

Environmental Impact Evaluation

Project Identification:

Expansion and Upgrade of The Mattabassett District Water Pollution Control Facility.

Cromwell, Connecticut

The applicant's Facility Plan and all associated comments submitted in regard to this project have been reviewed by the Connecticut Department of Environmental Protection (DEP) in accordance with the Connecticut Environmental Policy Act Regulations, Sections 22a-1a-1 through 22a-1a-12. The findings of this review are summarized below:

A. Summary of Environmental Review

In order to meet current environmental regulations and projected growth, The Mattabassett District Water Pollution Control Facility will require an expansion and upgrade. Overall wastewater flow and pollutant loads to the plant are projected to increase by approximately 75% by 2030. This increase is based on wastewater treatment capacity allotments requested by The District's member communities and contract communities, and accounts for the planned connection of the City of Middletown's wastewater flows to the District's system.

As a result of the aging system, increased environmental regulations that include nutrient removal, and projected increased flows, the Mattabassett District charged Black & Veatch with developing a Wastewater System Facilities Plan that addresses the needs of the wastewater treatment plant.

In accordance with the regulations of the Connecticut Environmental Policy Act sections 22a-1a-1 to 22a-1a-12, the findings of the environmental review of the Black & Veatch 2004 Waste Water System Facilities Plan as well as a "Value Engineering Evaluation & Hydraulic Evaluation" performed by Wright Pierce in 2008 are summarized below.

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1. Project Description

The 2004 Wastewater System Facilities Plan (2004 Facilities Plan) identified strategies for The Mattabassett District's Water Pollution Control Facility to remain in compliance with current and proposed regulations despite increases in flows and loads. These regulations include the Total Nitrogen to Long Island Sound TMDL requirement, the ability to treat high flows associated with extreme wet weather conditions, and the Capacity, Management, Operations, and Maintenance (CMOM) Program requirements.

The 2004 Facilities Plan assesses operation and maintenance requirements of the existing facility, the physical condition of the existing system, and presents recommendations for facilities and equipment improvements, a plan to implement nitrogen reduction at the plant for both the short-term and long-term future through 2030, a capital improvement plan through 2030, and planning level funding requirements.

In 2008, Wright-Pierce performed a Value Engineering Evaluation & Hydraulic Evaluation (2008 VE Evaluation) of the 2004 Facilities Plan. The 2008 VE Plan recommends the implementation of the Four-Stage Bardenpho process with two additional aeration tanks, a sidestream reactor and secondary clarifier tankage rather than the MLE process and would provide for future IFAS media addition if needed. The final plan will include the 2008 VE Plan recommendations.

The expanded and upgraded facility will require modifications of the four existing aeration tanks to the four-stage Bardenpho configuration. Included would be construction of baffle walls, anoxic zone mixers and internal recycle pumps. The four-stage Bardenpho process will also require the construction of two additional aeration tanks, two additional secondary clarifiers and a side stream reactor to treat solids handling recycle flows prior to discharge to the secondary treatment system. The side stream reactor will require construction of a new pump station to transfer solids handling recycle flows. There would be modifications to the Return Activated Sludge (RAS) pumping system to pump RAS from the existing and new secondary clarifiers to the sidestream reactor. A new primary effluent splitter structure to provide even flow split to each of the six aeration tanks will be required.

The project would be designed to allow for continual operation of the facility while the expansion and upgrades are implemented.

2. Existing Conditions

The Mattabassett District Water Pollution Control Facility processes wastewater from the member towns of New Britain, Cromwell and Berlin. The District also receives flow from portions of the non-member towns of Middletown, Farmington, Rocky Hill and Newington, and treats septage and merchant sludge from the surrounding communities. Treated effluent is discharged to the Connecticut River. From the outfall, the Connecticut River flows approximately twenty miles ultimately discharging to the Long Island Sound.

The existing Mattabassett District Water Pollution Control Facility has an average design flow of 20 MGD with a 45 MGD maximum sustained flow capacity. In 2010 the facility's average daily flow was 17.2 MGD with a daily maximum flow of 47 MGD. The plant provides primary and secondary biological wastewater treatment and is able to remove some nitrogen as well. All sludge is ultimately sent to the plant's fluidized bed incinerator. The ash from the incinerator is held onsite in one of the two existing ash lagoons. Periodically, the ash is removed and disposed of at the District's Ash Landfill.

3. Purpose and Need

Total Maximum Daily Load (TMDL) for nitrogen discharges to Long Island Sound has served as a principal driver in The District's decision to undertake this facility upgrade. The District recognizes that the nitrogen regulatory requirements could potentially impact operation and performance of all areas of the plant. In addition to evaluating alternative nitrogen treatment processes, needs for sludge dewatering, disinfection, service buildings, and emergency power upgrades were considered. Optimization and modernization of plant systems and facilities that were implemented in the mid -1980's were also looked at. There are also considerations to tie in the Middletown facility as well as anticipated growth that would require a facility upgrade and expansion. It is expected that Middletown's wastewater treatment facility will be decommissioned and all of its wastewater will be conveyed to the Mattabassett District for treatment. Middletown's Waste Water Treatment Facility is currently permitted at 6.75 MGD. Considering Middletown's flows, total flows to this facility are anticipated to increase even with increased abatement of combined sewers and infiltration. By year 2030 the treatment facility is anticipated to handle an annual average flow of 35 MGD and maximum monthly flow capacity of 55 MGD.

4. Discussion of Alternatives

a. No Action

The current system does not meet future discharge requirements for nitrogen removal. Costs for repairing and maintaining the system continue to increase as well as the cost

for nitrogen credits. The Mattabassett District Water Pollution Control Facility must prepare for the increased flows and loads from member and neighboring communities.

Besides the Mattabassett District Water Pollution Control Facility not meeting its own treatment goals, if no action is taken, Middletown Waste Water Treatment Facility would be required to upgrade their facility to meet permit limitations and existing flows. This would require increased expenditure as well as increased inefficiency of transporting thickened sludge to the Mattabassett District Water Pollution Control Facility. Given the close proximity of the two facilities and The Mattabassett District Water Pollution Control Facility currently having better treatment potential, it makes better fiscal and environmental sense to consolidate treatment at The Mattabassett District Water Pollution Control Facility.

The Mattabassett District Water Pollution Control Facility would also benefit from the improved equipment reliability that results from replacement of aging and worn equipment. New equipment and enhanced reliability would decrease future operation and maintenance costs.

b. Upgrade and Expand Facility

Upgrading the facility will allow for proper treatment of wastewater to meet NPDES permit requirements with future flow increases. Wastewater flow and pollutant loads are expected to increase 75% by 2030. This projection is based on wastewater treatment allotments requested by The District's member communities and the anticipated interconnection of the City of Middletown's wastewater flows. Depending on the level of nitrogen removal, the system will operate more cost effectively due to less purchasing of nitrogen credits. Much less funds would have to be designated for operation and maintenance which do not alleviate long term needs. An increased customer base will help to better stabilize user fees. Wastewater will be treated to a higher degree and meeting the goals for nitrogen removal to Long Island Sound will be feasible. Modifications to the plant to handle peak wet weather flow will reduce release of poorly treated wastewater during storm events.

Upgrading and expanding The Mattabassett District Water Pollution Control Facility is the most cost effective and environmentally responsible approach to treat wastewater within the region, and is the best approach to incur the least environmental impact while reaching overall wastewater treatment goals. As outlined below in the socio-economic impacts section this project is in line with other similar treatment facility improvement projects within the state and overall expenditure will result in more stable long term expenditures that are shared amongst a greater user base.

Two options for upgrading this facility were considered and are outlined below:

1. The 2004 Facilities Plan Option

This alternative is presented in the Draft Report Mattabassett District WPCF Facilities Plan by Black & Veatch dated November 2004. It would employ a phased approach to plant improvements, focused around nitrogen removal and plant hydraulic improvements. It attempts to maximize treatment capacity of existing major treatment units with the net result of reducing construction disturbances while providing much of the needed treatment to meet future nitrogen removal needs. Given the time remaining before the 2014 Nitrogen limits take effect, this option would have to be implemented in one phase, and is presented here as such.

Construction of upgrades to the existing biological treatment system with the inclusion of an innovative technology (Integrated Fixed Film Activated Sludge or IFAS) to achieve nitrogen removal would be undertaken. This would include modifications to the existing aeration tanks, the addition of one new 150 foot diameter in-ground concrete secondary settling tank, and a new pump station and piping to connect them.

Wet weather peak flow treatment improvements would be included. Modifications to one of the four existing primary settling tanks would be done to handle peak storm flows. The remaining primary settling system would be enhanced with the addition of a polymer system to increase the performance of these tanks. Peak storm flows from the wet weather treatment system would bypass the secondary treatment, blend with secondary effluent and discharge with plant effluent.

Other improvements included would provide support to the new treatment system and provide increased plant reliability. These include addition of fine screening of plant influent, replacement of the existing chemical disinfection with an ultraviolet light system, replacement of aging sludge dewatering equipment, replacement of the existing sludge incinerator with a new unit, and addition of and improvements to various plant support systems, such as electrical equipment, site access improvements and other miscellaneous improvements.

This alternative would add needed hydraulic capacity and pollutant treatment capacity. This is needed to handle the projected flows and loads to the plant over the planning period. It also provides much of the nitrogen removal capacity needed to meet the 2014 goal. One main drawback to this alternative is that it relies upon purchase of nitrogen credits to meet the plant's total obligation for nitrogen removal in the future.

2. The 2008 Value Engineering Report

This is the selected alternative and is presented in the Value Engineering Evaluation & Hydraulic Evaluation for the Mattabassett District Final Draft by Wright-Pierce dated October 2008. This alternative includes most of the features as the 2004 Facilities Plan alternative with the notable exception of being able to meet the 2014 Nitrogen removal goals.

This approach employs construction of additions and upgrades to the existing biological treatment system to achieve nitrogen removal to meet the 2014 General Permit limit for the plant. It includes two new in-ground concrete aeration tanks, a new "side stream" in-ground concrete tank to treat high strength waste from the sludge processing area and new in-ground concrete secondary settling tanks. A new pump station and piping system will connect them.

Peak wet weather flow treatment improvements would be included. Modifications would be made to two of the four existing primary settling tanks allowing them to treat peak storm flows. The remaining primary settling system would be enhanced with the addition of a polymer system to increase the performance of these tanks. Peak storm flows from the wet weather treatment system would bypass the secondary treatment and gravity discharge from the plant.

Other improvements would support the new treatment system and provide increased plant reliability. These include addition of fine screening of plant influent, modifications of the existing chemical disinfection, replacement of aging sludge dewatering equipment, replacement of the existing sludge incinerator with a new system, and addition of and improvements to various plant support systems, such as electrical equipment, site access improvements and other miscellaneous improvements.

This selected alternative provides hydraulic and treatment capacity to meet the plant's future obligations, including nitrogen removal. It also increases the plant reliability.

5. Impact of Proposed Project on the Environment

- a. Direct Impacts
 - i. Air Quality

As a result of the construction, the proposed project will have negative air quality impacts due to construction equipment and dust. Both of these impacts will be short term, and will be mitigated to the maximum extent available by inclusion of dust control

measures in the construction contracts. Noise impacts from construction and demolition will be mitigated by limiting work hours. The new incinerator will include modern air pollution control systems which will improve air quality.

ii. Water Quality

Effluent discharge will meet NPDES permit requirements. Total Nitrogen discharged to Long Island Sound will be significantly reduced. Collectively the Mattabasset District Water Pollution Control Facility and the Middletown Wastewater Treatment Facility average a total nitrogen discharge of 1700 pounds per day. At the same flow after the upgrade which includes combination of the facilities that total nitrogen would be reduced to approximately 600 pounds per day.

The proposed alternative will increase discharge reliability. The expanded facility will better handle wet weather flows. The expansion also accommodates the abandonment of Middletown's smaller antiquated treatment system.

iii. Environmentally Sensitive Areas

Floodplains: The demolition and construction are mainly within the confines of the existing facility, a recently acquired industrial property, and existing collection piping. Original contours will be restored upon completion of the construction. Construction of the proposed project will not increase flood hazards or flood elevations, nor will it adversely impact flood storage capability.

Wetlands: The construction is within the confines of the existing facility. Best management practices will be used to minimize or eliminate impacts to the wetlands adjacent to the proposed project. Erosion and sedimentation control will be used in all areas adjoining the wetlands. Filter fabric fencing and hay bales will be used to isolate the construction area from the adjoining wetland areas. Inspection will occur of all erosion measures after each rainfall and at least daily during prolonged rainfall. No construction equipment will be operated, located, or stored in the wetlands areas. All exposed soils will be restored to their former condition, either with appropriate foliage or with erosion-resistant stone cover.

iv. Socio – Economic Impacts

Wastewater Treatment Facility Improvements

Overall Program Opinion of Construction Cost

Preliminary Treatment-Screenings and Grit Removal	\$5,316,000
Nitrogen Removal and Secondary	\$39,069,000

Facilities	
Wet Weather Treatment Facilities	\$2,025,000
Solids Handling	\$11,039,000
U.V. Disinfection	\$1,349,000
Effluent Pump Station	\$7,004,000
Outside Sludge / Septage Receiving	\$518,000
WPCF Site / Building Needs	\$7,210,000
Incinerator Cost	\$20,070,000
Odor Control – Primaries and Sludge Storage Bldg	\$1,268,000
Electrical Upgrades	\$2,908,000
Middletown Force Main	\$499,000
Total	\$98,275,000

Revenue will be generated through a larger number of service fees due to an increased service area. Clean Water Funding as well as Middletown's initial tie in contribution will help reduce the capitalization costs of this upgrade.

Treatment Plant Funding Approximation

23% CWF Grant	\$22,603,250
77% Loan at 2% fixed annual rate for 20 years	\$75,671,750
Approximate Annual Cost	\$4,594,000

This loan estimation will be further reduced with Middletown's initial buy in fee that has not been finalized and included in this estimation as of yet.

v. Historical/Archeological and National Landmarks

The State Historic Preservation Office will review the proposed undertakings effect on historic, architectural, or archaeological resources listed on or eligible for the National Register of Historic Places. This projects proposed upgrade-related activities shall be undertaken within the confines of the existing facility.

vi. Endangered Species

A number of populations of State or Federal Endangered, Threatened, or Special Concern Species have extant populations adjoining the proposed project area. However, no impacts to these species are expected if the project remains within the confines of the currently proposed area. If the impacted area is altered during design, DEP program staff should be consulted for additional measures that may be necessary to provide the required protection for these species.

vii. Coastal Zone Management

The project area is not within the coastal management boundary.

viii. Wild and Scenic Rivers

Neither the Mattabassett River nor the Connecticut River is classified as a wild or scenic river in the vicinity of this project.

ix. Prime Farmland

The project will not be impacting any prime farmland areas that are not already within the confines of the treatment plant site.

c. Indirect Impacts

There will be no long-term adverse environmental impacts on air or water quality due to this project. There will be no change in flood elevations or long-term erosion patterns. There is no developable land within areas characterized as wetlands or floodplains which will be impacted by this project. This project will not result in displacement of homes or businesses. The facility upgrade is within the confines of the existing facility.

d. Irreversible and Irrecoverable Commitment of Resources

Resources being committed to the implementation of the project include all fuel, labor, and materials necessary for work involving the waste water treatment facility. This project also requires a long-term commitment on the part of the town to provide labor and management resources to properly operate and maintain the wastewater collection and conveyance system as well as the wastewater treatment facility.

e. Relationship of Project to Approved Land Use Plans

The project is in the confines of the existing facility. This location conforms to the Connecticut Conservation and Development Policies Plan 2006-2010 as prepared by the Connecticut Office of Policy and Management.

f. Unavoidable Adverse Impacts

Unavoidable adverse impacts are limited to short-term impacts directly related to construction operations. Dust and noise will be present during construction operations. Erosion and sedimentation may occur on the site. All these adverse impacts can be minimized, as shown below.

g. Mitigation of Adverse Environmental Impacts

In terms of air quality, dust pollution resulting from construction activities can be controlled by dust control measures such as calcium chloride or sprinkler trucks that minimize dust dispersion. Disruption due to noise can be minimized by restraining construction to normal working hours only.

To avoid any adverse water quality impacts, sediment and erosion control measures such as hay bale barriers and silt fences shall be used in wetlands areas. Construction easements through wetlands should be minimized as much as possible while still maintaining sufficient width for safe and efficient operations. No equipment or material storage will be allowed in the wetlands area. If any vegetative clearing is necessary, it should be minimized and should be immediately replaced after the end of construction. Last, to prevent disturbance of existing wetlands, no fill should be placed above existing contours in these areas.

h. Energy Considerations

Energy expenditure for this project falls into two categories: construction and operations. In terms of construction, energy consumption will be primarily that needed to power construction vehicles and produce construction materials. These expenditures are considered relatively minor. In terms of operation, the energy expenditures will be those needed to power the conveyance pumps at the pumping stations, and that energy used to operate the wastewater treatment facility. There is no foreseen substantial operational energy expenditure increase from previous conditions. The newer facility will have an increased efficiency in energy and operation expenditure. Abandonment of the Middletown Facility will eliminate energy and costs of conveying thickened sludge which is currently being trucked to the Mattabassett Facility.

6. Licenses, Permits, & Certifications Needed

a. NPDES Permit

The plant's current NPDES permit CT0100317 is based upon the plant Design Flow Rate of 20 MGD and is set to expire June 29, 2014. Given the proposed increase in plant design capacity as a result of the upgrade, the plant's permit will need to be modified. This may occur with the next permit renewal application which must be submitted 180 days prior to that.

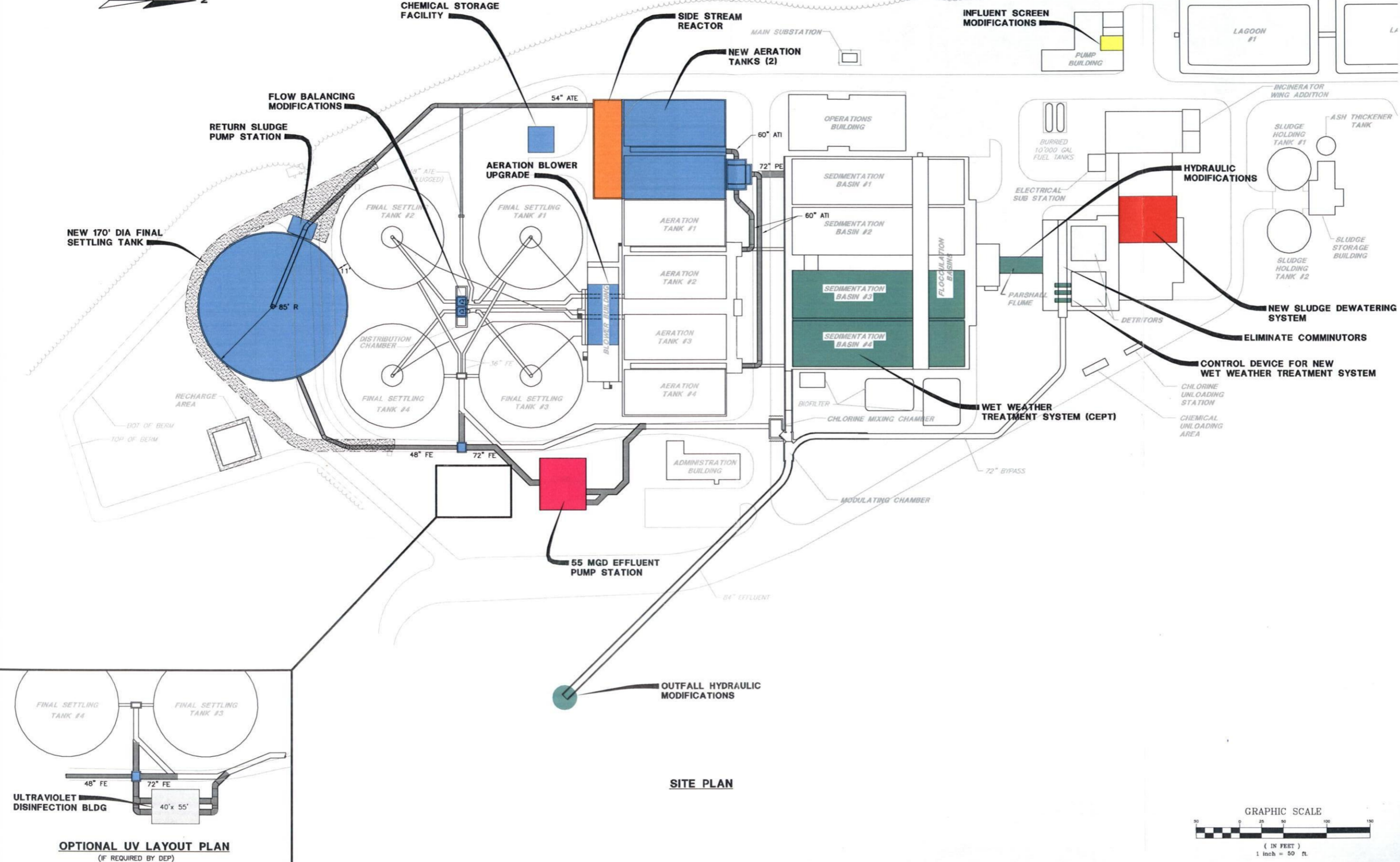
b. Flood Management Certificates

Flood Management Certification from the CT DEP was issued by the Department of Environmental Protection on March 1, 2011.

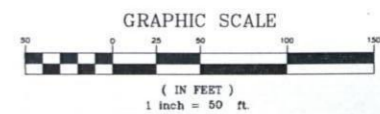
c. Stormwater Construction General Permit

d. Other Local Permits

Determinations for requirements of approvals from the Cromwell Planning and Zoning Commission still may be required for new structures associated with the plant upgrade, as well as local building permits may be required for new structures as well.



OPTIONAL UV LAYOUT PLAN
(IF REQUIRED BY DEP)



NO.	DATE	BY	REVISIONS

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THE MATTABASSETT DISTRICT
 NUTRIENT REMOVAL VALUE ENGINEERING
 AND HYDRAULIC EVALUATION
 RECOMMENDED IMPROVEMENT PLAN
 SITE LAYOUT

Mattabassett Water Pollution Control Facility

