APPENDIX D

WRITTEN TECHNICAL COMMENTS

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September 18, 2019

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September 18, 2019

Honorable Chair Paul Ehrlich and Members
Planning Board
Town of Huntington
100 Main Street
Huntington, NY 11743

RE: The Proposed Preserve at Indian Hills, DEIS – Fort Salonga, NY

Honorable Chair Paul Ehrlich and Members of the Planning Board:

I have begun to review the July 2019 DEIS for The (proposed) Preserve at Indian Hills along with several planning documents and existing data within several external governmental documents as related to the referenced project. The comments WBL and Associates, LLC will provide tonight are the result of our limited analysis to-date. This submission will be followed up by a more detailed set of comment and analysis by October 18, 2019. WBL and Associates, LLC is and will be presenting these comments and analyses on behalf of the Fort Salonga Homeowners Association.

PROCESS

The Proposed Preserve at Indian Hills is not a re-development project. One, existing use is not being replaced by another. Rather, the existing golf course use, which used the entire original acreage of land to justify its creation and "density" will *remain* if the project receives Planning Board (and Zoning Board) approval. Then a second use, residential housing, which is attempting to use the entire, original acreage of land (plus some relatively small, additional lands) to justify its creation and "density" will be layered on top of that original use. This doubling of density by and of itself requires either a change of zone for the property, a jurisdiction of the Town Board, or an approval by the Zoning Board of Appeals (see below). Further, it is contrary to the enabling laws for Town zoning in New York State (NYS). That is, Section 261 and 278 requires that the Town (1) not allow "overcrowd" of the land for environmental and demographic purposes, (2) "shall in no case exceed the number which could be permitted...if the land were subdivided into conforming lots..." (i.e., no double use of a parcel of land's density) and (3) must, "determine that there will be no significant environmentally damaging consequences." This proposed project, in "double

D-1
Sec.
2.12

dipping" the density of the same land to allow what would be two separate and distinct uses (and legal entities) and counting the same lands justify each uses' full density, is in contravention to good planning and the intent of the State's requirements for zoning laws[1].

The Indian Hill Golf Course was not allowed under the current zoning of the property at R40. It was rather enabled as a use of the site by Special Permit issued by the Zoning Board of Appeals. If the current proposal is approved by the Planning board, it will violate a basic tenant of that prior Zoning Board approval. That is, the Special Permit was granted on the basis of a certain "density" of the use and assumedthe golf course would occupy certain parcels lands with a certain acreage. If The Preserve at Indian Hills is approved by the Planning Board, the original parcel will be subdivided and acreage will be removed for another use (which derives its density from the same, original golf course parcel). Thus, the original parcels/lands which received the Special Permit approval will no longer exist and the golf course use, itself, will have increased an "density." Thus, the Special Permit will be invalid and will require another review by the Zoning Board of Appeals.

D-2
Sec.
2.12

The DEIS itself, in Section 1.6.2 on Page 1-11 acknowledges these conflicts in jurisdiction for The proposed Preserve at Indian Hills. That is, the DEIS states, "During the course of review, the matter may be referred to the ZBA or an application may be made for the amendment of the previously issued Special Use Permit..." The only quarrel I have with this statement are the words, "may" and "refer;" the project *will* require Zoning Board of Appeals approval and since the first, basic use has already required same, the project should be *remanded* To the Zoning Board of Appeals.

Given the above, it is at least uncertain as to whether or not the current proposal is viable under existing Town Zoning and NY State's enabling laws. Thus, no further efforts of the Town Planning Board members, the Town staff or neighbors with substantial concerns should be or need be expended on the proposed project at this point. The Planning Board should suspend its review of the proposal and remand[2] the project to the Zoning Board of Appeals.

TECHNICAL

The portion of the DEIS' technical analyses upon which I am focused tonight is the groundwater (and some surface water) quality on the subject property and in the area bounded by Crab Meadow, Long Island Sound and the Fresh Pond corridor.

For groundwater quality, I begin with the existing condition. I will largely focus on nitrogen concentrations as a proxy for the general condition of the upper glacial aquifer in this area. Nitrogen is a naturally

[1] The use of "clustering" in NY State, in my 40 years' experience, has been to allow one use to claim density from any given piece of land. Then, to cluster that use on a smaller portion of that land to preserve either an agricultural use or natural resource. The result is that one entity usually controls the land and then leases the land or controls its maintenance for that second use. In terms of recreational space, if present, it is held in common but only for the exclusive use of the residents and guests.

[2] The Zoning Board of Appeals was and is the initial approval authority of the Golf course, which use unpins this entire proposal. With out the golf course in place, the Planning Board would not consider a plan other than an as-of-right subdivision or cluster. Thus, this would be a remanding and not a simple referral of the proposal back to that Board.

occurring element which is an important nutrient. Below certain levels (see below) nitrogen is a nutrient; above certain levels it is a pollutant. The human health standard for nitrogen is expressed as nitrates at 10 milligrams per liter (mg/l). The environmental standard for nitrogen is between 1.25 and 1.5 mg/l as total nitrogen. The importance of nitrogen is that it drives the growth of plants by enabling the production of chlorophyll (the compound which converts light to biological energy). When plants grow too fast or abundantly, they trigger algal (simple, often single cell plants) blooms. When the blooms die off, they usually settle to the aquatic water's bottom and decay. The decay then strips most of the oxygen out of the water column and kills the aquatic organisms ranging from zooplankton (which eat the algae) to fish that feed on the zooplankton. This condition is called hypoxia.

The Indian Hills Golf Course (and proposed project) essentially occur on an elevated peninsula of sand and gravel bounded by wetlands and water bodies in low-lying topography to the west by Crab Meadow, to the north by Long Island Sound and to the east by the Fresh Pond Corridor. Incident precipitation generally percolates to the ground water; which dominantly flows to the north (DEIS Figure 2-6). The upper glacial aquifer's is generally a suppressed version of the topography. Thus, the ground water also flows with a westward component into Crab Meadow[3] and an eastward component into the Fresh Pond corridor (more so than is conveyed in DEIS Figure 2-6. The nitrogen content in groundwater will significantly impact these surface water', ecology[4].

D-3 Sec. 2.8

There are two wells on the property which have been sampled for ground water quality. The first is cited in the DEIS and it is the golf course's irrigation well. This well has nitrate levels at 7.21 and 7.56 mg/l. These are cited by the DEIS as being due largely to upgradient residences[5]. However, the well location is some 800 feet within the golf course on its western side, adjacent to Fresh Pond Road. With the easterly component of groundwater flow down slope and into the Fresh Pond corridor, this well also reflects percolating waters from the golf course. This conclusion is borne out by Suffolk County monitoring well #115186, which occurs 1,800 feet into the golf course and again on its western side but before substantial residential influence. This well has tested above 5 mg/l in the most recently available results in 2015. Further, this well has doubled in nitrate concentration in 15 years from 2 to 3.1 mg/l in 1999 to the present levels. Thus, the golf course and its fertilization have had an impact on these groundwaters and will impact the adjacent surface waters over time.

The Long Island Sound Study of March 2018 by the US Environmental Protection Agency shows hypoxic locations to the east of the Fresh Pond outlet (Subtask A, Figure 1). This area already frequently experiences dissolved oxygen levels of less than 3 mg/l in summertime. As the ground water beneath the proposed project site discharges directly northward into Long Island Sound or westward into the Fresh Pond corridor, it may impact upon and spread this condition westward. Thus, ground water quality (with

D-4 Sec. 2.9

[3] I have personally noted spring flows off the hillsides in question down into the Crab Meadow ponds many times.
[4] This is borne out by the Town of Huntington's hydrology and watershed characterization study which is" currently underway with the objective of understanding the environmental drivers and stressors within the Crab Meadow Watershed. The assessment will provide the basis for the development of a Watershed Stewardship Plan." – TOH website. The Town should await the finalization of this study before proceeding with the proposed project.
[5] Even if this were the case, the Preserve at Indian Hills proposes to *add* residences with their resultant nitrogen discharges as a layer on "top" of and simultaneous with the golf course.

nitrogen as the proxy) is an important factor for consideration in allowing or disallowing the project. In the same study series (Subtask G), the authors derive Nitrogen Endpoints - that is, levels of total nitrogen which will cause stress and a negative "response" to that stress. For the Northport-Centerport complex (the closest to the project area to the west) the total nitrogen endpoint is 1.27 mg/l (using the higher, chlorophyll a corrected levels). For the Nissequogue River complex (the closest to the project area to the east) the total nitrogen endpoint is 1.21 mg/l. Thus, at the Indain Hills golf course site, groundwater nitrogen levels are already well above these stressor levels.

To evaluate the nitrogen levels of the project when developed, the applicant has use the SONIR model to develop total expected nitrogen loads. The SONIR model is a useful tool for predicting nitrogen loadings. However, the outputs rely entirely on the inputs and many of these are assumptions. The predicted nitrogen loads are then divided by the project acreages to provide an "average," mass-balanced nitrogen level in mg/l[6].

The DEIS SONIR analysis in Appendix J-3 shows an existing condition level of 0.76 mg/l. This level clearly understates the existing loading of nitrogen on the subject property where the irrigation well and Suffolk County well #115816 show levels of 7 and 5 (plus) mg/l, respectively. The Alternative 2 SONIR analysis, a standard subdivision with no golf course (which the applicant does not favor), shows a more realistic 5.63 mg/l result. Further, DEIS Table 5-1 shows an expected, SONIR-predicted nitrogen level of 1.95 mg/l for the proposed project, including both the golf course and residential housing layered on top of that use. This is approximately one third of the nitrogen levels found in groundwater in the existing condition, with only one use – the existing Indian Hills golf course- - on the property.

The reason for this discrepancy lies in the inputs to the model. For example, the applicant is using a leaching rate for applied nitrogen in fertilizers of 10 percent. The Suffolk County Draft Subwatershed Plan of August 2019 uses 20 percent leaching for golf courses. This one change will approximately *double* the SONIR nitrogen loading result provided in the DEIS. Further, the Alternative 2 SONIR analysis, a standard subdivision with no golf course (which the applicant does not favor), assumes the use of conventional sanitary disposal systems with a 5.63 mg/l result but Alternative 3 SONIR analysis, a clustered subdivision with no golf course assumes the use of innovative sanitary disposal systems and has a lesser predicted result of 4.08 mg/l of nitrogen discharged to ground water. The use of either a conventional or an innovative sanitary system for *both* Alternatives would provide an "apples to apples" comparison.

Further analysis of the DEIS SONIR modeling will be forthcoming by October 18, 2019. We urge both you and the Town staff to look closely at the inputs and resultant outputs of the SONIR modeling in order to (1) more accurately predict the groundwater impacts of the project (with its proposed, two simultaneous uses on one property) and (2) to make an "apples to apples" comparison and (3) to make aninformed decision.

In reference to <u>surface waters</u>, we have had almost no time as yet to focus on the DEIS text, tables and figures. However, we note in Table 2-2 surface water pond sampling that the results show no total or nitrate nitrogen. However, sample results from 2016 in Table 2-4 show total nitrogen levels at 6.03 mg/l

D-5 Sec. 2.9

[6] Which may in part be the subject of a more detailed review.

and nitrate levels at 0.23 mg/l. Further, the Table 2-2 results show total phosphorous levels in all but one sample and the highest sample had up to 1,060 mg/l phosphorous. In biological systems, the nitrogen to phosphorous ratio is usually approximates 7:1, i.e., higher nitrogen levels and lower phosphorous levels. Thus, we believe these locations need some repetitions of sampling to determine a more consistent (and realistic?) result.

Finally, Section 4.2 **Cumulative Impacts** in the DEIS is incomplete. It is focused entirely on the potential cumulative impacts of other subdivisions on traffic volumes.

D-6 Sec. 2.5

However, if the above project is approved, it can set a precedent for other golf courses (e.g., the Crescent Club, Huntington Country Club, and the Town's own golf courses.) and private or public recreational uses (e.g., tennis clubs, yacht clubs, etc.). Thus, what would be the expected impact of at least those golf course properties following suit with The Preserve at Indian Hills, as it effectively doubles the density of use upon the lands it currently occupies?

In summary, we urge both the Planning Board and the Town staff to look closely at the inputs and resultant outputs of the various DEIS analyses in order to more accurately predict the impacts of the project (with its proposed, two simultaneous uses on one property) and so, be aided in making a properly informed decision.

SUMMARY

A. Given the above PROCESS discussion, it is at least uncertain as to whether or not the current proposal is viable under existing Town Zoning and NYS enabling laws. Thus, the Planning Board should suspend its review of the proposal and remand the project to the Zoning Board of Appeals.
B. We urge both the Planning Board and the Town staff to look closely at the TECHNICAL inputs and resultant outputs of the various DEIS analyses in order to more accurately predict the impacts of the project (with its proposed, two simultaneous uses on one property) and so, make a properly informed decision.
C. Given the depth of TECHNICAL analysis that the Proposed Preserve at Indian Hills requires (witness the extensive DEIS and numerous appendices) and if the Planning Board does not remand the project back to the Zoning Board, then we believe this situation requires another chance to publicly review the process and technical responses of applicant to these comments, our upcoming, more detailed analysis of October 18 and other public comments prior to preparation of an FEIS and Findings Statement.

If you have any questions, please do not hesitate to contact our offices as provide in the letterhead.

Sincerely,

Michael P. Bontje

SEQRA – DEIS Process and Technical Review for The Preserve at Indian Hills Fort Salonga, New York

October 30, 2019

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SEQRA – DEIS Process and Technical Review for The Preserve at Indian Hills Fort Salonga, New York

October 30, 2019

Table of Contents

1.0 INTRODUCTION

WBL and Associates LLC staff have read and analyzed the July 2019 DEIS for The (proposed) Preserve at Indian Hills along with several planning documents and existing data within several external governmental documents as related to the referenced project. These additional comments follow up WBL and Associates, LLC comments presented at the September 18, 2019 public hearing. WBL and Associates, LLC is and will be presenting these comments and analyses on behalf of the Fort Salonga Property Owners Association (FSPOA). Examples of the external governmental documents include planning documents for the area including Crab Meadow watershed, Suffolk County groundwater studies in general, Suffolk County Subwatersheds Wastewater Plan GEIS, August 2019, and the continuing Long Island Sound Studies program (as sponsored by US EPA, NYSDEC, etc.).

2.0 PROCESS

2.1 Planning Board and Other Jurisdictions

The Proposed Preserve at Indian Hills is presented as a re-development project. It is not a re-development project. In a re-development project, one, existing use is being replaced by another. In this case, that is not true. Rather, the existing golf course use, which used the entire original acreage of land to justify its creation and "density" will remain, if the project receives Planning Board (and Zoning Board) approval. Then, a second use, residential housing, which is attempting to use the entire, original acreage of land (plus some relatively small, additional lands) to justify its creation and "density" will be layered on top of that original use.

D-7 Sec. 2.12

This approximate doubling of density by and of itself would require a change of zone for the property. The change of zone or increase in the density of uses on lands within the Town is within the jurisdiction of the Town Board, or requires an approval by the Zoning Board of Appeals (see below). Any revision to the existing Special Use Permit Zoning Board of Appeals by the Planning Board is simply outside of the Planning Board's jurisdiction and function as provided in the enabling laws for Town zoning in New York State (NYS). It is additionally contrary to the enabling laws for Town zoning in New York State (NYS) in that Sections 261 and 278 require that the Town (1) not allow "overcrowding" of the land for environmental and demographic purposes, (2) "shall in no case exceed the number which could be permitted...if the land were subdivided into conforming lots..." (i.e., no double use of a parcel of land's density) and (3) must, "determine that there will be no significant environmentally damaging consequences." This proposed project, in "double dipping" the density of the same land to allow what would be two separate and distinct uses (and legal entities[1]) and counting much *of the same lands* to justify each uses' full density, is in contravention to good planning and the intent of the State's requirements for zoning laws.

The Indian Hills Golf Course was and is not allowed under the current zoning of the property as R40. It was rather enabled as a use of the site by Special Use Permit issued by the Zoning Board of Appeals. If the current proposal is approved by the Planning board, it will violate a basic tenant of that prior Zoning Board approval. That is, the Special Use Permit was granted per Town Code Section § 198-109 and § 198-110 (C) (5) on the basis of a certain "density" of the use and assumed the golf course would occupy certain parcels of land with certain acreages. If The Preserve at Indian Hills is approved by the Planning Board, the original parcel(s) will be subdivided and some of the acreage from the original golf course approval by the Zoning Board will be removed for

D-8 Sec. 2.12

[1] It may, in fact, be three uses, two commercial and one residential use, if the expanded club house is used by/leased to a catering company for event staging.

another use (which will also derive most of its density from the same, original golf course parcels). The original parcels/lands which received the Special Permit approval will no longer exist and the golf course use, itself, will have increased in "density." Thus, the Special Permit will be invalid. Since the Planning Board cannot approve a golf course within the R-40 zone (it is not an allowed/specifically-listed use in that zone), the golf course approval will be null and void and will require another review and approval by the Zoning Board of Appeals. Since the Zoning Board is the original approval authority for the golf course and is the only authority allowed to increase the density of that same use[2], it should be the Lead Agency and restart the current process from the beginning.

The DEIS itself, in Section 1.6.2 on Page 1-11 acknowledges these conflicts in jurisdiction for The proposed Preserve at Indian Hills. That is, the DEIS states, "During the course of review, the matter may be referred to the ZBA or an application may be made for the amendment of the previously issued Special Use Permit..." The first two "quarrels" with this statement are the words, "may" and "refer;" the project *will* require Zoning Board of Appeals approval and since the first, basic use has already required same, the project should be *remanded* to the Zoning Board of Appeals. Further, as provided above, since the Zoning Board is the original approval authority for the golf course, as it is the only Town authority empowered to do so, this project's current applications, with its attempt to "double count" the site's density, would not even be possible (although also disputed by applicant[3]) without the original golf course use.

Given the above, it is at least uncertain as to whether or not the current proposal is viable under existing Town Zoning and NY State's enabling laws. Thus, no further efforts of the Town Planning Board members, the Town staff or neighbors with substantial concerns should be or need be expended on the proposed project at this point. The Planning Board should suspend its review

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[2] Simultaneously with the approval of any plat upon which the Planning Board is empowered to act pursuant to § 276 of the Town Law, such Board may make any reasonable modification of the zoning regulations applicable to the land so platted as authorized by § 278 of the Town Law in order to preserve the, "natural and scenic qualities of open space including historic landmarks" and sites. Unless otherwise specified in article 278, any modification of the zoning regulations made by the Planning Board in connection with plat approval **shall be limited to** size of lot, minimum yard dimensions, location of buildings, location and extent of parking and loading areas and provision of public recreation areas, including parks and playgrounds, or public school sites. The Planning Board cannot increase the overall density of uses allowed on a parcel and cannot approve a golf course within zones where it is specifically not included as an allowed use. Since its approval of this project would invalidate the original Golf Course approval, that is exactly what the Planning Board would be doing.

[3] That is, the applicant is arguing that the presence of the golf course allows for the conservation of "open space and scenic views." Putting aside the fact that the clustering concept in not reserved for commercial uses, the golf course would not exist except for the Zoning Board's approval of the Special Use Permit which a Planning Board approval would invalidate.

of the proposal and remand[4] the project to the Zoning Board of Appeals. It should be declared the Lead Agency and restart the current process from the beginning.

2.2 Financial Considerations

In addition to the above, the project sponsor has indicated that without the additional funds that the residential portion of the project (and expanded catering at the Club House facilities) will provide, the Indian Hills Golf Course could not continue as a viable commercial enterprise. First, this is not a justification for an environmental impact statement to consider. The economic viability of a land use is the province of the owner and applicant; it is not a determining factor in the Lead Agency's land use planning decisions regarding the proposed project. If true, it is not the role of the Planning Board to determine whether or not the Golf Course and future project run at a "profit" and to determine that to do so, they must "burden" the neighboring properties and neighborhood. Secondly, no financial data for (i) the existing commercial golf course operation, (ii) the proposed, future, simultaneously-occurring, commercial golf course operation (iii) the simultaneously-occurring, proposed commercial catering operation and (iv) the simultaneously-occurring, proposed residential homeowners association's operation are provided by the applicant for both the Town of Huntington or the general public to review and to determine the efficacy of this claim. If the applicant continues to pursue this claim, the financial data provided should include the capital (e.g., purchase prices and financing of the various lands, construction costs, etc.) and operating costs of the "current" use and the three, future, simultaneously-occurring uses[5].

D-9 Sec. 2.3

It should be noted by the Board that numerous home owners have made claims of negative financial impacts to their properties' value in the event that the proposed project is approved and constructed. These owners have provided data to support these claims in the form of before and after appraisals from a number of independent sources.

2.3 Alternatives Analyses

The Alternatives Analysis in the project DEIS is lacking lesser density options. That is, the alternatives to the project all include the same number of residences. Alternatives with a lesser number of residential units is tenable and should be presented and analyzed in this case. For

D-10 Sec. 2.20

[4] This would, in fact, be a "remand" and not a "referral" as the Zoning Board was the only and proper approval authority for the original golf course review. Since a Planning Board approval would be a de facto change in density of the original golf course use approved under a Special Use Permit, thus invalidating it, the remand should occur now.

[5] The applicant has not enumerated the ownership structure of the proposed gym facility. Will it in fact be a separate corporation and fourth "use" on the property? Will it be open to separate membership outside of the golf club membership and future residents?

example[6], the application includes a number of parcels of land which were not a part of the original Special Use Permit which enabled construction and use of the golf course. These properties could yield conforming lots under the existing R40 zoning. These lots, with the golf course on its originally-permitted lots and acreage "next door," should be analyzed for both as-of-right development and development as a mixed use of the golf course with clustered units equal to the "new" parcels' as-of-right yield. Additional, lesser density alternatives should also be enumerated and discussed.

The No Action should discuss implementation of the Integrated Turf Health Management (ITHM) system. That is, if there is currently an impact to the groundwater and surface waters in and around the Indian Hills Golf Course at present, this ITHM system should be implemented now and whether or not an additional use is added to the property.

D-11 Sec. 2.3

2.4 Site Plan Application and Review

The above considerations also would require halting any further consideration of the Site Plan application or its withdrawal altogether at present. That is, the above process issues may materially affect the layout of any future project. They may actually change the proposed action, densities and layouts. As such, it is premature to consider any Site Plan application. Subdivision and Site Plan applications are not required to be considered simultaneously; they can be, and often are, considered consecutively.

[6] This is not meant to be a complete "list" of tenable alternatives with a lesser density.

3.0 NITROGEN LOADING AND IMPACT ANALYSIS

3.1 Introduction to Nitrogen

This analysis focuses on the nitrogen loading of the proposed Preserve at Indian Hills. The nitrogen loading analysis was conducted for the DEIS as a combination of a loading calculation (spreadsheet) model called SONIR and analysis of various groundwater and surface water sampling. Of interest in these analyses is the groundwater (and some surface water) quality on the subject property and in an area bounded by Crab Meadow, Long Island Sound and the Fresh Pond corridor.

This analysis will use nitrogen concentrations as a proxy for the general condition of the upper glacial aquifer in this area. Nitrogen is a naturally occurring element which is an important nutrient. Below certain levels (approximately 1.25 mg/l) nitrogen is a nutrient; above certain levels it is a pollutant. The human health standard for nitrogen is expressed as nitrates at 10 milligrams per liter (mg/l). The environmental standard for nitrogen is between 1.25 and 1.5 mg/l as total nitrogen. The importance of nitrogen is that it drives the growth of plants by enabling the production of chlorophyll (the compound which converts light to biological energy). When simple, often single-celled plants found in surface waters grow too fast or abundantly, they trigger algal blooms. When the blooms die off, they usually settle to the aquatic water's bottom and decay. The decay then strips most of the oxygen out of the water column (normally 10 - 12 mg/l and above dissolved oxygen dropping to 3 - 2 mg/l and below dissolved oxygen) and kills the aquatic organisms ranging from zooplankton (which eat the algae) to fish that feed on the zooplankton. This condition is called hypoxia.

The locations of hypoxia and potential hypoxia conditions are shown in the Suffolk County Subwatersheds Wastewater Plan and GEIS of August 2019 Wastewater Management and Water Quality Characterization figures for Crab Meadow Creek and Smithtown Bay plus the Long island Sound Study, 1994, Figure 3 (with minimum dissolved oxygen levels between 1 and 2 mg/l). The continuing Long Island Sound Study of March 2018 by the US Environmental Protection Agency shows hypoxic locations to the east of the Fresh Pond outlet (Subtask A, Figure 1). This area already frequently experiences dissolved oxygen levels of less than 3 mg/l in summertime. As the groundwater beneath the proposed project site discharges directly northward into Long Island Sound or westward into the Fresh Pond corridor, it may impact upon and spread this condition westward. Thus, groundwater quality (with nitrogen as the proxy) is an important factor for consideration in allowing or disallowing the project at the proposed density with approximately double (possibly triple) uses on much the same property.

The Indian Hills Golf Course (and proposed project) essentially occurs on an elevated peninsula of sand and gravel bounded by wetlands and water bodies in low-lying topography to the west by Crab Meadow, to the north by Long Island Sound and to the east by the Fresh Pond Corridor. Incident precipitation generally percolates down to the groundwater in the upper glacial aquifer. The upper glacial aquifer dominantly flows to the north as depicted in DEIS Figure 2-6. However, this figure lacks detail and precision which is required for the detailed analysis of the Preserve at Indian Hills. In general, the upper glacial aquifer's "surface" is generally a suppressed version of the topography. Thus, for this elevated peninsula, the groundwater also flows with a westward component into Crab Meadow[7] and an eastward component into the Fresh Pond corridor (more so than is conveyed in DEIS Figure 2-6). The nitrogen content in groundwater will discharge into and significantly impact these surface water's ecology[8].

D-12 Sec. 2.8

The DEIS Figure should be revised based upon the water table elevation findings of the "Extensive soil borings" taken on site (See Appendix B-1, in excess of 32 borings were conducted) plus existing well records on site. The information should be compiled to graphically depict the upper glacial aquifer in this subwatershed, including "perched" water conditions based on subsurface clays and lower permeability soils." (DEIS page 2-36). This more precise, graphical depiction (both vertical and horizontal) of groundwater flows is needed to accurately characterize the existing condition and the proposed action's impacts to both groundwater and adjacent surface waters/wetlands for (i) residential wastewater systems and (ii) continuing fertilizer use at the golf course. This more detailed information should then be included in modeling of the existing golf courses' and project alternatives' inputs (impacts) to the aquifer and adjacent surface waters.

The Suffolk County Subwatersheds Wastewater Plan and GEIS of August 2019 devotes a considerable portion of Executive Summary page 12 to the Suffolk County Main Body Flows model and four versions of same which were used in their three-dimensional analysis groundwater contamination. Further, Table 2 states that the study uses, "groundwater flow and contamination transport models to simulate nitrogen concentrations within the aquifer system resulting from 2016 land use and wastewater management resulting from the migration of the parcel-specific nitrogen loads through the aquifer." As a further example, DYNTRACK and DYNAFLOW three dimensional model developed by CDM Smith, with multiple nodes, is already

[7] WBL personnel have personally noted spring flows off the hillsides in question down into the Crab Meadow ponds many times.

[8] This is borne out by the Town of Huntington's hydrology and watershed characterization study which is "currently underway with the objective of understanding the environmental drivers and stressors within the Crab Meadow Watershed. The assessment will provide the basis for the development of a Watershed Stewardship Plan." – TOH website. The Town should await the finalization of this study before proceeding with planning for the proposed project.

established in Suffolk County and the subject location was used in determining impacts to groundwater from nitrogen loadings (i.e., through its contaminant transport and particle tracking subroutines). Once a detailed 3-dimensional mapping is developed from the dozens of existing, on site borings[9], then the same or similar modeling should be undertaken to more precisely determine the existing condition and then the impacts of the proposed dual property use and increase in density.

This particular watershed was included in the Suffolk County Subwatersheds Wastewater Plan and GEIS of August 2019. This study "requires" a 60% reduction in nitrogen loading in the Crab Meadow watershed per **Table 2-49, Subwatersheds where Additional Nitrogen load Reductions are Required**. It is shown on the Subwatershed Planning Criteria for Smithtown Bay, September 2018 (to which both Crab Meadow and Fresh Pond are tributary) that the uplands will have 516 "High Density Residential" units. However, these high density residential units are <u>not</u> shown on The Preserve at Indian Hills properties. The Indian Hills property is shown as the golf course, and the adjacent parcels as "Low Density Residential." Thus, the Suffolk County Subwatersheds Wastewater Plan and GEIS of August 2019 did not anticipate the second, simultaneous residential use on site in its calculations and wastewater /nitrogen projections for this subwatershed and so, The Preserve at Indian Hills would be contrary to the stated goal of that study.

D-13 Sec. 2.9

We note that the proposed additional data, changes, clarification, etc. as cited in this analysis should require that the applicant revise and reissue the DEIS **as a second DEIS[10]**. This will allow further public, peer and Agency review.

3.2 Existing Groundwater Nitrogen Levels and Sampling results

There are two wells which have been sampled to determine existing groundwater quality. One well is on the property and the second well is immediately adjacent to it on the eastern (Fresh Pond) side. The first is cited in the DEIS and is the golf course's irrigation water source. This well has nitrate levels at 7.21 and 7.56 mg/l. These are cited by the DEIS as being due largely to upgradient residences[11]. However, the well location is some 800 feet within the golf course on its western side, adjacent to Fresh Pond Road. With the easterly component of groundwater

D-14 Sec. 2.8

[9] If the existing soil borings on site are insufficient to create this model, then additional borings should be conducted and analyzed.

[10] Or, as cited in PROCESS discussions above, the ZBA should have the project remanded to it, declare itself Lead Agency and re-start the DEIS process. A FEIS would not allow sufficient time or public disclosure and analysis of the complex changes and additions suggested by this analysis. Further, the DEIS lacks a significant, required Scope element as the specifications of the Innovative and Alternative Onsite Wastewater Treatment Systems (I/A OWTS) are not provided (see below).

[11] Even if this were the case, The Preserve at Indian Hills proposes to *add* residences with their resultant nitrogen discharges as a layer on "top" of and simultaneous with the golf course.

flow down slope and into the Fresh Pond corridor, this well also reflects percolating waters from the golf course. This conclusion is borne out by Suffolk County monitoring well #115186, which occurs 1,800 feet into the golf course (i.e., downgradient of the golf course) and again on its western side but before substantial residential influence. This well has tested above 5 mg/l in the most recently available results in 2015. Further, this well has doubled in nitrate concentration in 15 years from 2 to 3.1 mg/l in 1999 to the present levels. Thus, the golf course and its fertilization have had an impact on these groundwaters. In addition to the above nitrogen levels, a breakdown product of the pesticide Dacthal has been detected in multiple samples from this well over the years it has been installed and tested.

The above groundwater contaminants will impact the adjacent surface waters in a short time. The Suffolk County Subwatersheds Wastewater Plan of August 2019 places the golf course property within the 0 to 2 year impact travel time and 2 to 10 year impact travel time zones for Long Island Sound, Smithtown Bay and Crab Meadow (Figure – Wastewater Management and Water Quality Characterization 50 Year Contributing Area 1702-0023+0233+0234). Thus, the time frame is short, a matter of 2 years and certainly less than a decade.

In summary, this existing condition and project impact should be more precisely determined in part by constructing the more detailed description of the localized subwatershed and by detailed computer modeling as described above. This would strongly suggest taking an environmentally conservative approach to any decisions involving groundwater quality.

In the Long Island Sound Study series (March 2018, Subtask G), the authors derive Nitrogen Endpoints - that is, levels of total nitrogen which will cause stress and a negative "response" to that stress. For the Northport-Centerport complex (the closest to the project area to the west) the total nitrogen endpoint is 1.27 mg/l (using the higher, chlorophyll a corrected levels). For the Nissequogue River complex (the closest to the project area to the east) the total nitrogen endpoint is 1.21 mg/l. Thus, at the Indian Hills golf course site, groundwater nitrogen levels are already well above these stressor levels.

3.3 SONIR Loading Model Inputs and Outputs

D-15 Sec. 2.8

To evaluate the nitrogen levels of the project when developed, the applicant has used the SONIR model to develop total expected nitrogen loads. The SONIR model is a useful tool for predicting nitrogen loadings. However, the outputs rely entirely on the inputs and many of these are assumptions. The predicted nitrogen loads are then divided by the project acreages to provide an "average," mass-balanced nitrogen level in mg/l[12]. Further, the inputs from the various

[12] Which may in part be the subject of a more detailed review.

alternatives have been frequently altered from scenario to scenario to favor the outcome the applicant desires (i.e., the preferred, dual use alternative has the lowest future nitrogen loadings). Thus, we would urge the reviewers to alter these inputs as suggested below to provide a true "apples to apples" comparison of future nitrogen loading impacts.

The DEIS SONIR analysis in Appendix J-3 shows an existing condition level of 0.76 mg/l. This level clearly understates the existing loading of nitrogen on the subject property where the irrigation well and Suffolk County well #115816 show levels of 7 and 5 (plus) mg/l, respectively. The Alternative 2 SONIR analysis, a standard subdivision with no golf course (which the applicant does not favor), shows a more realistic 5.63 mg/l result. Further, DEIS Table 5-1 shows an expected, SONIR-predicted nitrogen level of 1.95 mg/l for the proposed project, including both the golf course and residential housing layered on top of that use. This is only one third of the nitrogen levels found in groundwater in the existing condition, with only one use – the existing Indian Hills golf course- - on the property and is only one third of the nitrogen levels predicted of a "standard" subdivision.

In brief, the SONIR nitrogen loading model needs to be calibrated against existing known/measured nitrogen levels and then input factors should be "equalized" between these alternatives to accurately predict future nitrogen levels and allow for their comparison to determine (i) the least impactful alternative and (ii) mitigating measures for same as required by SEQRA per 6 NYCRR Part 617. The calibrated future nitrogen loading should then be modeled for dispersion using a detailed map of the local aquifer developed from information in the wells and many borings conducted on site to-date (and/or adding more borings as necessary).

The reason for this discrepancy between the known existing condition and the DEIS Modeling results lies in the inputs to the SONIR model in the DEIS. For example, the applicant is using a leaching rate for applied nitrogen in fertilizers of 10 percent. The Suffolk County Draft Subwatershed Plan of August 2019 uses 20 percent leaching for golf courses. This one change will approximately *double* the SONIR nitrogen loading result provided in the DEIS. The SONIR analysis has been used in several other development analyses on Long Island. In the Manhasset Crest project, the SONIR analysis used a 15 % (50% higher) nitrogen leaching rate. The Hills proposed development in East Quogue had numerous reviewers suggest that the best-supported leaching rate for a golf course (and residential uses under the same management) as 20% (The Hills at Southampton, September 2017, FEIS, Appendix J and following commentaries/reviews by Dr. Gobler, etc.). The Current SONIR analysis in the DEIS increases the leaching rate from 10% for the Proposed project to 30% for the as-of-right residential development (i.e., it <u>triples</u> the rate of nitrogen loading).

The SONIR analysis also alters the number of occupants among several of the alternatives, with the lowest number in the preferred alternative and since the residential nitrogen loading is 10 pounds per person per year, this again dramatically changes the comparative impacts among the alternatives. For example, the preferred alternative assigns a population of 1.5 persons per dwelling. The US Census Bureau has calculated an average of 2.89 persons per dwelling in the demographic unit which includes Fort Salonga. The DEIS SONIR analysis effectively doubles the loading from the applicant's preferred alternative to the as-of-right residential development by doubling the predicted population[13].

The predicted fertilized acreage for the various alternatives also significantly varies. The preferred alternative estimates 32.77 acres of both golf course and residential uses. This seems substantially underestimated. In roughing-out the acreage which will remain open for the golf course and residences and by subtracting for the proposed ponds (approximately 15 acres for irrigation and other reasons) a more accurate acreage can be obtained. After making this adjustment, the fertilized acreage would increase from 32.77 to 56 to 65 acres. Again, this would approximately double the fertilization load of the preferred alternative. Also, the as-of-right residential development assumes extensive clearing of each lot and predicts 96 acres of fertilized land (approximately three times the preferred alternative which includes a continued golf course use – a use which routinely has a lot of open, fertilized land).

Irrigation rates vary between the alternatives and are twice that recommended in the Suffolk County Subwatersheds Wastewater Plan GEIS, August 2019; this would effectively dilute the predicted nitrogen concentration of the project.

In regard to sanitary systems, the DEIS makes a number of assumptions which vary (favorably to the applicant) between the alternatives. First, it assumes that residences in a standard subdivision will have conventional sanitary disposal systems and the proposed action will have Innovate and Alternative systems as defined by the Suffolk County Department of Health Services. The nitrogen discharge assigned to the two systems is 50 mg/l for the conventional sanitary disposal systems and 19 mg/l for the Innovate and Alternative systems. The former value is correct (see attached tables) but the average measured performance by the Suffolk County Department of Health Services is 31.4 mg/l for the latter. Also, in any event, both the applicant's preferred, proposed action and the as-of-right residential subdivision should both be assumed to have the Innovate and Alternative systems so as not to "favor" one verses the other. Also, the Suffolk County Subwatersheds Wastewater Plan GEIS, August 2019 recommended/assumed the

[13] This factor also favors the preferred alternative in many other technical matters, e.g., traffic impacts, water consumption, etc.

use of Innovate and Alternative systems by residential development in the Smithtown Bay Subwatersheds.

The use of Innovate and Alternative systems for residential sanitary waste disposal has been used only for single family, detached dwellings until very recently. Thus, the use of these systems for residential sanitary waste disposal at multi-unit (family), attached dwellings is very new and no data as to their effectiveness has been published. The Scoping document for the DEIS (November 13, 2018) in Section 1.6.5 requires, "Specifications of the Innovative and Alternative Onsite Wastewater Treatment Systems (I/A OWTS), including sizes and locations of systems..." be provided. The DEIS does not include these designs and specifications or how they relate to this specific use and siting. These data are complex and (among other requirements cited herein) will require reissuance of a DEIS and not progressing to an FEIS at this stage in the project review.

WBL and Associates, LLC personnel reviewed the above (and other) SONIR inputs in the DEIS and conducted a series of adjusted calculations. The results are summarized in Table 1 below. Detailed tables showing these comparisons and the resultant nitrogen loadings are shown in Appendix A.

TABLE 1 - SONIR NITROGEN MODELING COMPARISONS

EXISTING CONDITION (APPLICANT)	0.76 mg/l* Nitrogen (single use, golf course)
EXISTING CONDITION (REVISED)	4.5 mg/l* Nitrogen (*verses 5 – 7.5 mg/l monitored)
PROPOSED ACTION (APPLICANT)	1.95 mg/l Nitrogen (dual use golf course & residential)
PROPOSED ACTION (REVISED)	4.8-7.7 mg/l Nitrogen (dual use golf course & residential)
AS-OF-RIGHT, RESIDENTIAL (APPLICANT)	4.8 mg/l Nitrogen (single use, golf course)
AS-OF-RIGHT, RESIDENTIAL (REVISED)	3.3-3.4 mg/l Nitrogen (dual use golf course & residential)

There are a number of other input factors which are adjusted by the applicant to favor the preferred alternative. These have resulted in substantial differences between the alternatives in the area of nitrogen loading and its impact on groundwater and, ultimately, local surface waters. We urge both Planning Board (or, more properly the Zoning Board) and the Town staff to look closely at the inputs and resultant outputs of the SONIR modeling in order to (1) more accurately

predict the groundwater – stormwater impacts of the project (with its proposed, two simultaneous uses on one property) (2) to make an "apples to apples" comparison and (3) to make an informed decision based equalized comparisons between the proposed action and the alternatives.

3.4 Existing Surface Water Nitrogen Levels and Sampling results

In reference to surface waters, Table 2-2 surface water pond sampling results show *no* total or nitrate nitrogen. However, sample results from 2016 in Table 2-4 show total nitrogen levels at 6.03 mg/l and nitrate levels at 0.23 mg/l. Groundwater monitoring wells on site show 5 to 7.5 mg/of nitrogen. The surface pond has to have drainage from adjacent uplands (i.e., the existing golf course) to create and sustain it. It seems unlikely that the groundwaters would contain substantial nitrogen and yet the surface pond would have none. Further, the Table 2-2 results show total phosphorous levels in all but one sample and the highest sample had up to 1,060 mg/l phosphorous. In biological systems, the nitrogen to phosphorous ratio usually approximates 7:1, i.e., higher nitrogen levels and lower phosphorous levels. Thus, these locations need several repetitions of sampling to determine a more consistent (and realistic?) result.

D-16 Sec. 2.9

4.0 CONCLUSION

The current process of reviewing the project via Planning Board review is incorrect both in terms of zoning laws and SEQRA. The Planning Board cannot alter the density of parcels as currently allowed by Town of Huntington zoning, it cannot allow multiple uses to claim density from the same parcels of land, and it cannot alter the conditions of an original Special Use Permit issued by the Town of Huntington's Zoning Board of Appeals (which in this case, serves as the underlying reason allowing this application even to be conceived). The Planning Board should immediately remand the applicant (with a new project application) to the Zoning Board of Appeals. The Zoning Board of Appeals should declare itself the Lead Agency and restart the SEQRA process.

D-17 Sec. 2.12

The SONIR nitrogen loading analysis has a number of *inputs* which are favorable to the applicant's Proposed Action which are then varied to disfavor the alternatives. The double and tripling of input factors and the resulting outputs in the SONIR nitrogen loading analysis in the current DEIS analyses does not allow for an "apples to apples" comparison of the proposed project and its alternatives. The applicant's result is an output of 0.76 mg/l nitrogen for the existing condition when the monitoring wells show an existing condition of 5-7.5 mg/l nitrogen. The results similarly underestimate the proposed action's future nitrogen loading and overestimate the alternative's future nitrogen loadings. The model needs to be calibrated against existing known/measured nitrogen levels and then input factors should be "equalized" between these alternatives to accurately allow for their comparison to determine (i) the least impactful alternative and (ii) mitigating measures for same as required by SEQRA per 6 NYCRR Part 617. The calibrated future nitrogen loading should then be modeled using a detailed map of the local aquifer developed from information in the wells and many borings conducted on site to-date. This is especially important as the threshold ecological levels for nitrogen in the adjacent waters was found to be approximately 1.25 to 1.5 mg/l in the Long Island Sound Studies.

D-18 Sec. 2.8

These data are complex and (among other requirements cited herein) will require reissuance of a DEIS and not progressing to an FEIS at this stage in the project review.

Appendix A
The Preserve at Indian Hills - SONIR Nitrogen Loading WBL Review

EXISITING CONDITION SONIR MODELING AND REVISIONS

A	Site Recharge Parameters	Applicant IHCC Existing Cond		Revised Values	Justification for Revision
1	Area of site	145.32		145.32	
2	Precipitation Rate	49.9		46.24	Islip Airport Long-Term Mean
3	Acreage of Fertilized Land	28.11		75	GIS Map (still being worked on)
4	Fraction of Land Above	0.193		0.516	
5	Evaporation from Above	21.2		24.2	Used in at least 3 other SONIR Reports
6	Runoff From Above	0.5		0.5	
7	Arcreage of Unfertilized Landscaping	67.52		20.64	
8	Fraction of Above	0.465		0.142	
9	Evapotranspiration from Above	21.2		24.2	Used in at least 3 other SONIR Reports
10	Runoff From Above	0.5		0.5	
11	Acreage of Unvegetated/Dirt Roads	1.77		1.77	
12	Fraction of Above	0.012		0.012	
13	Evapotranspiration from Above	21.2		24.2	Used in at least 3 other SONIR Reports
14	Runoff From Above	0		0	
15	Acreage of Water/Ponds	3.7		3.7	
16	Fraction of Site in above	0.025		0.025	
17	Evaporation from above	30		30	
18	Makeup Water (if applicable)	0		0	
19	Acreage of Natural	37.43		37.43	
20	Fraction of above	0.258		0.258	
21	Evapotranspiration from above	21.2		24.2	Used in at least 3 other SONIR Reports
22	Runoff from above	0.5		0.5	
23	Acreage of Impervious/Paved/Bldgs	6.78		6.78	
24	Fraction of Land in above	0.047		0.047	
25	Evapotrans. from above	4.99		4.99	
26	Runoff from Impervious	0		0	
23	Acreage of Other	0		0	
24	Fraction of Land in above	0		0	
25	Evapotrans. from above	21.2		24.2	Used in at least 3 other SONIR Reports
26	Runoff from above	0		0	
27	Acreage of Land Irrigated	28.11		28.11	
28	Fraction of Land Irrigated	0.193		0.193	
29	Irrigation Rate	27.74		14.04	Suffolk County Draft Subwatershed Plan
30	Number of Dwellings	0		0	
31	Water Use per Dwelling	0		0	
32	Wastewater Design Flow (clubhouse)	3950		3950	

B	Nitrogen Budget Parameters	Nason & Pope IHCC Existing Cond		Revised Values	Justification for Revision
1	Persons per Dwelling	1.5		1.5	
2	Nitrogen per Person per Year	10		10	
3	a.Sanitary Nitrogen Leaching Rate	84%		84%	
3	b.Treated Sanitary Nitrogen Leaching Rate	100%		100%	
4	Fertilized Landscaping	28.11		75	
5	Fertilizer Application Rate (for above)	1.66		3.89	Suffolk County Draft Subwatershed Plan
6	Fertilizer Nitrogen Leaching Rate (for above)	10%		20%	Suffolk County Draft Subwatershed Plan
7	Fertilized Land (other, if applicable)	0		0	
8	Fertilizer Application Rate (for above)	0		0	
9	Fertilizer Nitrogen Leaching Rate (for above)	0%		0%	
10	Outdoor Cat Population	0.19		0.19	
11	Cat Waste Nitrogen Load	3.22		3.22	
12	Outdoor Dog Population	0.35		0.35	
13	Dog Waste Nitrogen Load	4.29		4.29	
14	Pet Waste Nitrogen Leaching Rate	25%		25%	
15	Area of Land Irrigated	28.11		37.5	Half fetilized area ?
16	Irrigation Rate	27.74		14.04	Suffolk County Draft Subwatershed Plan
17	Irrigation Nitrogen Leaching Rate	10%		20%	Suffolk County Draft Subwatershed Plan
18	Atmospheric Nitrogen Application/Load	0.04		0.04	
19	Atmos. N Leaching Rate (Natural/Wetlands)	25%		25%	
20	Atmos. N Leaching Rate (Turf/Landscaped)	20%		20%	
21	Atmos. N. Leaching Rate (Ag; Imperv; Other)	40%		40%	
22	Nitrogen in Water Supply	2		7	SCWA Water Quality Report
23	Nitrogen in Sanitary Flow	50		65	

Sheet 2				
	Site Recharge	Neson & Pope IHCC Existing Cond		Revised Values
A	5-R(a)	28.2		21.54
A	6-R(A)	5.45		11.12
B	5-R(b)	28.2		21.54
B	6-R(B)	13.10		3.06
C	5-R(c)	28.7		22.04
C	6-R(C)	0.35		0.27
D	5-R(d)	19.9		16.24
D	6-R(D)	0.51		0.41
E	5-R€	28.2		21.54
E	6-R€	7.26		5.55
F	5-R(f)	44.91		41.25
F	6-R(F)	2.10		1.92
G	5-R(g)	28.7		22.04
G	6-R(G)	0		0
H	5-R(h)	6.34		-7.36
H	6-R(H)	1.23		1.42
I	5-R(i)	0.030		0.030
I	6-R(I)	0.37		0.37
J	1-Q(A)	0.097		0.258
J	2-Q(B)	0.232		0.071
J	3-Q(C)	0.000		0.000
J	4-Q(E)	0.129		0.129
J	5-Q(H)	0.000		0.000
J	6-Q(I)	0.000		0.000
J	7-Q(tot)	0.46		0.46
	Total Site Recharge	30.82		21.73

Sheet 3				
	Nitrogen in Recharge	Neson & Pope IHCC Existing Cond		Revised Values
A-8	N(S)	0		0
B-6	N(P) -Cat	0		0
B'-6	N(P) -Dog	0		0
C-9	N(S)	505.37		656.99
E-5	N(F1)	203.26		2541.73
G-4	Atmos (natural/wetlands) N1	48.51		48.51
G-7	Atmos (golf/turf) N2	10.04		10.04
G-10	Atmos (ag, imper, other) N3	4.84		4.84
G-11	N(at)	63.39		63.39
H-10	N(irr)	1.56		(16.94)
	Total Site Nitrogen	773.59		3245.16
	Total Nitrogen (mg)	350,836,146		1,471,729,885
	Total Recharge (feet)	2.57		1.81
	Area of Site (Sq Ft)	6,330,139		6,330,139
	R (cu ft)	16,258,962.19		11,462,965.54
	Site Rechareg Volume (liters)	460,453,809.32		324,631,184.02
	Nitrogen Concentration (mg/l)	**0.762**		**4.5**

Vs. **5 to 7.5 mg/l** measured in wells on site

PROPOSED ACTION PLAN SONIR MODELING AND REVISIONS

A	Site Recharge Parameters	Applicant Proposed Action Plan	Revised Values -1	Justification for Revision	Revised Values -2	Justification for Revision
1	Area of site	154.56	154.56			
2	Precipitation Rate	49.9	46.24	Islip Airport Long-Term Mean	154.56	
3	Acreage of Fertilized Land	32.77	65	Subtract 4 acres for 98 building footprints + 6 additional acres not fert.	46.24	Islip Airport Long-Term Mean
4	Fraction of Land Above	0.212	0.421		65	Subtract 4 acres for 98 building footprints + 6 additional acres not fert.
5	Evaporation from Above	21.2	24.2	Used in at least 3 other SONIR Reports	0.421	
6	Runoff From Above	0.5	0.5		24.2	Used in at least 3 other SONIR Reports
7	Acreage of Unfertilized Landscaping	71.41	71.41		0.5	
8	Fraction of Above	0.462	0.462		71.41	
9	Evapotranspiration from Above	21.2	24.2	Used in at least 3 other SONIR Reports	0.462	
10	Runoff From Above	0.5	0.5		24.2	Used in at least 3 other SONIR Reports
11	Acreage of Unvegetated/Dirt Roads	1.09	1.09		0.5	
12	Fraction of Above	0.007	0.007		1.09	
13	Evapotranspiration from Above	21.2	24.2	Used in at least 3 other SONIR Reports	0.007	
14	Runoff From Above	0	0		24.2	Used in at least 3 other SONIR Reports
15	Acreage of Water/Ponds	15.11	15.11		0	
16	Fraction of Site in above	0.098	0.098		15.11	
17	Evaporation from above	30	30		0.098	
18	Makeup Water (if applicable)	0	0		30	
19	Acreage of Natural	20.73	20.73		0	
20	Fraction of above	0.134	0.134		20.73	
21	Evapotranspiration from above	21.2	24.2	Used in at least 3 other SONIR Reports	0.134	
22	Runoff from above	0.5	0.5		24.2	Used in at least 3 other SONIR Reports
23	Acreage of Impervious/Paved/Bldgs	13.49	13.49		0.5	
24	Fraction of Land in above	0.087	0.087		13.49	
25	Evapotrans. from above	4.99	4.99		0.087	
26	Runoff from Impervious	0	0		4.99	
23	Acreage of Other	0	0		0	
24	Fraction of Land in above	0	0		0	
25	Evapotrans. from above	21.2	24.2	Used in at least 3 other SONIR Reports	0	
26	Runoff from above	0	0		24.2	Used in at least 3 other SONIR Reports
27	Acreage of Land Irrigated	32.77	32.77		0	
28	Fraction of Land Irrigated	0.212	0.212		32.77	
29	Irrigation Rate	27.74	14.04	Suffolk County Draft Subwatershed Plan	0.212	
30	Number of Dwellings	98	98		14.04	Suffolk County Draft Subwatershed Plan
31	Water Use per Dwelling	300	300		98	
32	Wastewater Design Flow (clubhouse)	33350	33350		300	
					33350	

B	Nitrogen Budget Parameters	Neson & Pope Proposed Plan	Revised Values	Justification for Revision	Revised Values	Justification for Revision
1	Persons per Dwelling	1.5	1.5		1.5	
2	Nitrogen per Person per Year	10	10		10	
3	a.Sanitary Nitrogen Leaching Rate	84%	84%		84%	
3	b.Treated Sanitary Nitrogen Leaching Rate	100%	100%		100%	
4	Fertilized Landscaping	32.77	65	Subtract 4 acres for 98 building footprints + 6 additional acres not fert.	65	Subtract 4 acres for 98 building footprints + 6 additional acres not fert.
5	Fertilizer Application Rate (for above)	1.66	3.89	Suffolk County Draft Subwatershed Plan	3.89	Suffolk County Draft Subwatershed Plan
6	Fertilizer Nitrogen Leaching Rate (for above)	10%	20%	Suffolk County Draft Subwatershed Plan	20%	Suffolk County Draft Subwatershed Plan
7	Fertilized Land (other, if applicable)	0	0		0	
8	Fertilizer Application Rate (for above)	0	0		0	
9	Fertilizer Nitrogen Leaching Rate (for above)	0%	0%		0	
10	Outdoor Cat Population	0.19	0.19		0%	
11	Cat Waste Nitrogen Load	3.22	3.22		0.19	
12	Outdoor Dog Population	0.35	0.35		3.22	
13	Dog Waste Nitrogen Load	4.29	4.29		0.35	
14	Pet Waste Nitrogen Leaching Rate	25%	25%		4.29	
15	Area of Land Irrigated	32.77	50	Estimated	25%	
16	Irrigation Rate	27.74	14.04		50	Estimated
17	Irrigation Nitrogen Leaching Rate	10%	20%	Suffolk County Draft Subwatershed Plan	14.04	
18	Atmospheric Nitrogen Application/Load	0.041	0.041		20%	Suffolk County Draft Subwatershed Plan
19	Atmos. N Leaching Rate (Natural/Wetlands)	25%	25%		0.041	
20	Atmos. N Leaching Rate (Turf/Landscaped)	20%	20%		25%	
21	Atmos. N. Leaching Rate (Ag; Imperv; Other)	40%	40%		20%	
22	Nitrogen in Water Supply	2	7	SCWA Water Quality Report	40%	
23	Nitrogen in Sanitary Flow	19	65	Convential Septic System (SCDHS Annual Tech Review I/A OWTS Page iv)	7	SCWA Water Quality Report
					31.4	Average of all I/A OWTS (SCDHS Annual Tech Review I/A OWTS -Table 27)

Sheet 2

	Site Recharge	Neson & Pope Proposed Plan	Revised Values-1	Revised Values - 2
A	5-R(a)	28.2	21.54	21.54
A	6-R(A)	5.98	9.06	9.06
B	5-R(b)	28.2	21.54	21.54
B	6-R(B)	13.03	9.95	9.95
C	5-R(c)	28.7	22.04	22.04
C	6-R(C)	0.20	0.16	0.16
D	5-R(d)	19.9	16.24	16.24
D	6-R(D)	1.95	1.59	1.59
E	5-R(e	28.2	21.54	21.54
E	6-R(E	3.78	2.89	2.89
F	5-R(f)	44.91	41.25	41.25
F	6-R(F)	3.92	3.60	3.60
G	5-R(g)	28.7	22.04	22.04
G	6-R(G)	0	0	0
H	5-R(h)	6.34	-7.36	-7.36
H	6-R(H)	1.34	-1.56	-1.56
I	5-R(i)	0.242	0.242	0.242
I	6-R(I)	2.90	2.90	2.90
J	1-Q(A)	0.106	0.210	0.210
J	2-Q(B)	0.231	0.231	0.231
J	3-Q(C)	0.000	0.000	0.000
J	4-Q(E)	0.067	0.067	0.067
J	5-Q(H)	0.000	0.000	0.000
J	6-Q(I)	0.000	0.000	0.000
J	7-Q(tot)	0.40	0.51	0.51
	Total Site Recharge	33.51	29.09	29.09

Sheet 3

	Nitrogen in Recharge	Neson & Pope Proposed Plan	Revised Values-1	Revised Values-2
A-8	N(S)	0	0	0
B-6	N(P) -Cat	14.99	14.99	14.99
B'-6	N(P) -Dog	36.79	36.79	36.79
C-9	N(S)	1930.26	5546.97	2679.61
E-5	N(F1)	236.96	2202.83	2202.83
G-4	Atmos (natural/wetlands) N1	47.89	47.89	47.89
G-7	Atmos (glf/turf) N2	11.70	11.70	11.70
G-10	Atmos (ag, imper, other) N3	9.64	9.64	9.64
G-11	N(at)	69.23	69.23	69.23
H-10	N(irr)	2.00	(24.76)	(24.76)
	Total Site Nitrogen	2290.22	7846.04	4978.68
	Total Nitrogen (mg)	1,038,649,518	3,558,295,159	2,257,906,569
	Total Recharge (feet)	2.79	2.42	2.42
	Area of Site (Sq Ft)	6,732,634	6,732,634	6,732,634
	R (cu ft)	18,798,926.59	16,321,684.64	16,321,684.64
	Site Rechareg Volume (liters)	532,385,601.05	462,230,108.91	462,230,108.91
	Nitrogen Concentration (mg/l)	1.95	7.70	4.88

AS-OF-RIGHT, RESIDENTIAL ALTERNATIVE SONIR MODELING AND REVISIONS

A	Site Recharge Parameters	Applicant As-of-Right	Revised Values -1	Justification for Revision	Revised Values -1	Justification for Revision
1	Area of site	152.2	151.08		151.08	
2	Precipitation Rate	49.9	46.24	Islip McArthur Airport Long-Term Mean	46.24	Islip McArthur Airport Long-Term Mean
3	Acreage of Fertilized Land	95.98	17.87	Sub Water shed 25% of remaining After Removing Bldgs	17.87	Sub Water shed 25% of remaining After Removing Bldgs
4	Fraction of Land Above	0.631	0.118		0.118	
5	Evaporation from Above	21.2	24.2	Used in at least 3 other SONIR Reports	24.2	Used in at least 3 other SONIR Reports
6	Runoff From Above	0.5	0.5		0.5	
7	Arcreage of Unfertilized Landscaping	0	0		0	
8	Fraction of Above	0.000	0.000		0.000	
9	Evapotranspiration from Above	21.2	24.2	Used in at least 3 other SONIR Reports	24.2	Used in at least 3 other SONIR Reports
10	Runoff From Above	0.5	0.5		0.5	
11	Acreage of Unvegetated/Dirt Roads	0	0		0	
12	Fraction of Above	0.000	0.000		0.000	
13	Evapotranspiration from Above	21.2	24.2	Used in at least 3 other SONIR Reports	24.2	Used in at least 3 other SONIR Reports
14	Runoff From Above	0	0		0	
15	Acreage of Water/Ponds	5.05	5.05		5.05	
16	Fraction of Site in above	0.033	0.033		0.033	
17	Evaporation from above	30	30		30	
18	Makeup Water (if applicable)	0	0		0	
19	Acreage of Natural	29.44	91.03		91.03	
20	Fraction of above	0.193	0.603		0.603	
21	Evapotranspiration from above	21.2	24.2	Used in at least 3 other SONIR Reports	24.2	Used in at least 3 other SONIR Reports
22	Runoff from above	0.5	0.5		0.5	
23	Acreage of Impervious/Paved/Bldgs	21.74	37.2		37.2	
24	Fraction of Land in above	0.143	0.246		0.246	
25	Evapotrans. from above	4.99	4.99		4.99	
26	Runoff from Impervious	0	0		0	
23	Acreage of Other	0	0		0	
24	Fraction of Land in above	0	0		0	
25	Evapotrans. from above	21.2	24.2	Used in at least 3 other SONIR Reports	24.2	Used in at least 3 other SONIR Reports
26	Runoff from above	0	0		0	
27	Acreage of Land Irrigated	95.98	95.98		95.98	
28	Fraction of Land Irrigated	0.631	0.635		0.635	
29	Irrigation Rate	24	24		24	
30	Number of Dwellings	98	98		98	
31	Water Use per Dwelling	300	300		300	
32	Wastewater Design Flow (clubhouse)	600	600		600	

B	Nitrogen Budget Parameters	Nelson & Pope As-of-Right	Revised Values	Justification for Revision	Revised Values	Justification for Revision
1	Persons per Dwelling	2.93	2.93		2.93	
2	Nitrogen per Person per Year	10	10		10	
3	a.Sanitary Nitrogen Leaching Rate	84%	84%		84%	
3	b.Treated Sanitary Nitrogen Leaching Rate	100%	100%		100%	
4	Fertilized Landscaping	95.98	17.8		17.8	
5	Fertilizer Application Rate (for above)	2.04	2.04	Suffolk County Draft Subwatershed Plan	2.04	Suffolk County Draft Subwatershed Plan
6	Fertilizer Nitrogen Leaching Rate (for above)	30%	30%	Suffolk County Draft Subwatershed Plan	30%	Suffolk County Draft Subwatershed Plan
7	Fertilized Land (other, if applicable)	0	0		0	
8	Fertilizer Application Rate (for above)	0	0		0	
9	Fertilizer Nitrogen Leaching Rate (for above)	0%	0%		0%	
10	Outdoor Cat Population	0.74	0.74		0.74	
11	Cat Waste Nitrogen Load	3.22	3.22		3.22	
12	Outdoor Dog Population	1.4	1.4		1.4	
13	Dog Waste Nitrogen Load	4.29	4.29		4.29	
14	Pet Waste Nitrogen Leaching Rate	25%	25%		25%	
15	Area of Land Irrigated	95.98	95.98		95.98	
16	Irrigation Rate	24	24		24	
17	Irrigation Nitrogen Leaching Rate	10%	10%		10%	
18	Atmospheric Nitrogen Application/Load	0.041	0.041		0.041	
19	Atmos. N Leaching Rate (Natural/Wetlands)	25%	25%		25%	
20	Atmos. N Leaching Rate (Turf/Landscaped)	20%	20%		20%	
21	Atmos. N. Leaching Rate (Ag; Impery; Other)	40%	40%		40%	
22	Nitrogen in Water Supply	2	7	SCWA Water Quality Report	7	SCWA Water Quality Report
23	Nitrogen in Sanitary Flow	50	65	Convental Septic Syetem (SCDHS Annual Tech Review I/A OWTS Page F	31.4	Average of all I/A OWTS (SCDHS Annual Tech Review I/A OWTS - Page 23

	Site Recharge	Nelson & Pope As-of-Right	Revised Values-1
A	5-R(a)	28.2	21.54
A	6-R(A)	17.78	2.55
B	5-R(b)	28.2	21.54
B	6-R(B)	0.00	0.00
C	5-R(c)	28.7	22.04
C	6-R(C)	0.00	0.00
D	5-R(d)	19.9	16.24
D	6-R(D)	0.66	0.54
E	5-R€	28.2	21.54
E	6-R€	5.45	12.98
F	5-R(f)	44.91	41.25
F	6-R(F)	6.41	10.16
G	5-R(g)	28.7	22.04
G	6-R(G)	0	0
H	5-R(h)	2.6	2.6
H	6-R(H)	1.64	1.65
I	5-R(i)	0.004	0.004
I	6-R(I)	0.05	0.05
J	1-Q(A)	0.315	0.059
J	2-Q(B)	0.000	0.000
J	3-Q(C)	0.000	0.000
J	4-Q(E)	0.097	0.301
J	5-Q(H)	0.000	0.000
J	6-Q(I)	0.000	0.000
J	7-Q(tot)	0.41	0.36
	Total Site Recharge	32.42	28.29

Revised Values-1
21.54
2.55
21.54
0.00
22.04
0.00
16.24
0.54
21.54
12.98
41.25
10.16
22.04
0
2.6
1.65
0.004
0.05
0.059
0.000
0.000
0.301
0.000
0.000
0.36
28.29

	Nitrogen in Recharge	Nelson & Pope As-of-Right	Revised Values-1
A-8	N(S)	2411.976	2411.976
B-6	N(P) -Cat	58.38	58.38
B'-6	N(P) -Dog	147.15	147.15
C-9	N(S)	76.77	99.80
E-5	N(F1)	2558.70	474.53
G-4	Atmos (natural/wetlands) N1	15.40	15.40
G-7	Atmos (gf/turf) N2	34.28	34.28
G-10	Atmos (ag, imper, other) N3	15.53	26.58
G-11	N(at)	65.21	76.25
H-10	N(irr)	7.13	25.16
	Total Site Nitrogen	5325.32	3293.23
	Total Nitrogen (mg)	2,415,109,384	1,493,529,590
	Total Recharge (feet)	2.70	2.36
	Area of Site (Sq Ft)	6,629,832	6,581,045
	R (cu ft)	17,910,439.69	15,515,640.12
	Site Rechareg Volume (liters)	507,223,652.07	439,402,928.19
	Nitrogen Concentration (mg/l)	4.76	3.40

Revised Values-1
2411.976
58.38
147.15
48.21
474.53
15.40
34.28
26.58
76.25
25.16
3241.65
1,470,134,293
2.36
6,581,045
15,515,640.12
439,402,928.19
3.35

~~FTSIHL01 -02 DEIS PB~~
~~Hearing Record Comments~~

SUFFOLK COUNTY DHS

2017 Annual Technicalology Review

Innovative & Alternative Onsite Wastewater Treatment Systems - Table 27 - Page 4-2

Advantex AX	24.2
Advantex RT 18.8 mg	18.8
HydroAction NSF 15 mg	11.6
Norweco Singuair	18.3
Norweco Hydro-Kinetic	17.5
BUSSE MF	83.4
Amphidrome	17.7
BioMicrobics BioBarrier	49.7
FujiClean	16.6
Pugo	28.6
Ecoflow Coco	37.4
Ecoflow Coco + Denite	29.8
Waterloo BioFilter	54.3
Average	31.4

Convental Septic Syetem (SCDHS Annual Tech Review I/A OWTS Page iv)	65.0

ppm N in discharge.