TOWN OF SOUTHAMPTON
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP

COMMUNITY PRESERVATION FUND (CPF)

WATER QUALITY IMPROVEMENT PROGRAM

CHECKLIST/APPLICATION INSTRUCTIONS

The CPF Water Quality Improvement Project Plan (WQIPP) Fund follows the objectives in the adopted Water Quality Improvement Project Plan (see http://www.southamptontownny.gov/WQIPP)

To apply for funding, an application must be COMPLETED and submitted along with detailed narratives and supporting information as described below. Parcel acquisitions will be considered on an ongoing basis, independent of this application process.

Note: Electronic application submission required and 4 - full printed sets of application, site plan and narrative. Upload application at www.southamptontownny.gov/WQIPPSUBMISSION
A Public Hearing and Town Board Resolution will be required for all projects pursuant to Chapter 140 of the Town Code.

WATER QUALITY IMPROVEMENT PROJECT MEANS:

[1] DEFINITIONS:

1. **Wastewater Treatment Improvement Project** means the planning, design, construction, acquisition, enlargement, extension, or alteration of a wastewater treatment facility, including alternative systems to a sewage treatment plant or traditional septic system, to treat, neutralize, stabilize, eliminate or partially eliminate sewage or reduce pollutants in treatment facility effluent, including permanent or pilot demonstration wastewater treatment projects, or equipment or furnishings thereof. Stormwater collecting systems shall also be included within the definition of a wastewater improvement project.

2. **Nonpoint Source Abatement and Control Program Projects** developed pursuant to section eleven-b of the soil and water conservation districts law, title 14 of article 17 of the environmental conservation law, section 1455b of the federal coastal zone management act, or article forty-two of the executive law;

3. **Aquatic Habitat Restoration Project** means the planning, design, construction, management, maintenance, reconstruction, revitalization, or rejuvenation activities intended to improve waters of the state of ecological significance or any part thereof, including, but not limited to ponds, bogs, wetlands, bays, sounds, streams, rivers, or lakes and shorelines thereof, to support a spawning, nursery, wintering, migratory, nesting, breeding, feeding, or foraging environment for fish and wildlife and other biota.

4. **Pollution Prevention Project** means the planning, design, construction, improvement, maintenance or acquisition of facilities, production processes, equipment or buildings owned or operated by municipalities for the reduction, avoidance, or elimination of the use of toxic or hazardous substances or the generation of such substances or pollutants so as to reduce risks to public health or the environment, including changes in production processes or raw materials; such projects shall not include incineration, transfer from one medium of release or discharge to another medium, off-site or out-of-production recycling, end-of-pipe treatment or pollution control.

5. **The Operation of the Peconic Bay National Estuary Program**, as designated by the United States Environmental Protection Agency. Such projects shall have as their purpose the improvement of existing water quality to meet existing specific water quality standards. Projects which have as a purpose to permit or accommodate new growth shall not be included within this definition

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COMMUNITY PRESERVATION FUND (CPF)
WATER QUALITY IMPROVEMENT PROGRAM
PROPOSAL SUMMARY

Project Applicant: Village of Southampton
Project Title: Old Town Pond Constructed Treatment Wetland
Project Manager Name: Gary Goleski

Name	Gary Goleski
Title	Superintendent of Public Works
Organization	Village of Southampton
Address	23 Main Street, Southampton NY 11968
Phone	631-283-0247
Email	ggoleski@southamptonvillage.org

Property owner (if different from Project manager organization):

Name	Same
Affiliation	
Organization	
Address	
Phone	
Email	

Project Address: Old Town Pond SCTM #(S) 904 018 029 1

Type of Project (Check all that apply):
☑ Reduction ☐ Remediation ☐ Restoration

Project Summary: (Provide a brief narrative description of proposed WQIPP project)

The Village of Southampton proposes final design and construction of an enhanced horizontal subsurface flow constructed treatment wetland (CTW) system to treat nitrogen at Old Town Pond, located less than a mile from the Village of Southampton central business district.

The project scope of work will consist of additional groundwater characterization, engineering design, permitting and regulatory approvals, construction, startup, and maintenance. Based on the initial groundwater characterization conducted by the Village's engineering consultant, the CTW will be able to treat 25,000 gallons per day (gpd) of nitrogen impacted stormwater, shallow groundwater, and surface water, and remove approximately 1,000 pounds of nitrogen from Old Town Pond each year.

Old Town Pond is assessed by the NYSDEC as an impaired waterbody that experiences frequent harmful algal blooms. The expected outcomes of the CTW system are to reduce total nitrogen levels in Old Town Pond, reduce likelihood of algal blooms, and reduce the toxicity of blue green algae.

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If additional information is needed to describe the project; a project narrative can accompany the application. Please limit the narrative to approximately 3 pages of project description, provide a summary of water quality benefits/objectives of approximately 2 pages and provide a cost estimate of approximately 2 to 4 pages with supporting estimates. Any additional materials should be focused specifically on the proposed project with references to other studies that are pertinent

1. PROJECT TYPE (check all that apply)

Must meet at least one of the definitions of "Water Quality Improvement Project" per State Law Chapter 551 cited above. Check all that apply.

- ☐ Wastewater Treatment Improvement Project
- ☑ Non-point source abatement and control
- ☐ Aquatic habitat restoration
- ☐ Pollution prevention
- ☐ Operation of Peconic Bay National Estuary Program (Grant Match)

Note: Monitoring costs are only potentially eligible for CPF funding within Aquatic habitat restoration projects.

2. PRIORITY AREA(S) (check all that apply)

Priority areas are defined in the Water Quality Improvement Project Plan (WQIPP).

- ☑ 303(d) Impaired
- ☑ High
- ☐ Medium
- ☐ Outside High and Medium priority areas*

*If Outside High and Medium priority areas, explain how the project is relevant to WQIPP goals.

3. PROJECT DESCRIPTION

3a. Existing conditions of applicable groundwater/sub-watershed/waterbody and most recent and relevant data available (provide sources).

Old Town Pond is an impaired waterbody that experiences harmful algal blooms. Nonpoint stormwater runoff is a known source of pollutants, as reported by the NYSDEC Priority Waterbody List 0701-0118). See attached Feasibility Study.

3b. How the proposed solution addresses the issue in the context of Reduction, Remediation and/or Restoration as per the CPF Water Quality Project Plan. Note all remediation and restoration projects must assure that reduction measures are also addressed.

A significant portion of the nitrogen loading to Old Town Pond is entering Old Town Pond from shallow groundwater at the north end of the pond. The proposed project consists of installing a horizontal subsurface flow constructed treatment wetland (CTW) on the north end of Old Town Pond, which will be designed to enhance microbial nitrogen treatment process (ammonification, nitrification, and denitrification) to provide sustainable, year-round nitrogen removal. See attached Feasibility Study.

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3c. Describe the proposed technology and its demonstrated efficacy in similar settings. May include published data.

See attached Feasibility Study.

3d. How the project supports Town of Southampton, Suffolk County, NYSDEC, Long Island Nitrogen Action Plan (LINAP) or other adopted goals/policies (provide references with pages numbers).

See Attachment 1.

3e. Review the following statements and indicate whether they are applicable to your project. For all "Yes" responses, please indicate how your project addresses the requirements indicated.

YES	N/A	
☑	☐	**If stormwater system or drainage is proposed:** The project must indicate compliance with the New York State Stormwater Design Manual (2015 and as updated).
☐	☑	**If project is related to farmland:** Describe any Agricultural Stewardship Plan or other long term strategy for Nitrogen abatement.
☐	☑	**If the project is for habitat restoration:** The narrative must address how underlying causes are being ameliorated and expected outcomes for local species populations or other ecological considerations are given.
☐	☑	**If project is a Sewage Treatment Plant (STP) or cluster treatment system:** Fund allocation request is based on cost for reduction of pre-existing conditions and not for purpose of accommodating new density (describe pre-existing density and associated flow (gallons per day) and total projected nitrogen reduction in narrative). Include detailed information on how many homes the system would treat as well as potential for formation of Sewer District, if required by Suffolk County Health Department or Town Law.
☐	☑	**If the project is requesting grant match:** Include information related to funding program source and purpose of application and any relevant items on this checklist. Note: A Town Board resolution will be required in order to encumber matching funds for grant applications.

4. WATER QUALITY BENEFIT

4a. Identify Nitrogen, Pathogen or Pollutant of Concern (POC) including Existing Condition and Target Reduction.

Nitrogen reduction is estimated at 1,000 LBS/YEAR.

See attached Feasibility Study.

4b. Describe plans for collecting and reporting on water quality over time.

The Village will continue to work with Dr. Gobler of the NYS Center for Clean Water Technology for ongoing water quality monitoring.

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4c. Indicate useful life of proposed technology (must meet or exceed five years).

30+ years with maintenance. See attached Feasibility Study.

5. COST FACTORS

5a. Explain how you have confirmed that the proposed budget is reasonable, appropriate and necessary. If available, provide third party estimates or other documentation of how costs were determined.

Cost estimates were prepared by professional engineering firm Roux Environmental Engineering and Geology, D.P.C. See attached Feasibility Study and statement of Qualifications of Principal Engineer, Charles J. McGuckin, P.E.

5b. Describe any matching funds to be provided.

The Village self-funded the attached feasibility study at a cost of $16,300. This amount is included in the proposal budget as the matching share.

5c. Explain: i. Why project cannot proceed and intended benefits cannot be achieved without external funding.
ii. if funds are awarded at a lower level than requested, or if there are cost overruns, explain how the project will proceed.

The Village has invested substantial funding to complete numerous stormwater remediation and other water quality improvement initiatives throughout the Village over the past 10+ years. It is also currently working toward design and engineering for a sewer district. Because funding needs far outweigh available local resources, the Village has attempted to leverage SCWQPRP, Community Preservation Fund (CPF), NYS, local, and other sources whenever possible. If funds are not awarded by CPF, or are awarded at a lower level than requested, the project will be delayed while additional funding sources are identified.

6. MANAGEMENT, EXPERIENCE, ABILITY

6a. Describe applicant's experience in completing similar projects.

Gary Goleski, Superintendent of Public Works, will perform the role of Project Manager. He has a degree in Public Sector Management from Cornell University and has been with the Village for more than 25 years. His educational and experiential background make him well qualified to oversee successful implementation of the proposed project. Under Mr. Goleski's direction, the Village has successfully administered several prior CPF and SCWQPRP grant awards in compliance with Town and County requirements.

6b. Describe community support or opposition to project. If there is opposition, explain how this is to be addressed.

The Village has received expressions of community support for the project. No opposition is noted. The Village of Southampton will engage the public in the design and construction and startup phases of the project through presentations to be made at meetings of the Village Board. Updates will also be provided via the Village newsletter and special events to raise awareness around water quality issues and the Village's ongoing efforts around environmental protection.

6c. Describe any permits needed and time frame/status of approvals. If permits are approved, indicate same.

See attached Feasibility Study.

CP-13107 (rev. 4/2021)

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7. MAINTENANCE, MONITORING, EVALUATION

Estimate ongoing maintenance costs and explain how these will be supported. Explain stewardship and monitoring activities planned for ensuring sustainability of the project.

See attached Feasibility Study.

8. DURATION OF PROJECT

8a. Provide a projected project timeline.

See attached Feasibility Study.

8b. If project is multi-year or phased, provide a breakdown of budget and milestones for each year and phase.

N/A

9. ATTESTATION

Allocation of CPF funds will not be for the purpose of accommodating new growth, as this is prohibited by State law.

☑ Check box to certify that funds will not be directed for projects for the purpose of accommodating new growth.

Signature: _____ Date 5/13/21

10. REQUIRED ATTACHMENTS Confirm that the following required documents are attached to this application:

- ☑ Photos of existing conditions
- ☑ Location Map
- ☑ State Environmental Quality Review Act (SEQRA) Long or Short Environmental Assessment Form (EAF) https://www.dec.ny.gov/permits/6191.html
- ☑ Completed EPA Spreadsheet Tool for Evaluating Pollutant Load (STEPL) https://www.epa.gov/nps/spreadsheet-tool-estimating-pollutant-loads-stepl or similar standardized methodology (describe)
- ☑ Project budget (see attached template)
- ☑ Ownership commitment is provided via letter of intent (LOI) for non-municipal owners or municipal resolution for municipal owners

11. OTHER ATTACHMENTS

List other attachments provided, including cost estimates, bids, plans, documentation of matching funds, and other as appropriate to demonstrate project readiness, quality, feasibility, and cost effectiveness

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BUDGET PROPOSAL

PLANNING/ENGINEERING/DESIGN	Town CPF Request	Matching Funds Committed	Matching Funds Pending	Estimated Total Project Costs
Task 1- Design bidding to select consultant	$- 2,500.00	$-	$-	$- 2,500.00
Task 2- Water Quality Testing to support design	$- 26,800.00	$-	$-	$- 26,800.00
Task 3- Draft Engineering Design	$- 52,000.00	$-	$-	$- 52,000.00
Task 4- Permitting/Regulatory Support	$- 14,100.00	$-	$-	$- 14,100.00
Task 5- Final Engineering/Bid support	$- 43,600.00	$-	$-	$- 43,600.00
Task 6- Startup & Performance Monitoring Year 1	$- 63,200.00	$-	$-	$- 63,200.00
	$-	$-	$-	$- 0.00
Planning/Engineering/Design Cost Total	$- 202,200.00	$- 0.00	$- 0.00	$- 202,200.00

Contractual Services				
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
Contractual Services Cost Total	$- 0.00	$- 0.00	$- 0.00	$- 0.00

Construction & Site Improvements				
Construction (per attached estimate)	$- 779,500.00	$-	$-	$- 779,500.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
Construction & Site Improvements Cost Total	$- 779,500.00	$- 0.00	$- 0.00	$- 779,500.00

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Equipment/Materials/Supplies	Town CPF Request	Matching Funds Committed	Matching Funds Pending	Estimated Total Project Costs
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
	$-	$-	$-	$-0.00
				$ 0.00
				$ 0.00
				$ 0.00
				$ 0.00
				$ 0.00
				$ 0.00
				$ 0.00
Equipment/Materials/Supplies Total	$-0.00	$0.00	$-0.00	$-0.00

Additional Cost				
Feasibility Study (matching share; pre-application cost)	$-	$- 16,300.00	$-	$- 16,300.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
	$-	$-	$-	$- 0.00
Additional Cost Total	$- 0.00	$- 16,300.00	$- 0.00	$- 16,300.00

Planning/Engineering/Design Cost Total (from page 7)	$- 202,200.00	$- 0.00	$- 0.00	$- 202,200.00

Total Project Cost	$-998,000.00
Applicant matching funds committed	$-16,300.00
Applicant matching funds pending approval (e.g. grant request submitted pending determination)	$-0.00
Total CPF Funds Requested	$-981,700.00

Source of matching funds	Amount
Southampton Village Match (pre-application cost)	$ 16,300.00

September 15, 2021

Ms. Lisa Kombrink
Community Preservation Fund Manager
Department of Community Preservation
Town of Southampton
116 Hampton Road
Southampton, NY 11968

Re: In support of Old Town Pond Constructed Treatment Wetland

Dear Ms. Kombrink:

The Village of Southampton Environmental Committee and Clean Water Task Force Members would like to express our strong support for the grant application being submitted by the Village of Southampton for the Old Town Pond Constructed Treatment Wetland. If funded, this project will provide a Constructed Treatment Wetland system with groundwater collection trench (pumped), aerated gravel nitrification zone, woodchip denitrification zone and in-pond re-aeration zone to treat nitrogen at Old Town Pond.

For Village residents, support for water quality improvement projects is a priority. A Management Plan with summaries recommending strategies to restore Old Town Pond was approved by the Mayor/Board of Trustees in 2020 and is posted on the Village web site. Old Town Pond is included on the current (2016) NYS Section 303(d) List of Impaired Waters with frequent occurrences of blue-green algae blooms from 2014 to 2021. As a result, health officials have asked residents not to use or swim or wade in these waters and to keep their children and pets away from the area.

Based on groundwater sampling results by Roux Environmental Engineering for the Village in January 2021, a significant portion of the nitrogen loading coming into Old Town Pond is from groundwater. A Constructed Treatment Wetland system at the north end of Old Town Pond will be able to treat 25,000 gallons per day of nitrogen impacted stormwater and groundwater, removing approximately 1,000 pounds of nitrogen from Old Town Pond each year. In addition, it can treat some of the nitrogen already present in Old Town Pond by using a surface water pumping system.

In summary, the wetland will:

- Provide sustainable nitrogen treatment for Old Town Pond;
- Reduce nitrogen inputs from groundwater flowing into Old Town Pond; and
- Remove nitrogen already in Old Town Pond.

Action is needed to limit the nutrients and pollutants that contribute to the harmful algae blooms. This project is a strong step in the right direction, and we hope that this proposal receives every consideration from the Town of Southampton for Green Innovation Grant Program funds.

Importantly, as an integrated component of the Old Town Pond management plan, approved by the Village of Southampton Mayor & Board of Trustees in December 2020, a Constructed Treatment Wetland will also complement bioswales that will be constructed by the Village later this year at the north and south ends of Old Town Pond. The protective vegetation and naturally occurring plants will combine with the wetland to help reduce harmful pollutants flowing into Old Town Pond.

Sincerely yours,

/s/ Tom Louthan for Village of Southampton Environmental Committee & Clean Water Task Force Members: Rob Coburn & Tom Louthan Co-Chairs, John Halsey, Daniela Kronemeyer, Holly Peterson. https://www.southamptonvillage.org/251/Environmental-Committee

TOWN OF SOUTHAMPTON COMMUNITY PRESERVATION FUND
WATER QUALITY IMPROVEMENT PROGRAM

VILLAGE OF SOUTHAMPTON
OLD TOWN POND CONSTRUCTED TREATMENT WETLAND

Supporting Documentation

VILLAGE OF SOUTHAMPTON
OLD TOWN POND CONSTRUCTED TREATMENT WETLAND

ATTACHMENT 1
SUPPLEMENTAL NARRATIVES

PROJECT SUMMARY:

The Village of Southampton proposes final design and construction of an enhanced horizontal subsurface flow constructed treatment wetland (CTW) system to treat nitrogen at Old Town Pond, located less than a mile from the Village of Southampton central business district.

The project scope of work will consist of additional groundwater characterization, engineering design, permitting and regulatory approvals, construction, startup, and maintenance. Based on the initial groundwater characterization conducted by the Village's engineering consultant, the CTW will be able to treat 25,000 gallons per day (gpd) of nitrogen impacted stormwater, shallow groundwater, and surface water, and remove approximately 1,000 pounds of nitrogen from Old Town Pond each year.

Old Town Pond is assessed by the NYSDEC as an impaired waterbody that experiences frequent harmful algal blooms. The expected outcomes of the CTW system are to reduce total nitrogen levels in Old Town Pond, reduce likelihood of algal blooms, and reduce the toxicity of blue green algae.

The project is complementary and additive to the Old Town Pond bioswale project that was funded by the CPF program in 2020, and will provide additional nitrogen removal benefits.

Please refer to the attached feasibility study.

3. PROJECT DESCRIPTION

3a. Existing conditions of applicable groundwater/sub-watershed/waterbody and most recent and relevant data available (provide sources).

Old Town Pond is assessed by the NYSDEC as an impaired waterbody due to recreational uses that are considered to be impaired by frequent to persistent occurrences of harmful algal blooms. Aquatic life may also be impacted by resulting low dissolved oxygen in the ponds. Nonpoint stormwater runoff is a known source of pollutants, as reported by the NYSDEC Priority Waterbody List for Old Town Pond (0701-0118). The NYSDEC has documented the occurrence of Harmful Algal Blooms (HABs) in Old Town

Pond every year from 2014 to 2020. In July 2020, there were six (6) Harmful Algal Bloom notifications posted by the NYSDEC, on July 1,6,15,20, 23 and 29.[1]

The Village is working to reduce flow of pollutants into the pond in order to improve water quality, protect public health and support health of the Long Island South Shore Estuary Reserve. Bioswales are planned for installation in the near future, supported in part by Town of Southampton CPF funds. The proposed project will provide maximal pollutant load reduction benefit.

3d. How the project supports Town of Southampton, Suffolk County, NYSDEC, Long Island Nitrogen Action Plan (LINAP) or other adopted goals/policies (provide references with pages numbers).

Long Island South Shore Estuary Reserve Comprehensive Management Plan (SSER CMP)[2]
The NYSDEC PWL indicates that the waterbody is included within the South Shore Estuary Reserve (SSER). The SSER CMP is an element of the LI Nitrogen Action Plan. The project is supported by SSER implementation action 1-1: *Construction of stormwater abatement projects in significant nonpoint source contributing areas associated with closed shellfish beds, impaired living resources, and bathing beaches that experience periodic closures due to water quality concerns.*

Suffolk County Subwatershed Plan[3]
Old Town Pond is discussed as a water body that has experienced freshwater Harmful Algal Blooms (HABs), and is indicated as a Priority 1 subwatershed for nitrogen reduction via wastewater management (p. 2-74). While the Village is actively investigating wastewater management options relating to onsite septic systems, stormwater inputs are a feasible near-term action that will improve water quality.

Town of Southampton Water Quality Improvement Project Plan[4]
The plan indicates that stormwater collection/abatement initiatives meet State Law Chapter 551 definition of "water quality improvement project" and "wastewater treatment improvement project." Stormwater Best Management Practices and treatment fall within the category of mitigation initiatives for nitrogen pollution (p. 21). Old Town Pond is shown in the Plan as being situated in a High Priority area. See attached map.

Village of Southampton Old Town Pond-Wickapogue Pond 2020 Management Plan[5]
The Management Plan calls for stormwater improvements including bioswales in the Old Town Pond watershed for the purpose of pollutant reduction.

[1] https://nysdec.maps.arcgis.com/apps/webappviewer/index.html?id=ae91142c812a4ab997ba739ed9723e6e
[2] https://www.dos.ny.gov/opd/sser/pdf/Full%20CMP%20Document.pdf
[3] https://suffolkcountyny.gov/Portals/0/formsdocs/planning/CEQ/2020/RevisedComplete%20SWP2-21-20.pdf
[4] https://www.southamptontownny.gov/DocumentCenter/View/7318/Water-Quality-Improvement-Plan-CPF-Referendum-PDF?bidId=
[5] https://www.southamptonvillage.org/DocumentCenter/View/768/Old-Town-Pond---Wickapogue-Pond-2020-Management-Plan-Summary-Recommendations

Village of Southampton

23 MAIN STREET
SOUTHAMPTON, NEW YORK 11968-4899

Phone: (631) 283-0247
Fax: (631) 283-4990
Website: www.southamptonvillage.org

Resolution
2021-17

Information: Approve the 2021 Town of Southampton Community Preservation Fund Water Quality Improvement Program application to support the Constructed Treatment Wetland at Old Town Pond.

Department:	Village Hall	**Sponsors:**	
Category:	Resolutions	**Functions:**	

Financial Impact

Body

RESOLVED, that the Village of Southampton hereby authorizes the Mayor or his designee to execute any and all documents pertaining to the 2021 Town of Southampton Community Preservation Fund Water Quality Improvement Program application to support estimated project costs associated with design and construction of a Constructed Treatment Wetland at Old Town Pond.

Voting

Motioned: Mayor Warren
Seconded: Trustee Parash
All in favor: Mayor Warren, Trustee Arresta, Trustee McLoughlin, Trustee Parash, Trustee Pilaro.
Y: Five
N: None
A: None
N/A:

Certified By:

Charlene G. Kagel-Betts CPA, CGMA

Administrator, Village of Southampton

Village of Southampton

23 MAIN STREET
SOUTHAMPTON, NEW YORK 11968-4899

Phone: (631) 283-0247
Fax: (631) 283-4990
Website: www.southamptonvillage.org
email: info@southamptonvillage.org

STATE OF NEW YORK
ss:
COUNTY OF SUFFOLK

This is to certify that the following is a true, accurate, and complete copy of a resolution which was adopted by the Board of Trustees of the Village of Southampton on February 11, 2021. The original of this resolution is on file in the Clerk's Office in Village Hall, 23 Main Street, Southampton, NY 11968.

WHEREAS, The New York State Green Innovation Grant Program (GIGP) provides grants on a competitive basis to projects that improve water quality and mitigate the effects of climate change through practices including green stormwater infrastructure, energy efficiency and water efficiency; and

WHEREAS, GIGP funding is provided through the Clean Water State Revolving Fund and is administered by the New York State Environmental Facilities Corporation (EFC), and

WHEREAS, the Village of Southampton intends to request GIGP funding for the Old Town Pond Green Infrastructure Project for the purpose of installing a constructed treatment wetland in the Old Town Pond watershed area; and

WHEREAS, The Village of Southampton is eligible to apply for up to 90% of eligible project costs; and

WHEREAS, on behalf of the Village, Roux Environmental Engineering & Geology, DPC (Roux) has prepared the conceptual design plan, Feasibility Study and Short Environmental Assessment Form, Parts I, II and III pursuant to the NY State Environmental Quality Review Act, which identified no potential for significant adverse impacts and recommended that the Village Board adopt a Negative Declaration; and

WHEREAS, the estimated cost of the project is $981,700;

NOW, THEREFORE, BE IT RESOLVED, that the Village Board of the Village of Southampton hereby states its support of the Water Quality Improvement Project at Old Town Pond, and authorizes the Mayor or his designee to sign any and all documents related to the grant; and be it further

RESOLVED that the Village will request 90% of eligible project costs, up to an estimated $883,530 in GIGP funds and providing a 10% matching share estimated at $98,170; and be it further

RESOLVED that the Village Board accepts the SEQR documentation prepared by Roux and adopts a Negative Declaration.

On a motion by Mayor Warren and seconded by Trustee Arresta, the resolution was unanimously approved.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Village of Southampton this 12th day of February 2021.

Charlene Kagel-Betts, CPA, CGM
Administrator
Incorporated Village of Southampton

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 – Project and Sponsor Information

Old Town Pond Water Quality Improvement Project

Name of Action or Project:

Old Town Pond, Southampton, NY

Project Location (describe, and attach a location map):

Up-gradient of Old Town Pond within easement area

Brief Description of Proposed Action:

The proposed project consists of installing a horizontal subsurface flow constructed treatment wetland (CTW) on the north end of Old Town Pond, in an area owned by the Village of Southampton. The CTW system will be designed to enhance microbial nitrogen treatment processes (ammonification, nitrification, and denitrification) to provide sustainable, year-round nitrogen removal. The CTW design for this project will be innovative, and engineered specifically for treatment of stormwater, shallow groundwater and surface water at the site. In addition, the CTW will maintain the park-like aesthetic of the area, with the surface of the wetland planted with native wetland plants.

Name of Applicant or Sponsor:	Telephone: 631-283-0247 Ext. 224
Village of Southampton	E-Mail: ckagel-betts@southamptonvillage.org

Address:

23 Main Street

City/PO:	State:	Zip Code:
Southampton	New York	11968

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other government Agency? If Yes, list agency(s) name and permit or approval: NYSDEC & USACE	☐	☑

3. a. Total acreage of the site of the proposed action? 3.6 acres
   b. Total acreage to be physically disturbed? 1 acres
   c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 13.2 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:

5. ☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☐ Residential (suburban)
   ☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other(Specify):
   ☑ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑

	NO	YES
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area?		
If Yes, identify: _____	☑	☐

	NO	YES
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation services available at or near the site of the proposed action?	☑	☐
c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?	☑	☐

	NO	YES
9. Does the proposed action meet or exceed the state energy code requirements?		
If the proposed action will exceed requirements, describe design features and technologies:		
Not Applicable	☐	☐

	NO	YES
10. Will the proposed action connect to an existing public/private water supply?		
If No, describe method for providing potable water: _____		
Not Applicable	☑	☐

	NO	YES
11. Will the proposed action connect to existing wastewater utilities?		
If No, describe method for providing wastewater treatment: _____		
The CTW will be designed to treat groundwater, stormwater and surface water.	☑	☐

	NO	YES
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places?	☐	☑
b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☑	☐

	NO	YES
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☐	☑
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____		
There will be an in-pond re-aeration system encompassing an area of approximately 1,600 square feet planned for installation in the waterbody located north of Old Town Pond		

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional

☑ Wetland ☐ Urban ☑ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered? Piping Plover, Least Tern	☐	☑
16. Is the project site located in the 100-year flood plan?	☐	☑
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	☐	☑
a. Will storm water discharges flow to adjacent properties?	☑	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)?	☑	☐
If Yes, briefly describe: Water treated by the CTW system will be discharged into the pond located just north of Old Town Pond.		
18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? If Yes, explain the purpose and size of the impoundment: For this project, the proposed CTW system will consist of two horizontal subsurface flow cells, connected in series (one follows the other). Each CTW cell will be lined to ensure water stays inside the cell. All water will flow horizontally through the subsurface media with no standing water. The CTW cells are planted with carefully selected native wetland vegetation.	☐	☑
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	☑	☐

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor/name: Charlene Kagel-Betts Date: February 12, 2021

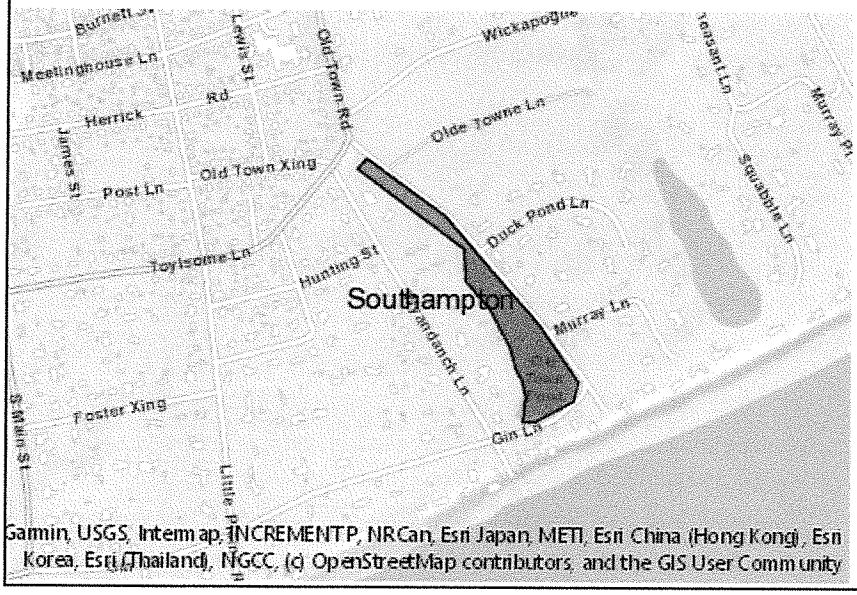
Signature: Title: Village Administrator

PRINT FORM

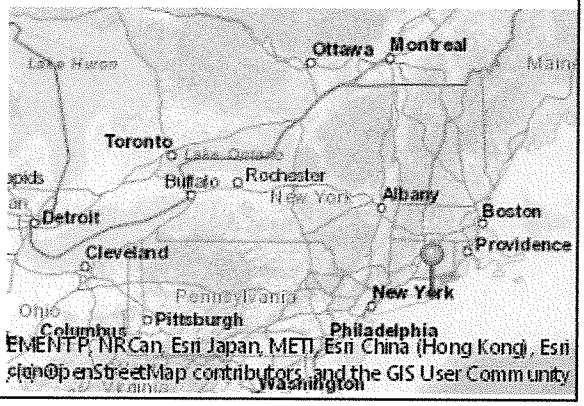
SHV 8

EAF Mapper Summary Report

Friday, February 5, 2021 10:25 AM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.



Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	Yes
Part 1 / Question 12b [Archeological Sites]	No
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	Yes
Part 1 / Question 15 [Threatened or Endangered Animal - Name]	Piping Plover, Least Tern
Part 1 / Question 16 [100 Year Flood Plain]	Yes
Part 1 / Question 20 [Remediation Site]	No

Agency Use Only [If applicable]

Project:	
Date:	

Short Environmental Assessment Form
Part 2 - Impact Assessment

Part 2 is to be completed by the Lead Agency.
Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☑	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☑	☐
3. Will the proposed action impair the character or quality of the existing community?	☑	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☑	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☑	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☑	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☑	☐
b. public / private wastewater treatment utilities?	☑	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☑	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☑	☐
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☑	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☑	☐

PRINT FORM

Agency Use Only [If applicable]

Project:

Date:

Short Environmental Assessment Form
Part 3 Determination of Significance

For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

The main objective of this project is to restore water quality in Old Town Pond, and reduce the likelihood and prevalence of algal blooms caused by excess nutrients (primarily nitrogen). The goal will be accomplished by:
- Providing sustainable nitrogen treatment for Old Town Pond
- Reducing nitrogen inputs from groundwater flowing into Old Town Pond
- Removing nitrogen already in Old Town Pond

Based on data collected and the anticipated flow rate, the proposed CTW treatment system will remove approximately 1,000 lbs of nitrogen per year from contributing sources that include stormwater runoff, groundwater and surface water from Old Town Pond. From a flow perspective, at 25,000 gpd, the proposed system will treat the equivalent of the wastewater flowrate from approximately 225 people or 84 houses in Southampton. Water in the CTW will come into contact with the microbial communities populated within the CTW media, and along vegetation roots. The plant root systems will promote and enhance the microbial communities by releasing both oxygen and enzymes to encourage microbial growth and diversification. From the outside, the CTWs will look like natural emergent wetlands with native plants. Over time, the CTW system will reduce total nitrogen levels in Old Town Pond, reduce the likelihood of algal blooms, and reduce the toxicity of blue green algae.

Piping plover and least tern are threatened and endangered species identified with a potential presence within the vicinity of the proposed project site; however, the habitats present surrounding Old Town Pond, mowed lawn and freshwater wetlands, are not known to support the piping plover and least tern species. Both of these species nest in areas with sandy or gravelly beaches. Furthermore, this project is intended to provide water quality improvement which would only benefit local wildlife.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☑ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Village of Southampton	February 12, 2021
Name of Lead Agency	Date
Charlene Kagel-Betts	Village Administrator
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT FORM

Town of Southampton CPF Water Quality Improvement Project Plan

VILLAGE OF SOUTHAMPTON

Project Location
Old Town Pond

Great Peconic Bay
Cold Spring Pond
Shinnecock Bay East
Shinnecock Inlet
Atlantic Ocean
Far Pond
Middle Pond
Honey Pot
Old Fort Pond
Pheasant Pond
Jule Pond
Little Jule Pond
Phillips Pond
Wickapogue Pond
Old Town Pond
Coopers Neck Pond
Halsey Neck Pond
Heady Creek
Taylor Creek
Mill Creek
Mecox Bay
Meyers Creek
Little Burnett Creek
Burnett Creek
Lazy Marsh

TUCKAHOE
NORTH SEA
WATER MILL
SHINNECOCK HILLS
SHINNECOCK INDIAN NATION
VILLAGE OF SOUTHAMPTON
HAMPTON BAYS

COUNTY RD 39
SEBONAC RD
NORTH RD
MILLER RD
PROSPECT ST
WHITE ST
DODGE ST
BOWDEN SQ
POND LN
OX PASTURE RD
GREAT PLAINS RD
BOATMANS LN
MEADOW LN
ROAD D
OLD SOLDIERS RD
WEST CHURCH ST
BOYESEN RD
OLD TOWN RD
HUNTTING ST
FOSTER XING
GIN LN
WICKAPOGUE RD
HALSEY FARM DR
HALSEY PATH
PIERSON CT
HOLLY LN
COLD SPRING POINT RD
COLD SPRING RD
WHITES LN
COUNTRY CLUB DR
INLET RD
HILL TOP RD
HILLS STATION RD
RIDGE RD
HIGHLAND RD
CHEVIOTS RD
SOUTH BEACH RD
AQUA DR
WESTWAY DR
CEDAR DR
MIDDLE POND RD
FAR POND RD
LITTLE NECK RD
PARRISH POND LN
ST ANDREWS RD
TUCKAHOE RD
TUCKAHOE LN
MAGEE ST
LEECON CT
N BISHOPS LN
HENRY RD
ROMAN RD
N MAIN ST
DALE ST
PULASKI ST
DAVID WHITES LN
ELM ST
WOOLEY ST
NARROW LN
DAVIDS CT
DOWNS PATH
FOWLER ST
JULE POND DR
MILL CREEK CLOSE
COBB RD
DIAMON CT
PINE ST
JAMES ST
LITTLE PLAINS RD
LEWIS ST
BARONS LN
S MAIN ST
TERRY CT
LEOS LN
JOHNNY LN
HALSEY NECK LN
MOSES LN
HALSEY ST
BREESE LN
BISHOPS LN
PLEASANT LN
LEE AVE
CAPTAINS NECK LN
WEST GATE RD
LITTLE BEACH RD
CHURCH ST
ARABASH RD
OLD POINT RD
COOPERS NECK LN
FIRST NECK LN
FAIR LEA RD
HALSEY NECK LN

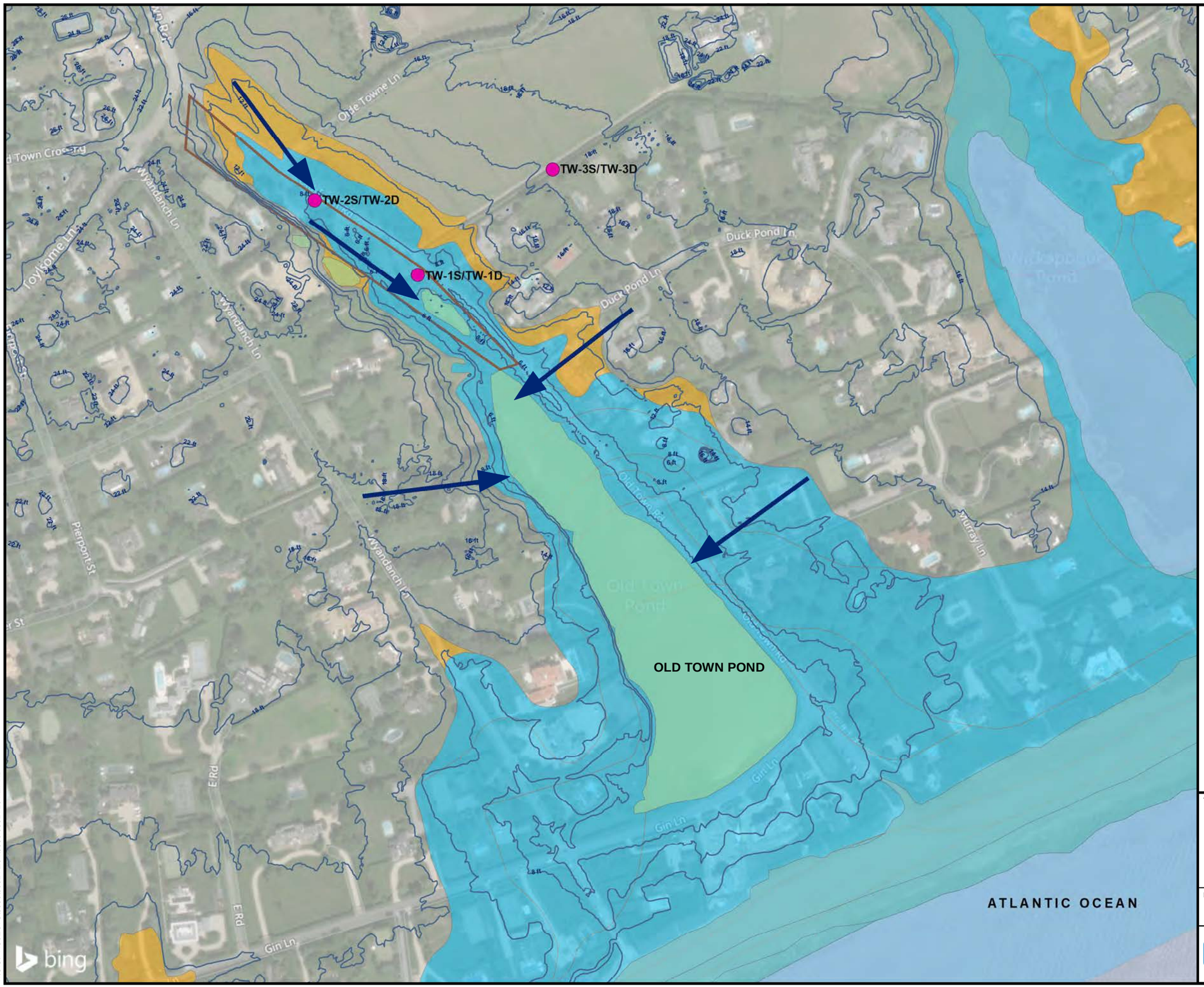
52
38
39
39A
27
80
27A

High Priority Area
Medium Priority Area
NYS DEC 303d Impaired Waterbodies (2014)
Protected/ Public Parcels

0 1,850 3,700 7,400 Feet

SHV 12

Prepared By:The Town of Southampton Dept of Geographic Information Systems Date: 7/5/2016 - MAP ID: 2514



N

LEGEND

- USGS ELEVATION CONTOUR (NAVD88)
- TEMPORARY NESTED WELL LOCATION
- SITE BOUNDARY
- ESTUARINE AND MARINE DEEPWATER
- ESTUARINE AND MARINE WETLAND
- FRESHWATER POND
- FEMA 1% ANNUAL CHANCE FLOOD HAZARD
- FEMA 0.2% ANNUAL CHANCE FLOOD HAZARD
- STORMWATER FLOW DIRECTION

NOTE

USGS - UNITED STATES GEOLOGICAL SURVEY

300 0 300'

Title:

EXISTING CONDITIONS

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/05/21
Prepared by: M.S.R.	Scale: AS SHOWN
Project Mgr: K.S.	Project: 3656.0001Y002
File: 3656.0001Y104.1.mxd	SHV 13

FIGURE 1

V:\GIS\PROJECTS\3656\0001Y\104\3656.0001Y104.1.MXD


Photo Location 2
Old Town Rd
Photo Location 1
Old Town Rd
Old Town Rd
Duck Pond Ln
Photo Location 4
Photo Location 3
Wyandanch Ln
Wyandanch Ln
Old Town Rd

Photograph 1: View of the proposed CTW area facing southeast

Photograph 2: View of the proposed CTW area facing northwest

Photograph 3: View of Old Town Pond facing southeast.

Photograph 4: View of Old Town Pond facing northwest.

Charles J. McGuckin, P.E.

Vice President Principal Engineer

Mr. McGuckin is a Vice President and Principal Engineer at Roux and has been with Roux since 1994. Mr. McGuckin is a registered Professional Engineer with over 30 years experience in environmental engineering and consulting. He holds a B.S. in Civil Engineering from the University of Delaware and an MBA from Adelphi University. Mr. McGuckin's areas of expertise include evaluation of remedial options, design and construction of soil and groundwater remediation systems, Brownfields cleanup plans to support redevelopment, and stormwater management studies. His experience includes manufacturing, chemical, petroleum, transportation and energy industry sites, as well as public parks and recreational facilities. His projects have involved design of groundwater extraction and treatment systems, NAPL recovery systems, landfill caps and site cover systems, barrier walls, in situ solidification of sludges, in situ treatment for groundwater, vapor mitigation systems, dredging of open water bodies, and shoreline stabilization.

REPRESENTATIVE PROJECTS

Decommissioning and decontamination of a pharmaceutical facility covering multiple city blocks in New York City. The former laboratory complex was decontaminated for reuse as small business space. Multiple other large buildings were demolished. Responsibilities included preparation of interior abatement plans to address lead and PCBs in building materials and review of Interim Remedial Measure (IRM) work plans for lead, benzene, and mercury-contaminated soil excavation and disposal. Groundwater remediation design included air sparge/soil vapor extraction, in situ oxidation and a reactive barrier wall using colloidal carbon and ZVI to address BTEX, PCE and daughter products.

Preparation of feasibility studies and remedial action work plans for multiple operable units of a large railyard located in Queens, New York under the NYSDEC Inactive Hazardous Waste Program. For the former engine house and maintenance area unit, pre-design studies included product plume thickness data collection and modeling, ex situ biopiles treatment, in situ enhanced bioremediation, and in situ chemical oxidation. The final design consisted of decontamination and removal of structures, excavation of

CONTACT INFORMATION

Phone: (631) 232-2600

Email: cmcguckin@rouxinc.com

Location: Islandia, NY

DOWNLOAD vCARD

EXPERTISE

Feasibility Studies

Remedial Options Analysis

Cost Evaluations

Design and Construction of Soil and Groundwater Remediation Systems

Remedial Action Plans for Brownfields Cleanup Sites

Design of Natural Media and Engineered Wetlands Systems for Treatment of Wastewater and Stormwater

EDUCATION

M.B.A., Management - Adelphi University

B.C.E., Civil Engineering - University of Delaware

PROFESSIONAL PROFILE

Evaluation of remedial alternatives and design/construction support for multiple areas of concern at a petroleum storage and pipeline transfer facility in New England. Projects included excavation of soil hot spots, closure of large oil-water separators, a slurry wall containment barrier, a groundwater extraction and treatment system to prevent off-site migration of petroleum compounds, in situ stabilization of tar materials, stormwater system evaluations, and compliance plan preparation.

Engineering certification of all remediation activities related to the seven-city-block Barclay's Arena and Atlantic Yards redevelopment in Brooklyn, New York. This multi-billion dollar redevelopment includes the Arena, which will be focal point of a the largest redevelopment project in Brooklyn, consisting of an urban complex of housing, commercial and retail space, as well as several acres of landscaped public open space. The existing properties being redeveloped are residential, commercial, and industrial properties, including a large rail yard. Engineering certification included multiple RAWPs under the NYSDEC Spills Program, UST removals, soil excavation, in situ groundwater treatment, and remedy oversight services. The project also includes ACM and lead paint abatement, building demolition, soil pre-waste classification and coordination with the receiving facilities, and oversight of the removal of 1,000,000 cubic yards of soil (~550,000 yards removed to date), representing one of the largest excavation and soil removal projects performed in New York City.

Design, construction management, and O&M of a 60,000-gpd constructed wetlands treatment system for a former manufacturing facility in Virginia. The 16-acre treatment system was designed within an existing phragmites wetland to remove zinc and iron from landfill leachate prior to discharge to an adjacent creek. The treatment system consisted of alkalinity-producing cells, oxic ponds, compost and limestone berms, anaerobic cells, and aerobic cells. The design included a 400-foot reinforced earthen dike together with hydraulic control structures and piping to maintain cell water levels and flow rates. The system also includes a pump station and force main for both effluent discharge and irrigation purposes. Joint wetlands and local permit approvals were obtained for the project.

REPRESENTATIVE EXPERT RETENTIONS/APPEARANCES

Expert settlement support services provided to a county municipality in New York. The case involved an EPA Order for underground storage tank (UST) compliance for over 50 county-operated facilities with over 125 USTs. The project involved the field inventory of the USTs at each facility and

Detailed cost estimates were prepared for multiple scenarios for upgrading USTs, including tightness testing, manway repairs, leak detection and overfill protection monitoring systems, UST removal and replacement, and new piping. The upgrade evaluation and negotiations included incorporation of Supplemental Environmental Projects (SEPs) in accordance with EPA requirements. SEPs included centralized monitoring systems for leak detection and inventory control.

Independent expert engineering review of change orders for the New York MTA Office of the Inspector General associated with electric utility substations reconstruction damaged during the 2012 Superstorm Sandy. The cost review focused on contracting procedures, waste classification of impacted structures and soils, and proper waste management and disposal. Findings were compiled in a report to determine if costs were legitimate and justifiable and providing recommendations for improved specifications for bidding and of management waste handling contracts.

Expert report and expert witness for a former valve manufacturing facility remediation project in New York. The report was prepared on behalf of counsel for a contractor who performed remedial construction work for this State Superfund site. The actions were against the holder of the construction contract, a state agency. The remedial action included building demolition, remediation of soils impacted by chlorinated VOCs, removal of DNAPL source areas, treatment of excavated soils using low temperature thermal desorption, and consolidation and capping of metals-impacted soils. The expert project work involved a detailed review of the RI/FS, remedial action plans, and construction progress documentation to formulate opinions regarding the contract documents' industry acceptable accuracy.

Independent expert environmental consulting services for a large landfill O&M contract under review by the New York City Department of Investigation. The work entailed reviewing the scope of routine vs. non-routine work performed over a one-year period for compliance with contract requirements. The O&M Work included routine cover maintenance, groundwater and gas monitoring, landfill gas extraction, major system repairs, and waste handling. Memos of findings were prepared assessing acceptability of work, compliance with permit regulations, and providing recommendations for improvements.

December 7, 2020

Mayor Jesse Warren
Village of Southampton
23 Main Street, NY 11968
Village of Southampton, New York

Re: Proposal for Old Town Pond Water Quality Testing and Conceptual Design
Village of Southampton, New York

Dear Mayor Warren:

Roux Environmental Engineering and Geology, D.P.C. (Roux) appreciates the opportunity to submit this proposal (Proposal) to the Village of Southampton Clean Water Committee (Client) for environmental consulting services related to water quality improvements for Old Town Pond, Southampton (Site). Old Town Pond is approximately 8.5 acres in size and is located in the Village of Southampton, Suffolk County, New York. Old Town Pond is included on the 2016 NYS Section 303(d) List of Impaired/TMDL waters, with frequent occurrences of blue-green algae blooms and has been included in several management plans and studies over the past decade. Old Town Pond is adjacent to the South Shore Estuary Reserve (SSER), which encompasses the tidal waters and associated watersheds between the Nassau-Queens County line and eastern boundary of Shinnecock Bay. The main objective of the proposed work is to provide enough justification to apply for Town of Southampton Community Preservation Fund (CPF) funding for an Old Town Pond water quality improvement project through the incorporation of Constructed Treatment Wetland (CTW) technologies.

The Suffolk County Subwatersheds Wastewater Plan (2014) and the Long Island South Shore Estuary Reserves Eastern Bays Project: Nitrogen Loading, Sources and Management Options Final Report by Stony Brook University (2016) have identified groundwater as a major source of nitrogen loading. The Stony Brook study specifically mentions groundwater being responsible for 90% of the nitrogen transport load in the SSER subwatersheds while stream and stormwater runoff was small. Nitrogen loading contributes to the eutrophication and blue-green algae blooms observed in Old Town Pond and other waterbodies throughout the adjacent SSER. The recent report by Stony Brook (2017), Quantifying Nitrogen Loading to from Southampton Village to Surrounding Water Bodies and their Mitigation by Creating A Sewer District describes the modeling that was completed to determine the total nitrogen loading into Old Town Pond as 4,048 kg per year, with the three largest contributors being:

1.) wastewater from unsewered areas comprising 62% (2,498 kg/year);
2.) fertilizer from residential lawns, agriculture and parks & golf courses comprising 15% (620 kg/year); and
3.) benthic flux comprising 10% (387 kg/year).

Stormwater drains were also identified as contributing 1% (42 kg/year).

To date, there have been multiple efforts focused on reduction of stormwater runoff but limited projects regarding the implementability of natural, green, long-term treatment technologies such as CTWs to treat groundwater and surface water.

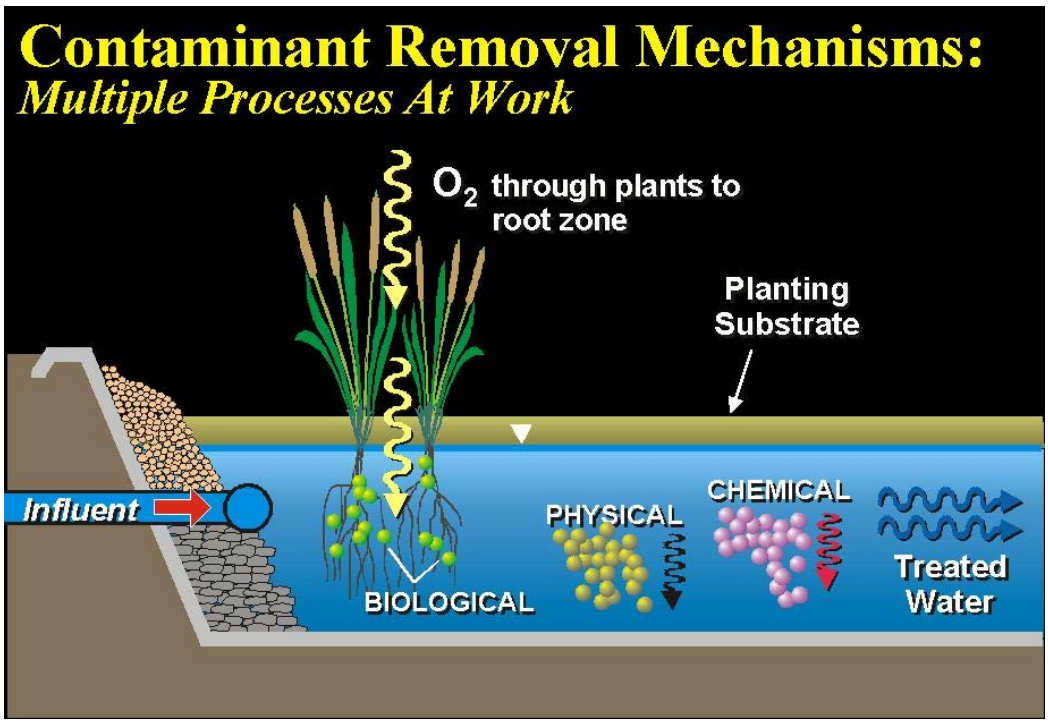
Alternative green technologies can efficiently and cost-effectively meet a variety of water management needs. Roux's implementation of these strategies has resulted in cost savings of millions of dollars when compared to more conventional treatment methods. The following sections provide an overview of CTWs, Roux's successes designing and installing these systems, and our proposed scope of work for an Old Town Pond water quality study, and conceptual groundwater treatment design.

CTW Technology for Groundwater, Sanitary Wastewater and Stormwater Treatment

Roux's team consists of nationally recognized experts and leaders in the design, installation and operation of the CTW for wastewater, stormwater and groundwater treatment. Roux has been actively involved in developing and applying CTW technologies since 1993. Our long-term and continuing commitment to the technology has resulted in the award of a U.S. Patent for an enhanced subsurface-flow CTW design. Our patented enhanced subsurface-flow technology has reduced the size of a typical CTW by more than 50%, while simultaneously enhancing year-round and predictable treatment performance. Our use of carefully selected media, sequencing and passive hydraulic controls have resulted in state-of-the-science 4th generation designs that are cost-effective, reliable and sustainable even under extreme environmental conditions. In fact, four of our CTW designs for a Fortune 100 client received separate Global Environmental Health and Safety (EHS) awards for innovation, cost-effectiveness, and excellence.

CTWs are built to remove total suspended solids (TSS), biochemical oxygen demand (BOD), organic compounds, nitrogen, and pathogens through the following natural physical, chemical, and biological processes that simultaneously occur within the CTW environment:

- *Sedimentation* and *filtration* for the removal of TSS;
- *Microbial degradation* for the removal of TSS, BOD nitrogen and heavy metals; and
- *Microbial destruction* of pathogens.



Physical processes such as sedimentation and natural filtration help to remove particles and pollutants from the water column. Ponds used in combination with marshes provide water storage and enhance the wetland's ability to control pollutants, while decreased flow rates and velocities promote sedimentation. In addition to physical treatment processes, the aerobic and anaerobic zones in a CTW provide a diversity of chemical removal mechanisms including adsorption, cation exchange, and precipitation.

CTWs are frequently inundated and host to diverse populations of microbial and plant species. The functions of wetland organisms are interdependent and versatile, resulting in the ability of the system as a whole to adapt to changing environmental conditions with the input of wastewater (Kadlec and Knight, 1996). Because of their vast diversity, wetland organisms can adapt and use the compounds in wastewater as food for growth and reproduction, manipulating and transforming contaminants and improving water quality.

Wetland plant root systems help to stabilize sediment and, thus, decrease the potential for resuspension of settled particles. Wetland plants can also absorb, and uptake select organic and inorganic contaminants directly through their roots, resulting in the immobilization and degradation of the contaminant within the plant. The natural degradation of wetland vegetation helps by adding a continual source of organic matter (carbon for microbial respiration and chemical adsorption), and nutrients through plant degradation and mineralization (Kittle et al., 1995).

With proper engineering, CTWs are an effective and sustainable technology for treatment of groundwater, wastewater and stormwater.

Project Objectives

- *Provide enough justification to apply for the Town of Southampton CPF funding;*
- *Quantify nitrogen discharge from groundwater to Old Town Pond surface water;*
- *Understand surface water quality conditions; and*
- *Preparation of a conceptual CTW design based upon water quality evaluation data.*

SCOPE OF WORK

Based upon our experience, quantifying subsurface discharge into Old Town Pond can be complex given the seasonal nature of the surrounding residents. Therefore, to meet project objectives and obtain baseline water quality data for the CTW conceptual design, Roux has developed the following scope of work:

- Task 1: Preliminary Water Quality Testing; and
- Task 2: Water Quality Data Evaluation & CTW Conceptual Design Report.

Additional water quality testing will be required during the design phase to understand maximum nitrogen loading in Summer to early fall.

Task 1: Preliminary Water Quality Study

The preliminary water quality testing will include the installation of two nested monitoring wells at three locations and the collection of two surface water samples.

Groundwater Sampling

Based upon available USGS data, the estimated depth to groundwater is between 5 feet and 10 feet. A total of six (6) monitoring wells will be installed at 3 locations (two monitoring wells per location) to determine the groundwater quality and hydraulic gradient entering Old Town Pond (Figure 1). At each location two nested wells will be installed to capture the 5-ft interval just below the water table interface and 15-ft below the water table interface to determine if the majority of the loading into the pond is from shallow or deeper groundwater. Prior to drilling, each boring location will be cleared to a minimum depth of five feet below land surface [ft bls]) using hand tools (e.g., post-hole digger, shovel, hand-auger, etc.). If utilities or USTs are encountered during clearance activities, the location will be moved as appropriate and cleared using the above procedure. Each 1-inch monitoring well will be installed using a track mounted Geoprobe™ direct-push instrument. Soil collected during monitoring well installation will be visually characterized according to the Unified Soils Classification System (USCS).

Following the monitoring well installation, soil bore holes will be backfilled with clean #1 sand to approximately one foot below ground surface and sealed with granular bentonite to fill the remaining annular space to the surface. The temporary monitoring wells will be finished as a flush mount. The measuring point for each monitoring well will be surveyed by Roux.

All six (6) installed temporary monitoring wells will be purged and sampled using low flow sampling procedures. Prior to groundwater sampling, a comprehensive round of water level measurements will be performed in all monitoring wells. Following well recovery and stabilization, a groundwater sample will be collected, and measurements of pH, specific conductance, turbidity, dissolved oxygen, temperature, salinity, and oxidation-reduction potential will be obtained and recorded in a dedicated field log. Measurements will be obtained with a Horiba water quality meter that has been calibrated to laboratory standards prior to use.

Surface Water Sampling

Surface water quality samples will be collected in two (2) locations, one sample from Old Town Pond and one sample from the small water body just north of Old Town Pond, to determine the interactions between the groundwater and surface water in Old Town Pond. The two (2) surface water sampling locations are shown on Figure 1. Surface water samples will be collected by boat with a Wheaton™ water sampler, which allows samples to be collected with a minimum resuspension of underlying sediment. All sampling equipment will be decontaminated following the collection of each sample. *In situ* measurements of pH, specific conductance, turbidity, dissolved oxygen, temperature, salinity, and oxidation-reduction potential will be obtained and recorded in a dedicated field log at the time each surface water sample is collected. Measurements will be obtained with a Horiba water quality meter that has been calibrated to laboratory standards prior to use. Locations of the surface water sample locations will be recorded through the use of a hand-held GPS receiver.

Lab Analyses

Groundwater and surface water samples will be analyzed for total nitrogen and the various forms of nitrogen (i.e., ammonia, nitrate, nitrite, Total Kjeldahl Nitrogen, total organic nitrogen). In addition, the following additional analyses will be completed: phosphorus, alkalinity, total organic carbon (TOC), biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), sulfate, Target Analyte List Metals + Mercury, dissolved iron and pesticides.

Task 2: Water Quality Data Evaluation & CTW Conceptual Design Report

As part of this task, Roux will complete hydrogeologic calculations using Darcy Law to quantify groundwater flux into Old Town Pond. The results of the field investigations and CTW conceptual design evaluation will be provided electronically to the Village of Southampton in the form of a summary letter report. The summary letter report will provide a brief description of the scope of work, a summary and interpretation of the analytical results, the results of the groundwater flux calculations, and recommendations on the CTW system layout. It is anticipated that a CTW system could be installed within Village owned park land immediately upgradient of the pond. The CTW system would capture groundwater feeding the pond and surface water within the pond itself. A cost estimate for the system design and installation will be provided in the summary report. The report will be prepared to provide enough justification to apply for the Town of Southampton CPF funding.

ESTIMATED COST

Roux proposes to provide the design services described in this proposal for $16,300. Additional services will be considered out of scope.

Task Description	Estimated Costs
Task 1: Preliminary Water Quality Study	$13,700
Task 2: Water Quality Data Evaluation & CTW Conceptual Design Report	$2,600
Total	**$16,300**

SCHEDULE

Roux can initiate SOW within one week of notice to proceed from Village of Southampton. Water Quality Testing start date will be determined based upon the schedule of the driller.

TERMS AND CONDITIONS

All work will be billed on a time and materials basis in accordance with the rates provided in the attached Schedule of Fees (Attachment 2). Roux will not exceed the **$16,300** without prior written approval (including email) from the Client.

Roux appreciates the opportunity to provide this Proposal. If it is acceptable to you, please indicate your approval and authorization for Roux to commence the Scope of Work by signing the enclosed Professional Services Agreement (Agreement) provided in Attachment 2, and by returning a copy of the signed Agreement to Charlie McGuckin. Please retain a copy of this Proposal, Agreement, and enclosures for your records. Upon receipt of the signed Agreement, Roux will commence the performance of the services as described in this Proposal.

Should you have any questions or require further information regarding this Proposal, do not hesitate to contact Mr. Charlie McGuckin by telephone at 631-232-2600 or by email at cmcguckin@rouxinc.com.

Sincerely,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

Kathryn Sommo, CPESC, ISA Arborist
Senior Scientist/Ecologist

Charles J. McGuckin, P.E.
Principal Engineer/Vice President

Enclosures:
1. Fee Schedule
2. Professional Services Agreement

VILLAGE OF SOUTHAMPTON hereby authorizes ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C. to commence Scope of Work set forth herein, and accepts and agrees to the General Terms and Conditions set forth in the enclosed Roux Environmental Engineering and Geology, D.P.C. Professional Services Agreement and in this Proposal, incorporated therein.

(Signature)	(Title)
(Please Print Name)	(Date)

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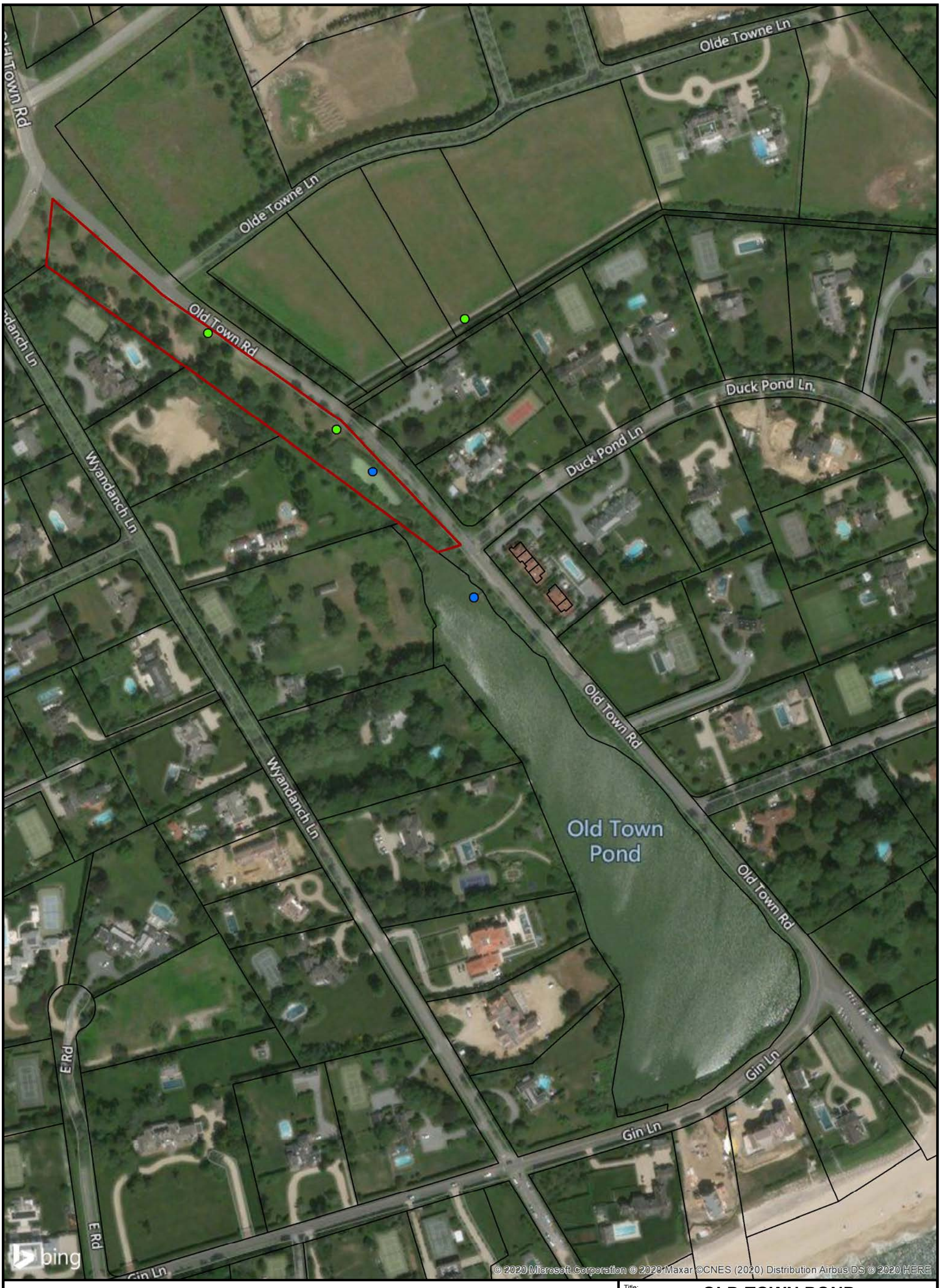

LEGEND

- PROPOSED SURFACE WATER SAMPLE LOCATION
- PROPOSED TEMPORARY NESTED WELL LOCATION
- SOUTHAMPTON VILLAGE ROAD RIGHT-OF-WAY
- SUFFOLK COUNTY NEW YORK, PARCELS

NOTES

1. APPROXIMATE TEMPORARY WELL LOCATIONS ARE SHOWN

N

300 0 300'

Title:

OLD TOWN POND SAMPLING PLAN

VILLAGE OF SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON
CLEAN WATER COMMITTEE

ROUX

Compiled by: K.S.	Date: 12/04/20
Prepared by:K.S.	Scale: AS SHOWN
Project Mgr: K.S.	Project: X.X.
File: X10671.01.mxd	SHV 27

FIGURE 1

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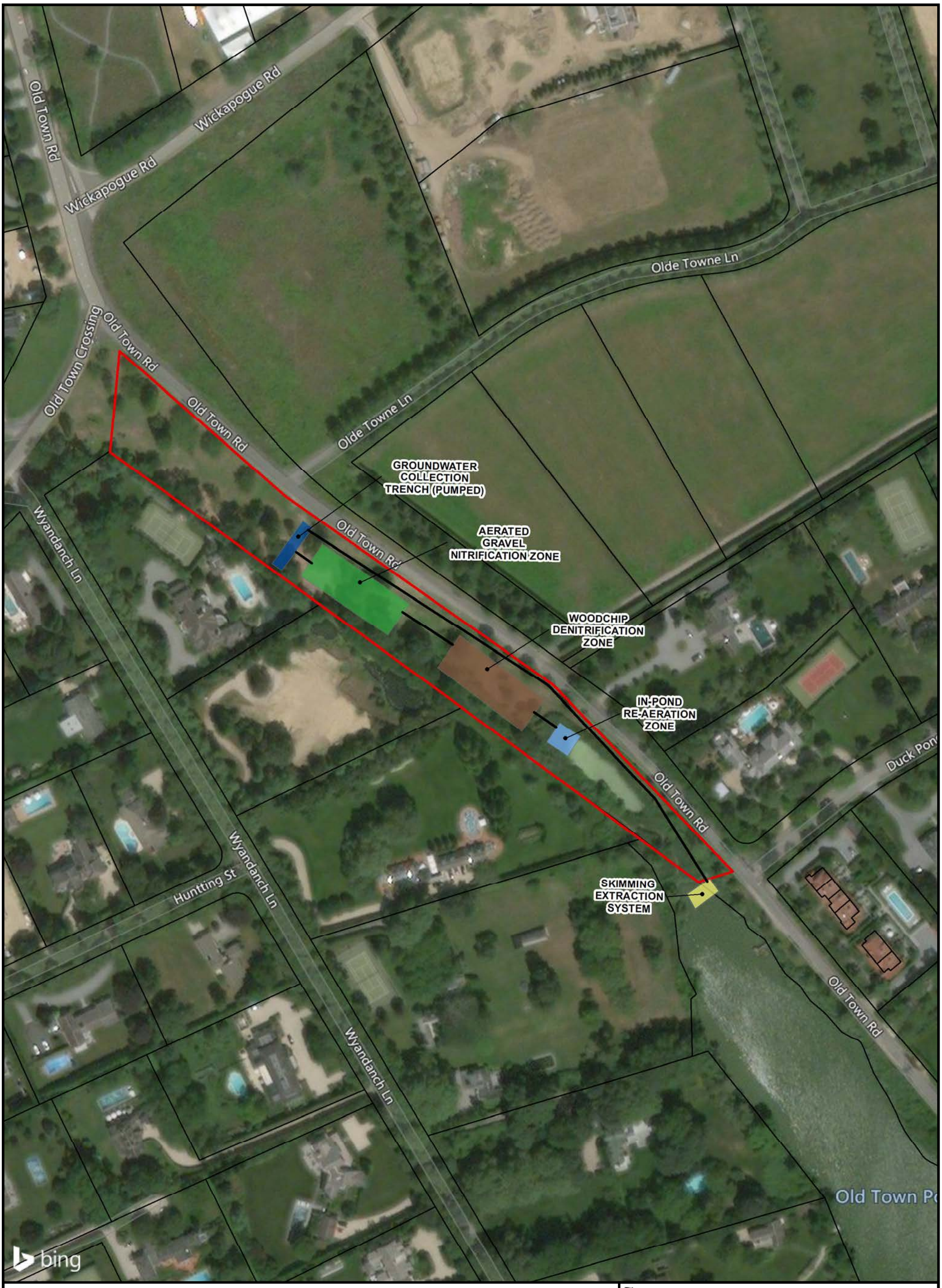


LEGEND

- SUFFOLK COUNTY NEW YORK, PARCELS
- SOUTHAMPTON VILLAGE ROAD RIGHT-OF-WAY
- GROUNDWATER COLLECTION TRENCH (PUMPED)
- AERATED GRAVEL NITRIFICATION ZONE
- WOODCHIP DENITRIFICATION ZONE
- IN-POND RE-AERATION ZONE
- SKIMMING EXTRACTION SYSTEM

NOTES

1. CTW = CONSTRUCTED TREATMENT WETLAND

N

150 0 150'

Title:

OLD TOWN POND CONCEPTUAL CTW AREA

VILLAGE OF SOUTHAMPTON

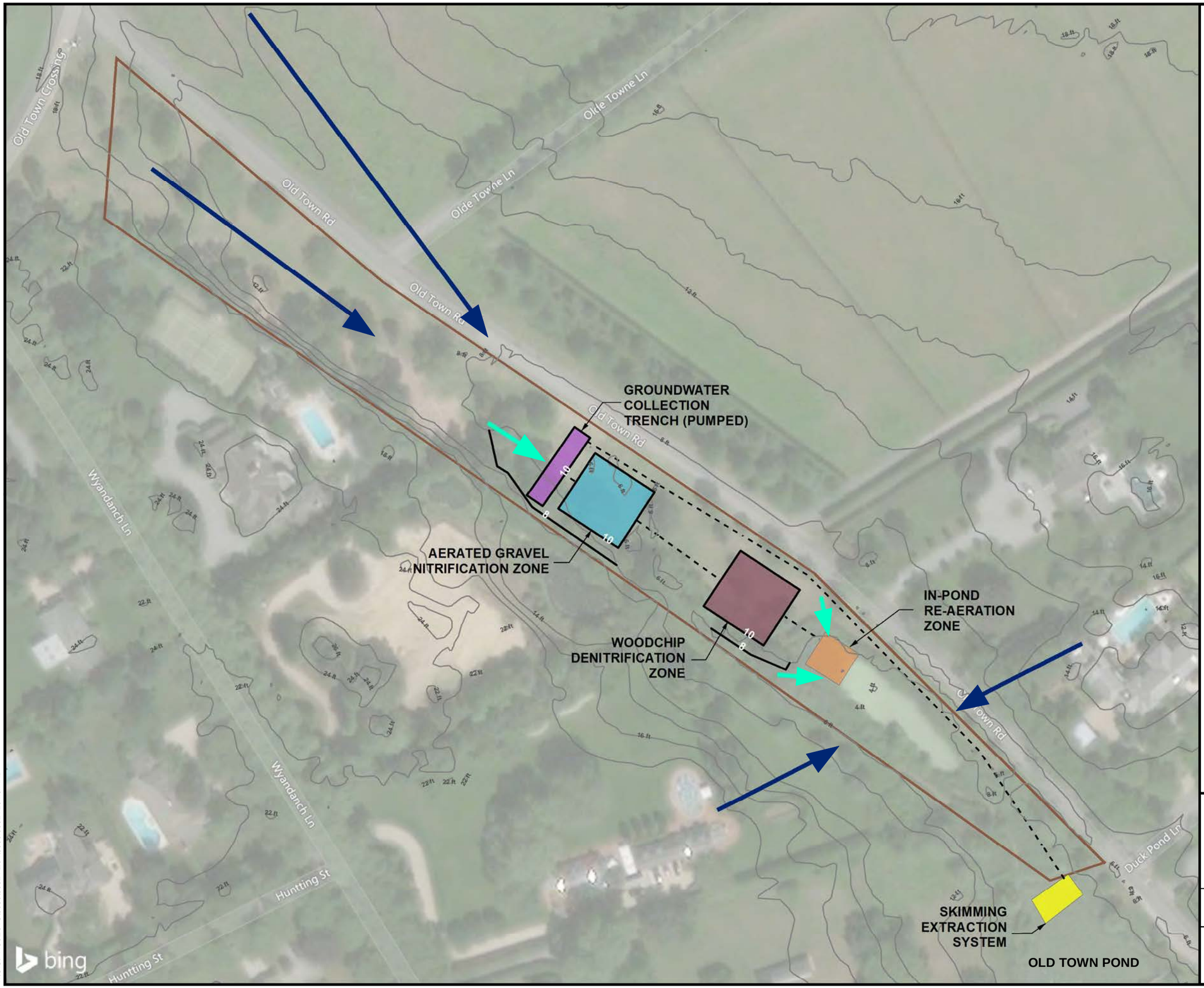
Prepared for:

VILLAGE OF SOUTHAMPTON
CLEAN WATER COMMITTEE

ROUX

Compiled by: K.S.	Date: 12/02/20
Prepared by:K.S.	Scale: AS SHOWN
Project Mgr: K.S.	Project: X.X.
File: X10671.02.mxd	SHV 28

FIGURE 1



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LEGEND

- USGS ELEVATION CONTOUR (NAVD88)
- PROPOSED GRADING CONTOURS
- CTW CONNECTIONS
- AERATED GRAVEL NITRIFICATION ZONE
- GROUNDWATER COLLECTION TRENCH (PUMPED)
- IN-POND RE-AERATION ZONE
- SKIMMING EXTRACTION SYSTEM
- WOODCHIP DENITRIFICATION ZONE
- SITE BOUNDARY
- STORMWATER FLOW DIRECTION
- PROPOSED MODIFICATION TO STORMWATER FLOW DIRECTION

NOTES

1. CTW SYSTEM WILL TREAT STORM WATER THAT HAS INFILTRATED INTO SHALLOW GROUNDWATER AND ALSO STORM WATER CAPTURED IN THE SKIMMING EXTRACTION SYSTEM.

CTW - CONSTRUCTED TREATMENT WETLAND
USGS - UNITED STATES GEOLOGICAL SURVEY

100 0 100'

Title:

OLD TOWN ROAD CONCEPTUAL CTW AREA

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/05/21	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	3
Project Mgr: K.S.	Project: 3656.0001Y002	
File: 3656.0001Y104.3.mxd	SHV 29	

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Feasibility Study

Constructed Treatment Wetland for Excess Nitrogen at Old Town Pond Southampton, New York

February 11, 2021

Project Owner:

Village of Southampton
23 Main Street
Southampton, New York 11968

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York 11749

3656.0001Y104/CV

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6. Proposed New Well Locations

Attachments

1. Site Photographs
2. Soil Boring Logs
3. Groundwater and Surface Water Quality Results

1. Executive Summary

Old Town Pond is an 8.5-acre freshwater pond, located just north of the South Shore Estuary of Long Island, in the Village of Southampton, Suffolk County, New York.

Old Town Pond has frequent occurrences of blue-green algae blooms. Previous studies completed by Stony Brook University, among others, have identified excess nitrogen, and to a lesser extent, phosphorus, as the primary cause of the algal blooms in Southampton.[1]

Nitrogen comes from a combination of stormwater runoff and groundwater recharge. Stormwater runoff flows directly to Old Town Pond, and a portion of stormwater infiltrates into groundwater, which also enters Old Town Pond through groundwater recharge. Groundwater upgradient of Old Town Pond is also impacted by nitrogen from sanitary wastewater. Residences and businesses upgradient of Old Town Pond are unsewered; wastewater goes into septic tanks or cesspools, and then into groundwater.

Based on the shape of Old Town Pond, groundwater flow direction, stormwater runoff direction, and sampling completed by Roux Environmental Engineering and Geology, D.P.C. (Roux), a significant portion of the nitrogen loading to Old Town Pond is entering Old Town Pond from shallow groundwater at the north end of the pond. As a result, this area is the proposed project area (Figure 1).

The proposed project consists of installing a horizontal subsurface flow constructed treatment wetland (CTW) on the north end of Old Town Pond, in an area owned by the Village of Southampton. A CTW can be designed to enhance microbial nitrogen treatment process (ammonification, nitrification, and denitrification) to provide sustainable, year-round nitrogen removal. In addition, the CTW will maintain the park-like aesthetic of the area, with the surface of the wetland planted with native wetland plants.

The proposed project will require additional groundwater characterization, engineering design, permitting and regulatory approvals, construction, startup, and maintenance. Based on the initial groundwater characterization conducted by Roux, the CTW will be able to treat 25,000 gallons per day (gpd) of nitrogen impacted stormwater, shallow groundwater, and surface water, and remove approximately 1,000 pounds of nitrogen from Old Town Pond each year. Costs to complete the project are estimated to be $979,200 and the project is estimated to take 1.5 to 2 years to complete design, construction, and startup. Estimated operations and maintenance consists primarily of site inspections, water quality monitoring, maintaining mechanical equipment, and electrical costs. Estimated annual OM&M costs are $25,000 per year, with additional costs equipment repair/replacement necessary periodically.

From a flow perspective, at 25,000 gpd, the proposed system will treat the equivalent of the wastewater flowrate from approximately 225 people or 84 houses in Southampton.[2] Over time, the CTW system will reduce total nitrogen levels in Old Town Pond, reduce the likelihood of algal blooms, and reduce the toxicity of blue green algae.

[1] Gobler, Christopher J., February 2017. Quantifying Nitrogen Loading to From Southampton Village to Surrounding Water Bodies and Their Mitigation by Creating a Sewer District. Page 4.

[2] Based on housing statistics for Old Town Creek, as described in Gobler, 2017, page 15.

2. Project Objectives

The main objective of this project is to restore water quality in Old Town Pond, and reduce the likelihood and prevalence of algal blooms caused by excess nutrients (primarily nitrogen). The goal will be accomplished by:

- Providing sustainable nitrogen treatment for Old Town Pond
- Reducing nitrogen inputs from groundwater flowing into Old Town Pond
- Removing nitrogen already in Old Town Pond

Based on data collected and the anticipated flow rate, the proposed CTW treatment system will remove approximately 1,000 lbs of nitrogen per year from contributing sources that include stormwater runoff, groundwater, and surface water from Old Town Pond. When designed properly, CTWs have higher treatment efficiencies for nitrogen than other types of green infrastructure and Best Management Practices.

3. Existing Conditions

The proposed treatment area is located just north of Old Town Pond, in an area owned by the Village of Southampton. This area is depicted in Figure 1. Representative photographs of the project area are presented in Attachment 1.

3.1 Land Use & Underground Utilities

The proposed project location surrounding land use is primarily residential, with farmland and the Stony Brook Southampton Hospital located among the residential properties to the north, and Old Town Pond to the south. Old Town Pond is adjacent to the South Shore Estuary Reserve (SSER), which encompasses the tidal waters and associated watersheds between the Nassau-Queens County line and eastern boundary of Shinnecock Bay. Old Town Pond is hydraulically connected to the Atlantic Ocean by a culvert with a manually operated valve that's drains to the beach immediately adjacent to the Atlantic Ocean. The valve is only opened during potential flooding conditions.

Overhead utilities are present along Old Town Road, however this area will not be impacted by the proposed project. A utility mark out was completed, in January 2021 there are no subsurface utilities located within the project area.

3.2 Depth to Bedrock

Bedrock was not encountered during soil boring activities that took place in January 2021. Borings were advanced to a maximum depth of 20 feet below land surface. Estimated depth to bedrock is approximately 1,500 feet below land surface based on USGS Geohydrolic Appraisal of Water Resources of the South Fork, Long Island, New York.

3.3 Soil Classification

A soil classification map was downloaded from the USDA SCS. The soil type in the project area is Haven loam with a thick surface layer. Haven loam consists of loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits. The soil profile is listed as 19 inches of loam, another 9 inches of gravelly loam, underlain by stratified gravelly sand.

Soil borings were collected in the proposed project area, and upgradient of the proposed project area. In the project area, soil was classified as silty sand in the upper 2 feet, underlain by 6 inches of silty clay, underlain by sand with some gravel. Soil boring logs are presented in Attachment 2.

3.4 Depth to Water

Groundwater monitoring wells were installed by Roux in January 2021. Depth to water in the project area is approximately 1.4 feet below ground surface. A groundwater flow map is provided as Figure 2.

3.5 Other Considerations

General topography, freshwater and tidal wetlands, the nearest receiving waterbody, stormwater flow path direction, the mapped 100-year floodplain and the completed soil boring and water quality sampling locations are shown on the Figure 1 Existing Conditions.

Freshwater wetlands were observed during visits to the proposed project area. Wetlands typically appeared to be low quality, with a monoculture of the invasive species Phragmites australis. Additional work would be required to delineate the boundaries of the wetland area. Additional permitting would be required to do work in or adjacent to the wetland area.

NYSDEC Environmental Resources Mapper depicts the proposed project area in the vicinity of animals listed as threatened or endangered. Additional work will be required to determine if the area serves as habitat for the threatened or endangered species.

The proposed project site is within the 100 year flood plain. Potential long term flooding considerations must be taken into consideration during design.

An additional stormwater bioswale project is planned to be completed in the area directly adjacent to the proposed location. Coordination with the bioswale project grading will be necessary.

3.6 Previous Site Investigations

Suffolk County and Stony Brook University have investigated the sources of nitrogen loading to local waterbodies, including Old Town Pond. At the request of the Village of Southampton, Roux installed groundwater monitoring wells to evaluate nitrogen in groundwater.

3.6.1 Suffolk County and Stony Brook University Studies

The Suffolk County Subwatersheds Wastewater Plan (2014) and the Long Island South Shore Estuary Reserves Eastern Bays Project: Nitrogen Loading, Sources and Management Options Final Report by Stony Brook University (2016) have identified groundwater as a major source of nitrogen loading. The Stony Brook study specifically mentions groundwater being responsible for 90% of the nitrogen transport load in the SSER subwatersheds while the nitrogen loading attributed to stream and stormwater runoff was small. Nitrogen loading contributes to the eutrophication and blue-green algae blooms observed in Old Town Pond and other waterbodies throughout the adjacent SSER. The recent report by Stony Brook (2017), Quantifying Nitrogen Loading from Southampton Village to Surrounding Water Bodies and their Mitigation by Creating a Sewer District, describes the modeling that was completed to determine the total nitrogen loading into Old Town Pond as 4,048 kg per year, with the three largest contributors being:

- Wastewater from unsewered areas comprising 62% (2,498 kg/year);
- Fertilizer from residential lawns, agriculture and parks & golf courses comprising 15% (620 kg/year); and
- Benthic flux comprising 10% (387 kg/year).

3.6.2 Roux Soil and Groundwater Characterization

Following up on the Stony Brook Study, a limited groundwater investigation was designed to further evaluate impacts immediately upgradient of Old Town Pond. On January 9 and 10, 2021, Roux installed six groundwater monitoring wells at three locations (two monitoring wells per location) in the area north of Old Town Pond to confirm nitrogen impacted groundwater was flowing into Old Town Pond and what form of nitrogen was present. At each location, two nested wells were installed to capture the 5-ft interval just below the water table interface and 15-ft below the water table interface to determine if the majority of the loading into the pond is from shallow or deeper groundwater. The relative measuring point elevation for each monitoring well was surveyed by Roux.

Roux collected water level measurements and water quality samples at each of the six wells, along with two surface water samples from Old Town Pond. The location of the wells and surface water quality samples is shown in Figure 1. Groundwater monitoring well water quality results are summarized below (for nitrogen only). Surface water quality data and detailed groundwater quality results are provided in Attachment 3.

Table 1. January 2021 Groundwater Quality Summary

Constituent (mg/L)	TW-1S	TW-1D	TW-2S	TW-2D	TW-3S	TW-3D
Ammonia	1.110	0.124	0.770 J	0.088 J	0.084 J	0.138
Total Kjeldahl Nitrogen	4.550	0.200 U	1.430	0.200 U	0.200 U	0.200 U
Total Organic Nitrogen	5.660	0.50 U	1.510	0.500 U	0.500 U	0.500 U
Nitrate as N	0.029 J	2.30	7.580	0.841	1.190	1.870
Nitrate Nitrite as N	0.100 U	2.30	7.720	0.867	1.200	1.890
Nitrite as N	0.029 JB	0.20 U	0.144 JB	0.026 JB	0.015 JB	0.022 JB
Nitrogen, Total	**4.650**	**2.300**	**9.150**	**0.867**	**1.200**	**1.890**

Based on the groundwater sampling results, nitrogen loading from groundwater upgradient of Old Town Pond is at significant concentrations to negatively impact Old Town Pond. Our preliminary observations regarding nitrogen concentrations are summarized below:

- Nitrogen concentrations are highest in the shallow wells, indicating that shallow groundwater should be targeted for treatment.
- The highest concentration of organic nitrogen and ammonia was found at TW-1S, which is located directly upgradient of the small pond, just north of Old Town Pond. While organic nitrogen does not directly cause algal blooms, organic nitrogen can degrade to form ammonia, which is known to cause algal blooms. TW-1S is likely hydraulically connected to and influenced by the water quality in the small pond.
- The highest concentration of nitrite/nitrate was found at TW-2S, located further north of TW-1S. TW-2S contained relatively low concentrations of ammonia, indicating that the most likely source of the nitrite/nitrate is fertilizer rather than septic/cesspool wastewater (which would most likely be in the form of organic nitrogen or ammonia). The area immediately upgradient of this well has a long history of farm use.
- Water quality at TW-3S and TW-3D showed elevated concentrations of nitrate, but the concentrations were much less than those observed at TW-2S.
- Surface water quality data showed total nitrogen at 0.868 mg/L in the pond immediately upgradient of Old Town Pond, predominantly in the form of organic nitrogen, and total nitrogen at 1.4 mg/L in Old Town Pond, with detectable nitrogen only in the ammonia form.

Additional testing is needed prior to final design to determine if the nitrogen concentrations observed are typical, if they fluctuate seasonally, and if they are fully representative of the groundwater contributing to Old Town Pond.

4. Project Description

The proposed treatment system consists of an enhanced horizontal subsurface flow constructed treatment wetland (CTW) system to treat nitrogen at Old Town Pond, as shown in Figure 3. Alternative green technologies, like CTWs, can remove total suspended solids (TSS), biochemical oxygen demand (BOD), organic compounds, nitrogen, phosphorus, and pathogens through natural physical, chemical, and biological processes that simultaneously occur within the CTW environment. With proper engineering design, CTWs can efficiently and cost-effectively reduce nitrogen concentrations by optimizing the microbially mediated nitrogen transformation processes of ammonification, nitrification, and denitrification. CTWs have demonstrated long term performance for treating groundwater, wastewater, and stormwater.

4.1 Alternatives Considered

The nitrogen loadings to Old Town Pond could be addressed by multiple types of green and grey infrastructure improvements. Other alternatives considered included:

- Centralized wastewater treatment to remove nitrogen from sanitary wastewater.
  - Advantages: treats many homes at once; can treat to low levels of nitrogen; treats nitrogen before entering groundwater
  - Disadvantages: routing is cost prohibitive; requires a lot of space; relatively high operation and maintenance costs
- Advanced on-Site wastewater treatment septic tanks to remove nitrogen from sanitary wastewater.
  - Advantages: simple and easy to install; treats nitrogen before entering groundwater
  - Disadvantages: does not treat to low levels of nitrogen (typical effluent is 10 to 20 mg/L total nitrogen); costly for a large number of houses; does not address other nitrogen impacts to groundwater from fertilizer runoff.
- Shallow groundwater treatment north of Old Town Pond with other nitrogen removal technologies (MMBR, batch reactors).
  - Advantages: treats groundwater directly upgradient of Old Town Pond (takes advantage of natural treatment processes in aquifer upgradient of the pond).
  - Disadvantages: costs; energy demands; aesthetics; limited treatment levels.

These technologies were eliminated from the selection process due to increased costs, increased energy usage, limited nitrogen removal performance at low levels of nitrogen, and aesthetics.

4.2 Nitrogen Removal Using Innovative CTWs

Nitrogen is removed from water through a series of chemical transformations driven by microorganisms. Organic nitrogen transforms to ammonia, ammonia to nitrite, nitrite to nitrate, and nitrate to nitrogen gas. These transformations can only occur under specific environmental conditions (adequate temperature, pH range, oxygen range, etc.). CTWs can efficiently remove nitrogen by creating environments where the microorganisms that drive nitrogen transformations thrive, thus converting dissolved nitrogen to nitrogen gas.

4.2.1 CTW Overview

CTWs are most often seen in stormwater best management practices; however, CTWs have demonstrated success in treating contaminated groundwater, sanitary wastewater, and even higher strength industrial

wastewater, when designed appropriately. The CTW design for this project will be innovative, and engineered specifically for treatment of stormwater, shallow groundwater, and surface water at the site.

There are many types and configurations of CTWs. For this project, the proposed CTW system will consist of two horizontal subsurface flow cells, connected in series (one follows the other). Each CTW cell will be lined to ensure water stays inside the cell. Subsurface flow CTWs are filled with media, such as 1-2 inch diameter stone (stone is similar size to a ping pong ball or pool ball). All water will flow horizontally through the subsurface media with no standing water. This limits potential for people and wildlife to come into contact with the untreated water, and reduces potential for mosquitos. The CTW cells are planted with carefully selected native wetland vegetation. Water in the CTW will come into contact with the microbial communities populated within the CTW media, and along vegetation roots. The plant root systems will promote and enhance the microbial communities by releasing both oxygen and enzymes to encourage microbial growth and diversification. From the outside, the CTWs will look like natural emergent wetlands with native plants.

Figures 4a and 4b. Photographs of Horizontal Subsurface Flow Wetlands

The level of contaminant removal attainable in a CTW environment is largely contingent upon influent concentration, hydraulic retention time (size), pH, nutrients, and dissolved oxygen concentrations. In cooler climates, such as New York, winter operation is an important design consideration for any treatment system. The typical negative impact from temperature, although important, is ultimately addressed by the amount of hydraulic retention time designed into the system.

4.2.2 Conceptual CTW Design

The proposed system consists of two lined CTW cells in series: one enhanced aerobic CTW cell to handle ammonification and nitrification (organic nitrogen → ammonia → nitrite/nitrate), and one anaerobic wood chip CTW cell to handle denitrification (nitrite/nitrate → nitrogen gas). The effluent from the wood chip cell would be re-aerated prior to discharge to the Old Town Pond. Figure 3 shows the conceptual site plan.

Both ammonification (transformation of organic nitrogen to ammonia) and nitrification (transformation of ammonia to nitrite/nitrate) occur best under aerobic (oxygen-rich) conditions. The first CTW cell will contain enhanced aeration to ensure adequate oxygen concentrations and year-round performance. In addition to oxygen requirements, the pH should be between 6.5 and 8 for optimal nitrification. The nitrification process

uses alkalinity, and groundwater data showed pH as low as 5.5 (TW-3). As a result, the first CTW cell will contain reactive media, as well as gravel, to ensure the pH is within the appropriate range for nitrification.

Denitrification (transformation of ammonia to nitrite/nitrate) occurs only under anaerobic (low-oxygen) conditions. In addition, denitrification works best with a pH between 7 and 8.5, and also requires sufficient carbon source. Only one well had detectable BOD (TW-1S), and the level detected was not sufficient to serve as the carbon source for denitrification reactions. As a result, a supplemental carbon source, such as wood chip media, will be used in the second CTW cell to ensure denitrification is not carbon-limited.

The effluent from the wood chip cell would be re-aerated prior to discharge to the Old Town Pond. The reaeration will remove any remnant BOD from the wood chips as well as increase the dissolved oxygen content of the water to a level appropriate for a freshwater discharge.

Due to the site conditions, stormwater will infiltrate to shallow groundwater upgradient of the CTW cell, and directly in the groundwater collection trench. Infiltrated stormwater and shallow groundwater will be pumped to the CTW. Groundwater collection will likely occur using groundwater extraction wells located inside a groundwater extraction trench. The exact location of the wells or extraction trench will be determined after additional groundwater sampling occurs. In addition to shallow groundwater collection, a surface water extraction system will be installed to extract and treat surface water from Old Town Pond.

4.3 Water Treatment Volume and Anticipated Performance

The CTW will treat stormwater, groundwater, and surface water. To be conservative, the maximum groundwater or surface water concentrations observed in the January 2021 sampling event were used to evaluate sizing and performance. In addition, stormwater loadings were calculated using the 2013 Watershed Model developed by the Center for Watershed protection. Based on Site topography, soil type, Site cover conditions (grass and trees), and an average annual rainfall of 48 inches, the CTW is estimated to manage 333,200 cubic feet of runoff per year.

Based on the anticipated constituents in stormwater, groundwater, and surface water, the main contaminant driving the size of the CTW is nitrogen. Roux developed a CTW treatment and sizing model to evaluate treatability of nitrogen under various conditions (temperature, dissolved oxygen, alkalinity, carbon sources, etc.). To evaluate the minimum sizing requirements for the CTW, Roux assumed the maximum nitrogen concentrations identified in the January 2021 sampling event were typical, and that water temperature was 10 degrees C (50 degrees F). Based on these assumptions, the CTW will be able treat a flow of approximately 17 gallons per minute (gpm), which is equivalent to approximately 25,000 gpd.

In addition, the projected flow rate of 17 gpm is equivalent to the wastewater flowrate from approximately 225 people, or 84 houses (based on Southampton housing density and season housing rental estimates).[3]

At 17 gpm, the approximate CTW size would total 0.3 acres, with each cell measuring approximately 70 feet wide, by 75 feet long, with a depth of 3 feet. Roux's modeling outputs show that with strategic aeration and carbon addition with wood chips, the CTW can remove 96% of total nitrogen, which removes 445 kg of nitrogen per year (982 lbs/year). The nitrogen transformations occurring as water moves through Cell 1 (0-75 ft) and Cell 2 (75-150 ft) are shown in the figure below.

[3] Gobler, 2017, page 15.

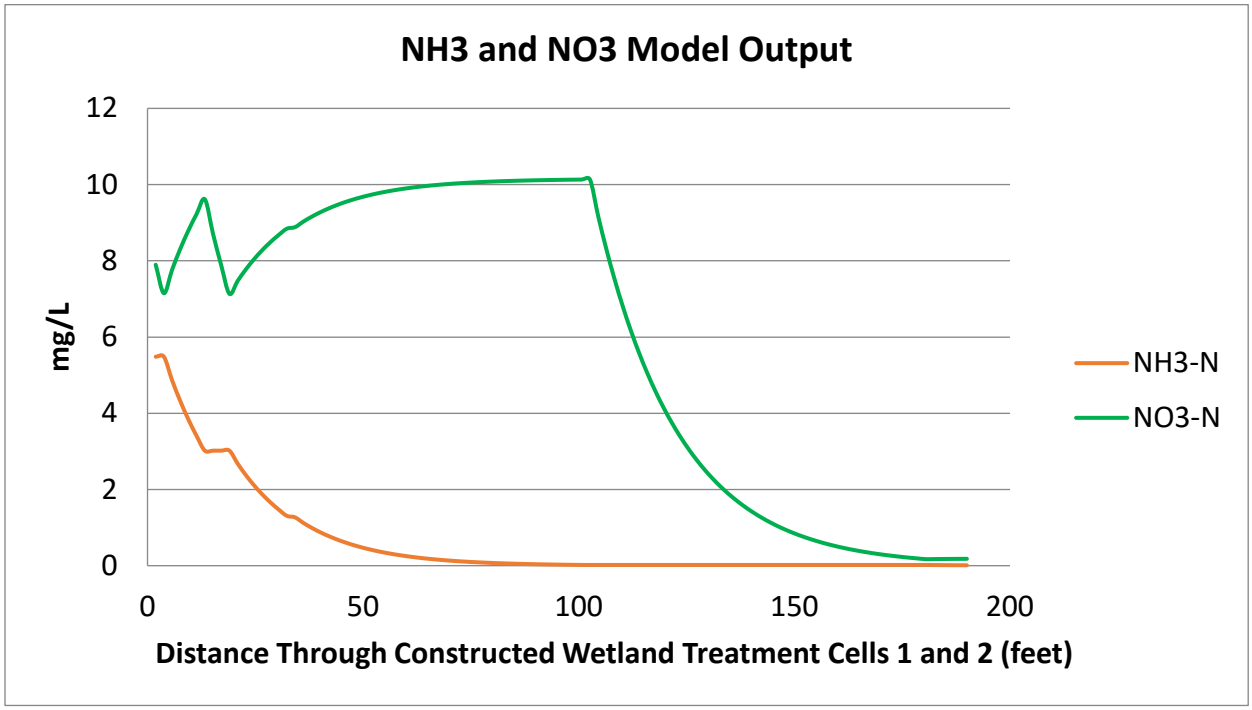

Figure 5. Ammonia (NH3-N) and Nitrate (NO3-N) Removal Through CTW Cells 1 and 2

Phosphorus removal will occur primarily though adsorption to wood chips. It is anticipated that the CTW will remove a total of 182 lbs/year of phosphorus from stormwater, shallow groundwater, and surface water.

Solids were not measured during the January 2021 groundwater study; however, it is anticipated that the solids loading from groundwater is low, based on low turbidity measurements. As a result, the solids loading will primarily come from stormwater. Solids will be removed in CTW hydraulic control structures, specialized influent flow distribution piping (with designated cleanouts), and throughout the CTW cells. It is estimated that the CTW will remove approximately 320 lbs of solids per year.

Coliforms are removed in a CTW through filtration, predation, and UV destruction. CTWs typically have high removal efficiencies for coliforms. Based on the anticipated stormwater loading rate, the CTW will remove approximately 628 billion counts of coliforms per year.

5. Proposed Project Schedule

Key project duration times are estimated below. Certain time duration estimates are subject to change depending on season they fall into (e.g., the planting component of construction and the CTW maturation period). The project timeline is dependent on the schedule to be followed by NYS to make awards and execute a contract. The following timeline assumes that the NYS grant contract will be executed by June 1, 2021, and may be adjusted due to weather conditions, COVID pandemic impacts, or the state's timeline for executing a contract.

Table 2. Project Schedule

Task	Responsibility	Duration	Anticipated Completed Date
Design Bidding to Select **Consultant**	Village of Southampton	4 weeks	7/1/2021
Water Quality Testing	Consultant	6 months	1/1/2022
Draft Engineering Design (70%)	Consultant	1 month	2/1/2022
Final Engineering Design	Consultant	2 months	4/1/2022
Permitting and Regulatory Approvals	Consultant	3 months	5/1/2022
Construction Bid Complete	Consultant & Village of Southampton	4 weeks	5/1/2022
Construction	Consultant & Contractor	2 to 3 months	5/13/2022 to 8/18/2022
System Startup & Maturation Period	Consultant	3 months	8/18/2022 to 11/18/2022
Performance Monitoring	Consultant	1 year	8/18/2022 and ongoing

6. Anticipated Regulatory Approval and Permits

The CTW system will require several regulatory approvals and permits, including:

- NYSEDEC Freshwater Wetlands Permit
- USACE 401 Water Quality Certification & Excavation and Fill in Navigable Water
- NYSDEC State Pollutant Discharge Elimination System (SPDES) Permit
- NYSDEC State Environmental Quality Review – Environmental Assessment Form (SEQR – EAF)
- Village of Southampton Board SEQR Approval

The Consultant will be responsible for filling out the permits listed above, and any other permits deemed necessary to complete the SOW. The consultant will communicate with the permitting agencies as necessary to obtain required permit approvals.

As part of the SPDES permitting process, it is anticipated that the consultant will prepare and submit an Engineering Report for the proposed CTW design. The Engineering Report will include background of the CTW technology, description of the process flow and removal mechanisms, design calculations, performance expectations (including performance data from installed systems), and the draft design package (drawings and specifications).

7. Project Cost Estimate

The total project cost from design through construction is estimated to be $979,200. The largest component of these costs would be the CTW construction, estimated to cost approximately $779,500. Annual O&M is estimated to be $25,000 per year. A breakdown of the costs is provided below. The costs include total costs for engineering, equipment, and construction, as well as force accounts and contingency.

Table 3. Project Cost Estimate

Task	Task Description	Estimated Costs	Force Accounts (5% Admin, 5% Technical)	Contingency (15%)	Total Estimated Costs
1	Design Bidding to Select Consultant	$2,000	$200	$300	$2,500
2	Water Quality Testing to Support Design	$21,500	$2,100	$3,200	$26,800
3	Draft Engineering Design	$41,600	$4,200	$6,200	$52,000
4	Permitting and Regulatory Support	$11,300	$1,100	$1,700	$14,100
5	Final Engineering Design	$29,800	$3,000	$4,500	$37,300
6	Construction Bidding to Select Contractor	$5,000	$500	$800	$6,300
7	Construction	$623,600	$62,400	$93,500	$779,500
8	Startup & Performance Monitoring (Includes OM&M for Year 1 Only)	$55,500	$5,100	$7,600	$63,200
	TOTAL	**$790,300**	**$78,600**	**$117,800**	**$981,700**

Detailed descriptions of each of these tasks is described below.

7.1 Design Bidding to Select Consultant

Upon receipt of the grant, the Village of Southampton will put out a request for proposals for a Consultant to complete the CTW design, construction, and start up.

7.2 Additional Water Quality Testing

Additional groundwater sampling is necessary to (1) evaluate any seasonal variability in groundwater nitrogen loadings to Old Town Pond; and (2) evaluate the most efficient location to place groundwater extraction wells. At a minimum, two additional groundwater monitoring wells should be installed at two locations upgradient of Old Town Pond, proposed sampling locations are shown on Figure 6.

All monitoring wells will be purged and sampled using low flow sampling procedures. Prior to groundwater sampling, a comprehensive round of water level measurements will be performed in all monitoring wells. Following well recovery and stabilization, a groundwater sample will be collected, and field measurements of pH, specific conductance, turbidity, dissolved oxygen, temperature, salinity, and oxidation-reduction

potential will be obtained and recorded in a dedicated field log. Groundwater and surface water samples will be analyzed for total nitrogen and the various forms of nitrogen (i.e., ammonia, nitrate, nitrite, Total Kjeldahl Nitrogen, total organic nitrogen). In addition, the following additional analyses will be completed: phosphorus, alkalinity, total organic carbon (TOC), biological oxygen demand (BOD), chemical oxygen demand (COD), and total dissolved solids (TDS).

7.3 CTW Draft Design

The data collected from water quality testing will be compiled and incorporated into development of a CTW Draft Design. The draft design will include CTW sizing and treatment calculations, and preparation of engineering design drawings and technical specifications. The engineering design drawings are expected to include details of construction, grading plans, areas of work, and other items necessary to establish the level of performance required for the work. Draft design drawings will, at a minimum, include the following sheets:

- Site Plan;
- Excavation and Grading Plan;
- Structure Details;
- CTW Layout Plan;
- CTW Cross Sections;
- CTW Planting Plan;
- Process and Instrumentation Plan;
- Detail Sheets; and
- General Notes and Conditions.

As part of the CTW Draft Design, a Draft Engineering Report will be prepared. This report will be necessary for permitting.

7.4 Permitting and Regulatory Support

See Section 7.

7.5 Final Engineering Design

Following approval of the Draft Engineering Design and approval of the required permits, the Consultant will prepare final design plans and specifications. The final design drawings and specifications will be compiled into a bid package, approved by the Village of Southampton.

7.6 Construction Bidding to Select Contractor

With the approval of the Village of Southampton, the Consultant will solicit contractor bids to complete the construction. The Consultant will review the bids with the Village of Southampton, and the Village of Southampton will award the contract to the most suitable contractor.

7.7 Construction

CTW construction will take approximately two to three months to complete. The costs for installing the system will be contingent upon the final design; however, to facilitate decision-making, an estimated

construction cost is provided below. The costs were developed based on similar projects, best engineering estimates, and the conceptual design/sizing calculations for a 25,000 gpd enhanced subsurface flow CTW system with enhanced aeration. Costs include materials, equipment, and labor.

Table 4. Construction Cost Estimate

Item	Description	Estimated Cost
General Sitework	Site Preparation, Mobilization, Demobilization	$78,660
CTW Earthwork	Excavation, Trenching, Backfill, CTW Liner	$100,330
CTW Aeration System	Blowers, Diffusers, Concrete Pad, Contactor Chambers, Valves & Appurtenances	$135,547
CTW Hydraulics	Groundwater Extraction System, Hydraulic Control Structures, Piping, Fittings, Valves & Appurtenances	$102,535
CTW Media & Wetland Plants	Stone, Limestone, Pea Gravel, Wood Chips, Emergent Wetland Plants	$167,734
	Force Accounts & Contingency (25%)	$146,202
	TOTAL	**$731,008**

7.8 CTW Startup & Performance Monitoring

Following construction, the CTW system will be subjected to an approximate three-month growth and maturation period while the CTW plants and microbes become established. During this time period, the Consultant will make frequent visits to ensure all of the components of the CTW system are functioning properly.

During the first year of operation, the Consultant will conduct monthly inspections to assess the overall growth and development of the system and to address interim maintenance needs.

During the monthly inspections, water quality sampling will be conducted to assess the performance of the CTW system. Samples will be collected from the influent and effluent hydraulic control structures and analyzed for the following compounds: biochemical oxygen demand (BOD5), total suspended solids (TSS), nitrite (NO2), nitrate (NO3), Total Kjeldahl Nitrogen (TKN), ammonia-N, total-nitrogen, and alkalinity. Samples will be submitted to a New York certified laboratory for subsequent analysis.

In addition, measurements of pH, specific conductance, turbidity, dissolved oxygen, temperature, salinity, and oxidation-reduction potential will be obtained and recorded in a dedicated field log. Measurements will be obtained with a Horiba water quality meter that has been calibrated to laboratory standards prior to use. Flow data will also be continuously monitored. Roux will evaluate the data collected, and make recommendations for adjustments or maintenance as needed.

8. Long Term Operation and Maintenance

The CTW system will require occasional OM&M to ensure that the CTW is operating efficiently. The system is designed to minimize equipment or systems with moving parts intended to make operations simplified with only minor adjustments expected on a routine basis.

The primary operational and maintenance activities required for the CTW system include:

- Periodic inspection of system components for overall condition;
- Periodic flushing/cleaning of system piping and structures;
- Maintenance of mechanical components in accordance with manufacturer recommendations;
- Water level and flow adjustment to achieve desired hydraulic residence time; and
- Sample collection as required to monitor overall system performance.

A detailed OM&M plan will be prepared during CTW construction. For planning and decision making purposes, the following table outlines typical annual OM&M.

Table 5. Annual CTW OM&M

Component	Monitoring	Monitoring Frequency	Type
Hydraulics Monitoring	• Water Levels • Flowrate • Pumps	Monthly or Quarterly	Site inspection or telemetry
Aeration System Monitoring	• Pressure • Air Flow	Monthly or Quarterly	Site inspection or telemetry
Water Quality Monitoring	• Effluent • Influent (as necessary)	Quarterly or Annually	Site visit
Equipment Maintenance	• Exercise valves • Calibrate meters • Inspect sensors • Inspect blowers • Inspect pumps	Annually	Site visit
Planting Maintenance	• Verify cover & health • Remove invasive plants • Remove woody plants	Annually	Site visit
Equipment Electrical Power	• Pumps • Blowers	Monthly Billing	N/A

Annual OM&M is estimated to be approximately $25,000 per year. During system startup, OM&M tasks will occur at a higher frequency (monthly). System startup and 1 year of OM&M is included in the proposed budget (see Section 5.8). Funding for routine OM&M after year 1 is anticipated to come from the Village of Southampton. The OM&M tasks should be completed by, or under the supervision of, a consultant or an engineer familiar with system operations. The monitoring and sampling field activities can be completed by a technician, or staff engineer.

In addition to annual OM&M, there are periodic OM&M tasks that may be required. Table 6 shows typical periodic maintenance along with general operational lifespans for components of the CTW system. Costs estimated to conduct periodic maintenance and equipment replacement activities are based on the conceptual design, and other similar projects.

Table 6. Periodic Maintenance and Equipment Lifespans

Component	Estimated Frequency	Estimated Cost	Variables
Pipe Jetting / Structure Cleaning with Vacuum Truck	5 years	$7,000	Dependent on solids coming into system; cost includes disposal
Erosion Repairs	5 years	$4,500	Dependent on slopes, vegetation stabilization, intensity of storms, etc.
Concrete Structure Repair	5 years	$4,500	Sealing and joint construction, operations during low ambient temperatures
Pump Replacement	10 years	$7,500	Average life expectancy
Blower Replacement	10 years	$15,000	Average life expectancy
Diffuser Replacement	20 years	$45,000	Average life expectancy
Flow Sensor Replacement	30 years	$5,000	Assuming magnetic flow meter average life expectancy
CTW Wood Chips Replacement	30 years+	$160,000	Depending on characteristics of wood chips and carbon leaching rates
CTW Gravel Replacement	30 years+	$140,000	Typically needed due to clogging – if solids are managed by pipe cleaning, structure cleaning, lifespan may be longer

Periodic maintenance tasks should be conducted at the recommendation of a consultant or engineer familiar with the system. The periodic maintenance work would be completed by experienced contractors, under the supervision and direction of a consultant or engineer. Funding for periodic OM&M is anticipated to come from the Village of Southampton, on an as-needed basis based on the findings of the annual inspections.

TABLES

All Tables are Embedded in the Text

1. January 2021 Groundwater Quality Summary
2. Project Schedule
3. Project Cost Estimate
4. Construction Cost Estimate
5. Annual CTW OM&M
6. Periodic Maintenance and Equipment Lifespans

FIGURES

1. Existing Conditions
2. Groundwater Flow Map
3. Old Town Road Conceptual CTW Area
4. Photographs of Horizontal Subsurface Flow Wetlands (Embedded)
5. Ammonia (NH3-N) and Nitrate (NO3-N) Removal Through CTW Cells 1 and 2 (Embedded)
6. Proposed New Well Locations

TW-3S/TW-3D
TW-2S/TW-2D
TW-1S/TW-1D
OLD TOWN POND
ATLANTIC OCEAN
Old Town Ln
Wyandanch Ln
Duck Pond Ln
Toylsome Ln
Pierpont St
E Rd
Gin Ln
Murray Ln
Old Town Pond
Windspeare Pond
bing

N

LEGEND

- USGS ELEVATION CONTOUR (NAVD88)
- TEMPORARY NESTED WELL LOCATION
- SITE BOUNDARY
- ESTUARINE AND MARINE DEEPWATER
- ESTUARINE AND MARINE WETLAND
- FRESHWATER POND
- FEMA 1% ANNUAL CHANCE FLOOD HAZARD
- FEMA 0.2% ANNUAL CHANCE FLOOD HAZARD
- STORMWATER FLOW DIRECTION

NOTE

USGS - UNITED STATES GEOLOGICAL SURVEY

300 0 300'

Title:

EXISTING CONDITIONS

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/05/21	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	1
Project Mgr: K.S.	Project: 3656.0001Y002	
File: 3656.0001Y104.1.mxd	SHV 51	

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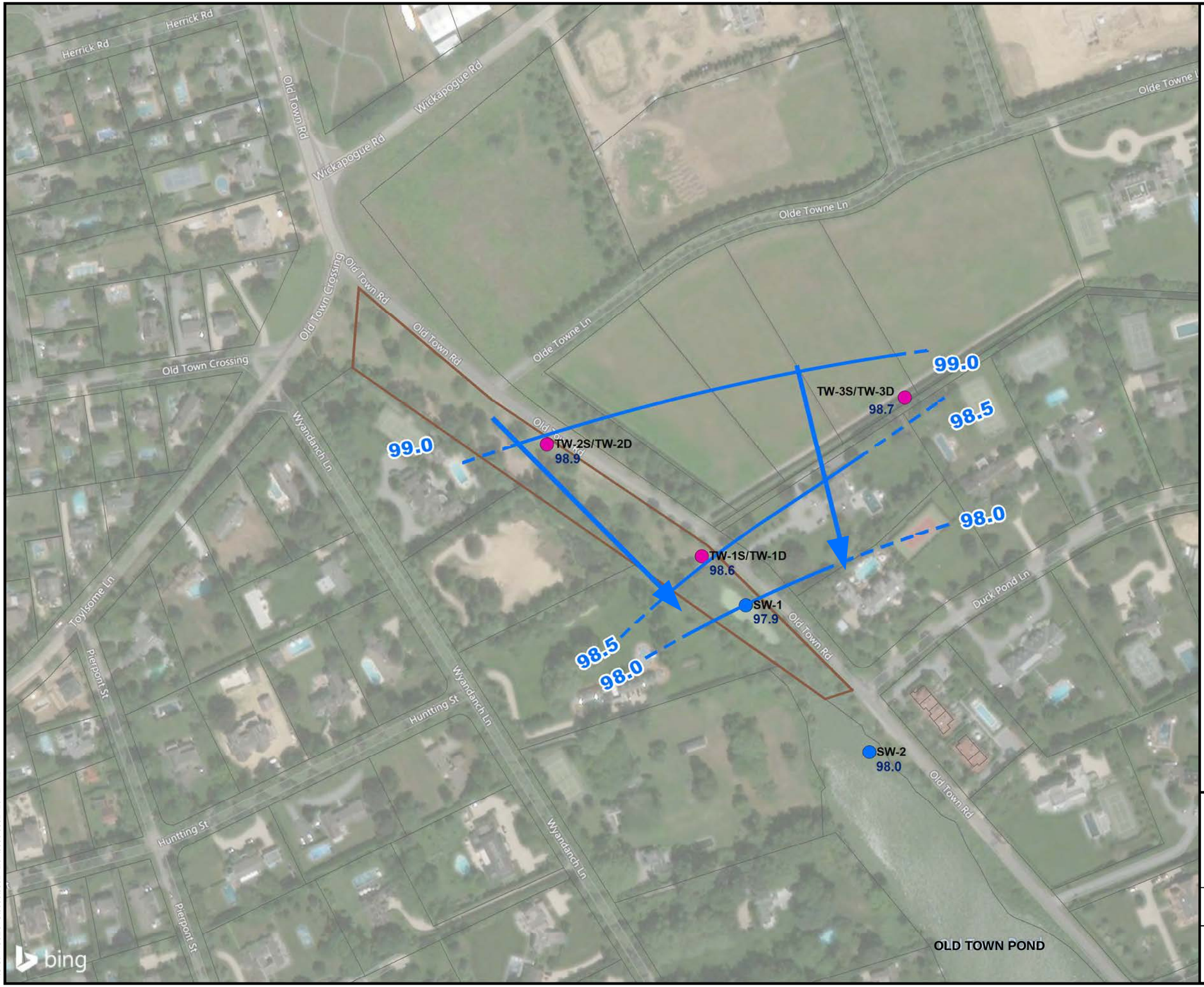

N

LEGEND

- SURFACE WATER SAMPLE LOCATION
- TEMPORARY NESTED WELL LOCATION
- 98.0 — LINE OF EQUAL GROUNDWATER ELEVATION (DASHED WHERE INFERRED) (NAVD1988)
- INFERRED GROUNDWATER FLOW DIRECTION
- SITE BOUNDARY
- *98.0* GROUNDWATER ELEVATION IN FEET

NOTES

1. ALL SAMPLE LOCATIONS ARE APPROXIMATE
2. GROUNDWATER ELEVATIONS BASED ON GAUGING DATA COLLECTED ON JANUARY 6, 2021
3. GROUNDWATER ELEVATION DATA IS RELATIVE

200 0 200'

Title:

GROUNDWATER FLOW MAP JANUARY 2021

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/03/21	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	
Project Mgr: K.S.	Project: 3656.0001Y002	2
File: 3656.0001Y104.2.mxd	SHV 52	

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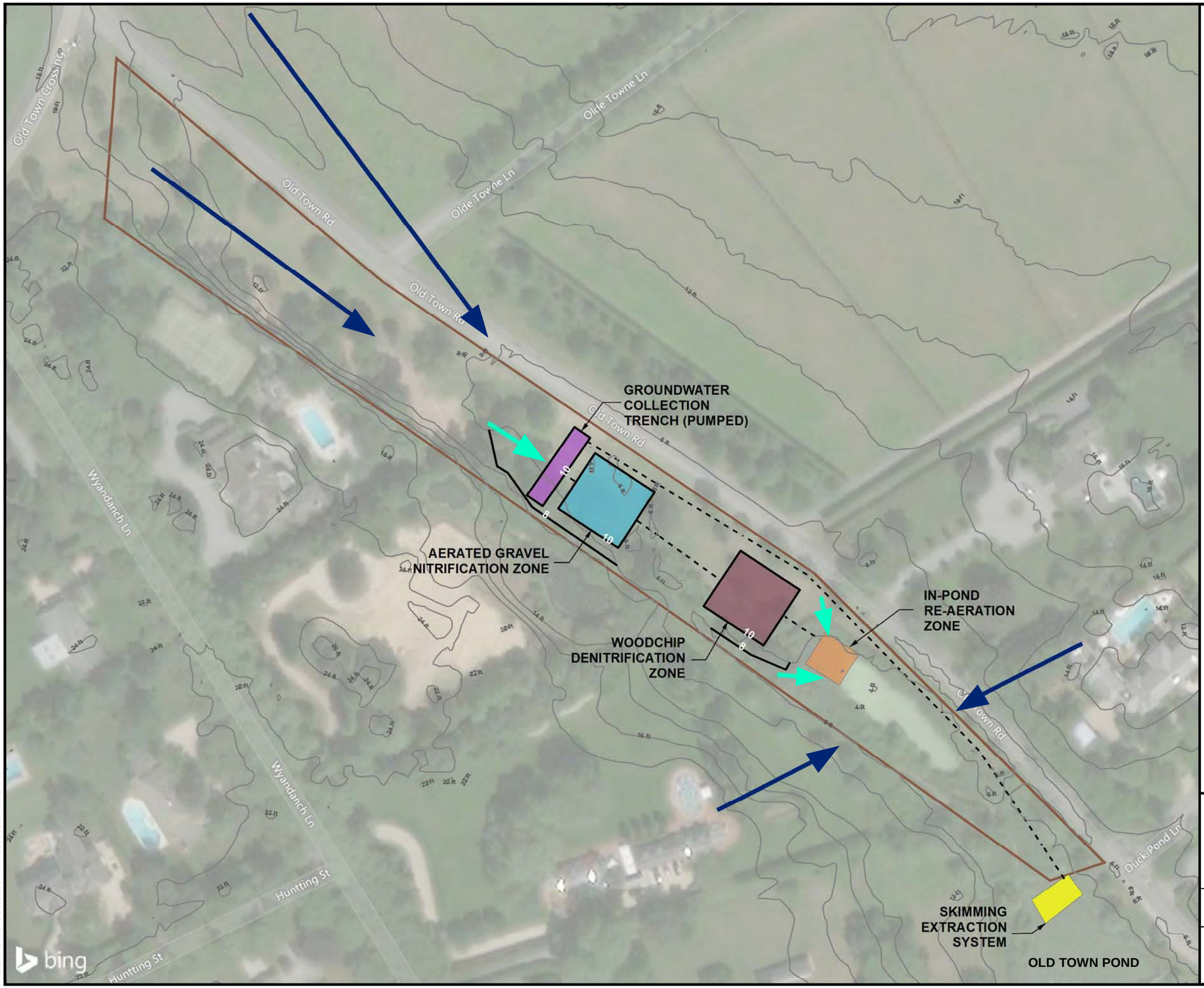


N

LEGEND

- USGS ELEVATION CONTOUR (NAVD88)
- PROPOSED GRADING CONTOURS
- CTW CONNECTIONS
- AERATED GRAVEL NITRIFICATION ZONE
- GROUNDWATER COLLECTION TRENCH (PUMPED)
- IN-POND RE-AERATION ZONE
- SKIMMING EXTRACTION SYSTEM
- WOODCHIP DENITRIFICATION ZONE
- SITE BOUNDARY
- STORMWATER FLOW DIRECTION
- PROPOSED MODIFICATION TO STORMWATER FLOW DIRECTION

NOTES

1. CTW SYSTEM WILL TREAT STORM WATER THAT HAS INFILTRATED INTO SHALLOW GROUNDWATER AND ALSO STORM WATER CAPTURED IN THE SKIMMING EXTRACTION SYSTEM.

CTW - CONSTRUCTED TREATMENT WETLAND
USGS - UNITED STATES GEOLOGICAL SURVEY

100 0 100'

Title:

OLD TOWN ROAD CONCEPTUAL CTW AREA

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/05/21	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	3
Project Mgr: K.S.	Project: 3656.0001Y002	
File: 3656.0001Y104.3.mxd	SHV 53	

V:\GIS\PROJECTS\3656\0001Y\104\3656.0001Y104.3.MXD

N

LEGEND

- SURFACE WATER SAMPLE LOCATION
- TEMPORARY NESTED WELL LOCATION
- PROPOSED TEMPORARY WELL LOCATION
- SITE BOUNDARY

NOTE

1. ALL SAMPLE LOCATIONS ARE APPROXIMATE

200 0 200'

Title:

PROPOSED NEW WELL LOCATIONS

OLD TOWN POND, SOUTHAMPTON

Prepared for:

VILLAGE OF SOUTHAMPTON

ROUX

Compiled by: K.S.	Date: 02/03/21
Prepared by: M.S.R.	Scale: AS SHOWN
Project Mgr: K.S.	Project: 3656.0001Y002
File: 3656.0001Y104.6.mxd	SHV 54

FIGURE 6

V:\GIS\PROJECTS\3656\0001Y\104\3656.0001Y104.6.MXD

ATTACHMENTS

1. Site Photographs
2. Soil Boring Logs
3. Groundwater and Surface Water Quality Results

ATTACHMENT 1

Site Photographs


Photo Location 2
Old Town Rd
Photo Location 1
Old Town Rd
Old Town Rd
Duck Pond Ln
Photo Location 4
Photo Location 3
Old Town Rd
Wyandanch Ln
Wyandanch Ln

Photograph 1: View of the proposed CTW area facing southeast

Photograph 2: View of the proposed CTW area facing northwest

Photograph 3: View of Old Town Pond facing southeast.

Photograph 4: View of Old Town Pond facing northwest.

ATTACHMENT 2

Soil Boring Logs

TW-1D

Client:	Site:	Project Number:
Village of Southampton	Old Town Pond	3656.0001Y002
Address:	**City/State:**	**Logged By:**
Old Town Road	Southampton, New York	D. Dray

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
1/5/2021 - 1/5/2021	Trinity Environmental	Geoprobe	2" Macro-Core
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
20 feet	Soil Cuttings	2-inches	1.44 feet
Area:	**Elevation:**	**Northing:**	**Easting:**
NM	100.05	264555.3781	1433402.255

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
20 feet	1-inch SCH 40 PVC	15-20 feet	20-Slot		

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
0	Flush mount J-plug			Brown, SAND and SILT, moist, no odor.				
				Light Brown, CLAY and SILT, wet, no odor.	G			Water observed at 19 inches bls.
				Light brown, SAND, some Gravel, wet, no odor.				
5								
	1-inch, Schedule 40, PVC Riser							
10								
15	1-inch, Schedule 40, 20-slot PVC							End of boring at 20 ft bls.

ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

TW-1S

Client:	Site:	Project Number:
Village of Southampton	Old Town Pond	3656.0001Y002
Address:	**City/State:**	**Logged By:**
Old Town Road	Southampton, New York	D. Dray

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
1/5/2021 - 1/5/2021	Trinity Environmental	Geoprobe	2" Macro-Core
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
6.5 feet	Soil Cuttings	2-inches	1.42 feet
Area:	**Elevation:**	**Northing:**	**Easting:**
NM	100.00	264555.3781	1433402.255

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
6.5 feet	1-inch SCH 40 PVC	1.5-6.5 feet	20-Slot		

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	Flush mount J-plug			Brown, SAND and SILT, moist, no odor.				
	1-inch, Schedule 40, PVC Riser							
				Light Brown, CLAY and SILT, wet, no odor.				Water observed at 19 inches bls.
				Light brown, SAND, some Gravel, wet, no odor.	G			
	1-inch, Schedule 40, 20-slot PVC							
5								
								End of boring at 6.5 ft bls.

ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

TW-2D

Client:	Site:	Project Number:
Village of Southampton	Old Town Pond	3656.0001Y002
Address:	**City/State:**	**Logged By:**
Old Town Road	Southampton, New York	D. Dray

Start to Finish Date:	Contractor:	Drill Type:	Sampler Type/Method:
1/5/2021 - 1/5/2021	Trinity Environmental	Geoprobe	2" Macro-Core
Borehole Depth:	**Backfill:**	**Borehole Diameter:**	**DTW:**
20 feet	Soil Cuttings	2-inches	2.57 feet
Area:	**Elevation:**	**Northing:**	**Easting:**
NM	100.98	264789.5784	1433078.29

Well Depth:	Well Dia./Materials:	Screen Interval:	Screen Slot Size:	Sand/Filter Pack Size:	Annular Seal:
20 feet	1-inch SCH 40 PVC	15-20 feet	20-Slot		

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	Flush mount J-plug			Dark brown, SAND and SILT, moist, no odor.				
				Brown, SAND and SILT, moist, no odor.				
				Brown, CLAY and SILT, moist, no odor.				
				Light brown, coarse SAND, some Gravel, wet, no odor.	G			Water observed at 3 ft bls.
5				Light brown, SAND, some Gravel, wet, no odor.				
	1-inch, Schedule 40, PVC Riser							
10								
15								
	1-inch, Schedule 40, 20-slot PVC							End of boring at 20 ft bls.

ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

ROUX

TW-2S

Client: Village of Southampton	Site: Old Town Pond	Project Number: 3656.0001Y002
Address: Old Town Road	City/State: Southampton, New York	Logged By: D. Dray

Start to Finish Date: 1/5/2021 - 1/5/2021	Contractor: Trinity Environmental	Drill Type: Geoprobe	Sampler Type/Method: 2" Macro-Core
Borehole Depth: 5.5 feet	Backfill: Soil Cuttings	Borehole Diameter: 2-inches	DTW: 2.12 feet
Area: NM	Elevation: 101.3	Northing: 264789.5784	Easting: 1433078.29

Well Depth: 5.5 feet	Well Dia./Materials: 1-inch SCH 40 PVC	Screen Interval: 0.5-5.5 feet	Screen Slot Size: 20-Slot	Sand/Filter Pack Size:	Annular Seal:

Depth (ft)	Well Diagram	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
	Flush mount J-plug			Dark brown, SAND and SILT, moist, no odor.				
	1-inch, Schedule 40, PVC Riser			Brown, SAND and SILT, moist, no odor.				
				Brown, CLAY and SILT, moist, no odor.				
				Light brown, coarse SAND, some Gravel, wet, no odor.	G			Water observed at 3 ft bls.
	1-inch, Schedule 40, 20-slot PVC							
5								End of boring at 5.5 ft bls.

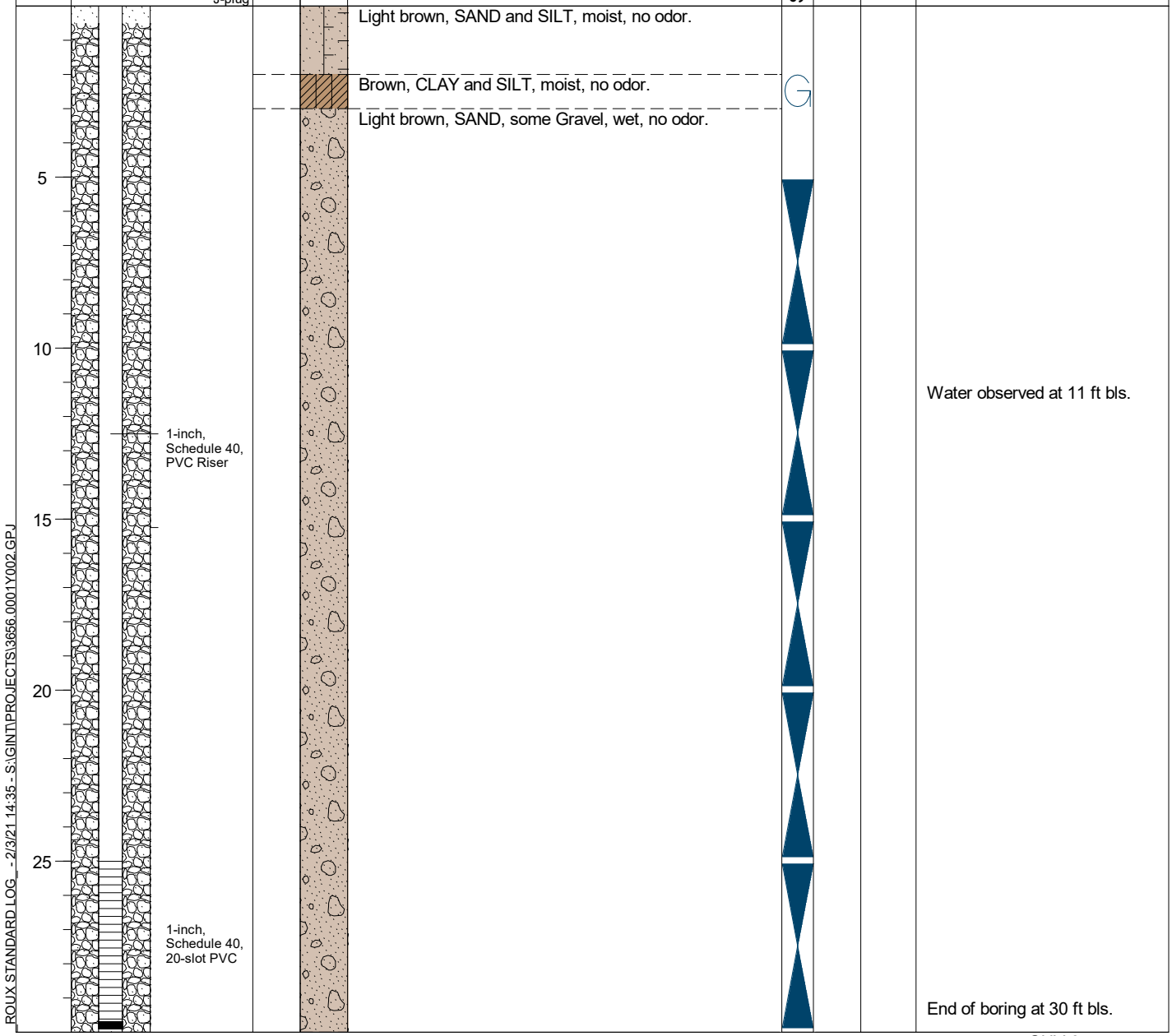
ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

TW-3D

Client: Village of Southampton	Site: Old Town Pond	Project Number: 3656.0001Y002
Address: Old Town Road	City/State: Southampton, New York	Logged By: D. Dray

Start to Finish Date: 1/5/2021 - 1/5/2021	Contractor: Trinity Environmental	Drill Type: Geoprobe	Sampler Type/Method: 2" Macro-Core
Borehole Depth: 30 feet	Backfill: Soil Cuttings	Borehole Diameter: 2-inches	DTW: 10.66 feet
Area: NM	Elevation: 109.39	Northing: 264887.4339	Easting: 1433826.437

Well Depth: 30 feet	Well Dia./Materials: 1-inch SCH 40 PVC	Screen Interval: 25-30 feet	Screen Slot Size: 20-Slot	Sand/Filter Pack Size:	Annular Seal:



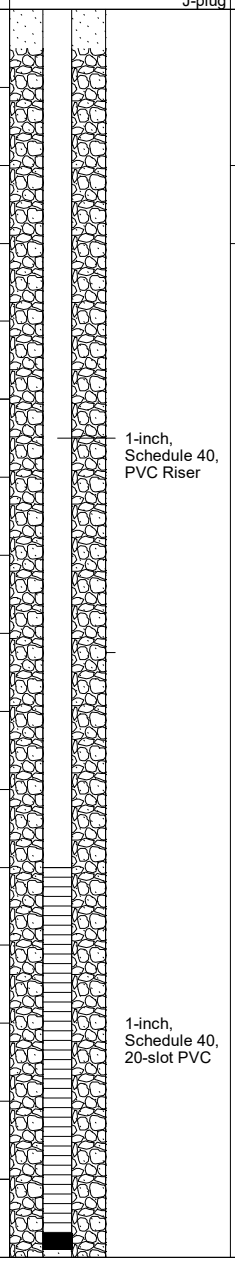
ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

TW-3S

Client: Village of Southampton	Site: Old Town Pond	Project Number: 3656.0001Y002
Address: Old Town Road	City/State: Southampton, New York	Logged By: D. Dray

Start to Finish Date: 1/5/2021 - 1/5/2021	Contractor: Trinity Environmental	Drill Type: Geoprobe	Sampler Type/Method: 2" Macro-Core
Borehole Depth: 16 feet	Backfill: Soil Cuttings	Borehole Diameter: 2-inches	DTW: 10.75 feet
Area: NM	Elevation: 109.49	Northing: 264887.4339	Easting: 1433826.437

Well Depth: 16 feet	Well Dia./Materials: 1-inch SCH 40 PVC	Screen Interval: 11-16 feet	Screen Slot Size: 20-Slot	Sand/Filter Pack Size:	Annular Seal:



Depth (ft)	USCS	USCS Graphic	Visual Description	Sample Interval	Recovery (ft)	PID	Notes
			Light brown, SAND and SILT, moist, no odor.				
			Brown, CLAY and SILT, moist, no odor.	G			
			Light brown, SAND, some Gravel, wet, no odor.				
							Water observed at 11 ft bls.
							End of boring at 16 ft bls.

ROUX STANDARD LOG - 2/3/21 14:35 - S:\GINT\PROJECTS\3656.0001Y002.GPJ

ATTACHMENT 3

Groundwater and Surface Water Quality Results

Notes Utilized Throughout Tables	
Groundwater Tables	
J -	Estimated Value
U -	Compound was analyzed for but not detected
B -	The analyte was found in an associated blank as well as in the sample
NA -	Compound was not analyzed for by laboratory
µg/L -	Micrograms per liter

Table 1. Summary of Metals in Water Quality Data Results, Old Town Pond, Southampton, New York

Parameter (Concentrations in µg/L)	Sample Designation: / Sample Date:	SW-1 1/6/2021	SW-2 1/6/2021	TW-1D 1/6/2021	TW-1S 1/6/2021	TW-2D 1/6/2021	TW-2S 1/6/2021	TW-3D 1/6/2021	TW-3S 1/6/2021 Total	TW-3S 1/6/2021 Dissolved
Aluminum		51.5	76.3	50.5	10300	31.1 J	535	33.9 J	19.5 J	NA
Antimony		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	NA
Arsenic		1.2 J	2.2	2.0 U	24.4	2.0 U	2.0 U	2.0 U	2.0 U	NA
Barium		25.3	10.8	18.1	51.9	9.1	8.1	41.8	14.3	NA
Beryllium		0.80 U	0.80 U	0.80 U	0.69 J	0.80 U	0.80 U	0.80 U	0.80 U	NA
Cadmium		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	NA
Calcium		16300	11500	12000	21100	26300	15300	20400	7000	NA
Chromium		4.0 U	4.0 U	4.0 U	6.9	4.0 U	4.0 U	4.0 U	4.0 U	NA
Cobalt		0.82 J	4.0 U	4.7	3.1 J	5.5	2.2 J	6.2	3.9 J	NA
Copper		2.6 J	4.0 U	4.0 U	62.6	4.0 U	3.8 J	4.0 U	4.0 U	NA
Iron		1490	191	131	22800	703	620	951	221	207
Lead		1.2 U	1.2 U	1.2 U	86.1	1.2 U	1.9	1.2 U	1.2 U	NA
Magnesium		5150	7990	3790	3000	2970	3950	4890	2140	NA
Manganese		463	74.4	875	570	983	960	701	562	NA
Mercury		0.20 U	0.20 U	0.20 U	0.2	0.20 U	0.20 U	0.20 U	0.20 U	NA
Nickel		2.9 J	1.2 J	3.3 J	5.4	5.5	1.3 J	5.9	3.4 J	NA
Potassium		4300	4950	4080	1100	2900	465	4400	2980	NA
Selenium		2.5 U	2.5 U	2.5 U	0.66 J	2.5 U	2.5 U	2.5 U	2.5 U	NA
Silver		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	NA
Sodium		28200	66900	6290	7600	10600	12000	9020	7710	NA
Thallium		0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.22 J	0.80 U	NA
Vanadium		4.0 U	1.0 J	4.0 U	21.7	4.0 U	1.0 J	4.0 U	4.0 U	NA
Zinc		16.0 U	16.0 U	16.0 U	121	16.0 U	16.0 U	16.0 U	16.0 U	NA

Table 2. Summary of Pesticides in Water Quality Data Results, Old Town Pond, Southampton, New York

Parameter (Concentrations in µg/L)	**Sample Designation:** / **Sample Date:**	SW-1 1/6/2021	SW-2 1/6/2021	TW-1D 1/6/2021	TW-1S 1/6/2021	TW-2D 1/6/2021	TW-2S 1/6/2021	TW-3D 1/6/2021	TW-3S 1/6/2021
4,4'-DDD		0.020 U	0.020 U	0.020 U	0.08	0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDE		0.020 U	0.020 U	0.020 U	0.04	0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDT		0.020 U	0.020 U	0.020 U	0.19	0.020 U	0.020 U	0.020 U	0.020 U
Aldrin		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
alpha-BHC		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
beta-BHC		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Chlordane (Technical)		0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
delta-BHC		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Dieldrin		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endosulfan I		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endosulfan II		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endosulfan sulfate		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endrin aldehyde		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endrin ketone		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Endrin		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
gamma-BHC (Lindane)		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Heptachlor epoxide		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Heptachlor		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Methoxychlor		0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Toxaphene		0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Table 3. Summary of General Chemistry in Water Quality Data Results, Old Town Pond, Southampton, New York

Parameter (Concentrations in µg/L)	**Sample Designation:** / **Sample Date:**	SW-1 1/6/2021	SW-2 1/6/2021	TW-1D 1/6/2021	TW-1S 1/6/2021	TW-2D 1/6/2021	TW-2S 1/6/2021	TW-3D 1/6/2021	TW-3S 1/6/2021
Alkalinity, Bicarbonate (As CACO3)		44000	32100	26600	38700	56700	24600	5000 U	5000 U
Alkalinity, Carbonate (As CACO3)		5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U
Alkalinity, Hydroxide (As CACO3)		5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	18400	10400
Alkalinity, Total (As CACO3)		44000	32100	26600	38700	56700	24600	23400	14500
Ammonia		65.1 J	100 U	124	1110	87.6 J	77.2 J	138	83.5 J
Biochemical Oxygen Demand (BOD)		1200	5700	1000 U	21500	1000 U	1000 U	1000 U	1000 U
Nitrate		305	100 U	2300	29.0 J	841	7580	1870	1190
Nitrite		25.6 BJ	100 U	200 U	29.0 BJ	26.0 BJ	144 BJ	21.8 BJ	14.9 BJ
Nitrogen, Nitrate + Nitrite		537	1400	2300	4550	200 U	1430	200 U	200 U
Phosphane		72.9	144	30.0 U	854	30.0 U	71.5	60.8	30.0 U
Phosphorus, Total Orthophosphate (As PO4)		223	441	90.0 U	2620	90.0 U	219	186	90.0 U
Sulfate (As SO4)		15200	21300	17300	2740 J	10900	6420	42300	18500
Total Dissolved Solids		168000	357000	119000	113000	154000	148000	160000	62000
Total Nitrogen		868	1400	2300	4650	867	9150	1890	1200
Total Organic Carbon		3540	5100	1330	14300	2070	3760	1230	1180
Total Organic Nitrogen		602	1500	500 U	5660	500 U	1510	500 U	500 U