Connecticut Department of Energy and Environmental Protection

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New Haven WPCF

Report of the Nitrogen Credit Advisory Board for Calendar Year 2016 To the Joint Standing Environment Committee of the General Assembly

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REPORT OF THE NITROGEN CREDIT ADVISORY BOARD FOR CALENDAR YEAR 2016

TO THE JOINT STANDING ENVIRONMENT COMMITTEE OF THE GENERAL ASSEMBLY

Concerning the

NITROGEN CREDIT EXCHANGE PROGRAM

As required by Section 22a-523(c) of the Connecticut General Statutes

XXXXXXX

This report has been prepared by the Nitrogen Credit Advisory Board and is respectfully submitted to the Joint Standing Environment Committee of the General Assembly pursuant to the requirement of Connecticut General Statutes (CGS) Section 22a-523(c). Such section requires that the Nitrogen Credit Advisory Board submit to the Joint Standing Environment Committee of the General Assembly a report that addresses issues associated with the implementation of the Nitrogen Credit Exchange Program. This report covers the period from January 1, 2016 to December 31, 2016.

This report provides a summary of the technical progress and financial requirements that the Nitrogen Credit Advisory Board deems necessary to achieve progress in this important program in reducing nitrogen loads to Long Island Sound. The continued success of this program is dependent upon the development and application of innovative approaches and management techniques to meet nutrient reduction goals for Long Island Sound.

Executive Summary

In accordance with CGS Sec. 22a-523(c) the Nitrogen Credit Advisory Board (NCAB) submits this Report for calendar year 2016 on the progress of the Nitrogen Credit Exchange Program.

Major accomplishments and activities relative to the 2016 program operations include:

- One of the Department of Energy and Environmental Protection's (DEEP) management strategies to reduce nitrogen loading was to implement an innovative nitrogen-trading program among the Water Pollution Control Facilities (WPCFs) located throughout the State which are covered under the 2016 General Permit for Nitrogen Discharges (NGP). The goal was to cost-effectively reduce the nitrogen load from those sources by about 65% by the end of 2014 through:

    - Encouraging denitrification at WPCFs with increased Clean Water Fund (CWF) grants,
    - Spreading nitrogen removal upgrades over thirteen years, thereby reducing the financial impact on the CWF and,
    - Providing a fiscal alternative to the immediate expenditure of capital funds.

- The Total Maximum Daily Load (TMDL) allocation for the State of Connecticut is 9,148 equalized pounds of nitrogen per day (eq. lbs N/day). In 2016, the state as a whole complied with the TMDL and discharged only 7,583 eq. lbs N/day to the Long Island Sound (LIS). The warm weather aided the State in complying with the TMDL. During this time, two WPCFs became "project facilities" by completing nitrogen removal upgrades to their treatment plants, Manchester and Plymouth. New Haven (GNHWPCF) was already considered a project facility since an interim project was completed in 1997, however, final improvements were also made to their nitrogen removal system in 2016.

- The trading program moved to a self-sufficiency scenario in trading year 2016, pursuant to Public Act 15-38, in which the State achieved a revenue-neutral condition in the following manner: The WPCFs not meeting the NGP goals ("the buyers") bought credits and the WPCFs meeting the NGP goals ("the sellers") divided the funds paid by the buyers proportionally, based on the seller's relative performance. Most sellers received a reduction in the amount received as the State will no longer be subsidizing credits.

- The Nitrogen Credit Advisory Board formally submitted recommendations to the DEEP Commissioner that he establish the value of an equalized nitrogen credit for buyers at $6.70 for trading in 2016 and for sellers at $2.65971.

- In 2016, twenty-five facilities were required to purchase credits equivalent to 1024.3 eq. lbs in order to remain in compliance with the NGP. Those payments totaled $2,511,788 and were shared amongst the fifty-four facilities selling 2580.28 eq. lbs.

The Nitrogen Credit Advisory Board highlights:

- The Clean Water Fund Project Priority List for Fiscal Years (FY) 2014 and 2015 was approved on July 18, 2014 and provided a plan for the expenditure of $67M in general obligation bonds and $318M in revenue bonds in FY 2014 and $218M in general obligation bonds and $261M revenue bonds in FY 2015. A portion of those funds for FY 2014 and FY 2015 were expended for nitrogen removal projects in Mattabassett, Hartford, New Haven, Plymouth, Manchester, and the

Middletown WPCF abandonment project. Nitrogen removal projects that are currently under construction include Rocky Hill, Farmington, and Middletown.

- Fifty-six (56) WPCFs have become project facilities by completing construction for nitrogen removal through 2016 with an expected total of fifty-eight (58) project facilities completing construction by 2019. The cost to the Clean Water Fund for project facilities to remove 16,381 eq. lbs of N/day is $452M to date with an expected cost of $97M for projects in process through 2022. It is estimated that between $300M to $400M has been saved by not requiring all WPCFs to upgrade their treatment plants for nitrogen removal.

- DEEP and the NCAB proposed legislation to move the nitrogen trading program to self-sufficiency ("State subsidy neutral") for the 2016 trading calendar year, with credit exchange transactions to be completed by August 2017. To address the unsustainable State subsidization of the program, and to avoid discontinuing the program, on June 5, 2015, Public Act 15-38, *An Act Concerning the Sustainability of the Nitrogen Credit Exchange Program* was enacted. For 2016, the self-sufficient scenario was implemented and the State did not subsidize the Nitrogen Credit Exchange program, thereby saving the state $3,798,286.74 dollars.

I. Introduction

Background

Long Island Sound's (LIS) most pressing water quality problem is caused by the over enrichment of nutrients, specifically nitrogen, which leads to greatly reduced levels of dissolved oxygen (DO) in the bottom waters of western LIS. The overload of nitrogen fuels excessive growth of algae, which eventually dies, sinks to the bottom, and decays. During decay, the oxygen is consumed by bacteria and the DO in the water falls to levels well below those allowable in State Water Quality Regulations. Low oxygen levels, or "hypoxia" typically occurs during the months of July through September. These conditions are inadequate to support healthy populations of aquatic life because they create an imbalance in the ecosystem by disrupting the feeding, growth, and reproduction of nearly all forms of aquatic life. Primary sources of nitrogen include municipal WPCF discharges, atmospheric deposition, and storm water runoff from urban, suburban, and agricultural areas.

The Federal Clean Water Act requires that the State establish Total Maximum Daily Loads (TMDLs) for all water bodies that do not meet the minimum State Water Quality Regulations, such as LIS. Once the State has established a TMDL, federal law requires that it be reviewed and approved by the Federal Environmental Protection Agency (EPA). In April 2001, EPA approved Connecticut and New York's jointly submitted TMDL to address the impairment of LIS water quality that results from excessive nitrogen loading. The TMDL established the maximum loading amount of nitrogen that the LIS can assimilate without causing impaired water quality. It also apportioned the maximum loading amount among various sources, and created a plan to achieve the loading reductions necessary to meet State Water Quality Regulations for each state.

In the TMDL, the primary sources of nitrogen enrichment in the LIS are targeted for control, which include discharges from WPCFs, storm water runoff, and atmospheric deposition. By 2014, the TMDL required both Connecticut and New York to achieve a 58.5% collective reduction of nitrogen loading from point discharges and urban and agricultural runoff sources to the LIS from an established baseline. In Connecticut a 64% reduction goal was set for WPCFs through a waste load allocation (WLA) process.

"Nitrogen trading" was identified as a mechanism for cost-effectively attaining the aggregate goal for Connecticut WPCFs. Public Act 01-180, codified in the Connecticut General Statutes in Sections 22a-521 through 527, established a Nitrogen Credit Exchange (NCE) overseen by a Nitrogen Credit Advisory Board (NCAB – Attachment A), and authorized the issuance of the 2016 General Permit for Nitrogen Discharges. Collectively, the 2016 General Permit for Nitrogen Discharges, NCE, and NCAB form the foundation for the nitrogen trading program instituted by Connecticut in 2002, which has successfully completed 15 years of operation.

Condition of Long Island Sound

Nitrogen trading has led to measurable reductions in Connecticut's nitrogen load to LIS. Signs of improvement in hypoxia are evident, but more reductions are still needed to meet management goals to attain a healthy LIS. Added attention must be directed towards point and non-point sources from outside of Connecticut, atmospheric sources, and storm water and nonpoint source runoff.

The areas affected by hypoxia in LIS are monitored each summer by DEEP staff with funding from the EPA Long Island Sound Study (LISS), providing a good indicator of the overall condition and long term trend (Figure 1). Although annual variation can be large, subject to changing weather conditions that affect the severity of hypoxia each year, the underlying trend in hypoxic area is downward. That change is illustrated by the direction of the Hypoxic Area trend (Figure 1). Since 1987, the affected area has

averaged about 183 square miles and during the last 10 years, only 2003 and 2012 were significantly higher than the long term average. Taking into consideration that several of the warmest years on record, which exacerbate hypoxia, have occurred in the last 10 years, the areal indicator still appears to be benefitting from nitrogen management.

According to the Northeast Regional Climate Center, July and August of 2015 were 2-3°F warmer than normal and early spring temperatures were below normal. Additionally, precipitation was below normal for the summer period (June-August). Compared to the averages throughout the 28-year period as shown in Figure 1, the hypoxia level in 2015 was below average in area and close to average in duration. In fact, 2015 had the second smallest area behind 1997, which had an area of 38.3 square miles. During 2015, hypoxia in Long Island Sound reached its maximum extent by mid-August and continued into September, finally subsiding around September.

The summer of 2016 was warm and dry, with the summer being recorded as the warmest on record for Connecticut. As a whole, the northeast region was 2.2ºF above normal. The average August 2016 temperature in Bridgeport was 5.1ºF above normal. According to the Northeast Regional Climate Center at Cornell, "at the beginning of June, 1% of the Northeast was in a drought. … by mid-September 37% of the Northeast was in a moderate, severe, or extreme drought."

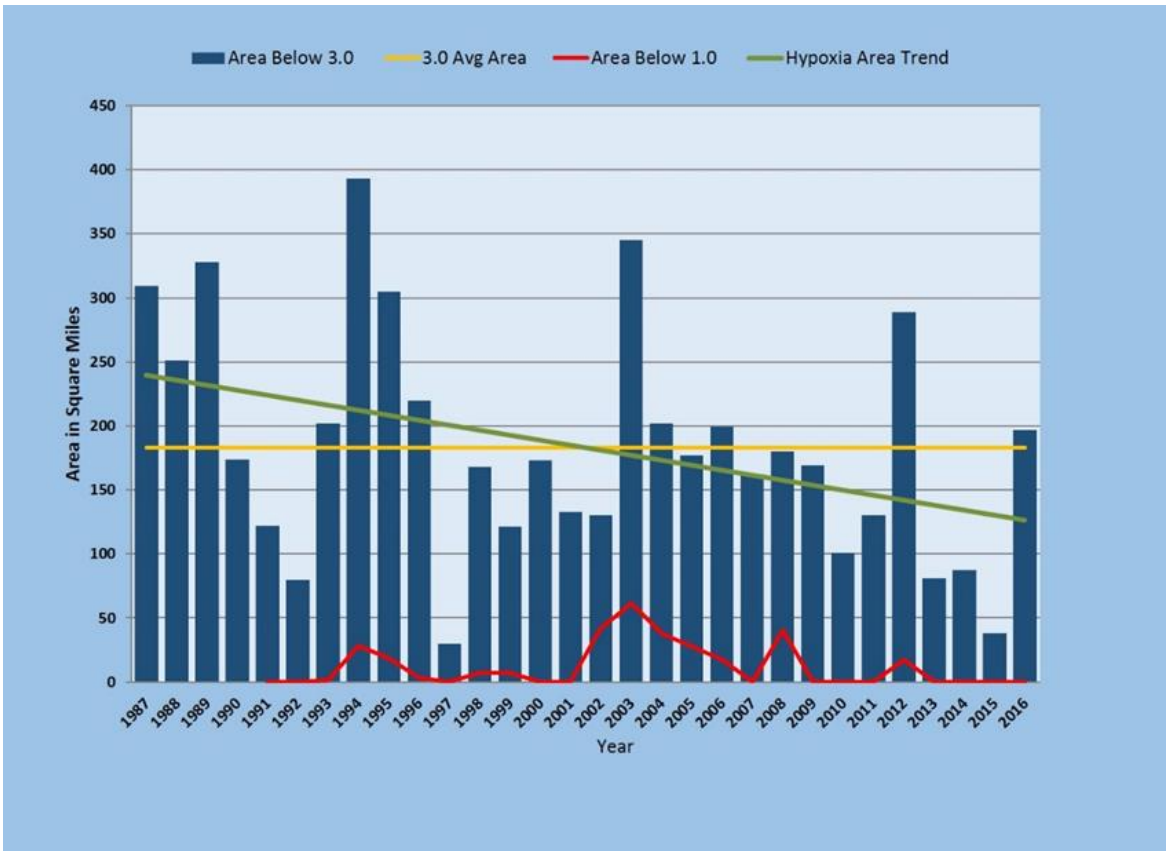

Figure 1. Area and trend of hypoxia in Long Island Sound, 1987-2015.

Over the course of the season, hypoxic conditions were found during three surveys. The peak event occurred during the cruise between August 16th and 18th. The maximum area was 197.5 square miles. The estimated duration was 51 days. In 2016, similar to 2014, there was a clear period where concentrations rose above the 3.0 mg/L threshold and remained there for eight days in the beginning of August before again falling below the threshold. The lowest dissolved oxygen concentration (1.37 mg/L) was

documented during the August 16th cruise at Station A4. Compared to the previous 24-year average, 2016 was slightly above average in area and near average in duration.

2016 Performance of the Nitrogen Credit Exchange

In 2016, the nitrogen loading from WPCFs to LIS averaged approximately 7,583 eq. lbs N/day, which is 1,565 eq. lbs N/day lower than the 2015 TMDL permit limit of 9,148 eq. lbs N/day (Attachment B). Two new project facilities plus the improvements made in New Haven, low precipitation levels, and warm weather helped the State to comply with the permit. As expected, February and March of 2016 had the highest aggregate nitrogen load with 11,583 eq. lbs N/day, due to the combination of generally wet and cold weather (Figure 2).

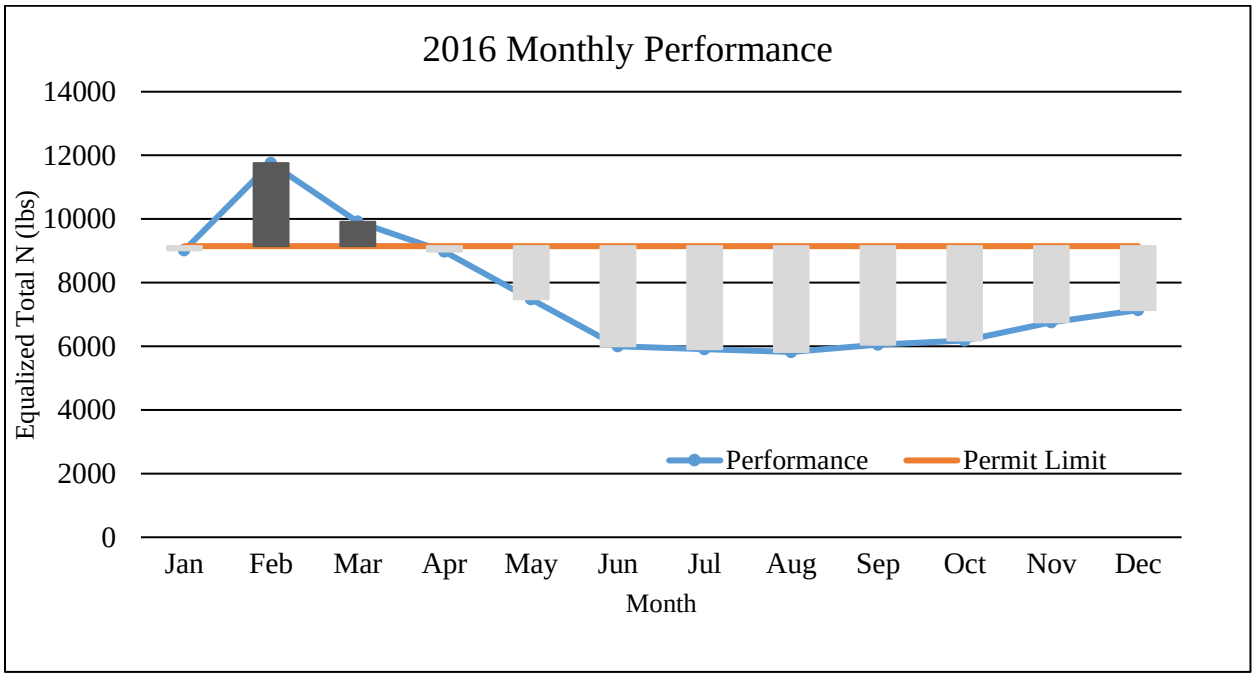

Figure 2. Monthly aggregate performance of 79 facilities during 2016.

II. 2016 Nitrogen Credit Exchange

Credit Price

Annually the NCAB proposes a value for equalized nitrogen credits to the Commissioner of the Department of Energy and Environmental Protection. The NCAB derives this value by dividing the total annual project cost by the reduction in equalized pounds of nitrogen. The state statute identifies the total project cost as: 1) capital expenditures for construction of nitrogen removal facilities and 2) ongoing operation and maintenance costs for nitrogen removal treatment.

The cost of an equalized credit is derived by the following formula:

The value of an equalized credit = (Capital Costs + Operational Costs) / Total amount of equalized nitrogen reduced from project facilities

"Nitrogen Removal Project" is defined as any alteration financed by Connecticut's Clean Water Fund (CWF) of the physical structure of a wastewater treatment facility specifically constructed to remove

nitrogen. A "Project Facility" is further defined as any facility with a fully operational nitrogen removal system of any scale as of January 1st of the trading year. Under this definition Plymouth and Manchester became project facilities in 2016. New Haven (GNHWPCF) was already considered a project facility since an interim project was completed in 1997.

"Capital Costs" were established by the NCAB using the annual CWF repayment amount associated with the construction of nitrogen treatment facilities as set forth in the loan agreement between the municipality and DEEP. Financing derived from grants to municipalities is not considered to be part of the capital cost for the purpose of setting credit prices. Using this procedure, the NCAB established the annual capital cost for nitrogen removal in 2016 as $17,711,711 (Attachment G). This value represents the annual interest and repayment of principal cost on the 2% loans for nitrogen removal processes. In 2016, the annual capital cost for nitrogen removal increased since two facilities, Plymouth and Manchester, became project facilities. However, final improvements were also made to New Haven's (GNHWPCF) nitrogen removal system in 2016.

"Operation and maintenance costs" were estimated by means of a survey sent to all project facilities. The Department staff reviewed all survey data for consistency and reasonableness and an estimate of $22,928,659 was adopted by the NCAB as the annual operation and maintenance cost for nitrogen removal in 2016. Combining capital cost and operation and maintenance costs yielded a total cost of $40,640,430 (Attachment G). In 2016, the total annual operation and maintenance cost didn't increase substantially because the warm weather helped electricity usage stay stable.

The reduction in equalized pounds of nitrogen was calculated by subtracting the actual pounds of nitrogen discharged by each of the project facilities from the "baseline" loading established for that facility in the TMDL for Long Island Sound. The baseline loading represents the loading of nitrogen each facility would have discharged if no nitrogen removal was provided. Load reductions for each facility were multiplied by the equalization factor for the facility (converting the pounds reduced to equalized pounds reduced) and the statewide reduction was calculated by summing the equalized pounds reduced for all project facilities. Using this procedure, the cost of a credit in 2016 was determined by dividing the total project cost of $40,640,430 by 16,564.6 pounds per day of equalized nitrogen removed during the year multiplied by 365 days in a year equaling $6.70 for the price of a credit (Attachment E).

In 2014, the NCAB voted to move the trading program forward to self-sufficiency and statutory changes were made in 2015 to avoid long-term State subsidization.

The self-sufficiency scenario achieves a revenue-neutral condition in the following manner: The WPCF not meeting the Nitrogen General Permit goals ("the buyers") will continue to buy credits and the WPCFs meeting the Nitrogen General Permit goals ("the sellers") will divide the funds paid by the buyers proportionally, based on the seller's relative performance. Most sellers will receive a reduction in the amount received as the State will no longer be subsidizing credits and the number of buyers is decreasing.

The NCAB formally submitted recommendations to the DEEP Commissioner that he establish the value of an equalized nitrogen credit for buyers at $6.70 and for sellers $2.65971 for trading of 2016 credits. The Deputy Commissioner, on behalf of Commissioner Klee, accepted these recommendations and issued draft rulings pursuant to CGS Section 22a-527 (Attachment I). No municipality petitioned for a review of the Commissioner's draft ruling during the statutory 15-day review period, and the draft rulings became final establishing the value of an equalized nitrogen credit at $6.70 for buyers and $2.65971 for sellers.

The price of a nitrogen credit in 2016 was slightly lower than in 2015.

Numbers of Credits Traded and Final Balances

In 2016, twenty-five facilities were required to purchase credits in the amount of $2,511,788 (1024.3 eq. lbs) in order to remain in compliance with the 2016 General Permit for Nitrogen Discharges. Those payments were shared amongst fifty-four facilities selling credits equating to 2580.28 eq. lbs at a rate of $2.65971 (Attachment D). As a whole, facilities were in compliance with their permit limit in 2016, therefore, more credits were available for sale than were needed by buyers to meet the TMDL (Attachment D).

III. Compliance with TMDL goal

Nitrogen Loading Trend

In 2016, the equalized average dropped to 7,583 eq. lbs N/day, which is 8,257 lbs lower than the average nitrogen load in 2002 of 15,840 eq. lbs N/day. The warm weather helped the majority of the plants to operate the plant efficiently by allowing the biology to perform better in those conditions.

Looking at the linear trend line as well as the 12 month moving average (yellow line) in Figure 3, the total equalized nitrogen loading to LIS has been consistently decreasing due to the increased number of WPCFs completing upgrades for nitrogen removal facilities.

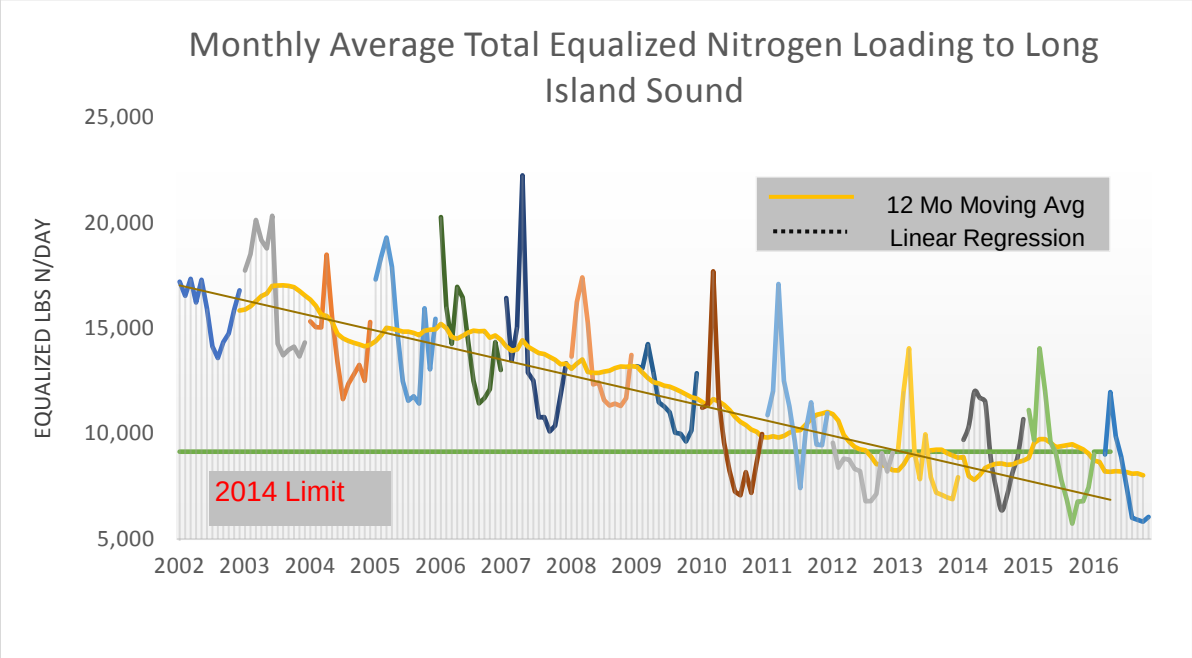

Figure 3. Monthly average total nitrogen loading to Long Island Sound 216

Meeting the 2016 Waste load Allocation and Permit Limits.

The nitrogen trading program has been an innovative approach to cost effectively meet the TMDL goal of reducing nitrogen loading by 65% through:

- Encouraging denitrification at WPCFs by providing enhanced Clean Water Fund grants,
- Spreading nitrogen removal upgrades over fifteen years, allowing WPCFs to purchase credits rather than immediately upgrade to meet 65% removal requirements,

- Providing a fiscal alternative to the immediate expenditure of capital funds.

The DEEP expects that the State will continue to comply with the TMDL. An additional 216 eq. lbs N/day is projected to be reduced as a result of projects reaching completion in Rocky Hill, Farmington, and the abandonment of Middletown WPCF by 2019. This will be aided by the continuation of operators optimizing nitrogen removal at WPCFs. A total of 58 project facilities are anticipated to be on line by the 2019 trading year (Figure 4).

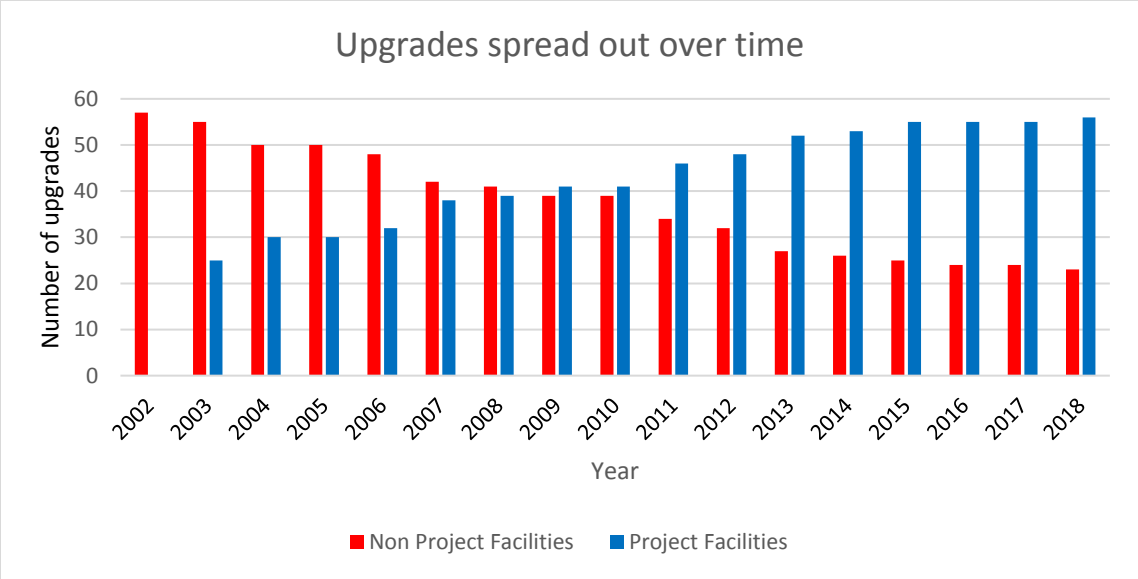

Figure 4. Upgrades of WPCFs 2002-2018

IV. Finances

The Clean Water Fund (CWF)

The FY 2016 and FY 2017 State capital budget increased Connecticut's ability to meet State wastewater infrastructure needs and provided a stimulus to the economy.

The CWF Priority List for FY 2016 and FY 2017 became effective on June 13, 2016. The level of State funding for the CWF program was as follows:

FY	General Obligation Bonds	Revenue Bonds	Total Funding
2016	$45M	$31M	$76M
2017	$67M	$180M	$247M

A portion of the available funding for FY 2016 and FY 2017 was expended for a nitrogen removal project in Farmington. It is expected that in FY 2018, nitrogen removal projects will be under construction in East Hartford and Torrington.

Investment in Projects Online

The full list of nitrogen removal projects that have been completed or are currently approved for funding by the CWF are shown in Attachment H.

The Nitrogen Trading Program has been an innovative approach to cost effectively meet the 2014 TMDL. It is estimated that this fiscal strategy has resulted in cost savings of $300 - $400 million. To date, $452 million has been funded by the CWF to upgrade 58 treatment plants for nitrogen removal.

Use of Nitrogen Credit Exchange Funds

According to CGS Sec. 22a-524(b)(11), the Commissioner, in consultation with the NCAB, shall: "Establish accounts of funds created from the purchase and sale of equivalent nitrogen credits to be used for administration of the Nitrogen Credit Exchange Program and which may be used for nitrogen removal projects, habitat restoration projects and research". Furthermore, in CGS Sec. 22a-524(b)(12), the Commissioner, in consultation with the NCAB, shall: "Establish any other policies or procedures the commissioner may deem necessary to carry out the Nitrogen Credit Exchange Program"; and CGS, Sec. 22a-524(b)(13) provides abilities to "establish a technical assistance program to educate and assist municipalities in implementing the Nitrogen Credit Exchange Program".

Over the past years, the NCAB recommended funds be used for training and providing technical assistance.

Projects that are in progress and funded with the credit exchange funds are:

- Provide funding to the USGS for enhanced Connecticut River monitoring. In November 2007, $180,000 was allocated to monitor the river. In December 2010, the NCAB allocated an additional $90,000 for FY 2011 and FY 2012 to continue monitoring and in 2012, an additional $45,000 was allocated to monitor the river during 2013. USGS monitored nitrogen loads during different seasons and during the tropical storms in 2011 and 2012. The monitoring of the Connecticut River at Middle Haddam uses new and novel approaches for continuous total nitrogen monitoring. The project is ongoing and the data analysis developed under this project element will help to advance the understanding of the hydrologic and water-quality processes in the tidal environment, as well as advancing both field and analytical methodology. Supplemental funding of $100,000 was approved to for nitrogen monitoring in 2016 of the Connecticut River at Middle Haddam.

- The NCAB funded enhanced nutrient monitoring Statewide by partnering with the USGS. In 2008, $240,000 was provided for monitoring to be conducted in rivers throughout the State to better determine nitrogen loads from within and outside of Connecticut. A total of $400,000 was allocated from 2011 to 2015 for monitoring. Utilizing the data along with their existing database; USGS released a report on nitrogen loads and trends in Long Island Sound entitled *Estimated Nitrogen Loads from Selected Tributaries in Connecticut Drainage to Long Island Sound, 1999 – 2009*. Another $100,000 was appropriated in 2016 for monitoring rivers throughout the State.

- The nitrogen load monitoring at different sites is essential for Long Island Sound nitrogen load calculations. The results from the sites allow us to highlight the changes that have taken place at some of the sewage treatment plants outfalls. USGS is finalizing regression models to calculate nitrogen from continuously measured data and a web tool has been built to present the data more frequently.

- The NCAB recommended five years of membership (2011-2016) in the Water Environment Research Foundation (WERF), now Water Environment & Reuse Foundation (WE&RF), at a cost of $10,250 per year. WERF keeps members informed on the latest research, technology,

technical discussion groups, seminars, and workshops relevant to treatment plant operations and nitrogen removal.

- The NCAB also recommended $1,966,500 be used for the purchase of on-line (automated) or portable analyzers for dissolved oxygen (DO) and nitrogen analyzer equipment for those WPCFs that did not have adequate equipment. WPCFs were reimbursed 75% of the purchase price, which was limited to $40,000 for two on-line analyzers and $3,000 for portable analyzers. Seventeen facilities requested money and were reimbursed $550,097. Since the installation of the analyzers, facilities have been better able to control the amount of dissolved oxygen entering the anoxic zones and optimize nitrate recycle rates and the amount supplemental carbon added to the treatment process.

V. Revisions to the TMDL/Upper Connecticut River

The Total Maximum Daily Load (TMDL) for nitrogen to the Long Island Sound, adopted in 2001, included a timeline for regular evaluation of TMDL progress and revisions, as appropriate, in order to account for the phased implementation approach of the TMDL. These steps were anticipated to account for finalization of the federal dissolved oxygen criteria for coastal waters, anticipated changes in Connecticut and New York water quality regulations, a new System-Wide Eutrophication Model (SWEM) for Long Island Sound, more specific nitrogen reduction targets for upper Connecticut River sources throughout Massachusetts, New Hampshire and Vermont and for atmospheric deposition. To date, the federal dissolved oxygen criteria has been finalized, Connecticut and New York's water quality regulations for dissolved oxygen have been adopted, the SWEM model has been adapted for Long Island Sound, and several studies related to nitrogen loading and delivery in the upper Connecticut River watershed have been completed.

In 2010, the EPA Regional Administrators (Regions 1 and 2) and the Commissioners from the Long Island Sound watershed States agreed to proceed with a five-State TMDL. A TMDL workgroup was formed which held bi-weekly conference calls to work through the necessary tasks relative to TMDL implementation and evaluation. In 2011, the workgroup identified technical issues and held a joint meeting with State water directors and EPA. The outcome of this meeting was to develop an enhanced implementation plan for the current TMDL, while moving forward with a more comprehensive analysis to support the revision of the TMDL at a later date. In 2013, the five-States and the New England Interstate Water Pollution Control Commission completed an evaluation of current storm water and nonpoint source control efforts to qualitatively assess whether they were adequate for meeting the 2000 TMDL load allocations.

In 2015, EPA released a new Nitrogen Reduction Strategy for LIS which is intended to advance implementation of the TMDL and increase the area subject to nitrogen reductions. The approach addresses three watershed groups of LIS: coastal watersheds (embayments), large riverine watersheds (Housatonic River, Connecticut River, and Thames River), and Western Long Island Sound. EPA's strategy involves the use of nitrogen thresholds to develop ecologically based targets for each of these groups. EPA initiated the first phase of this process in the fall of 2016 which focused on six embayment complexes in CT, the Connecticut River, and the eastern and western narrows of Long Island Sound. DEEP, along with NYDEC and select members of the academic and non-profit community serve on the technical stakeholder group for this project.

Subsequently, DEEP formalized a new nitrogen reduction plan named the Second Generation Nitrogen Strategy as it follows initial efforts aimed at reducing nitrogen in order to achieve dissolved oxygen concentrations in LIS. The Second Generation Strategy will focus nitrogen reduction efforts on three main areas: wastewater treatment plants, nonpoint source and storm water, and embayments. DEEP's

strategy also includes prioritizing watersheds and embayments for additional actions towards nitrogen reductions within the next five years (*Integrated Resources Water Management Report*); as well as a special study to develop nitrogen guidelines for the Niantic River Estuary; and evaluate the nitrogen load from onsite wastewater treatment systems (septic systems). This effort also includes coordinating with UConn's Center for Land Use Education and Research (CLEAR) to support education and outreach efforts.

In 2010, a project to improve the SWEM model was undertaken and funded by the LISS. The project improved the calibration of SWEM to more accurately reflect actual production and respiration estimates, incorporated an algal production formulation, developed high resolution output in NETCDF format, and developed a website dedicated to making the SWEM model more accessible to the scientific community. This project increased the model's consistency with the scientific communities' understanding of mixing and circulation in estuaries when compared to the previous version. Although the model is now more consistent with observed estimates of primary production and community respiration, the model continues to over predict dissolved oxygen levels observed in the bottom water of LIS and has been deemed limited for management use. Considering advancements in computer science since SWEM was developed, LISS has decided to contract with the New York City Department of Environmental Protection to develop a more robust water quality model that in addition to computer processing and storage advances, may include a finer grid resolution and extend spatially into embayments and tributaries. Conceptually, this effort will result in an integrated watershed, estuary, and ecosystem model. The model will be developed in stages with input from modeling experts and a team of reviewers.

EPA's LISS continues to support the development of a tracking system to quantitatively assess progress relative to the original 2000 TMDL nonpoint source and storm water allocations. The New England Interstate Water Pollution Control Commission (NEWIPCC) is currently seeking grant funding to pursue the development of a tracking tool for the Long Island Sound Watershed.

VII. Attachments

A. Nitrogen Credit Advisory Board Members 2016
B. Total Nitrogen Balance Sheet – 2016 Monthly Averages by Plant
C. Total Nitrogen Balance Sheet – Monthly Averages by Plant 2002 - 2016
D. LIS Total Nitrogen Credit Exchange Balance – 2016
E. Equalized lbs Reduced by Project Facilities 2016
F. Total Annual Project Cost 2016
G. Nitrogen Removal Projects Financed by the CWF through 2016
H. Notice of Proposed Value of an Equivalent Nitrogen Credit for 2016
I. General Permit for Nitrogen Discharges
J. LIS Total Nitrogen Credit Exchange Projections – 2016 and 2017
K. Nitrogen Credit Advisory Board 2018 Meeting Schedule

VIII. Acknowledgements

DEEP wishes to thank the members of the NCAB for their contributions to this document and their ongoing participation in the NCE Program.

Attachment A

LIST OF APPOINTEES

	Name	**Appointed Authority**	**Term***
1.	Vacant	Senate Majority Leader	3 years
2.	Thomas A. Tyler The Metropolitan District 240 Brainard Road Hartford, CT 06114	Senate President Pro Tempore	3 years
3.	Betsey Wingfield Bureau Chief DEEP 79 Elm St Hartford, CT 06016 Phone: (860) 424-3704	Robert Klee Commissioner Energy & Environmental Protection	No specific term
4.	Marie Moylan Office of the Treasurer 55 Elm Street Hartford, CT 06106 Phone: (860) 702-3000	Denise L. Nappier Secretary Office of the Treasurer	No specific term
5.	Astrid T. Hanzalek 31 Abraham Terrace Suffield, CT 06078 Phone: (860) 668-2739	Lawrence F. Cafero, Jr. House Minority Leader (Ward Appointee)	3 years
6.	Vacant	House Majority Leader	3 years
7.	Joseph Michelangelo 1 Fitzgerald Lane Branford, CT 06405	John McKinney Senate Minority Leader	3 years

8.	Vacant	Governor	3 years
9.	Guy P. Russo 599 Chamberlain Hill Road Middletown, CT 06457	Joe Aresimowicz House Majority Leader	3 years
10.	Vacant	Senate Majority Leader	3 years
11.	William Norton, Director City of West Haven WPCA 355 Main Street West Haven, CT06516 (203) 937-3706	Christopher G. Donovan Speaker of the House	3 years

* Appointees remain active until removed by their appointees' authority

Attachment B

Total Nitrogen Balance Sheet -2016 Monthly Averages by Plant

Plant	Limit	Avg	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Zone 1														
GROTON CITY WPCF	99	80	165	128	109	104	89	44	54	38	44	46	59	82
GROTON TOWN WPCF	153	244	208	234	206	367	393	267	235	186	169	123	225	309
JEWETT CITY WPCF	15	7	9	9	6	4	5	2	2	1	2	3	9	30
KILLINGLY WPCF	131	102	75	76	95	102	95	102	139	134	112	90	93	108
LEDYARD WPCF	7	6	8	10	9	7	5	3	4	4	4	4	6	9
MONTVILLE WPCF	118	51	67	60	66	58	62	34	46	59	50	29	29	56
NEW LONDON WPCF	386	380	414	455	503	554	398	270	339	248	273	294	432	375
NORWICH WPCF	201	512	595	558	466	438	498	377	377	426	530	665	580	637
PLAINFIELD NORTH WPCF	34	68	78	96	61	76	60	35	40	38	89	61	92	84
PLAINFIELD VILLAGE WPCF	24	29	63	56	21	11	10	8	5	4	10	54	51	51
PUTNAM WPCF	53	44	34	68	63	40	31	22	24	22	43	47	84	48
SPRAGUE WPCF	7	10	16	13	12	13	12	10	12	7	9	5	8	6
STAFFORD SPRINGS WPCF	60	63	68	64	59	56	77	55	59	56	59	68	67	70
STONINGTON BOROUGH WPCF	14	5	4	8	5	4	4	3	3	4	4	4	4	8
STONINGTON MYSTIC WPCF	27	20	25	28	16	21	18	17	26	22	15	17	19	17
STONINGTON PAWCATUCK WPCF	24	16	14	15	17	18	15	19	13	10	12	14	18	24
THOMPSON WPCF	10	41	49	54	43	29	22	19	28	43	50	54	45	52
UCONN WPCF	44	104	127	172	123	120	52	40	41	43	125	237	107	57
WINDHAM WPCF	125	82	101	146	106	100	75	63	62	55	73	64	63	72
Zone 2														
BRISTOL WPCF	398	414	446	483	448	435	473	408	355	352	327	366	413	460
CANTON WPCF	24	44	58	56	52	43	41	46	37	50	41	31	31	40
EAST HAMPTON WPCF	54	80	109	93	84	88	55	47	60	55	74	84	96	117
EAST HARTFORD WPCF	292	346	370	458	578	321	430	304	279	245	289	246	317	319
EAST WINDSOR WPCF	59	37	40	37	36	40	43	31	32	30	39	34	39	48
ENFIELD WPCF	278	155	185	182	194	193	141	141	151	131	121	124	136	159
FARMINGTON WPCF	178	268	441	338	331	352	313	246	202	194	183	234	177	199
GLASTONBURY WPCF	98	62	68	79	75	65	42	127	56	50	51	50	43	43
HARTFORD WPCF	2377	3563	4075	5401	7493	5320	3595	2525	1831	2463	2585	2208	2728	2527
MANCHESTER WPCF	312	174	255	221	229	291	182	88	89	120	161	93	165	199
MATTABASSETT WPCF	834	402	355	425	553	592	356	275	322	315	405	437	418	366
MIDDLETOWN WPCF	222	503	479	826	586	635	478	368	392	378	511	344	527	506
NEW HARTFORD WPCF	3	1	1	2	1	1	1	1	1	1	1	2	2	2
PLAINVILLE WPCF	101	67	46	59	66	73	80	83	81	57	59	57	65	77

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Total Nitrogen Balance Sheet -2016 Monthly Averages by Plant

Plant	Limit	Avg	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PLYMOUTH WPCF	42	23	72	40	33	25	16	12	12	12	12	15	12	17
PORTLAND WPCF	31	29	26	61	45	32	36	17	25	18	18	16	30	19
ROCKY HILL WPCF	288	350	466	438	443	496	455	555	390	200	160	187	191	217
SIMSBURY WPCF	107	36	43	54	36	32	34	31	30	29	32	36	32	42
SOUTH WINDSOR WPCF	106	95	97	106	97	98	106	100	91	93	95	91	88	80
SUFFIELD WPCF	45	21	35	26	11	19	13	11	15	14	16	28	27	37
VERNON WPCF	184	424	368	377	423	584	451	450	423	480	364	369	403	397
WINDSOR LOCKS WPCF	66	49	56	88	67	58	48	40	36	34	37	36	42	49
WINDSOR POQUONOCK WPCF	98	482	546	510	512	519	524	477	428	444	415	451	491	461
WINSTED WPCF	64	60	87	91	72	65	81	45	41	50	43	48	43	56

Zone 3

BRANFORD WPCF	192	113	108	154	223	95	135	95	88	87	78	59	107	129
CHESHIRE WPCF	103	56	14	21	35	49	46	64	82	82	99	66	65	53
MERIDEN WPCF	449	159	116	586	178	121	92	72	59	68	62	87	354	117
NEW HAVEN EAST WPCF	1568	1224	1795	3365	2111	1895	984	550	557	657	573	663	532	1002
NORTH HAVEN WPCF	158	145	176	215	171	183	150	127	109	117	109	103	133	150
SOUTHINGTON WPCF	204	136	188	194	189	140	102	92	94	107	90	113	140	178
WALLINGFORD WPCF	269	379	429	523	505	425	405	300	314	271	321	329	336	385
WEST HAVEN WPCF	353	196	201	280	210	242	191	174	178	167	171	145	177	217

Zone 4

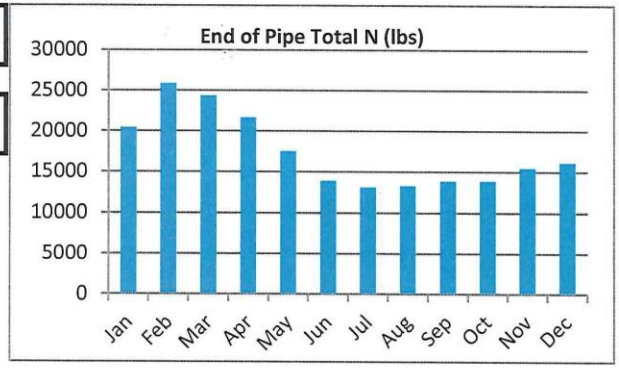
ANSONIA WPCF	115	43	48	69	48	49	47	39	40	39	36	29	31	35
BEACON FALLS WPCF	12	48	51	45	39	27	27	32	50	45	58	63	71	69
DANBURY WPCF	442	346	399	490	357	332	324	277	320	314	323	326	341	346
DERBY WPCF	71	81	98	83	72	70	78	94	87	91	80	87	72	65
LITCHFIELD WPCF	24	12	9	13	15	11	10	7	8	5	9	19	18	19
MILFORD BEAVER BROOK WPCF	94	48	51	59	53	33	46	46	43	53	49	43	43	54
MILFORD HOUSATONIC WPCF	307	206	154	211	276	278	208	131	140	206	209	182	184	289
NAUGATUCK TREATMENT Co.	246	162	159	231	211	174	160	118	171	198	139	121	119	144
NEW MILFORD WPCF	28	23	23	26	23	22	22	23	21	27	23	20	24	21
NEWTOWN WPCF	17	13	14	16	20	12	11	8	8	9	12	14	18	18
NORFOLK WPCF	11	14	12	26	19	23	14	14	8	12	11	9	7	12
NORTH CANAAN WPCF	13	28	32	32	30	25	24	24	26	20	24	29	29	41
SALISBURY WPCF	21	21	25	31	20	22	22	24	23	15	16	17	16	20
SEYMOUR WPCF	61	57	51	100	89	63	84	45	33	37	77	57	22	29

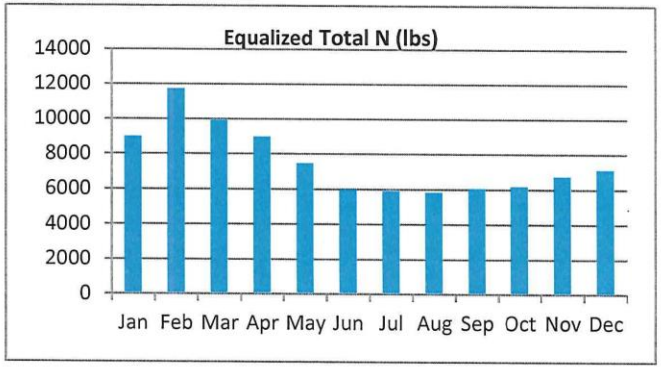
Total Nitrogen Balance Sheet -2016 Monthly Averages by Plant

Plant	Limit	Avg	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SHELTON WPCF	106	86	35	56	68	58	78	206	234	79	33	25	36	123
STRATFORD WPCF	356	198	169	194	229	155	145	218	151	310	153	159	181	314
THOMASTON WPCF	42	20	26	29	24	17	20	31	21	16	21	10	10	17
TORRINGTON WCPF	248	227	265	331	309	319	252	219	172	177	168	142	176	192
WATERBURY WPCF	1010	504	881	798	675	803	552	394	301	265	321	355	331	367
Zone 5														
BRIDGEPORT EAST WPCF	362	228	614	436	196	175	166	129	157	130	122	142	202	265
BRIDGEPORT WEST WPCF	1041	1452	1523	2295	1569	1629	1620	944	1201	967	1212	1491	1683	1291
FAIRFIELD WPCF	406	299	321	433	269	239	306	329	320	304	251	252	263	297
WESTPORT WPCF	87	24	22	32	32	28	21	21	25	20	18	19	21	25
Zone 6														
GREENWICH WPCF	479	443	504	526	452	436	471	453	343	381	391	423	415	524
NEW CANAAN WPCF	64	14	27	32	18	15	10	9	10	10	9	8	9	16
NORWALK WPCF	718	625	723	952	972	745	483	451	506	472	558	488	584	561
RIDGEFIELD SOUTH ST. WPCF	29	45	58	82	44	40	47	35	32	31	38	44	51	41
STAMFORD WPCF	926	265	280	240	216	244	288	327	302	295	316	286	187	197
End of Pipe Total			20445	25907	24418	21693	17556	13940	13122	13299	13892	13891	15495	16155
Equalized Total			9014	11757	9913	8973	7477	5998	5909	5823	6054	6183	6756	7139

End of Pipe Permit = 18,425
End of Pipe Avg = 17,484

Equalized Permit = 9,148
Equalized Avg = 7,583





Attachment C

Total Nitrogen Balance Sheet - Monthly Averages lbs/day by Plant, 2002 - 2016

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011 to 2016
ZONE:1																
GROTON CITY WPCF	210	161	179	132	118	129	110	114	107	99	76	98	98	80	80	90
GROTON TOWN WPCF	566	465	447	444	470	421	451	353	278	260	246	199	220	240	244	233
JEWETT CITY WPCF	36	40	39	13	10	13	13	8	9	6	5	11	7	9	7	8
KILLINGLY WPCF	162	147	159	177	152	158	191	126	170	247	225	277	151	129	102	206
LEDYARD WPC	5	3	4	5	7	5	7	5	5	6	6	6	7	4	6	6
MONTVILLE WPCF	187	153	222	92	98	69	82	91	82	115	63	54	62	55	51	70
NEW LONDON WPCF	449	405	332	434	423	414	377	391	335	304	243	296	281	280	380	281
NORWICH WPCF	758	986	769	748	828	684	673	612	481	470	457	535	562	452	512	495
PLAINFIELD NORTH WPCF	50	87	78	90	119	108	105	88	481	65	66	108	88	63	68	78
PLAINFIELD VILLAGE WPCF	32	44	41	49	54	42	42	43	51	31	28	48	49	56	29	42
PUTNAM WPCF	163	170	174	193	205	206	206	157	140	147	153	68	42	43	44	91
SPRAGUE WPCF	15	7	10	13	22	14	15	21	21	16	7	12	12	9	10	11
STAFFORD SPRINGS WPCF	135	131	121	131	114	120	160	162	129	191	208	164	89	74	63	145
STONINGTON BOROUGH WPCF	55	55	42	47	37	22	19	13	11	8	7	11	14	4	5	9
STONINGTON MYSTIC WPCF	36	43	49	48	51	31	30	25	32	28	30	41	30	15	20	29
STONINGTON PAWCATUCK	46	34	46	30	25	18	19	25	33	32	22	18	16	11	16	20
THOMPSON WPCF	21	35	29	33	28	28	21	18	30	29	44	31	47	36	41	37
UCONN WPCF	78	70	107	65	94	67	103	83	65	55	52	60	73	57	104	59
WINDHAM WPCF	265	243	216	165	167	174	258	364	340	289	146	112	141	92	82	156
End of Pipe Total	3269	3279	3064	2909	3022	2723	2882	2699	2800	2398	2084	2149	1989	1709	1864	2066
ZONE:2																
BRISTOL WPCF	949	1121	793	567	575	532	511	452	560	632	416	517	508	427	414	500
CANTON WPCF	70	87	101	106	113	92	99	100	121	103	90	95	81	59	44	86
EAST HAMPTON WPCF	86	119	96	85	140	110	136	121	117	127	82	101	83	80	80	95
EAST HARTFORD WPCF	755	749	812	803	902	391	417	418	366	505	397	525	462	309	346	440
EAST WINDSOR WPCF	20	34	31	45	32	32	27	26	20	31	32	29	30	28	37	30
ENFIELD WPCF	914	839	275	535	331	218	272	282	248	324	219	252	253	238	155	257
FARMINGTON WPCF	386	354	401	398	440	433	309	269	250	340	241	289	311	373	268	311
GLASTONBURY WPCF	263	307	340	214	290	295	364	223	118	101	77	51	62	49	62	68
HARTFORD WPCF	5978	5900	6529	6831	7408	5839	5326	4217	3841	5090	3282	3888	3194	4360	3563	3963
MANCHESTER WPCF	822	762	755	772	785	715	705	851	866	1069	1064	946	674	293	174	809
MATTABASSETT WPCF	2120	1795	1453	1408	1202	1129	1053	1123	1261	1377	1200	1127	1198	822	402	1145
MIDDLETOWN WPCF	392	385	424	486	440	397	446	490	497	567	521	581	544	501	503	543
NEW HARTFORD WPCF												3	4	1	1	2
PLAINVILLE WPCF	252	304	311	285	301	280	315	135	97	129	122	104	112	82	67	110
PLYMOUTH WPCF	73	69	68	76	80	71	87	85	68	100	74	83	67	57	23	76
PORTLAND WPCF	24	28	36	33	34	26	33	33	28	39	25	23	21	23	29	26
ROCKY HILL WPCF	631	767	780	919	787	610	484	526	498	542	446	412	420	457	350	455
SIMSBURY WCPF	344	316	323	368	206	84	70	84	43	84	50	48	57	37	36	55
SOUTH WINDSOR WPCF	298	324	317	340	298	322	323	326	342	276	111	109	103	104	95	141
SUFFIELD WPCF	34	37	38	72	88	74	88	47	25	35	34	36	27	22	21	31
VERNON WPCF	483	663	538	488	580	469	426	361	386	520	422	344	427	395	424	422
WINDSOR LOCKS WPCF	131	116	100	143	98	94	110	113	96	89	58	71	56	51	49	65
WINDSOR POQUONOCK	427	422	441	467	432	419	457	450	494	500	483	512	525	503	482	505
WINSTED WPCF	250	187	201	206	223	120	82	66	64	70	63	79	84	72	60	74
End of Pipe Total	15701	15683	15163	15647	15785	12752	12140	10798	10406	12650	9509	10225	9303	9343	7685	10207
ZONE:3																
BRANFORD WPCF	142	79	129	135	103	111	105	94	110	102	94	131	108	92	113	105
CHESHIRE WPCF	468	492	536	480	171	74	75	63	38	74	48	78	73	60	56	67
MERIDEN WPCF	860	917	882	781	827	810	1008	1051	696	253	142	164	145	116	159	164
NEW HAVEN EAST WPCF	1400	1630	1408	1703	2271	2201	1650	1592	1494	1993	1493	1667	2894	3183	1224	2246

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011 to 2016
NORTH HAVEN WPCF	534	502	489	424	226	214	249	191	164	199	172	150	158	138	145	163
SOUTHINGTON WPCF	819	798	768	754	761	868	911	725	194	262	99	99	198	83	136	148
WALLINGFORD WPCF	549	601	627	657	522	340	381	429	456	517	356	427	423	463	379	437
WEST HAVEN WPCF	796	668	511	601	546	498	779	549	612	673	326	249	291	211	196	350
End of Pipe Total	4168	4057	3941	3832	3156	2915	3508	3102	2270	2080	1237	1298	1396	1163	1184	1435
ZONE:4																
ANSONIA WPCF	273	307	260	287	289	237	260	270	178	76	63	59	59	52	43	62
BEACON FALLS WPCF	41	45	38	42	44	50	57	58	60	52	40	42	52	50	48	47
DANBURY WPCF	1866	1875	1825	1766	2072	1778	1885	1974	644	576	462	401	374	339	346	430
DERBY WPCF	53	64	58	59	65	63	64	64	63	82	71	54	66	68	81	68
LITCHFIELD WPCF	67	54	35	49	39	38	45	43	35	39	24	24	21	16	12	25
MILFORD BEAVER BROOK	130	180	120	127	130	132	121	137	101	127	74	70	55	51	48	75
MILFORD HOUSATONIC	439	429	431	479	574	662	742	324	238	598	291	343	365	262	206	372
NAUGATUCK TREATMENT	479	440	234	279	263	250	344	345	248	320	222	251	232	182	162	241
NEW MILFORD WPCF	76	52	56	91	86	88	103	109	135	117	32	27	25	24	23	45
NEWTOWN WPCF	34	50	32	24	36	26	19	18	21	20	18	15	13	15	13	16
NORFOLK WPCF	9	13	12	20	29	32	29	26	23	30	21	17	16	12	14	19
NORTH CANAAN WPCF	18	22	21	31	23	25	24	25	26	26	24	28	25	27	28	26
SALISBURY WPCF	27	27	23	28	29	28	34	32	34	35	28	33	28	22	21	29
SEYMOUR WPCF	55	56	61	69	66	62	58	69	62	89	41	52	63	53	57	60
SHELTON WPCF	452	545	509	501	480	413	219	219	113	121	69	61	64	87	86	80
SOUTHBURY TR. SCHOOL	17	18	16	14	10	7	8	4	7	9	3	3				5
STRATFORD WPCF	535	646	431	539	537	616	1425	605	245	259	179	300	352	245	198	267
THOMASTON WPCF	35	51	45	45	44	32	42	40	25	27	18	31	29	21	20	25
TORRINGTON WCPF	283	299	287	254	265	247	275	226	242	298	195	266	250	274	227	257
WATERBURY WPCF	778	1335	913	965	1001	1034	869	857	802	914	582	742	667	571	504	695
End of Pipe Total	5667	6508	5407	5669	6082	5820	6623	5445	3302	3815	2457	2819	2756	2371	2137	2846
ZONE:5																
BRIDGEPORT EAST WPCF	568	615	459	470	468	271	253	301	412	376	325	444	400	357	228	380
BRIDGEPORT WEST WPCF	2305	2306	1158	1564	1145	1146	1262	1019	1211	1017	1006	919	925	1029	1452	979
FAIRFIELD WPCF	735	453	417	383	530	408	488	431	325	388	338	296	273	296	299	318
WESTPORT WPCF	140	133	152	148	153	70	44	38	41	35	25	27	28	20	24	27
End of Pipe Total	3748	3508	2186	2565	2296	1895	2047	1789	1989	1816	1694	1686	1626	1702	2003	1705
ZONE:6																
GREENWICH WPCF	410	459	443	556	520	697	479	461	458	572	430	443	475	441	443	472
NEW CANAAN WPCF	21	24	20	30	30	38	29	30	29	39	21	25	26	17	14	26
NORWALK WPCF	605	888	784	818	755	1043	766	881	600	742	640	702	738	583	625	681
RIDGEFIELD SOUTH ST.	23	27	28	35	28	32	34	38	42	39	38	47	43	43	45	42
STAMFORD WPCF	1652	1645	1523	1418	1029	726	550	510	497	592	506	440	408	278	265	445
End of Pipe Total	2711	3044	2798	2857	2362	2536	1858	1920	1626	1984	1635	1657	1690	1362	1392	1666
State End of Pipe Total	36664	37708	33966	33182	34974	30842	30702	27345	27345	10054	7232	7651	7693	6762	6858	7880

Attachment D

LIS Total Nitrogen Credit Exchange

Final

Under the Self-Sufficient Program (Effective 2016)

SELLING Credits

Facility Name	Credits	2016 at $2.65971
STAMFORD WPCF	661	$643,453
WATERBURY WPCF	303.6	$295,541
NEW HAVEN EAST WPCF	206.4	$200,921
MERIDEN WPCF	142.1	$138,328
BRIDGEPORT EAST WPCF	113.9	$110,876
STRATFORD WPCF	105.86	$103,050
WEST HAVEN WPCF	94.2	$91,699
NORWALK WPCF	93	$90,531
FAIRFIELD WPCF	90.95	$88,536
MATTABASSETT WPCF	86.4	$84,106
MILFORD HOUSATONIC WPCF	67.67	$65,876
WESTPORT WPCF	53.55	$52,128
NAUGATUCK TREATMENT Co.	50.4	$49,062
NEW CANAAN WPCF	50	$48,673
ANSONIA WPCF	48.24	$46,959
BRANFORD WPCF	47.4	$46,142
DANBURY WPCF	44.16	$42,988
GREENWICH WPCF	36	$35,044
SOUTHINGTON WPCF	33.32	$32,435
MILFORD BEAVER BROOK WPCF	30.82	$30,002
MANCHESTER WPCF	26.22	$25,524
ENFIELD WPCF	23.37	$22,750
CHESHIRE WPCF	23.03	$22,419
SHELTON WPCF	13.4	$13,044
NEWTOWN WPCF	13.34	$12,986
THOMASTON WPCF	13.2	$12,850
SIMSBURY WPCF	12.78	$12,441
TORRINGTON WCPF	12.6	$12,266
MONTVILLE WPCF	12.06	$11,740
NORTH HAVEN WPCF	7.8	$7,593
GLASTONBURY WPCF	7.2	$7,009
WINDHAM WPCF	6.45	$6,279
PLAINVILLE WPCF	6.12	$5,958
SUFFIELD WPCF	4.56	$4,439
LITCHFIELD WPCF	4.2	$4,089
EAST WINDSOR WPCF	4.18	$4,069
KILLINGLY WPCF	4.06	$3,952
GROTON CITY WPCF	3.42	$3,329
PLYMOUTH WPCF	3.42	$3,329
WINDSOR LOCKS WPCF	3.23	$3,144
SEYMOUR WPCF	2.68	$2,609
NEW MILFORD WPCF	2.3	$2,239
SOUTH WINDSOR WPCF	2.09	$2,035
STONINGTON BOROUGH WPCF	1.62	$1,577
JEWETT CITY WPCF	1.36	$1,324
STONINGTON PAWCATUCK WPCF	1.36	$1,324
PUTNAM WPCF	1.26	$1,227
STONINGTON MYSTIC WPCF	1.26	$1,227
NEW LONDON WPCF	1.08	$1,051
WINSTED WPCF	0.72	$701
PORTLAND WPCF	0.4	$389
NEW HARTFORD WPCF	0.36	$350
LEDYARD WPCF	0.18	$175
SALISBURY WPCF	0	$0
Total Sum		**$2,511,788.00**

BUYING Credits

Facility Name	Credits	2016 at $6.70
BRIDGEPORT WEST WPCF	349.35	$856,676
HARTFORD WPCF	237.2	$581,662
WINDSOR POQUONOCK WPCF	72.96	$178,913
WALLINGFORD WPCF	66	$161,845
MIDDLETOWN WPCF	56.2	$137,814
NORWICH WPCF	55.98	$137,274
VERNON WPCF	45.6	$111,820
BEACON FALLS WPCF	24.12	$59,147
GROTON TOWN WPCF	16.38	$40,167
FARMINGTON WPCF	16.2	$39,726
RIDGEFIELD SOUTH ST. WPCF	16	$39,235
ROCKY HILL WPCF	12.4	$30,407
EAST HARTFORD WPCF	10.26	$25,160
UCONN WPCF	9	$22,070
DERBY WPCF	6.7	$16,430
THOMPSON WPCF	5.58	$13,683
NORTH CANAAN WPCF	5.25	$12,874
EAST HAMPTON WPCF	5.2	$12,751
PLAINFIELD NORTH WPCF	4.76	$11,672
CANTON WPCF	3.6	$8,828
BRISTOL WPCF	2.88	$7,062
NORFOLK WPCF	1.05	$2,575
PLAINFIELD VILLAGE WPCF	0.7	$1,717
SPRAGUE WPCF	0.48	$1,177
STAFFORD SPRINGS WPCF	0.45	$1,103
Total Sum		**$2,511,788.00**

Self-Sufficient Program was approved under Publict Act 15-38. The program consists of the buyers purchasing the credits (1024.3 equalized at $6.70) they need to meet their General Permit with those Payments being shared ($2,511,788) among the sellers credits (2580.28 equalized at $2.65971) proportionally. Therefore, there will be no purchase of excess credits. The 2016 year data is traded in 2017.

Attachment E

Equalized lbs Reduced by Project Facilities and Cost of Credit 2016

Project Facilities	Baseload	Average TN	EOP Reduced	E Factor	E Pounds Reduced
ANSONIA WPCF	314	43	271	0.67	181.57
BRANFORD WPCF	526	113	413	0.6	247.8
BRIDGEPORT EAST WPCF	991	228	763	0.85	648.55
BRIDGEPORT WEST WPCF	2852	1452	1400	0.85	1190
BRISTOL WPCF	1091	414	677	0.18	121.86
CHESHIRE WPCF	281	56	225	0.49	110.25
DANBURY WPCF	1211	346	865	0.46	397.9
DERBY WPCF	195	81	114	0.67	76.38
EAST HAMPTON WPCF	148	80	68	0.2	13.6
EAST HARTFORD WPCF	801	346	455	0.19	86.45
EAST WINDSOR WPCF	163	37	126	0.19	23.94
ENFIELD WPCF	763	155	608	0.19	115.52
FAIRFIELD WPCF	1113	299	814	0.85	691.9
GLASTONBURY WPCF	268	62	206	0.2	41.2
GREENWICH WPCF	1313	443	870	1	870
GROTON TOWN WPCF	420	244	176	0.18	31.68
HARTFORD WPCF	6512	3563	2949	0.2	589.8
JEWETT CITY WPCF	42	7	35	0.17	5.95
LEDYARD WPCF	20	6	14	0.18	2.52
LITCHFIELD WPCF	64	12	52	0.35	18.2
MANCHESTER WPCF	855	174	681	0.19	129.39
MATTABASEET WPCF	2285	174	2111	0.19	401.09
MERIDEN WPCF	1230	159	1071	0.49	524.79
MILFORD BEAVER BROOK WPCF	258	48	210	0.67	140.7
MILFORD HOUSATONIC WPCF	844	206	638	0.67	427.46
NEW CANAAN WPCF	175	14	161	1	161
NEW HARTFORD WPCF	12	1	11	0.18	1.98
NEW HAVEN EAST WPCF	4294	1224	3070	0.6	1842
NEW MILFORD WPCF	66	23	43	0.46	19.78
NEW LONDON WPCF	1057	380	677	0.18	121.86
NEWTOWN WPCF	45	13	32	0.46	14.72
NORTH HAVEN WPCF	433	145	288	0.6	172.8
NORWALK WPCF	1967	625	1342	1	1342
PLAINVILLE WPCF	277	67	210	0.18	37.8
PLYMOUTH WPCF	114	23	91	0.18	16.38
PORTLAND WPCF	86	29	57	0.2	11.4
PUTNAM WPCF	145	44	101	0.14	14.14
RIDGEFIELD SOUTH ST. WPCF	80	45	35	1	35
SEYMOUR WPCF	167	57	110	0.67	73.7
SHELTON WPCF	290	86	204	0.67	136.68
SIMSBURY WPCF	293	36	257	0.18	46.26
SOUTHINGTON WPCF	557	136	421	0.49	206.29
SOUTH WINDSOR WPCF	289	95	194	0.19	36.86
STAFFORD WPCF	164	63	101	0.15	15.15
STAMFORD WPCF	2536	265	2271	1	2271

Equalized lbs Reduced by Project Facilities and Cost of Credit 2016

Project Facilities	Baseload	Average TN	EOP Reduced	E Factor	E Pounds Reduced
STRATFORD WPCF	974	198	776	0.67	519.92
SUFFIELD WPCF	122	21	101	0.19	19.19
THOMASTON WPCF	114	20	94	0.6	56.4
UCONN WPCF	120	104	16	0.15	2.4
WALLINGFORD WPCF	737	379	358	0.6	214.8
WATERBURY WPCF	2766	504	2262	0.6	1357.2
WEST HAVEN WPCF	967	196	771	0.6	462.6
WESTPORT WPCF	238	24	214	0.85	181.9
WINDHAM WPCF	344	82	262	0.15	39.3
WINDSOR LOCKS WPCF	180	49	131	0.19	24.89
WINSTED WPCF	175	60	115	0.18	20.7
Total					**16564.6**
Project Cost					**$ 40,640,430.00**
Credit Cost:					**$ 6.70**
BOLD=New Project Plant for Year 2016					

Attachment G

Total Annual Project Cost 2016

Project Facilities	Total Annual Capital Cost	Total Annual O&M Cost	Total Annual Project Cost
ANSONIA WPCF	$465,697	$203,754	$669,451
BRANFORD WPCF	$168,661	$227,663	$396,324
BRIDGEPORT EAST WPCF	$51,755	$748,268	$800,023
BRIDGEPORT WEST WPCF	$155,266	$1,128,337	$1,283,603
BRISTOL WPCF	$28,759	$104,681	$133,440
CHESHIRE WPCF	$317,316	$247,012	$564,328
DANBURY WPCF	$46,466	$446,486	$492,952
DERBY WPCF	$31,785	$163,238	$195,023
EAST HAMPTON WPCF	$30,144	$123,740	$153,884
EAST HARTFORD WPCF	$82,707	$206,940	$289,647
EAST WINDSOR WPCF	$61,136	$107,212	$168,348
ENFIELD WPCF	$0	$310,935	$310,935
FAIRFIELD WPCF	$514,885	$577,876	$1,092,761
GLASTONBURY WPCF	$272,568	$480,590	$753,158
GREENWICH WPCF	$0	$178,399	$178,399
GROTON TOWN WPCF	$242,100	$244,476	$486,576
HARTFORD WPCF	$3,804,815	$2,870,016	$6,674,831
JEWETT CITY WPCF	$65,659	$153,807	$219,466
LEDYARD WPCF	$18,062	$38,987	$57,049
LITCHFIELD WPCF	$45,829	$212,262	$258,091
MANCHESTER WPCF	**$333,911**	**$422,470**	**$756,381**
MATTABASSETT WPCF	$1,235,054	$479,217	$1,714,271
MERIDEN WPCF	$492,418	$914,300	$1,406,718
MILFORD BEAVER BROOK WPCF	$143,806	$200,806	$344,612
MILFORD HOUSATONIC WPCF	$399,082	$415,981	$815,063
NEW CANAAN WPCF	$56,656	$133,707	$190,363
NEW HARTFORD WPCF	$0	$55,235	$55,235
NEW HAVEN EAST WPCF	**$640,070**	**$753,958**	**$1,394,028**
NEW LONDON WPCF	$54,978	$481,737	$536,715
NEW MILFORD WPCF	$299,782	$55,235	$355,017
NEWTOWN WPCF	$72,954	$99,301	$172,255
NORTH HAVEN WPCF	$54,418	$115,814	$170,232
NORWALK WPCF	$276,853	$843,107	$1,119,960
PLAINVILLE WPCF	$253,448	$443,690	$697,138
PLYMOUTH WPCF	**$59,682**	**$105,118**	**$164,800**
PORTLAND WPCF	$44,740	$174,537	$219,277

PUTNAM WPCF	$0	$321,828	$321,828
RIDGEFIELD SOUTH ST. WPCF	$0	$63,254	$63,254
SEYMOUR WPCF	$14,654	$186,596	$201,250
SIMSBURY WPCF	$211,063	$81,867	$292,930
SHELTON WPCF	$21,642	$446,189	$467,831
SOUTHINGTON WPCF	$201,085	$556,098	$757,183
SOUTH WINDSOR WPCF	$303,783	$223,177	$526,960
STAFFORD WPCF	$0	$73,241	$73,241
STAMFORD WPCF	$2,238,236	$973,827	$3,212,063
STRATFORD WPCF	$648,477	$480,977	$1,129,454
SUFFIELD WPCF	$0	$68,062	$68,062
THOMASTON WPCF	$56,408	$147,795	$204,203
UCONN WPCF	$0	$286,028	$286,028
WALLINGFORD WPCF	$122,125	$292,051	$414,176
WATERBURY WCPF	$737,935	$1,465,614	$2,203,549
WEST HAVEN WPCF	$359,358	$1,642,923	$2,002,281
WESTPORT WPCF	$1,688,193	$73,972	$1,762,165
WINDHAM WPCF	$159,477	$250,199	$409,676
WINDSOR LOCKS WPCF	$84,200	$119,166	$203,366
WINSTED WPCF	$43,673	$706,903	$750,576
TOTAL	$17,711,771	$22,928,659	$40,640,430
BOLD = New Project Plant for Year 2016			

Attachment H

Nitrogen Removal Projects Financed by the CWF through 2016						
City or Town	**Total Project Cost ($)**	**Nitrogen Cost Portion ($)**	**Year Project Completed**	**Baseline lbs/day**	**2015 lbs/day**	**2016 lbs/day**
Seymour	9,800,000	250,000	1993	167	53	57
East Windsor	10,000,000	1,000,000	1996	163	28	37
Fairfield Phase 1	4,700,000	4,700,000	1996	1113	296	299
Greenwich	500,000	500,000	1996	1313	441	443
Milford BB Phase 1	1,000,000	1,000,000	1996	258	51	48
Milford H Phase 1	650,000	650,000	1996	844	262	206
Norwalk Phase 1	1,100,000	1,100,000	1996	1967	583	625
Ridgefield	200,000	200,000	1996	80	43	45
Stratford Phase 1	800,000	800,000	1996	974	245	198
Univ. of Conn	12,000,000	1,058,000	1996	120	57	104
West Haven Phase 1	750,000	750,000	1996	967	211	196
Westport Phase 1	400,000	400,000	1996	238	20	24
Ledyard	3,500,000	350,000	1997	20	4	6
New Haven Phase 1	8,200,000	8,200,000	1997	4294	3183	1224
Newtown	12,000,000	1,058,000	1997	45	15	13
Stamford Phase 1	3,500,000	3,500,000	1997	2536	278	265
Derby	2,763,000	677,000	2000	195	68	81
New Canaan	14,000,000	1,235,000	2000	175	17	14
Norwalk Phase 2	56,000,000	5,538,000	2000	1967	583	625
Waterbury	120,000,000	17,359,000	2000	2766	571	504
East Hampton	690,000	690,000	2001	148	80	80
Thomaston	9,313,000	1,164,000	2001	114	21	20
New London	3,069,000	2,669,000	2002	1057	280	380
Portland	5,200,000	1,047,000	2002	86	23	29
Branford	21,542,000	3,158,000	2003	526	92	113
Fairfield Phase 2	40,551,000	12,046,000	2003	1113	296	299
Windsor Locks	2,349,000	1,841,000	2003	180	51	49
Bridgeport E Phase 1	2,090,000	2,090,000	2004	991	357	228
Bridgeport W Phase 1	2,375,000	2,375,000	2004	2852	1029	1452
Bristol	584,000	584,000	2004	1091	427	414
Enfield	2,390,000	2,390,000	2004	763	238	155
Litchfield	4,000,000	1,000,000	2004	64	16	12
Jewett City	10,000,000	1,500,000	2005	42	9	7
Stamford Phase 2	97,223,000	59,500,000	2006	2536	278	265
North Haven	1,000,000	1,000,000	2006	433	138	145

City or Town	Total Project Cost ($)	Nitrogen Cost Portion ($)	Year Project Completed	Baseline lbs/day	2015 lbs/day	2016 lbs/day
Wallingford	2,276,000	2,276,000	2006	737	463	379
East Hartford	1,965,000	1,965,000	2007	801	309	346
Cheshire	5,775,000	5,775,000	2007	281	60	56
Simsbury	21,231,000	4,044,000	2007	293	37	36
Suffield	4,075,000	3,370,000	2007	122	22	21
Winsted	1,100,000	1,100,000	2007	175	72	60
Westport Phase 2	37,131,000	8,253,000	2008	238	20	24
Shelton	21,642,000	4,293,000	2008	290	87	86
Hartford Phase 1	6,900,000	6,900,000	2008	6512	4360	3563
Plainville	22,931,076	4,815,525	2008	277	82	67
Milford BB Phase 2	11,700,000	1,613,000	2009	258	51	48
Milford H Phase 2	34,900,000	10,038,000	2009	844	262	206
Stratford Phase 2	54,000,000	10,116,000	2009	974	245	198
Danbury	5,000,000	5,000,000	2010	1211	339	346
Groton Town	16,551,000	4,842,000	2010	420	240	244
Southington	13,000,000	13,000,000	2010	433	84	136
Meriden	42,455,000	32,517,000	2010	1230	116	159
New Hartford	10,000,000	1,000,000	2010	12	1	1
Stafford	Funded by USDA		2011	164		63
Glastonbury	23,701,000	272,570	2011	268	49	62
South Windsor	36,000,000	7,300,000	2012	289	104	95
Windham	22,917,000	1,638,583	2012	344	92	82
New Milford	29,900,000	6,080,545	2012	66	24	23
West Haven	55,000,000	13,200,000	2012	967	211	196
Ansonia	41,731,000	10,015,000	2012	314	52	43
Putnam	Funded by USDA		2014	145		44
Mattabassett	107,864,987	31,084,566	2014	228	822	402
Manchester	52,185,765	7,695,619	2015	855	293	174
New Haven	61,043,403	11,262,508	2015	4294	3183	1224
Plymouth	1,200,499	728,845	2015	114	57	23
Rocky Hill	53,236,199	7,373,705	2017	789	457	350
Hartford Phase 2	547,000,000	74,688,881	2018	6512	4360	3563

Attachment I

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Notice of Proposed Value of an Equivalent Nitrogen Credit for 2016

To: Connecticut Municipalities with Sewage Treatment Facilities

From: Robert Kaliszewski, Deputy Commissioner, Department of Energy and Environmental Protection
Betsey Wingfield, Chair, Nitrogen Credit Advisory Board

The Connecticut Department of Energy and Environmental Protection, working with the Nitrogen Credit Advisory Board, has established a Nitrogen Credit Exchange Program and General Permit to comply with Sections 22a-521 through 22a-527 of the General Statutes of Connecticut (CGS) (The Nitrogen Reduction Program in Connecticut for Long Island Sound).

Under the exchange program, the cost of a credit is calculated on an annual basis. Accordingly, pursuant to Section 22a-527(b), the Nitrogen Credit Advisory Board hereby gives notice that it proposes an annual value for an equivalent nitrogen credit of $6.72 for calendar year 2016. This value was derived, as specified in Section 22a-527(b), by dividing the total annual project cost ($40,640,430) for nitrogen removal projects at Connecticut sewage treatment facilities by the reduction in equivalent pounds (16564.6 eq. lbs) of nitrogen achieved and divided by 365 for daily eq. lbs.

The Department will continue to administer the program in accordance with Section 22a-524 of the CGS as modified by Public Act No.15-38 "Concerning the sustainability of the Nitrogen Credit Exchange Program". The buyers will purchase the credits (1024.3 equalized at $6.72) they need to meet their General Permit with those payments being shared ($2,512,404) among the sellers credits (2568.78 equalized at $2.6796) proportionally. Therefore, there will be no purchase of excess credits. 2016 year data is traded in 2017.

The Commissioner of the Department of Environmental Protection hereby issues a draft ruling accepting the Board's proposal of a value of $6.72 for an equivalent nitrogen credit in calendar year 2016 for buyers and $2.6796 for sellers. You have until April 19, 2016 to review the data. Please look over the data for your facility and if you have any questions or objections please contact Iliana Raffa at the number listed below.

Pursuant to Section 22a-527(c), the Commissioner's draft ruling shall become final if no municipality or group of municipalities' petition for a review of the proposed value of an equivalent nitrogen credit within 15 business days after the issuance date of the Commissioner's draft ruling.

Enclosed with this notice is a table that lists the facilities that will be buying and selling nitrogen credits under this program for the year 2016. Should you have any questions please contact Ms. Iliana Raffa of the Department's Water Protection and Land Reuse Bureau at 860-424-3758 or email Ms. Raffa at iliana.raffa@ct.gov.

Sincerely,

Betsey Wingfield
Chairman, Nitrogen Credit Advisory Board

Sincerely,

Robert E. Kaliszewski,
Deputy Commissioner
Date: 3/31/2017

cc: Astrid T. Hanzalek, Suffield
Joseph Michelangelo, Fairfield
Marie Moylan, Office of the State Treasurer
William Norton, Fairfield
Thomas Tyler, Metropolitan District Commission

Attachment J

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

General Permit for Nitrogen Discharges

Effective Date: January 1, 2016
Expiration Date: December 31, 2018

Bureau of Water Protection and Land Reuse
Water Planning and Standards Division
860-424-3704

General Permit for Nitrogen Discharges

Table of Contents

General Permit for Nitrogen Discharges

Section 1. Authority

This general permit is issued under the authority of sections 22a-521 through 527 and Chapter 446k of the Connecticut General Statutes.

Section 2. Definitions

As used in this general permit, and as defined or modified from section 22a-521 of the Connecticut General Statutes:

"Annual mass loading of total nitrogen" (expressed in pounds per day) means the sum of monthly mass loading of total nitrogen for each month from January through December divided by 12 and rounded to the nearest whole number.

"*Authorized activity"* means any activity authorized by this general permit.

"CFR" means Code of Federal Regulations.

"*Commissioner"* means commissioner as defined by section 22a-2(b) of the General Statutes

"Daily composite" means a composite sample taken over a full operating day consisting of grab samples collected at equal intervals of no more than sixty (60) minutes and combined proportionally to flow; or, a composite sample continuously collected over a full operating day proportional to flow.

"Daily mass loading of total nitrogen" (expressed in pounds per day) means the total nitrogen concentration (expressed in mg/L to the nearest 0.1 mg/L) multiplied by the total daily flow (expressed as MGD, to the nearest 0.1 MGD for facilities with a design capacity of 1.0 MGD or greater and to the nearest 0.01 MGD for facilities with a design capacity of less than 1.0 MGD) then multiplied by 8.34 and rounded to the nearest whole number to convert to pounds per day units.

"Department" means the Department of Energy and Environmental Protection.

"Discharge Monitoring Report" or *"DMR"* means a report form provided or approved by the commissioner for use by a permittee to submit discharge monitoring data to the Department relating to compliance with limits and conditions established in the individual permit for a facility.

"Equivalency factor" means a ratio of the unit response of dissolved oxygen to nitrogen in Long Island Sound for each POTW based on the geographic location of the specific POTW's discharge point divided by the unit response of the geographic area with the highest impact.

"Equivalent nitrogen credit" means a nitrogen credit multiplied by the equivalency factor.

"Individual permit" means a permit issued to a named permittee under section 22a-430-4of the Regulations of Connecticut State Agencies.

"Monthly mass loading of total nitrogen" (expressed in pounds per day) means the sum of the daily mass loading of total nitrogen for each monitored day during the month divided by the number of

monitoring days during the month and rounded to the nearest whole number.

"Municipality" means municipality as defined by section 22a-423 of the Connecticut General Statutes.

"Nitrogen analysis report" or *"NAR"* means a report form provided or approved by the commissioner for use by a permittee in submitting monitoring data to the Department related to the discharge of nitrogen from a facility.

"Nitrogen credit" means the difference between the annual mass loading of total nitrogen specified for a POTW in the general permit for treated nitrogen discharges and the monitored annual mass loading of total nitrogen discharged by that POTW expressed as pounds of nitrogen per day.

"Nitrogen credit exchange program" means the program within the Department established pursuant to section 22a-524 of the Connecticut General Statutes.

"Nitrogen wasteload allocation" means a total load of nitrogen assigned to a discharger expressed in pounds per day of total nitrogen discharged.

"Permittee" means a municipality or person discharging nitrogen as authorized by the general permit.

"Person" means person as defined by section 22a-423 of the Connecticut General Statutes.

"Publicly owned treatment works" or *"POTW"* means a system used for the collection, treatment or disposal of sewage from one or more parcels of land and that discharges to the waters of the state and is owned by a municipality of the state.

"Sample date" means the date on which the daily composite sampling ended.

"Total daily flow" means the total flow of wastewater over an operating day.

"Total maximum daily load" or "TMDL" means the total maximum daily load analysis to achieve water quality standards for dissolved oxygen in Long Island Sound as established by the Department and as approved by the United States Environmental Protection Agency on April 3, 2001.

"Total nitrogen" means the total of the concentrations of ammonia nitrogen, organic nitrogen, nitrite nitrogen, and nitrate nitrogen expressed as milligrams of nitrogen per liter.

Section 3. Authorization Under This General Permit

(a) Eligible Activities or Discharges

This general permit authorizes the discharge of total nitrogen from the POTWs listed in Appendix 1 of this general permit, provided the activities are conducted in accordance with this general permit.

This general permit does not authorize any discharge of water, substance or material into the waters of the state other than the one specified in this section. Any person or municipality which initiates, creates, originates or maintains such a discharge must first apply for and obtain authorization under section 22a-430 of the General Statutes.

(b) Geographic Area

This general permit applies throughout the State of Connecticut.

(c) Effective Date and Expiration Date of this General Permit

This general permit is effective on January 1, 2016, and expires on December 31, 2018.

(d) Effective Date of Authorization

An activity is authorized by this general permit on the date the general permit is issued.

Section 4. Conditions of this General Permit

A permittee shall conduct activities authorized by this general permit in accordance with the following conditions:

(a) Discharge Limits

(1) Annual discharge limit applicable to each POTW are set forth in Appendix 1, which is incorporated herein in its entirety, as part of this general permit.

(2) Each permittee shall limit the discharge of nitrogen to the annual discharge limits set forth in Appendix 1 of this general permit, except as set forth in Section 4(b)(1)(b) of this general permit.

(b) Compliance During Term of Permit

(1) A permittee shall be in compliance with its annual discharge limits of this general permit if:

(a) the POTW's annual mass loading of total nitrogen is less than or equal to the discharge limit set forth in Appendix 1 of this general permit; or,

(b) the permittee has secured state-owned equivalent nitrogen credits equal to the amount the POTW exceeded the annual discharge limit set forth in Appendix 1 of this general permit in accordance with the Nitrogen Credit Exchange Program and sections 22a-521 through 527 of the Connecticut General Statutes.

(2) A permittee shall be out of compliance with the annual discharge limits of the general permit and subject to the enforcement provisions of chapter 446k of the Connecticut General Statues if:

(a) the POTW's annual mass loading of total nitrogen is greater than the discharge limit set forth in Appendix 1 of this general permit; and

(b) the permittee fails to secure sufficient state-owned equivalent nitrogen credits in a timely manner in accordance with the Nitrogen Credit Exchange Program and sections 22a-521 through 527 of the Connecticut General Statutes.

(c) Operation of Nitrogen Removal Process Equipment

The permittee shall not bypass or fail to operate any of the approved nitrogen removal equipment or processes without the written approval of the commissioner. The permittee shall operate all necessary equipment to optimize nitrogen removal so as to reduce nitrogen discharges to the maximum extent practicable. This includes but is not limited to all recycle pumping systems, aeration equipment, aeration tank cycling, mixing equipment, anoxic basins, chemical feed systems or any other process equipment necessary for the optimal removal of nitrogen.

(d) Monitoring Requirements

(1) Effective upon issuance of this general permit, the permittee shall monitor total nitrogen in the final effluent in accordance with the following frequency:

(a) POTWs with a design flow rate specified in the individual permit for the facility of less than 10,000,000 gallons per day shall monitor the final effluent at a minimum frequency of weekly.

(b) POTWs with a design flow rate specified in the individual permit for the facility equal to or greater than 10,000,000 gallons per day shall monitor the final effluent at a minimum frequency of twice per week.

(2) Monitoring requirements shall commence on *January 1, 2016.*

(3) Final effluent and monitoring locations shall be identical to that used to determine compliance with final effluent limitations and monitoring conditions established in the individual permit for the facility.

(4) All samples analyzed to determine compliance with limits on total nitrogen shall be daily composite samples unless otherwise approved in writing by the commissioner.

(5) Chemical analyses to determine compliance with effluent limits and conditions established in this general permit shall be performed using the methods approved in or pursuant to 40 CFR 136 unless an alternative method has been approved in writing pursuant to 40 CFR 136.4.

(6) The permittee shall measure the total daily flow of wastewater received by the facility at the main flow meter as set forth in the individual permit for the facility.

(7) In the event of a flow meter malfunction on a day when a sample for total

nitrogen analysis is collected, the permittee shall utilize the arithmetic average of the 7 highest daily flows measured during the previous 30-day period to calculate the total daily nitrogen loading unless an alternative procedure has been agreed to by the commissioner.

(e) Reporting Requirements

The results of chemical analyss for the total nitrogen in all samples collected during the month and the total daily flow of effluent for each day on which a sample is collected during the month shall be entered on the Nitrogen Analysis Reports (NAR) and reported to the Department. Results must also be entered in Discharge Monitoring Reports (DMR) as a calculated monthly mass loading of total nitrogen. The NAR and DMR must be received at the following address by the 15th day of the month following the month samples are collected.

ATTN: Municipal Wastewater Monitoring Coordinator
Water Planning and Standards Division
Bureau of Water Protection and Land Reuse
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(f) Record Keeping Requirements

The permittee shall retain copies of all reports required by this general permit, and records of all data used to compile these reports for a period of at least five years from the date of the report submission to the Department.

Section 5. General Conditions

(a) Duty to Correct and Report Violations

Upon learning of a violation of a condition of this general permit, including any failure of flow monitoring equipment, the permittee shall immediately take all reasonable action to determine the cause of such violation, correct such violation and mitigate its results, prevent further such violation, and report in writing such violation and such corrective action to the commissioner within five (5) days of the permittee learning of such violation. Such report shall be certified in accordance with Section 5(c) of this general permit.

(b) Duty to Provide Information

If the commissioner requests any information pertinent to the authorized activity or to compliance with this general permit, the permittee shall provide such information in writing within thirty (30) days of such request. Such information shall be certified in accordance with Section 5(c) of this general permit.

(c) Certification of Documents

Any document, including but not limited to any notice, which is submitted to the commissioner under this general permit shall be signed by, as applicable, the permittee in accordance with section 22a-430-3(b)(2) of the Regulations of Connecticut State Agencies, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in the submitted information may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute."

(d) Date of Filing

For purposes of this general permit, the date of filing with the commissioner of any document is the date such document is received by the commissioner. The word "day" as used in this general permit means the calendar day; if any date specified in the general permit falls on a Saturday, Sunday, or legal holiday, such deadline shall be the next business day thereafter.

(e) False Statements

Any false statement in any information submitted pursuant to this general permit may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

(f) Correction of Inaccuracies

Within fifteen days after the date a permittee becomes aware of a change in any information in any material submitted pursuant to this general permit, or becomes aware that any such information is inaccurate or misleading or that any relevant information has been omitted, such permittee shall correct the inaccurate or misleading information or supply the omitted information in writing to the commissioner. Such information shall be certified in accordance with Section 5(c) of this general permit.

(g) Other Applicable Law

Nothing in this general permit shall relieve the permittee of the obligation to comply with any applicable federal, state and local law, including but not limited to the obligation to obtain and comply with any authorizations required by such law. In the event a POTW is subject to a more stringent nitrogen limitation than set forth in this general permit, the permittee shall comply with that more stringent limitation and may not purchase or transfer nitrogen credits to comply with that additional limitation.

(h) Other Rights

This general permit is subject to and does not derogate any present or future rights or powers of the State of Connecticut and conveys no rights in real or personal property nor any exclusive privileges, and is subject to all public and private rights and to any federal, state, and local laws pertinent to the property or activity affected by such general permit. In conducting any discharge authorized hereunder, the permittee may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this state. The issuance of this general permit shall not create any presumption that this general permit should or will be renewed.

Section 5. Commissioner's Powers

(a) Abatement of Violations

The commissioner may take any action provided by law to abate a violation of this general permit, including the commencement of proceedings to collect penalties for such violation. The commissioner may, by summary proceedings or otherwise and for any reason provided by law, including violation of this general permit, revoke a permittee's authorization hereunder in accordance with sections 22a-3a-2 through 22a-3a-6, inclusive, of the Regulations of Connecticut State Agencies. Nothing herein shall be construed to affect any remedy available to the commissioner by law.

(b) General Permit Revocation, Suspension, or Modification

The commissioner may, for any reason provided by law, by summary proceedings or otherwise, revoke or suspend this general permit or modify it to establish any appropriate conditions, schedules of compliance, or other provisions which may be necessary to protect human health or the environment or to implement the TMDL.

Issued Date: January 1, 2016

MICHAEL SULLIVAN
Deputy Commissioner

This is a true and accurate copy of the general permit executed on **January 1, 2016** by the Department of Energy and Environmental Protection.

APPENDIX 1

ANNUAL DISCHARGE LIMITS FOR TOTAL NITROGEN

Zone	Publicly Owned Treatment Works	Equivalency Factor	Total Nitrogen (Pounds/Day) 2016-2018
1	JEWETT CITY WPCF	0.17	15
1	GROTON CITY WPCF	0.18	99
1	GROTON TOWN WPCF	0.18	153
1	KILLINGLY WPCF	0.14	131
1	LEDYARD WPC	0.18	7
1	MONTVILLE WPCF	0.18	118
1	NEW LONDON WPCF	0.18	386
1	NORWICH WPCF	0.18	201
1	STONINGTON PAWCATUCK WPCF	0.17	24
1	PLAINFIELD NORTH WPCF	0.14	34
1	PLAINFIELD VILLAGE WPCF	0.14	24
1	PUTNAM WPCF	0.14	53
1	SPRAGUE WPCF	0.16	7
1	STAFFORD SPRINGS WPCF	0.15	60
1	STONINGTON BOROUGH WPCF	0.18	14
1	STONINGTON MYSTIC WPCF	0.18	27
1	THOMPSON WPCF	0.14	10
1	UCONN WPCF	0.15	44
1	WINDHAM WPCF	0.15	125
2	BRISTOL WPCF	0.18	398
2	CANTON WPCF	0.18	24
2	EAST HAMPTON WPCF	0.20	54
2	EAST HARTFORD WPCF	0.19	292
2	EAST WINDSOR WPCF	0.19	59
2	ENFIELD WPCF	0.19	278
2	FARMINGTON WPCF	0.18	178
2	GLASTONBURY WPCF	0.20	98
2	HARTFORD WPCF	0.20	2377
2	MANCHESTER WPCF	0.19	312
2	MATTABASSET WPCF	0.20	834
2	MIDDLETOWN WPCF	0.20	222
2	NEW HARTFORD	0.18	3
2	PLAINVILLE WPCF	0.18	101
2	PLYMOUTH WPCF	0.18	42
2	WINDSOR POQUONOCK WPCF	0.19	98
2	PORTLAND WPCF	0.20	31
2	ROCKY HILL WPCF	0.20	288
2	SIMSBURY WPCF	0.18	107

Zone	Publicly Owned Treatment Works	Equivalency Factor	Total Nitrogen (Pounds/Day) 2016-2018
2	SOUTH WINDSOR WPCF	0.19	106
2	SUFFIELD WPCF	0.19	45
2	VERNON WPCF	0.19	184
2	WINDSOR LOCKS WPCF	0.19	66
2	WINSTED WPCF	0.18	64
3	BRANFORD WPCF	0.60	192
3	CHESHIRE WPCF	0.49	103
3	MERIDEN WPCF	0.49	449
3	NEW HAVEN EAST WPCF	0.60	1568
3	NORTH HAVEN WPCF	0.60	158
3	SOUTHINGTON WPCF	0.49	204
3	WALLINGFORD WPCF	0.60	269
3	WEST HAVEN WPCF	0.60	353
4	ANSONIA WPCF	0.67	115
4	BEACON FALLS WPCF	0.67	12
4	DANBURY WPCF	0.46	442
4	DERBY WPCF	0.67	71
4	LITCHFIELD WPCF	0.35	24
4	MILFORD BEAVER BROOK WPCF	0.67	94
4	MILFORD HOUSATONIC WPCF	0.67	307
4	NAUGATUCK TREATMENT Co.	0.60	246
4	NEW MILFORD WPCF	0.46	28
4	NEWTOWN WPCF	0.46	42
4	NORFOLK WPCF	0.35	11
4	NORTH CANAAN WPCF	0.35	13
4	SALISBURY WPCF	0.35	21
4	SEYMOUR WPCF	0.67	61
4	SHELTON WPCF	0.67	106
4	SOUTHBURY TR. SCHOOL WPCF	0.46	15
4	STRATFORD WPCF	0.67	356
4	THOMASTON WPCF	0.60	42
4	TORRINGTON WPCF	0.60	248
4	WATERBURY WPCF	0.60	1049
5	BRIDGEPORT EAST WPCF	0.85	362
5	BRIDGEPORT WEST WPCF	0.85	1041
5	FAIRFIELD WPCF	0.85	406
5	WESTPORT WPCF	0.85	87
6	GREENWICH WPCF	1.00	479
6	NEW CANAAN WPCF	1.00	64
6	NORWALK WPCF	1.00	718
6	RIDGEFIELD SOUTH ST. WPCF	1.00	29
6	STAMFORD WPCF	1.00	926

Attachment K

Nitrogen Credit Advisory Board 2018 Meeting Schedule

All meetings are scheduled for 10:00 am at 79 Elm Street, Hartford, CT 06106-5127

February 14, 2018

March 14, 2018

June 13, 2018

October 17, 2018