the superstructure columns noted above will bear on concrete piers supported by isolated spread footings 5-feet below grade. Exterior reinforced foundation walls will extend 5-feet below grade to wall footings between the piers. Interior columns will

typically be supported by isolated spread footings. Concrete piers integral with the 1-foot, 6-inch-thick clear well concrete walls will be provided at the columns adjacent to the to the clear well. The piers will transfer the column loads to the approximately 2-foot thick clear well concrete mat slab.

The approximately 1-foot, 6-inch-thick elevated concrete slab above the clear well will be supported by the clear well walls. An 8-inch-thick concrete slab-on-grade section will be utilized at the Filter Room, Pump Room, and Garage areas. The remaining sections of the building will utilize a 6-inch-thick concrete slab-on-grade. The slabs-on-grade will be placed on vapor barrier over 6-inch-thick minimum compacted subbase. The clear well construction will utilize waterstops and an integral crystalline waterproofing admixture approved for potable water use.

4.5.3 Lagoons

Exterior cast-in-place concrete retaining walls will surround the lagoons on 3-sides and separate the 2-bays of the lagoons. The retaining wall footings will be 1-foot, 8-inches thick and approximately 12-feet wide. The 1-foot, 3-inch-thick concrete stems will support approximately 12-feet of unbalanced fill and top mounted guardrail. The lagoon construction will utilize waterstops and an integral crystalline waterproofing admixture. A geomembrane will be installed near the bottom of the concrete retaining walls to provide separation between the proposed granular filter media and underlying soils, and to prevent groundwater ingress into the lagoon.

4.6 HVAC SYSTEMS

The design of heating, ventilation, and air conditioning systems integral to the proposed WTP are not included in this conceptual design report. The design of these systems will be developed during detailed design. However, the building is exempt from the adopted "all-electric building act" included in Senate bill S4006C (§ 3. subdivision 19.c.iii) exemption for water treatment and pumping facilities. Fossil fuel heating sources are permitted.

4.7 ELECTRICAL SYSTEMS

The design of electrical systems integral to the proposed WTP are not included in this conceptual design report. The design of all electrical systems will be developed during detailed design.

5.0 IMPACT ON OPERATIONS

5.1 IMPACT ON UTILITIES

Construction phasing for the existing WTP modifications, raw water transmission main installation, and new WTP construction will be such that impacts on existing utilities should be minimal. The existing WTP is expected to remain in service until the new WTP is constructed and commissioned. Construction of the raw water transmission main, lagoon effluent piping, and new WTP are expected to be performed concurrently, and only until after the new WTP is commissioned and brought into service will demolition of the existing WTP equipment commence. During the commissioning phase of the new WTP, a temporary portable raw water pump will be utilized to draw water from the existing raw water clearwell and convey the raw water through the new transmission main via a temporary connection. The

temporary pump will also remain in operation throughout the duration of the existing WTP modification work and will only be removed following installation and commissioning of the new raw water pumps, chemical feed systems and appurtenances. A temporary sodium permanganate feed system will be provided while the demolition work is occurring within the existing WTP chemical feed room.

The finished water piping from the new WTP will be connected to the existing 10-inch ductile iron distribution system piping along Farrell Road, just west of Pumphouse Road, via a tapping sleeve and valve. Accordingly, water service along Farrell Road will not be impacted while this work is being performed.

6.0 PROJECT COST

The rough-order-of-magnitude cost estimate for the proposed project, based on the conceptual design, is $15,363,000, which includes the necessary modifications to the existing WTP, the installation of a new raw water transmission main, construction of a new WTP, installation of the lagoon effluent piping, and related site work. A breakdown of the estimated costs is provided in Appendix F.

7.0 PROJECT SCHEDULE

Although the construction phase of the project will be dependent upon the Town securing the necessary funding, an anticipated schedule for completing the project is provided below:

- Detailed Design Phase: Winter 2024 to Fall 2024
- Regulatory Review Submission: Fall 2024
- Bid Phase: Winter 2025
- Commence Construction: Spring 2025
- Construction Complete: Fall 2026

8.0 CODES & REGULATORY REQUIREMENTS

8.1 CODE COMPLIANCE

The following code requirements are expected:

- Town of Willsboro Zoning Law
- NYSDEC Stormwater Design Manual
- SPDES General Permit GP-0-20-001

- Town of Willsboro Zoning Law (Local Law 1 of 2015)
- 2021 International Building Code (IBC)
- 2020 Building Code of New York State (BCNYS)
- 2020 Energy Conservation Code of New York State (ECCNYS)
- 2020 Fire Code of New York State (FCNYS)
- 2010 Americans with Disabilities Act (ADA)

8.2 STATE ENVIRONMENTAL QUALITY REVIEW (SEQR)

The project (or action) is currently expected to be classified as an Unlisted SEQRA action as the project scope exceeds the thresholds of a Type II defined in Part 617.5. For an Unlisted Action, Parts 1 through 3 of a short environmental assessment must be completed Under ECL Part 617. Coordinated reviews for Unlisted actions are optional.

8.3 TOWN OF WILLSBORO LAND USE BOARD APPROVALS

8.3.1 Land Use

The project site is located in the Town of Willsboro's RL-5 Residential District (Low Density District 5). The proposed project is considered to be a "Public Utility" pursuant to the Town's Zoning Law, which requires Special Use Permit approval by the Town's Planning Board. An application for a Special Use Permit has been completed and submitted to the Town Planning Board. Approval is anticipated to be provided during the detailed design phase of the project.

8.3.2 Area Requirements

The RL-5 District includes the following area requirements. The proposed conditions are also presented in the table below:

Area Regulation	Required	Proposed	Variance Required
Front Yard Setback	100 feet min.	170 feet	No
Side Yard Setback	75 feet min.	Lagoon @ 36 feet Building @ 217 feet	**Yes (Lagoons)**
Rear Yard Setback	150 feet min.	74.96 feet	**Yes**
Lot Coverage	15% max.	Approx. 31%	**Yes**
Building Height	35 feet max.	Less than 35 feet	No

Based upon the proposed conditions, a total of three (3) area variances from the Zoning Board of Appeals (ZBA) will be required, including rear yard setback, side yard setback, and lot coverage. The shape of the parcel and significant rear yard setback requirement provide for very limited building area that cannot accommodate the proposed water treatment plant without relief from these regulations. An Area Variance Application will be submitted to the Town's ZBA as detailed design develops to ensure that adequate relief is sought.

8.4 SPDES GENERAL PERMIT GP-0-20-001

The project disturbance is expected to exceed one (1) acre, and therefore will be subject to SPDES General Permit GP-0-20-001 and will require a Stormwater Pollution Prevention Plan (SWPPP), which will be developed during detailed design. Based upon the described program, it is assumed that the project will be considered a new development project, and therefore will require both water quality and quantity treatment. A draft SWPPP will be prepared as part of the detailed design phase.

8.5 NEW YORK STATE DEPARTMENT OF HEALTH

Plans and specifications for the new WTP will be submitted to the NYSDOH for review and approval prior to initiating construction of the new facility. The project will be designed fully in accordance with Part 5 of the State Sanitary Code and the latest edition of the Recommended Standards for Waterworks to assure the facility meets all NYSDOH standards. Following construction of the WTP, a full review of the completed facility and start-up test results will be conducted by the NYSDOH. Upon final approval by the NYSDOH, the new WTP can then be placed in operation.

Plans and specifications will also be required to obtain approval for the new septic system to be installed on site.

8.6 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Several permits are required from the NYSDEC. The Town currently has a permit to withdraw 864,000 GPD from Lake Champlain to provide for the water requirements of the community, and therefore, based on the design capacity of the new WTP, a revised water withdrawl permit is not anticipated. However, a modified SPDES permit will be required for the discharge of the backwash wastewater from the proposed lagoon system. Additionally, permits may be required if any wetlands or lake shorelines are impacted during the construction of the new WTP, or during construction of the raw water transmission main and lagoon effluent piping. If determined that the proposed work will impact existing wetlands and/or shorelines, the appropriate Joint Application for Permit(s) will be submitted to the NYSDEC and USACOE accordingly. Finally, a NYSDEC chemical bulk storage permit may also be required for bulk handling and storage of treatment chemicals, specifically PCH 182 and sodium hypochlorite. The requirement for a bulk chemical storage permit will be dependent on the selected chemical delivery methods and storage quantities.

8.7 ADIRONDACK PARK AGENCY

The Essex County Office of Community Resources has submitted a jurisdictional inquiry to the Adirondack Park Agency (APA) for use in determining whether additional permitting through the APA is required. It is anticipated that the jurisdictional inquiry will evaluate potential impacts to wetlands, shorelines, and State-owned lands. If determined by the APA that permits are required for the proposed project, the appropriate permit applications will be submitted accordingly. If determined by the APA that the project will not result in the above environmental impacts, the APA will issue a No-Impact Statement, and no further actions will be taken with the APA.

8.8 NEW YORK STATE HISTORIC PRESERVATION OFFICE

The Essex County Office of Community Resources has submitted a jurisdictional inquiry to the New York State Historic Preservation Office (SHPO) for use in determining whether the project site is within an archaeologically sensitive area. As summarized in SHPO's response letter, dated November 15, 2021,

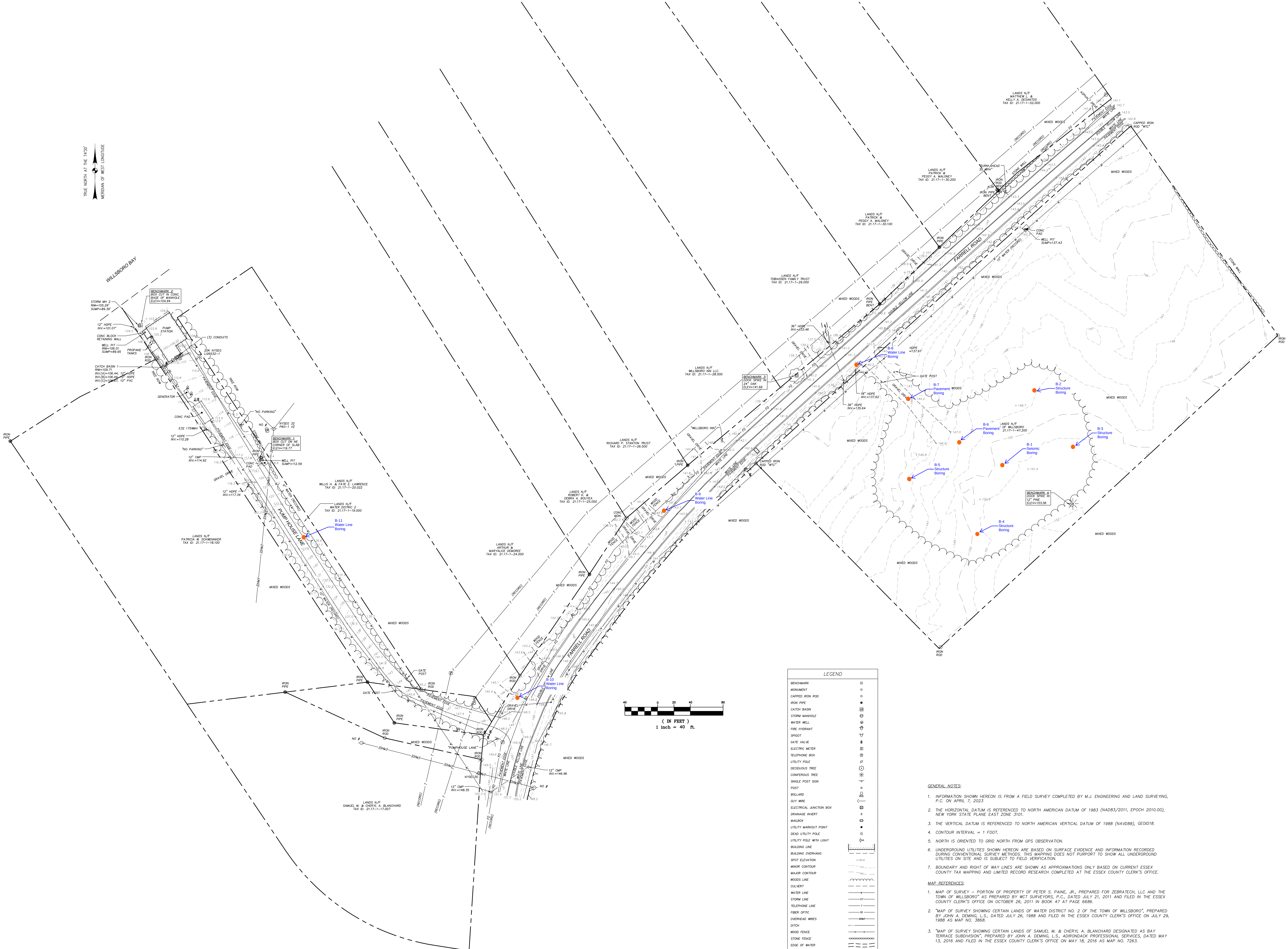
SHPO has determined that the project area is within an archaeological sensitive area, and that additional investigations are required. Per the SHPO response letter, a Phase IA/IB survey will be required within the limits of the proposed work area to determine the presence or absence of archeological sites, or other cultural resources. The November 15, 2021 response letter is provided in Appendix G.

8.9 TOWN OF WILLSBORO HIGHWAY DEPARTMENT

Plans and details of the work to be completed along Farrell Road will be submitted to the Town highway department for review and approval prior to commencing construction.

Appendix A \

Geotechnical Report



GENERAL NOTES:

1. INFORMATION SHOWN HEREON IS FROM A FIELD SURVEY COMPLETED BY M.J. ENGINEERING AND LAND SURVEYING, P.C. ON APRIL 7, 2023
2. THE HORIZONTAL DATUM IS REFERENCED TO NORTH AMERICAN DATUM OF 1983 (NAD83/2011, EPOCH 2010.00), NEW YORK STATE PLANE EAST ZONE 3101.
3. THE VERTICAL DATUM IS REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), GEOID18.
4. CONTOUR INTERVAL = 1 FOOT.
5. NORTH IS ORIENTED TO GRID NORTH FROM GPS OBSERVATION.
6. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON SURFACE EVIDENCE AND INFORMATION RECORDED DURING CONVENTIONAL SURVEY METHODS. THIS MAPPING DOES NOT PURPORT TO SHOW ALL UNDERGROUND UTILITIES ON SITE AND IS SUBJECT TO FIELD VERIFICATION.
7. BOUNDARY AND RIGHT OF WAY LINES ARE SHOWN AS APPROXIMATIONS ONLY BASED ON CURRENT ESSEX COUNTY TAX MAPPING AND LIMITED RECORD RESEARCH COMPLETED AT THE ESSEX COUNTY CLERK'S OFFICE.

MAP REFERENCES:

1. MAP OF SURVEY – PORTION OF PROPERTY OF PETER S. PAINE, JR., PREPARED FOR ZEBRATECH, LLC AND THE TOWN OF WILLSBORO" AS PREPARED BY WCT SURVEYORS, P.C., DATED JULY 21, 2011 AND FILED IN THE ESSEX COUNTY CLERK'S OFFICE ON OCTOBER 26, 2011 IN BOOK 47 AT PAGE 6686.
2. "MAP OF SURVEY SHOWING CERTAIN LANDS OF WATER DISTRICT NO. 2 OF THE TOWN OF WILLSBORO", PREPARED BY JOHN A. DEMING, L.S., DATED JULY 26, 1988 AND FILED IN THE ESSEX COUNTY CLERK'S OFFICE ON JULY 29, 1988 AS MAP NO. 3868.
3. "MAP OF SURVEY SHOWING CERTAIN LANDS OF SAMUEL M. & CHERYL A. BLANCHARD DESIGNATED AS BAY TERRACE SUBDIVISION", PREPARED BY JOHN A. DEMING, L.S., ADIRONDACK PROFESSIONAL SERVICES, DATED MAY 13, 2016 AND FILED IN THE ESSEX COUNTY CLERK'S OFFICE ON MAY 18, 2016 AS MAP NO. 7263.

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/5/2023** Finish Date: **5/9/2023**

Boring No.: **B-1** Sheet **1** of **2**

Groundwater Observations

Date	Time	Depth	Casing
5/9/2023	AM	6.5'	18.0'
5/9/2023	AM	7.5'	28.0'
5/9/2023	PM	4.8'	CAVED

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By: **NW (3") Casing**

Borehole caved at 29.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%)	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	4 4 4 5		Brown cmf SAND; some SILT; trace CLAY; trace f GRAVEL (wet, very slightly plastic)	17
2									
3		2	2.0	4.0	SS	5 5 12 12	3.0		14
4								Brown cmf SAND; trace mf GRAVEL; trace SILT (moist, non-plastic) w = 8.4%	
5		3	4.0	6.0	SS	15 18 20 26		Brown cmf+ SAND; and SILT; trace f GRAVEL (moist, non-plastic) w = 7.2%	24
6									
7		4	6.0	7.8	SS	28 34 41 50/3"		Similar Soil (moist, non-plastic) w = 6.1%	24
8									
9		5	8.0	9.8	SS	30 37 43 50/4"		Brown cmf SAND; little SILT; trace f GRAVEL (wet, non-plastic) w = 9.5%	18
10									
11		6	10.0	11.8	SS	41 41 48 50/3"		Brown cmf SAND; trace f GRAVEL; trace SILT (saturated, non-plastic) w = 8.2%	4
12									
13									
14		7	14.0	14.1	SS	50/1"		NO RECOVERY	0
15								Encountered BOULDER at 14.0 feet.	
16									
17							17.0		
18									
19		8	19.0	20.3	SS	32 46 50/3"		Grey cmf SAND; trace mf GRAVEL; trace SILT (wet, non-plastic)	13
20									
21									
22									
23									
24		9	24.0	24.4	SS	50/5"		Grey cmf SAND; little mf GRAVEL; trace SILT (saturated,	8
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **B-1** Report No.: **CD10530E-01-06-23** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
								f - fine; m - medium; c - course; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
26								non-plastic)	
27									
28									
29		10	29.0	29.4	SS	50/5"	29.4	Grey cmf SAND; trace mf GRAVEL; trace SILT (saturated, non-plastic)	
30								Boring terminated at 29.4 feet.	
31									
32								Notes:	
33								1. Borehole backfilled with on-site soils.	
34									
35									
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62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/9/2023** Finish Date: **5/9/2023**

Boring No.: **B-2** Sheet **1** of **2**

Groundwater Observations

Date	Time	Depth	Casing
5/9/2023	PM	1.2'	23.0'
5/9/2023	PM	1.0'	OUT

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By: **NW (3") Casing**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	WH 1 1 2	2.0	Brown CLAY; and cmf SAND; little mf GRAVEL; little SILT; trace ORGANIC MATERIAL (grass, roots) (saturated, plastic)	12
3		2	2.0	4.0	SS	2 4 3 4	4.0	Brown cmf SAND; little cmf GRAVEL; trace SILT (saturated, non-plastic) w = 10.0%	13
5		3	4.0	6.0	SS	12 12 28 47	6.0	Brown SILT; and cmf+ SAND; trace f GRAVEL (wet, non-plastic) w = 11.2%	16
7		4	6.0	7.8	SS	40 37 46 50/3"		Brown cmf SAND; trace mf GRAVEL; trace SILT (wet, non-plastic) w = 7.6%	12
9		5	8.0	9.8	SS	30 43 48 50/3"		Brown cmf SAND; trace f GRAVEL; trace SILT (wet, non-plastic) w = 7.1%	17
11		6	10.0	12.0	SS	31 41 42 47		Similar Soil (wet, non-plastic) w = 8.0%	20
13							13.0		
15		7	14.0	15.7	SS	27 45 46 50/2"		Grey cmf SAND; trace f GRAVEL; trace SILT (saturated, non-plastic)	19
19		8	19.0	19.8	SS	48 50/3"		Similar Soil (saturated, non-plastic)	7
24		9	24.0	24.3	SS	50/3"	24.3	Grey cmf SAND; and mf GRAVEL; trace SILT (saturated, non-plastic)	3

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **B-2** Report No.: **CD10530E-01-06-23** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
								f - fine m - medium c - course and - 35-50% some - 20-35% little - 10-20% trace - 0-10%	
26								Boring terminated at 24.3 feet.	
27									
28								Notes:	
29								1. Borehole backfilled with on-site soils.	
30									
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ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/9/2023** Finish Date: **5/9/2023**

Boring No.: **B-3** Sheet **1** of **2**

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

Groundwater Observations

Date	Time	Depth	Casing
5/9/2023	AM	0.9'	19.0'
5/9/2023	PM	1.4'	OUT

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
1	CASING	1	0.0	2.0	SS	1 2 2 4		Brown cmf SAND; little mf GRAVEL; trace SILT (saturated, non-plastic)	15
2		2	2.0	4.0	SS	4 6 5 6		Similar Soil (saturated, non-plastic) w = 9.0%	10
4		3	4.0	6.0	SS	5 9 32 54	5.0	Similar Soil (saturated, non-plastic) w = 7.5%	24
6		4	6.0	7.2	SS	32 44 50/2"		Brown cmf+ SAND; and SILT; trace f GRAVEL (wet, non-plastic) w = 7.7%	7
8		5	8.0	9.4	SS	26 42 50/5"		Brown cmf+ SAND; and SILT; trace f GRAVEL (wet, non-plastic) w = 6.8%	20
10		6	10.0	11.8	SS	26 49 42 50/4"		Similar Soil (wet, non-plastic) w = 8.0%	18
13							13.0		
14		7	14.0	15.3	SS	36 57 50/4"		Grey cmf SAND; little mf GRAVEL; trace SILT (saturated, non-plastic)	22
19		8	19.0	19.1	SS	50/1"		NO RECOVERY	0
24		9	24.0	24.4	SS	50/5"	24.4	Grey cmf SAND; trace f GRAVEL; trace SILT (saturated, non-plastic)	5

f - fine
m - medium
c - coarse
and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **B-3** Report No.: **CD10530E-01-06-23** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
								f - fine m - medium c - course and - 35-50% some - 20-35% little - 10-20% trace - 0-10%	
26								Boring terminated at 24.4 feet.	
27									
28								Notes:	
29								1. Borehole backfilled with on-site soils.	
30									
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62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/5/2023** Finish Date: **5/5/2023**

Boring No.: **B-4** Sheet **1** of **2**

Groundwater Observations

Date	Time	Depth	Casing
5/5/2023	**AM**	**DRY**	**24.0'**

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3.75" Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	1 WH/12" 2	2.0	Dark Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, grass) (saturated, non-plastic)	16
2		2	2.0	4.0	SS	2 1 1 1	4.0	Brown cmf+ SAND; and SILT; trace mf GRAVEL (saturated, non-plastic) w = 15.7%	13
4		3	4.0	6.0	SS	13 27 31 30		Brown cmf SAND; little mf GRAVEL; trace SILT (saturated, non-plastic) w = 7.4%	24
6		4	6.0	8.0	SS	22 28 35 33		Brown cmf SAND; trace mf GRAVEL; trace SILT (moist, non-plastic) w = 6.9%	19
8		5	8.0	8.3	SS	50/4"		Similar Soil (moist, non-plastic) w = 7.0%	4
10		6	10.0	10.8	SS	36 50/3"		Brown cmf SAND; trace f GRAVEL; trace SILT (wet, non-plastic) w = 7.4%	9
14		7	14.0	16.0	SS	29 32 38 36		Brown cmf SAND; little mf GRAVEL; trace SILT (moist, non-plastic)	
19		8	19.0	20.3	SS	40 44 50/3"		Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic)	
24		9	24.0	24.8	SS	52 50/4"	24.8	Similar Soil (moist, non-plastic)	

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **B-4** Report No.: **CD10530E-01-06-23** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
								f - fine m - medium c - course and - 35-50% some - 20-35% little - 10-20% trace - 0-10%	
26								Boring terminated at 24.8 feet.	
27									
28								Notes:	
29								1. Borehole backfilled with on-site soils.	
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
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48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-5** Sheet **1** of **2**

Groundwater Observations

Date	Time	Depth	Casing
5/10/2023	**AM**	***1.1'**	**19.0'**
5/10/2023	**AM**	***1.8'**	**OUT**

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By: **NW (3") Casing**

***May be affected by water utilized to advance the borehole.**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%)	Recovery (Inches)
0	CASING	1	0.0	2.0	SS	3 5 2 2		Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (wood fragments, roots) (wet, non-plastic)	14
2	CASING	2	2.0	4.0	SS	6 5 14 14	3.0	Dark Brown cmf SAND; trace f GRAVEL; trace SILT (saturated, non-plastic) w = 16.8%	16
4		3	4.0	6.0	SS	10 12 13 20		Brown cmf+ SAND; and SILT; trace mf GRAVEL (wet, non-plastic) w = 10.1%	14
6		4	6.0	8.0	SS	24 28 31 47		Similar Soil (wet, non-plastic) w = 8.0%	24
8		5	8.0	9.9	SS	47 48 45 50/3"		Similar Soil (wet, non-plastic) w = 7.8%	21
10		6	10.0	12.0	SS	43 45 43 49		Brown cmf SAND; little GRAVEL; trace SILT (moist, non-plastic) w = 6.9%	24
14		7	14.0	14.1	SS	50/1"		NO RECOVERY	0
19		8	19.0	20.7	SS	49 49 52 50/2"		Brown cmf SAND; little f GRAVEL; trace SILT (moist, non-plastic)	10
24		9	24.0	25.3	SS	49 44 50/4"		Brown cmf SAND; little mf GRAVEL; trace SILT (moist,	12

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: **B-5** Report No.: **CD10530E-01-06-23** Sheet **2** of **2**

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
							25.3	non-plastic)	

f - fine
m - medium
c - course

and - 35-50%
some - 20-35%
little - 10-20%
trace - 0-10%

Boring terminated at 25.3 feet.

Notes:
1. Borehole backfilled with on-site soils.

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-6** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	4 5 5 8	2.0	Dark Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (grass, roots) (moist, non-plastic)	10
2		2	2.0	4.0	SS	15 13 15 21		Brown cmf SAND; trace f GRAVEL; trace SILT (wet, non-plastic)	16
3									
4		3	4.0	6.0	SS	22 24 27 25		Brown cmf SAND; trace mf GRAVEL; trace SILT (moist, non-plastic)	18
5							6.0		
6								Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-7** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	10 11 10 10		Light Brown cmf SAND; trace SILT (wet, non-plastic)	16
2									
3		2	2.0	4.0	SS	9 8 12 13		Brown cmf SAND; trace SILT; trace ORGANIC MATERIAL (wood fragments) (wet, non-plastic)	8
4							4.0		
5		3	4.0	6.0	SS	14 20 21 26		Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic)	23
6							6.0		
7								Boring terminated at 6.0 feet.	
8									
9								Notes:	
10								1. Borehole backfilled with on-site soils.	
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-8** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	14 7 7 9	2.0	Light Brown cmf SAND; trace f GRAVEL; trace SILT (moist, non-plastic)	8
2		2	2.0	4.0	SS	10 11 11 12		Brown cmf SAND; little mf GRAVEL; trace SILT; trace CLAY (wet, very slightly plastic)	8
4		3	4.0	6.0	SS	15 17 20 19		Similar Soil (wet, very slightly plastic)	18
6		4	6.0	8.0	SS	16 18 23 25		Brown cmf SAND; little cmf GRAVEL; trace SILT (saturated, non-plastic)	10
8							8.0		
9								Boring terminated at 8.0 feet.	
10								Notes:	
11								1. Borehole backfilled with on-site soils.	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-9** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	1 2 2 3		Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (grass, roots) (moist, non-plastic)	9
2									
3		2	2.0	4.0	SS	4 5 7 6		Brown cmf SAND; trace mf GRAVEL; trace SILT; trace CLAY (wet, very slightly plastic)	15
4									
5		3	4.0	6.0	SS	8 9 12 12		Brown cmf SAND; trace f GRAVEL; trace SILT; trace ORGANIC MATERIAL (grass, roots) (wet, non-plastic)	11
6							6.0		
7		4	6.0	8.0	SS	12 10 13 17		Brown cmf SAND; trace mf GRAVEL; trace SILT (wet, non-plastic)	24
8							8.0		
9								Boring terminated at 8.0 feet.	
10									
11								Notes:	
12								1. Borehole backfilled with on-site soils.	
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATL-LOG1 LL CD10530 M.J. ENGINEERING - WILLSBORO.GPJ ATL4-08.GDT 6/8/23

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-10** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	3 13 5 3		Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots) (moist, non-plastic)	14
2									
3		2	2.0	4.0	SS	6 6 9 10		Dark Brown cmf SAND; trace f GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots) (moist, non-plastic)	18
4							4.0		
5		3	4.0	6.0	SS	10 7 13 13		Brown CLAY; trace mf SAND; trace SILT; trace ORGANIC MATERIAL (roots) (moist, plastic)	24
6									
7		4	6.0	8.0	SS	14 15 15 20		Similar Soil (roots) (moist, plastic)	17
8							8.0		
9								Boring terminated at 8.0 feet.	
10									
11								Notes:	
12								1. Borehole backfilled with on-site soils.	
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD10530E-01-06-23**

Client: **M.J. Engineering & Land Surveying**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Willsboro WTP
Willsboro, New York

Start Date: **5/10/2023** Finish Date: **5/10/2023**

Boring No.: **B-11** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
NW (3") Casing

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	CASING	1	0.0	2.0	SS	1 1 2 2		Brown cmf SAND; little SILT; trace f GRAVEL; trace ORGANIC MATERIAL (roots) (wet, non-plastic)	9
2									
3		2	2.0	4.0	SS	3 4 4 3		Brown cmf SAND; little SILT; trace f GRAVEL (saturated, non-plastic)	11
4									
5		3	4.0	6.0	SS	4 5 10 12	5.0	Similar Soil (saturated, non-plastic)	13
6									
7		4	6.0	8.0	SS	10 10 14 19		Brown cmf SAND; little f GRAVEL; trace SILT (moist, non-plastic)	15
8							8.0		
9								Boring terminated at 8.0 feet.	
10									
11								Notes:	
12								1. Borehole backfilled with on-site soils.	
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Jeffrey Donovan; Patrick Brennen**

Inspector:

Appendix B \

Wetland Assessment and Delineation Report

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

July 10, 2023

Carrie L. Dooley, P.E.
Director of Water and Wastewater Services
MJ Engineering & Land Surveying, P.C.
1533 Crescent Road
Clifton Park, NY 12065
Phone: (518) 371-0799
carriedooley@mjels.com

RE: **Wetlands Delineation – Town of Willsboro**
Town of Willsboro, Essex County, New York
Ambient Job No. 230323ENVA

Dear Ms. Dooley:

Ambient Environmental, Inc. was retained by M.J. Engineering, the client, to conduct a wetland assessment and delineation in support of sewer upgrades at the Town of Willsboro, Essex County, New York (Site). Two Project Areas were included in the wetland delineation and assessment as follows: The Town of Willsboro Wastewater Treatment Plant (WWTP) located at 26 Pumphouse Road in the Town of Willsboro, NY, and a vacant parcel located at 357-359 CR-62 (Tax Parcel 21.17-1-47.2) in Willsboro, NY. These project areas should be considered 'The Site'. A Site Location Map is included as Figure 1.

Introduction

On May 25, 2023, Rachel Oltmer of Ambient conducted a field investigation at the above-mentioned Site. The purpose of this Site visit was to determine, delineate, and map wetlands throughout the Site located in the town of Willsboro, Essex County, NY. Throughout the Site visit, the *New York State Freshwater Wetlands Delineation Manual* (1995)[1] was utilized to delineate the wetland boundaries. A photographic summary depicting on-Site activities is included in Appendix A.

Site Description

The Site is located in a mixed use residential and undeveloped area of Willsboro, NY. The Site is bordered by forested and residential lands to the north, and forested lands to the east, south, and west. A topographic map of the Site is included as Figure 2.

[1] New York State Freshwater Wetlands Delineation Manual. 1995. Browne, S., Crocoll, S., Goetke, D., Heaslip, N., Kerpez, T., Kogut, K., Sanford, S., Spada, D. New York State Department of Environmental Conservation, Albany, New York. 54pp.

Soil hydrology

Soil along the southwestern property boundary displayed the highest hydric rating. A hydric soil rating chart is presented below.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CgB	Cayuga silty clay loam, 3 to 8 percent slopes	0	2.9	52.1%
CuB	Cosad loamy fine sand, 3 to 8 percent slopes	0	0.0	0.1%
CvA	Covington clay, 0 to 3 percent slopes	92	0.0	0.5%
KyA	Kingsbury silty clay loam, 0 to 3 percent slopes	5	0.4	7.1%
KyB	Kingsbury silty clay loam, 3 to 8 percent slopes	3	1.4	25.6%
NeC	Nellis loam, 8 to 15 percent slopes	0	0.3	5.7%
VeC	Vergennes silty clay loam, 8 to 15 percent slopes	0	0.5	8.7%
W	Water	0	0.0	0.1%
Totals for Area of Interest			**5.6**	**100.0%**

Existing Wetland Mapping

The New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper, Adirondack Park Agency Web Maps, and National Wetland Inventory (NWI) Database was accessed to determine whether State or Federal wetlands had been determined for the Site.

An approximately 1.71-acre Freshwater Riverine runs through the northwestern portion of the southern project area. Furthermore, a 1.37-acre Freshwater Forested/Shrub Wetland is located south of the southern project area. Willsboro Bay is located just north of the northwestern project area.

The term "jurisdictional wetland" is used to denote an area that is recognized as a regulated wetland by the Adirondack Park Agency. Generally, jurisdictional, and therefore regulated, wetlands must be at least one acre in size, located adjacent to a body of water (including streams that have free interchange of water), or have unusual local importance as defined in the New

York State Freshwater Wetlands Act (ECL Article 24) (1975)[2]. Following review of the Adirondack Park Agency Web Maps, and the Essex County Geographic Information System (GIS) Database, jurisdictional wetlands are not present at the Site. Figures depicting the boundaries of Federal and APA wetlands on-Site are included as Figures 3 and 4, respectively.

Wetland Determination and Delineation Technique

Prior to mobilizing to the Site on May 25, 2023, topographic and soils maps were reviewed using the United States Fish and Wildlife Service (USFWS), and the United States Department of Agriculture (USDA) Natural Conservation Service (NRCS) databases.

Upon arrival, the Site was assessed to determine the existence of wetlands using the New York State Wetlands Delineation Manual[3]. Ambient inspected the Site for the presence of hydrophytes (wetland plants), culverts, or areas of inundation. Locations that displayed any of these characteristics were assessed for the presence of wetland vegetation (based the visual estimation of the predominance of hydrophytes), hydric soils (via soil samples), and presence of flowing or standing water. If an area displaying wetland characteristics was identified on the Site, the boundary was marked with pink plastic flags or metal stakes. Additionally, the flags were labelled with a unique alphanumeric to mark the edge of the wetland within the project areas. Outside of the scope of work, private lands were not assessed for the purpose of this wetland delineation.

Three test pits (TP-UP1, TP-UP2, and TP-UP3) were advanced during the assessment for the purpose of delineating the wetland boundary. TP-UP1 was advanced on the western portion of the southern project area. TP-UP2 was advanced on the south-central portion of the southern project area. TP-UP3 was advanced on the eastern portion of the southern project area. Soil colors were evaluated using a Munsell color chart, and hydric indicators were documented on the Wetland Determination Data Forms. The Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region[4] was utilized for the delineation. A copy of the completed form is attached. Throughout Site activities, GPS points were collected with a Trimble GeoXH GPS unit at each flag location.

Wetland Determination and Delineation Results

Three wetland areas were identified within the boundary of the Site along the northern boundary of the southern project area, south of CR-62. Wetland A was flagged with wetland flags A1 through A8, Wetland B was flagged with wetland flags B1 through B9, and Wetland C was flagged with wetland flags C1 through C11. The wetlands appeared to follow a drainage ditch that ran along the southern side of CR-62. Wetlands A, B, and C are all associated with an

[2] New York State Freshwater Wetlands, Article 24, Title 23 or Article 71 of the Environmental Conservation Law. 1975.

[3] Browne, S., Crocoll, S., Goetke, D., Heaslip, N., Kerpez, T., Kogut, K., Sanford, S., Spada, D. 1975. New York State Wetland Delineation Manual. NYS Department of Environmental Conservation, Albany, NY.

[4] U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. Version 2.0. US Army Engineer Research and Development Center, 3909 Halls Ferry Road, Vicksburg, MS.

approximately 1.71-acre federally regulated Freshwater Riverine that flows north across CR-62 via a culvert that feeds into Willsboro Bay.

Additionally, a small section of the Riverine is present on the northwestern portion of the southern project area. Ambient included the location of the riverine as it appeared to be intermittent and at the time of the Site visit, did not display wetland characteristics.

The three delineated wetlands on Site (Wetlands A, B, and C) meet the United States Army Corps of Engineers (USACE) three-parameter criteria (i.e., presence of dominant wetland vegetation, presence of hydric soils, and the presence of sufficient hydrologic factors) and would likely be considered jurisdictional by both the ACOE, but this would have to be determined by the agency. It is unlikely that the APA would have jurisdiction over the delineated wetlands, but this would have to be determined by the agency.

Ambient collected data from three test pits from the southern project area. The following vegetation was identified during the wetland assessment:

- **Test Pit-UP1**
  The tree stratum was dominated by White Pine, FACU (*Pinus strobus*), Northern Red Oak, FACU (*Quercus rubra*), and Common Buckthorn, FAC (*Rhamnus cathartica*). The herb stratum was dominated by Male Wood Fern, UPL (*Dryopteris filix-mas*).

  Based on the assessment of dominance, hydrophytic vegetation is not present at this TP location (Dominance test – 25% OBL, FACW, or FAC).

- **Test Pit-UP2**
  The tree stratum was dominated by White Pine, FACU (*Pinus strobus*), Northern Red Oak, FACU (*Quercus rubra*), and Common Buckthorn, FAC (*Rhamnus cathartica*). The sapling/shrub stratum was dominated by White Pine, FACU (*Pinus strobus*), Quaking Aspen, FACU (*Populus tremuloides*), and Green Ash, FACW (*Fraxinus pennsylvanica*). The herb stratum was dominated by Green Ash, FACW (*Fraxinus pennsylvanica*), and Male Wood Fern, UPL (*Dryopteris filix-mas*).

  Based on the assessment of dominance, hydrophytic vegetation is not present at this TP location (Dominance test – 37.5% OBL, FACW, or FAC).

- **Test Pit-UP3**
  The tree stratum was dominated by White Pine, FACU (*Pinus strobus*), Northern Red Oak, FACU (*Quercus rubra*), and Quaking Aspen, FACU (*Populus tremuloides*). The sapling/shrub stratum was dominated by Common Buckthorn, FAC (*Rhamnus cathartica*), Quaking Aspen, FACU (*Populus tremuloides*), and Shagbark Hickory, FACU (*Carya ovata*). The herb stratum was dominated by Sensitive Fern, FACW (*Onoclea sensibilis)*, and Male Wood Fern, UPL (*Dryopteris filix-mas*).

  Based on the assessment of dominance, hydrophytic vegetation is not present at this TP location (Dominance test – 14.3% OBL, FACW, or FAC).

According to the USDA Natural Resources Conservation Service Web Soil Survey for Essex County, New York, soil on the eastern portion of the Site is predominantly classified as 'Pyrities fine sandy loam, 3 to 8 percent slopes'. Additionally, soil on the western portion of the Site is primarily classified as 'Cayuga silty clay loam, 3 to 8 percent slopes'. Figures depicting the soil survey of the Site, as well as the hydric rating are included as Figures 5 and 6, respectively.

Soil from TP-UP1 was comprised of a medium brown (10YR 4/2), moist, fine-grained sandy loam with a low organic content. Standing water was not present, and hydrologic indicators such as oxidated rhizospheres, saturation, and hydrogen sulfide odors were not present at TPU-1. The soil from TP-UP2 was comprised of a medium brown (7.5YR 4/3), moist, fine-grained sandy loam with a low organic content. Standing water was not present, and hydrologic indicators such as oxidated rhizospheres, saturation, and hydrogen sulfide odors were not present at TP-UP2. Soil from TP-UP3 was comprised of a medium brown (7.5YR 3/4), moist, fine-grained sandy loam with a low organic content. Standing water was not present, and hydrologic indicators such as oxidated rhizospheres, saturation, and hydrogen sulfide odors were not present at TP-UP3.

Conclusions

Ambient delineated three wetlands within the southern project area. Additionally, a freshwater riverine was located on the northwestern portion of the southern Site boundary. Willsboro Bay is located along the northern boundary of the northern project area. Based on the size of the wetlands, and review of the NWI and APA Wetland Mapper, it is assumed that the APA will not have jurisdiction over the delineated wetlands; however, this would have to be determined by the agency. Based on the size of the wetlands, and review of the NWI, it is assumed that the USACE would have jurisdiction over the delineated wetlands; however, this would have to be determined by the agency.

Should future or proposed site activities impact the wetland areas or the bank of Willsboro Bay, it is recommended that the necessary notifications be made to the USACE regarding any proposed alterations to the watercourses pursuant to the requirements of the Nationwide Permit.

Ambient appreciates the opportunity to provide environmental consulting services. If you have any questions regarding this report, please contact me at (607) 341-5404 or by email: rachelo@ambient-env.com. Thank you again for your confidence in Ambient Environmental, Inc.

Sincerely,

Ambient Environmental, Inc.

Rachel Oltmer
Environmental Scientist

Cc: Mark Dugas – Ambient Environmental, Inc.

Attachments:

Figure 1 – Site Location Map
Figure 2 – Topographic Map
Figure 3 – Federally Regulated Wetlands and Waters of the US Map
Figure 4 – Adirondack Park Agency Wetlands Map
Figure 5 – Soil Map
Figure 6 – Hydric Rating Map
Figure 7 – Wetland Delineation Map
Appendix A – Photographic Summary
Appendix B – Wetland Determination Data Forms

ATTACHMENTS

FIGURES

Town of Willsboro

Figure 1 - Site Location Map

DRAWN BY REO	FIGURE TITLE **TOPOGRAPHIC MAP**	
SCALE Not to scale	PROJECT LOCATION **TOWN OF WILLSBORO** **WILLSBORO, NY**	
DATE 7/5/2023		
PROJECT # 230323ENVA	PREPARED FOR: M.J. Engineering	FIGURE NUMBER **2**

Town of Willsboro, NY

National Wetlands Inventory Map

Approximate Site Location

Legend

- NWI Wetland – Freshwater Forested / Shrub Wetland
- NWI Wetland – Freshwater Pond
- NWI Wetland – Freshwater Emergent Wetland
- NWI Wetland – Riverine

N

Willsboro, NY

Adirondack Park Wetlands Inventory Map

Areas shaded in blue represent APA regulated wetland areas

Map Scale: 1:2,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, New York
Survey Area Data: Version 22, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 18, 2020—Jun 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CgB	Cayuga silty clay loam, 3 to 8 percent slopes	2.9	52.1%
CuB	Cosad loamy fine sand, 3 to 8 percent slopes	0.0	0.1%
CvA	Covington clay, 0 to 3 percent slopes	0.0	0.5%
KyA	Kingsbury silty clay loam, 0 to 3 percent slopes	0.4	7.1%
KyB	Kingsbury silty clay loam, 3 to 8 percent slopes	1.4	25.6%
NeC	Nellis loam, 8 to 15 percent slopes	0.3	5.7%
VeC	Vergennes silty clay loam, 8 to 15 percent slopes	0.5	8.7%
W	Water	0.0	0.1%
Totals for Area of Interest		**5.6**	**100.0%**

Map Scale: 1:2,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, New York
Survey Area Data: Version 22, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 18, 2020—Jun 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CgB	Cayuga silty clay loam, 3 to 8 percent slopes	0	2.9	52.1%
CuB	Cosad loamy fine sand, 3 to 8 percent slopes	0	0.0	0.1%
CvA	Covington clay, 0 to 3 percent slopes	92	0.0	0.5%
KyA	Kingsbury silty clay loam, 0 to 3 percent slopes	5	0.4	7.1%
KyB	Kingsbury silty clay loam, 3 to 8 percent slopes	3	1.4	25.6%
NeC	Nellis loam, 8 to 15 percent slopes	0	0.3	5.7%
VeC	Vergennes silty clay loam, 8 to 15 percent slopes	0	0.5	8.7%
W	Water	0	0.0	0.1%
Totals for Area of Interest			**5.6**	**100.0%**

SCALE

NOT TO SCALE

NOTES

1. OVERLAY MAP SOURCED FROM MICROSOFT MAPS.
2. GPS POINTS COLLECTED WITH A TRIMBLE GEOXH GPS UNIT.

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www.ambient-env.com

PROJECT

TOWN OF WILLSBORO WWTP
TOWN OF WILLSBORO, ESSEX, NY

PROJECT NO.

230323ENVA

DATE

7/3/2023

FIGURE TITLE

WETLAND DELINEATION MAP

DRAWN BY

REO

FIGURE NO.

7

PHOTOGRAPHIC SUMMARY

Photographic Log
Town of Willsboro, NY
Wetland Delineation – 5/25/2023
Ambient Environmental, Inc.

Photograph 1 View of northern extent of the northern project area. View of Willsboro Bay is facing east.	
Photograph 2 View of the Willsboro Bay from the northern project area – facing north.	

Photographic Log
Town of Willsboro, NY
Wetland Delineation – 5/25/2023
Ambient Environmental, Inc.

Photograph 3 View of the southern project area – facing south.	
Photograph 4 View of wetland flags A along Farrell Road – facing southwest.	

Photographic Log
Town of Willsboro, NY
Wetland Delineation – 5/25/2023
Ambient Environmental, Inc.

Photograph 4 View of a culvert that runs underneath Farrell Road.	

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Town of Willsboro City/County: Willsboro/Essex Sampling Date: 5/25/2023

Applicant/Owner: M.J Engineering & Land Surveying State: NY Sampling Point: TPUP-1

Investigator(s): Rachel Oltmer Section, Township, Range:

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope %: 5%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: 44.3937 Long: -73.3890 Datum:

Soil Map Unit Name: CgB NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: TPUP-1

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	45	Yes	FAC
2. *Pinus strobus*	55	Yes	FACU
3. *Quercus rubra*	35	Yes	FACU
4.			
5.			
6.			
7.			
	135	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30 feet)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 30 feet)			
1. *Waldsteinia fragarioides*	5	No	FACW
2. *Dryopteris filix-mas*	25	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	45	x 3 =	135
FACU species	90	x 4 =	360
UPL species	25	x 5 =	125
Column Totals:	165 (A)		630 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point TPUP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 4/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rocky soil

Depth (inches): 15

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Town of Willsboro City/County: Willsboro/Essex Sampling Date: 5/25/2023

Applicant/Owner: M.J Engineering & Land Surveying State: NY Sampling Point: TPUP-2

Investigator(s): Rachel Oltmer Section, Township, Range:

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope %: 5%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: 44.3881 Long: -73.3881 Datum:

Soil Map Unit Name: CgB NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: TPUP-2

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	15	Yes	FAC
2. *Pinus strobus*	25	Yes	FACU
3. *Quercus rubra*	35	Yes	FACU
4.			
5.			
6.			
7.			
	75	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30 feet)			
1. *Rhamnus cathartica*	5	No	FAC
2. *Pinus strobus*	20	Yes	FACU
3. *Populus tremuloides*	25	Yes	FACU
4. *Fraxinus pennsylvanica*	15	Yes	FACW
5.			
6.			
7.			
	65	=Total Cover	
Herb Stratum (Plot size: 30 feet)			
1. *Fraxinus pennsylvanica*	25	Yes	FACW
2. *Dryopteris filix-mas*	25	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	105	x 4 =	420
UPL species	25	x 5 =	125
Column Totals:	190 (A)		685 (B)

Prevalence Index = B/A = 3.61

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point TPUP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 4/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Town of Willsboro City/County: Willsboro/Essex Sampling Date: 5/25/2023

Applicant/Owner: M.J Engineering & Land Surveying State: NY Sampling Point: TPUP-3

Investigator(s): Rachel Oltmer Section, Township, Range:

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope %: 5%

Subregion (LRR or MLRA): LRR L, MLRA 101 Lat: 44.3944 Long: -73.3879 Datum:

Soil Map Unit Name: KyB NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: TPUP-3

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	15	Yes	FACU
2. *Pinus strobus*	25	Yes	FACU
3. *Quercus rubra*	35	Yes	FACU
4.			
5.			
6.			
7.			
	75	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30 feet)			
1. *Rhamnus cathartica*	5	No	FAC
2. *Carya ovata*	15	Yes	FACU
3. *Populus tremuloides*	25	Yes	FACU
4.			
5.			
6.			
7.			
	45	=Total Cover	
Herb Stratum (Plot size: 30 feet)			
1. *Onoclea sensibilis*	25	Yes	FACW
2. *Dryopteris filix-mas*	25	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	5	x 3 =	15
FACU species	115	x 4 =	460
UPL species	25	x 5 =	125
Column Totals:	170 (A)		650 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point TPUP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
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- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

Appendix C \

Hazardous Material Survey Report

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

May 1, 2023

Carrie L. Dooley, P.E.
MJ Engineering and Land Surveying, P.C.
1533 Crescent Road
Clifton Park, NY 12065
Ph. 518.371.0799, x406
E: carriedooley@mjels.com

RE: Hazardous Materials Survey Report
Pre-Renovation
Asbestos, Lead-Based Paint, and PCB Caulk
Willsboro WTP
26 Pumphouse Lane
Willsboro, NY
Ambient Project Number: 230323AA

Dear Ms. Dooley:

Ambient Environmental, Inc. is pleased to submit the attached Hazardous Materials Survey Report for asbestos, lead-based paint, and polychlorinated biphenyls (PCB), at the above-referenced site. This report includes the procedures and methodologies followed, analytical laboratory results, and applicable conclusions and recommendations.

Ambient appreciates the opportunity to serve MJ Engineering and Land Surveying, P.C. and we look forward to working with you in the future. In the meantime, if you have questions or comments regarding the information in this report or if we can be of further assistance, please do not hesitate to contact us.

Sincerely,
Ambient Environmental, Inc.

C.D. Wolford
Operations Lead

Nathan Mastenbrook
Inspection Technician
Asbestos License # 17-27733

Enclosure

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

HAZARDOUS MATERIALS SURVEY
Pre-Renovation
Asbestos, Lead-Based Paint, and PCB Caulk

Willsboro WTP
26 Pumphouse Lane
Willsboro, NY

Survey Date(s): April 20, 2023

Prepared for:

Carrie L. Dooley, P.E.
MJ Engineering and Land Surveying, P.C.
1533 Crescent Road
Clifton Park, NY 12065

Prepared by:

Ambient Environmental, Inc.
828 Washington Ave.
Albany, New York 12203

Ambient Project No. 230323AA

TABLE OF CONTENTS

ATTACHMENTS

1.0 PURPOSE AND SCOPE OF SERVICES

The purpose of this project was to conduct a pre-renovation hazardous materials survey for asbestos, lead-based paint (LBP)and polychlorinated biphenyls (PCB) at 26 Pumphouse Lane., Willsboro, N.Y. (The Site). The Planned work is to renovate the existing water treatment building for use as the new raw water pumpstation. An inspection was completed of the interior and exterior of the Water Treatment Plant as well as the both roofs. Ambient Environmental, Inc. (Ambient) provided the following services for MJ Engineering & Land Surveying (Client) in accordance with Ambient proposal number 2023-01-0025.

Conduct a representative Hazardous Materials Survey in the identified building, which includes:

- Survey the site building.
- Identify accessible suspect asbestos-containing materials (ACMs) that were not previously tested using limited destructive means.
- Quantify ACMs, including material condition and location.
- Collect and analyze bulk samples of suspect friable and non-friable materials to eliminate suspect materials as asbestos containing.
- Conduct a limited lead-based paint inspection of the building with a Heuresis Corporation Pb200i Lead Paint Analyzer.
- Collect and analyze bulk samples of potential PCB containing window/door caulk.

2.0 EXECUTIVE SUMMARY

The inspection was conducted by NYS licensed and AHERA trained asbestos inspectors and trained lead inspectors. The inspection involved visual examinations and sampling of suspect materials that may be impacted by planned renovation projects.

Inspection results revealed the following findings:

- **The renovation area does contain asbestos containing materials**
- **The renovation area does not contain lead-based paint lead-containing paint was noted.**
- **The renovation area does not contain PCBs in caulking**

Please see attachments and specific report sections for sample locations, type of materials and analytical results.

3.0 ASBESTOS-CONTAINING MATERIALS SURVEY

Ambient performed an asbestos-containing material survey for planned renovations at the subject property. Ambient examined previous reports, if available, to determine if adequate sampling was performed in the work areas and collected additional samples that appeared to be deficient. New York State certified and AHERA trained asbestos inspectors conducted the asbestos survey of the area.

The building was visually inspected for the presence of any additional building materials in the path of renovation that are suspected to contain asbestos. Bulk samples of the newly identified suspect ACMs were collected and placed into individual containers for transport to a National Voluntary Laboratory Accreditation Program (NVLAP) and a New York State Department of Health Environmental Laboratory Approval Program (ELAP)-accredited laboratory for analysis. Materials visibly identified as non-asbestos (fibrous glass, foam rubber, wood, etc.) were not sampled. The asbestos survey consisted of three basic procedures: **1)** conducting a visual inspection of the structures; **2)** identifying homogeneous areas (HAs) of suspect surfacing, thermal system insulation, and miscellaneous materials; and **3)** sampling accessible, friable and non-friable suspect materials.

3.1 Sampling Protocol

3.1.1 Homogeneous Areas

Prior to collecting any samples, HAs were identified and listed to develop a sampling strategy. A homogeneous sampling area can be described as one or more areas of material that are similar in appearance and texture and that have the same installation date and function. The actual number of samples collected from each homogeneous sampling area may vary, based on the type of material and the professional judgment of the inspector.

3.1.2 Hazard Assessment Factors

From the list of suspect homogeneous materials, a physical assessment was performed for each material on the list. A physical assessment includes evaluating the condition, assessing the potential for disturbance, and determining the friability of each material. Friability is a term used to describe the ease in which a building material inherently lends itself to disturbance. By definition, "friable" materials are those that can be crumbled or reduced to powder by hand pressure when dry. Each material on the list was further classified into one of three categories, which have specific sampling requirements for each category.

Surfacing Materials:	Refers to spray-applied or troweled surfaces such as plaster ceilings and walls, fireproofing, textured paints, textured plasters, and spray-applied acoustical surfaces.
Thermal System Insulation:	Refers to insulation used to inhibit heat gain or loss on pipes, boilers, tanks, ducts, and various other building components.
Miscellaneous Materials:	Refers to friable and non-friable products and materials that do not fit in any of the above two categories such as resilient floor covering, baseboards, mastics, adhesives, roofing material, caulking, glazing, and siding. This category also contains wallboard and ceiling tile.

All confirmed ACMs were then assessed by their condition as good (intact), fair (damaged) or poor (significantly damaged) per Title 40 Code of Federal Regulations Part 763. Material with localized significant damage was also assessed as poor when observed.

3.1.3 Sampling Strategy

The asbestos inspection was conducted according to New York State Department of Labor Industrial Code Rule 56 guidelines using a minimum number of samples collected from each HA, which also meets the sampling requirement found in 29 CFR 1926.1101.

Sample collection depends on the category that the HA falls into and the amount of material present, as follows:

GUIDELINES FOR DETERMINING THE NUMBER OF SAMPLES TO TAKE		
HA CATEGORY	**HA SIZE**	**SAMPLES REQUIRED**
Surfacing Materials	<1,000 SF	3
	1,000-5,000 SF	5
	>5,000 SF	7 or more
Thermal System Insulation	No Stipulation	3+ (Must also sample all repair patches)
Miscellaneous Materials	No Stipulation	Per AHERA, these materials must be sampled "in a manner sufficient to determine whether or not they contain asbestos" typically 2-3 samples based upon inspector judgment.

If the analytical results indicated that all the samples collected per HA did not contain asbestos, then the HA (material) would be considered a non-ACM. However, if the analytical results of one or more of the samples collected per HA indicate that asbestos is present in quantities of greater than 1 percent asbestos by weight (as defined by EPA), all of the HA (material) would be treated as an ACM regardless of any other analytical results. Material, which can visually be determined to be non-asbestos (i.e., fibrous glass, foam rubber, etc.) by the accredited inspector are not required to be sampled.

Miscellaneous materials require adequately representative sampling, which is typically done by collecting from two to three samples per material. Inspectors typically rely on other survey observations such as the condition, friability, and quantity of material to determine what would be a sufficient number of samples to accurately evaluate the presence or absence of asbestos content.

Actual collection of a bulk asbestos sample involves physically removing a small piece of material and placing it in a marked, airtight container. Sample containers are marked with a unique identification number, which is also noted in the field notes.

3.1.4 Laboratory Analytical Results

Samples were sent to AmeriSci New York in New York, New York for analysis. AmeriSci is fully accredited for bulk sample analysis under the Environmental Laboratory Approval Program (ELAP) administered by the New York State Department of Health, (ELAP# 11480). AmeriSci is also accredited by the National Voluntary Laboratory Accreditation Program (NVLAP No. 200546-0) for both air and bulk sampling.

- *Friable Samples* – Friable suspect asbestos containing material samples were analyzed utilizing Method EPA/600/R-93/116 with New York State ELAP 198.1 revision to facilitate compliance with both AHERA and the New York State Department of Health polarized light

microscopy (PLM) analytical techniques. All fibers observed were identified to determine whether or not they contained asbestos.

- *Non-Friable Samples* – Non-friable organically bound (NOB) suspect asbestos containing material samples were analyzed utilizing Method EPA/600/R-93/116 with New York State ELAP 198.6 and 198.4 revisions to facilitate compliance with both AHERA and the New York State Department of Health polarized light microscopy (PLM) and transmission electron microscopy (TEM) analytical techniques. These non-friable organically bound samples must be weighed to record initial sample weights, then subjected to muffle furnace and acid bath sample preparation to eliminate the organic constituents. If the remaining inorganic sample residue is 1% or less of the original sample weight, the sample is considered a non-asbestos containing material. If the remaining inorganic sample residue is greater than 1% of the original sample weight then the sample must be analyzed using either PLM or TEM analytical techniques to determine that the sample is an asbestos containing material (positive) or TEM to prove that the sample is a non-asbestos containing material (negative). A non-friable organically bound sample must be proven a non-asbestos containing material utilizing the NYS ELAP 198.4 TEM test method to be in compliance with the New York state Department of Health.

3.2 Asbestos Containing Material Results

The results of the asbestos survey conducted at the subject property can be found in Attachment A.

The building survey included limited destructive sampling for "hidden" materials. Therefore, the results of this survey may not be inclusive of <u>all</u> asbestos containing material that may be present in the pathway of demolition. If, during the course of renovation, any suspect material is discovered that is not listed on the table in Attachment A it must be treated as asbestos containing material and handled appropriately or sampled by an inspector and analyzed according to NYS and EPA regulations.

One (1) copy of the results of the building/structure asbestos survey shall be immediately transmitted by the building/structure owner as follows:

- One (1) copy of the completed asbestos survey shall be sent by the owner or their agent to the local government entity charged with issuing a permit for such demolition, renovation, remodeling or repair work under applicable State or local laws.
- The completed asbestos survey for controlled demolition (as per Subpart 56-11.5) or pre-demolition asbestos projects shall also be submitted to the appropriate Asbestos Control Bureau district office.
- The completed asbestos survey shall be kept on the construction site with the asbestos notification and variance, if required, throughout the duration of the asbestos project and any associated demolition, renovation, remodeling or repair project.

4.0 LEAD-BASED PAINT SURVEY

Ambient conducted a limited lead-based paint (LBP) investigation of building components which will be affected by proposed renovation work. The purpose of this investigation was to assess if building components contain actionable quantities of lead-based paint.

The U.S Environmental Protection Agency (EPA) and U.S. Department of Housing and Urban Development (HUD) has established a definition of lead-based paint as a paint or other surface coating that contains lead equal to or greater than 1.0 mg/cm^2 or 0.5% by weight (equivalent units are: 5,000 µg/g, 5,000 mg/kg, or 5,000 ppm by weight). Surface coatings include paint, shellac, varnish, or any other coating, including wallpaper, which covers painted surfaces. A limited inspection for lead-based paint using XRF instrumentation was conducted to determine if lead coated surfaces were affected. This inspection was not in full compliance with HUD guidelines

4.1 Sampling Protocol

4.1.1 Methodology

Testing was performed using X-Ray Fluorescence in situ analysis (XRF) of painted construction materials. Ambient utilized the Pb200i analyzer manufactured by Heuresis Corporation for this survey.

The Pb200i Lead Paint Analyzer is a complete lead paint analysis system that quickly, accurately, and non-destructively measures the concentration of LBP on surfaces. The Pb200i relies on the measurement of the K-shell X-rays to determine the amount of lead present in the painted surface. K-shell X-rays can penetrate many layers of paint and allow a measurement of the lead content of paint to be made without being significantly affected by the thickness or number of layers of paint on the surface of the sample.

The Pb200i has the ability to analyze and compute corrections for the differences in the energy spectrums relating to different substrates. This analysis of the energy spectrum means that the lead paint reading displayed on the instrument already accounts for any substrate effects and correction is not required by the operator. The Pb200i's field of view is limited to a depth of 3/8", deep enough to handle virtually all painted surfaces, but not prone to detect lead objects located behind the surface.

There are two measurement modes of operation in the Pb200i analyzer namely the "Action Level Mode" and the "Extended Reading Mode. In the "Action Level" mode, the analyzer automatically adjusts the measurement time to be the least time that is needed to make a definitive measurement with a 95% confidence level (2-sigma). The Pb200i analyzer will finish a measurement once the 2-sigma confidence level is achieved and the data is statistically meaningful. This time period for conclusive measurements is typically between 1 to 5 seconds, but can extend to a measurement of 60 seconds depending on the action level for abatement. Ambient utilized the Pb200i in the "Action Level" mode for the testing performed.

Upon arrival at the job site and once every four hours or after the day’s paint testing work was completed, a "validation test" was performed to assure that the instrument was operating

properly. The "validation test" includes taking a series of three test measurements on the NIST Paint Film Standard (SRM No. 2579) as required by the instrument's PCS. The individual readings and an average of the three readings were recorded and compared to the standards. In all cases the instrument was functioning within the standard deviation as defined by the manufacturer and the PCS. All validation readings are recorded in the XRF in the order in which they were taken at the site. If for any reason the XRF does not pass the quality control procedures, it is Ambient's policy to replace that instrument with an XRF that passes the above criteria for calibration.

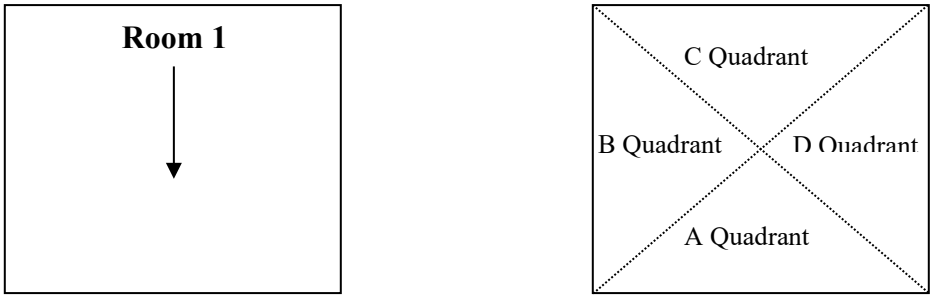
The parameters used to interpret XRF results are outlined in the HUD Guidelines and the Performance Characteristics Sheet (PCS) in Attachment B. According to the PCS, each XRF result is classified as positive for LBP if the result is greater than or equal to 1.0 mg/cm2 or negative for LBP if the result is below 1.0 mg/cm2.

When measurable amounts of lead are reported in the XRF result, the paint is classified by OSHA as a lead containing material.

4.1.2 Strategy

Location identifiers (reading numbers) were assigned to each room component. Each location sampled has a unique number. The associated sample results will be listed by room number, room location, room name, location in the space and description of material sampled. By convention a sample location is assigned a letter designator for each of the four walls. This divides the space into four equal quadrants, each quadrant consisting of a wall, portion of the floor and a portion of the ceiling. Please see Diagram 1. These letter designators are A, B, C and D. On the diagrams provided, the letter designators are marked for each of the quadrants. In this fashion the sampled space, location in the space and the description of the material sampled can be identified on the attached drawings and associated results table.

Diagram 1



4.2 Lead-Based Paint Results

The results of the lead-based paint survey conducted at the subject property can be found in Attachment B.

4.3 Recommendations

Any contractor disturbing a lead-based or lead containing paint is directed to comply with all applicable laws and regulations governing the disturbance of lead-based or lead containing materials including but not limited to *Occupational Safety and Health Administration (OSHA)* standards including *Construction Lead Standard 29 CFR 1926.62*. Air monitoring for employee exposures should be performed in accordance with the National Institute for Occupational Safety and Health (NIOSH) 7300 Method or equivalent. As an alternative to air monitoring, the contractor may provide objective data per 29 CFR 1926.62 Section (d)(3)(iv). The contractor shall employ work practices and controls to prevent the occurrence of lead contamination at the Site.

5.0 POLYCHLORINATED BIPHENYL (PCB) SURVEY

Ambient sampled suspect PCB containing caulk that could be impacted by the upcoming renovation and analyzed it for Polychlorinated Biphenyl (PCB) content.

The PCB survey involved a visual examination and sampling of caulk materials that may be impacted by the planned renovation projects. PCB, or Polychlorinated Biphenyl, was used in various products including caulking material from 1930 to approximately 1979 when PCB were banned by Congress. PCB are listed to be Probable Human Carcinogens by the ATSDR (Agency for Toxic Substances and Disease Registry), the National Cancer Institute and the World Health Organization.

PCB-containing materials are regulated under the Toxic Substances Control Act (TSCA) and 40 CFR 761 and are considered a regulated hazardous material at concentrations equal to or greater than 50 ppm (50,000 ppb). PCB must be segregated from construction debris and then be taken to a hazardous waste landfill in accordance with U.S. EPA regulations under the Toxic Substances Control Act (40 CFR761.62) and NYSDEC hazardous waste regulations (6NYCRR370-373). PCB can also be incinerated at an approved facility. There are also alternative methods for PCB destruction.

Bulk samples were collected and submitted to Schneider Labs, 2512 W. Cary Street, Richmond, Virginia. The samples were analyzed using EPA SW-846 Method 8082 PCB by Gas Chromatography.

5.1 Polychlorinated Biphenyls (PCB) Results

The results of the PCB survey conducted can be found in Attachment C.

6.0 ASSUMPTIONS, LIMITATIONS, AND OTHER CONCERNS

The results, findings, conclusions, and recommendations expressed in this report are based only on conditions that were noted during the inspection of the subject property.

- Ambient's selection of sample locations and frequency of sampling was based on observations and the assumption that like materials in the same area are homogeneous in content.

- Refer to Section 1.0 Purpose and Scope of Services of this report to see clarification of survey locations that were in our scope of work.
- Other than Paint and Flange Gaskets the interior of the plants process equipment was not inspected as part of this building survey. Process equipment may contain asbestos.
- No electrical equipment, wiring, or other electrical components were inspected as the building power was live at the time of the survey. These systems may contain asbestos.
- The inside of, piping, and other building mechanical systems were not inspected as these systems are operational and inaccessible and complete destruction or disassembly is required to gain access. These items may contain asbestos.
- Ambient did not inspect any exterior areas below grade. Foundation sealers, buried piping, and other items may exist below grade which may contain asbestos.
- The components of the window/door that were accessible without demolition were inspected. Limited intrusive demolition was performed during this inspection. There may be additional materials concealed beneath or behind window/door frames. Only full removal of the window/door unit would reveal these materials.
- The lead-based paint inspection was limited to representative accessible painted surfaces that are expected to be impacted by the planned renovation or demolition as of the date of the inspection. Representative locations were selected based on available information including construction and renovation history, conditions observed during the paint inspection and inspector safety when accessing the surfaces. OSHA requires the use of lead safe work practices to protect employees who are disturbing any lead containing material including, but not limited to, components coated with lead-based paint or varnish.
- Ambient drilled several holes in walls but raw vermiculite insulation was not found during this inspection; however, vermiculite insulation may exist in concealed spaces in the building. Currently, there is no approved analytical methodology to confirm vermiculite as non-asbestos; therefore, it automatically must be contaminated with asbestos in New York State. If encountered during renovation it must be handled as an asbestos containing material. Please refer to this link for more information http://www2.epa.gov/asbestos/protect-your-family-asbestos-contaminated-vermiculite-insulation
- Although there was no asbestos containing Thermal System Insulation (TSI) or pipe insulation found there may be TSI or pipe insulation found in unseen cavities or wet walls. A reasonable attempt was made to identify all TSI without performing full demolition.
- The limited coring of solid walls and roof decks and other solid surfaces was conducted. However, asbestos may be found within or behind solid surfaces upon demolition as only full demolition can reveal all hidden materials.
- This report reflects the conditions found at the date and time of the inspections. Conditions of the area may change due to external events or forces. Re-inspection of the area may be required prior to the start of any work if an extended period of time has passed or if disturbances have occurred.
- All locations on drawings are approximate and all quantities are estimated. Any contractor or other user of this report is required to physically visit the site to verify all measurements

and confirm the quantities of materials to be removed, to be bid for removal, or for any other purpose.

All construction personnel, as well as individuals who have access to locations where ACM exists, should be informed of its presence and the proper work practices in these areas. Conspicuous labeling of all ACM is suggested to ensure personnel is adequately informed. Personnel should be informed not to rest, lean or store material or equipment on or near these surfaces and not to cut, saw, drill, sand or disturb ACM. All removal, disturbance and repair of ACM should be performed in compliance with Title 12 NYCRR Part 56 by persons properly trained to handle ACM. Facility custodial and maintenance personnel should receive training commensurate with their work activities; as defined in 29 CFR 1910.1001.

The report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos or lead abatement contractors in locating ACM. Under no circumstances is the report to be utilized as a bidding document or as a project specification document since it does not have all the components required to serve as an Asbestos Project Design document or an Abatement Workplan.

Our professional services have been performed, our findings obtained, and our conclusions and recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

Ambient inspected and sampled materials, which were observable and accessible to the survey team. It is possible, however, that additional suspect materials may exist within interstitial spaces (i.e. underground chases, plenums, wall cavities, beneath pavement/asphalts pathways, etc.), which were not accessible or not made accessible and as a result, not noted in this report.

If questions arise regarding asbestos in materials/locations that were not tested by Ambient, then additional survey services should be procured to test these locations. Ambient makes no representation or warranty concerning the standards and specifications provided in applicable regulations. Any materials that have not been tested and/or found during future investigation must be assumed positive for asbestos, lead-based paint and/or PCB (if applicable).

ATTACHMENT A

SUMMARY OF RESULTS AND ASBESTOS LABORATORY ANALYSIS REPORT WITH CHAIN OF CUSTODY DOCUMENTATION

MJ ENGINEERING & LAND SURVEYING PC
WILLSBORO WTP
26 PUMPHOUSE LANE, WILLSBORO, NY
SUMMARY OF ASBESTOS SAMPLES AND ANALYSIS RESULTS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F))	Condition (G, D, SD)	Quantity	Homogeneous Area	Asbestos Content (Type & %)
001	01	Red Asphalt Shingle (M)	Exterior Lower Roof on Tar Paper	N	G	N/A	N/A	NAD
001	02	Red Asphalt Shingle (M)	Exterior Lower Roof on Tar Paper	N	G	N/A	N/A	NAD
002	01	Black Tar Paper (M)	Exterior Lower Roof on Wood Roof Deck	N	G	N/A	N/A	NAD
002	02	Black Tar Paper (M)	Exterior Lower Roof on Wood Roof Deck	N	G	N/A	N/A	NAD
003	01	Black EPDM (M)	Exterior Upper Roof on Foam Board	N	G	N/A	N/A	NAD
003	02	Black EPDM (M)	Exterior Upper Roof on Foam Board	N	G	N/A	N/A	NAD
004	01	Yellow Foam Board Paper Backing (M)	Exterior Upper Roof on Metal Roof Deck	N	G	N/A	N/A	NAD
004	02	Yellow Foam Board Paper Backing (M)	Exterior Upper Roof on Metal Roof Deck	N	G	N/A	N/A	NAD
005	01	Black EPDM W/ Yellow Glue (M)	Exterior Upper Roof on Concrete Parapet Edge	N	G	N/A	N/A	NAD
005	02	Black EPDM W/ Yellow Glue (M)	Exterior Upper Roof on Concrete Parapet Edge	N	G	N/A	N/A	NAD
006	01	White Caulk (M)	Interior Room 3 at Base of Plastic Wall Panels	N	G	N/A	N/A	NAD
006	02	White Caulk (M)	Interior Room 3 at Base of Plastic Wall Panels	N	G	N/A	N/A	NAD
007	01	Clear Caulk (M)	Exterior where power conduits go through wood siding	N	G	N/A	N/A	NAD
007	02	Clear Caulk (M)	Exterior where power conduits go through wood siding	N	G	N/A	N/A	NAD
008	01	Gray Caulk (M)	Exterior CMU Wall around Ventilation Hood	N	G	N/A	N/A	NAD
008	02	Gray Caulk (M)	Exterior CMU Wall around Ventilation Hood	N	G	N/A	N/A	NAD
009	01	Black Foundation Tar (M)	Exterior CMU Foundation	N	G	700 SF	On CMU Block Foundation of Building (Above & Below Grade)	4.1% Chrysotile
009	02	Black Foundation Tar (M)	Exterior CMU Foundation	N	G			NA/PS

MJ ENGINEERING & LAND SURVEYING PC
WILLSBORO WTP
26 PUMPHOUSE LANE, WILLSBORO, NY
SUMMARY OF ASBESTOS SAMPLES AND ANALYSIS RESULTS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F))	Condition (G, D, SD)	Quantity	Homogeneous Area	Asbestos Content (Type & %)
010	01	Gray Cementitious Patching (M)	Exterior Lake Side on Infilled Window	F	D	N/A	N/A	NAD
010	02	Gray Cementitious Patching (M)	Exterior Lake Side on Infilled Window	F	D	N/A	N/A	NAD
011	01	Green Paint (S)	Exterior on Wood Siding	N	G	N/A	N/A	NAD
011	02	Green Paint (S)	Exterior on Wood Siding	N	G	N/A	N/A	NAD
011	03	Green Paint (S)	Exterior on Wood Soffit	N	G	N/A	N/A	NAD
011	04	Green Paint (S)	Exterior on CMU Block Wall	N	G	N/A	N/A	NAD
011	05	Green Paint (S)	Exterior on CMU Block Wall	N	G	N/A	N/A	NAD
011	06	Green Paint (S)	Exterior on CMU Block Wall	N	G	N/A	N/A	NAD
011	07	Green Paint (S)	Exterior on CMU Block Wall	N	G	N/A	N/A	NAD
012	01	CMU Block (M)	Interior Room 1 Wall	F	G	N/A	N/A	NAD
012	02	CMU Block (M)	Interior Room 3 Wall	F	G	N/A	N/A	NAD
013	01	CMU Block Mortar (M)	Interior Room 1 Wall	F	G	N/A	N/A	NAD
013	02	CMU Block Mortar (M)	Interior Room 3 Wall	F	G	N/A	N/A	NAD
014	01	Concrete Floor (M)	Interior Room 3 Floor	F	G	N/A	N/A	NAD
014	02	Concrete Floor (M)	Interior Room 1 Floor	F	G	N/A	N/A	NAD
015	01	Plastic Wall Panel Adhesive (M)	Interior Room 3 Wall	N	G	N/A	N/A	NAD
015	02	Plastic Wall Panel Adhesive (M)	Interior Room 2 Wall	N	G	N/A	N/A	NAD
016	01	Red Flange Gasket (M)	Interior Room 3 on Processing Equipment Pipe Flanges	N	G	N/A	N/A	NAD
016	02	Red Flange Gasket (M)	Interior Room 3 on Processing Equipment Pipe Flanges	N	G	N/A	N/A	NAD

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26 PUMPHOUSE LANE, WILLSBORO, NY
SUMMARY OF ASBESTOS SAMPLES AND ANALYSIS RESULTS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F))	Condition (G, D, SD)	Quantity	Homogeneous Area	Asbestos Content (Type & %)
017	01	2'X4' White Wormtrack Ceiling Tile (M)	Interior Room 2 Drop Ceiling	N	G	N/A	N/A	NAD
017	02	2'X4' White Wormtrack Ceiling Tile (M)	Interior Room 2 Drop Ceiling	N	G	N/A	N/A	NAD
018	01	2'X4' White Smooth Surface Drywall type Ceiling Tile (M)	Interior Office Drop Ceiling	F	G	N/A	N/A	NAD
018	02	2'X4' White Smooth Surface Drywall type Ceiling Tile (M)	Interior Room 3 Ceiling	F	G	N/A	N/A	NAD
019	01	Drywall Wall (M)	Interior Bathroom Wall	F	G	N/A	N/A	NAD
019	02	Drywall Wall (M)	Interior Office Wall	F	G	N/A	N/A	NAD
020	01	Joint Compound (M)	Interior Bathroom Wall	F	G	N/A	N/A	NAD
020	02	Joint Compound (M)	Interior Office Wall	F	G	N/A	N/A	NAD
021	01	Drywall Ceiling (M)	Interior Room 1 Ceiling	F	G	N/A	N/A	NAD
021	02	Drywall Ceiling (M)	Interior Room 1 Ceiling	F	G	N/A	N/A	NAD
022	01	Ceiling Joint Compound (M)	Interior Room 1 Ceiling	F	G	N/A	N/A	NAD
022	02	Ceiling Joint Compound (M)	Interior Room 1 Ceiling	F	G	N/A	N/A	NAD

(T=TSI; S=Surfacing; M=Misc)

NAD = No asbestos detected NA/PS = Not analyzed/positive stop

SF = Square Foot LF = Linear Foot

* Quantities are estimates only and should be field verified.
* Quantities and homogenous locations only reflect renovation areas and do not represent other areas throughout the building.

Note: Refer to Assumptions & Limitations Section of the Report.

AmeriSci New York
117 EAST 30TH ST.
NEW YORK, NY 10016
TEL: (212) 679-8600 • FAX: (212) 679-3114

PLM Bulk Asbestos Report

Ambient Environmental, Inc.
Attn: Joella Viscusi
828 Washington Avenue

Albany, NY 12203

Date Received 04/24/23
Date Examined 04/27/23
ELAP # 11480

AmeriSci Job # 223042917
P.O. #
Page 1 **of** 9

RE: 230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
001-01 001	223042917-01 **Location:** Exterior Lower Roof On Tar Paper - Red Asphalt Shingle	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 26%			
001-02 001	223042917-02 **Location:** Exterior Lower Roof On Tar Paper - Red Asphalt Shingle	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 25.6%			
002-01 002	223042917-03 **Location:** Exterior Lower Roof On Wood Roof Deck - Black Tar Paper	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 25.2%			
002-02 002	223042917-04 **Location:** Exterior Lower Roof On Wood Roof Deck - Black Tar Paper	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 21.9%			
003-01 003	223042917-05 **Location:** Exterior Upper Roof On Foam Board - Black EPDM	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 24.1%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
003-02 003	223042917-06 **Location:** Exterior Upper Roof On Foam Board - Black EPDM	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 22.6%			
004-01 004	223042917-07 **Location:** Exterior Upper Roof On Metal Roof Deck - Yellow Foam Board Paper Backing	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Yellow/Black, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 50%, Fibrous glass 10%, Non-fibrous 40%			
004-02 004	223042917-08 **Location:** Exterior Upper Roof On Metal Roof Deck - Yellow Foam Board Paper Backing	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Yellow/Black, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 50%, Fibrous glass 10%, Non-fibrous 40%			
005-01 005	223042917-09 **Location:** Exterior Upper Roof On Concrete Parapet Edge - Black EPDM W/ Yellow Glue	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 19%			
005-02 005	223042917-10 **Location:** Exterior Upper Roof On Concrete Parapet Edge - Black EPDM W/ Yellow Glue	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 23.8%			
006-01 006	223042917-11 **Location:** Interior Room 3 At Base Of Plastic Wall Panels - White Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 16.2%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
006-02 006	223042917-12 **Location:** Interior Room 3 At Base Of Plastic Wall Panels - White Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 22.4%			
007-01 007	223042917-13 **Location:** Exterior Where Power Conduits Go Through Wood Siding - Clear Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Clear, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 16.8%			
007-02 007	223042917-14 **Location:** Exterior Where Power Conduits Go Through Wood Siding - Clear Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Clear, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 12%			
008-01 008	223042917-15 **Location:** Exterior CMU Wall Around Ventilation Hood - Gray Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 10.2%			
008-02 008	223042917-16 **Location:** Exterior CMU Wall Around Ventilation Hood - Gray Caulk	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 8.7%			
009-01 009	223042917-17 **Location:** Exterior CMU Foundation - Black Foundation Tar	***Yes***	4.1% (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile 4.1 % **Other Material:** Non-fibrous 10.3%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
009-02 009	223042917-18 **Location:** Exterior CMU Foundation - Black Foundation Tar		NA/PS
Analyst Description: Bulk Material **Asbestos Types:** **Other Material:**			
010-01 010	223042917-19 **Location:** Exterior Lake Side On Infilled Window - Gray Cementitious Patching	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
010-02 010	223042917-20 **Location:** Exterior Lake Side On Infilled Window - Gray Cementitious Patching	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
011-01 011	223042917-21 **Location:** Exterior On Wood Siding - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 49.9%			
011-02 011	223042917-22 **Location:** Exterior On Wood Siding - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 40.7%			
011-03 011	223042917-23 **Location:** Exterior On Wood Soffit - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 50.1%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
011-04 011	223042917-24 **Location:** Exterior On CMU Block Wall - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 54.6%			
011-05 011	223042917-25 **Location:** Exterior On CMU Block Wall - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 56.6%			
011-06 011	223042917-26 **Location:** Exterior On CMU Block Wall - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 53.5%			
011-07 011	223042917-27 **Location:** Exterior On CMU Block Wall - Green Paint	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Green, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 55%			
012-01 012	223042917-28 **Location:** Interior Room 1 Wall - CMU Block	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
012-02 012	223042917-29 **Location:** Interior Room 3 Wall - CMU Block	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
013-01 013	223042917-30 **Location:** Interior Room 1 Wall - CMU Block Mortar	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
013-02 013	223042917-31 **Location:** Interior Room 3 Wall - CMU Block Mortar	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
014-01 014	223042917-32 **Location:** Interior Room 3 Floor - Concrete Floor	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
014-02 014	223042917-33 **Location:** Interior Room 1 Floor - Concrete Floor	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: Gray, Homogeneous, Non-Fibrous, Cementitious, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
015-01 015	223042917-34 **Location:** Interior Room 3 Wall - Plastic Wall Panel Adhesive	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Tan, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 17.6%			
015-02 015	223042917-35 **Location:** Interior Room 2 Wall - Plastic Wall Panel Adhesive	***No***	NAD (by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Tan, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 24.4%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
016-01	223042917-36	***No***	NAD
016	**Location:** Interior Room 3 On Processing Equipment Pipe Flanges - Red Flange Gasket		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Red, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 9.2%			
016-02	223042917-37	***No***	NAD
016	**Location:** Interior Room 3 On Processing Equipment Pipe Flanges - Red Flange Gasket		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Red, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 9%			
017-01	223042917-38	***No***	NAD
017	**Location:** Interior Room 2 Drop Ceiling - 2' x 4' White Wormtrack Ceiling Tile		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 48.9%			
017-02	223042917-39	***No***	NAD
017	**Location:** Interior Room 2 Drop Ceiling - 2' x 4' White Wormtrack Ceiling Tile		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 51.2%			
018-01	223042917-40	***No***	NAD
018	**Location:** Interior Office Drop Ceiling - 2' x 4' White Smooth Surface Drywall Type Ceiling Tile		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Brown/White, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 39.7%			
018-02	223042917-41	***No***	NAD
018	**Location:** Interior Room 3 Ceiling - 2' x 4' White Smooth Surface Drywall Type Ceiling Tile		(by NYS ELAP 198.6) by Bo Sun on 04/27/23
Analyst Description: Brown/White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 43.4%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
019-01 019	223042917-42 **Location:** Interior Bathroom Wall - Drywall Wall	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 4%, Non-fibrous 96%			
019-02 019	223042917-43 **Location:** Interior Office Wall - Drywall Wall	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White/Brown, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%			
020-01 020	223042917-44 **Location:** Interior Bathroom Wall - Joint Compound	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
020-02 020	223042917-45 **Location:** Interior Office Wall - Joint Compound	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
021-01 021	223042917-46 **Location:** Interior Room 1 Ceiling - Drywall Ceiling	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White/Brown, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 20%, Non-fibrous 80%			
021-02 021	223042917-47 **Location:** Interior Room 1 Ceiling - Drywall Ceiling	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White/Brown, Homogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 15%, Non-fibrous 85%			

See Reporting notes on last page

PLM Bulk Asbestos Report

230323AA; MJ Engineering & Land Surveying PC; Willsboro
WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro,
N.Y. - Water Treatment Plant - Interior / Exterior

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
022-01 022	223042917-48 **Location:** Interior Room 1 Ceiling - Ceiling Joint Compound	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			
022-02 022	223042917-49 **Location:** Interior Room 1 Ceiling - Ceiling Joint Compound	***No***	NAD (by NYS ELAP 198.1) by Bo Sun on 04/27/23
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100%			

Reporting Notes:

Analyzed by: Bo Sun
Date: 4/27/2023

Reviewed by: Marwan A. Alahiri

*NAD/NSD =no asbestos detected; NA =not analyzed; NA/PS=not analyzed/positive stop, (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; PLM Bulk Asbestos Analysis using Motic, Model BA310 Pol Scope, Microscope, Serial #: 1190000538, by Appd E to Subpt E, 40 CFR 763 quantified by either CVES or 400 pt ct as noted for each analysis (NVLAP 200546-0), ELAP PLM Method 198.1 for NY friable samples, which includes the identification and quantitation of vermiculite, or ELAP 198.6 for NOB samples, or EPA 400 pt ct by EPA 600-M4-82-020 (NY ELAP Lab 11480); Note:PLM is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos-containing in NY State (also see EPA Advisory for floor tile, FR 59,146,38970,8/1/94) National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the lab.This PLM report relates ONLY to the items tested. RI Cert AAL-094, CT Cert PH-0186, Mass Cert AA000054, NJ Lab ID #NY031.

_____END OF REPORT_____

Client Name: Ambient Environmental, Inc.

Table I
Summary of Bulk Asbestos Analysis Results

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	001-01	001	0.295	22.8	51.2	26.0	NAD	NAD
Location:	Exterior Lower Roof On Tar Paper - Red Asphalt Shingle							
02	001-02	001	0.281	24.2	50.2	25.6	NAD	NAD
Location:	Exterior Lower Roof On Tar Paper - Red Asphalt Shingle							
03	002-01	002	0.210	45.5	29.3	25.2	NAD	NAD
Location:	Exterior Lower Roof On Wood Roof Deck - Black Tar Paper							
04	002-02	002	0.182	40.0	38.0	21.9	NAD	NAD
Location:	Exterior Lower Roof On Wood Roof Deck - Black Tar Paper							
05	003-01	003	0.210	73.5	2.5	24.1	NAD	NAD
Location:	Exterior Upper Roof On Foam Board - Black EPDM							
06	003-02	003	0.186	74.0	3.4	22.6	NAD	NAD
Location:	Exterior Upper Roof On Foam Board - Black EPDM							
07	004-01	004	----	----	----	----	NAD	NA
Location:	Exterior Upper Roof On Metal Roof Deck - Yellow Foam Board Paper Backing							
08	004-02	004	----	----	----	----	NAD	NA
Location:	Exterior Upper Roof On Metal Roof Deck - Yellow Foam Board Paper Backing							
09	005-01	005	0.185	72.8	8.2	19.0	NAD	NAD
Location:	Exterior Upper Roof On Concrete Parapet Edge - Black EPDM W/ Yellow Glue							
10	005-02	005	0.162	73.6	2.6	23.8	NAD	NAD
Location:	Exterior Upper Roof On Concrete Parapet Edge - Black EPDM W/ Yellow Glue							
11	006-01	006	0.140	68.8	15.0	16.2	NAD	NAD
Location:	Interior Room 3 At Base Of Plastic Wall Panels - White Caulk							
12	006-02	006	0.133	65.8	11.8	22.4	NAD	NAD
Location:	Interior Room 3 At Base Of Plastic Wall Panels - White Caulk							
13	007-01	007	0.222	68.1	15.1	16.8	NAD	NAD
Location:	Exterior Where Power Conduits Go Through Wood Siding - Clear Caulk							
14	007-02	007	0.138	72.7	15.3	12.0	NAD	NAD
Location:	Exterior Where Power Conduits Go Through Wood Siding - Clear Caulk							
15	008-01	008	0.094	66.6	23.2	10.2	NAD	NAD
Location:	Exterior CMU Wall Around Ventilation Hood - Gray Caulk							
16	008-02	008	0.086	67.8	23.5	8.7	NAD	NAD
Location:	Exterior CMU Wall Around Ventilation Hood - Gray Caulk							

See Reporting notes on last page

Table I
Summary of Bulk Asbestos Analysis Results

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	009-01	009	0.244	66.5	19.1	10.3	Chrysotile 4.1	NA
Location:	Exterior CMU Foundation - Black Foundation Tar							
18	009-02	009	0.196	66.2	20.6	13.1	NA/PS	NA
Location:	Exterior CMU Foundation - Black Foundation Tar							
19	010-01	010	----	----	----	----	NAD	NA
Location:	Exterior Lake Side On Infilled Window - Gray Cementitious Patching							
20	010-02	010	----	----	----	----	NAD	NA
Location:	Exterior Lake Side On Infilled Window - Gray Cementitious Patching							
21	011-01	011	0.156	35.3	14.8	49.9	NAD	NAD
Location:	Exterior On Wood Siding - Green Paint							
22	011-02	011	0.085	37.4	21.8	40.7	NAD	NAD
Location:	Exterior On Wood Siding - Green Paint							
23	011-03	011	0.174	38.3	11.6	50.1	NAD	NAD
Location:	Exterior On Wood Soffit - Green Paint							
24	011-04	011	0.117	29.4	16.0	54.6	NAD	NAD
Location:	Exterior On CMU Block Wall - Green Paint							
25	011-05	011	0.143	29.5	13.9	56.6	NAD	NAD
Location:	Exterior On CMU Block Wall - Green Paint							
26	011-06	011	0.119	28.8	17.8	53.5	NAD	NAD
Location:	Exterior On CMU Block Wall - Green Paint							
27	011-07	011	0.155	27.8	17.2	55.0	NAD	NAD
Location:	Exterior On CMU Block Wall - Green Paint							
28	012-01	012	----	----	----	----	NAD	NA
Location:	Interior Room 1 Wall - CMU Block							
29	012-02	012	----	----	----	----	NAD	NA
Location:	Interior Room 3 Wall - CMU Block							
30	013-01	013	----	----	----	----	NAD	NA
Location:	Interior Room 1 Wall - CMU Block Mortar							
31	013-02	013	----	----	----	----	NAD	NA
Location:	Interior Room 3 Wall - CMU Block Mortar							
32	014-01	014	----	----	----	----	NAD	NA
Location:	Interior Room 3 Floor - Concrete Floor							

See Reporting notes on last page

Table I
Summary of Bulk Asbestos Analysis Results

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
33	014-02	014	----	----	----	----	NAD	NA
Location:	Interior Room 1 Floor - Concrete Floor							
34	015-01	015	0.119	46.3	36.2	17.6	NAD	NAD
Location:	Interior Room 3 Wall - Plastic Wall Panel Adhesive							
35	015-02	015	0.192	48.8	26.8	24.4	NAD	NAD
Location:	Interior Room 2 Wall - Plastic Wall Panel Adhesive							
36	016-01	016	0.247	24.6	66.2	9.2	NAD	NAD
Location:	Interior Room 3 On Processing Equipment Pipe Flanges - Red Flange Gasket							
37	016-02	016	0.217	25.2	65.8	9.0	NAD	NAD
Location:	Interior Room 3 On Processing Equipment Pipe Flanges - Red Flange Gasket							
38	017-01	017	0.152	24.4	26.7	48.9	NAD	NAD
Location:	Interior Room 2 Drop Ceiling - 2' x 4' White Wormtrack Ceiling Tile							
39	017-02	017	0.129	24.7	24.0	51.2	NAD	NAD
Location:	Interior Room 2 Drop Ceiling - 2' x 4' White Wormtrack Ceiling Tile							
40	018-01	018	0.302	25.3	35.0	39.7	NAD	NAD
Location:	Interior Office Drop Ceiling - 2' x 4' White Smooth Surface Drywall Type Ceiling Tile							
41	018-02	018	0.199	53.6	3.0	43.4	NAD	NAD
Location:	Interior Room 3 Ceiling - 2' x 4' White Smooth Surface Drywall Type Ceiling Tile							
42	019-01	019	----	----	----	----	NAD	NA
Location:	Interior Bathroom Wall - Drywall Wall							
43	019-02	019	----	----	----	----	NAD	NA
Location:	Interior Office Wall - Drywall Wall							
44	020-01	020	----	----	----	----	NAD	NA
Location:	Interior Bathroom Wall - Joint Compound							
45	020-02	020	----	----	----	----	NAD	NA
Location:	Interior Office Wall - Joint Compound							
46	021-01	021	----	----	----	----	NAD	NA
Location:	Interior Room 1 Ceiling - Drywall Ceiling							
47	021-02	021	----	----	----	----	NAD	NA
Location:	Interior Room 1 Ceiling - Drywall Ceiling							
48	022-01	022	----	----	----	----	NAD	NA
Location:	Interior Room 1 Ceiling - Ceiling Joint Compound							

See Reporting notes on last page

Client Name: Ambient Environmental, Inc.

Table I
Summary of Bulk Asbestos Analysis Results

230323AA; MJ Engineering & Land Surveying PC; Willsboro WTP Hazardous Materials - 26 Pumphouse Lane, Willsboro, N.Y. - Water Treatment Plant - Interior / Exterior

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
49	022-02	022	----	----	----	----	NAD	NA

Location: Interior Room 1 Ceiling - Ceiling Joint Compound

Analyzed by: Marwan A. Alahiri 

Date: 4/28/2023

Reviewed by: Marwan A. Alahiri 

**Quantitative Analysis (Semi/Full); Bulk Asbestos Analysis - PLM by Appd E to Subpt E, 40 CFR 763 or NYSDOH ELAP 198.1 for New York friable samples or NYSDOH ELAP 198.6 for New York NOB samples; TEM (Semi/Full) by EPA 600/R-93/116 (or NYSDOH ELAP 198.4; for New York samples). Analysis using Hitachi, Model H600-Noran 7 System, Microscope, Serial #: 542-26-10. NAD = no asbestos detected during a quantitative analysis; NA = not analyzed; Trace = <1%; (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only; Qualitative Analysis: Asbestos analysis results of "Present" or "NVA = No Visible Asbestos" represents results for Qualitative PLM or TEM Analysis only (no accreditation coverage available from any regulatory agency for qualitative analyses): NVLAP (PLM) 200546-0, NYSDOH ELAP Lab 11480, NJ Lab ID #NY031.

Warning Note: PLM limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris for which PLM evaluation is recommended (i.e. soils and other heterogenous materials).

Ambient Environmental, Inc.
Comprehensive Building Science Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

PROJECT INFORMATION

Client:	Project Name:	Project Street Address:	Client Contact:
MJ Engineering & Land Surveying PC	Willsboro WTP Hazardous Materials	26 PUMPHOUSE LANE	Carly Carman
Project Number: 230323AA	**Inspector:** Nathan Mastenbrook	**Project Address City/State:** Willsboro, N.Y.	**Collection Date:** 4-20-23
Sample TAT: 5 Day	**Building Name:** Water Treatment Plant	**Sampling Areas:** Interior/Exterior	**Comments: (Field)** X Analyze to First Positive By Homogeneous Material; X For Negative NOB PLM's, continue to TEM

BULK SAMPLE LOCATION — TYPE OF MATERIALS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F)	Condition (G, D, SD)	Quantity (LF, SF, EA)	Homogeneous Areas	Asbestos Content (Type & %)
001	01	Red Asphalt Shingle (M)	Exterior Lower Roof on Tar Paper	N	G			
001	02	Red Asphalt Shingle (M)	Exterior Lower Roof on Tar Paper	N	G			
002	01	Black Tar Paper (M)	Exterior Lower Roof on Wood Roof Deck	N	G			
002	02	Black Tar Paper (M)	Exterior Lower Roof on Wood Roof Deck	N	G			
003	01	Black EPDM (M)	Exterior Upper Roof on Foam Board	N	G			
003	02	Black EPDM (M)	Exterior Upper Roof on Foam Board	N	G			
004	01	Yellow Foam Board Paper Backing (M)	Exterior Upper Roof on Metal Roof Deck	N	G			
004	02	Yellow Foam Board Paper Backing (M)	Exterior Upper Roof on Metal Roof Deck	N	G			
005	01	Black EPDM W/ Yellow Glue (M)	Exterior Upper Roof on Concrete Parapet Edge	N	G			
005	02	Black EPDM W/ Yellow Glue (M)	Exterior Upper Roof on Concrete Parapet Edge	N	G			
006	01	White Caulk (M)	Interior Room 3 at Base of Plastic Wall Panels	N	G			

#230429 17

CHAIN OF CUSTODY

	Relinquished By:	Date	Time	Received By:	Date	Time
I	[signature]	4-21-23		Alexandra Vaca	42423	0920
II						

LAB INFORMATION

Lab Name	Date	Time
a. Analyzed By: BOSCO	4.27.23	19:40
b. QC by: [signature]	4/28/23	6:57 pm

Project Manager: CD	Results To: Results@ambient-env.com	Drawings: ___ Sample Locations ___ Material Locations	Comments:

(T=TSI; S=Surfacing; M=Misc)

Ambient Environmental, Inc.
Comprehensive Building Science Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

PROJECT INFORMATION

Client:	Project Name:	Project Street Address:	Client Contact:
MJ Engineering & Land Surveying PC	Willsboro WTP Hazardous Materials	26 PUMPHOUSE LANE	Carly Carman
Project Number:	**Inspector:**	**Project Address City/State:**	**Collection Date:**
230323AA	Nathan Mastenbrook	Willsboro, N.Y.	4-20-23
Sample TAT: 5 Day	**Building Name:** Water Treatment Plant	**Sampling Areas:** Interior/Exterior	**Comments: (Field)** X Analyze to First Positive By Homogeneous Material; X For Negative NOB PLM's, continue to TEM

BULK SAMPLE LOCATION — TYPE OF MATERIALS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F)	Condition (G, D, SD)	Quantity (LF, SF, EA)	Homogeneous Areas	Asbestos Content (Type & %)
006	02	White Caulk (M)	Interior Room 3 at Base of Plastic Wall Panels	N	G			
007	01	Clear Caulk (M)	Exterior where power conduits go through wood siding	N	G			
007	02	Clear Caulk (M)	Exterior where power conduits go through wood siding	N	G			
008	01	Gray Caulk (M)	Exterior CMU Wall around Ventilation Hood	N	G			
008	02	Gray Caulk (M)	Exterior CMU Wall around Ventilation Hood	N	G			
009	01	Black Foundation Tar (M)	Exterior CMU Foundation	N	G			
009	02	Black Foundation Tar (M)	Exterior CMU Foundation	N	G			
010	01	Gray Cementitious Patching (M)	Exterior Lake Side on Infilled Window	F	D			
010	02	Gray Cementitious Patching (M)	Exterior Lake Side on Infilled Window	F	D			
011	01	Green Paint (S)	Exterior on Wood Siding	N	G			
011	02	Green Paint (S)	Exterior on Wood Siding	N	G			

#230429 17

CHAIN OF CUSTODY

	Relinquished By:	Date	Time	Received By:	Date	Time
I	[signature]	4-28-23		Alexandr Vaiu	4/24/23	0920
II						

Project Manager: CD	Results To: Results@ambient-env.com	Drawings: ___ Sample Locations ___ Material Locations

(T=TSI; S=Surfacing; M=Misc)

LAB INFORMATION

Lab Name	Date	Time
a. Analyzed By: [signature]	4-27-23	19:40
b. QC by: [signature]	4/28/23	6:57 pm

Comments:

Ambient Environmental, Inc.
Comprehensive Building Science Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

PROJECT INFORMATION

Client:	Project Name:	Project Street Address:	Client Contact:
MJ Engineering & Land Surveying PC	Willsboro WTP Hazardous Materials	26 PUMPHOUSE LANE	Carly Carman
Project Number:	**Inspector:**	**Project Address City/State:**	**Collection Date:**
230323AA	Nathan Mastenbrook	Willsboro, N.Y.	4-20-23
Sample TAT: 5 Day	**Building Name:** Water Treatment Plant	**Sampling Areas:** Interior/Exterior	**Comments: (Field)** X Analyze to First Positive By Homogeneous Material; X For Negative NOB PLM's, continue to TEM

BULK SAMPLE LOCATION — TYPE OF MATERIALS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F)	Condition (G, D, SD)	Quantity (LF, SF, EA)	Homogeneous Areas	Asbestos Content (Type & %)
011	03	Green Paint (S)	Exterior on Wood Soffit	N	G			
011	04	Green Paint (S)	Exterior on CMU Block Wall	N	G			
011	05	Green Paint (S)	Exterior on CMU Block Wall	N	G			
011	06	Green Paint (S)	Exterior on CMU Block Wall	N	G			
011	07	Green Paint (S)	Exterior on CMU Block Wall	N	G			
012	01	CMU Block (M)	Interior Room 1 Wall	F	G			
012	02	CMU Block (M)	Interior Room 3 Wall	F	G			
013	01	CMU Block Mortar (M)	Interior Room 1 Wall	F	G			
013	02	CMU Block Mortar (M)	Interior Room 3 Wall	F	G			
014	01	Concrete Floor (M)	Interior Room 3 Floor	F	G			
014	02	Concrete Floor (M)	Interior Room 1 Floor	F	G			

CHAIN OF CUSTODY

#223042917

Relinquished By:	Date	Time	Received By:	Date	Time
I	4-21-23		Alexander Valiv	42423	0920
II					

LAB INFORMATION

Lab Name	Date	Time
a. Analyzed By: BOSwell	4.27.23	19:40
b. QC by: Mamun Alahmn	4/28/23	6:57pm

Project Manager: CD	Results To: Results@ambient-env.com	Drawings: ___ Sample Locations ___ Material Locations	Comments:

(T=TSI; S=Surfacing; M=Misc)

Ambient Environmental, Inc.
Comprehensive Building Science Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

PROJECT INFORMATION

Client:	Project Name:	Project Street Address:	Client Contact:
MJ Engineering & Land Surveying PC	Willsboro WTP Hazardous Materials	26 PUMPHOUSE LANE	Carly Carman
Project Number: 230323AA	**Inspector:** Nathan Mastenbrook	**Project Address City/State:** Willsboro, N.Y.	**Collection Date:** 4-20-23
Sample TAT: 5 Day	**Building Name:** Water Treatment Plant	**Sampling Areas:** Interior/Exterior	**Comments: (Field)** X Analyze to First Positive By Homogeneous Material; X For Negative NOB PLM's, continue to TEM

BULK SAMPLE LOCATION / TYPE OF MATERIALS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F)	Condition (G, D, SD)	Quantity (LF, SF, EA)	Homogeneous Areas	Asbestos Content (Type & %)
015	01	Plastic Wall Panel Adhesive (M)	Interior Room 3 Wall	N	G			
015	02	Plastic Wall Panel Adhesive (M)	Interior Room 2 Wall	N	G			
016	01	Red Flange Gasket (M)	Interior Room 3 on Processing Equipment Pipe Flanges	N	G			
016	02	Red Flange Gasket (M)	Interior Room 3 on Processing Equipment Pipe Flanges	N	G			
017	01	2'X4' White Wormtrack Ceiling Tile (M)	Interior Room 2 Drop Ceiling	N	G			
017	02	2'X4' White Wormtrack Ceiling Tile (M)	Interior Room 2 Drop Ceiling	N	G			
018	01	2'X4' White Smooth Surface Drywall type Ceiling Tile (M)	Interior Office Drop Ceiling	F	G			
018	02	2'X4' White Smooth Surface Drywall type Ceiling Tile (M)	Interior Room 3 Ceiling	F	G			
019	01	Drywall Wall (M)	Interior Bathroom Wall	F	G			
019	02	Drywall Wall (M)	Interior Office Wall	F	G			
020	01	Joint Compound (M)	Interior Bathroom Wall	F	G			

#230429 17

CHAIN OF CUSTODY

Relinquished By:	Date	Time	Received By:	Date	Time
	4-27-23		Alexandra Vacca	42423	0920
II					

LAB INFORMATION

Lab Name	Date	Time
a. Analyzed By: BOSOM	4.27.23	19:40
b. QC by: Marcus Mahon	4/28/23	6:57 pm

Project Manager: CD	Results To: Results@ambient-env.com	Drawings: ___ Sample Locations ___ Material Locations

Comments:

(T=TSI; S=Surfacing; M=Misc)

Ambient Environmental, Inc.
Comprehensive Building Science Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

PROJECT INFORMATION

Client:	Project Name:	Project Street Address:	Client Contact:
MJ Engineering & Land Surveying PC	Willsboro WTP Hazardous Materials	26 PUMPHOUSE LANE	Carly Carman
Project Number: 230323AA	**Inspector:** Nathan Mastenbrook	**Project Address City/State:** Willsboro, N.Y.	**Collection Date:** 4-20-23
Sample TAT: 5 Day	**Building Name:** Water Treatment Plant	**Sampling Areas:** Interior/Exterior	**Comments: (Field)** X Analyze to First Positive By Homogeneous Material; X For Negative NOB PLM's, continue to TEM

BULK SAMPLE LOCATION — TYPE OF MATERIALS

Homogeneous Area Number	Bulk Sample ID Number	Sampled Material (T, S, M)	Sample Location	Friability (N/F)	Condition (G, D, SD)	Quantity (LF, SF, EA)	Homogeneous Areas	Asbestos Content (Type & %)
020	02	Joint Compound (M)	Interior Office Wall	F	G			
021	01	Drywall Ceiling (M)	Interior Room 1 Ceiling	F	G			
021	02	Drywall Ceiling (M)	Interior Room 1 Ceiling	F	G			
022	01	Ceiling Joint Compound (M)	Interior Room 1 Ceiling	F	G			
022	02	Ceiling Joint Compound (M)	Interior Room 1 Ceiling	F	G			

#223042917

CHAIN OF CUSTODY

Relinquished By:	Date	Time	Received By:	Date	Time
I	4-20-23		Alexandra Vnuk	4/24/23	0920
II					

Project Manager: CD	Results To: Results@ambient-env.com	Drawings: ___ Sample Locations ___ Material Locations

(T=TSI; S=Surfacing; M=Misc)

LAB INFORMATION

Lab Name	Date	Time
a. Analyzed By: BOSun	4.27.23	19:40
b. QC by: Brianna Alwine	4/28/23	6:57 pm

Comments:

ATTACHMENT B
LEAD-BASED PAINT TESTING RESULTS

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

Lead Based Paint Inspection Detailed Report

828 Washington Avenue
Albany, New York

INSPECTION SITE:	26 Pumphouse Lane Willsboro, New York
INSPECTION DATE:	4/20/2023 - 4/20/2023
REPORT NUMBER:	230323AA
INSTRUMENT TYPE:	Viken Detection Pb200i XRF Lead Paint Analyzer 2327
ACTION LEVEL:	1.0 (mg/cm²)
Job ID:	,230323aa
STATEMENT:	Paint conditions included in this report represent conditions observed by the inspector at the time of the inspection

Lead Based Paint Inspection Detailed Report

Inspection Date: 4/20/2023 - 4/20/2023
Action Level: 1.0 (mg/cm²)
Report Number: 230323AA
Total Readings: 23
Unit Started: 04/20/2023 10:20:30
Unit Ended: 04/20/2023 10:41:36

Inspection Site: 26 Pumphouse Lane
Willsboro, New York

Read #	Result	Job	Room -->RoomChoice	Structure	-->Member	Substrate	Wall	Location	Condition	Color	Lead (mg/cm²)	Mode
7	Negative	wtp	Exterior Building	Misc	wall	Wood	A	1	Intact	Green	0.1 mg/cm²	Action Level
8	Negative	wtp	Exterior Building	Misc	wall	Wood	B	1	Intact	Green	0.0 mg/cm²	Action Level
9	Negative	wtp	Exterior Building	Misc	wall	Concrete	B	1	Intact	Green	0.0 mg/cm²	Action Level
10	Negative	wtp	Exterior Building	Misc	wall	Concrete	B	1	Intact	Green	0.0 mg/cm²	Action Level
11	Negative	wtp	Exterior Building	Misc	wall	Concrete	C	1	Intact	Green	0.0 mg/cm²	Action Level
12	Negative	wtp	Exterior Building	Misc	wall	Concrete	D	1	Intact	Green	0.0 mg/cm²	Action Level
13	Negative	wtp	Exterior Building	Misc	wall	Wood	D	1	Intact	Green	0.1 mg/cm²	Action Level
14	Negative	wtp	Exterior Building	Soffit		Wood	D	1	Intact	Green	0.1 mg/cm²	Action Level
15	Negative	wtp	Exterior Building	Soffit		Wood	A	1	Intact	Green	0.0 mg/cm²	Action Level
16	Negative	wtp	Interior Building	Misc	wall	Drywall	A	2	Intact	White	0.1 mg/cm²	Action Level
17	Negative	wtp	Interior Building	Misc	wall	Drywall	A	2	Intact	Light Blue	0.1 mg/cm²	Action Level
18	Negative	wtp	Interior Building	Misc	wall	Concrete	C	2	Intact	Light Blue	0.0 mg/cm²	Action Level
19	Negative	wtp	Interior Building	Misc	wall	Concrete	C	2	Intact	White	0.0 mg/cm²	Action Level
20	Negative	wtp	Interior Building	Misc	ceiling	Drywall	C	2	Intact	White	0.0 mg/cm²	Action Level
21	Negative	wtp	Interior Building	Door	Casing	Wood	C	2	Intact	White	0.5 mg/cm²	Action Level
22	Negative	wtp	Interior Building	Door	Casing	Wood	C	2	Intact	Light Blue	0.1 mg/cm²	Action Level
23	Negative	wtp	Common	Misc	wall	Drywall	B	4	Intact	Light Blue	0.0 mg/cm²	Action Level
24	Negative	wtp	Commor	Misc	wall	Drywall	B	4	Intact	White	0.2 mg/cm²	Action Level
25	Negative	wtp	Common	Misc	process equipment	Metal	C	5	Intact	Blue	0.1 mg/cm²	Action Level
26	Negative	wtp	Commor	Misc	process equipment	Metal	C	5	Intact	Blue	0.0 mg/cm²	Action Level
27	Negative	wtp	Common	Pipe		Metal	C	5	Intact	Light Blue	0.3 mg/cm²	Action Level

Lead Based Paint Inspection Detailed Report

Inspection Date:	4/20/2023 - 4/20/2023	Inspection Site:	26 Pumphouse Lane Willsboro, New York
Action Level:	1.0 (mg/cm²)		
Report Number:	230323AA		
Total Readings:	23		
Unit Started:	04/20/2023 10:20:30		
Unit Ended:	04/20/2023 10:41:36		

Read #	Result	Job	Room -->RoomChoice	Structure	-->Member	Substrate	Wall	Location	Condition	Color	Lead (mg/cm²)	Mode
28	Negative	wtp	Commor	Pipe		Metal	C	5	Intact	Light Green	0.1 mg/cm²	Action Level
29	Negative	wtp	Common	Stair		Concrete	A	5	Intact	Light Blue	0.2 mg/cm²	Action Level

------ END OF READINGS ------

ATTACHMENT C

PCB RESULTS AND LABORATORY ANALYSIS REPORT WITH CHAIN OF CUSTODY DOCUMENTATION

MJ ENGINEERING & LAND SURVEYING PC
WILLSBORO WTP
26 PUMPHOUSE LANE, WILLSBORO, NY
SUMMARY OF PCB SAMPLES AND ANALYSIS RESULTS

Material Description/Sample Location	Sample Number	Total PCB (PPM)
White Caulk / Interior Room 3 at Base of Plastic Wall Panels	PCB-01	<.624
Clear Caulk / Exterior where power conduits go through wood siding	PCB-02	<.496
Exterior CMU Wall around Ventilation Hood	PCB-03	<4.790

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Ambient Environmentals LLC. (3639)
Address: 828 Washington Ave
Albany, NY 12203-1622

Attn:

Project: Willsboro WTP Hazardous Mtrls
Location: 26 Pumphouse Lane Willsboro NY
Number: 230323AA

Order #: 513690

Matrix Bulk
Received 04/24/23
Reported 04/27/23

PO Number:

Sample ID / Parameter	Cust. Sample ID	Location / Method	Result	RL*	Units	Analysis Date	Analyst
513690-001	PCB-01	White Caulk Asb #006					
Semi-volatile Organic Compounds							
Aroclor - 1016		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1221		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1232		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1242		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1248		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1254		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1260		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1262		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
Aroclor - 1268		SW846 8082A	**<624**	623	µg/kg	04/24/23	KF
513690-002	PCB-02	Clear Caulk Asb #007					
Semi-volatile Organic Compounds							
Aroclor - 1016		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1221		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1232		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1242		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1248		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1254		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1260		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1262		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
Aroclor - 1268		SW846 8082A	**<496**	495	µg/kg	04/24/23	KF
513690-003	PCB-03	Gray Caulk Asb #008					
Semi-volatile Organic Compounds							
Aroclor - 1016		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1221		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1232		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1242		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1248		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1254		SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Ambient Environmentals LLC. (3639)
Address: 828 Washington Ave
Albany, NY 12203-1622

Attn:

Project: Willsboro WTP Hazardous Mtrls
Location: 26 Pumphouse Lane Willsboro NY
Number: 230323AA

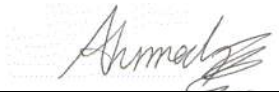
Order #: 513690

Matrix Bulk
Received 04/24/23
Reported 04/27/23

PO Number:

Sample ID / Parameter	Cust. Sample ID / Method	Result	RL*	Units	Analysis Date	Analyst
513690-003	PCB-03 / Gray Caulk Asb #008					
Aroclor - 1260	SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1262	SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF
Aroclor - 1268	SW846 8082A	**<4790**	4780	µg/kg	04/24/23	KF

513690-04/27/23 11:43 AM



Reviewed By: **Ahmed Elnasseh**
Analyst

Surrogate Recoveries

513690-001 - PCB
DCB MI
TCMX MI

513690-002 - PCB
DCB MI
TCMX MI

513690-003 - PCB
DCB MI
TCMX MI

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Ambient Environmentals LLC. (3639)
Address: 828 Washington Ave
Albany, NY 12203-1622

Attn:

Project: Willsboro WTP Hazardous Mtrls
Location: 26 Pumphouse Lane Willsboro NY
Number: 230323AA

Order #: 513690

Matrix Bulk
Received 04/24/23
Reported 04/27/23

PO Number:

Sample ID	Cust. Sample ID	Location					
Parameter		Method	Result	RL*	Units	Analysis Date	Analyst

State Certifications

Method	Parameter	New York	Virginia
SW846 8082A	Aroclor - 1016	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1221	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1232	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1242	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1248	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1254	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1260	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1262	ELAP Certified	VELAP Certified
SW846 8082A	Aroclor - 1268	ELAP Certified	VELAP Certified

State	Certificate Number
New York	ELAP 66375
Virginia	VELAP 12299

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

SCHNEIDER LABORATORIES GLOBAL, INC.
2512 West Cary Street, Richmond, Virginia 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475
www.slabinc.com • info@slabinc.com

S 3

513690

V:\513\513690

thawks 4/24/2023 8:51:49 AM
Federal Express 817941060887

Submitting Co.	Ambient Environmental, Inc.	State of Collection	NY	Cert. Required	☐ YES ☐ NO
828 Washington Avenue		Acct #	3639	Phone	518 482-0704
Albany, NY 12203		Email	Results@ambient-env.com		
Project Name	Willsboro WTP Hazardous Mtls	PO #			
Project Location	26 Pumphouse Lane Willsboro NY	Special Instructions			
Project Number	230323AA				
Collected By	Nathan Mastenbrook				

Turn Around Time **

- ☐ Same day *
- ☐ 1 business day
- ☐ 2 business days
- ☐ 3 business days
- ☒ 5 business days

* not available for all tests

Matrix

- ☐ Paint
- ☒ Bulk
- ☐ Soil
- ☐ Wipe
- ☐ Ground Water
- ☐ Waste Water

** A job received past 3 PM will begin its TAT the next business day

Please schedule rush tests in advance

Test selection for all Samples listed below (Circle desired method)

- ☐ VOC (8260/624)
- ☐ SVOC (8270/625)
- ☐ Pesticides (8081/608)
- ☐ Herbicides (8151)
- ☐ Chlordane (8081/608)
- ☐ Toxaphene (8081/608)
- ☒ PCB (8082)
- ☐ TPH-DRO (8015)
- ☐ TPH-GRO (8015)
- ☐ BTEX (8260/8021)
- ☐ MTBE (8260/8021)
- ☐ Naphthalene (8260/8270)

TCLP

- ☐ Volatiles
- ☐ Semi-Volatiles
- ☐ Herbicides
- ☐ Pesticides
- ☐ Full TCLP (10 Day)

Miscellaneous

- ☐ Chlorides (300/9056)
- ☐ Silica (7602)
- ☐ Sulfates (300/9056)
- ☐ PAH (8270/625)
- ☐ Oil and Grease (1664)
- ☐ TPH (EPA 418.1)

Individual Sample Requests

Sample #	Date Sampled	Time Sampled	# of Containers	Sample Identification	Wipe Area
PCB-01	4/20/23	9 AM	1	White Caulk ASB #006	
PCB-02	4/20/23	9:15 AM	1	Clear Caulk ASB #007	
PCB-03	4/20/23	9:30 AM	1	Gray Caulk ASB #008	

For Aqueous and Solid samples ensure enough sample is sent for duplicate and spike analyses

Relinquished By: Nathan Mastenbrook Signature: Nathan Mastenbrook Date/Time 4-21-23

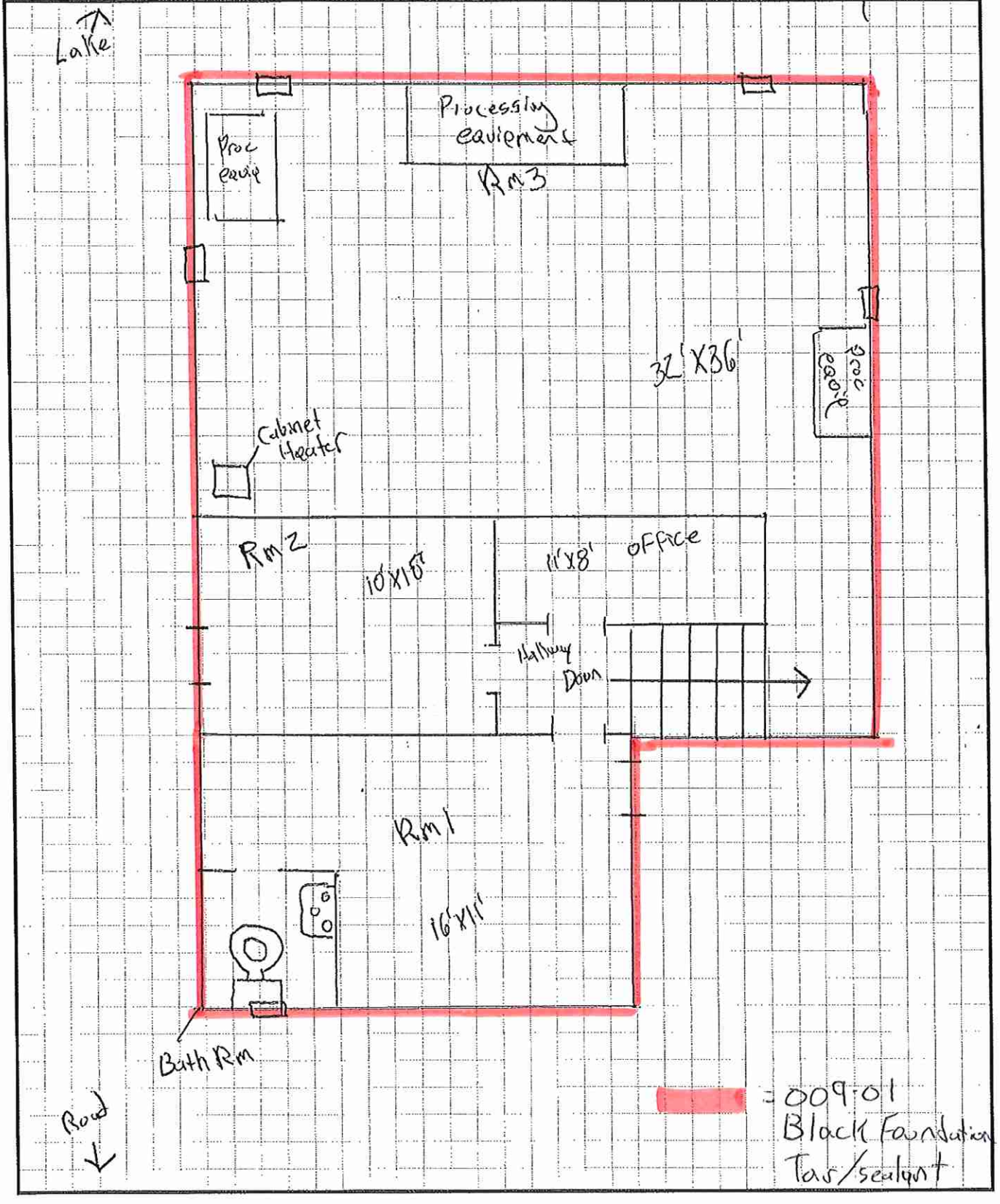
! ALL SHADED FIELDS MUST BE FILLED TO AVOID DELAYS !

Chain-of-Custody documentation continued internally

ATTACHMENT D
HAZARDOUS MATERIAL LOCATION DRAWINGS

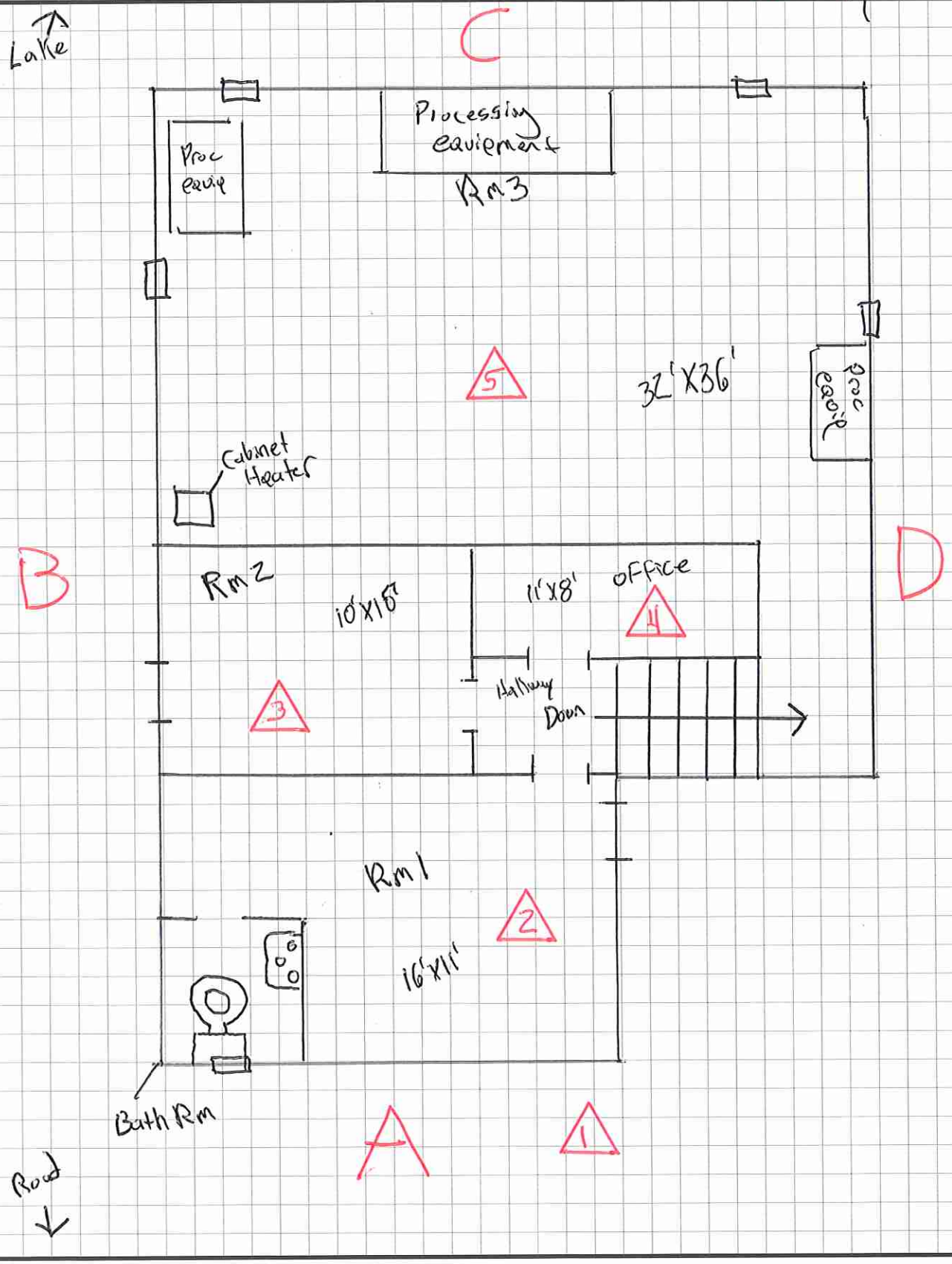
Ambient Environmental, Inc.
Building Science and EHS Solutions
828 Washington Ave., Albany, NY 12203
PH: 518-482-0704 | FX: 518-482-0750
NYS Certified WBE, SBA EDWOSB & DBE

PROJECT NUMBER 230323AA
SHEET 1 OF 1
DATE 5-1-23
PROJECT Willsboro WTP Hazardous Mtls
PHASE Materials Location DWG



Ambient Environmental, Inc.
Building Science and EHS Solutions
828 Washington Ave., Albany, NY 12203
PH: 518-482-0704 | FX: 518-482-0750
NYS Certified WBE,
SBA EDWOSB & DBE

PROJECT NUMBER 230323AA
SHEET 1 OF 1
DATE 4-20-23
PROJECT Willsboro WTP Hazardous Mtrls
PHASE PB DWG



ATTACHMENT E
PHOTOGRAPHIC DOCUMENTATION

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

PHOTO LOG

Ambient Project #230323AA
Willsboro WTP Hazardous Materials
25 Pumphouse Lane, Willsboro, N.Y.
MJ Engineering & Land Surveying PC
May 1st 2023

Photograph 1- 009-01 Black Foundation Tar/Sealant

Photograph 2- 009-01 Black Foundation Tar/Sealant (Historical Photograph of same exterior wall as Photograph-1 shown during initial construction of building before bottom 6ft of walls were backfilled with stone/dirt)

ATTACHMENT F

COMPANY, INSPECTOR AND LABORATORY ACCREDITATION AND LICENSES

New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

Ambient Environmental, Inc.

828 Washington Avenue

Albany, NY 12203

FILE NUMBER: 06-0549
LICENSE NUMBER: 29608
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 07/05/2022
EXPIRATION DATE: 07/31/2023

Duly Authorized Representative – Joella Viscusi.

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

SH 432 (8/12)

United States Environmental Protection Agency

This is to certify that

Ambient Environmental, Inc.

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires May 12, 2023

LBP-16658-2

Certification #

November 14, 2019

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

NEW YORK STATE

MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISE ("MWBE")

CERTIFICATION

Empire State Development's Division of Minority and Women's Business Development grants a

Women Business Enterprise (WBE)

pursuant to New York State Executive Law, Article 15-A to:

Ambient Environmental, Inc.

Certification Awarded on: January 30, 2020
Expiration Date: January 30, 2025
File ID#: 50943

NEW YORK STATE OF OPPORTUNITY. Division of Minority and Women's Business Development

A Division of Empire State Development

Certification: View

Help & Tools

Certification List | Add Date Alert

Vendor Information

BUSINESS NAME	**Ambient Environmental, Inc.**
SYSTEM VENDOR NUMBER	**20167029**
PRIMARY OWNER'S NAME	**Ms. Joella Viscusi**
ETHNIC GROUP	**Other Minority**
GENDER	**Female**

Certification Information

CERTIFYING AGENCY	**New York State Department of Transportation**
CERTIFICATION TYPE	**DBE - Disadvantaged Business Enterprise**
EFFECTIVE DATE	**3/27/2013**
RENEWAL DATE	**3/27/2023**

Contact Information

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Addresses

PHYSICAL ADDRESS	**828 Washington Ave.** **Albany, NY 12203-1622 [map]**
MAILING ADDRESS	**828 Washington Ave.** **Albany, NY 12203-1622 [map]**

Business Capabilities

BUSINESS CERTIFIED FOR	**Environmental Services.**
FULL DESCRIPTION OF	**Environmental Services.**

CAPABILITIES/PRODUCTS		
COMMODITY CODES	**NAICS 541620**	**Environmental consulting services** (More)

Owner Ethnicity and Gender

ETHNIC GROUP	**Other Minority**
GENDER	**Female**

Location

COUNTY	**Albany (NY)**

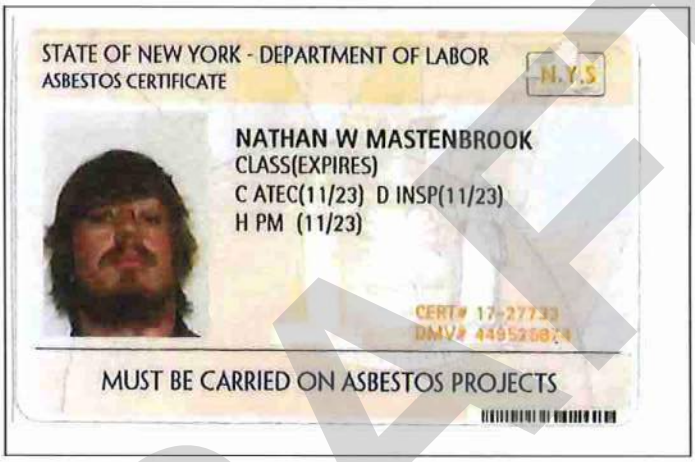
Certification List

Ambient Environmental, Inc.
Building Science and EHS Solutions
NYS Certified WBE,
SBA EDWOSB & DBE

AMBIENT ENVIRONMENTAL, INC.
NEW YORK STATE DEPARTMENT OF LABOR
ASBESTOS LICENSE

Nathan Mastenbrook

Front of License



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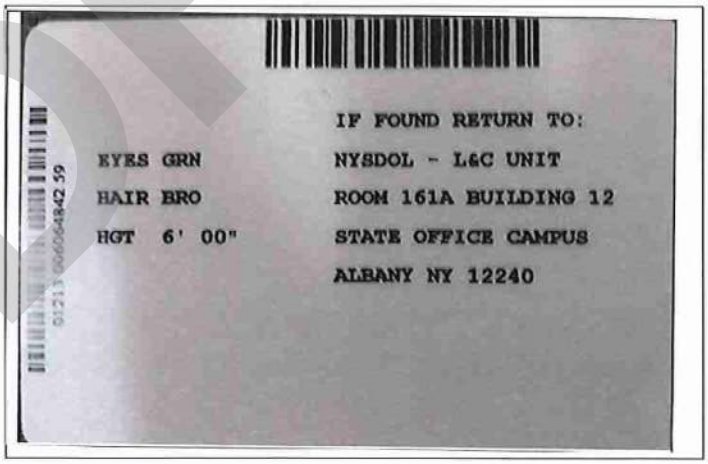

Codes:

A- Asbestos Handler
B- Restricted Handler
C- Project Air Sampling Technician
D- Inspector – R III
E- Management Planner
F- Operations and Maintenance
G- Supervisor
H- Project Monitor
I- Project Designer
J- Allied Trades

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. KAROL H. LU
AMERICA SCIENCE TEAM NEW YORK, INC
117 EAST 30TH ST
NEW YORK, NY 10016

NY Lab Id No: 11480

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
	EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual

Serial No.: 66402

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2024
Issued April 01, 2022
Revised March 30, 2023

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. FAYEZ ABOUZAKI
SCHNEIDER LABORATORIES GLOBAL, INC
2512 WEST CARY STREET
RICHMOND, VA 23220-5117

NY Lab Id No: 11413

is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:

Metals III	
Cobalt, Total	EPA 6010D
Molybdenum, Total	EPA 6010D
Thallium, Total	EPA 6010D
Tin, Total	EPA 6010D
Titanium, Total	EPA 6010D
Miscellaneous	
Boron, Total	EPA 6010D
Polychlorinated Biphenyls	
Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
Sample Preparation Methods	
	EPA 3010A
	EPA 3050B
	EPA 3550C

Serial No.: 66375

Appendix D \

Pilot Study Report

Pilot Report For:
Town of Willsboro
Willsboro, NY

Equipment:
R199 Trident® and
Trident® HS Pilot Plant

Engineers:
Carrie Dooley, PE
Warren Longacker, PE
MJ Engineering
New York

Represented By:
Rich Suriano
Koester Associates

Furnished By: Justin Roth
WesTech Engineering, LLC
Ames, IA 50010
Phone: (515) 268-8523
jroth@westech-inc.com
Date: June 13th, 2023

WesTech®

Executive Summary

The Town of Willsboro, NY currently operates one water treatment plant to meet the demands of the residents. Treatment of raw water of Lake Champlain is achieved through conventional Diatomaceous Earth (DE) Filtration methods. The Town of Willsboro is looking to replace their existing water treatment systems, which are reaching the end of their usable lifespans, and to increase capacity. The new system will continue to receive its water from Lake Champlain. This pilot study was conducted to verify the effectiveness and determine the efficiency of the Trident® Package Plant designed by WesTech Engineering in turbidity, total organic carbon (TOC), and metals removal for the raw water source. The pilot study took place from March 24th to April 14th 2023 using WesTech Engineering Pilot Plant HS2 Water Treatment Trailer (R199).

The following objectives/goals were outlined for the study:

- Mixed Media Filter (MMF) effluent turbidity ≤0.10 NTU (95% of samples) & <0.30 NTU (100% of samples).
- MMF effluent iron ≤0.30 mg/L.
- MMF effluent manganese ≤0.050 mg/L.
- MMF effluent aluminum ≤0.15 mg/L.
- MMF effluent color ≤10 cu.
- Particle count log reduction ≥2.0 (2-200 µm range).
- Total organic carbon (TOC) reduction >35%.
- Evaluate loading rates up to 10 and 5 gpm/sqft through the Adsorption Clarifier (AC) and MMF respectively.
- Determine efficiency and net production of the process.
- Determine optimum water treatment chemicals and dosage levels to meet quality goals.

The test data collected over the study period led to the following conclusions:

- The Trident system was capable of successfully treating the source water for turbidity, color, and metal removal using PCH182 as a coagulant. When operating at AC and MMF loading rates of 10.0 and 5.0 gpm/sqft respectively, the system achieved an average waste net production (ratio of waste produced to treated water produced) of ~90%.
- Optimum performance was achieved with a PCH182 dose of ~20-25 mg/L, potassium permanganate dose of ~0.30 mg/L, 10 minutes of detention time, and cationic polymer dose of 0.25 mg/L to the AC.
- MMF effluent turbidities of <0.10 NTU for >95% of samples were observed under optimal, stable operating conditions throughout the study.
- MMF effluent particle count log reductions of >2.0 were observed under optimal, stable operating conditions throughout the study.
- MMF effluent colors of <10 cu were observed under optimal, stable operating conditions throughout the study.
- MMF effluent typical iron and manganese levels of <0.01 and <0.01 mg/L respectively were observed under optimal, stable operating conditions throughout the study.
- With the addition of 5 mg/L of carbon (PAC), a TOC removal percentage of >35% was achieved. Without carbon, the TOC removal averaged ~30%.

Overall, the Trident treatment process demonstrated acceptable treatment performance for the proposed source water. The recommended chemical treatment scheme is PCH182 as a coagulant, a cationic polymer as an AC flocculant aid and potassium permanganate as an oxidant. Additional provisions for PAC dosing may be needed for enhanced TOC removal.

Table of Contents

Appendices

Tables & Figures

1.0 Introduction

The Town of Willsboro, NY currently operates one water treatment plant to meet the demands of the residents. Treatment of raw water from Lake Champlain is achieved through conventional Diatomaceous Earth (DE) Filtration methods. The Town of Willsboro is looking to replace their existing water treatment system, which is reaching the end of its usable lifespan, and to increase capacity. The new system will continue to receive its water from Lake Champlain. This pilot study was conducted to verify the effectiveness and determine the efficiency of the Trident® Package Plant designed by WesTech Engineering in turbidity, total organic carbon (TOC), and metals removal for the raw water source. The pilot study took place from March 24th to April 14th 2023 using WesTech Engineering Pilot Plant HS2 Water Treatment Trailer (R199).

Figure 1 | Area Map of Willsboro, NY and Water Treatment Plant

Section 2.0 of this report outlines the pilot study protocol and goals. Section 3.0 presents the information on the treatment process and pilot set-up. Section 4.0 presents raw water characteristics. Section 5.0 gives a summary and discussion of test data. Section 6.0 outlines the process efficiency of the proposed treatment method. Conclusions and recommendations are presented in Section 7.0. Complete run data and ancillary documentation from the pilot study are presented in the appendices.

2.0 Pilot Study Protocol

The primary objective of the pilot study was to verify the Trident process was capable of meeting water quality standards at loading rates of up to 10 gpm/sqft through the upflow Mixed Media Adsorption Clarifier® (AC) and 5 gpm/sqft through the Mixed Media Filter (MMF). The following objectives/goals were outlined for the study:

- MMF effluent turbidity ≤0.10 NTU (95% of samples) & <0.30 NTU (100% of samples).
- MMF effluent iron ≤0.30 mg/L.
- MMF effluent manganese ≤0.050 mg/L.
- MMF effluent aluminum ≤0.15 mg/L.
- MMF effluent color ≤10 cu.
- Particle count log reduction ≥2.0 (2-200 µm range).
- Total organic carbon (TOC) reduction >35%.
- Evaluate loading rates up to 10 and 5 gpm/sqft through the AC and MMF respectively .
- Determine efficiency and net production of the process.
- Determine optimum water treatment chemicals and dosage levels to meet quality goals.

Pilot performance was tracked via automatic logging instrumentation and on-site water quality analysis. On-site tests were conducted via titrations and the Hach DR1900 Spectrophotometer. On-site tests conducted for iron, manganese, color, aluminum, and alkalinity used certified methods in compliance with United States Environmental Protection Agency (USEPA) standard for water and wastewater analysis. A summary of on-site data collection is shown in Table 1.

Table 1 | On-Site Data Collection Method Summary

Sample Method	Parameter	Location	Frequency	Hach Method
Auto	Flow Rate	Raw, Post Det., MMF Eff.	10 minutes	N/A
Auto	Differential Pressure	AC, MMF	10 minutes	N/A
Auto	Turbidity	Raw, Post Det., AC Eff., MMF Eff.	10 minutes	N/A
Auto	Particle Counts	Raw, MMF Eff.	10 minutes	N/A
Auto	pH	Raw, Coagulated, MMF Eff.	10 minutes	N/A
Auto	Temperature	Raw	10 minutes	N/A
Grab	Iron	Raw, AC Eff., MMF Eff.	≥2x/run	8008
Grab	Manganese	Raw, AC Eff., MMF Eff.	≥2x/run	8149
Grab	Color	Raw, AC Eff., MMF Eff.	≥2x/run	8025
Grab	UV254%T	Raw, AC Eff., MMF Eff.	≥2x/run	N/A
Grab	Aluminum	Raw, MMF Eff.	≥2x/run	8012
Grab	Alkalinity	Raw, MMF Eff.	≥2x/run	8203

Along with these standard tests, numerous samples for various analytes were pulled from runs and analyzed by an independent analytical laboratory. The results of these samples can be found in their entirety in Appendix B.

3.0 Treatment Process & Pilot Set-Up Description

The pilot study was conducted using the HS2 Pilot Plant, which has the capability to simulate the Trident and Trident HS treatment processes. This includes a tube settler, upflow MMAC, MMF, tube blowdown, AC flush, and MMF backwash capabilities, along with multiple chemical feed points, in order to provide effective turbidity, particle count, TOC, and metal removal. The plant is also equipped with multiple sample ports for both continuous and grab sampling for on-site water quality analysis. Figure 2 illustrates the complete pilot plant treatment capabilities with general flow and hydraulic loading rates.

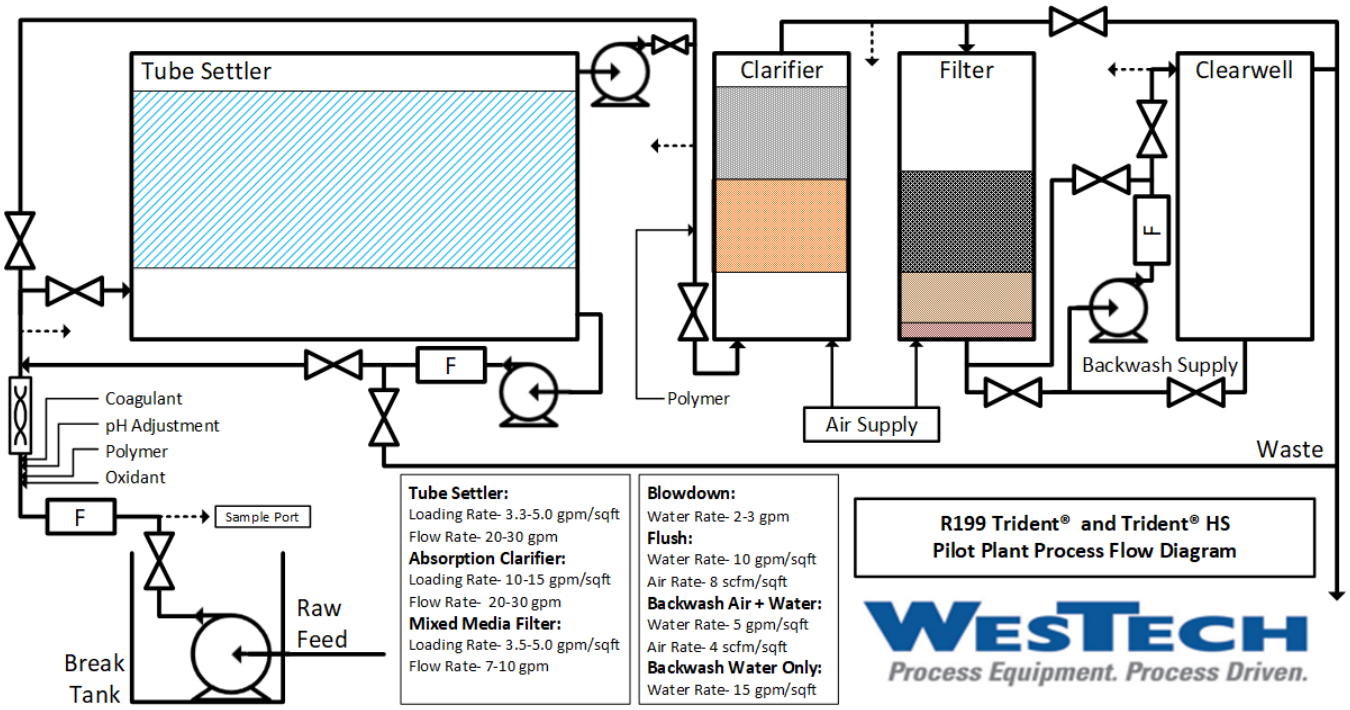

Figure 2 | Generic HS2 Process Flow Diagram

For the purposes of this pilot study, the HS2 Pilot Plant was equipped with the following:

- Feed tank and supply pump
- Tube Clarifier (Operated as detention tank with and without tubes installed)
- Upflow Mixed Media Adsorption Clarifier
- Mixed Media Filter
- MMF feed/backwash pump
- 300-gallon clearwell
- Two Siemens Mag5000 flow meters
- One level transmitter and one differential pressure transmitter
- Three Swan Monitor AMI Turbiwell w/LED turbidimeters
- Two ChemTrac PC-3400 particle counters
- Chemical makeup system and feed pumps
- On-line automatic data collection system
- On-site water quality testing capabilities

The Trident® system can be broken down into three processes. The first process is the addition of chemicals (Primary coagulant and oxidant) to the influent line. Proper chemical dosage results in rapid colloid destabilization. Additionally, a polymer is injected to aid in the removal process. This solution is then pumped directly to the AC, the second process. The AC utilizes a mixed packed bed of NSF® approved buoyant and compressible media. This media configuration combines the functions of additional mixing, contact flocculation, and solids removal. The AC "polishes" and conditions any remaining solids prior to the stream entering the MMF.

The effluent from the AC enters the third process of the system, filtration. The configuration of the MMF used during this pilot study consisted of 3 inches of fine garnet, 9 inches of 0.35-0.45 mm silica sand, and 6 inches of 1.0-1.1 mm anthracite. Finished water is collected through an underdrain at the bottom of the MMF. This finished water is then pumped into the clearwell for use in a MMF backwash.

For this pilot, one additional treatment step was added prior to the AC. This step was added using the tube clarifier section, normally used in the Trident HS application. This was utilized as a detention tank prior to the AC, but without settling tubes installed. The primary coagulant and oxidant were added prior to the detention tank (DT) which provided about 10 minutes of detention. Water was repumped after the DT to the AC where the polymer aid was injected, and the standard Trident process described above began. Figure 3 shows the overall flow diagram of the pilot study. The following sample points are labeled on Figure 3: A- True Raw, B- Post-Aeration, C- Coagulated, D- Post-Detention, E- Clarifier Effluent, F- MMF Effluent.

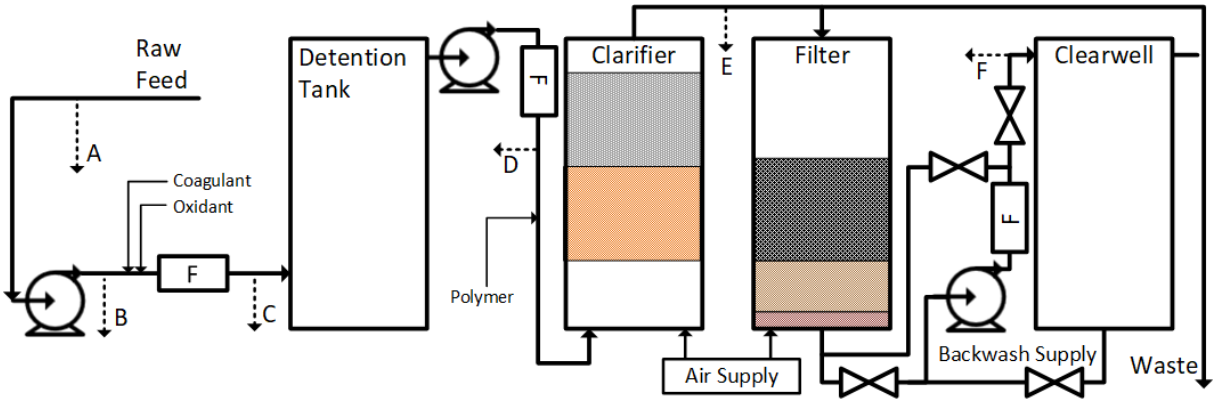

Figure 3 | Willsboro, NY Trident Pilot Study Process Flow Diagram

The Trident HS Demonstration Plant runs at a constant but adjustable flow rate. Automatic flow control devices ensure constant but adjustable flow throughout the run. For this study, the primary loading rates tested were 10.0 gpm/sqft (20 GPM) through the AC and 5.0 gpm/sqft (10 GPM) through the MMF. Because of scale considerations, the AC is larger than needed for flow to the MMF. The excess AC effluent is split off to waste and the other 10 gpm is passed through the MMF. The AC and MMF are each equipped with a pressure transmitter and recording device to monitor headloss development.

Cleaning of the AC is accomplished in a multiple step process as follows: The influent feed water to the AC is shut off along with the flow to the MMF. The clarifier media is then fluidized by injecting air at 8.0 scfm/sqft into the bottom of the AC chamber. After 1 minute, when the media is totally fluidized, the influent flow is restarted at 10 gpm/sqft. The influent water flushes solids upward and out through a waste trough. The air and water flush step averaged 8 minutes during the study period. The air and water are then shut off, and the bed is allowed to settle for 1 minute. After the 1 minute settling time, the water only flush is started at 10 gpm/sqft and is sent to waste for 5 minutes. Upon completion of the flush cycle, the flow from the AC is diverted from waste back to the MMF. The flush cycle can be initiated by any of three means: By manual initiation with push-button, by terminal headloss development, or by a timer. Additionally, all flush step timers can be operator adjusted based upon site specific conditions.

For a MMF backwash, the feed flow is stopped and the MMF is drained down until the water level is a few inches above the media surface. Air and water are introduced to the MMF for a combined air and water backwash until the water level reaches the trough, approximately 3 minutes. The air flow rate for this step is 4.0 scfm/sqft and the water flow rate is 5.0 gpm/sqft. The air is then shut off while a water only wash takes place for additional 8 minutes at 15 gpm/sqft. At the end of the backwash sequence, the MMF is put back into filtration mode and effluent turbidity monitored. The backwash cycle can be initiated manually, by terminal headloss development, or by a timer. Additionally, all backwash step timers can be operator adjusted based upon site specific conditions. The times listed above were optimized for this site over the course of the study.

Table 2 | MMF Column Set-Up and Loading Rates

Section	MMF Media	Media Depth [in]	Cross Sect. Area [sqft]	Flow Rate [gpm]	Loading Rate [gpm/sqft]
Detention Tank	None	-	6.0	20	3.33
Adsorption Clarifier	24” Compressible Media 24” 50/50 Buoyant Media	48	2.0	20	10.0
MMF	3” 0.25-0.35 Garnet 9” 0.35-0.45 Silica Sand 18” 1.0-1.1 Anthracite	30	2.0	10	5.0

4.0 Raw Water Characteristics

The pilot plant was fed with raw water from the full scale plant intake wet well which operates in equilibrium with Lake Champlain. This raw water source was utilized through the entire study and remained relatively stable. Raw samples were collected prior to chemical addition and water quality was analyzed on-site by WesTech Engineering. Table 3 summarizes the raw water characteristics analyzed during the pilot study. Values were determined by averaging over all runs.

Table 3 | Raw Water Characteristics

Water Quality Parameter	Raw Feed	Unit
Turbidity	0.29 ± 0.03	NTU
Particle Counts	1200 ± 300	cts/mL (2-200 µm)
Iron	0.02 ± 0.01	mg/L
Manganese	0.01 ± 0.01	mg/L
Aluminum	0.02 ± 0.02	mg/L
Color	10 ± 9	c.u.
UV%T	83 ± 1	%T
TOC	3.4 ± 0.4	mg/L
Alkalinity (HCO_3)	50 ± 10	mg/L $CaCO_3$
Hardness (Total)	70 ± 10	mg/L $CaCO_3$
pH	8.0 ± 0.1	units
Temperature	3.0 ± 0.9	Celsius

5.0 Data Summary and Discussion

The pilot study was conducted in two phases: optimization and performance. During the optimization phase chemical dosage rates were adjusted multiple times within MMF runs to determine optimal treatment ranges. Initial chemicals and dosages were determined based on historical operation of the current water treatment plant. During this phase the chemicals that failed to meet performance standards were removed from the testing plan for performance runs. The following conclusions were made as a result of testing performed during the optimization phase:

- The primary coagulants tested, PCH180, PCH182, and Alum were capable of meeting all turbidity and effluent water quality goals.
- It was determined that approximately 10 minutes of detention was required after coagulant and oxidant dose to achieve satisfactory AC solids capturing and effluent turbidity.
- The primary coagulants PCH 180 and 182 resulted in higher effluent UV%T and lower turbidity values in the MMF effluent than Alum.
- The primary coagulant Alum resulted in longer AC run times with similar turbidities than PCH180 and 182.
- The primary coagulant PCH182 was selected as the optimal coagulant due to UV%T, turbidity removal and slightly longer AC run times than PCH180.
- A primary coagulant dose of 20-25 mg/L was determined to be optimal in meeting the treatment goals.
- A potassium permanganate dose of ~0.30 mg/L was utilized to enhance treatment.

- A cationic polymer (VC201) dose of ~0.25 mg/L was required to achieve stable AC effluent turbidities throughout a run cycle with the optimized coagulant dose.

The performance phase includes all runs that were focused on observing the performance of specific treatment schemes. The runs for this study are grouped into weeks. The same loading rate of 10.0 and 5.0 gpm/sqft for the AC and MMF respectively were used for the entire study except for Run 9 where loading rates of 6.0 and 3.0 gpm/sqft were used respectively. During Run 11 turbidity spiking up to 5 NTU was performed for portions of the run. A summary of all runs and the chemical treatment schemes used is shown in Table 4. Chemical Safety Data Sheets (SDS) and chemical supplier information can be found in Appendix C.

Table 4 | Chemical Treatment Summary

Run #	MMF Loading Rate [gpm/sqft]	Coagulant	Dose [mg/L]	KMnO4 Dose [mg/L]	VC201 Dose [mg/L]	PAC Dose [mg/L]
1	5.0	PCH182	20	0.30	0.25	-
2	5.0	PCH182	25	0.30	0.25	-
3	5.0	PCH182	25	0.30	0.15	-
4	5.0	Alum	15	0.30	0.30	-
5	5.0	PCH182	25	0.30	0.25	-
6	5.0	PCH182	25	0.30	0.25	-
7	5.0	PCH182	25	0.30	0.25	10.0
8	5.0	PCH182	25	0.30	0.25	5.0
9	3.0	PCH182	25	0.30	0.25	-
10	5.0	PCH182	25	0.30	0.25	-
11*	5.0	PCH182	25	0.30	0.25	-
12	5.0	PCH182	25	-	0.25	-
13	5.0	Alum	15	-	0.25	10.0

-PCH182: Polyaluminum Chloride
-Alum: Aluminum Sulfate
-$KMnO_4$: Potassium Permanganate
-VK201: Viking Technologies, Inc. Cationic MMF Aid Polymer
-PAC: Powder Activated Carbon
*Turbidity Spiking

Chemical dosage rates were calculated using the following equation

$$Dose\ \left[\frac{mg}{L}\right] = \frac{[C]\frac{g}{L} * S.G. * 1000\frac{mg}{g} * Q_c\ \frac{mL}{min}}{Q\ gpm * 3785\ \frac{mL}{gal}}$$

where [C] is the stock concentration of chemical, S.G. is the specific gravity of the stock chemical, Q_c is the chemical feed rate, and Q is the water feed flow rate.

5.1 Turbidity Removal

Turbidities were continuously monitored at four locations (influent, post-detention, AC effluent, and MMF effluent) using Swan Turbiwell on-line turbidimeters verified using Swan recommended verification methods. The raw turbidities averaged 0.29 NTU during normal conditions throughout the testing period. Through normal turbidity conditions at stable, optimized operation, the Trident treatment process met the turbidity protocol goals of ≤0.10 NTU for 95% of the samples. Table 5 summarizes the average and percentile turbidities for the AC and MMF effluent samples.

Table 5 | Turbidity Removal

Run	Raw [NTU]	AC Eff. [NTU]		MMF Eff. [NTU]	
#	Average	Average	95% Below	Average	95% Below
1	0.32	0.22	0.29	0.045	0.051
2	0.31	0.12	0.15	0.043	0.048
3	0.26	0.15	0.21	0.042	0.046
4	0.27	0.35	0.47	0.052	0.068
5	0.29	0.26	0.47	0.042	0.047
6	0.28	0.13	0.21	0.042	0.047
7	0.26	0.16	0.19	0.041	0.045
8	0.27	0.13	0.17	0.041	0.045
9	0.27	0.13	0.27	0.041	0.044
10	0.27	0.29	0.42	0.041	0.046
11	1.52	0.12	0.18	0.040	0.046
12	0.29	0.11	0.19	0.043	0.046
13	0.30	0.25	0.42	0.048	0.057

The PCH182 coagulant was very effective in meeting effluent turbidity goals. Little to no adjustments were needed for the coagulant dose as conditions varied in the raw water. The treatment schemes tested did not lead to any significant turbidity breakthrough as the MMF approached terminal headloss. With an appropriate cationic polymer dose there was also little to no breakthrough of solids in the AC throughout its cycle. It was observed that if breakthrough did occur in the AC prematurely, MMF run times were significantly reduced due to the extra solids loading. This was observed during the optimization phase where high AC effluent turbidities caused an increase in the MMF headloss development rate. The Alum coagulant met the turbidity goals, but was not as effective as PCH182. Figures 4-6 show the turbidity profile for runs during High Rate Operation (Run 2), Low Rate Operation (Run 9), and PAC Operation (Run 8) respectively. These runs were characteristic of all runs throughout the study in terms of turbidity removal. The large spikes in AC and MMF effluent turbidity seen in the graphs is not due to contaminate breakthrough. Rather these values are recording during the flush when no water is flowing through the turbidimeter and is simply a product of the functions of the instrument.

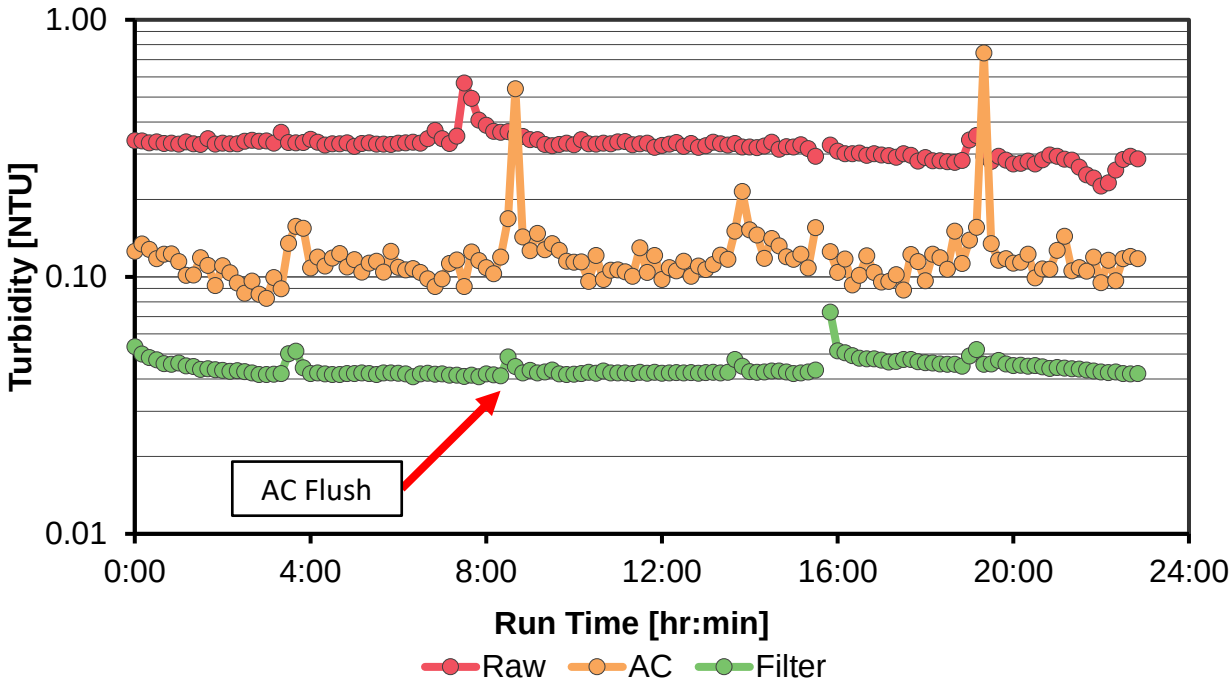

Figure 4 | Characteristic High Rate Turbidity Profile (Run 2)

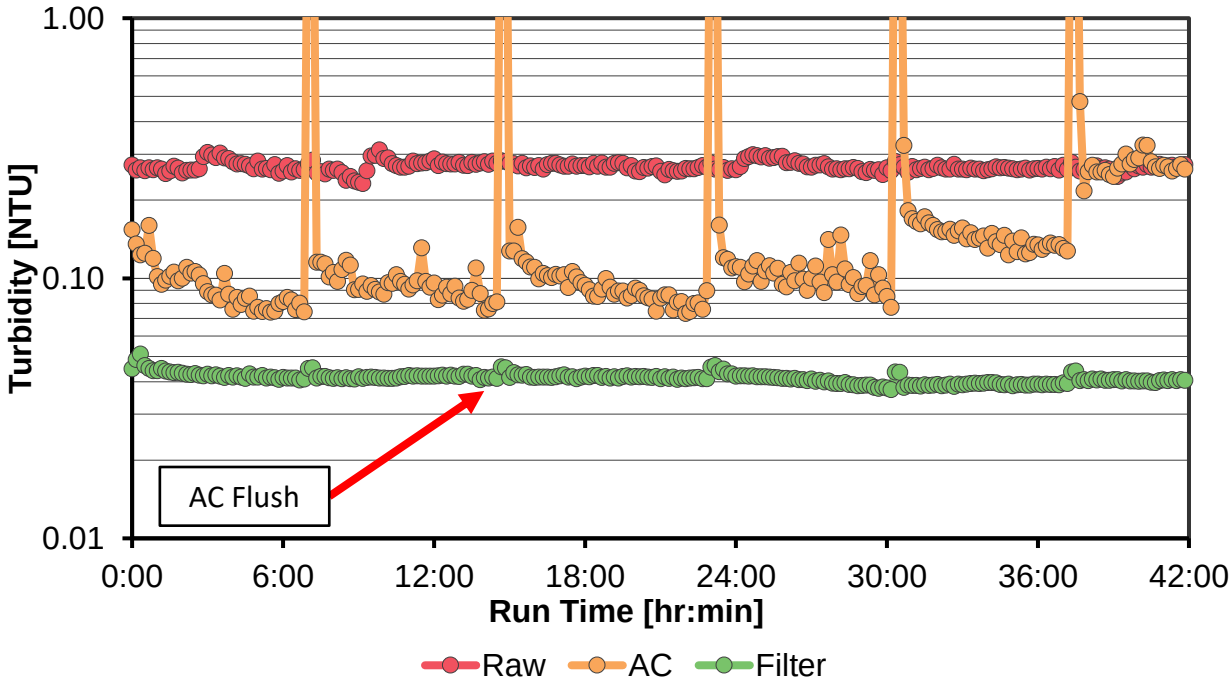

Figure 5 | Characteristic Low Rate Turbidity Profile (Run 9)

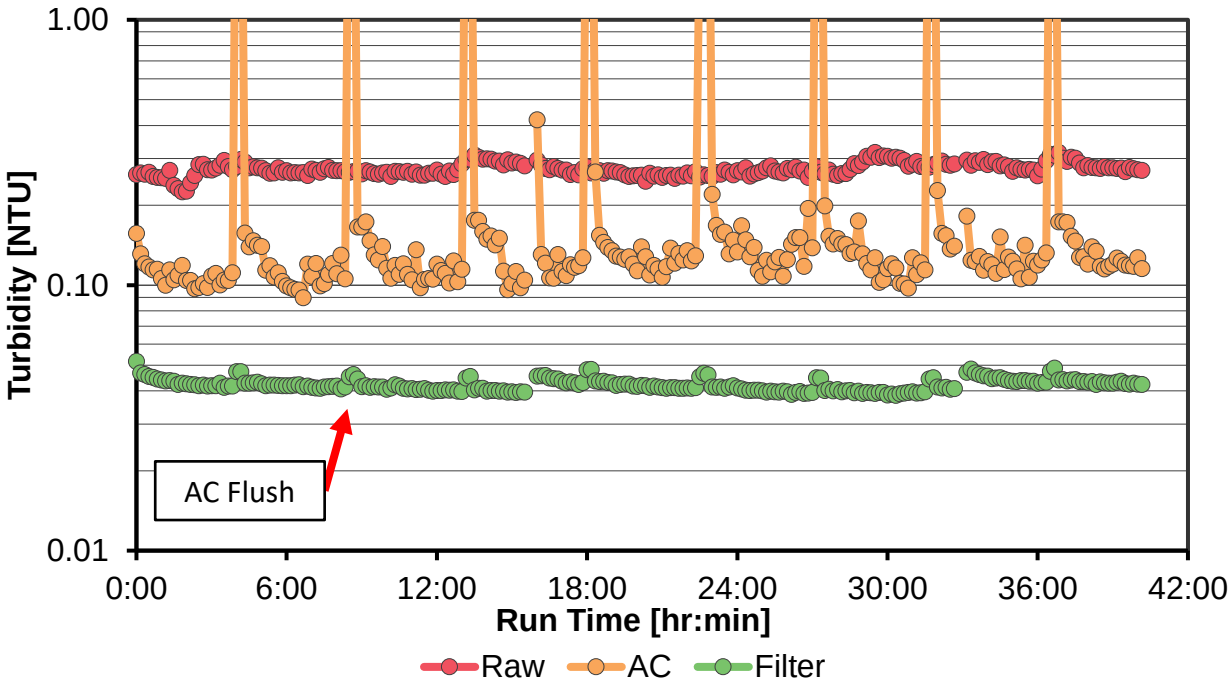

Figure 6 | Characteristic PAC Turbidity Profile (Run 8)

5.2 Particle Count Removal

Particle counts were continuously monitored at two locations (influent and MMF effluent) using ChemTrac PC-3400 on-line particle counters. The raw particle counts averaged 1200 cts/mL during normal conditions throughout the testing period. Table 6 summarizes the particle counts removal data of the system.

Table 6 | Particle Count Removal

Run #	Raw Particle Count Avg. [cts/mL]	MMF Effluent Particle Count 2-200 µm Avg. [cts/mL]	Log Rem. Avg.	Log Rem. 95% Below
1	1360	36	1.5	1.5
2	1220	16	1.8	1.7
3	1170	25	1.6	1.6
4	1070	21	1.7	1.6
5	1300	10	2.1	1.7
6	1120	10	2.1	1.8
7	1280	6	2.3	2.2
8	1180	5	2.3	2.2
9	1100	2	2.8	2.5
10	1050	4	2.4	2.2
11	8950	3	2.9	2.2
12	1010	4	2.4	2.2
13	510	4	2.0	1.9

Through normal conditions at stable, optimized operation, the Trident treatment process met the particle count protocol goals of a log reduction >2.0. Initially the treatment scheme did not meet the goal, but this can be attributed to new MMF media and is normal to see as the pilot study starts up. Figures 7-9 show the particle count profile for runs during High Rate Operation (Run 2), Low Rate Operation (Run 9), and PAC Operation (Run 8) respectively. These runs were characteristic of all runs throughout the study in terms of particle count removal.

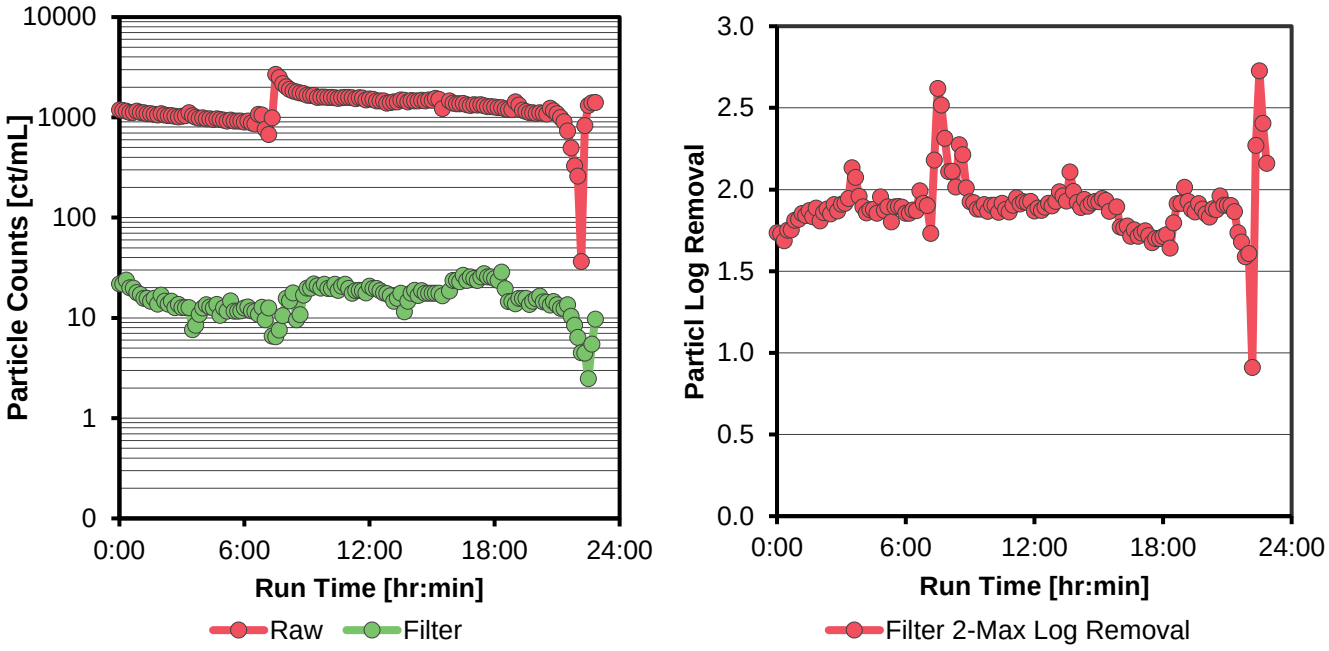

Figure 7 | Characteristic High Rate Particle Count Profiles (Run 2)

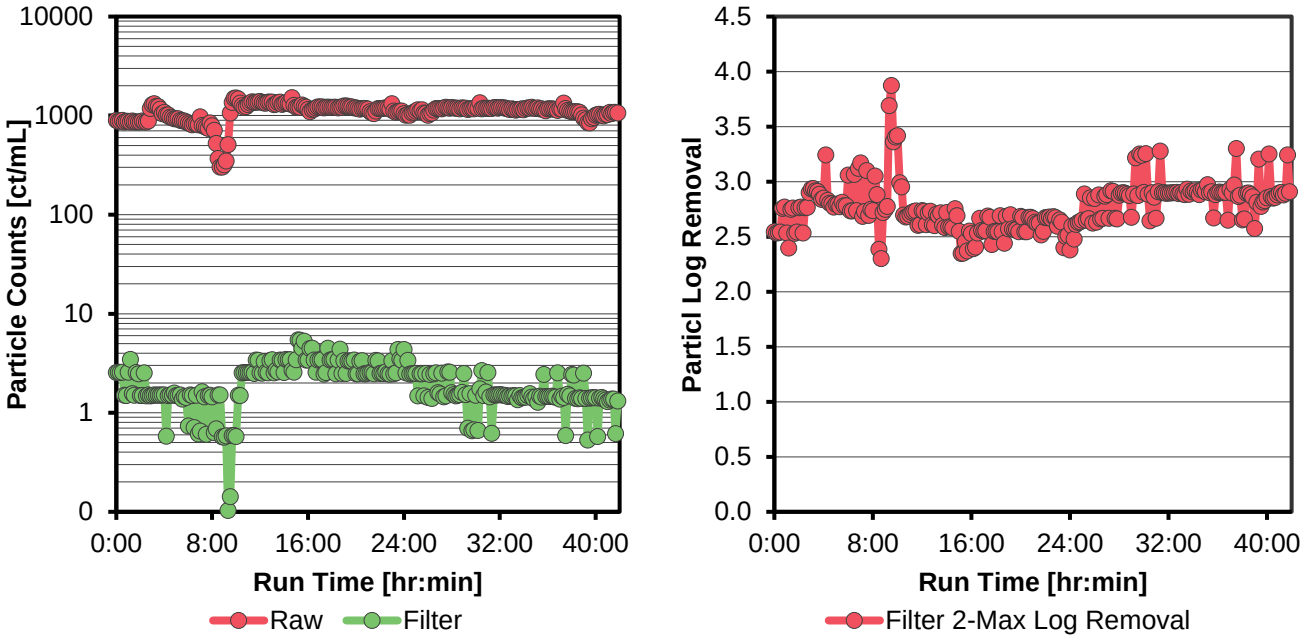

Figure 8 | Characteristic Low Rate Particle Count Profiles (Run 9)

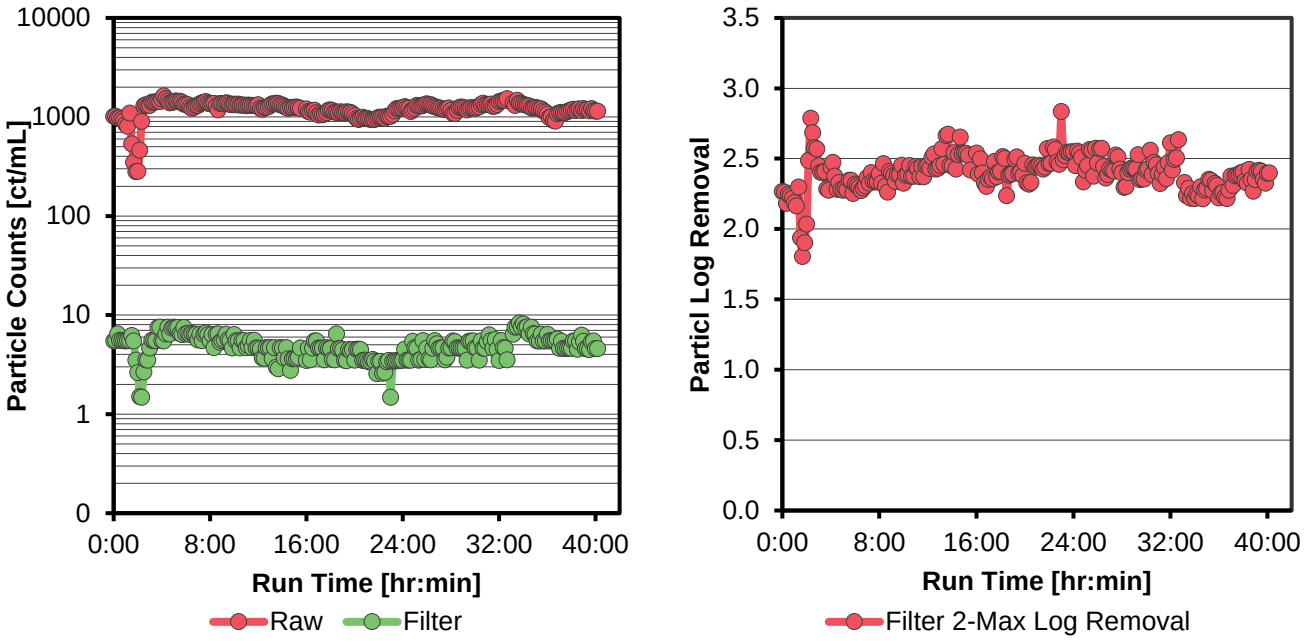

Figure 9 | Characteristic PAC Particle Count Profiles (Run 8)

5.3 Color, UV%T, and TOC Removal

The raw color averaged 10 cu during normal conditions throughout the testing period. Through normal conditions at stable, optimized operation, the Trident treatment process met the color protocol goals of <10 cu.

USEPA's Stage 1 Disinfection By-Products (DBP) Rule requires surface water treatment systems to reduce TOC in order to minimize the formation of DBP. The required reduction is determined by the source water TOC and alkalinity levels and was achieved by coagulation. Based upon the raw TOC and raw alkalinity averages found in Table 3, Table 7 shows 35% TOC removal is required.

Table 7 | Required TOC Removal Percentage Matrix

Source TOC [mg/L]	**Source Alkalinity [mg/L as $CaCO_3$]**		
	0-60	**60-120**	**>120**
2.0-4.0	**35%**	25%	15%
4.0-8.0	45%	35%	25%
>8.0	50%	40%	30%

In the field, UV transmission (UV%T) was used as a surrogate for TOC testing. Throughout the study MMF effluent UV%T were relatively stable at 92% transmittance.

Table 8 | Color, UV%T, and TOC Removal

Run #	MMF Effluent Quality				
	Color [cu]	UV%T [%T]	Absorbance [1/cm]	TOC [mg/L]	% Rem
1	2.0	90.4	0.044	<0.5	>86.5%
2	2.0	91.7	0.038	2.8	26.3%
3	1.5	91.8	0.037	2.8	26.3%
4	6.5	90.0	0.046	3.0	21.1%
5	2.0	91.7	0.038	2.7	28.9%
6	3.0	92.1	0.036	2.7	28.9%
7[A]	1.0	92.5	0.034	-	-
8[B]	2.1	92.3	0.035	1.9 1.9	35.6%
9	1.7	91.8	0.037	2.0	31.0%
10	1.7	91.4	0.039	2.0	29.8%
11	1.0	91.4	0.039	2.0	35.5%
12[A]	3.0	91.5	0.039	-	-
13[A]	6.0	93.1	0.031	-	-

A- Independent samples not available for Runs 7, 12, or 13
B- Two samples collected during Run 8

With the base chemical treatment scheme of PCH182 as a coagulant, the 35% TOC removal goal was not met. However, during PAC addition and turbidity spiking runs, the goal was met. There was also improved performance at the lower loading rate. During the pilot study, TOC results did not have a quick enough turn around time to fine tune the treatment scheme for maximum removal. The runs that met the goal indicate that with fine tuning of the scheme, the removal goal can be met with the full scale plant. In addition to TOC sampling, tests were run for DBP Formation Potential (DBPFP) to estimate the DBP's that may develop in the system. However, due to lab issues the results are unavailable. Samples have since been collected from the existing water treatment plant for DBPFP analysis to estimate the performance of the new system. The results will be included within the final report.

5.4 Metal Removal

Iron levels in the raw water averaged 0.01 mg/L, well below the SMCL of 0.30 mg/L. Through normal conditions at stable, optimized operation, the Trident treatment process met the iron protocol goals of <0.30 mg/L and never exceeded 0.02 mg/L. Manganese levels in the raw water averaged 0.01 mg/L, well below the SMCL of 0.050 mg/L. Through normal conditions at stable, optimized operation, the Trident treatment process met the manganese protocol goals of <0.050 mg/L.

The raw water contained little to no aluminum meaning the primary source of aluminum came from the coagulants used. Through normal conditions at stable, optimized operation, the Trident treatment process met the aluminum protocol goals of <0.15 mg/L. Table 9 summarizes the iron, manganese, aluminum, and removal percentages of MMF effluent samples.

Table 9 | Metals Removal

Run #	Eff. Iron [mg/L]	Eff. Manganese [mg/L]	Eff. Aluminum [mg/L]
1	0.02	0.01	0.03
2	0.01	0.01	0.03
3	0.01	0.01	0.03
4	0.01	0.01	0.02
5	0.01	0.02	0.03
6	0.01	0.02	0.04
7	0.01	0.01	0.02
8	0.01	0.01	0.03
9	0.01	0.01	0.04
10	0.01	0.01	0.03
11	0.01	0.01	0.04
12	0.01	0.01	0.04
13	0.01	0.01	0.03

5.5 Turbidity Spiking Testing

During Run 11, artificial turbidity spiking was performed to asses the process performance under abnormal conditions. Twice during the run, solids collected from around Lake Champlain were dosed to feed tank to simulate a natural turbidity spike. The spiking resulted in turbidies of ~5 NTU which is consistent with historical data from the current treatment plant. Figure 10 below shows the turbidity profile for Run 11. As shown in the graph, the increase in raw turbidity had no impact on MMF effluent turbidity demonstrating that the Trident process would handle these adverse events. Additionally, TOC samples were collected during the spiking event and the process achieved a >35% reduction further indicating the success of treatment.

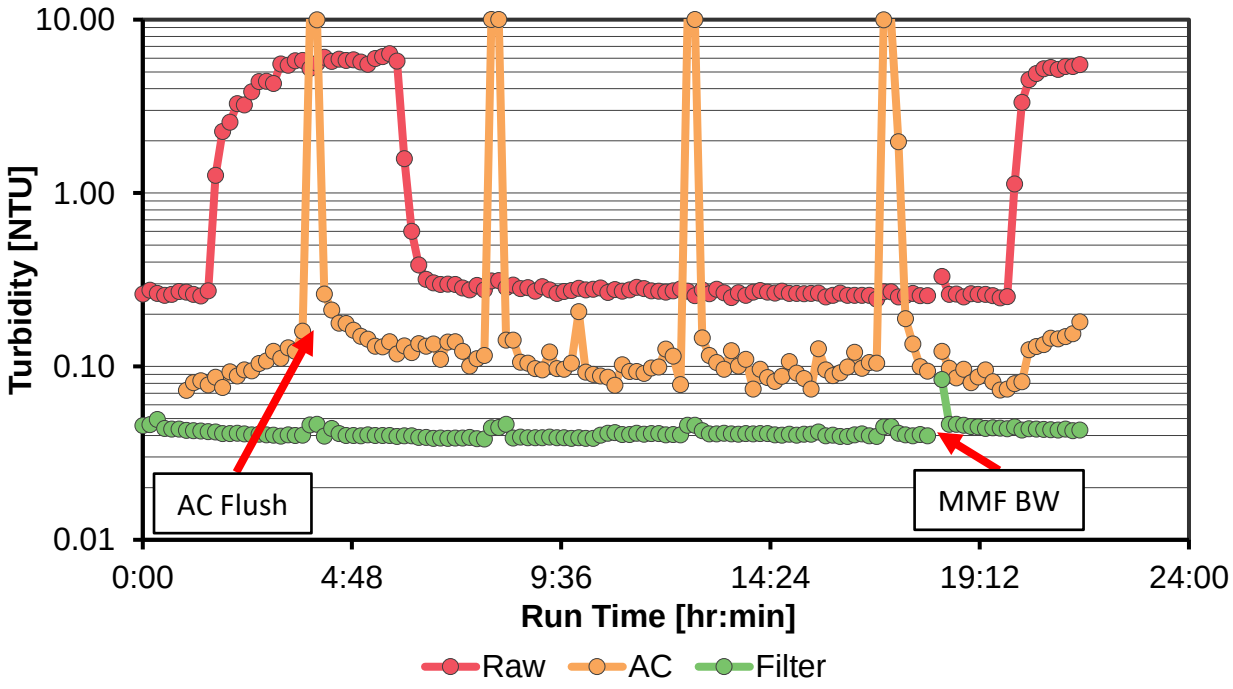

Figure 10 | Turbidity Spiking Turbidity Profile (Run 11)

6.0 Process Efficiency

Hydraulic performance of the Trident treatment system is qualified by the following criteria:

- Mixed Media Adsorption Clarifier- Run length in hours to terminal pressure, pre-determined time interval or contaminant breakthrough.
- Mixed Media Filter- Run length in hours to terminal pressure, pre-determined time interval or contaminant breakthrough.

The Waste Net Production, expressed as a percentage, is calculated based upon generated waste volume compared to the total volume of treated water using the following equation

$$Waste\ NP\ \% = \frac{V_T - V_{BW} - V_F}{V_T} * 100\%$$

where V_T is the total volume of treated water, V_{BW} is the total volume of waste generated during backwashes, and V_F is the total volume of waste generated during flushes. The Availability Net Production, expressed as a percentage, is calculated based upon the total volume of treated water compared to the theoretical maximum potential of water to be treated in the MMF run time using the following equation

$$Avail.NP\ \% = \frac{V_G - V_T}{V_G} * 100\%$$

Where V_G is the gross volume or maximum potential amount of treated water. For this study, these calculations were made assuming one MMF backwash per run and were normalized for the required process loading rates. During the first week the backwash and flush rates and times were optimized and remained unchanged for the rest of the study.

The following rates and times were used for calculating waste generated during flushes and backwashes:

- Flush- Fluidization: 1 minute at 0 gpm/sqft
- Flush- Air and Water: 8 minutes at 10 gpm/sqft
- Flush- Bed Settle: 1 minute at 0 gpm/sqft
- Flush- Flush to Waste: 5 minutes at 10 gpm/sqft
- Backwash- Air and Water: 2.5 minutes at 5 gpm/sqft
- Backwash- Water Only: 8 minutes at 15 gpm/sqft
- Backwash- Filter to Waste: 10 minutes at 5 gpm/sqft (3 gpm/sqft for lower rate runs)

6.1 AC Performance and Run Length

The AC was operated primarily at a clarification rate of 10.0 gpm/sqft. The AC was automatically flushed at 60 inches (water) of dynamic pressure or based on accumulated run time (operator adjusted). AC run lengths varied based on the coagulant and loading rate. In general, the AC was flushed multiple times between MMF backwashes due to the majority of solids removal that occurs in the AC.

- High Rate Operation: 4.0-4.5 hours
- Low Rate Operation: 7.0 hours
- PAC Operation: 4.0 hours

A composite sample of the flush waste was taken during Run 6. The total suspended solids measured for this sample was 164 mg/L.

6.2 MMF Performance and Run Length

The MMF was operated primarily at a filtration rate of 5.0 gpm/sqft. Run termination was defined by 8 feet (water) total headloss or run time (operator defined). For most runs, operation was terminated after the MMFreached terminal headloss. MMF run lengths were primarily dependent on AC effluent quality and loading rate.

- High Rate Operation: 13.0-18.0 hours
- Low Rate Operation: 46.5 hours
- PAC Operation: 16.0 hours

A composite sample of the backwash waste was taken during Run 6. The total suspended solids measured for this sample was 76.3 mg/L. Appendix E contains a summary of waste characteristic information compiled from numerous past Trident pilot studies which lead to a better understanding of waste handling and expectations. Figures 11-13 illustrate typical AC and MMF hydraulic performance profiles for High Rate Operation, Low Rate Operation, and PAC Operation respectively. Reference Appendix A for complete AC and MMF headloss data & profiles.

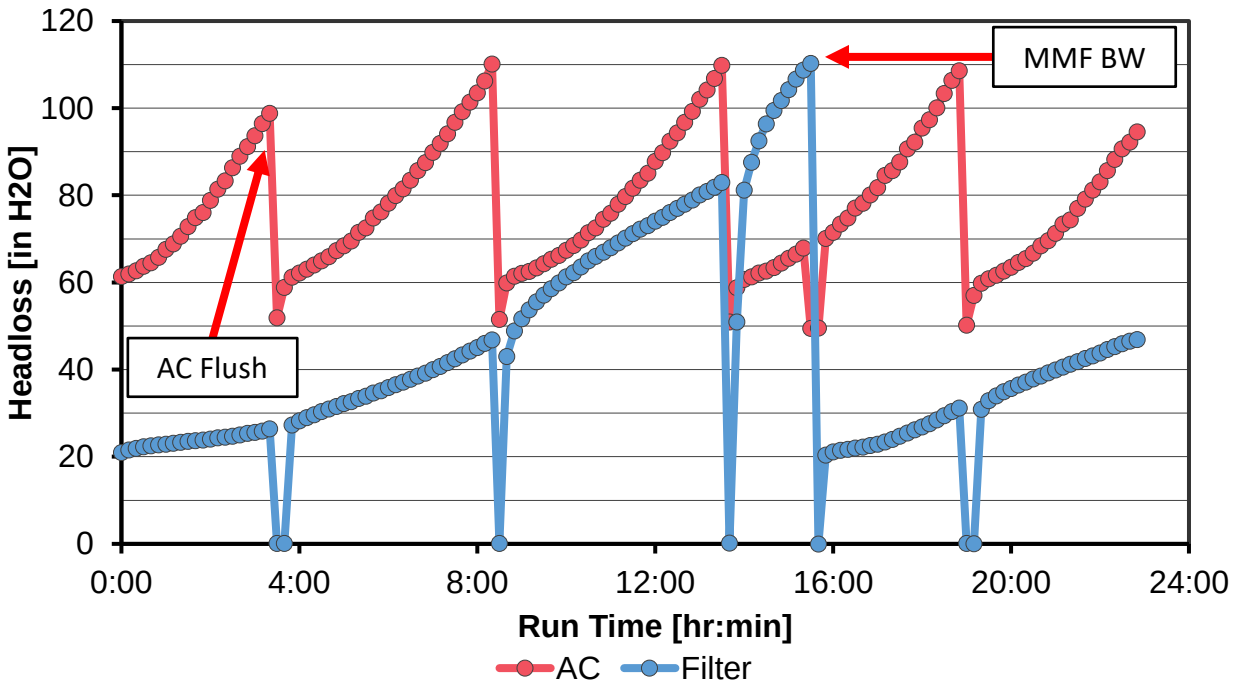

Figure 11 | Characteristic High Rate Headloss Development Profile (Run 2)

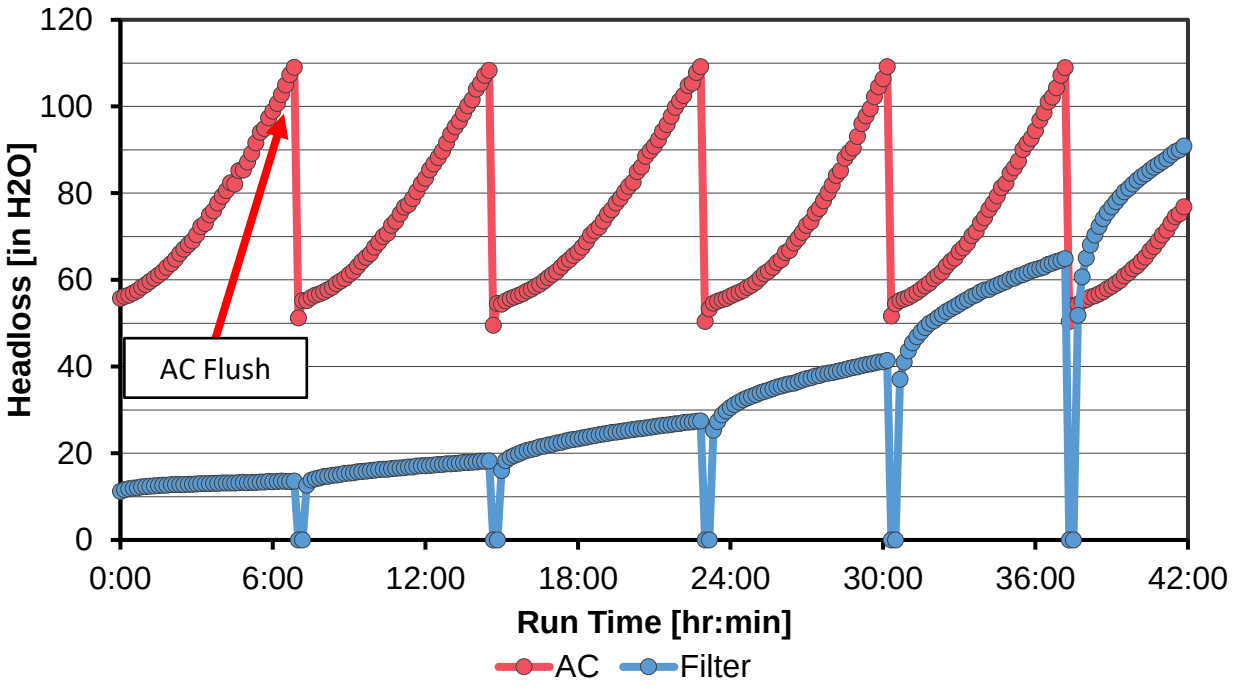

Figure 12 | Characteristic Low Rate Headloss Development Profile (Run 9)

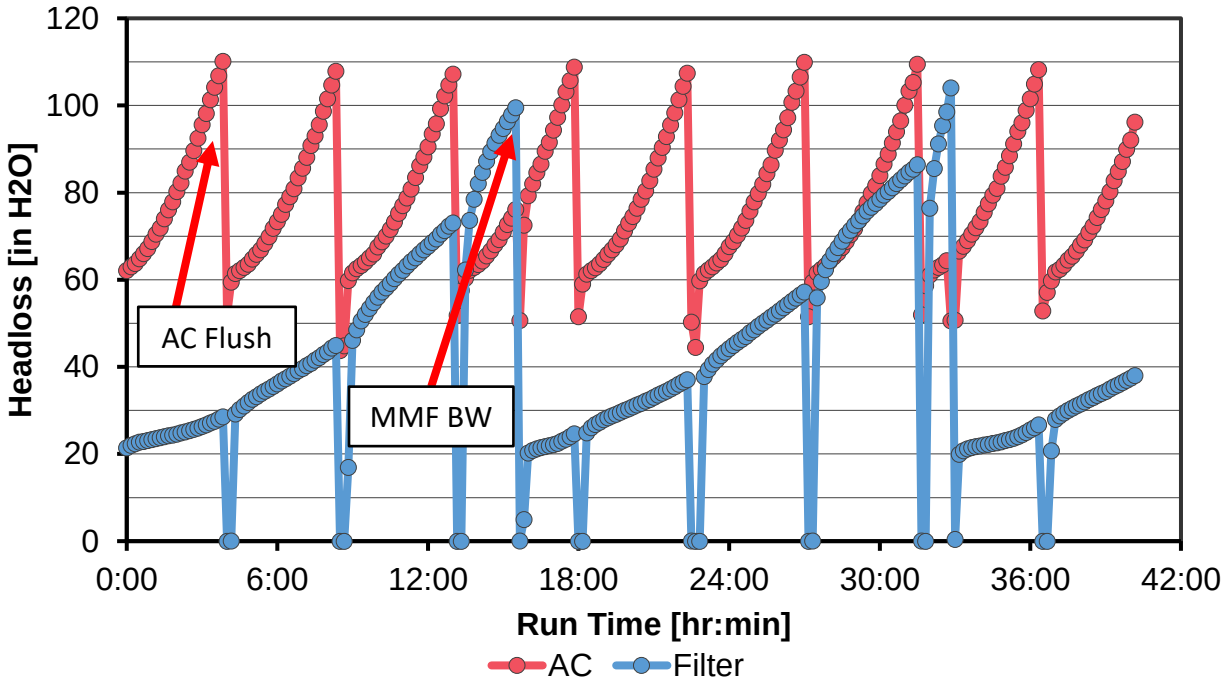

Figure 13 | Characteristic PAC Headloss Development Profile (Run 8)

6.3 Net Production

The net production calculations are the primary indicator for process efficiency. It is important to note that in the Trident process the AC flush uses raw water and not finished water from the clearwell. Unit MMF Run Volume (UFRV) is the normalized net volume of water produced during a MMF run where a

value of ~5000 gal/sqft or more signifies optimal performance. During the pilot, a goal of maximum TOC removal dictated a higher coagulant dose than what was required to meet turbidity goals. This additional coagulant is one of the reasons the system struggled to meet UFRV goals consistently. Table 10 displays results in terms of net yield that were achieved during the study period.

Table 10 | Run Length and Net Production

Week #	AC Run Lg. [hr]	MMF Run Lg. [hr]	UFRV [gal/sqft]	Flush Vol. [gal/sqft]	BW Vol. [gal/sqft]	Waste NP %	Avail. NP %
1	4.5	13.0	3575	380	170	90.0%	88.8%
2	4.5	15.5	4275	450	170	90.8%	89.7%
3	5.5	10.5	2900	250	170	89.9%	88.5%
4	9.0	13.0	3675	190	170	92.8%	91.5%
5	4.3	13.0	3575	400	170	89.6%	88.5%
6	4.5	15.0	4150	430	170	90.7%	89.5%
7	3.5	15.0	4075	560	170	89.0%	88.0%
8	4.0	16.0	4400	520	170	90.2%	89.1%
9	7.0	46.5	7975	870	150	92.7%	94.2%
10	4.0	18.0	4950	590	170	90.7%	89.6%
11	4.0	18.0	4950	590	170	90.7%	89.6%
12	3.5	17.5	4775	650	170	89.6%	88.7%
13	5.5	12.5	3475	300	170	90.8%	89.5%

7.0 Conclusions

The test data collected over the study period led to the following conclusions:

- The Trident system was capable of successfully treating the source water for turbidity, color, and metal removal using PCH182 as a coagulant. When operating at AC and MMF loading rates of 10.0 and 5.0 gpm/sqft respectively, the system achieved an average waste net production (ratio of waste produced to treated water produced) of ~90%.
- Optimum performance was achieved with a PCH182 dose of ~20-25 mg/L, potassium permanganate dose of ~0.30 mg/L, 10 minutes of detention time, and cationic polymer dose of 0.25 mg/L to the AC.
- MMF effluent turbidities of <0.10 NTU for >95% of samples were observed under optimal, stable operating conditions throughout the study.
- MMF effluent particle count log reductions of >2.0 were observed under optimal, stable operating conditions throughout the study.
- MMF effluent colors of <10 cu were observed under optimal, stable operating conditions throughout the study.
- MMF effluent typical iron and manganese levels of <0.01 and <0.01 mg/L respectively were observed under optimal, stable operating conditions throughout the study.
- With the addition of 5 mg/L of carbon (PAC), a TOC removal percentage of >35% was achieved. Without carbon, the TOC removal averaged ~30%.

Overall, the Trident treatment process demonstrated acceptable treatment performance for the proposed source water. The recommended chemical treatment scheme is PCH182 as a coagulant, a cationic polymer as an AC flocculant aid and potassium permanganate as an oxidant. Additional provisions for PAC dosing may be needed for enhanced TOC removal.

Appendix E \

Manufacturer Data Sheets

Willsboro

New York

Engineer
M.J. Engineering and Land Surveying

Representative
Rich Suriano
Koester Associates, Inc.
Canastota, New York
(518) 888-4413
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Table of Contents

Technical Proposal

Item A – Three (3) Trident® Package Treatment Units, Model 1½TR-210A

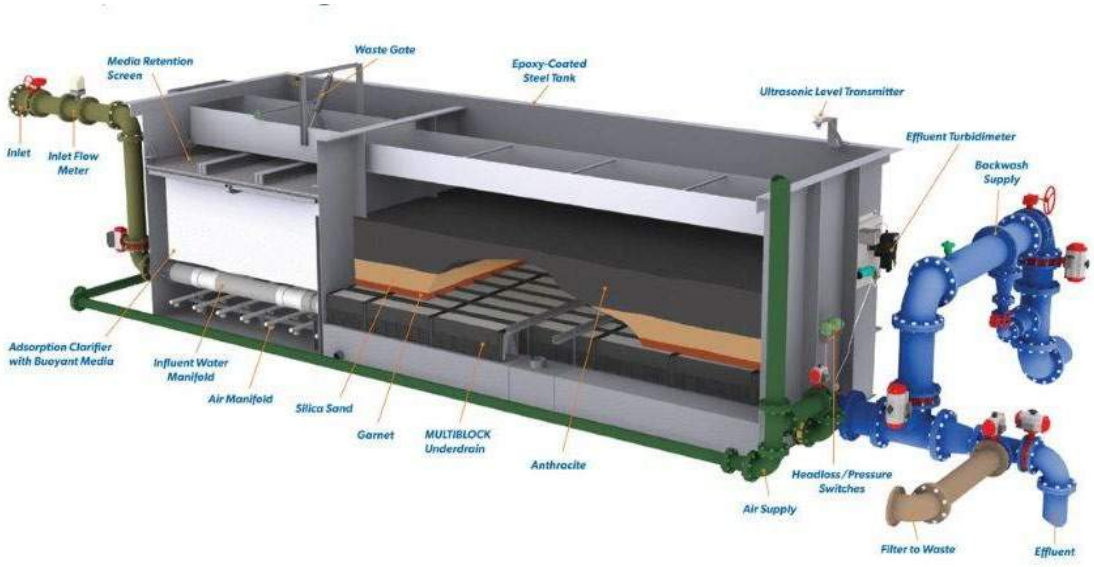
Design Criteria	
Application	Treatment for Drinking Water
Trident Design Flow	350 gpm per unit; (175 gpm minimum)
Number of Units	3; (total max flow capacity of 1050 gpm)
Adsorption Clarifier® Area	35 ft^2 per unit
Adsorption Clarifier Loading Rate	10 gpm/ft^2 (@ design flow)
Adsorption Clarifier Water Flush Rate	350 gpm
Adsorption Clarifier Air Flush Rate	140 scfm (4 $scfm/ft^2$)
Filter Area	70 ft^2 per unit
Filter Loading Rate	5 gpm/ft^2 (@ design flow)
Backwash Method	Air & Water
Low-Rate Backwash Water Loading Rate	5.0 gpm/ft^2
Low-Rate Backwash Water Flow Rate	350 gpm
High-Rate Backwash Water Loading Rate*	15 gpm/ft^2
High-Rate Backwash Water Flow Rate*	1050 gpm
Airwash Loading Rate	4 $scfm/ft^2$
Airwash Flow Rate	280 scfm
Backwash Water Source	External backwash supply
Backwash Control	High and low using three valve loop configuration

*The design high-rate backwash listed is based on a temperature of 25 °C. The actual backwash water rate must be adjusted 2% up or down for each degree Celsius difference above or below from design temperature; i.e., above 25 °C increase by 2%, below 25 °C decrease by 2%.

Features and Benefits

The Trident® is a pre-engineered system consisting of a pretreatment and filtration system contained in a single shippable tank. The internal components and ancillaries shall be shipped loose for installation by the contractor. The Trident® system combines a variety of chemical treatment solutions. The patented Adsorption Clarifier® system and Mixed Media Filter deliver excellent predictable finished water quality. The system also includes a flat plate direct retention air/water backwash underdrain system. Each system includes the Aquaritrol® PLC program for continuous effluent quality control.

- Treat water with up to 75 NTU or up to 35 color units; combined total NTU and color of 75.
- Capable of 2 log removal of Crypto and Giardia size particles.
- Proprietary design with over 700 installations.
- The clarifier reduces turbidity 75–95%, causing settling to be insignificant.
- The Trident system reduces coagulant usage 5–10% and filter aid usage as much as 60%.
- Installation costs are less than that of conventional systems.
- The footprint is up to 60% smaller than conventional plants



Trident® system depicted. May not entirely reflect unit quoted.

Tankage Scope of Supply

Item	Size
Tank Material	304 Stainless Steel
Tank Dimensions	14 ft 6 in long x 8 ft 11 in wide x 8 ft 5 in tall
Weights (per unit, approximate)	10,250 lbs. (Shipping), 70,000 lbs. (Operating)

Note

- Tank is shipped without internals. Internal components and ancillaries listed below are shipped loose for installation by others.

Tank Connections

Item	Size
Influent	6 in
Filter Effluent/Backwash Supply	8 in
Waste/Overflow	10 in
Adsorption Clarifier Air	3 in
Filter Air	4 in

Adsorption Clarifier Scope of Supply

Feature	Quantity	Notes
Adsorption Clarifier Media	140 ft^3/unit	Media depth is 4 ft. Adsorption Clarifier media is 50/50 R&S. & NSF Std. 61 approved.
Clarifier Media Retention	35 ft^2/unit	Stainless steel screen mesh under stainless steel grating
Collection Trough	1/unit	Rectangular trough (factory installed) running length of AC section with waste gate
Inlet Distribution	1 Lot/unit	PVC header-lateral pipe system with supports
Air Distribution	1 Lot/unit	PVC header-lateral pipe system with supports

Note

- Components and media are shipped loose for installation by others.

Filter Scope of Supply

Feature	Quantity	Notes
Flat plate underdrain w/media retaining nozzles	70 ft^2/unit	The underdrain system shall be of the collector chamber design, consisting of a rigidly supported stainless steel plate extending over the entire bottom of the filter area with Model 1108 MSA media retaining nozzles constructed of high strength erosion resistant ABS plastic.
Washtrough	1/unit	Rectangular trough running length of filter section (factory installed)

Note

- All required hardware is supplied by WesTech for assembly of the tank internals at the jobsite by the contractor.
- Components unless otherwise noted are shipped loose for installation by others.

Media Scope of Supply

Type	Quantity	Layer Depth	Effective Size	Uniformity Coefficient	Packaging
Anthracite	107 ft^3/unit	18 in	1.0-1.1 mm	$\leq$1.7	Bagged and palletized
Silica Sand	56 ft^3/unit	9 in	0.35-0.45 mm	$\leq$1.4	Bagged and palletized
Garnet	19 ft^3/unit	3 in	0.2-0.32 mm	$\leq$1.7	Bagged and palletized

Note

- Media quantities include sufficient volume for skimming.
- Media is shipped loose for installation by others.

Trident Control Panel Scope of Supply

Quantity	Number of Units Controlled	Operational Modes
1	3	Manual, Semi-Automatic, Automatic
Feature	**Description**	**Notes**
Housing	NEMA 12 – Coated Steel	Wall mounted
PLC	Allen Bradley CompactLogix	Included
OIT	Allen Bradley PanelView Plus 7	10-in display; graphical representation of all buttons, lights, switches, etc.
UPS	15 minutes	Power supply for the PLC and OIT only
SCADA Interface	Via Ethernet/IP	Included

Note

- Filter control panel is shipped loose for field installation by others.
- 120 V AC power to the control panel is to be provided by others.
- Field terminations within the WesTech supplied panel are to be performed by others.

Valves Scope of Supply

Item	Size	Quantity	Type	Operator Type
Influent Valve	6 in	1/unit	Butterfly	Electric - Modulating
Backwash Inlet Valve	8 in	1/unit	Butterfly	Electric - Open/Close
Backwash High-Rate Valve	8 in	1/system	Butterfly	Electric - Open/Close
Effluent	6 in	1/unit	Butterfly	Electric - Modulating
Filter to Waste	6 in	1/unit	Butterfly	Electric - Modulating
AC Air Scour	3 in	1/unit	Butterfly	Electric - Open/Close
Filter Air Scour	4 in	1/unit	Butterfly	Electric - Open/Close
Waste Gate	N/A	1/unit	Linear Cylinder	Hydraulic - Open/Close
Backwash Low-Rate Set	3 in	1/system	Butterfly	Manual - Handwheel
Backwash High-Rate Set	8 in	1/system	Butterfly	Manual - Handwheel
Influent Isolation	6 in	1/unit	Butterfly	Manual - Handwheel
AC Air Check Valve	3 in	1/unit	Check	None
Filter Air Check Valve	4 in	1/unit	Check	None

Note

- For quantity, unit is per one Trident unit, system is for all Trident units.
- All butterfly valves are **Pratt** wafer style.
- Automatic butterfly valves have electric motor actuators manufactured by **Rotork.**
- Valves are shipped loose for installation by others.
- Electrical wiring, conduit, and connection of electrical wiring to terminals within WesTech's control panels is not provided by WesTech and is to be furnished and installed by others.

Instrumentation Scope of Supply

Description	Quantity	Type	Signal	Notes
Inlet Meter	1/unit	Magnetic Flow	4–20 mA	Endress+Hauser
Filter Liquid Level Transmitter	1/unit	Radar	4–20 mA	Endress+Hauser w/ mounting bracket
Backwash Control Level Switches	2/unit	Float	On/Off	One low & one high
Clarifier Pressure Transmitter	1/unit	Transmitter assembly with digital display	4-20 mA	Rosemount
Filter Pressure Transmitter	1/unit	Transmitter assembly with digital display	4-20 mA	Rosemount
Air Scour Blower Pressure Switch	1/system	2 ½ in, 0–5 psi	Discrete	Ashcroft
Effluent Turbidimeter	1/unit	TU5300 sc	To SC4500	HACH with communication cables
Turbidimeter Controller	2/system	SC4500	4-20 mA	HACH
Effluent Turbidity Sample Pump	1/unit	1/16 hp Centrifugal	N/A	115 V, 60 Hz, 1 ph
Calibration Kit	1/system	Maintenance Tools	N/A	HACH

Note

- Components are shipped loose for installation at the jobsite by others.
- Electrical wiring, conduit, and connection of electrical wiring to terminals within WesTech's control panels is not provided by WesTech and is to be furnished and installed by others.

Air Scour Blower Scope of Supply

Quantity	Volume	Pressure	Type	Motor
3	140 scfm (each)	3.6 PSG	Regenerative	6.2 hp, 230/460 V, 60 Hz, 3 ph, TEFC
Features				
Air intake filter with dirty filter indicator				
Spring loaded pressure safety relief valve				
Check valve				
Pressure indicator				
Aluminum housing with common steel baseplate				

Note

- Blower manufactured by FPZ.
- One blower used for Adsorption Clarifier flush; two blowers used for filter backwash; third blower for redundancy.
- Pressure gauge and switch to be placed in main air supply line for installation by others.
- Components are shipped loose for installation by others.
- Motor starters (if required), electrical wiring, conduit, and connection of electrical wiring to terminals within WesTech's control panels is not provided by WesTech and is to be furnished and installed by others.

Coagulant Feed Scope of Supply

Feature	Quantity	Notes
Chemical Feed Pump	2	168 gpd positive displacement diaphragm type, electronic control by Aquaritrol® PLC program
Analog to Digital Converter	1	4–20 mA output
Calibration Column	1	1000 mL with connection nipple
Corporation Stop and Nozzle	1	¾ in NPT-bronze with CPVC nozzle
Ball Valves	3	½ in NPT, PVC
Misc. Hardware	1 lot	

Note

- One chemical feed pump in service, second pump for redundancy.
- Tank and mixer for coagulant chemical feed system are to be provided by others.
- Coagulant feed components shipped loose for installation by others.

Filter Aid Polymer Feed Scope of Supply

Feature	Quantity	Notes
Tank	1	360-gallon HDPE with cover
Chemical Feed Pump	4	108 gpd positive displacement diaphragm type, electronic control by Aquaritrol® PLC program
Mixer	1	Tank mounted, direct drive 1/3 hp, 115/230 V, 60 Hz, single phase motor with stainless steel shaft and dual propellers. Support is included
Chemical Disperser	1	Funnel for mixing tank
Calibration Column	1	1000 mL with connection nipple
Corporation Stop and Nozzle	1	¾ in NPT-bronze with CPVC nozzle
Ball Valves	4	½ in NPT, PVC
Misc. Hardware	1 lot	

Note

- One chemical feed pump per unit in service, fourth pump for redundancy.
- Polymer feed components shipped loose for installation by others.

WesTech Trips to the Site

Trips	Days	Includes
4	16	Installation inspection of major Trident components, observation of filter media installation, startup, and instruction of plant personnel

Note: Any Item Not Listed Above to Be Furnished by Others.

Clarifications and Exceptions

General Clarifications

Terms & Conditions: This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Paint: If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

Escalation: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

USA Tariffs and Current Trade Laws: All prices are based on current USA and North America tariffs and trade laws/agreements at time of bid. Any changes in costs due to USA Tariffs and trade laws/ agreements will be passed through to the purchaser at cost.

The Infrastructure Investment and Jobs Act of 2021 (IIJA) includes potentially significant changes to historical “Buy American” or “American Iron and Steel” (AIS) requirements for federally funded projects, including water-related infrastructure projects as administered by the Environmental Protection Agency (EPA). The IIJA was signed into law on Nov 15, 2021. However the EPA has yet to issue additional information and guidance clarifying the application and interpretation of these changes. Although WesTech makes every effort to source the steel for our equipment and products domestically, not everything is reasonably or commercially available to meet all project specific constraints. Consequently, any proposal or offer for sale by WesTech, including any resulting equipment order, does not guarantee compliance with the Buy American provisions of the Infrastructure Investment and Jobs Act of 2021 at this time.

Trident Clarifications

- The Trident is a pre-engineered system consisting of a pretreatment and filtration system contained in a single shippable tank. The tank is shipped without internals. All internal components and ancillaries shall be shipped loose for installation by others.
- The contractor will be responsible for, but not limited to, setting the tanks, installing internal & external components for the tanks, piping, field wiring, and electrical power. Please note below for items not included.
- Tank is designed for installation on coal tar or asphaltic type base mastic compound applied to concrete base pad by others.
- The filter is periodically backwashed (using treated water). The Adsorption Clarifier is normally washed (using influent water) one or more times between filter backwashes. The waste holding system should be sized to handle a total of two complete flush/wash volumes from each compartment.
- The influent pumping system should provide a range of 20–30 feet head at tank inlet connection. The high-rate water only backwash of the filter shall be 15–18 gpm/ft^2 with an available head of 13 feet at the tank connection.
- Other chemical feeds such as Caustic Soda (Sodium Hydroxide), Soda Ash (Sodium Carbonate), Oxidant may be required for proper treatment by the plant. These are the responsibility of others; not by WesTech Engineering, LLC.
- Availability of equipment components specified may dictate substitutions of equal quality at the discretion of WesTech Engineering, LLC.
- All hardware is crated and shipped to the jobsite for assembly by the contractor.

Items Not Furnished by WesTech

- Unloading of equipment from delivering carrier, protected storage of equipment
- Installation, supervision of installation.
- All underground and interconnecting piping, face piping and fittings, pipe supports, wall inserts or sleeves, Dresser or flexible couplings, hangers, valves (not specifically listed), pneumatic tubing from air compressor to filter batteries, air release piping and valves, sampling lines and sinks, small pressure water supply piping, field work of piping (i.e., drilling and tapping for instrumentation) and flow meters (not specifically listed).
- Interconnection wiring and conduit.
- Walkways, handrails, stairways and ladders.
- Finish paint and intermediate field coats, cathodic protection systems.
- All chemical feeders (not specifically listed), feed lines, chemicals, tanks (not specifically listed), labor and procedures for the disinfection of equipment, laboratory test equipment.
- Structural design, supply and installation of concrete pads, foundations, rebar, anchors, concrete, grout, sealant, sumps and concrete fill for filter underdrains.
- Motor control center, motor starters, disconnects, electrical wiring and conduit, connection of electrical wiring to terminals within WesTech's control panels, telemetering equipment, turbidity monitoring equipment (not specifically listed), supports for controls.
- SCADA System.
- All pumps (not specifically listed), air compressors, dryers, operating and start-up lubricants.
- Any equipment or service not listed in this proposal.

Exceptions

Not applicable

Commercial Proposal

Proposal Name: Willsboro
Proposal Number: 2130133
Thursday, December 21, 2023

1. Bidder's Contact Information

Company Name	WesTech Engineering, LLC
Primary Contact Name	Greg Payne
Phone	(801) 265-1000
Email	gpayne@westech-inc.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

2. Budget Pricing

Currency: USD

Scope of Supply

A	Three (3) Trident® Unit, Model 1½TR-210A	$1,790,000
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)	Not Included

Prices are valid for a period not to exceed 30 days from date of proposal.

Additional Field Service

Daily Rate (Applicable Only to Field Service Not Included in Scope)	$1,350

Pricing does not include field service unless noted in scope of supply, but is available at the daily rate plus expenses. The greater of a two week notice or visa procurement time is required prior to departure date. Our field service policy can be provided upon request for more details.

3. Payment Terms

Purchase Order Acceptance and Contract Execution	10%
Submittals Provided by WesTech	15%
Release for Fabrication	35%
Notification of Ready to Ship	40%

All payments are net 30 days. Partial shipments are allowed. An approved Letter of Credit is required if Incoterms CIF, CFR, DAP, CIP, or CPT are applicable. Payment is required in full for all other Incoterms prior to international shipment. Other terms per WesTech proforma invoice. Please note that the advising bank must be named as: Wells Fargo Bank, International Department, 9000 Flair Drive, 3rd Floor, El Monte, California 91731, USA.

4. Schedule

Submittals, after Purchase Order Acceptance and Contract Execution	10 to 12 weeks
Ready to Ship, after Receipt of Final Submittal Approval	22 to 24 weeks
Estimated Weeks to Ready to Ship	**32 to 36 weeks***

*Customer submittal approval is typically required to proceed with equipment fabrication and is not accounted for in the schedule above. Project schedule will be extended to account for time associated with receipt of customer submittal approval.

5. Freight

Domestic	FOB Shipping Point - Full Freight Allowed to Jobsite (FSP-FFA)	
From	**Final Destination**	**Number of Trucks or Containers**
WesTech Shops	Willsboro, NY	TBD

One-Year Warranty

WesTech is meeting a global need for clean water through technology treatment solutions. We are proud that the equipment and systems we design, build, maintain, and operate are making the world a better place and creating a more sustainable environment for future generations.

Equipment manufactured or sold by WesTech Engineering, LLC, once paid for in full, is backed by the following warranty:

Subject to the terms below, WesTech warrants all new equipment manufactured or sold by WesTech Engineering, LLC to be unencumbered and free from defects in material and workmanship, and WesTech will replace or repair, F.O.B. its factories or other location it chooses, any part or parts returned to WesTech which WesTech's examination and analysis determine have failed within the warranty period because of defects in material and workmanship. The warranty period is either, one calendar year immediately following start-up, or eighteen (18) months from when WesTech sent its ready-to-ship notification to the purchaser, whichever expires sooner. All repair or replacement parts qualifying under this warranty shall be free of charge. Purchaser will provide timely written notice to WesTech of any defects it believes should be repaired or replaced under this warranty. WesTech will reject as untimely any warranty defect claim that purchaser submits more than thirty (30) days after the possible warranty defect first occurred. Unless specifically stated otherwise, this warranty does not cover normal wear or consumables. This warranty is not transferable.

This warranty shall be void and shall not apply where the equipment or any part thereof

a) has been dismantled, modified, repaired or connected to other equipment, outside of a WesTech factory, or without WesTech's written approval, or
b) has not been installed in complete adherence to all WesTech's or parts manufacturer's requirements, recommendations, and procedures, or
c) has been subject to misuse, abuse, neglect, or accident, or has not at all times been operated and maintained in strict compliance with all of WesTech's requirements and recommendations therefor, including, but not limited to, the relevant WesTech Operations & Maintenance Manual and any other of WesTech's specified guidelines & procedures, or
d) has been subject to force majeure events; use of chemicals not approved in writing by WesTech; electrical surges; overloading; significant power, water or feed supply fluctuations; or non-compliance with agreed feedwater or chemical volumes, specifications or procedures.

In any case where a part or component of equipment under this warranty is or may be faulty and the component or part is also covered under the warranty of a third party then the purchaser shall provide reasonable assistance to first pursue a claim under the third party warranty before making a claim under this warranty from WesTech. WesTech Engineering, LLC gives no warranty with respect to parts, accessories, or components purchased other than through WesTech. The warranties which apply to such items are those offered by the respective manufacturers.

This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

Terms & Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering, LLC The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

1. SPECIFICATIONS: WesTech Engineering, LLC is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

2. ITEMS INCLUDED: This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

3. PARTIES TO CONTRACT: WesTech Engineering, LLC is not a party to or bound by the terms of any contract between WesTech Engineering, LLC's customer and any other party. WesTech Engineering, LLC's undertakings are limited to those defined in the contract between WesTech Engineering, LLC and its direct customers.

4. PRICE AND DELIVERY: All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering, LLC or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering, LLC of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering, LLC shall constitute acceptance by Purchaser, relieving WesTech Engineering, LLC of any liability for shipping damages or shortages.

5. PAYMENTS: All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering, LLC is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

6. PAYMENT TERMS: Credit is subject to acceptance by WesTech Engineering, LLC's Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering, LLC, in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering, LLC may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering, LLC until such payment has been received.

7. ESCALATION: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

8. APPROVAL: If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering, LLC supplying any equipment shall be such complete approval.

9. INSTALLATION SUPERVISION: Prices quoted for equipment do not include installation supervision. WesTech Engineering, LLC recommends and will, upon request, make available, at WesTech Engineering, LLC's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering, LLC or installed in accordance with WesTech Engineering, LLC's instructions, and inspected and accepted in writing by WesTech Engineering, LLC, rests entirely with Purchaser; and any work performed by WesTech Engineering, LLC personnel in making adjustment or changes must be paid for at WesTech Engineering, LLC's then current per diem rates plus living and traveling expenses.

WesTech Engineering, LLC will supply the safety devices described in this proposal or shown in WesTech Engineering, LLC's drawings furnished as part of this order but excepting these, WesTech Engineering, LLC shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering, LLC from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering, LLC or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

10. ACCEPTANCE OF PRODUCTS: Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering, LLC within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering, LLC unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

11. TAXES: Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.

12. TITLE: The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering, LLC until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering, LLC's title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering, LLC may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering, LLC may suffer from any cause.

13. INSURANCE: From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering, LLC's benefit, adequate insurance including, but not limited

to, builders risk insurance on the equipment against any loss of any nature whatsoever.

14. SHIPMENTS: Any shipment of delivery dates recited represent WesTech Engineering, LLC's best estimate but no liability, direct or indirect, is assumed by WesTech Engineering, LLC for failure to ship or deliver on such dates.

WesTech Engineering, LLC shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering, LLC may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from WesTech Engineering, LLC that the equipment is ready for shipment; and thereafter any storage or other charge WesTech Engineering, LLC incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than WesTech Engineering, LLC or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond WesTech Engineering, LLC's reasonable control and occurring at a location other than WesTech Engineering, LLC or its supplier's shipping points, WesTech Engineering, LLC assumes no liability in delivery delay. If Purchaser refuses such delivery, WesTech Engineering, LLC may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

15. WARRANTY: WesTech Engineering LLC warrants equipment it supplies only in accordance with the attached WesTech Warranty. This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

16. PATENTS: WesTech Engineering, LLC agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering, LLC is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering, LLC needed information, assistance, and authority to enable WesTech Engineering, LLC so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering, LLC shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering, LLC will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering, LLC's request. The foregoing states the entire liability of WesTech Engineering, LLC, with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering, LLC assumes no responsibility for process patent infringement.

17. SURFACE PREPARATION AND PAINTING: If furnished, shop primer paint is intended to serve only as minimal protective finish. WesTech Engineering, LLC will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. WesTech Engineering, LLC assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

Motors, gear motors, and other components not manufactured by WesTech Engineering, LLC will be painted with that manufacturer's standard paint system. It is WesTech Engineering, LLC's intention to ship major steel components as soon as fabricated, often before drive, motors, and other manufactured components. Unless Purchaser can ensure that shop primed steel shall be field painted within thirty (30) days after arrival at the job site, WesTech Engineering, LLC encourages the Purchaser to order these components without primer.

WesTech Engineering, LLC's prices are based on paints and surface preparations as outlined in the main body of this proposal. In the event that an alternate paint system is selected, WesTech Engineering, LLC requests that Purchaser's order advise of the paint selection. WesTech Engineering, LLC will then either adjust the price as may be necessary to comply or ship the material unpainted if compliance is not possible due to application problems or environmental controls.

18. CANCELLATION, SUSPENSION, OR DELAY: After acceptance by WesTech Engineering, LLC, this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering, LLC to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering, LLC's plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

19. FORCE MAJEURE: Neither party hereto shall be liable to the other for default or delay in delivery caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, act of government, pandemic, delay of carriers, failure of normal sources of supply, complete or partial shutdown of plant by reason of inability to attain sufficient raw materials or power, and/or other similar contingency beyond the reasonable control of the respective parties. The time for delivery specified herein shall be extended during the continuance of such conditions, or any other cause beyond such party's reasonable control. Escalation resulting from a Force Majeure event shall be equitably adjusted per the escalation policy stated above.

20. RETURN OF PRODUCTS: No products may be returned to WesTech Engineering, LLC without WesTech Engineering, LLC's prior written permission. Said permission may be withheld by WesTech Engineering, LLC at its sole discretion.

21. BACKCHARGES: WesTech Engineering LLC will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering LLC furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering LLC purchase order, or work requisition signed by WesTech Engineering LLC.

22. INDEMNIFICATION: Purchaser agrees to indemnify WesTech Engineering, LLC from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

23. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings and is not subject to modification except by a writing signed by an authorized officer of each party.

24. MOTORS AND MOTOR DRIVES: In order to avoid shipment delays of WesTech Engineering, LLC equipment, the motor drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

25. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

26. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of $100,000 USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering LLC against which a claim is sought.

27. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____

Customer Address: _____

_____

_____

Contact Name: _____

Contact Phone: _____

Contact Email: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

NUVONIC

formerly Aquionics, Berson, Hanovia and Orca GmbH

ProLine PQ IL DVGW

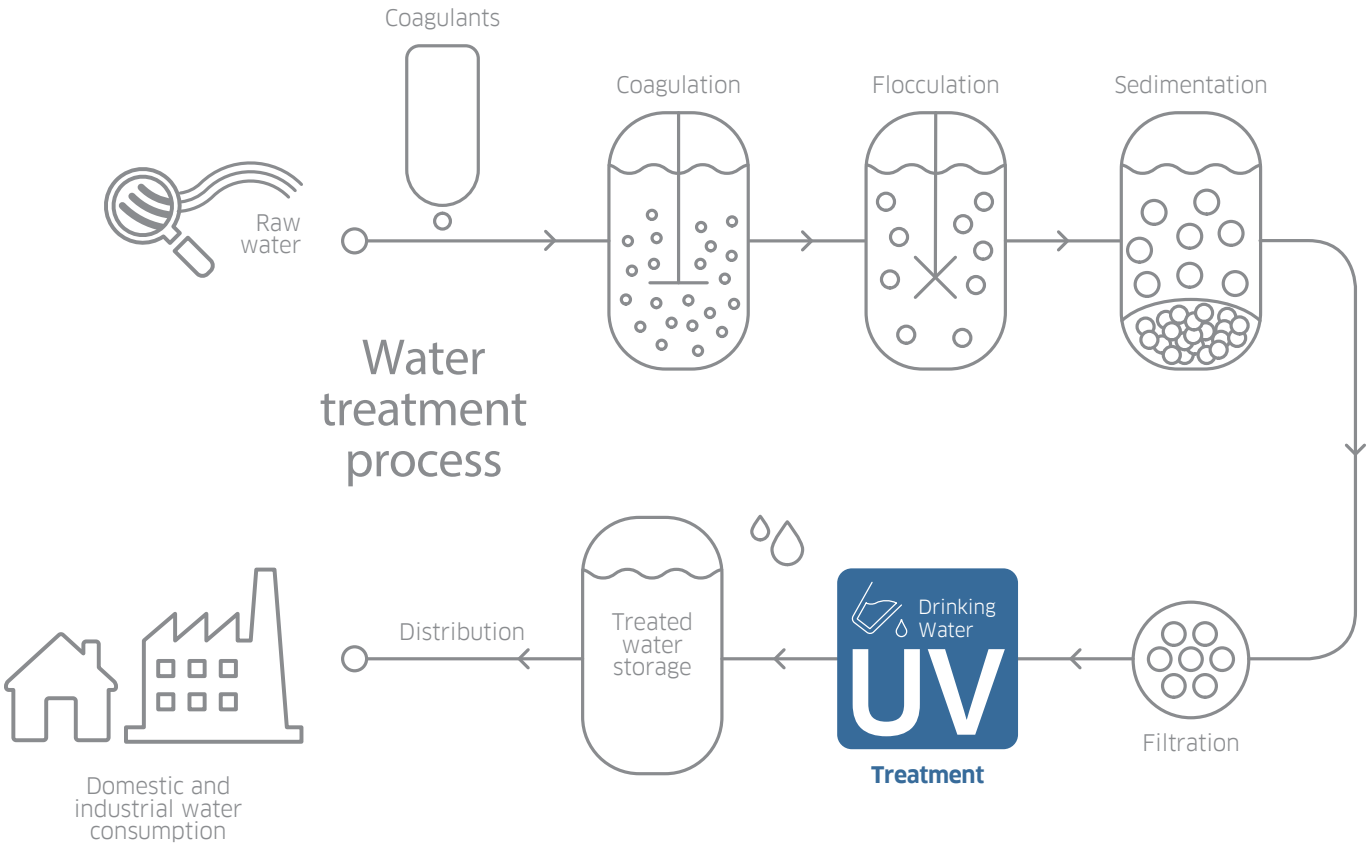
CERTIFIED UV TREATMENT FOR DRINKING WATER

Our **ProLine PQ IL DVGW** systems are aimed specifically at providing third party certified UV treatment for municipal drinking water. By using a third party certified UV system you can be certain that the UV dose being produced will treat the water, eliminate harmful micro-organisms, reduce the bio-burden, protect against bio-fouling and lower operating costs.

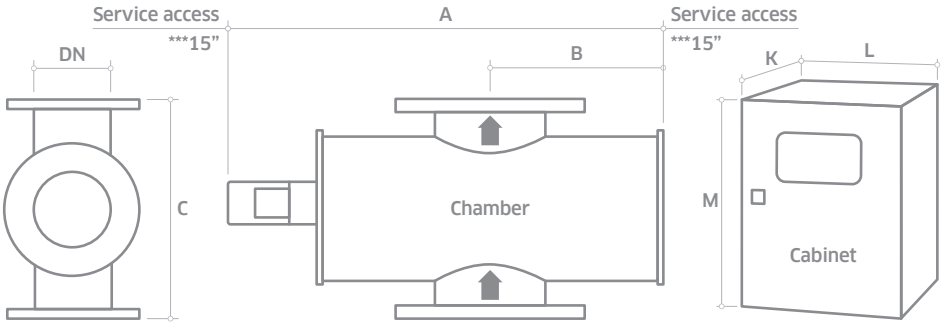
Each system comes with a certified dry UV sensor allowing checking of UV performance. The flow and UV sensor values are monitored to ensure that the dose is always at least 40mJ/cm^2 as per the DVGW certification.

Application Optimized UV for Drinking Water

POTENTIAL LOCATIONS OF THE PROLINE PQ IL DVGW™ IN DRINKING WATER TREATMENT PROCESS



KEY FEATURES	WHAT IT GIVES YOU	BENEFITS FOR YOU
INTELLIGENCE		
Dry DVGW approved UV sensor measuring active wavelengths	Continuous verification of performance and in-built low dose warning	Easy to monitor and log system performance
Flow meter input	UV intensity monitoring based on actual process conditions when meters are connected	Accurate UV intensity reading guaranteed under wide range of operating conditions
OPTIMIZATION		
DVGW certified UV systems	UV system dose equations and sizing have been independently derived	Confidence the system will perform as stated
UV water treatment	Protects your drinking water from microbiological contamination including chlorine resistant Cryptosporidium and Giardia	Does not affect taste and odour
		No chemicals
Designed for treatment of drinking water	UBA & FDA-approved materials used for all wetted parts	Industry compliant materials
	Flanged connections, high standard internal finish	Designed to international standards
	Automatic wiper (quartz cleaning)	Self cleaning to maintain performance
INTEGRATION		
Compact design	Can be retrofitted to existing process	Easy integration



* Allow dimension L in front of cabinet for door opening and panel access.

** M dimension includes the space for the cabinet mounting brackets but you need to allow space below the cabinet for cable entry and access (minimum of 9.8").

[a] Attention: the optional cabinet with A/C islarger. Ask for dimensions.

All dimensions are approximate for clearance purposes only. We have a policy of continuous product development, exact drawings are available on request.

All specifications are subject to change without notification. Your distributor or our account manager can advise on correct sizing and specification requirements.

*** 400mm up to IL5000, 19" on IL5000

MODEL NUMBER	MAX POWER (KW)	NO OF LAMPS	DIMENSIONS (INCHES)								APPROX WEIGHT (LB)	
			Chamber				Cab.	Cabinet (fan cooled)[a]			Chamber	Cabinet
			A	B	C	DN	No***	K*	L	M**	Empty	Fan cooled
ProLine PQ IL DVGW 100	1.8	2	30	12	15	4	1	11	31	47	95	169
ProLine PQ IL DVGW 200	2.9	1	30	12	15	6	1	11	31	47	108	169
ProLine PQ IL DVGW 450	5.6	2	30	12	15	8	1	11	39	55	152	264
ProLine PQ IL DVGW 1000	11.0	4	30	12	15	8	1	11	39	55	154	286
ProLine PQ IL DVGW 5000	34.8	8	36	14	21	14	1	23	47	82	403	683

UV CHAMBER

Material:	StSt 316L / 1.4404
Internal finish:	< 0.8 µm Ra, welds ground out, electropolished and passivated
External finish:	Brushed to K280, electropolished and passivated
Process (mating) connections:	ANSI 150
Drain connection:	NPT
Air vent connection:	NPT
End plate:	Removable end plate
Degree of protection:	IP54 equivalent to NEMA 12
Wiper:	Automatic (electrically driven)
Lamps:	Medium pressure
Quartz Sleeves:	Doped quartz (F240)
Number of Lamps:	See table above
Expected lamp life:	10,000 hours
Temperature sensor:	Yes
UV sensor:	Dry DVGW compliant UV sensor
Working fluid temperature:	41°F to 104°F
Hydrostatically pressure tested:	Yes
Chamber mounting:	Flow horizontal or vertical (lamps horizontal only)
Operating pressure:	145 psi (positive pressure only)
Seals:	EPDM, ADI free, EC 1935:2004, EN681-1 WA-WB-WC-WD, FDA 21 CFR 177.2600, KIWA-ATA, UBA Elastomerleitlinie, W270, WRAS approved

OPTIONS

Document Support Pack	
Weld documentation pack	
Cabinet:	Stainless steel 304
	Stainless steel 304 with air conditioning (41°-122°F), NEMA 4X (IP56), relative humidity <95% non-condensing*
	Stainless steel 316 with sloping roof and air conditioning (41°-122°F), NEMA 4X (IP56), relative humidity <95% non-condensing*
Manual	Operation and Maintenance manual and printed Installation and Commissioning manual in Chinese, English, French, German & Spanish
Flange options:	PN10 (except IL5000), ANSI 150, JIS, Table 'E'
Lead length:	65 and 95 ft
In-field UV reference sensor kit	
Water leak detection:	Detects water leaks from quartz sleeve
UV Connect:	Remote access & monitoring

CABINET (CONTROLLER UV TOUCH - AB850 PLC & TOUCHSCREEN)

Material:	Polyester coated carbon steel, RAL 7035
Degree of protection:	NEMA 12 (IP54)
Supply voltages:	PQ IL DVGW 100-1000: 208V 3Ph 240V 1P+N 220V 1PH +N 277/480V 3P+N PQ IL DVGW 5000: 480V 3Ph
Operating temperature range:	41-105°F
Relative humidity:	<85% non-condensing
Cooling fans:	Yes
Interconnecting cable:	32 ft (default length)
Variable power:	Stepless variable power (70% reduction from maximum ballast power)

HMI/CONTROL

Display:	Touch-sensitive back-lit LCD, indicating system status including alarms
Operating menu:	3 access levels (2 with password protection)
Fault finding:	Event log

CUSTOMER OUTPUTS

4-20 mA passive outputs:	UV intensity, UV dose, configurable
VFC outputs:	System in remote control, system available warming, flow enable, running, system cooling down, any trip, any warning, low UV dose, water leak, configurable (x3)

CUSTOMER INPUTS

4-20 mA active or passive inputs:	Flow meter, UVT meter
VFC inputs:	Remote lamp on/off, remote pulsed start/stop, remote reset, remote wipe, go to high power, reduce power, valve open, valve closed, valve healthy

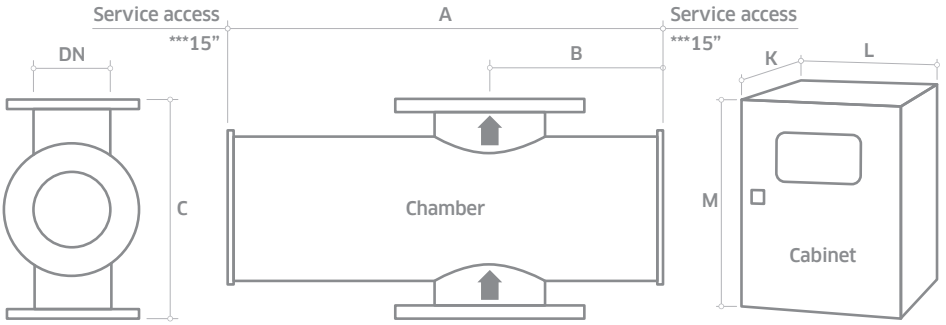
CUSTOMER COMMINICATION PORT

Modbus TCP/IP and Ethernet

APPROVALS

CE marked, DVGW certified, UL 508A

* See sales drawings for dimensions



* Allow dimension L in front of cabinet for door opening and panel access.

** M dimension includes the space for the cabinet mounting brackets but you need to allow space below the cabinet for cable entry and access (minimum of 9.8").

*** CC: Control cabinet, PC: Power cabinet

[a] Attention: the optional cabinet with A/C is bigger. Ask for dimensions.

All dimensions are approximate for clearance purposes only. We have a policy of continuous product development, exact drawings are available on request. All specifications are subject to change without notification. Your distributor or our account manager can advise on correct sizing and specification requirements.

MODEL NUMBER	MAX POWER (KW)	NO OF LAMPS	DIMENSIONS (INCHES)								APPROX WEIGHT (LB)	
			Chamber				Cab.	Cabinet (fan cooled)[a]			Chamber	Cabinet
			A	B	C	DN	No***	K*	L	M**	Empty	Fan cooled
ProLine PQ IL DVGW 4000	17.5	4	35.2	14.4	21.6	13.7	1	23.6	39.3	82.6	330	396

UV CHAMBER

Material:	StSt 316L / 1.4404
Internal finish:	< 0.8 µm Ra, welds ground out, electropolished and passivated
External finish:	Brushed to K280, electropolished and passivated
Process (mating) connections:	ANSI 150
Drain connection:	NPT
Air vent connection:	NPT
End plate:	Removable end plate
Degree of protection:	IP54 equivalent to NEMA 12
Wiper:	Automatic (electrically driven)
Arc tube (lamp):	Medium pressure
Arc tube enclosure:	Doped quartz (F240)
Number of arc tubes (lamps):	See table above
Expected lamp life:	10,000 hours
Temperature sensor:	Yes
UV sensor:	Dry DVGW compliant UV sensor
Working fluid temperature:	41°F to 104°F
Hydrostatically pressure tested:	Yes
Chamber mounting:	Flow horizontal or vertical (lamps horizontal only)
Operating pressure:	145 psi (positive pressure only)
Seals:	EPDM, ADI free, EC 1935:2004, EN681-1 WA-WB-WC-WD, FDA 21 CFR 177.2600, KIWA-ATA, UBA Elastomerleitlinie, W270, WRAS approved

OPTIONS

Document Support Pack	
Cabinet:	Stainless steel 304
	Stainless steel 304 with air conditioning (41°-122°F), NEMA 4X (IP54), relative humidity <95% non-condensing*
	Stainless steel 316 with air conditioning with sloping roof (41°-122°F), NEMA 4X (IP66), relative humidity <95% non-condensing*
Manual	Operation and Maintenance manual and printed Installation and Commissioning manual in Chinese, English, French, German & Spanish
Flange options:	PN16, ANSI 150, JIS, Table 'E'
Lead length:	65 and 95 ft
In-field UV reference sensor kit	
Bleed:	Valve with BSP connection or NPT if ANSI flange
Water leak detection:	Detects water leaks from quartz sleeve
Welder pack	

CABINET (CONTROLLER UV TOUCH - AB850 PLC & TOUCHSCREEN)

Material:	Polyester coated carbon steel, RAL 7035
Degree of protection:	IP54 (NEMA 12 (IP54)
Supply voltages:	PQ IL DVGW 4000: 480V 3Ph, 60Hz
Operating temperature range:	41°F to 105°F
Relative humidity:	<85% non-condensing
Cooling fans:	Yes
Interconnecting cable:	32 ft (default length)
Variable power:	Stepless variable power (70% reduction from maximum ballast power)

HMI/CONTROL

Display:	4 line LCD, indicating system status including alarms
Operating menu:	3 levels (2 with password protection)
Fault finding:	Event log

CUSTOMER OUTPUTS

4-20 mA passive output:	UV intensity, ballast power
VFC outputs:	Standby in remote, system standby, system cooling down, any trip, any warning, UV intensity failure, system ready, wiper failure, lamp failure, water leak, water temperature warning, water & cabinet temperature alarm

CUSTOMER INPUTS

4-20 mA active or passive inputs:	Flow meter
VFC inputs:	Remote stop/start, remote clear message, remote wipe, remote set power high

CUSTOMER COMMINICATION PORT

Modbus RS 485 serial RTU for SCADA connection

APPROVALS

CE marked, DVGW certified, UL 508A

* See sales drawings for dimensions

ProLine PQ IL DVGW

Also available in our Drinking Water product range...

PROLINE PQ AF

Small community, low energy amalgam range with USEPA validation

PROLINE PQ EO

Energy Optimised medium pressure range, USEPA validated UVT compensation

PROLINE PQ AL

Small-mid sized region, low energy lamp amalgam range with USEPA validation UVT compensation

PROLINE PQ IL

Compact medium pressure range with USEPA validation

Canada
+1 980 256 5700
americas@nuvonicuv.com

China
+86 21 6167 9599
apac@nuvonicuv.com

Germany
+44 175 351 5300
emea@nuvonicuv.com

Malaysia
+60 16 440 8834
sea@nuvonicuv.com

Mexico
+1 980 256 5700
americas@nuvonicuv.com

United Kingdom
+44 175 351 5300
emea@nuvonicuv.com

USA
+1 980 256 5700
americas@nuvonicuv.com

NUVONIC

A Halma company

formerly Aquionics, Berson, Hanovia and Orca GmbH

nuvonicuv.com

FM 29365

Appendix F \

Conceptual Design Cost Estimate

TOWN OF WILLSBORO
NEW WATER TREATMENT PLANT

MJ Project Number:
1075.11

Conceptual Design Cost Estimate

Engineering and Land Surveying, P.C.

21 Corporate Drive
Clifton Park, NY 12065

March 13, 2024

Project:	**NEW WATER TREATMENT PLANT**
Client:	**TOWN OF WILLSBORO**
Project Phase:	Conceptual Design Cost Estimate
Prepared By:	MJ Engineering and Land Surveying, P.C.
MJ PN:	1075.11

TECHNICAL ASSUMPTIONS

HAZARDOUS MATERIALS EXCLUDED
ESTIMATE IS BASED ON CONCEPTUAL DESIGN DRAWINGS DATED 3/19/2024
CONSTRUCTION PERIOD ASSUMED TO BE 2025/2026, WITH ESCALATION TO MID POINT

ESCALATION

	2025												2026											
Task	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Bidding																								
Contract Execution																								
Construction																								
MidPoint																								

Escalation 32 months @ 0.25% per month (from date of Concept Design Submission)

Escalation = 8.00%

TOWN OF WILLSBORO
NEW WATER TREATMENT PLANT

PROJECT ESTIMATE SUMMARY SHEET

Phase Report: Conceptual Design Cost Estimate
Prepared By: MJ Engineering and Land Surveying, P.C.
MJ PN: 1075.11

CSI DIVISION	DIVISION TITLE		SUBTOTAL	TOTAL
Base Bid Work				
020000	Existing Conditions		$ 129,000	
260000	Electrical		$ 350,000	
310000	Earthwork		$ 225,000	
320000	Exterior Improvements		$ 1,235,000	
330000	Utilities		$ 1,240,000	
400000	Process Interconnections		$ 275,000	
430000	Gas Handling Equipment		$ 510,000	
460000	Water and Wastewater Equipment		$ 2,275,000	
500000	Building Costs		$ 2,640,000	
	Subtotal			**$ 8,879,000**
			SUB TOTAL ESTIMATE	**$ 8,879,000**
	GENERAL CONDITIONS :	10.00%	$ 887,900	
	OVERHEAD AND PROFIT :	10.00%	$ 976,690	
			SUB TOTAL W/ MARKUPS	**$ 10,743,590**
	PROJECT CONTINGENCY	35.00%	$ 3,760,257	
	ESCALATION :	8.00%	$ 859,487	
			TOTAL CONSTRUCTION COST ESTIMATE	**$ 15,363,000**

Project:	**NEW WATER TREATMENT PLANT**
Client:	**TOWN OF WILLSBORO**
Project Phase:	Conceptual Design Cost Estimate
Prepared By:	MJ Engineering and Land Surveying, P.C.
MJ PN:	1075.11

DETAILED ESTIMATE

Construction Contract

	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT
020000	**Existing Conditions**				
	Existing Water Treatment Plant Equipment Demolition	1	LS	$ 75,000.00	$ 75,000
	Tree Clearing/Grubbing	2	AC	$ 27,000.00	$ 54,000
260000	**Electrical**				
	Service Entrance	1	LS	$ 75,000.00	$ 75,000
	Emergency Standby Generator	1	LS	$ 125,000.00	$ 125,000
	Radio Telemetry and SCADA	1	LS	$ 150,000.00	$ 150,000
310000	**Earthwork**				
	Grading Allowance	1	LS	$ 200,000.00	$ 200,000
	Erosion and Sediment Controls	1	LS	$ 25,000.00	$ 25,000
320000	**Exterior Improvements**				
	Backwash Lagoons	14,500	SF	$ 55.00	$ 797,500
	Asphalt Paving	750	Ton	$ 325.00	$ 243,750
	Concrete Sidewalk	125	LF	$ 44.00	$ 5,500
	Concrete Curb	260	LF	$ 23.00	$ 5,980
	Gravel (Stone and Fabric)	4,500	SF	$ 15.00	$ 67,500
	Site Accessories	1	LS	$ 15,000.00	$ 15,000
	Topsoil, Seed, Fertilizer, and Mulch	40,000	SF	$ 2.50	$ 100,000
330000	**Utilities**				
	12" Ductile Iron Raw Water Transmission Main	1,600	LF	$ 375.00	$ 600,000
	10" Finished Water Yard Piping	160	LF	$ 350.00	$ 56,000
	12" SDR Lagoon Effluent Piping	1,600	LF	$ 340.00	$ 544,000
	Onsite Wastewater Treatment System (Septic)	1	LS	$ 40,000.00	$ 40,000
400000	**Process Interconnections**				
	Process Piping	1	LS	$ 200,000.00	$ 200,000
	Miscellaneous Instrumentation	1	LS	$ 75,000.00	$ 75,000
430000	**Process Liquid Handling Equipment**				
	Raw Water Pumps and Variable Frequency Drives	1	LS	$ 170,000.00	$ 170,000
	Finished Water Pumps and Variable Frequency Drives	1	LS	$ 170,000.00	$ 170,000
	Backwash Pumps and Variable Frequency Drives	1	LS	$ 170,000.00	$ 170,000
460000	**Water and Wastewater Equipment**				
	Packaged Trident Filter Plant	1	LS	$ 2,000,000.00	$ 2,000,000
	Sodium Permanganate Chemical Feed Equipment	1	LS	$ 65,000.00	$ 65,000
	Sodium Hypochlorite Chemical Feed Equipment	1	LS	$ 55,000.00	$ 55,000
	Orthophosphate Chemical Feed Equipment	1	LS	$ 55,000.00	$ 55,000
	Ultraviolet Disinfection Equipment	1	LS	$ 100,000.00	$ 100,000
500000	**Building Costs**				
	Office Space	2,400	SF	$ 350.00	$ 840,000
	Industrial Space	3,400	SF	$ 300.00	$ 1,020,000
	Clearwell	1,500	SF	$ 200.00	$ 300,000
	Garage Space	1,600	SF	$ 300.00	$ 480,000
TOTAL DIRECT COST					**$ 8,879,230**

Appendix G \

State Historical Preservation Office Archeological Determination Letter

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

November 15, 2021

Jessica DesLauriers
Grant Administrator
Essex County Office of Community Resources
7514 Court Street
Elizabethtown, NY 12870

Re: NYSEFC
Willsboro Water Treatment Plant Upgrades
26 Pumphouse Ln, Willsboro, NY 12996
21PR07735

Dear Jessica DesLauriers:

The State Historic Preservation Office (SHPO) understands that there are temporal and financial concerns regarding this project that require a letter from the SHPO so that funds may be committed. The SHPO does not oppose the obligation of funds as long as there is a commitment from the Town of Willsboro to conduct any SHPO recommended cultural resource investigations prior to construction, with NYSEFC concurrence, including the Phase IA/IB archaeological survey requested by the SHPO. The SHPO appreciates the opportunity to comment on this information.

If you have any questions, I can be reached at Jessica.Schreyer@parks.ny.gov.

Sincerely,

Jessica E. Schreyer

Jessica Schreyer
Scientist Archaeology

NEW YORK STATE OF OPPORTUNITY. Parks, Recreation and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

ARCHAEOLOGY COMMENTS

Phase IA/IB Archaeological Survey Recommendation
Project: Willsboro Water Treatment Plant Upgrades
PR#: 21PR07735
Date: 11/15/2021

Your project is in an archaeologically sensitive area. Therefore, the State Historic Preservation Office/Office of Parks, Recreation and Historic Preservation (SHPO/OPRHP) recommends a Phase IA/IB archaeological survey for components of the project that will involve ground disturbance, unless substantial prior ground disturbance can be documented. A Phase IA/IB survey is designed to determine the presence or absence of archaeological sites or other cultural resources in the project's Area of Potential Effects (APE).

If you consider the entire project area to be disturbed, documentation of the disturbance will need to be reviewed by SHPO/OPRHP. Examples of disturbance include mining activities and multiple episodes of building construction and demolition. Documentation of ground disturbance typically consists of soil bore logs, photos, or previous project plans. Agricultural activity is not considered to be substantial ground disturbance.

Please note that in areas with alluvial soils or fill archaeological deposits may exist below the depth of superficial disturbances such as pavement or even deeper disturbances, depending on the thickness of the alluvium or fill. Evaluation of the possible impact of prior disturbance on archaeological sites must consider the depth of potentially culture-bearing deposits and the depth of planned disturbance by the proposed project.

Our office does not conduct archaeological surveys. A 36 CFR 61 qualified archaeologist should be retained to conduct the Phase IA/IB survey.

Please also be aware that a Section 233 permit from the New York State Education Department (SED) may be necessary before archaeological fieldwork is conducted on State-owned land. If any portion of the project includes the lands of New York State, you should contact the SED before initiating survey activities. The SED contact is Christina Rieth and she can be reached at (518) 402-5975 or christina.rieth@nysed.gov. Section 233 permits are not required for projects on private land.

If you have any questions concerning archaeology, please contact Jessica Schreyer at Jessica.Schreyer@parks.ny.gov.

Appendix H \

Conceptual Design Drawings

PROCESS PIPING & VALVE SYMBOLS

- GATE VALVE
- CHECK VALVE
- BUTTERFLY VALVE
- BALL VALVE
- DOUBLE CHECK VALVE ASSEMBLY
- HOSE BIBB
- AIR RELEASE VALVE
- PRESSURE REDUCING VALVE
- DIRECTION OF FLOW
- EXPANSION JOINT
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- RESTRAINED PLUG
- COUPLING
- STRAINER
- GLOBE VALVE
- STATIC MIXER

INSTRUMENTATION, ELECTRICAL & RELATED SYMBOLS

- M — ELECTRIC MOTOR
- FM XXX — ELECTROMAGNETIC FLOW METER
- FIT XXX — FLOW INDICATING TRANSMITTER
- PIT XXX — PRESSURE INDICATING TRANSMITTER
- PH XXX — PH METER
- TB XXX — TURBIDIMETER
- CL XXX — CHLORINE ANALYZER
- LIT XXX — LEVEL INDICATING TRANSMITTER
- LS XXX — LEVEL SWITCH TRANSMITTER
- VFD XXX — VARIABLE FREQUENCY DRIVE

- TRANSMITTER ELECTRICAL SIGNAL
- AIR — AIR LINE
- BUILDING BOUNDARY
- SAMPLE PANEL

EQUIPMENT SYMBOLS

- CENTRIFUGAL PUMP
- WATER STORAGE TANK
- LAKE
- CHEMICAL FEED PUMP
- TRANSFER PUMP
- CHEMICAL STORAGE TANK / TOTE
- TRIDENT 210-A UNIT
- AIR BLOWER
- DRY CHEMICAL STORAGE
- DRUM MIXER
- RADAR LEVEL SENSOR
- LEVEL SWITCH

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	BMF	PMH	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	BMF
DRAWN BY:	BMF
CHECKED BY:	PMH

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

PROCESS AND INSTRUMENTATION DIAGRAM LEGEND

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: NOT TO SCALE
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-001

File Name: F:\MJ1075\1075.11 Town of Willsboro - WTP Design\21104-1 Willsboro\MJ1075.11 C-001 PID_pmh.dwg (Layout: C-001)
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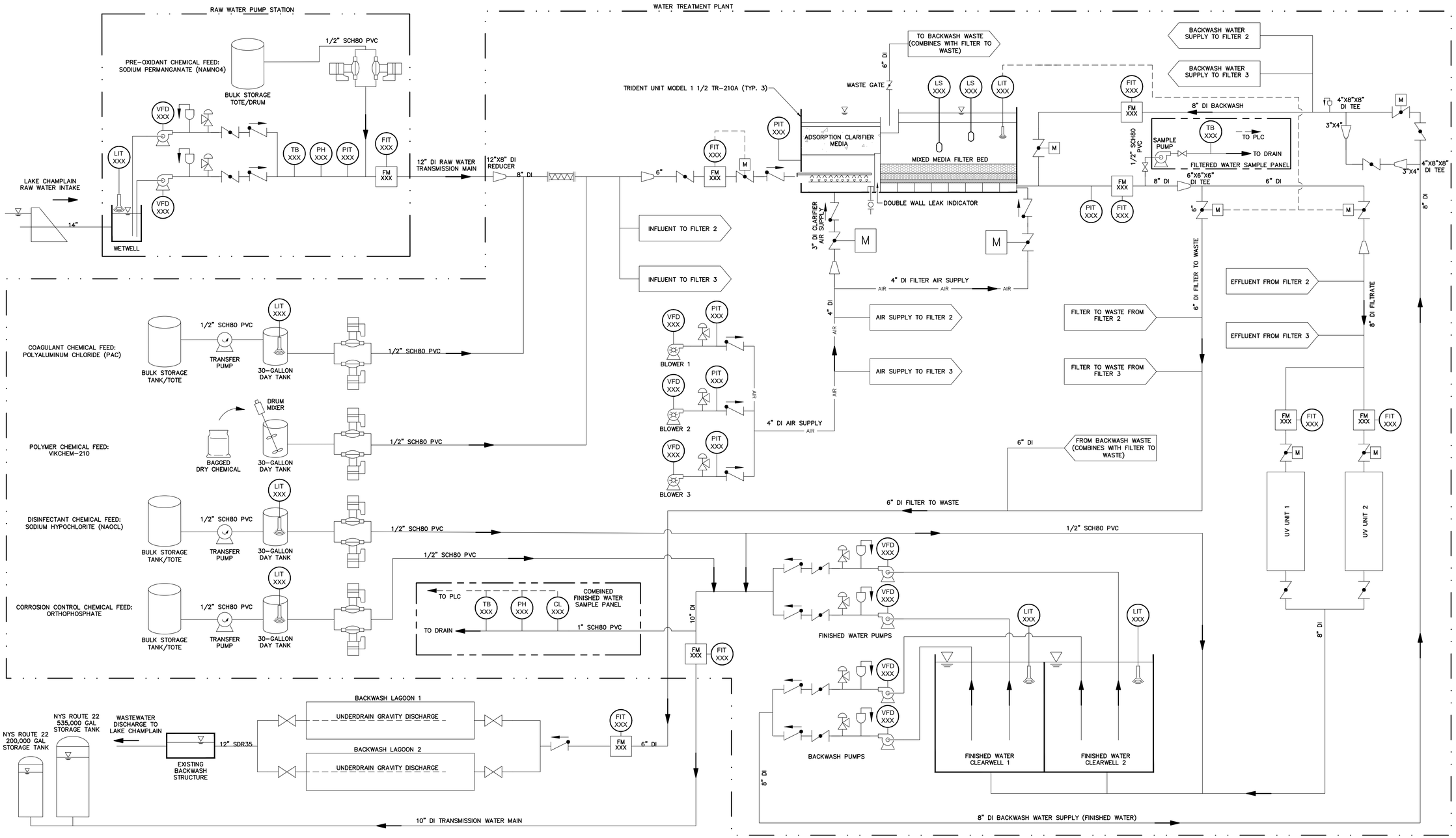

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	BMF	PMH	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	BMF
DRAWN BY:	BMF
CHECKED BY:	PMH

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

PROCESS AND INSTRUMENTATION DIAGRAM

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: NOT TO SCALE
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-002

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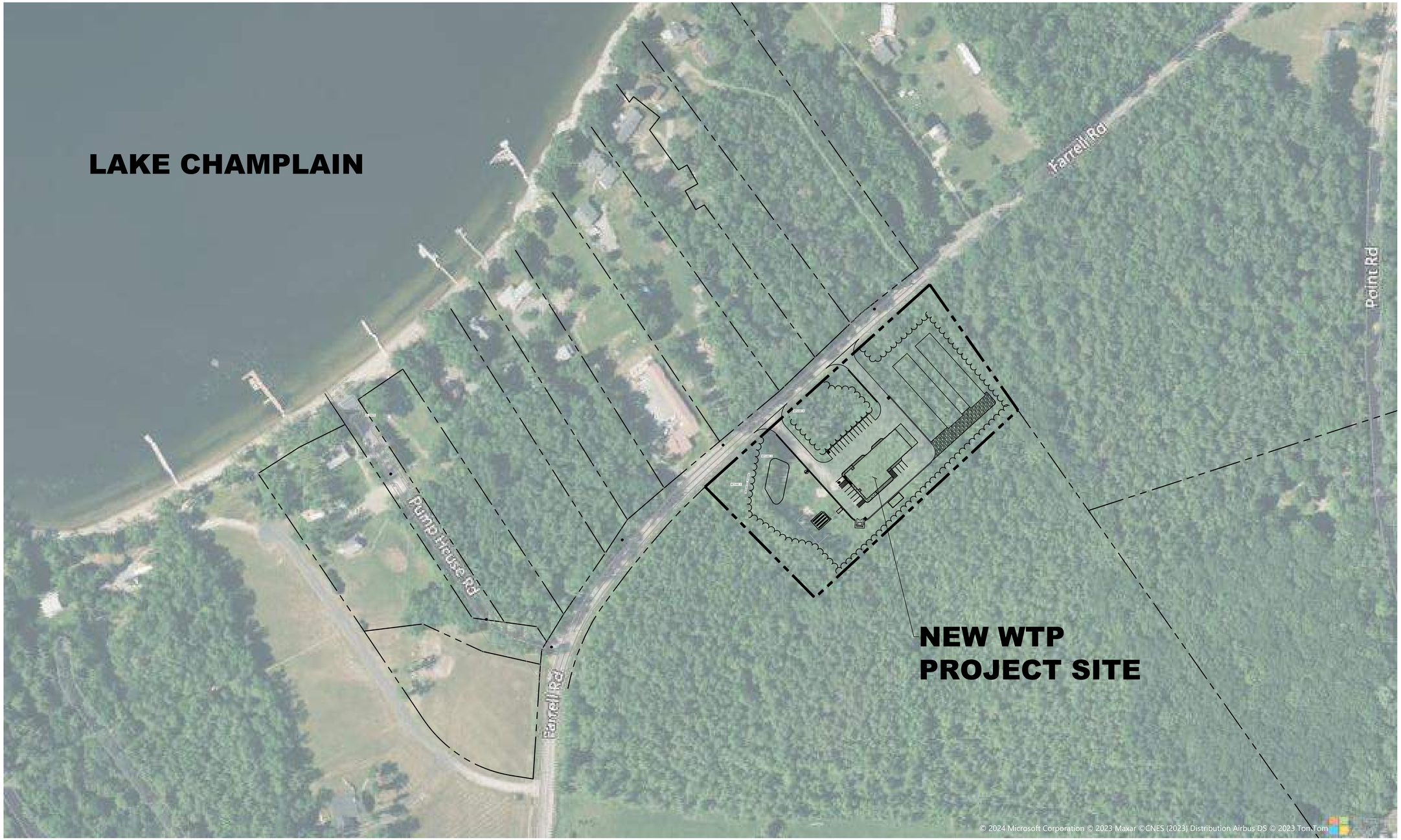

TRUE NORTH AT THE 74°30' MERIDIAN OF WEST LONGITUDE

100' 50' 0 100'

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	CEC	JML	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	CEC
DRAWN BY:	CEC
CHECKED BY:	JML

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

OVERALL SITE PLAN

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-100

File Name: C:\Users\ccaswell\AppData\Local\Temp\AcPublish_10580\MJ1075.11 C-100 SITE PLAN.dwg (Layout: C-100)
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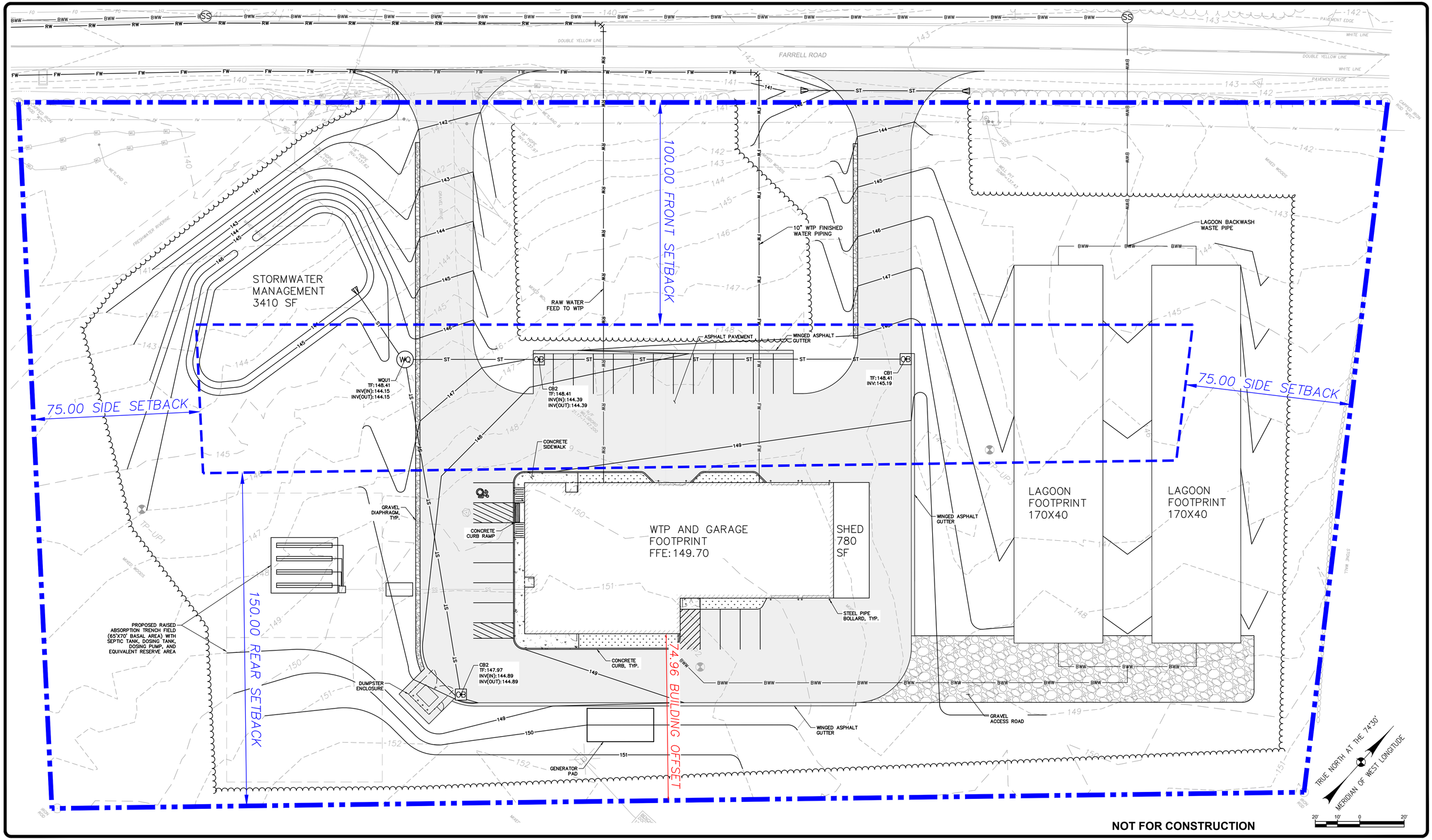

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	CEC	JML	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	CEC
DRAWN BY:	CEC
CHECKED BY:	JML

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

SITE PLAN

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-101

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FARRELL ROAD

DOUBLE YELLOW LINE

WHITE LINE

PAVEMENT EDGE

STORMWATER MANAGEMENT 3410 SF

WTP AND GARAGE FOOTPRINT FFE: 149.70

SHED 780 SF

LAGOON FOOTPRINT 170X40

LAGOON FOOTPRINT 170X40

10" WTP FINISHED WATER PIPING

LAGOON BACKWASH WASTE PIPE

RAW WATER FEED TO WTP

ASPHALT PAVEMENT

WINGED ASPHALT GUTTER

GRAVEL DIAPHRAGM, TYP.

CONCRETE SIDEWALK

STEEL PIPE BOLLARD, TYP.

CONCRETE CURB RAMP

CONCRETE CURB, TYP.

PROPOSED RAISED ABSORPTION TRENCH FIELD (65'X70' BASAL AREA) WITH SEPTIC TANK, DOSING TANK, DOSING PUMP, AND EQUIVALENT RESERVE AREA

DUMPSTER ENCLOSURE

GENERATOR PAD

GRAVEL ACCESS ROAD

TRUE NORTH AT THE 74°30' MERIDIAN OF WEST LONGITUDE

20' 10' 0 20'

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	CEC	JML	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	CEC
DRAWN BY:	CEC
CHECKED BY:	JML

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

SITE PLAN RENDER

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-102

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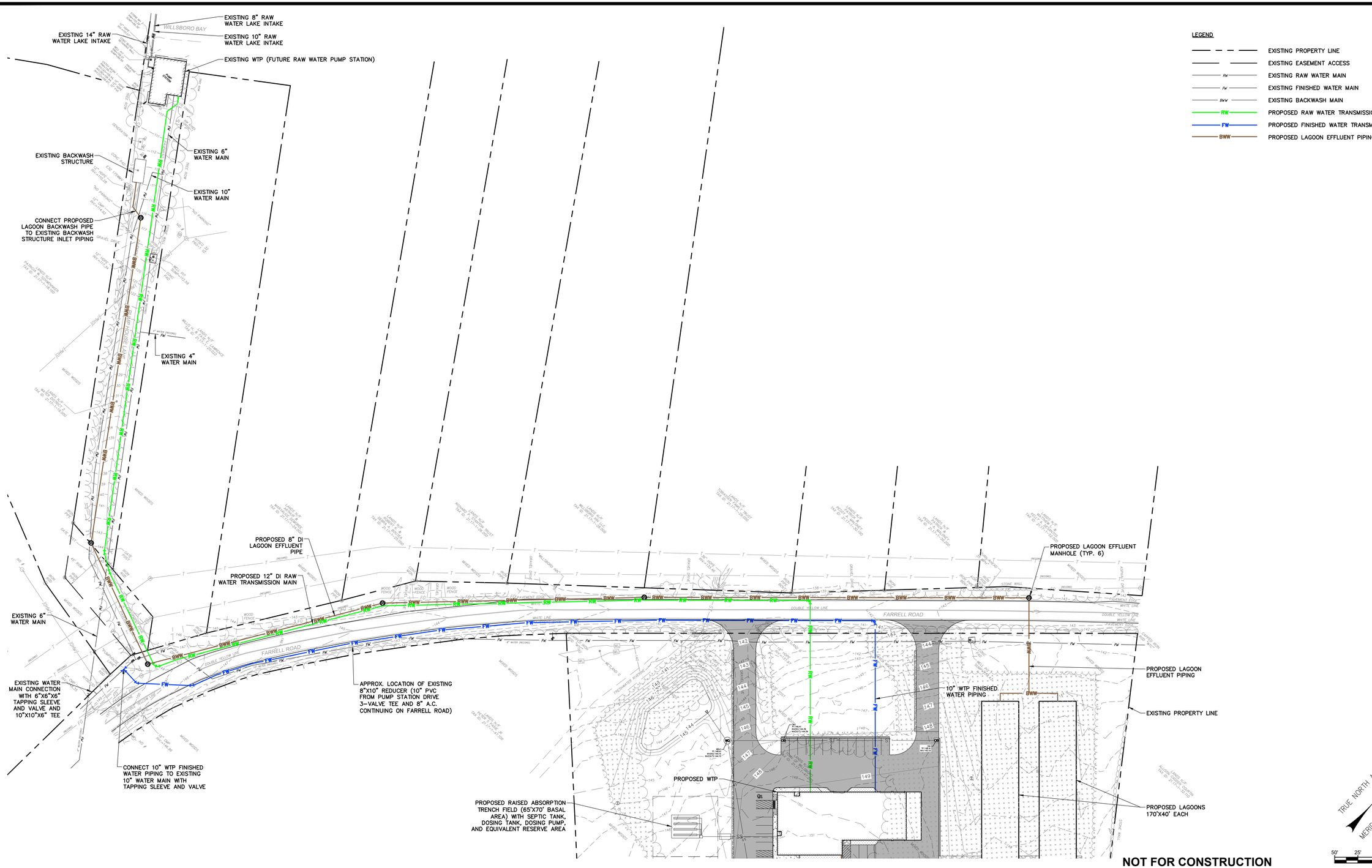

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS					
No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	BMF	PMH	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	PMH
DRAWN BY:	BMF
CHECKED BY:	CLD

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

UTILITY PLAN

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE:	AS SHOWN
CONTRACT No.:	
MJ PROJ. No.:	1075.11
DATE:	3/13/24

C-200

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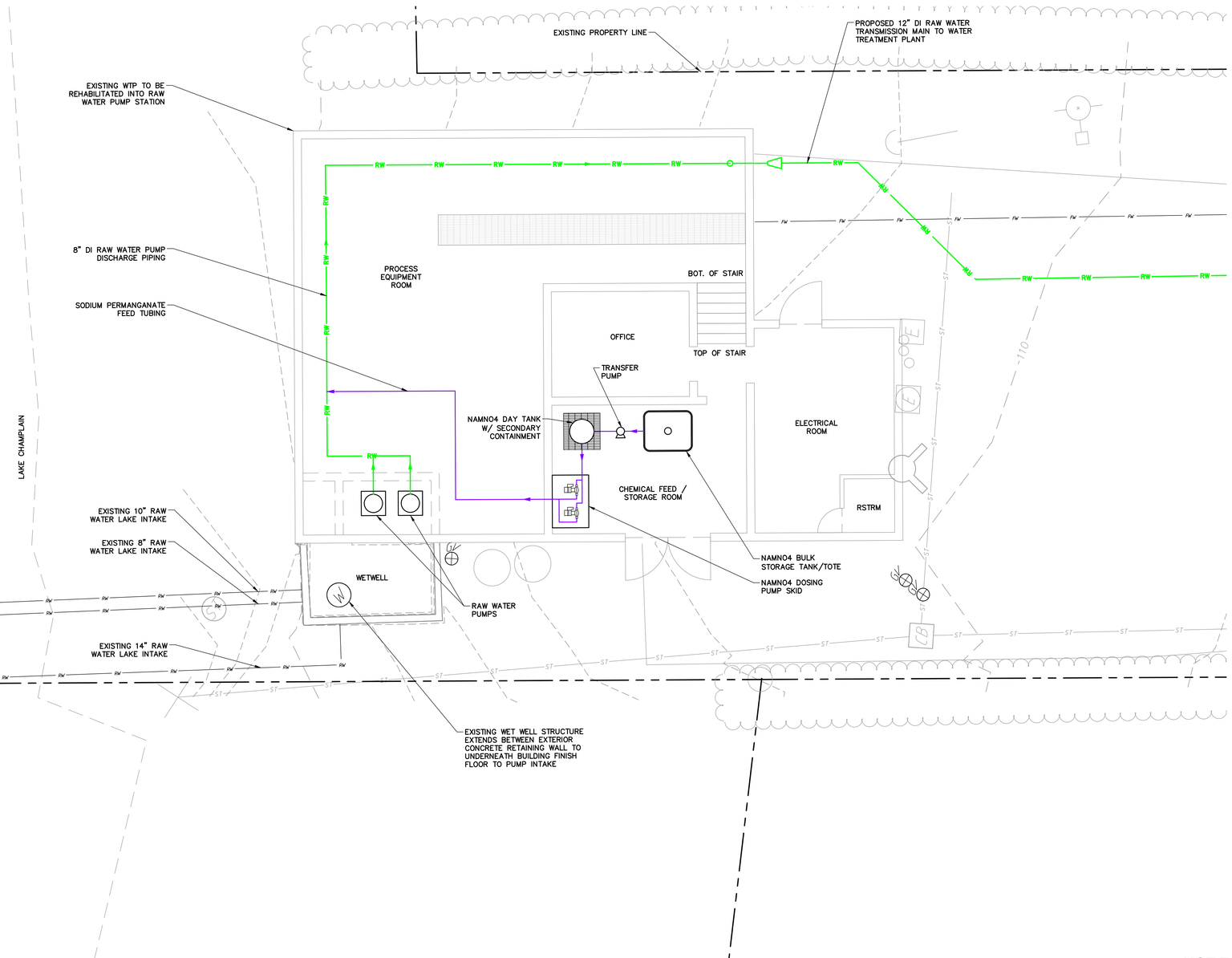
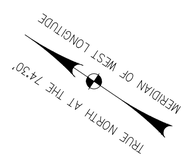
Date: Wed, Mar 13, 2024 - 9:01 AM (Name: bfitzgerald)

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RAW WATER MAIN
- EXISTING FINISHED WATER MAIN
- PROPOSED RAW WATER TRANSMISSION MAIN
- PROPOSED SODIUM PERMANGANATE (NAMNO4) CHEMICAL FEED





5' 2.5' 0 5'

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	BMF	PMH	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	PMH
DRAWN BY:	BMF
CHECKED BY:	CLD

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

RAW WATER PUMP STATION PROCESS PLAN

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.:
MJ PROJ. No.: 1075.11
DATE: 3/13/24

C-201

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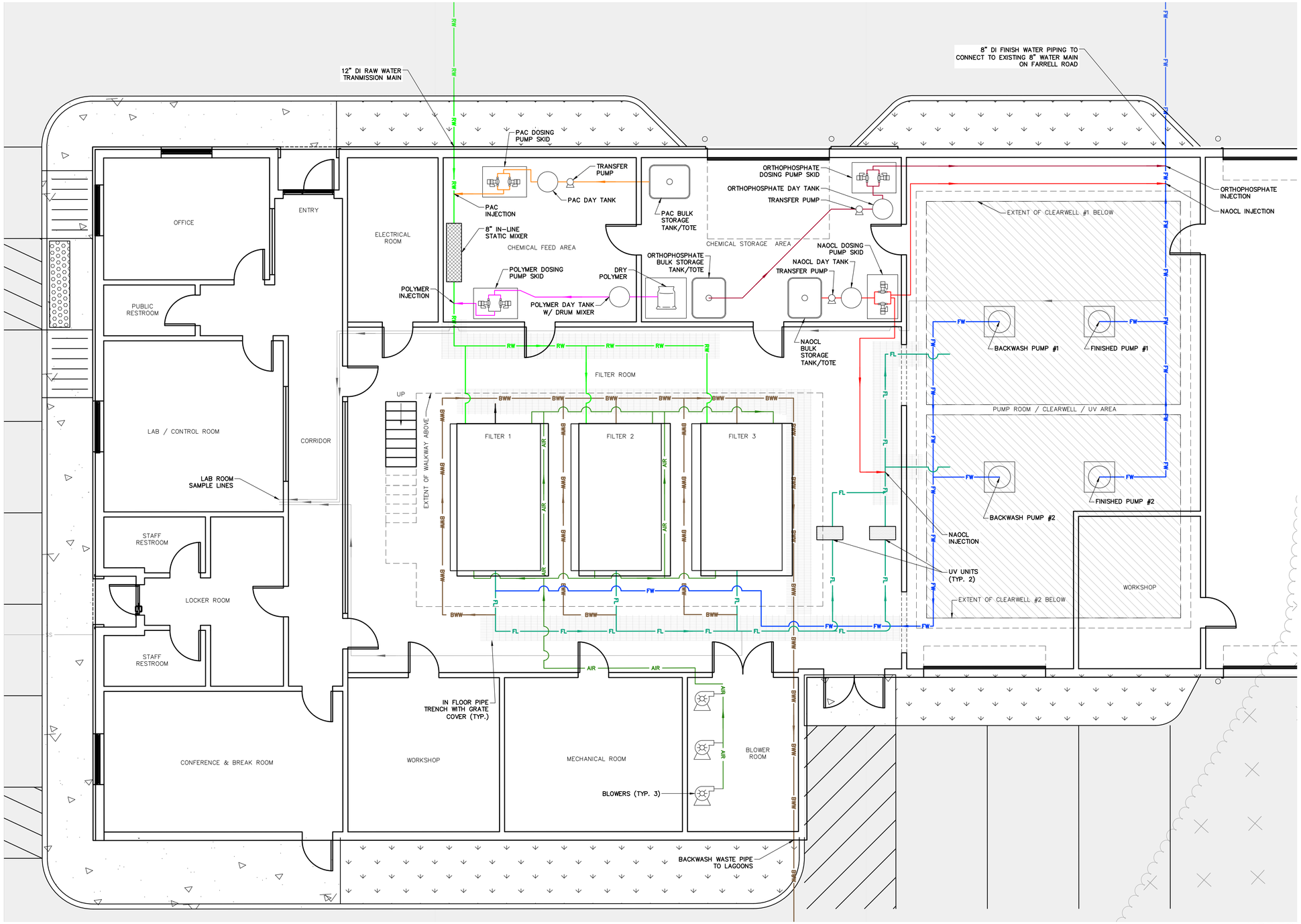
Date: Wed, Mar 13, 2024 - 9:01 AM (Name: bfitzgerald)



LEGEND

- RW — PROPOSED RAW WATER TRANSMISSION MAIN
- FW — PROPOSED FINISHED WATER MAIN
- BWW — PROPOSED BACKWASH WASTE PIPING
- FL — PROPOSED FILTERED WATER PIPING
- PROPOSED POLYALUMINUM CHLORIDE (PAC) CHEMICAL FEED
- PROPOSED POLYMER CHEMICAL FEED
- PROPOSED SODIUM HYPOCHLORITE (NAOCL) CHEMICAL FEED
- PROPOSED ORTHOPHOSPHATE CHEMICAL FEED
- AIR — PROPOSED AIR PIPING
- PROPOSED SAMPLE LINE

TRUE NORTH AT THE 74°30' MERIDIAN OF WEST LONGITUDE

5' 2.5' 0 5'

NOT FOR CONSTRUCTION

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	BMF	PMH	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	PMH
DRAWN BY:	BMF
CHECKED BY:	CLD

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

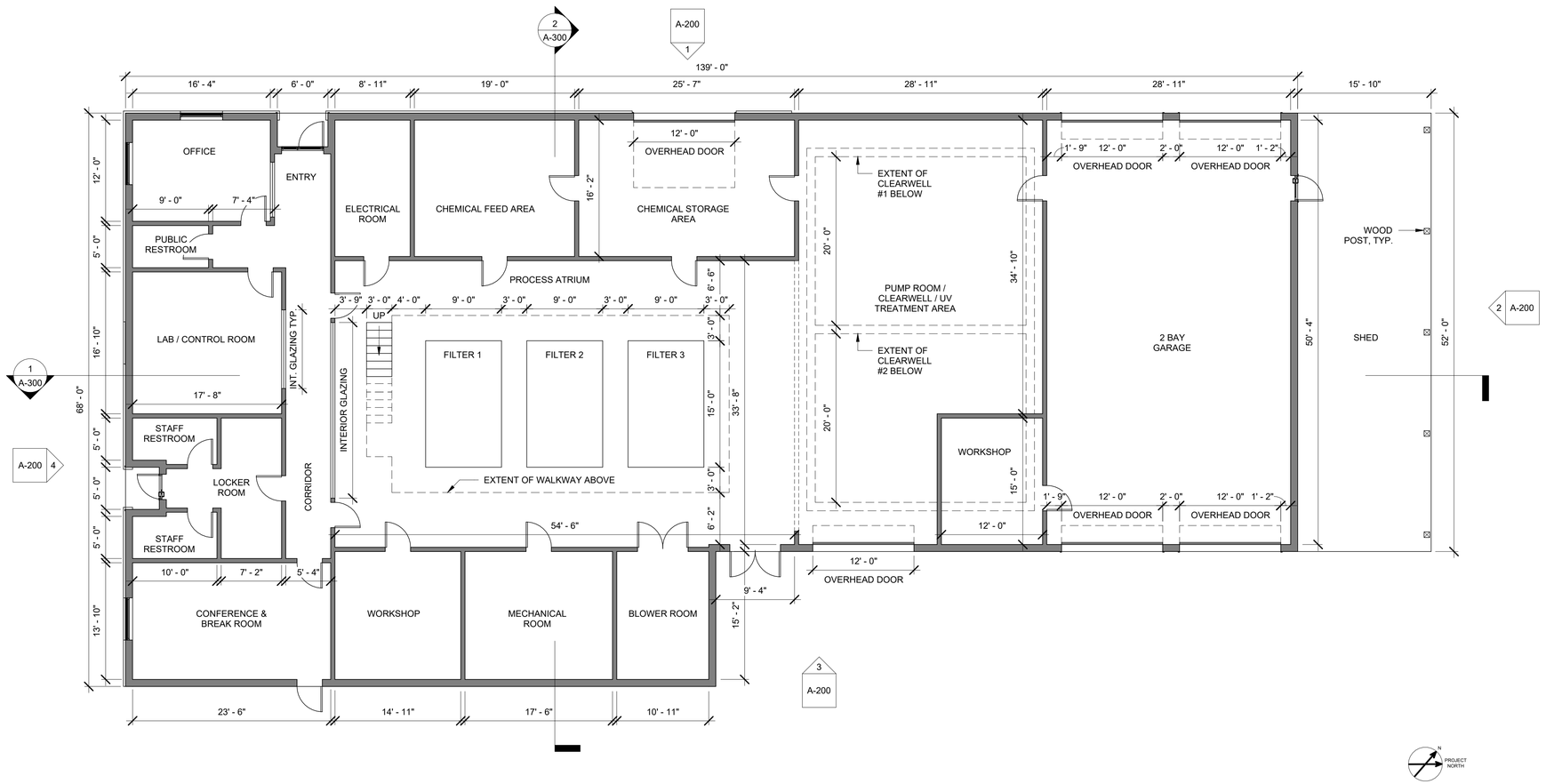
WATER TREATMENT PLANT PROCESS PLAN

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE:	AS SHOWN
CONTRACT No.:	
MJ PROJ. No.:	1075.11
DATE:	3/13/24

C-202

File Name: F:\MJ1075\1075.11 Town of Willsboro - WTP Design\21104-1 Willsboro\MJ1075.11 C-200 UTILITY PLAN.dwg (Layout: C-202)
Date: Wed, Mar 13, 2024 - 9:01 AM (Name: bfitzgerald)



1 FLOOR PLAN - planning board
1/8" = 1'-0"

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3/13/2024 9:49:14 AM

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24

PROJ. MANAGER:	CLD
DESIGNED BY:	ZLW
DRAWN BY:	JMF
CHECKED BY:	NGC

MJ Engineering and Land Surveying, P.C.

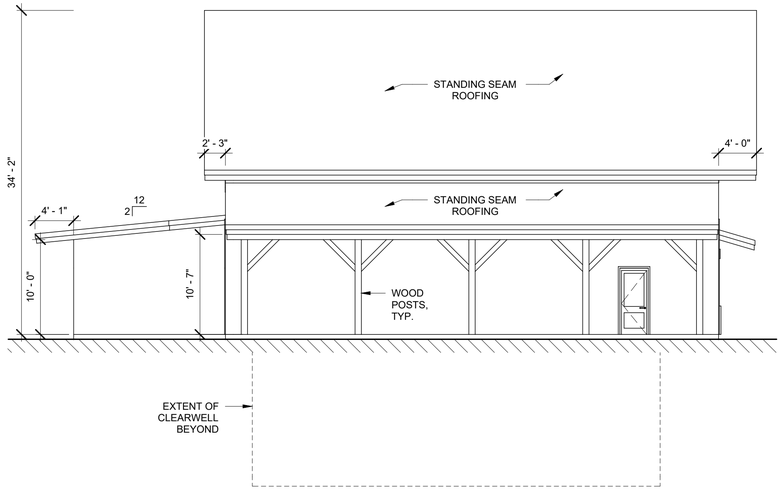
TOWN OF WILLSBORO

FIRST FLOOR PLAN

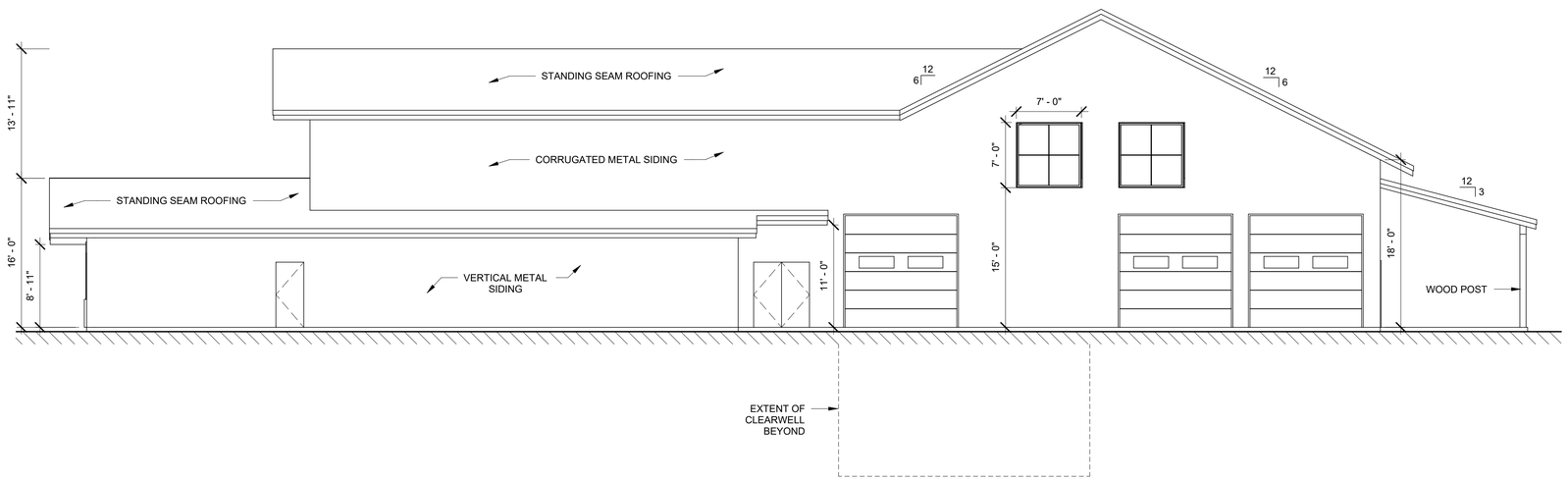
NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE:	AS SHOWN
CONTRACT No.:	-
MJ PROJ. No.:	1075.11
DATE:	3/13/24

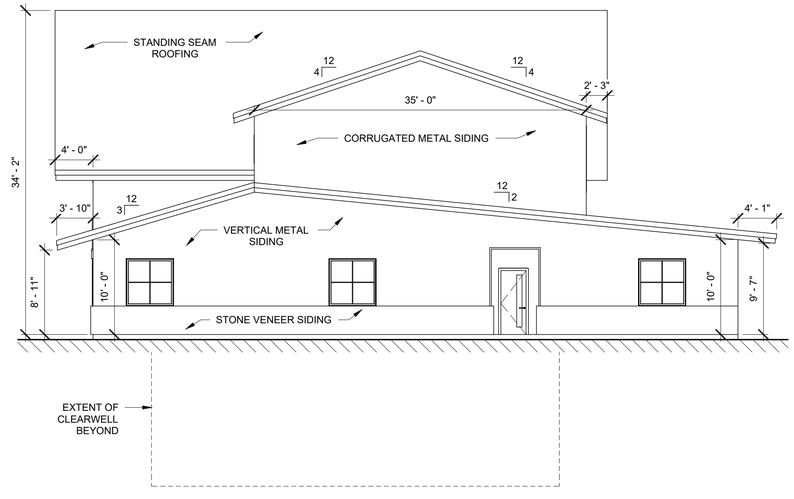
A-100



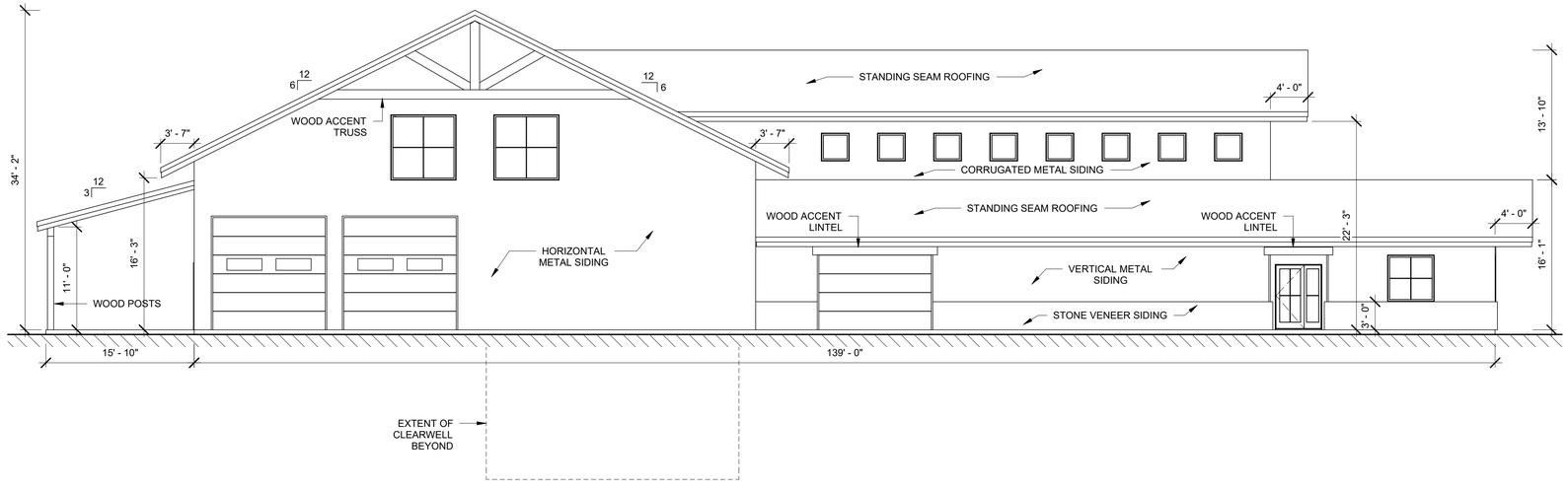
1 NORTH ELEVATION
1/8" = 1'-0"



2 EAST ELEVATION
1/8" = 1'-0"



3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

SUBMITTAL / REVISIONS							
No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE	PROJ. MANAGER:	CLD
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24	DESIGNED BY:	ZLW
						DRAWN BY:	JMF
						CHECKED BY:	NGC

MJ Engineering and Land Surveying, P.C.

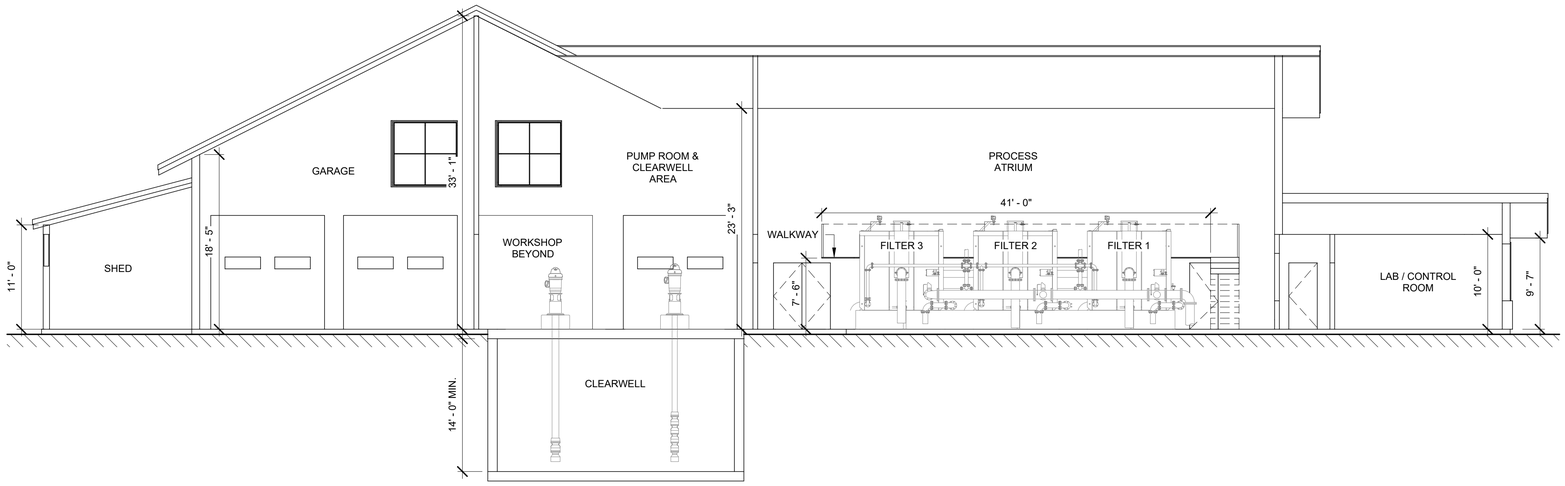
TOWN OF WILLSBORO

BUILDING ELEVATIONS

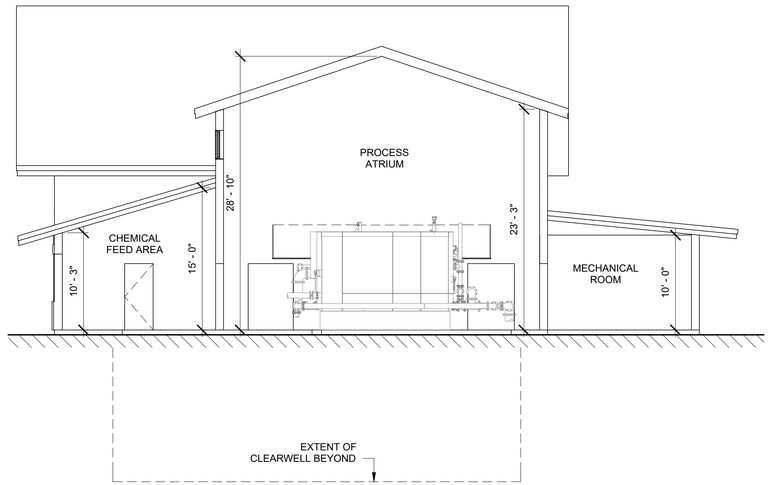
NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE:	AS SHOWN
CONTRACT No.:	-
MJ PROJ. No.:	1075.11
DATE:	3/13/24

A-200



1 BUILDING SECTION 1
1/8" = 1'-0"



2 BUILDING SECTION 2
1/8" = 1'-0"

SUBMITTAL / REVISIONS							
No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE	PROJ. MANAGER:	CLD
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24	DESIGNED BY:	ZLW
						DRAWN BY:	JMF
						CHECKED BY:	NGC

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

BUILDING SECTIONS

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.: -
MJ PROJ. No.: 1075.11
DATE: 3/13/24

A-300

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3/13/2024 9:49:15 AM

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE	PROJ. MANAGER:	CLD
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24	DESIGNED BY:	ZLW
						DRAWN BY:	JMF
						CHECKED BY:	NGC

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

ARCHITECTURAL RENDERING 1

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.: -
MJ PROJ. No.: 1075.11
DATE: 3/13/24

A-400

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3/13/2024 9:49:16 AM

SUBMITTAL / REVISIONS							
No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE	PROJ. MANAGER:	CLD
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24	DESIGNED BY:	ZLW
						DRAWN BY:	JMF
						CHECKED BY:	NGC

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TOWN OF WILLSBORO

ARCHITECTURAL RENDERING 2

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE:	AS SHOWN
CONTRACT No.:	-
MJ PROJ. No.:	1075.11
DATE:	3/13/24

A-401

SUBMITTAL / REVISIONS							
No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE	PROJ. MANAGER:	CLD
1	3/13/24	CONCEPTUAL DESIGN SUBMISSION	ZLW	NGC	3/13/24	DESIGNED BY:	ZLW
						DRAWN BY:	JMF
						CHECKED BY:	NGC

MJ Engineering and Land Surveying, P.C.

TOWN OF WILLSBORO

ARCHITECTURAL RENDERING 3

NEW WATER TREATMENT PLANT
ESSEX COUNTY, NY

SCALE: AS SHOWN
CONTRACT No.: -
MJ PROJ. No.: 1075.11
DATE: 3/13/24

A-402