NACWA
A Clear Commitment to America's Waters

Testimony of:

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The Role of Water Quality Trading in Achieving Water Quality Objectives

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Introduction

Chairman Gibbs, Ranking Member Bishop, and members of the Subcommittee, thank you for the opportunity to appear before you today. My name is Jim Pletl and I am the Director of Water Quality for the Hampton Roads Sanitation District (HRSD) in Virginia Beach, Virginia. I am proud to have the opportunity to share with you my unique experience and insights on water quality trading based on my role in supporting HRSD's compliance with its National Pollution Discharge Elimination System (NPDES) permit limits for nitrogen and phosphorous.

More than 70 years ago, voters took the bold step to address pollution in the Hampton Roads region by approving a referendum creating the Virginia state-enabled Hampton Roads Sanitation District (HRSD). That public approval capped a 15-year grassroots campaign that began when shell-fishing beds in Hampton Roads were closed by the Virginia Department of Health. At the time, over 30 million gallons of untreated sewage was being discharged into the waters of the Hampton Roads each day. 32 years later, the U.S. Congress tackled the issue of water pollution on a national scale, finally passing the Clean Water Act (CWA) in 1972.

Nearly 75 years later, HRSD has developed into one of the premier wastewater treatment organizations in the nation. With 13 treatment plants capable of treating 249 million gallons of wastewater each day and serving a population of over 1.6 million people, HRSD has eliminated the daily discharge of untreated sewage into the waters of Hampton Roads from the homes and businesses within our region.

I have been fortunate enough to work with HRSD for nearly 25 years now, addressing numerous and varied water quality, air and solid waste environmental issues where compliance with state and federal regulations and statute is required. The issues have ranged from the reliability of laboratory procedures to data integrity determinations to wastewater treatment plant performance to evaluating aquatic life condition instream given multiple stressors to the establishment environmental standards like water quality criteria to the latest environmental challenges including emerging contaminants and green-house gas emissions. I have represented Publically Owned Treatment Work (POTW) organizations within Virginia and nationally throughout this career.

I also serve as the Water Quality Committee Vice-Chair for the National Association of Clean Water Agencies (NACWA), which represents the interests of more than 350 municipally owned wastewater treatment agencies and organizations that collectively treat and reclaim the majority of the wastewater generated across the Nation. Like HRSD, NACWA's members are public servants working each and every day to meet the objectives of the CWA. It is my pleasure to testify on NACWA's behalf today as well as on behalf of the 17 cities and counties in southeast Virginia which HRSD serves.

The Infrastructure Challenge

Since passage of the CWA in 1972, the estimated investment in the Nation's wastewater infrastructure totals $1.4 trillion. While successes to date under the Act have been impressive and a majority of waters

that once were impaired now meet water quality standards, data over the past several years suggest that we may have hit a plateau in terms of water quality gains and that the gains made to date may be at risk absent additional investment.

The U.S. Environmental Protection Agency (EPA) estimates repairing, replacing, and upgrading aging wastewater infrastructure will cost between $300 billion to $1 trillion over the next 20 years. Municipalities currently shoulder approximately 97% of the cost of clean water infrastructure projects, and face an immediate backlog of over $40 billion. Clean water utilities have raised rates by more than double the rate of inflation over the last decade to meet their current clean water challenges and existing debt obligations. Today 40% of households across America are already paying more out of their disposable incomes for wastewater management than EPA says is affordable.

In addition to this growing investment need EPA regulations on wet weather-related discharges, biosolids management, and nutrients under the 1972 Clean Water Act (CWA) have expanded, leading to more expensive levels of wastewater treatment. Given the current economic environment and federal budget shortfall publicly owned treatment works (POTWs) are struggling to make the necessary upgrades to protect public health and the environment without going bankrupt or increasing rates as well as their debt loads to unsustainable levels.

The Nutrient Challenge

Excessive amounts of nutrients, primarily nitrogen and phosphorous, in waterways is one of the largest pollution problems facing our nation's waters. The States have reported that many of the nation's lakes, streams, rivers and bays are moderately to severely degraded by nutrient pollution. Excess nutrients have been identified as contributing to algal blooms, fish kills, and shellfish poisonings around the country.

Effluent discharges from POTWs are one of many contributors to nutrient pollution in surface waters. Because they can be regulated through NPDES permits under the CWA, EPA has increased its focus on controlling nutrient discharges from these sources. However, it is important to recognize that POTWs are not the only, nor always the greatest, source of nutrient pollution in many waterways. Runoff from agricultural land, rich in nutrients from fertilizer and livestock manure, is often responsible for the majority of nutrient pollution. Nevertheless, here in the Chesapeake Bay watershed, where excessive amounts of nutrients in rivers and streams are contributing to low dissolved oxygen conditions; the reduction of nutrient loadings in HRSD's effluent has been a high priority.

In association with development of the Chesapeake Bay Nutrient and Sediment Total Maximum Daily Load (TMDL), in 2006, Virginia established nutrient discharge limits for all wastewater facilities that discharge within the state and to the Chesapeake Bay watershed. This TMDL, which affected all of HRSD's wastewater treatment plants, was the catalyst for the largest capital improvement program in HRSD's history. In less than five years HRSD developed a comprehensive nutrient reduction strategy that included the upgraded design of five treatment plants. HRSD was required to meet the new strict

nutrient discharge limits beginning in 2011 and has met those requirements in every instance since the requirement began.

Traditionally, utilities have relied on technology controls and upgrades to reduce their nutrient loadings at the end of pipe. Though technology fixes can be effective, they are often extremely expensive. For example, HRSD is currently upgrading a 30 MGD facility to meet the Chesapeake Bay TMDL requirements for nitrogen and phosphorous at a capital cost of $129 million dollars. HRSD will spend over $375 million dollars to meet the Bay TMDL requirements through 2017 and even more upgrades may be required when the TMDL is revisited in 2017.

Another factor to consider is that the law of diminishing returns applies to the cost of reducing nutrients as higher levels of performance are required. The cost of upgrading a facility without nitrogen removal technology, per pound of nitrogen removed, has proven to be three times less expensive than upgrading a facility that already has some of this technology but must now perform at a higher level and remove more nitrogen.

The situation for POTWs is further complicated because the technology to remove nitrogen and some phosphorous is biological rather than chemical or mechanical. The uncertainty of biological systems requires a more conservative approach to design, which increases the costs. One must also consider that the cost to upgrade a facility to meet nutrient discharge limits will be a function of the current plant design. Therefore, the cost to upgrade a facility will be facility-specific. Given costs of this magnitude and the associated issues many utilities must look at alternative ways to meet nutrient discharge requirements.

The Case for Nutrient Trading

Since 2011, HRSD's compliance with nutrient discharge permits was accomplished with expensive plant upgrades but upgrades were not required at every HRSD facility because nutrient trading between facilities was supported through regulation in Virginia. In 2005, the Virginia General Assembly authorized the concept of nutrient (total nitrogen and total phosphorous) trading and also allowed for the creation of an organization to facilitate the trading. Through the Virginia Association of Municipal Wastewater Agencies (VAMWA), POTW managers came together to establish the Virginia Nutrient Credit Exchange Association, which in-turn created the framework for nutrient credit trading between wastewater facilities, both public and private. The Virginia Nutrient Credit Exchange Association now represents 53 public/municipal and 19 private/industrial plant owners operating 105 wastewater plants from throughout Virginia.

Nutrient trading has enabled nutrient-limit compliance at all HRSD facilities at a greatly reduced cost. This is due to the ability to balance deficits and surpluses in nutrient discharges, relative to permit limits, across facilities. Trading in Virginia is based on the concept of the nutrient credit. Nutrient credits are simply a representation of the pounds of nutrients removed from a wastewater discharge beyond that required by permit. For example, if a plant has an annual limit of 1000 pounds of nitrogen that can be

discharged and it actually discharges 800 pounds in one year that plant has generated 200 pounds of nitrogen credits. These credits can be applied to other facilities with nitrogen load limits within the same water segment or downstream of that segment, allowing those other facilities to comply with their respective limits without expending a proportional amount of resources. To further illustrate the example, if another facility has a limit of 1200 pounds of nitrogen but discharges 1300 pounds it can apply part or all of the 200 pound credit generated by the first facility in my example to balance the excess 100 pounds discharged. Another way of demonstrating the concept is that as long as the total pounds discharged for the two facilities (in this case it is 2100 pounds) is equal to or less than the total of the load limits for both facilities (2200 pounds) then both facilities are in compliance with their respective limits.

This approach provides the same environmental result at a significantly lower cost because the second facility in this example did not have to install new technology to meet its permit limits. Additionally, the concept of trading has allowed HRSD to select and upgrade the facilities that will provide the greatest amount of nutrient removal at the lowest cost. This would not be possible if trading was not available; all plants would otherwise require technology upgrades and some of those upgrades would not be cost effective compared to others. The concept of nutrient trading has saved the residents of Hampton Roads hundreds of millions of dollars in wastewater plant upgrades without compromising attainment of goals established to attain water quality standards.

HRSD currently trades nitrogen and phosphorous credits, on an annual load basis, amongst its 13 facilities across three different watersheds of the Chesapeake Bay. One of the most significant cost saving trades for HRSD occurs on the Rappahannock River where its Urbanna plant obtains credits from other permitted facilities on this river in order to comply with its permit limits. The Urbanna plant would only be able to meet its nutrient permit limits with a technology upgrade or through a trade. HRSD is planning to replace the Urbanna facility and the cost of this replacement effort, which will meet all permit limits, will likely approach $10 million dollars or more even though the current design flow of the plant is only 0.05 MGD. The cost per pound of nutrient removed here will be extremely high compared to that of other HRSD facilities. The inability to trade nutrient credits on the Rappahannock River would cost HRSD's customers millions of dollars for very little nutrient benefit.

Despite the availability of nutrient trading, over 2 billion dollars of public and utility customer funds are being invested in Virginia to upgrade many of the public/municipal wastewater treatment plants. This investment would have been significantly higher without trading because every facility did not require a treatment technology upgrade with trading available. I estimate the cost to HRSD's customers would have been twice to three times the cost so far realized without the ability to trade between facilities. Water quality trading of nutrient credits has allowed all Association members to meet their respective goals without upgrading every facility, saving citizens of the Commonwealth hundreds of millions of dollars while supporting compliance with regulatory and watershed goals.

Trading is particularly important given that factors such as replacement of aging infrastructure and compliance with Federal and State mandates to reduce sanitary sewer overflows as well as new Clean

Air Act requirements are requiring HRSD to pursue an aggressive capital improvement program that will expend $1.1 billion dollars over the next 10 years. Continual rate increases are necessary to support this investment level despite best efforts to control annual operational costs.

Complicating the financial forecast is a continued decrease in per capita water consumption in Hampton Roads and other parts of the nation. Water conservation efforts over the past decade have taken hold and a definitive trend of decreasing water demand year to year has emerged. HRSD's primary revenue source is wastewater treatment as measured by water used by each account holder. Despite the nearly full reliance on this variable revenue source, HRSD's actual costs are nearly fully fixed and do not vary significantly with consumption. Due to the high percentage of fixed costs, HRSD's costs do not decrease in proportion to the reduction of revenue resulting from reduced water consumption. In order to compensate for the declining consumption unit prices (rates) must increase to fully cover the fixed costs that are spread across fewer units sold (hundred cubic feet of wastewater treated). All of these factors, in addition to nutrient removal requirements, increase the cost of treating wastewater and the cost to the residents of Hampton Roads. Trading is critical because it has the capability of reducing these costs without reducing environmental expectations.

Trading with Non-Permitted Sectors

HRSD's experience with water quality nutrient trading has been limited to activities with other permitted discharges; trades with the non-permitted sectors have not yet been realized in Virginia. Virginia regulation and the Virginia Nutrient Credit Exchange Association have largely eliminated roadblocks to trading for the NPDES permitted sector. However, trading with the non-permitted sectors like crop agriculture has been found to be somewhat problematic due primarily to the uncertainty in estimating, measuring and controlling the discharges from these sectors. To address this uncertainty, States often put in place requirements that must be met before a trade with these sectors can take place; these requirements do not apply to permitted discharges. For example, dischargers in non-permitted sectors must achieve their respective load goals before they can trade. This is often referred to as a baseline requirement. Since funding to mitigate the non-permitted discharges is usually not available and these sectors are often not required to mitigate the discharges as part of a permit system it is not likely that these sectors will meet their goals in the near future and trading cannot occur.

Another example where states address uncertainty with non-permitted sector trading is the application of a trading ratio. The trading ratio directly reduces the incentive to trade with the non-permitted sector because it reduces the value of the non-permitted sector credits. A trading ratio of 2 will be used in Virginia; this reduces the value of non-permitted sector credits by 50 percent. If a permitted entity in Virginia wishes to obtain 1000 nutrient pounds of credit from a member of the non-permitted sector the non-permitted sector member must remove 2000 nutrient pounds of credit from its discharge, beyond its discharge goal, before the trade will be approved. Requirements to meet a baseline goal prior to trading and artificially inflated trading ratios for non-permitted sector dischargers act as strong disincentives to trading and will prevent attainment of watershed goals.

Conclusion

Forty years after the passage of the CWA around the country like HRSD are transforming the way they deliver clean water services. They are becoming Utilities of the Future focused on doing more with less and bringing maximum value to their ratepayers and communities. At the heart of this transformation are innovative, market-based approaches, like water quality trading, that can stretch ratepayer dollars, improve the environment, create jobs, and stimulate the economy.

But utilities cannot master this transformation alone. They need the support of Congress which should promote greater adoption of watershed-based solutions by explicitly encouraging trading in the CWA. Similarly EPA should work with delegated states to promote viable and flexible trading programs. Doing so will give utilities the green light to engage in more nutrient transactions that can yield tangible water quality improvements while addressing the affordability concerns of POTWs and stormwater utilities around the country.

Thank you for the opportunity to appear before you today, I look forward to addressing any questions the Committee may have regarding my testimony.