In Situ Nutrient Remediation Program

Term Nutrient Credit Prospectus

(March 6, 2015)

I. INTRODUCTION

Overarching policy objectives set by the General Assembly for the Chesapeake Bay Watershed Nutrient Credit Exchange Program ("Exchange Program") clearly mandate the incorporation of market-based solutions in development and exchange of nutrient credits.[1] The adoption of a market-based nutrient credit trading program aims to:

> assist in (a) meeting these cap load allocations cost-effectively and as soon as possible in keeping with the 2010 timeline and objectives of the Chesapeake 2000 Agreement, (b) accommodating continued growth and economic development in the Chesapeake Bay watershed, and (c) providing a foundation for establishing market-based incentives to help achieve the Chesapeake Bay Program's nonpoint source reduction goals.[2]

Incorporating private sector aquaculture as a nutrient trading credit option would certainly meet these objectives. The In-Situ Nutrient Remediation Program ("ISNRP"), developed by the Oyster Company of Virginia, LLC ("OCVA") is an oyster aquaculture-based nutrient reduction that would fulfill this role. First, the roll-out capability and long term scalability of the ISNRP will allow for quick introduction of additional nutrient credits into the market that can also be flexible over time to address market needs, nicely meeting the first Exchange Program policy objective. Second, the ISNRP developed by the Oyster Company of Virginia, LLC ("OCVA") would also enable further growth and economic development by adding more offsets and credits to the nutrient credit market (and which may be at lower cost than other available credits). ISNRP also offers unique and beneficial job-saving and generating effects for the oyster industry and related businesses in Virginia. Expanding growth and economic development in these ways fulfills the second goal of the Exchange Program. Finally, credits generated by the ISNRP would contribute to the foundation of a nonpoint source market by meeting the offset and credit needs of both point sources and nonpoint sources of nutrient loading, thus satisfying the third goal of the Exchange Program.

Accordingly, OCVA seeks approval and authorization by the Department of Environmental Quality ("DEQ") of the ISNRP as a means to generate Term Nutrient Credits eligible for certification and trading under Va. Code §§ 62.1-44.19:20 *et seq*. This Term Nutrient Credit Certification Prospectus provides information in support of OCVA's request.[3]

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[1] Va. Code Ann. ("VA Code') § 62.1-44.19:12.

[2] *Id.*

[3] If in the future OCVA seeks to amend the terms of approval and authorization of the ISNRP to allow for expanded opportunities for ISNRP operations or use of Nutrient Credits generated through the ISNRP, OCVA will submit to DEQ a revised Term Nutrient Credit Certification Prospectus for approval by DEQ.

II. DEFINITIONS

"Department" or "DEQ" means the Virginia Department of Environmental Quality or its successor.

"In-Situ Nutrient Remediation Program" or "ISNRP" means that program and related business enterprise operated and managed by OCVA for the annual seeding, growing, harvesting and production and certification of oysters in and from cages placed above the bottom lands of the waters and tributaries of the Chesapeake Bay pursuant to leases granted by the Commonwealth to OCVA or ISNRP Operators, all as a means of reducing nutrient loadings in the Chesapeake Bay and its tributaries to generate nonpoint source Nutrient Credits that may be sold and traded within the Commonwealth of Virginia and to produce oysters for retail and commercial markets.

"ISNRP Broker Contract" means a contract between a broker of Nutrient Credits generated through the ISNRP, and a permittee/discharger seeking to offset nutrient loading through the use of Nutrient Credits.

"ISNRP Co-op Contract" means a contract between OCVA and an ISNRP Operator for the ISNRP Operator to perform seeding, growing, harvesting and production services as part of the INSRP and which may apply to one or more ISNRP Sites.

"ISNRP Cooperative" means a cooperative among OCVA and other ISNRP Operators and lessees of state bottomlands working under the ISNRP Cooperative agreement for mutual assistance, support, economic gain, and water quality improvements to be achieved by the growth, harvesting, and production of oysters in the Chesapeake Bay and its tributaries.

"ISNRP Nonpoint Nutrient Offset Credit Certification Compliance Report" or "ISNRP Compliance Report" means the annual report of nonpoint source Nutrient Credits generated by the ISNRP, based on the aggregate of all such credits generated through each ISNRP Contract, which shall be calculated on the basis of oysters harvested in each twelve month period from July 1 through June 30 and submitted to the Department no later than the following July 31. The ISNRP Compliance Report form is shown in Appendix 1.

"ISNRP Number" means a distinct tracking number assigned to each ISNRP Contract reflecting the VAR Permit Number or VPDES Number (or other applicable permit types/numbers as may be issued by DEQ for a remediation/discharge activity) to which the ISNRP-based Nutrient Credits generated by that ISNRP Contract have been allocated.

"ISNRP Operator" means an independent oyster grower participating in the ISNRP Cooperative who is a lessee or sub-lessee of state bottomlands, and with whom OCVA has entered into an ISNRP Contract for the seeding, growing, harvesting and production of oysters as part of the ISNRP.

"ISNRP Performance Standards" means those Performance Standards established for and applicable to the ISNRP set forth in Article V of this Prospectus and which have been approved by the Department or which are otherwise required by applicable law.

"ISNRP Site" means one or more locations based on a lease of bottom lands of state waters from the Commonwealth of Virginia, at which location oysters are grown, harvested and produced as part of the ISNRP pursuant to an ISNRP contract between OCVA and the ISNRP Operator.

"Nutrient Credit" means a nutrient reduction that is certified pursuant to Va. Code § 62.1-44.19:20 and expressed in pounds of phosphorus or nitrogen either (i) delivered to tidal waters when the credit is generated within the Chesapeake Bay Watershed or (ii) as otherwise specified when generated in the Southern Rivers watersheds. "Nutrient credit" as used herein does not include point source nitrogen credits or point source phosphorus credits as defined in Va. Code § 62.1-44.19:13.

"Nutrient Credit-Generating Entity" means an entity that generates nonpoint source Nutrient Credits.

"OCVA" means the Oyster Company of Virginia, LLC, a Virginia limited liability company, which operates and oversees the ISNRP and which, through operation of the ISNRP, has been determined by the Department to be a Nutrient Credit-generating entity.

"Performance Standards" means the minimum objectives or specifications required of a particular management practice by the Department in order to assure predicted nutrient reductions will be achieved.

"Perpetual Nutrient Credit" or "Perpetual Credit" mean a Nutrient Credit sold and certified as being permanent in nature pursuant to Va. Code § 62.1-44.19:20.

"Term Nutrient Credit" or "Term Credit" means a Nutrient Credit resulting from a Nutrient-Generating Activity that reduces nutrients for a determined and finite period of at least one year but not permanently.

III. BACKGROUND AND SCIENTIFIC BASIS OF ISNRP

A. BACKGROUND.

The Oyster Company of Virginia, LLC ("OCVA") was founded as a means to integrate three goals: (i) help to accelerate the emergence of Virginia's oyster aquaculture industry, sustaining and protecting the "watermen" culture in Virginia; (ii) produce the finest Virginia oysters for market; and (iii) help to improve the water quality of the Chesapeake Bay and its tributaries through oysters as natural filter feeders that can reduce nutrient and sediment loading in Bay tributaries and main stem waters.

As part of OCVA's overall mission, it has created the In-Situ Nutrient Remediation Program ("ISNRP") as a sustainable business model for integrating modeled and measured science; oyster growing and harvesting technologies; watermen and other shellfish industry partners; retail/commercial, wholesale, and industrial customer markets; and nutrient remediation and nutrient credit trading. The ISNRP business model is therefore based on proven science of nutrient reduction through oyster growth and harvesting, market demand for oysters, experienced and participating watermen, and opportunities for helping stormwater and wastewater dischargers

in particular meet stringent new nutrient loading restrictions enforced through various water quality regulatory and permitting programs, including Chesapeake Bay Total Maximum Daily Load requirements.

The definition of "Nutrient Credit" as discussed herein and the corresponding Term Nutrient Credit certification process are referenced or contemplated by statute in two major water quality permitting programs: the Virginia Stormwater Management Program ("VSMP") municipal separate storm sewer system ("MS4") permitting, and the Watershed General Virginia Pollutant Discharge Elimination System Permit ("Watershed General Permit"). For purposes of each, "nutrient credit" means a credit certified pursuant to the Exchange Program statutory authority, which would include DEQ's statutory authority to issue such credits prior to the issuance of regulations.[4] An MS4 permittee is authorized to acquire nutrient credits to achieve compliance with permit terms.[5] Similarly, a permittee for a new or expanded Watershed General Permit discharge is authorized to use nutrient credits to achieve nutrient offsets for the effects of the new or expanded discharge.[6] Thus, ISNRP Term Nutrient Credits, once certified, could be used by MS4 permittees and VPDES wastewater discharge permittees to help meet their nutrient waste load reduction goals and discharge permit limits.

Though decimated in recent decades due to disease and pollutants, oyster populations in the Bay are poised for a rebound and can accelerate the restoration of Bay water quality. Oysters, being filter feeders like other shellfish, are excellent natural filtration systems that can process large amounts of water and remove impressive levels of nutrients and sediments from those waters. When aggregated together in large numbers, the effects of their natural water quality improvement characteristics can produce substantial nutrient and sediment removal results. These effects occur through two main mechanisms: (i) filtration and return of filtered water to the environment and (ii) filtration and bio-assimilation (or retention) of nutrients and sediments in the body mass and in shell growth.

The ISNRP model focuses initially on the second means, the filtration and bio-assimilation mechanism, as the basis for demonstration of nutrient reduction and, in turn, generation of nutrient credits that can be sold and traded to those parties needing to offset their own nutrient loading in their stormwater or wastewater effluent discharges. As explained more fully below, the other major benefit of this model for nutrient reduction is that the amount of nutrient reduction is verifiable based on the size of the oysters harvested, so the ISNRP will result in annually measured and documented nutrient reduction and corresponding water quality improvement benefits. OCVA is not aware of any other nutrient reduction method that offers the degree of verifiable nutrient reduction effects resulting from such method. This lends great assurance and reliability to the results and the nutrient credits that will be based on that reduction.

A further benefit of the ISNRP model is that a certain percentage of annual revenues from the sale of Term Nutrient Credits generated by the ISNRP will be used to fund the creation and implementation of permanent oyster reefs using the OCVA Reeftek™ technology. This set-aside and use of revenues for this specific purpose is an aspirational and voluntary measure by OCVA to

[4] *See* Va. Code Ann. § 62.1-44.19:13. That statutory authority is found at Va. Code Ann. § 62.1-44.19:20.C.
[5] Va. Code Ann. § 62.1-44.19:21.A. This is the same section defining nutrient credit by the certification process discussed above.
[6] Va. Code Ann. § 62.1-44.19:14; Va. Code Ann. §§ 62.1-44.19:15(B)(1)(b), (d).

help further oyster growth in the Bay watershed; it is not required by law, nor will it be a condition for approval of ISNRP Term Nutrient Credits by DEQ. These new oyster reefs will add yet additional water quality benefits to the Chesapeake Bay and its tributaries through their bio-assimilative characteristics retaining nutrients and placement at key locations coordinated with the Virginia Marine Resources Commission. Modeled and measured studies with general consensus should quantify additional nutrient remediation values through bio-assimilation and sequestration, along with other water quality and environmental benefits, providing the Commonwealth with asset valued results without increasing government expenditures.[7]

B. ISNRP SCIENTIFIC BASIS.

Well documented scientific studies, including that approved by the Chesapeake Bay Program's Scientific and Technical Advisory Committee ("STAC"), have confirmed that oyster growth and harvesting have significant nutrient removal benefits in affected waters due to nutrient assimilation within the shell and body mass of the oysters.[8] These nutrient filtration and bioaccumulation rates are shown below in Table 1.

TABLE 1

Nutrient Reduced	In Soft Body Tissue (as % of dry weight)	In Shell (as % of dry weight)
Nitrogen	8.2%	0.2%
Phosphorous	1.07%	0.06%

Using typical oyster sizes grown and harvested for commercial purposes, these nutrient reduction rates can then be used to establish benchmark levels of net nutrient removal and retention within the combined soft body tissue and shell body mass of the oyster, as shown in Table 2 below.[9] Table 2 also shows the bio-assimilation rate of carbon in similar fashion as for nitrogen and phosphorous. Accordingly, the ISNRP will lay a foundation for establishing carbon reduction credits that will help provide other Bay water quality benefits.[10]

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[7] Though this set-aside is voluntary on the part of OCVA, and the number of Reeftek modules deployed will be at OCVA's discretion, OCVA offers to provide annual reports to DEQ (on a calendar or fiscal year basis to be agreed upon by OCVA and DEQ) describing the number of Reeftek™ modules placed into a particular tributary watershed in that year.

[8] *See, e.g.,* R. Newell and R. Mann, *Shellfish Aquaculture: Ecosystem Effects, Benthic-Pelagic Coupling and Potential for Nutrient Trading*, A Report Prepared for Virginia Secretary of Natural Resources, 13 (June 21, 2012); STAC Factsheet: Oyster Nutrient Reduction Potential (May 2014), *found at* http://www.chesapeake.org/pubs/321_Luckenbach2014.pdf (last visited November 17, 2014).

[9] *See* C. Higgins., K. Stephenson, and B. Brown, "Nutrient Bioassimilation Capacity of Aquacultured Oysters: Quantification of an Ecosystem Service," *J. Environ. Qual.* 40:271–277 (2011), available at https://www.vcu.edu/cesweb/faculty%20profiles/Brown/Higgins%20et%20al%20'11%20JEQ.pdf (last visited November 17, 2014). The experiment used to verify these rates of reduction based on size class of the oysters was performed in floating cages located near the mouth of the Potomac River that were essentially identical in function to those to be used as part of the ISNRP.

[10] Carbon reduction credits could serve to offset air pollution deposition of carbon-based pollutants, such carbon dioxide, as well to offset Bay watershed acidification through related formation of carbonic acid in Bay waters.

TABLE 2

Oyster Size Class (mm or inches)	**Total Nitrogen (TN) Retained** (grams or pounds per oyster)	**Total Phosphorous (TP) Retained** (grams or pounds per oyster)	**Total Carbon (TC) Retained** (grams or pounds per oyster)
Cocktail >51-75 or >2-3	0.112 g or 0.0002 lbs.	0.016 g or 0.00004 lbs.	3.391 g or 0.0075 lbs.
Regular >76-102 or >3-4	0.176 g or 0.0004 lbs.	0.026 g or 0.00006 lbs.	5.375 g or 0.0118 lbs.
Jumbo > 102 or >4	0.394 g or 0.0009 lbs.	0.050g or 0.0001 lbs.	10.011 g or 0.02207 lbs.

The scientific bases of the nutrient reduction performance of the oyster's filtration and bio-assimilation action and then using that performance as a means to determine nutrient retention based on the size of the oyster are both well-researched, documented and accepted by the STAC. Beyond the significant inherent benefit of the science supporting the ISNRP, this science (and common experience) demonstrates and brings to light the following important benefits that distinguish the ISNRP from other nutrient reduction methods:

- Nutrient reduction through the ISNRP is very predictable and can be verified through measurement each harvesting season, providing great comfort that ISNRP Term Nutrient Credits are meaningful and reflect water quality benefits.

- The nutrient reduction efficiency of the ISNRP will also be much greater than that for other nutrient reduction practices, particularly typical land-based non-point source controls, offering potential economic and market cost savings.[11]

- The science of the ISNRP approach holds true whether one is operating only a few cages of oysters or thousands, so that the nutrient reduction benefits are scalable along with the size of the ISNRP operation, allowing confidence in increased scale of operation and resulting greater nutrient reduction that comes with that increased scale of operation.

Further, it should be understood that ISNRP harvests will take from the cage only those oysters of "Regular" or greater size (effectively, at least three (3) inches in length).[12] This fits

[11] In the cited study by C. Higgins, *et al*., it is noted that:

> on a hectare-per-hectare basis, aquacultured oysters remove greater amounts of nutrients as compared with agricultural BMPs, such as planting early cover crops or implementing continuous conservation tillage, which reduce TN loads between 0.04 and 2.25 kg ha^{-1} and 2.7 and 0.8 kg ha^{-1}, respectively, depending on the location of the land in the watershed (VADEQ, 2008). Converting agricultural land to forest cover can reduce TN by 3.6 to 23.2 kg ha^{-1} (VADEQ, 2008). *Compared with these agricultural nonpoint source BMPs, oyster cultivation removes 29 to 1257 times the amount of TN per unit area*.

Id. at 276 (emphasis added).

with general industrial practice so that there is a convenient means to compare harvests, but it also ensures that the smaller oysters will be allowed to continue to grow to the standard size. This, in turn, allows for these smaller oysters to develop greater nutrient reduction capability over the next year, and means that there is a ready stock of "maturing oysters" in the cages to provide a buffering nutrient reduction capacity within the ISNRP, further improving the water quality benefits associated with the ISRNP.

So, if one is looking to offset the expected additional nutrient loads caused by municipal separate storm sewer system or wastewater treatment plant nutrient loadings on an annual or fixed term, multi-year basis, the nutrient reduction capability of the ISNRP can help the dischargers achieve their required nutrient reduction goals, and there will be verifiable results in any of these cases to confirm actual nutrient reductions.

IV. BUSINESS GROWTH AND ECONOMIC BENEFITS OF ISNRP

The ISNRP has been designed as a *complimentary* program for the Bay TMDL-mandated program for the five states and the District of Columbia that directly impact the Chesapeake Bay. The ISNRP provides the first "in situ" modeled and measured "market based" solution for removing nitrogen and phosphorous (and even carbon) in the watersheds affecting the Chesapeake Bay. The ISNRP can be used to meet mandated compliance within the Virginia Stormwater Management Program by supporting MS4 permit applicants who prefer or need to mitigate their nutrient loading by off-site practices.[13] ISNRP can also be easily adapted for other point source and nonpoint solutions (Remediation/Municipality compliance).

ISNRP-generated Term Nutrient Credits will be marketed through an exclusive brokerage relationship between OCVA and an affiliated broker entity ("Broker"). OCVA will assign any certified Term Nutrient Credits it generates to the Broker and guarantee the Term Nutrient Credits to the Broker, who will sell the Term Nutrient Credits to permittees/discharges through ISNRP Broker Contracts. This guarantee will also include the limited assignment of rights to the financial assurances posted by OCVA to the Broker so that, in the case of failure of OCVA to perform and call on the financial assurance when required, the Broker may do so promptly to ensure performance of the ISNRP Broker Contract and fulfill the Term Nutrient Credit obligations thereunder to the permittee/discharger. Consideration will be paid by the Broker to OCVA for the assigned interests in the ISNRP Term Nutrient Credits.

There are currently approximately 3,000 registered commercial watermen left in the Chesapeake Bay area, with approximately 500 working the waters full time. The number of jobs created and sustained by the ISNRP would be scalable to the number of credits generated. This would be followed by acceleration of additional aquaculture related jobs through increased supply of aquaculture oysters and need for related operational equipment, vessels, materiel, and oyster nursery stock. Based on expected demand for ISNRP oysters and nutrient credits, OCVA projects

[12] Aquaculture oysters generally take approximately one year to reach maturity, which means nearly all oysters in a given cage should achieve the "Regular" size by harvest time.

[13] Providing the regulated community and general public with a market-based "product" solution that is addressing the nutrients already in the water is as important as the land-based methods. This is a logical and sound model for complimenting the overall EPA/DEQ nutrient reduction goals for the Bay watersheds.

thousands of jobs directly added or saved over the next four years while also sustaining and supporting thousands of indirect jobs as a result of ISNRP.

Estimates for jobs created and sustained directly or indirectly as a result of full development of the ISNRP can be validated by the number of entities that would support or benefit from the ISNRP, which can be expected to include the following kinds of workers and industry categories:[14]

- OCVA's and contract watermen performing and managing the ISNRP growing and harvesting operations;
- Oyster cage manufacturers;
- Oyster hatcheries and nurseries;
- Aquaculture equipment and support service providers;
- Commodity food and food product brokers;
- Food processors and packagers;
- Those involved in handling and transportation of the seed oysters and oysters harvested for market;
- Marine vessel and vessel systems manufacturing, repair and maintenance providers;
- Shoreline dock, fueling and transloading operators;
- Cold storage operators;
- Security providers;
- Systems and data managers;
- Nutrient credit brokers;
- Ecotourism providers;
- Job and technical career trainers;
- Researchers and educators from secondary to university level; and
- Agency personnel with oversight roles, such as those from the Virginia Marine Resources Commission, DEQ, Virginia Department of Health, and Environmental Protection Agency.

V. ISNRP PERFORMANCE STANDARDS

To implement the ISNRP and provide meaningful assurance to all stakeholders and regulatory agencies of the viability and efficacy of the ISNRP as a Term Nutrient Credit generating mechanism, OCVA has designed the ISNRP to include business model, operational, financial, and

[14] The economic impact has been estimated by OCVA by examining the positive revenues generated from ISNRP Contracts which accelerate the values of: "Oysters For Life"; oyster sales generally; ISNRP cooperative fees; state, federal and NGO matching fund opportunities for USACOE and state oyster restoration projects; and other valuations as a percentage of the values published by CBF, NOAA, SeaGrant, VIMS, EPA and other published documents. *See also* T. Murray and K. Hudson, Virginia Institute of Marine Science, *Economic Activity Associated with Shellfish Aquaculture in Virginia – 2012* (July 2013), *available at* http://www.vims.edu/GreyLit/VIMS/mrr13-04.pdf (last visited November 18, 2014); K. Hudson and T. Murray, Virginia Institute of Marine Science, *Virginia Shellfish Aquaculture Situation and Outlook Report: Results of the 2013 Virginia Shellfish Aquaculture Crop Reporting Survey* (April 2014), *available at* http://www.vims.edu/research/units/centerspartners/map/aquaculture/docs_aqua/20140411_Shellfish_Aq_Report.pdf (last visited January 22, 2014).

reporting and recordkeeping controls and systems, which shall constitute the ISNRP Performance Standards. These controls and systems create operational transparency as to the location, volume, harvest and mortality rate, and nutrient reduction rates achieved by the ISNRP on an annual basis, which in turn forms the basis for generating Term Nutrient Credits that can be certified by DEQ and traded in the marketplace with confidence.

A. OPERATIONS AND RELATED CONTROLS.

In its essence, the ISNRP is based on a system of ISNRP-owned and sub-contracted oyster growing and harvesting operations that will generate Term Nutrient Credits. Because of the straightforward science behind the ISNRP, operations are relatively straightforward as well. Likewise, the ISNRP builds upon existing regulatory model for reporting, recordkeeping and operational controls to ensure Term Nutrient Credits relate to approved credit generating activities that can be verified in the field. The following is a description of the main ISNRP operational elements and controls:

- OCVA or ISNRP Operators will obtain or use existing leases of submerged bottom lands to establish ISNRP Sites for the growth and harvesting of oysters.

- Multiple leaseholds may comprise a single ISNRP Site if the leaseholds are adjacent or proximately located and are under a common ISNRP Coop Contract.

- Each ISNRP Site shall be contained within the same designated watershed, and no single ISNRP Site may extend from one Chesapeake Bay watershed to another.

- Oyster seeds will be placed into and grown in "off bottom oyster cages" specifically designed for their growth, protection and harvesting, which are secured on long lines and anchored at each ISNRP Site.

- Each oyster cage used for the ISNRP will be assigned: (i) to a specific Chesapeake Bay watershed and ISNRP Site; (ii) a specific cage number reflecting the designated watershed and ISNRP Site of that cage; and (iii) a specific ISNRP Number.

- No cages, or oysters within those cages, may be moved beyond their designated ISNRP Site or watershed prior to harvest/certification. No oysters may be moved among cages, except among those within the same ISNRP Site.

- Only aquaculture oysters that are harvested from ISNRP cages with both individual cage numbers and ISNRP Numbers may be used to generate certified Term Nutrient Credits. No native, wild or aquaculture oysters grown loose (such as spat on shell) qualify.

- For each ISNRP cage, harvested ISNRP oysters will be counted individually (*not* by bushel) and classified by size (i.e., cocktail, regular, or jumbo) using the classification system set out in Table 2 above (also included in ISNRP Compliance Report form).[15]

- Tallies of oysters harvested will be made for each ISNRP Site and according to each ISNRP Contract and each watershed, which tallies shall be included as part of the ISNRP Compliance Report. See ISNRP Compliance Report included as Appendix 1.

- The ISNRP oyster count and size classification will be used to determine the total number of eligible nitrogen and total phosphorous Term Nutrient Credits available for each watershed, according to Table 2 above (which is also included in ISNRP Compliance Report form).

- ISNRP produced oysters will generally be sold as whole oysters, body and shell together.[16]

- Reporting of the oysters harvested and the eligible Nitrogen and Phosphorous Term Nutrient Credits will be submitted to DEQ through ISNRP Compliance Reports, along with required certifications of the information in the ISNRP Compliance Reports.

- Annual compliance dates for allocation of the certified credits by the permittee/entity are established or approved by DEQ (calendar, fiscal, and or by Permit).

B. DOCUMENTATION OF OPERATIONS, OYSTER PRODUCTION, AND CERTIFICATION.

Each Nutrient Credit Generating Entity, whether OCVA or an ISNRP Operator, or the discharger seeking to use ISNRP Nutrient Credits, shall complete an ISNRP Registration form and related Appendix 1 – ISNRP Cage Summary form (both part of the ISNRP Compliance Report). This form provides information about the Nutrient Credit Generating Entity, the Bay watersheds involved, the number and locations of cages to be used for the generation of Term Nutrient Credits and to be certified, the name of the Term Nutrient Credit broker, and the location of the discharging activity that will acquire the Term Nutrient Credits.

[15] Counting of oysters may be performed by automated oyster counter systems or by hand.

[16] While consistent with the STAC-approved science for nutrient reduction benefit of harvested aquaculture oysters, it is also clear from available science that returning clean shells from harvested oysters to Bay water for use in reestablishing natural or creating new oyster reefs and grounds would provide a many-fold nutrient reduction benefit above the reintroduction of the shell into the water for two main reasons: (i) nutrient content in the shell is bound in the shell and will not "leach" back into the water over time at any appreciable rate, and (ii) the oyster growth on these shells will add much more nutrient reduction capacity than would otherwise exist for a substantial net positive water quality impact. The whole oyster is removed at harvest time due to market demand for whole oysters but also to quantify the actual nutrient content in the shell (based on oyster counts and sizes) to determine the number of credits to be certified.

Duplicate annual harvesting reports will be filed with the Virginia Marine Resources Commission ("VMRC") for oyster harvesting reporting purposes and with DEQ for reporting of nonpoint offset nutrient credits and credit-generating activities. These harvesting reports will be aggregated and submitted to DEQ in whole, not in part, unless otherwise agreed to by DEQ, and will be summarized within, and submitted to DEQ as supporting documentation for, the attached form of the ISNRP Compliance Report. These reports will contain the references for each of the following: the relevant watershed where the oysters were grown and harvested, the leased bottom lands, and ISNRP Number (or whether for sale posted through the Nutrient Credit Registry). In addition, interim, quarterly summary reports of oysters harvested from each tributary system (and the nutrient reductions associated with same) will be provided to DEQ within thirty days of the end of each calendar year quarter.[17]

Term Nutrient Credits eligible for certification shall be calculated in accordance with the ISNRP Nutrient Credit Calculation Table (provided in the ISNRP Compliance Report) and identified in the ISNRP Compliance Report. Term Nutrient Credits created, purchased and or assigned through the ISNRP shall be certified by or through the DEQ. Depending on whether the Term Nutrient Credits are sold beforehand or not, Term Nutrient Credits may be (a) certified, posted to the DEQ Credit Registry, assigned and retired as an offset for a specific period of time of nutrient loading under a specific permit or (b) certified and offered through the DEQ Credit Registry to the market but only applied and sold for the year designated and may not be carried forward, unless otherwise agreed to by DEQ.

DEQ will review the ISNRP Compliance Reports in a timely manner and notify OCVA of its determination of concurrence with the number of Term Nutrient Credits eligible for certification.

VI. PERFORMANCE ASSURANCES

The sale of Term Nutrient Credits will involve contractual provisions and obligations requiring OCVA (for the Broker) to ensure generation of the required number of Term Nutrient Credits each year. Such obligations will be enforceable contractual duties and, depending on the arrangements between the parties, may include other performance assurances like indemnification or financial mechanisms. As a result, the contractual obligations between the parties will provide sufficient performance assurances for generation and certification of Term Nutrient Credits.

VII. BASELINE AND ADDITIONALITY ANALYSIS

As part of the evaluation of how Term Nutrient Credits would be generated and applied to the nutrient reduction effects of the ISNRP, this section of this Prospectus presents what is commonly called the baseline and additionality analyses. These analyses are used to determine the relative nutrient reduction benefits associated with a proposed nutrient reduction method or practice for which Term Nutrient Credits may be awarded and traded. Baseline and additionality analyses should be based on the unique operational model of the method or practice proposed to

[17] DEQ should understand that some of these quarterly reports may show little or even no harvested oysters, depending on the timing of the oyster growing and harvest seasons.

receive Term Nutrient Credits. However, the nature of the operations of the ISNRP requires a somewhat different approach than used for traditional land-side practices baseline and additionality analyses.

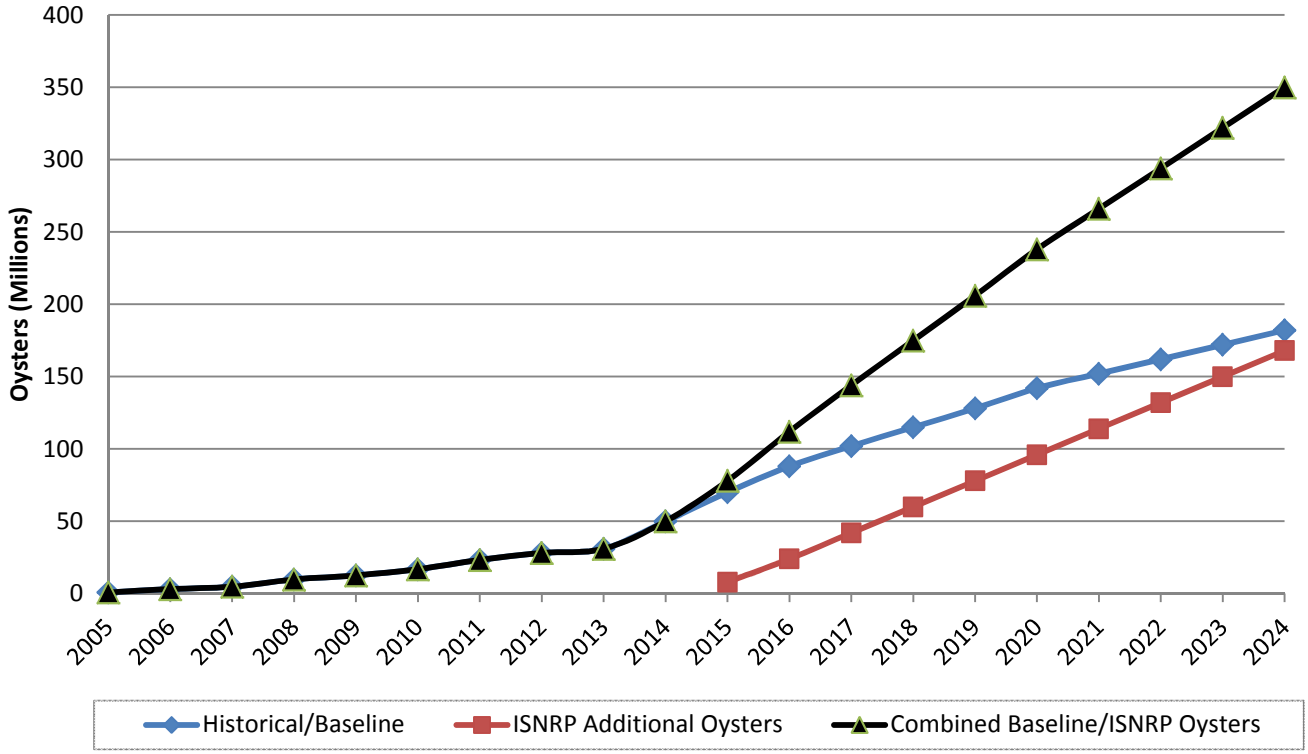
In short, the baseline analysis examines the level of nutrient reduction associated with those ambient or normal conditions presently occurring and those that would be reasonably expected to occur over time if the new nutrient reduction method or practice is not introduced. On the other hand, the additionality analysis examines the additional nutrient reduction benefit associated with the new method or practice that is achieved over and above that which would occur under the current and forecasted ambient or normal conditions. The difference in nutrient reduction benefits between the two is then used as the basis for assigning Term Nutrient Credits to the new method or practice nutrient reduction effects.[18]

For the ISNRP, these analyses result in a comparison of the nutrient reduction effects of the existing and related projected aquaculture oyster harvests without the ISNRP to such nutrient reduction effects when the ISNRP has been introduced. For the purposes of the baseline and additionality analyses here, the projections extend ten years from the present day. The baseline analyses does account for the past ten years of harvests to help predict the projected baseline harvests over that future ten year period. Other market forces reasonably expected to affect the baseline harvests of oysters are also addressed. The additionality analyses for the ISNRP nutrient reduction effects accounts for unique market factors introduced when ISNRP-generated Term Nutrient Credits are traded, that serve to drive additional growth and harvests of aquaculture oysters.

Because the specifics of the baseline and additionality analyses are rather lengthy and involve a number of assumptions of forecasting future conditions and quantitative evaluations of nutrient reduction benefits and market trends, the details of these analyses for the ISNRP are presented in Appendix 2 of this Prospectus. Note that these analyses reflect the unique bio-assimilative nutrient reduction capabilities of the oyster, the operational model of the ISNRP as described above, and the commercial oyster markets, which are very different from conventional land-based nutrient reduction practice factors. However, Charts 1, 2 and 3 below summarize the results of these analyses. As can be seen from the data presented in Chart 1, the ISNRP would have a substantial compounding effect on the numbers of oysters in the Bay watershed at any one time. Chart 2 shows the dramatic additional total nitrogen reduction associated with the ISNRP over the 2005-2024 period, even though the ISNRP would not be introduced until 2015. Chart 3 shows similarly impressive results for the reduction of total phosphorous.

[18] Although this Prospectus involves only the proposed use of Term Nutrient Credits from the ISNRP, both the same baseline oyster industry activity and same ISNRP scientific and operational principles would apply to any Nutrient Credits generated by the INSRP, including Perpetual Nutrient Credits.

Chart 1
Baseline and ISNRP Additionality Projections



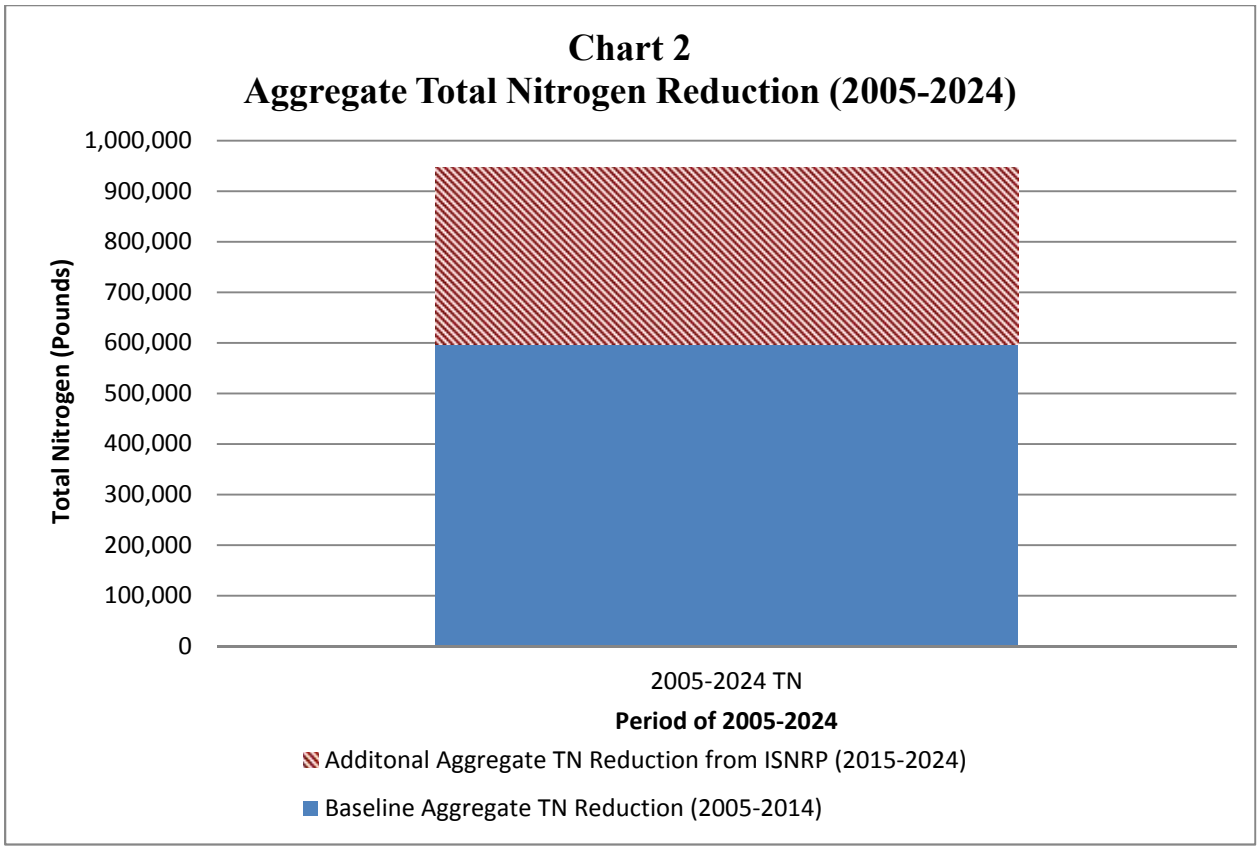


Chart 2
Aggregate Total Nitrogen Reduction (2005-2024)
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
Total Nitrogen (Pounds)
2005-2024 TN
Period of 2005-2024
Additonal Aggregate TN Reduction from ISNRP (2015-2024)
Baseline Aggregate TN Reduction (2005-2014)

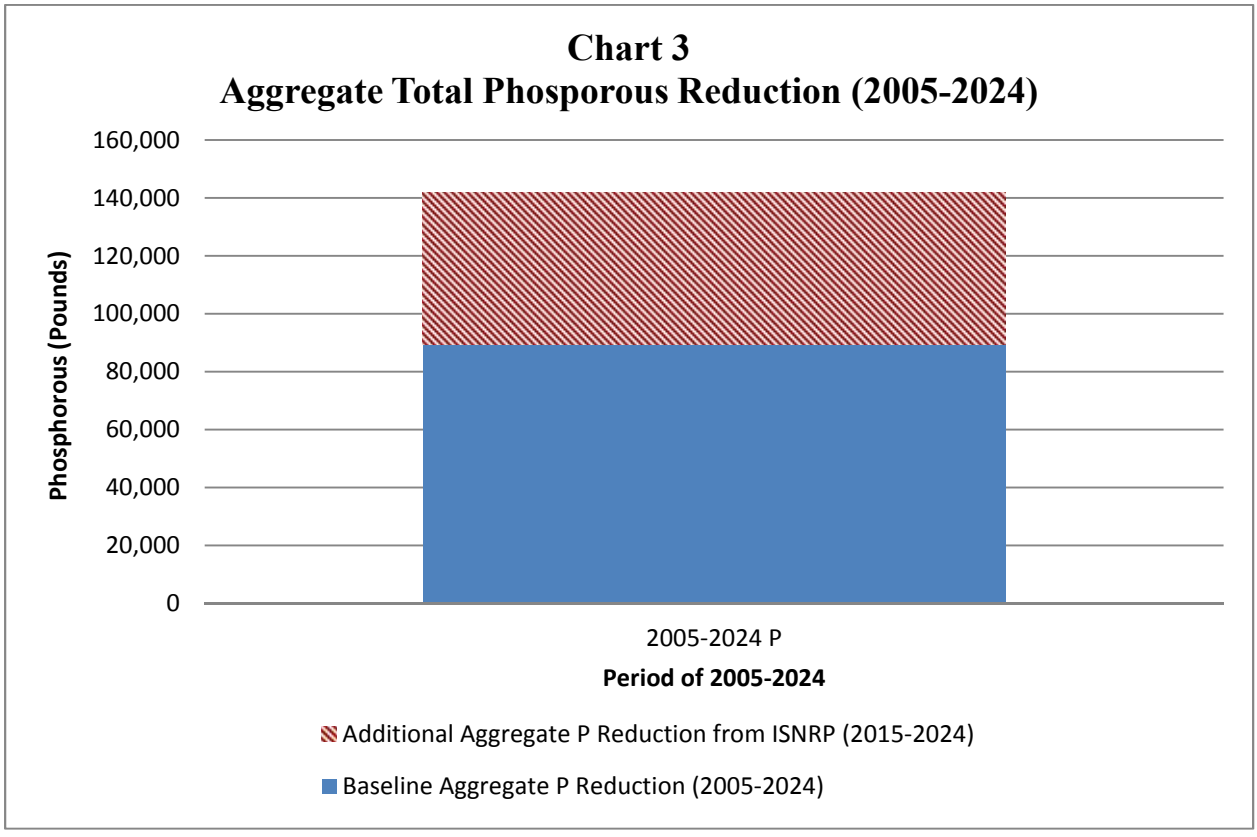


Chart 3
Aggregate Total Phosporous Reduction (2005-2024)
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Phosphorous (Pounds)
2005-2024 P
Period of 2005-2024
Additional Aggregate P Reduction from ISNRP (2015-2024)
Baseline Aggregate P Reduction (2005-2024)

Appendix 1

Nonpoint Term Nutrient Credit Certification Compliance Report

NONPOINT TERM NUTRIENT CREDIT

CERTIFICATION COMPLIANCE REPORT

IN-SITU NUTRIENT REMEDIATION PROGRAM ("ISNRP")

Instructions:

Nonpoint term nutrient credits created, purchased and or assigned through the oyster aquaculture operations shall be registered and certified by or through the Department of Environmental Quality ("DEQ").

Harvesting reports completed and filed with the Virginia Marine Resource Commission (VMRC) will be submitted to DEQ as an identical copy in support of annual certification of nonpoint term nutrient credits. These harvesting reports must be aggregated and submitted to DEQ in whole, not in part, unless otherwise agreed to by DEQ. These reports must contain the appropriate reference for each watershed, private leased bottom and cage numbers assigned to the permit for which the credits will be applied or note that they are for sale through the Credit Registry. No cages, or oysters within those cages, can be relayed outside the designated watershed prior to harvest/certification. No oysters may be relayed into those cages, except from other cages within the same watershed. Only aquaculture oysters that are contained in numbered cages or floats may be certified. No native wild or aquaculture oysters grown loose (such as spat on shell) qualify.

The sum total of harvested aquaculture oysters submitted by size, (Cocktail; Regular; Jumbo) and unit count (*not* by bushels) are applied to the "formula", validated by DEQ and certified for compliance. Annual compliance dates are set by DEQ (calendar, fiscal, and or by Permit).

Depending on whether the Term Nutrient Credits are sold beforehand or not, Term Nutrient Credits may be (a) certified, posted to the DEQ Credit Registry, assigned and retired as an offset for a specific period of time of nutrient loading under a specific permit or (b) certified and offered through the DEQ Credit Registry to the market but only applied and sold for the year designated and may not be carried forward, unless otherwise agreed to by DEQ.

DEQ will review the ISNRP Compliance Reports in a timely manner and notify OCVA of its determination of concurrence with the number of Term Nutrient Credits eligible for certification.

NONPOINT TERM NUTRIENT CREDIT CERTIFICATION COMPLIANCE REPORT

ISNRP CREDIT-GENERATING ENTITY REGISTRATION

Fill In For Nutrient / Credit Registration Compliance for Fiscal/Calendar Year* Ending 20___:

Nutrient Credit-Generating Entity:

Name: _____ Fed ID No: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ Phone: ( ) _____

VMRC Aquaculture Producer(s) / Harvester Number(s): _____

Watershed:	**Number of Cages****	**Oysters Harvested**	**Nutrient Credits*** **
		Regular/ Jumbo	**Nitrogen / Phosphorous**
Potomac	**_____Cages**	**_____ /_____**	**_____lbs / _____lbs**
Rappahannock	**_____Cages**	**_____ / _____**	**_____lbs / _____lbs**
Eastern Shore	**_____Cages**	**_____ / _____**	**_____lbs / _____lbs**
York	**_____Cages**	**_____ / _____**	**_____lbs / _____lbs**
James	**_____Cages**	**_____ / _____**	**_____lbs / _____lbs**

* Use of calendar v. fiscal year to be determined by DEQ. (Fiscal Year is July 1-June 30.)

** Using "Standard Double Stack Cage" (4' x 3'). See Exhibit A.

*** Using ISNRP Nutrient Credit Calculation Table.

NONPOINT TERM NUTRIENT CREDIT CERTIFICATION COMPLIANCE REPORT

ISNRP PURCHASER REGISTRATION

Fill In For *Each* Permit to Which Term Nutrient Credits Are Applied in Calendar/Fiscal Year Ending 20___

Name of Nutrient Credit Purchaser

ISNRP Number: _____ Permit Number: _____

Name/ Entity: _____

Address: _____

_____

Watershed:_____

Annual Nitrogen Credits Purchased: _____ lbs.

Annual Phosphorous Credits Purchased: _____lbs.

ISNRP Cage numbers Assigned to Permit: _____

_____

Nutrient Credit Broker:

Name:_____ Fed. ID No. _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ Phone: ( ) _____

Daytime Phone Number: ( ) _____

Nutrient Bank (if applicable):

Bank Name: _____

Mailing Address: _____

EXHIBIT A

NONPOINT TERM NUTRIENT CREDIT CERTIFICATION COMPLIANCE REPORT
ISNRP Registration and Cage Summary
Certification Calendar/Fiscal Year 20___

WATERSHED **NUMBER OF CAGES**

Potomac _____**Total Cages**

ASSIGNED TO PERMITS _____**Cages**

Cage Numbers:

UNASSIGNED, AVAILABLE FOR SALE THRU REGISTRY** _____**Cages**

Cage Numbers:

Rappahannock _____**Total Cages**

ASSIGNED TO PERMITS _____**Cages**

Cage Numbers:

UNASSIGNED, AVAILABLE FOR SALE THRU REGISTRY ** _____**Cages**

Cage Numbers:

Eastern Shore _____**Total Cages**

ASSIGNED TO PERMITS _____**Cages**

Cage Numbers:

UNASSIGNED, AVAILABLE FOR SALE THRU REGISTRY** _____**Cages**

Cage Numbers:

* Use of calendar v. fiscal year to be determined by DEQ. (Fiscal Year is July 1-June 30.)
** Shown on Registry in Pounds of N/P

EXHIBIT A (Cont.)

NONPOINT TERM NUTRIENT CREDIT CERTIFICATION COMPLIANCE REPORT
ISNRP Registration
ISNRP Cage Summary

Certification Calendar/Fiscal Year 20___

WATERSHED **NUMBER OF CAGES**

York _____**Total Cages**

ASSIGNED TO PERMITS _____**Cages**

Cage Numbers:

UNASSIGNED, AVAILABLE FOR SALE THRU REGISTRY** _____**Cages**

Cage Numbers:

James _____**Total Cages**

ASSIGNED TO PERMITS _____**Cages**

Cage Numbers:

UNASSIGNED, AVAILABLE FOR SALE THRU REGISTRY** _____**Cages**

Cage Numbers:

* Use of calendar v. fiscal year to be determined by DEQ. (Fiscal Year is July 1-June 30.)
** Shown on Registry in Pounds of N/P

NONPOINT NUTRIENT CREDIT CERTIFICATION COMPLIANCE REPORT

ISNRP NUTRIENT CREDIT CALCULATION TABLE

The following results have been published and received general consensus for baseline nutrient values for the aquaculture oyster and is hereby being used for modeled and measured "In Situ" nutrient remediation for nonpoint offset credits:*

Oyster Size Class (mm or inches)	**Total Nitrogen (TN) Retained** (grams or pounds per oyster)	**Total Phosphorous (TP) Retained** (grams or pounds per oyster)	**Total Carbon (TC) Retained** (grams or pounds per oyster)
Cocktail >51-75 or >2-3	0.112 g or 0.0002 lbs.	0.016 g or 0.00004 lbs.	3.391 g or 0.0075 lbs.
Regular >76-102 or >3-4	0.176 g or 0.0004 lbs.	0.026 g or 0.00006 lbs.	5.375 g or 0.0118 lbs.
Jumbo > 102 or >4	0.394 g or 0.0009 lbs.	0.050g or 0.0001 lbs.	10.011 g or 0.02207 lbs.

The factors listed in this table shall be used in determining the number of Nutrient Credits eligible for certification.

27646089.1

* C. Higgins., K. Stephenson, and B. Brown, "Nutrient Bioassimilation Capacity of Aquacultured Oysters: Quantification of an Ecosystem Service," *J. Environ. Qual.* 40:271–277 (2011), *available at* https://www.vcu.edu/cesweb/faculty%20profiles/Brown/Higgins%20et%20al%20'11%20JEQ.pdf (last visited November 17, 2014).

Appendix 2

Baseline and Additionality Analysis

Baseline and Additionality Analysis

As discussed in the main text of the Prospectus, the ISNRP will have a compounding effect on the number of oysters grown and harvested in the Chesapeake Bay and its tributaries. To demonstrate this effect further, and to lay a foundation for how Term Nutrient Credits would be calculated to apply to the increased nutrient reduction effect provided by the additional degree of oyster population resulting from the ISNRP, two analyses are discussed and shown below.

A. BASELINE ANALYSIS.

The first relates to what is called a "baseline" analysis of the number of oysters and related nutrient reduction benefits that would arise from aquaculture oysters *without* the introduction of the ISNRP to generate Term Nutrient Credits. OCVA has researched reliable sources for information of projections of aquaculture oysters over the next decade or so, including trade industry and Virginia Institute of Marine Sciences ("VIMS") contacts. No such projections of aquaculture oyster production appear to exist. In light of the lack of published or other reliable harvest forecasts for years out, OCVA turned to reports of historical harvests to determine a trend that could be reasonably extended into the future. For this, OCVA considered the VIMS *Virginia Shellfish Aquaculture Situation and Outlook Report: Results of the 2013 Virginia Shellfish Aquaculture Crop Reporting Survey* (April 2014) ("VIMS 2013 Aquaculture Survey") to find the best data of aquaculture oysters harvested.[1] The VIMS 2013 Aquaculture Survey includes an aquaculture oyster sales history for the years 2005 through 2013, and a sales projection for the year 2014.[2]

Next, using Excel spreadsheet and data regression analysis, OCVA derived a reasonable trend curve to match the 2005-2013 data and the 2014 projection. This trend curve was extended out 10 years to 2024, as a reasonable projected sales history timeline for forecasting growth. See Figure 1 below for the historical data and the projected trend curve based on that data.

Looking out to 2024, however, there are several external factors that are likely to affect the trend over this time period. The curve as shown already accounts for recent and projected near-term high growth rates for aquaculture oysters given present demand factors.[3] However, it fails to account for other key market forces that are reasonable to expect and, from today's perspective, appear likely to brake the rate of growth of aquaculture oysters without the ISNRP as a credit generating incentive:

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[1] *See* note 5 above for full citation.

[2] VIMS 2013 Aquaculture Survey at 3-4.

[3] The trend curve shown is a polynomial equation curve, which has an excellent regression value of 0.9706. Interestingly, the best match for the historical data was actually an exponential equation curve that resulted in a lower end point for the projected number of aquaculture oysters produced. However, given recent surges in aquaculture harvests that would appear poised to continue for perhaps several years given current market growth, the exponential curve does not seem to adequately reflect likely near-term rate of growth in oyster production. These current and near-term market factors, if reflected in projected harvest data, would tend to "pull" the longer trend curve of projected harvest values higher than that represented by the exponential equation. The polynomial curve reflects this recent and near term high growth rate better, resulting in greater aquaculture oyster baseline production values over time. Accordingly, the polynomial curve was chosen for the baseline analysis here.

- Generally expected market behavior. The recent and current rates of growth are in the 30-50% range year over year. While very impressive, this seems to be an unsustainable rate of growth over the long run due to general principles that markets will tend to work toward an equilibrium barring intervening factors, which would suggest more modest, but still respectable, growth rates for the foreseeable future.

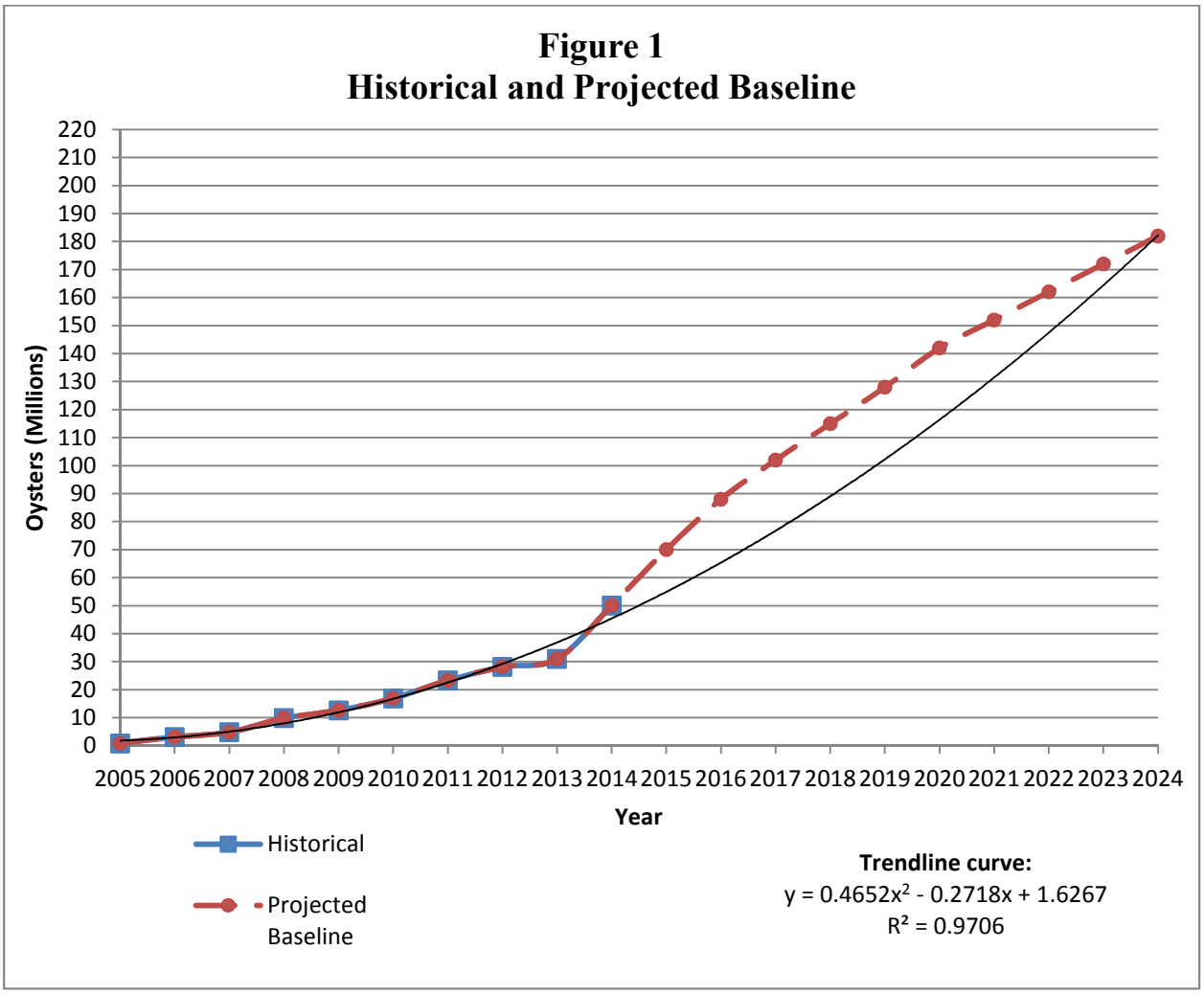
- Limited capital and financing for new significant growers. Growing aquaculture oysters is a capital intensive proposition, with the need for oyster boats, cages, and shoreline facilities to count and process the oysters for end market uses. Given the generational losses in the oyster industry, there are very few watermen left who both know how to oyster and that have the working capital to invest in and start up an oyster aquaculture enterprise. Also, this is not yet a market that is attracting conventional lenders such as banks to finance the capital investment necessary to reach the critical mass needed to be successful in aquaculture oyster industry. This leaves such financing to private, boutique or other nonconventional sources. Some of these sources are already participating in the market, and so that resource is spoken for within the current baseline activity. Generally, though, very few are prepared to enter the oyster aquaculture industry at this time. Accordingly, OCVA believes that the relatively readily available capital and financing is already being utilized or is already poised to enter the industry very soon. After that, left without any intervening driver of new market growth, capital and financing capacity can be expected to be roughly equivalent or more difficult, which will tend to slow down the rate of entry of new oyster growers and rate of increase of oyster aquaculture production over time.

- Limited number of qualified oystermen willing to reenter workforce. Whether due to generational demographics or the hard work of a waterman's trade, there are fewer qualified and willing watermen left in the market at this time than in prior generations. Recent growth in oystering is serving to reemploy the ready stock of experienced watermen, and there is some workforce "reserve" remaining. Again, though, without an intervening market force to drive wages and investment in the industry, and once that ready workforce reserve is tapped, available experienced watermen needed to lead to new aquaculture teams will likely fall in numbers. This lack of available experienced labor force could slow down the pace of oyster growth.

- Growing but still limited oyster hatchery and nursery capacity. With recent growth in the oyster industry, there has been additional demand for hatchery and nursery capacity, but there is still some lag in available production of nursery stock for aquaculture oyster industry needs. While expected to grow in capacity, it is also a capital intensive endeavor to establish or expand such hatcheries and nurseries, triggering some of the same financing concerns noted above for watermen.

Given these factors, and their likely braking effect on the rate of growth in aquaculture oysters, OCVA believes that a corrected projected baseline trend curve should appear more like that shown in Figure 1 below.[4] In summary, then, OCVA believes that this projected baseline harvest growth curve is reasonable given the lack of industry group-based and academic-based projections for aquaculture oyster harvesting over time, its proven experience, expertise and market position in the industry, and common sense analysis of readily identifiable market forces that can be reasonably expected to affect harvests over time.

Figure 1
Historical and Projected Baseline



In light of the historical data for aquaculture oyster harvesting values and the baseline projection shown in Figure 1, and given the science supporting oyster bio-assimilation nutrient reduction discussed above, deriving the nutrient reduction achieved historically and through the

[4] OCVA wants to be very clear it believes these factors will operate only to slow down the rate of growth, not reverse it altogether. The baseline projection curve in Figure 1 shows that the current and projected market without nutrient credit trading based on aquaculture oysters will continue to grow with greater numbers of oysters in the Bay and its tributaries over time. However, OCVA also believes that allowing Term Nutrient Credits based on the ISNRP operation will serve as an intervening market accelerator, and that OCVA has available to it the resources to overcome the financial and workforce limiting factors noted above.

baseline projection end date of 2024 is rather straightforward. As discussed above, the science behind nutrient reduction from oyster growth and harvesting allows for a standard nutrient reduction factor for each size category of oyster. Accordingly, the overall level of nutrient reduction hinges on the number and sizes of oysters grown and harvested. Customary industry practice for reporting and tracking harvests is to assume they are of the "Regular" size, or at least three (3) inches in length. Using the STAC-approved researched nutrient reduction factors associated with the Regular oyster size – i.e., 0.0004 lbs. Total Nitrogen per oyster and 0.00006 lbs. Total Phosphorous per oyster – the degree of nutrient reduction already achieved since 2005 and that would be achieved based on the baseline projection of aquaculture oysters harvested is summarized in Table 3 below and shown in Figure 2 below.

Table 3*

BASELINE NUTRIENT REDUCTION EFFECTS

Year	Baseline Aquaculture Oysters Harvested (without ISNRP) (in Millions)	Baseline Annual Total Nitrogen Reduction (pounds)	Baseline Annual Phosphorous Reduction (pounds)
2005	0.8	232	34
2006	3.1	899	130
2007	4.8	1,392	202
2008	9.8	2,842	412
2009	12.6	3,654	529
2010	16.9	4,901	710
2011	23.3	6,757	979
2012	28.1	8,149	1,180
2013	31	8,990	1,302
2014	50	14,500	2,100
2015	*70*	*28,000*	*4,200*
2016	*88*	*35,200*	*5,280*
2017	*102*	*40,800*	*6,120*
2018	*115*	*46,000*	*6,900*
2019	*128*	*51,200*	*7,680*
2020	*142*	*56,800*	*8,520*
2021	*152*	*60,800*	*9,120*
2022	*162*	*64,800*	*9,720*
2023	*172*	*68,800*	*10,320*
2024	*182*	*72,800*	*10,920*
Total	***1,493.4***	***597,360***	***89,604***

* Italics indicate Baseline Projection values.

B. ADDITIONALITY ANALYSIS.

The second analysis involves an evaluation of the so-called "additionality" of nutrient reduction benefits associated with the ISNRP operation's nutrient reduction effects and within the context of trading Term Nutrient Credits. In particular, this trading system would allow current and prospective dischargers of nutrients to obtain Term Nutrient Credits to offset the nutrient loads in their discharges, based on the nutrient reduction functionality of the oysters grown and harvested. This system would then be expected to drive a market for aquaculture oysters to be grown and harvested as a means to offset nutrient loads, in turn injecting additional working capital into the aquaculture industry and helping to generate demand for aquaculture oysters well beyond the existing traditional (baseline) market demand for oysters.

As with the baseline analysis, however, the ISNRP's nutrient reduction effects are proportional to the numbers of oysters grown and harvested, though now focusing on those numbers generated only through the ISNRP as distinct from the existing aquaculture oyster market without Term Nutrient Credits. So, the additionality analysis for the ISNRP is made very simple as to determining nutrient reduction effects arising just from the ISNRP. This simplicity is enhanced and those effects are made more verifiable because the ISNRP operational model contemplates an accounting of the numbers and sizes of oysters grown and harvested from each cage. As noted previously, the standard ISNRP procedure is to take only oysters of Regular size or greater. (As a result, the average ISNRP oyster cage (as currently sized) can yield up to approximately 2,000 Regular oysters.) As noted above, the amount of nutrient reduction resulting from the bio-assimilation process of aquaculture oysters is 0.0004 lbs. total nitrogen per oyster and 0.00006 lbs. total phosphorous per oyster.

Significant production related factors affecting the number of oysters that can be grown as part of the ISNRP include and are discussed as follows:

- Capital Needs and Financing. Oyster aquaculture operations and capital needs are similar as between current industry practice and that of the ISNRP, in terms of boats, cages, and land-side facilities. However, while traditional oyster production market presents difficult financing options for many watermen, the ISNRP is in large measure self-funding based on advanced Term Nutrient Credit sales. This find as you go approach provides the necessary additional working capital missing from the current marketplace. The other important factor to recall is that the ISNRP is inherently scalable to meet market demand, using a networked cooperative approach with watermen around the state, and so will not grow beyond what can be sustained by rising market demand. In any event, OCVA has available the necessary financial resources to power its operational launch and sustain itself for capital and operational needs.

- Workforce Availability. The ISNRP is largely shielded from the general concerns about workforce availability noted in the baseline analysis above because of the pre-established extensive cooperative of watermen OCVA already has poised to participate in the ISNRP. Also, the introduction of Term Nutrient Credit trading

as an intervening market driver in the oyster aquaculture industry will change the demand for additional watermen greatly, encouraging those who may have been not inclined to reenter this industry, or been hesitant to enter for the first time. Also, the cooperative arrangement with ISNPR watermen will help alleviate the entry costs for them, again facilitating their ability to serve the ISNRP.

- Cage Production. OCVA has excellent resources and business relationships for cage production and is positioned to have cages produced in sufficient quantity and quality to meet projected ISNRP growth.

- Hatchery and Nursery Capacity. As noted for the baseline analysis, hatchery and nursery capacity has been a limited factor, lagging behind demand under current industry conditions. The ISNRP will, with its strong growth, serve to expedite expansion of existing and encourage new hatchery and nursery facilities in ways that the current conventional market may not, essentially providing the tipping force in the market to overcome the current limiting factors.

Because the ISNRP would lead the market for trading Term Nutrient Credits based on aquaculture oysters, underlying demand for Term Nutrient Credits and market efficiency are factors that will affect the additionality effect of the ISNRP on nutrient reduction. OCVA recognizes that, as a market leader, there is often risk in entering a new market segment. However, in this case, such risk is mitigated (indeed, reversed) in large measure by the current and evolving legal and regulatory framework compelling dischargers of nutrients to reduce their nutrient loadings, particularly among MS4's, land developers, and wastewater treatment plant owners and operators.

The regulatory climate is actually driving the market to seek Term Nutrient Credits, a demand that the ISNRP will help meet. Broadly speaking, under the Bay TMDL rule, by 2025, Virginia is obligated to reduce, on average, nitrogen loadings into the Bay watershed by 13.8 million pounds per year and phosphate loadings into the Bay watershed by 1.8 million pounds per year. More specifically, MS4's and wastewater treatment plants face increasingly stringent limits and obligations to reduce nutrient loadings in their discharges, and there can be immense capital and operational costs associated with currently available best practices, infrastructure retrofitting and new treatment options. Property developers are likewise facing more stringent restrictions for nutrient loading in construction stormwater and post-development site design. Agricultural interests are also facing growing pressure to offset nutrient loadings associated with fertilizer application and animal feeding operations.

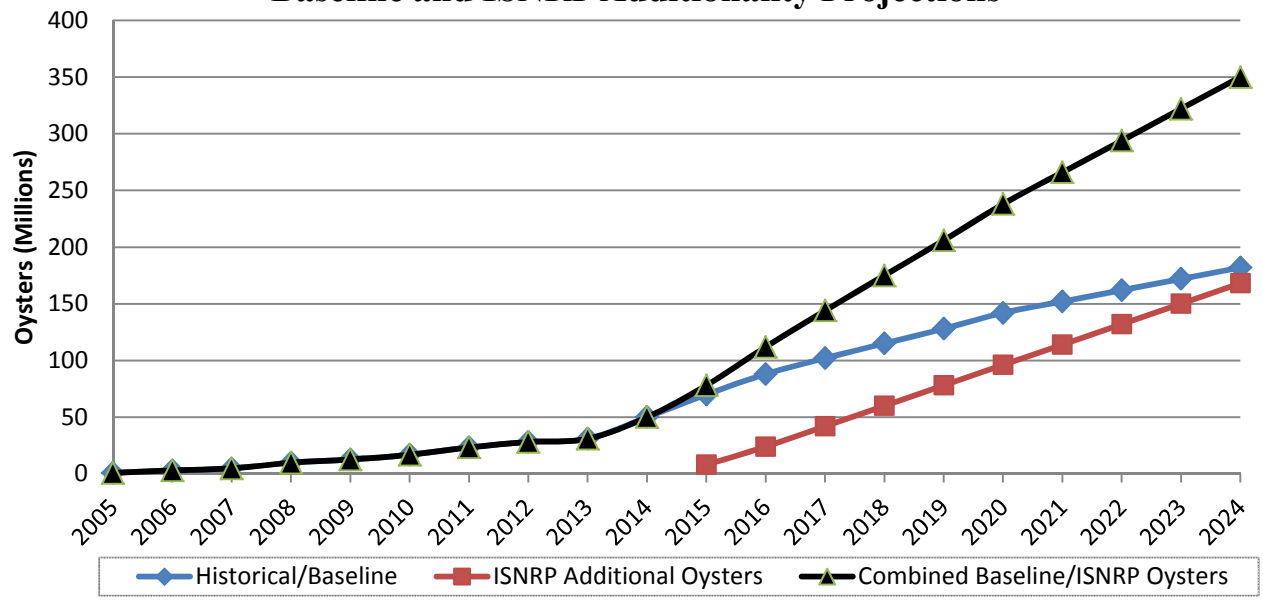
There could also be concern about the expected back-end demand for all of the oysters that would be harvested through the ISNRP. OCVA believes that some of that production will go to help fill a growing global demand that would not be met under the current industry capacity because it lacks the infusion of new capital afforded through the Term Nutrient Credit trading market. Other segments of the demand for these additional oysters are, however, are expected to be accounted for with major brand customers operating outside of the usual retail, restaurant or traditional market for oysters driven mostly by human consumption demand. Therefore, OCVA expects no concerns in finding ready customers for the ISNRP-based

additional oyster harvest. Because its customer base is diverse and still is only a portion of overall demand for oysters over time, pricing impacts are not expected to be material over time either, preserving the profitability of the industry.

At this point, then, there are mounting needs for off-site sources of nutrient reduction offsets that also provide Term Nutrient Credits that can be acquired by regulated community parties. Demand for Nutrient Credits from various sectors will continue to grow and at a volume that greatly exceeds the level of available and affordable Nutrient Credits provided by traditional best management practices. ISNRP would play an important and complementary role in helping these regulated parties meet their permit requirements for reduced nutrient loads and, in turn, help Virginia achieve the required nutrient load reductions mandated under the Bay TMDL. As a result, overall demand for Nutrient Credits would continue to drive demand for ISNRP generated Term Nutrient Credits for many years. Also, compared to other forms of practices that can generate Nutrient Credits, ISNRP-based Term Nutrient Credits are expected to be very competitively priced, which should further enhance demand for them over time.

Based on all of the above information and factors for the ISNRP and related market conditions, OCVA projects that the ISNRP rate of growth and harvest of aquaculture oysters will be substantial over time and will therefore provide for correspondingly substantial additional degree of nutrient reduction from the ISNRP over and above the regular aquaculture oyster industry shown in the baseline analysis. Figure 2 below represents the projected ISNRP oyster production activity over the next ten years compared to and then combined with the historical and baseline trend projection. As shown, the ISNRP would be expected to nearly double the rate of increase of oyster population in the Chesapeake Bay and its tributaries. This is achieved by the multiplier effect of meeting the additional demand for Term Nutrient Credits and the addition of nearly 18,000,000 oysters per year on average for the next ten years.

Figure 2
Baseline and ISNRP Additionality Projections



With this increase in the number of oysters in the Bay watershed, substantial nutrient reduction effects will follow, as described above. Table 4 and Figures 3 and 4 below shows the additional positive impact on nutrient reduction that the ISNRP is expected to generate over the next ten years.

Table 4

Additional and Combined Nutrient Reduction Effects of ISNRP

	Additionality Data				Combined Data		
Year	**Additional Oysters Harvested with ISNRP (Millions)**	**Additional Annual TN Reduction with ISNRP (pounds)**	**Additional Annual P Reduction with ISNRP (pounds)**		**Combined Baseline Oysters and Additional Oysters from ISNRP (Millions)**	**Combined Annual TN Reduction (Pounds)**	**Combined Annual P Reduction (Pounds)**
2005					0.8	232	34
2006					3.1	899	130
2007					4.8	1,392	202
2008					9.8	2,842	412
2009					12.6	3,654	529
2010					16.9	4,901	710
2011					23.3	6,757	979
2012					28.1	8,149	1,180
2013					31	8,990	1,302
2014					50	14,500	2,100
2015	8	3,200	480		78	31,200	4,680
2016	24	9,600	1,440		112	44,800	6,720
2017	42	16,800	2,520		144	57,600	8,640
2018	60	24,000	3,600		175	70,000	10,500
2019	78	31,200	4,680		206	82,400	12,360
2020	96	38,400	5,760		238	95,200	14,280
2021	114	45,600	6,840		266	106,400	15,960
2022	132	52,800	7,920		294	117,600	17,640
2023	150	60,000	9,000		322	128,800	19,320
2024	168	67,200	10,080		350	140,000	21,000
Total	**872.0**	**348,800**	**52,320**		**2,365.4**	**946,160**	**141,924**

Figure 3
Aggregate Total Nitrogen Reduction (2005-2024)

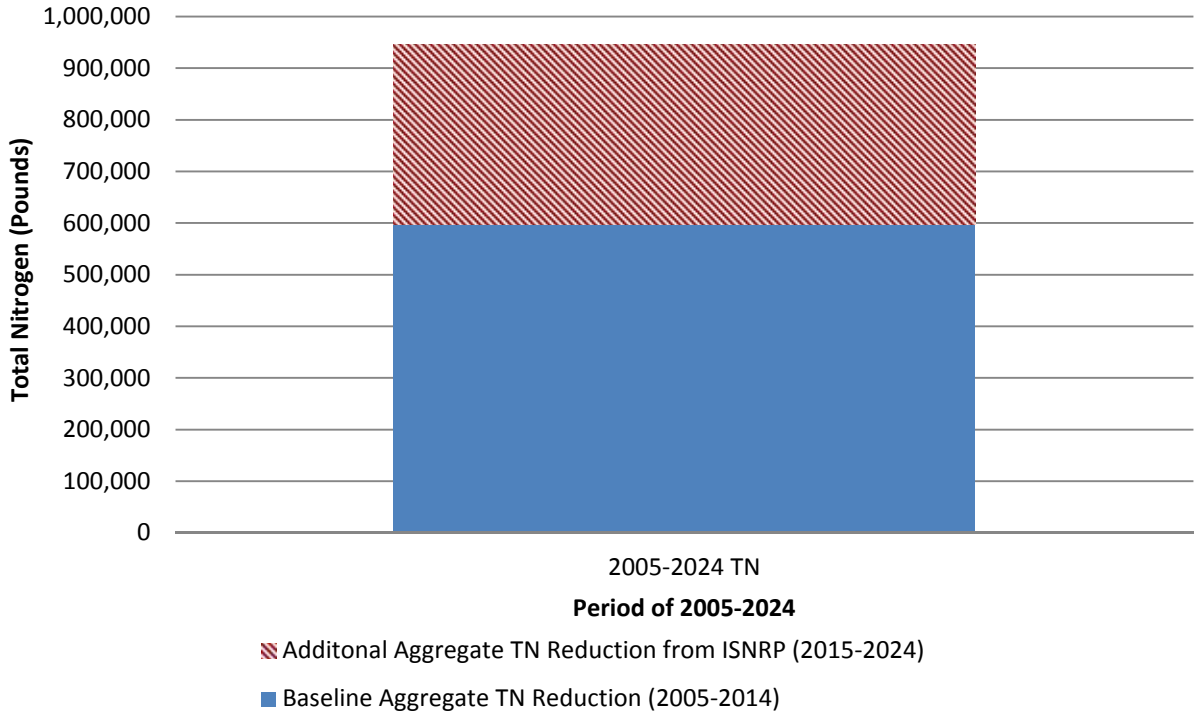
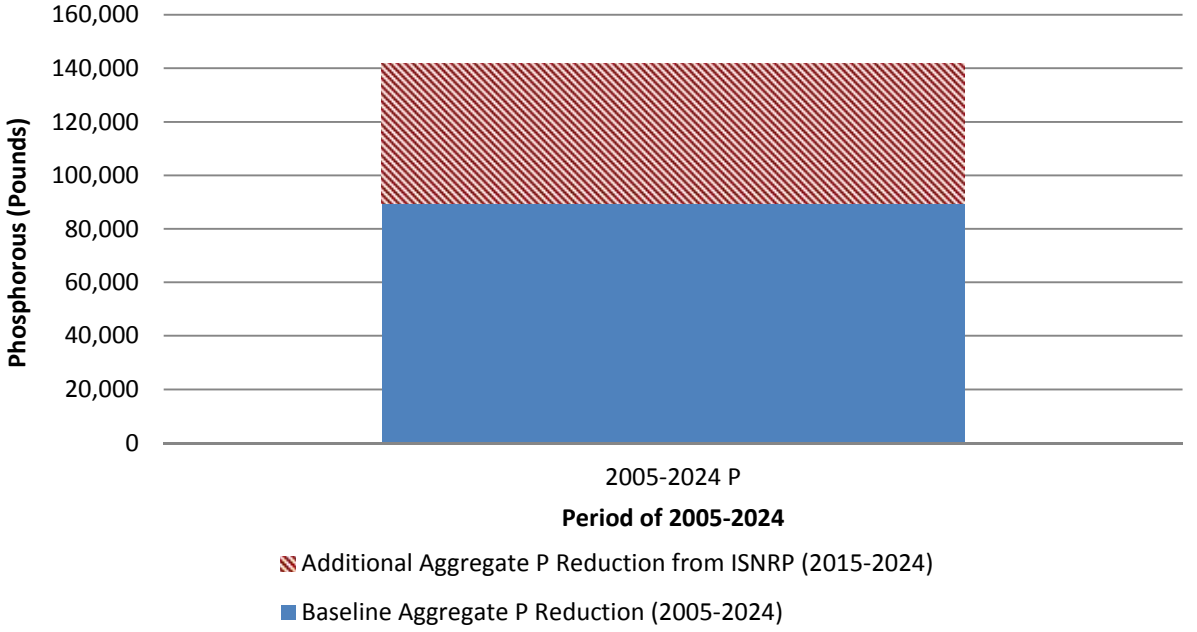


Figure 4
Aggregate Total Phosporous Reduction (2005-2024)



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