



COMMISSION MEETING MINUTES
December 19, 2017

<u>No.</u>	<u>Topic</u>	<u>Page</u>
1.	<u>Awards and Recognition</u>	3-4
2.	<u>Consent Agenda</u>	5
a.	<u>Approval of Minutes</u>	5
b.	<u>Contract Awards</u>	5
c.	<u>Sole Source</u>	5
3.	<u>Applied Coliphage and Human Viral Pathogen Research Study University of North Carolina-Chapel Hill Agreement</u>	6
4.	<u>Nansemond Treatment Plant Motor Control Center Replacements Initial Appropriation and Contract Change Order</u>	7-8
5.	<u>Newport News Transportation Center Acquisition of Real Property 600 Severn Road, Newport News, VA</u>	9
6.	<u>Oceana Off-Line Storage Facility Initial Appropriation and Task Order</u>	10-11
7.	<u>Regionalization of Wet Weather Capacity Memorandum of Agreement Amendment</u>	12-13
8.	<u>Central Environmental Laboratory Briefing</u>	14
9.	<u>Unfinished Business – Annual Financial Disclosure Report and Mandatory Training</u>	15
10.	<u>New Business</u>	15
11.	<u>Commissioner Comments</u>	15
12.	<u>Public Comments Not Related to Agenda</u>	15



COMMISSION MEETING MINUTES
December 19, 2017

<u>No.</u>	<u>Topic</u>	<u>Page</u>
13.	<u>Informational Items</u>	15
a.	<u>Management Reports</u>	15
b.	<u>Strategic Planning Metrics Summary</u>	15
c.	<u>Effluent Summary</u>	15
d.	<u>Air Summary</u>	15
14.	<u>Closed Meeting</u>	16
a.	<u>Acquisition of real property for a public purpose of publicly held real property located in the City of Norfolk</u>	16
b.	<u>Acquisition of real property for a public purpose of publicly held real property located in the City of Portsmouth</u>	16
15.	<u>Reconvened Meeting</u>	16
Attachments (6)		



COMMISSION MEETING MINUTES
December 19, 2017

Name	Title	Present for Item Nos.
Elofson, Frederick N.	Commission Chair	1-15
Lynch, Maurice P.	Commission Vice-Chair	1-15
Glenn, Michael E.	Commissioner	1-15
Lakdawala, Vishnu K.	Commissioner	1-15
Levenston, Jr., Willie	Commissioner	1-15
Rodriguez, Stephen C.	Commissioner	1-13
Taraski, Elizabeth	Commissioner	1-15
Templeman, Ann	Commissioner	1-15

1. **AWARDS AND RECOGNITION**

Action: No action is required.

Brief:

- a. Mr. Henifin recognized Mr. Korey Kendall, PE, Hydraulic Analysis Manager, who recently received a Professional Engineer (PE) license. Korey has the honor of being our first intern in the Engineering Department. Korey's internship in 2009 encouraged him to focus on water and the environment. He graduated from the University of Virginia with a Bachelor of Science in Civil/Environmental Engineering in 2011 and received his Master of Science degree in Environmental Fluid Mechanics and Hydrology from Stanford University in 2012. Upon graduation, Korey joined CDM Smith where he worked on building HRSD's Regional Hydraulic Model and a few locality hydraulic models before returning to HRSD in 2015. As Hydraulic Analysis Manager, Korey is utilizing the same model he helped build to execute HRSD's mission. He is involved with performing hydraulic capacity analyses of CIP projects, reviewing development projects throughout HRSD's service area, and serving as a Project Manager for the Elbow Road Pressure Reducing Station project.
- b. Mr. Henifin recognized Ms. Laura Kirkwood, PE, South Shore Engineering Project Manager, who recently received a Professional Engineer (PE) license. Laura holds a Bachelor of Science degree in Chemical and Biomolecular Engineering from the Georgia Institute of Technology and a Master's Degree in Environmental Engineering from Old Dominion University. Laura joined HRSD's Planning and Analysis Division as a Data Analyst in September 2010 and was promoted to Project Manager in the Design & Construction Division in July 2013. She currently focuses on implementing the Interceptor system projects associated with diverting flow to the Atlantic Treatment Plant and closing the Chesapeake-Elizabeth Treatment Plant.



COMMISSION MEETING MINUTES
December 19, 2017

- c. Mr. Henifin recognized Ms. Leila Rice, APR, who recently earned her Accreditation in Public Relations (APR) professional credential. The Accreditation program assesses competence in 60 areas of knowledge, skills and abilities associated with the public relations profession through a combination of requisite experience and education, the formal presentation of a portfolio to a professional panel and the successful completion of a computer-based exam.

Attachment: None

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

2. **CONSENT AGENDA**

Action: Approve the items listed in the Consent Agenda.

Moved: Stephen Rodriguez **Ayes:** 8
Seconded: Willie Levenston **Nays:** 0

Brief:

- a. Approval of minutes from previous meeting.
- b. Contract Awards
 - 1. [Atlantic Treatment Plant Emerson Ovation Distributed Control System \(DCS\) Addition](#) \$443,178
 - 2. [Medium Voltage Equipment Preventative Maintenance Contract](#) \$1,200,000
- c. Sole Source
 - 1. [Gas Chromatography – Triple Quadrupole \(GC-QQQ\)](#)
 - 2. [Meiden Ceramic Membranes](#)
 - 3. [Teledyne Tekmar ATOMX Purge and Trap Preventive Maintenance Contract](#)

Item(s) Removed for Discussion: None

Attachment #1: [Consent Agenda](#)

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

3. **APPLIED COLIPHAGE AND HUMAN VIRAL PATHOGEN RESEARCH STUDY
UNIVERSITY OF NORTH CAROLINA-CHAPEL HILL AGREEMENT**

Action: Approve University of North Carolina at Chapel Hill Office of Sponsored Research as a provider of continued services to conduct research studies for HRSD.

Moved:	Vishnu Lakdawala	Ayes:	8
Seconded:	Stephen Rodriguez	Nays:	0

Brief: The University of North Carolina at Chapel Hill Office of Sponsored Research is conducting research studies for the Applied Coliphage and Human Viral Pathogen Investigation in Wastewater Discharge and Receiving Waters in the Context of Potential Future Criteria Development for the Technical Services Division (TSD).

The [original term of the study](#) was for a one-year period. TSD has requested the [study](#) continue for another year due to the need for additional data.

Attachment #2: [Agreement and Amendment](#)

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

4. **NANSEMOND TREATMENT PLANT MOTOR CONTROL CENTER REPLACEMENTS
INITIAL APPROPRIATION AND CONTRACT CHANGE ORDER (>25% OR \$50,000)**

Actions:

- a. **Appropriate total project funding in the amount of \$1,986,000.**
- b. **Approve a change order with EG Middleton, Inc. in the amount of \$223,620.**

<u>Moved:</u>	Willie Levenston	<u>Ayes:</u>	8
<u>Seconded:</u>	Ann Templeman	<u>Nays:</u>	0

CIP Project: NP013000

Project Description: This project is to replace five motor control centers (MCCs). The MCCs were installed in the early 1980s. The MCCs feed the primary pump station #1, blower and generator building, secondary clarifier pump station, dewatering and Struvite Recovery Facility pump station.

Funding Description: This request provides funding for the purchase and replacement of the dewatering Motor Control Centers (MCCs) and provides funding to replace additional MCCs over the next four fiscal years as provided in the CIP at the Nansemond Treatment Plant. Staff originally set out to mitigate a potential arc flash hazard in the dewatering MCCs by replacing the critical main breakers, which are in poor condition (with no direct replacement) and a potential arc-flash hazard. New breakers in the MCCs would save a considerable amount of money as compared to replacing the entire MCC even though there is no direct replacement of the breakers. New breakers would require changes in the breaker bus connections. In Fiscal Year 2017, staff hired the manufacturer through a local contractor (EG Middleton, Inc.) to investigate the required changes to receive new main breakers. The investigation required a complete shutdown of the dewatering system to allow the manufacturer to measure the existing bus and determine the dimensions for a new bus design to provide for new main breakers. When the MCCs were opened and inspected by the manufacturer, the condition of the entire MCC was far worse than anticipated. The manufacturer is unable to make upgrades due to the overall condition of the MCC's and recommended a full replacement of the MCCs. The original funding to simply replace the breakers and bus was obligated in the 2017 Operating budget by purchase order in the amount of \$376,231. To date, approximately \$30,000 has been spent. Replacing the entire MCC requires a change order of \$223,620 and activation of the CIP.



COMMISSION MEETING MINUTES
December 19, 2017

Contract Status:	Amount	Cumulative % of Contract
Original Contract with EG Middleton, Inc.	\$376,231	
Total Value of Previous Change Orders	\$0	0%
Requested Change Order No. 1	\$223,620	
Total Value of All Change Orders	\$223,620	59%
Revised Contract Value	\$599,851	

Time (Additional Calendar Days)		98
---------------------------------	--	----

Schedule:	PER	May 2017
	Design	May 2017
	Bid	May 2017
	Construction	May 2017
	Project Completion	May 2021

Analysis of Cost: The estimated cost for this project is based on previous procurement of MCCs and labor. The estimated cost was \$550,000 to \$600,000.

Attachment: None

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

5. **NEWPORT NEWS TRANSPORTATION CENTER
ACQUISITION OF REAL PROPERTY – 600 SEVERN ROAD, NEWPORT NEWS, VA**

Actions:

- a. **Appropriate funding in the amount of \$150,000.**
- b. **Accept the terms and conditions of the draft Purchase Agreement (and subsequent Deed) with Two-O-Seven Co., L.C., seller, of a 4.9 acre vacant parcel located at 600 Severn Road in Newport News, Virginia and authorize the General Manager to execute same, substantially as presented, together with such changes, modifications and deletions as the General Manager may deem necessary.**

Moved: Maurice Lynch **Ayes:** 8
Seconded: Elizabeth Taraksi **Nays:** 0

Project Description: The City of Newport News is planning to construct a multi-modal transportation center within the Patrick Henry area of Newport News. Completion of the project will allow for increased passenger train ridership, decreased costs because AMTRAK will be able to turn and maintain trains on site, and CSX will also have more main line track time available for cargo traffic because passenger trains will not need to utilize the main lines as much. Transportation options will also increase through new inter-city bus service with local connections including HRT, airport shuttles and taxi service. The planned project will require relocation of HRSD infrastructure currently located on City property and right of way. The acquisition of 600 Severn Road will allow for adequate relocation of HRSD facilities, ingress/egress capabilities and provide a lay down area for construction purposes.

Agreement Description: The attached draft [Purchase agreement](#) has been reviewed by HRSD staff and legal counsel. The forthcoming deed will be reviewed by staff and counsel before execution. A [Facilities Orientation Map](#) is provided for clarification purposes.

Analysis of Cost: Two-O-Seven Co., L.C. has tentatively agreed to a sales price of \$125,000 based on comparable land sales, and staff anticipates that the acquisition price, due diligence efforts and legal fees will not exceed a total cost of \$150,000.

Discussion Summary: The Commission discussed where the pipeline was currently located and the assessment of the land, which is unbuildable due to marshlands and space constraints.

Attachment #3: [Draft Purchase Agreement and Map](#)

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

6. **OCEANA OFF-LINE STORAGE FACILITY
INITIAL APPROPRIATION AND TASK ORDER (>\$200,000)**

Actions:

- a. **Appropriate total project funding in the amount of \$16,900,000.**
- b. **Approve a task order with Kimley-Horn and Associates, Inc. (KHA) in the amount of \$400,000.**
- c. **Dissolve existing scopes and funding appropriations totaling \$5,441,000 for the following CIP projects: CE011832, CE011833, and CE011834.**

<u>Moved:</u>	Willie Levenston	<u>Ayes:</u>	8
<u>Seconded:</u>	Ann Templeman	<u>Nays:</u>	0

CIP Project: CE011840

Project Description: This project will construct a five million gallon storage tank for use during wet weather events to handle flow from HRSD's interceptor system located along Virginia Beach Boulevard in the vicinity of the Oceana Naval Air Station. The project is needed to provide reliable capacity and maintain HRSD's pressure policy when flow is diverted in support of the Chesapeake-Elizabeth Treatment Plant closure and for the ultimate Regional Wet Weather Management Plan (RWWMP). This project must be substantially complete by June 2021.

Funding Description: The total cost for this project is estimated at \$16,900,000 in the RWWMP and assumes an aboveground tank construction with a drain pump station; a land acquisition cost of roughly \$1 million, and an architectural treatment and landscaping cost of roughly \$2 million. This estimate does not include the potential for any special or unique costs associated with the land acquisition or improvements required to address public concerns. These issues will be addressed once a final site is determined for the storage facility.

KHA was awarded a contract in September 2016 to perform the Program Definition Phase to develop a coordinated plan of required interceptor system improvements in support of the Chesapeake-Elizabeth Treatment Plant closure. They will continue with preliminary engineering on the individual capital improvement projects identified in the program definition report as well as this additional project. Future phases of work will be negotiated after the preliminary engineering report is completed.

While this project was included in the recently submitted RWWMP, it was not part of the original Chesapeake-Elizabeth offline solution set developed assuming a two-year level of service (LOS). The original project solution set included numerous locality pump station upgrades (CIP #: CE011831, CE011832, CE011833, CE011834, CE011835) due to the increased pipeline pressures associated with the flow diversion. With the implementation of



COMMISSION MEETING MINUTES
December 19, 2017

the Oceana Off-line Storage Facility, the number of locality pump stations with anticipated upgrades can be reduced from 11 to three, and three previously funded CIP projects can be eliminated. CE011832 has a current appropriation of \$2,237,000; CE011833 has \$1,006,000; and CE011834 has \$2,198,000. HRSD will invest money in a storage tank that will be needed to handle the five-year LOS and will reduce pipeline pressures, thereby reducing the risk of failure and/or overflows associated with HRSD and locality infrastructure.

Task Order Description and Analysis of Cost: This task order will provide a PER for this project at a not to exceed cost of \$400,000. This cost is based on the PER preparation for the Providence Road Off-Line Storage Facility, a proposed 5.2 million gallon storage tank.

<u>Schedule:</u>	PER	January 2018
	Design	August 2018
	Bid	October 2019
	Construction	January 2020
	Project Completion	May 2021

Discussion Summary: The size of the tank and land required for the Oceana storage tank is similar to the proposed Providence Road Off-Line Storage Facility. This tank is required as part of the RWWMP. Staff does not foresee recreational facilities installed on the surface of the tank at this time.

Attachment: None

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

- Provide full access to data, information and system assets as necessary for HRSD to develop and implement the RWWMP
- Maintain any existing flow monitoring equipment
- Provide staff or consultant resources to coordinate development and implementation of the RWWMP as it applies to each Locality
- Timely issue permits and not withhold, condition or delay unreasonably
- Accommodate reasonable requests for standard work hours and maintenance of traffic

In the subsequent years much has changed with our approach to resolving wet weather issues in the region. The most significant is the schedule as proposed in the integrated plan submitted on September 29, 2017. The schedule now calls for HRSD to complete five specific priority projects while implementing SWIFT on a full-scale between plan approval and 2030. The plan also includes a full review of wet weather capacity work in the period between 2028 and 2030 to ensure the appropriate critical data are updated to account for changes in weather patterns, impact of work on priority projects, local and national economic conditions among other factors.

The schedule impacts the MOA in that HRSD would not be responsible for ensuring wet weather capacity for the region until 2053 or beyond, leaving localities responsible for capacity-related overflows that could be the result of inadequate regional infrastructure. HRSD is in the best position to analyze each wet weather overflow and determine cause and potential remedial actions. For this reason, staff is recommending the MOA be amended to have HRSD assume regulatory liability for wet weather overflows upon plan approval (likely in 2019), as opposed to upon complete implementation of the wet weather work.

This [amendment](#) has been sent to local government staff for review and approvals will be scheduled for spring of 2018.

This amendment has been reviewed by HRSD Counsel (AquaLaw).

Discussion Summary: There is no additional cost to the local governments as a result of the amendment.

Attachment #4: [MOA and Amendment](#)

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

8. **CENTRAL ENVIRONMENTAL LABORATORY
BRIEFING**

Action: No action is required.

Brief: HRSD has invested in its laboratory capabilities for over 40 years. This interest has culminated in the Central Environmental Laboratory (CEL) we know today. HRSD laboratory function has evolved from one primarily performing analyses in support of HRSD's Virginia Pollutant Discharge Elimination System (VPDES) permit, process, and pretreatment program monitoring to one fueling the Municipal Assistance Program as well as HRSD's extensive research program which includes innovative techniques for pathogen analysis and wastewater treatment. Sustainable Water Initiative for Tomorrow (SWIFT) has presented many analytical challenges requiring a seemingly continuous modification of the CEL's functions and responsibilities; including the development of capabilities to conduct drinking water methods and other analytically sensitive methods. The presentation described the capabilities of the CEL and how they support SWIFT and many other programs while the CEL continues to meet laboratory accreditation requirements.

Discussion Summary: Ms. Crandall explained the bi-annual onsite assessment accreditation requirement, chemistry and safety, training and space limitations, automation, and equipment requirements for SWIFT analytics.

Attachment #5: [PowerPoint Presentation](#)

Public Comment: None



COMMISSION MEETING MINUTES
December 19, 2017

9. **UNFINISHED BUSINESS**

Ms. Cascio informed the Commission and staff the Annual Financial Disclosure forms had been published by the Virginia Conflict of Interest and Ethics Advisory Council. These new forms will be forwarded to the Commission and staff in “positions of trust” (as defined by the HRSD Ethics Policy) by the end of the week for completion no later than February 1, 2018. A link to the mandatory training module also from the Advisory Council will be provided.

10. **NEW BUSINESS – None**

11. **COMMISSIONER COMMENTS – None**

12. **PUBLIC COMMENTS NOT RELATED TO AGENDA – None**

13. **INFORMATIONAL ITEMS**

Action: No action required.

Brief: The items listed below were presented for information.

- a. [Management Reports](#)
- b. [Strategic Planning Metrics Summary](#)
- c. [Effluent Summary](#)
- d. [Air Summary](#)

Attachment #6: [Informational Items](#)

Public Comment: None

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #1

AGENDA ITEM 1. – Consent Agenda

CONSENT AGENDA ITEM 2.b.1. – December 19, 2017

Subject: Atlantic Treatment Plant Emerson Ovation Distributed Control System (DCS) Addition
Contract Award (>\$200,000)

Recommended Action: Award a contract to Emerson Process Management in the amount of \$443,178.

CIP Project: AT013500

Budget	\$60,666,815
Previous Expenditures and Encumbrances	(\$57,730,091)
Available Balance	<u>\$2,936,724</u>

Contract Description: This contract is for the purchase of additional Ovation DCS hardware required for the Thermal Hydrolysis Process and Fog Receiving Station at the Atlantic Treatment Plant. The Emerson DCS was approved as a sole source in June 2016 for all HRSD Ovation Sites.

Project Description: The purpose of this project is to implement a Thermal Hydrolysis Process (THP) at the Atlantic Treatment Plant to produce Class A Biosolids, to minimize cake storage requirements, to decrease the quantity of cake solids by improving de-waterability, and to improve product odor and stackability. The project will include a new Pre-Dewatering Building, thermal hydrolysis equipment, fire-tube boiler, final dewatering improvements, and DCS programming. The facilities will be sized to handle the additional solids loading resulting from the closure of the Chesapeake-Elizabeth Treatment Plant.

<u>Schedule:</u>	PER	December 2013
	Design	January 2015
	Bid	July 2017
	Construction	July 2017
	Project Completion	October 2020

CONSENT AGENDA ITEM 2.b.2. – December 19, 2017

Subject: Medium Voltage Equipment Preventive Maintenance Contract
Contract Award (>\$200,000)

Recommended Action: Award a contract for medium voltage equipment preventive maintenance services to Electric Power Systems International Inc. DBA Electric Power Systems in the estimated amount of \$200,000 for year one with five annual renewal options and an estimated cumulative value in the amount of \$1,200,000.

Type of Procurement: Competitive Negotiation

Proposers	Technical Points	Recommended Selection Ranking
Electric Power Systems International Inc. DBA Electric Power Systems	87	1
Reuter & Hanney, Inc.	78	2
ABM Electrical Power Solutions LLC	Non-responsive	
Eaton Corporation	Non-responsive	
EG Middleton Inc.	Non-responsive	

Contract Description: This contract is an agreement for medium voltage preventative maintenance services to various electrical equipment on an as-needed basis for HRSD. Contractor shall provide maintenance and calibrations in accordance with Maintenance Testing Standards and submit detailed reports of work performed and document repairs needed at each location. The first year of services include the contractor providing consulting services in order to familiarize and prioritize the medium voltage equipment at each HRSD location while verifying accuracy of documentation and the development of a five year budgetary schedule.

In accordance with HRSD competitive negotiation procedures, the Procurement Division advertised and solicited proposals from potential Offerors. A total of five proposals were received and two were evaluated based upon the requirements of the Request for Proposal. Independent interviews were held with the two top-ranked Offerors to negotiate a fair and reasonable cost. The proposal submitted by Electric Power Systems International Inc. DBA Electric Power Systems (EPS) was ranked by technical points to be highest qualified.

The proposal submitted by EPS includes a set of dedicated local technicians allowing for a faster response time to HRSD requests for service. They are InterNational Electrical Testing Association (NETA) certified, an active member of the independent testing industry and has developed a select staff of technicians with a broad spectrum of capabilities to meet any testing needs.

ABM Electrical Power Solutions LLC was evaluated as non-responsive for not including the required pricing schedule with the online proposal.

Eaton Corporation and EG Middleton Inc. were evaluated as non-responsive for not responding to the request for clarification of their online proposals in the allotted time provided.

CONSENT AGENDA ITEM 2.c.1 – December 19, 2017

Subject: Gas Chromatography – Triple Quadrupole (GC-QQQ)
Sole Source (>\$10,000)

Recommended Action: Approve Agilent Technologies, Inc. as the source for Gas Chromatography – Triple Quadrupole (GC-QQQ) instruments for use by the Central Environmental Laboratory.

Sole Source Justification:

- Compatibility with existing equipment or systems is required
- Support of a special program in which the product or service has unique characteristics essential to the needs of the program
- Product or service is covered by a patent or copyright
- Product or service is part of standardization program to minimize training for maintenance and operation, and parts inventory
- Only known source

Details: The Central Environmental Lab uses similar instruments purchased from Agilent Technologies that are capable of analyzing trace levels of organic compounds including organochlorine pesticides and polychlorinated biphenyls. An additional GC/QQQ will allow the CEL to analyze compounds like NDMA and 1,4-dioxane at very low but required detection limits while conserving financial and staff resources in support of the Sustainable Water Initiative for Tomorrow (SWIFT). Additional advantages to purchasing from Agilent are the ability to share parts/consumables between instruments, receive discounts on the service contract and decrease the need for further training.

Purchase of this instrument will eliminate the need to outsource these analyses to a third party laboratory. The third party laboratory uses the exact same instrument that is being requested here and has already developed and published the methods needed. In addition, this purchase will allow for improved data turn-around times (shortened by 50 percent or more), lower cost per analysis, and less staff time managing the shipment of samples.

Existing instruments have been previously purchased from Agilent Technologies through Competitive Negotiation and are already integrated with the Laboratory Information Management System (LIMS). The discounted purchase price includes installation, implementation and the first year of maintenance and support. A sole source agreement for service for the existing instruments was previously approved by the Commission on May 23, 2017.

CONSENT AGENDA ITEM 2.c.2. – December 19, 2017

Subject: Meiden Ceramic Membranes
Sole Source (>\$10,000)

Recommended Action: Approve Meiden America, Inc. as the provider of ceramic membranes for use at the King William Treatment Plant.

CIP Project: MP012000

Sole Source Justification:

- Compatibility with existing equipment or systems is required
- Support of a special program in which the product or service has unique characteristics essential to the needs of the program
- Product or service is covered by a patent or copyright
- Product or service is part of standardization program to minimize training for maintenance and operation, and parts inventory
- Only known source

Details: This product is a ceramic flat-sheet membrane. These membranes will replace the polymeric membranes currently in use in the membrane bioreactors at the King William Treatment Plant. Ceramic membranes are preferred for the membrane replacement due to greater durability, anticipated longer life, and anticipated lower lifecycle costs. As part of the Preliminary Engineering Report (PER) for King William Treatment Plant Improvements, CH2M and HRSD sought information from various membrane manufacturers and identified three suppliers of ceramic membranes. Meiden America, Inc., also known as Meidensha Corporation, was the only supplier that had any experience with this size and type of installation. Meiden has provided an informal quotation for the ceramic membranes in the amount of \$221,865. The ceramic membranes will be procured either directly by HRSD or by a general contractor through the construction contract for this project. Negotiation for the final cost of the system will occur as details are finalized during design.

CONSENT AGENDA ITEM 2.c.3 – December 19, 2017

Subject: Teledyne Tekmar ATOMX Purge and Trap Preventive Maintenance Contract
Sole Source (>\$10,000)

Recommended Action: Approve Teledyne Instruments, Inc. as the source for Preventive Maintenance Services to the Tekmar ATOMX Purge and Trap instrument in use at the Central Environmental Laboratory.

Sole Source Justification:

- Compatibility with existing equipment or systems is required
- Support of a special program in which the product or service has unique characteristics essential to the needs of the program
- Product or service is covered by a patent or copyright
- Product or service is part of standardization program to minimize training for maintenance and operation, and parts inventory
- Only known source

Details: The Central Environmental Laboratory uses the ATOMX Purge and Trap instrument for the analysis of volatile organic compounds in soils and waters through a unique methanol extraction automation feature. Analyses for these compounds are required by HRSD discharge permits and the Pretreatment and Pollution Prevention program. This maintenance package includes a 48-hour response time, free unlimited technical phone support, free parts for repairs (excluding consumable parts) and free upgrades.

Teledyne Instruments, Inc. is the only authorized service provider for their equipment.

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #2

AGENDA ITEM 3. - Applied Coliphage and Human Viral Pathogen Research Study
University of North Carolina-Chapel Hill

- [Agreement December 1, 2016](#)
- [Agreement December 1, 2017](#)

An Applied Coliphage and Human Viral Pathogen Investigation in Wastewater Discharge and Receiving Waters in the Context of Potential Future Criteria Development

PI: Rachel T. Noble

Project Start Date: December 1, 2016

Project end date: December 1, 2017

Statement of the Problem: Waterborne enteric viruses, in particular norovirus and adenovirus have been cited and speculated as the main causative agents of gastroenteritis in humans at recreational beaches (Soller et al. 2010). Although risk from bacterial pathogens found in contaminated coastal waters is not negligible, it is thought that the very low infectious doses (as low as 1-10 virus particles), combined with high host specificity, and extended viral persistence in coastal receiving waters (e.g. Fong and Lipp, 2005) makes viral pathogens a more serious concern. Extensive research has documented the risks associated with enteric viruses, including adenovirus, enterovirus, rotavirus, and norovirus to name a few. It has been suggested that because human viral pathogens persist in contaminated receiving waters for longer periods than the currently utilized fecal indicator bacteria (FIB), that FIB are ineffectual proxies for pathogenic viruses (e.g. Baggi et al. 2001, Harwood et al. 2005, Anderson et al. 2005). Methodological limitations prevent the desirable multiple target viral analysis that could provide vital information for controlling viral pathogens from specific sources (such as stormwater and sewage discharge), determining human health risks based on assessments of human virus loading and exposure (such as during epidemiological studies). A range of issues prevent human viral pathogens from being easily quantified in sewage effluent, wastewater, stormwater, and coastal receiving waters. The lack of ability to culture noroviruses, difficulties in sample processing and concentration across complex water matrices, and major differences between molecular and culture dependent methods are some of the most prominent hurdles to successful viral pathogen quantification. Coliphage (bacteriophage that infect *E. coli* bacteria) have been previously cited as a potential fecal viral indicator. While coliphage are not as easily quantified as FIB in complex water matrices, they benefit from being quantifiable in a range of water types (drinking, groundwater, recreational waters) using previously validated methods (EPA Method 1601 and EPA Method 1602). Furthermore, coliphage (specifically F+ coliphage) have been identified as having significant relationships to human health outcomes in recent epidemiological studies conducted in Southern California (Colford et al. 2007, Griffith et al. in preparation). Based upon the previously raised issues, USEPA has suggested the need to develop new coliphage-based criteria for recreational waters for the protection of public health. USEPA is in the process of actively developing these new criteria in the next calendar year. Any new criteria development for viruses in water, whether for recreation, wastewater discharge, or drinking, would revolutionize the management of water globally. Currently, risk associated with water is only managed through the use of FIB concentrations.

Two recent summits have been conducted in the past nine months on the issues related to the development of new criteria for viral indicators. In specific studies, relationships between coliphage and human pathogenic enteric viruses have been noted, but they are not consistent across studies. Ogorzaly et al. (2009) found a positive correlative relationship between F-RNA coliphage, genotype II, bacterial indicators, and human adenovirus. Love et al. (2010) found a weak positively correlated relationship

between enterococci and coliphage densities. However, other studies, Espinosa et al. 2009 Jiang and Chu 2001, Hot et al., 2003) have demonstrated that no relationship between coliphages and human viral pathogens existed. One limitation of many of the existing studies is that different classes of methods have been utilized for virus quantification. Recently Jones et al. (2014) compared 5 currently published methods for recovery of coliphage by either plaque assay or RT PCR and found that the recovery of spiked river samples varied from <1% to 52%. A second limitation is that detection limits of some approaches have hampered the ability to compare concentrations of enteric viruses and coliphage at the lower concentrations that are expected in coastal receiving waters. Grabou et al. (1998) found that F-RNA coliphage outnumbered cytopathogenic enteric virus by a factor of 100, which may explain why there is a lack of a correlative relationship in many studies. Finally, many human enteric viral pathogens have strong noted seasonalities, e.g. norovirus is known as the “winter super-bug”, and adenovirus and enterovirus are more prominently found in sewage in the summer and fall (e.g. Skrabber et al. 2004, Jiang and He, 2007), whereas coliphage densities in sewage have a tendency to be more consistent year-round (Noble et al. unpublished data). Given the limitations and issues faced by both USEPA for implementation of a new virus based standard and the potential impact on wastewater treatment plants nationally, it is vital to thoroughly assess the available literature in the context of data gaps. Secondarily, given the fact that enteric viruses are important at low concentrations (low infectious dose) it is vital to conduct real-world assessments of the relationships of coliphage and human enteric viruses in receiving waters at realistic concentrations observed in coastal receiving waters. Existing studies of coliphage/human enteric virus relationships that have been conducted by inoculating laboratory held mesocosms with artificially high concentrations of both virus types, and examining relationships of decay may not be appropriate ways to interpret the dynamics of each virus type in coastal receiving waters. There is a need to 1) use real world studies to address questions of persistence, coliphage regrowth, and seasonal variations, 2) include both somatic and F+ coliphage measurements, using both culture and molecular methods for quantification, and 3) to address questions related to enteric virus and coliphage persistence with the most advanced and sensitive methods (i.e. ddPCR).

EPA has recently published a literature review (see <http://water.epa.gov/scitech/swguidance/standards/criteria/health/microbial/upload/coliphages-literature-review-report-2015.pdf>) in which effort is devoted to assessing the relationships between coliphage concentrations and human health outcomes across a range of epidemiological studies. The studies range in size and location. Some of the studies have been conducted in areas that are impacted by point source sewage discharges (e.g. Lee et al. 1997), while others have been conducted in areas that are impacted not by point sources of known human sewage (treated or untreated) discharge, but only by non-point source contamination (Griffith et al. 2015 in preparation). The studies that have been conducted demonstrate results similar to those that have been observed previously for fecal indicator bacteria (FIB). Some statistically significant relationships have been observed, but in other studies, no statistically significant relationships were observed to human health outcomes. Colford et al. (2007) found that a relationship with F+ coliphage emerged from epidemiology studies conducted in Southern California, however, it was a very small sample size that drove the relationships observed. In the Southern California epidemiological studies conducted at beaches in Avalon, Doheny, Malibu, Enterococcus was a superior indicator to human health when all data was combined for multiple viral

and bacterial indicators. It was found that F+ RNA coliphage proved to be a useful indicator at Avalon and Doheny Beaches, but only by one method (single agar overlay), the other method (DAL) did not produce significant results (Griffith et al, in prep). In an extensive study conducted by Wyer et al. (2012), it was determined that human adenovirus quantification was not related or correlated to FIB. A relationship was found for somatic coliphage, but only in freshwater, and there was no relationship observed in marine waters, (Wyer et al. 2012). As part of an EU Methods Standardization project, (Bofill-Mas et al. 2010) there was no relationship shown between human adenovirus and FIB or somatic coliphage whenever laboratory data was pooled across many laboratories. Only when data presented from individual studies were some significant relationships was presented. This highlights the existing variability in virus measurement approaches (Jones et al 2014).

A recent event held at the UNC Water Microbiology Conference, the Coliphage Side Event, brought together a range of experts in the field of discharge and receiving water quality science to discuss the potential development of new criteria for recreational waters and shellfish harvesting waters for coliphage. In this special meeting, an area of research that was highlighted as being immediately necessary was the dynamics of coliphage in stormwater discharge to receiving waters. Furthermore, it was highlighted that many of the coliphage to human viral pathogen relationship assessments that have been previously conducted have been attempted with poor data, including presence/absence data, which makes quantitative assessment of relationships not possible. Furthermore, it was noted that coliphage populations have been noted previously in biosolids, and other animal fecal material samples at high concentrations (Havelaar, et al. 1990, Leclerc, et al. 2000) and these populations would have no relationship to human viral pathogens, the E. coli host prevalence is what dictates their high concentrations. Given the data gaps that exist, many of which have been highlighted by the research community (Noble et al. in preparation), there is a need to conduct real world assessments of coliphage dynamics from influent through final effluent in the context of human viral pathogen quantification and fate and transport. Only a limited number of studies cited in the EPA literature review were fully quantitative for a range of human viral pathogens.

Objective 1: Complete quantitative assessment of coliphage and human viral pathogen dynamics from wastewater influent to final effluent. The tenet of this objective is that newer digital droplet PCR and qPCR techniques have not been applied in a standardized, fully quantitative way in prior coliphage assessments.

Primary Objective: Characterize and quantify viral indicators, pathogens, and their relationship throughout different HRSD WWTPs.

- Simultaneously quantify male-specific and somatic coliphage, as well as adenovirus, norovirus (genogroups I and II), and human polyomavirus from sewage influent to effluent at specific points throughout the treatment system in three different treatment plants
- The three treatment plants to be investigated over the course of this project are: 1) James River Treatment Plant (secondary treatment at design capacity of 20 MGD), 2) Virginia Initiative Plant (VIP, secondary treatment at design capacity of 40 MGD), and 3) Boat Harbor WWTP (secondary treatment at design capacity of 20 MGD)
- Nansemond WWTP will be evaluated for the last 2 months of the study.

- Incorporation of redundant methodological approaches and highly replicated sampling design
- Include assessment of influent, primary clarifier effluent, secondary effluent, and final effluent
- Conduct dry weather assessment every month during dry weather (treatment flow does not exceed prior 3 day average)
- Conduct 4 storm event characterizations in order to assess the impacts of outside sources (stormwater based) of *E. coli*/coliphage to the sewage-based coliphage signal within the treatment plant
- Use of advanced sampling approaches and state of the art digital PCR technology using standardize/optimized approaches to quantify all targets
- Sample collection will be an adaptive process. Samples could be distributed to priority time periods (i.e. bathing season, high use shellfish harvesting periods)dependent on initial data
- Analyses to be conducted by HRSD: *E. coli*, Fecal Coliforms, Enterococcus, coliphage by method 1602, norovirus genogroup I and genogroup II, adenovirus, HF183, human polyomavirus, free chlorine, combined chlorine, ammonia, relevant environmental parameters (salinity, turbidity, temperature, dissolved oxygen)

Figure 1: Study Design for Objective 1.

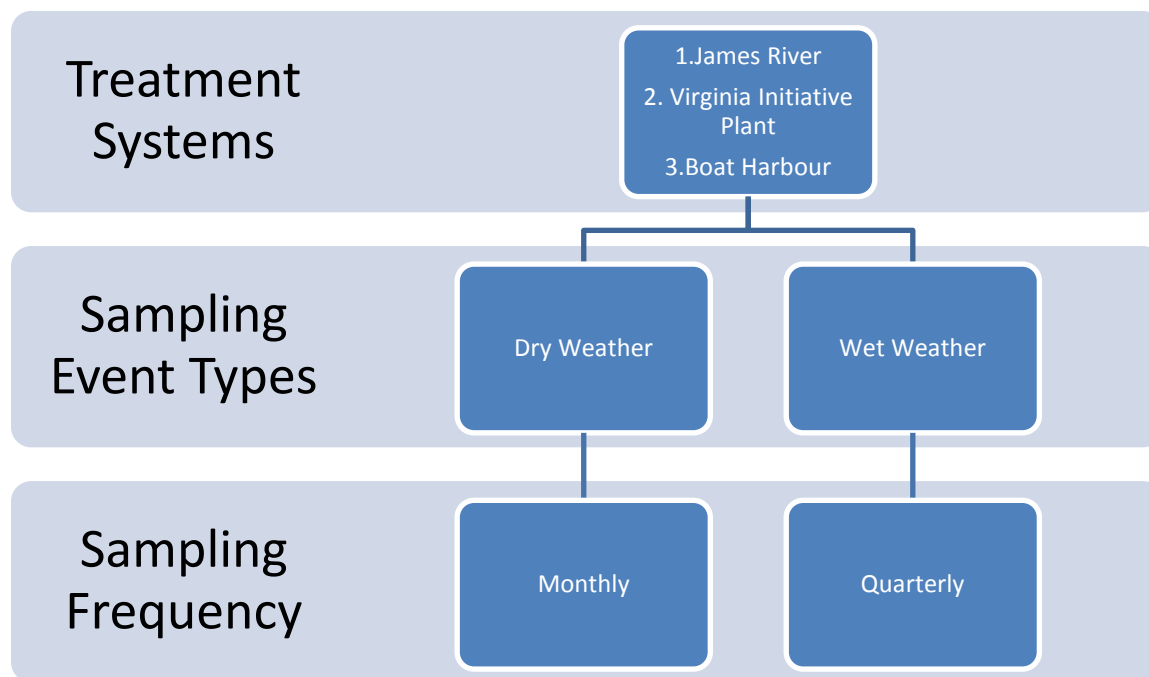


Table 1: Objective 1 Sampling Framework. For each treatment system, samples will be collected as follows:

Full Assessment → 1) influent, 2) primary clarifier effluent, 3) secondary effluent, 4) final effluent

WWTP	Dry Weather Samples	Wet Weather Samples	Sample Totals WWTP Fate Study:
James River, Boat Harbor, and Virginia Initiative Plant	3 plants x 4 stages x 12 events= 144 Total: 144	3 plants x 4 stages x 4 events= 48 Total: 48	Total samples: 192
Nansemond	1 plants x 4 stages x 2 events= 8 Total: 8	None	Total samples: 8
			Overall Total: 200

QA/QC

- Molecular samples (qPCR, ddPCR) samples will be analyzed in triplicate. Culture samples will be analyzed in duplicate
- QA metric information will be included with bacterial data to allow for collaborators to use data
- 10% (minimum) to 20% (if deemed essential for project success by HRSD) of total samples will be used for sample splits with UNC Institute of Marine Sciences. UNC will analyze for adenovirus, noroviruses (I and II)
- HRSD will maintain the project database to allow data use across applicable projects and collaborators
- HRSD must approve content before any data presentations

UNC Chapel Hill Project Costs

This estimate of cost is based on an assumed 10% virus samples to be split between HRSD and UNC CH IMS, and subsequent analyses by UNC CH IMS. The UNC CH per sample cost for norovirus genogroup I and genogroup II and adenovirus analysis is \$1838. The per sample cost includes the previously negotiated 25% indirect cost rate. There will be a minimum 10% of samples will be split with UNC for viral analyses. The contract between UNC Chapel Hill Institute of Marine Sciences (PI Rachel Noble) and HRSD will initially be crafted assuming the minimum 10% splits for virus samples, totaling \$183,800.00. As additional sampling and analyses are added to the project, supplemental funds will be added with the appropriate scope.

UNC Cost	Samples	Cost	Total
10% Virus Splits (200 study samples)	20	\$1,838.00	\$36,760.00

References cited:

1. Anderson KL, Whitlock JE, Harwood VJ. 2005. Persistence and differential survival of fecal indicator bacteria in subtropical waters and sediments. *Appl. Environ. Microbiol.* 71:3041–3048
2. Baggi F, Demarta A, and R Peduzzi R. 2001. *Persistence of viral pathogens and bacteriophages during sewage treatment: lack of correlation with indicator bacteria.* *Res Microbiol* 152(8):743-75
3. Bofill-Mas S, Calgua B, Clemente-Casares P. et al., 2010. Quantification of human adenoviruses in European recreational waters. *Food Environ Virol* 2: 101–109.
4. Colford JM Jr., Wade TJ, Schiff KC, Wright CC, Griffith JF, Sandhu SK, et al. 2007. Water quality indicators and the risk of illness at beaches with nonpoint sources of fecal contamination. *Epidemiology* 18(1):27–35.
5. Espinosa, AC, Arias, CF, Sánchez-Colón S, & Mazari-Hiriart M. 2009. Comparative Study of Enteric Viruses, Coliphages and Indicator Bacteria for Evaluating Water Quality in a Tropical High-Altitude System. *Environmental Health*, 8:49. <http://dx.doi.org/10.1186/1476-069X-8-49>
6. Fong T., Lipp EK. 2005- Enteric Viruses of Humans and Animals in Aquatic Environments: Health Risks, Detection, and Potential Water Quality Assessment Tools- *Microbiology Molecular Biology Reviews*, 69:(2), 357-371. doi: 10.1128/mubr.69.2.357-371.2005
7. Grabow WOK, Vrey A, Uys M, De Villiers JC. 1998. Evaluation of the application of bacteriophages as indicators of water quality. Report 411/1/99. Pretoria, South Africa: Water Research Commission
8. Griffith JF, Weisberg SB, Arnold BF, Cao Y, Schiff KC, Colford JM. Epidemiologic evaluation of alternate microbial water quality monitoring indicators at three California, *In prep.*
9. Harwood VJ, Levine AD, Scott TM, Chivukula V, Lukasik J, Farrah SR & Rose JB .2005. Validity of the indicator organism paradigm for pathogen reduction in reclaimed water and public health protection. *Appl Environ Microbiol* 71: 3163–3170
10. Havelaar, A.H, Pot-Hogeboom WM, Furuse K, Pot R, and Hormann M P. 1990. Fspecific RNA bacteriophages and sensitive host strains in feces and wastewater of human and animal origin. *J. Appl. Bacteriol.* 69:30-37.
11. Hot, D.; Legeay O, Jacques J, Gantzer C, Caudrelier, Y, Guyard, K, Lange M, Andréoletti, L. 2003. Detection of somatic phages, infectious Enteroviruses and Enterovirus genomes as indicators of human enteric viral pollution in surface water. *Water Research*, 37:19:4703. [http://dx.doi.org/10.1016/S0043-1354\(03\)00439-1](http://dx.doi.org/10.1016/S0043-1354(03)00439-1).
12. Jiang, S., R. Noble and W. Chu. 2001. Human adenoviruses and coliphages in urban runoff-impacted coastal waters of Southern California. *Appl. Environ. Microbiol.* 67:179-184.
13. Jiang, S.C.; Chu, W.; & He, J.-W., 2007. Seasonal Detection of Human Viruses and Coliphage in Newport Bay, California. *Applied and Environmental Microbiology*, 73:20:6468. <http://dx.doi.org/10.1128/AEM.01370-07>.
14. Leclerc, H., S. Edberg, V. Pierzo, and J. M. Delattre. 2000. Bacteriophages as indicators of enteric viruses and public health risk in groundwaters. *J. Appl. Microbiol.* 88:5-21
15. Love, D.C., Lovelace, G.L., Money, E.S., Sobsey, M.D., 2010b. Microbial fecal indicator concentrations in water and their correlation to environmental parameters in nine geographically diverse estuaries. *Water Qual. Exp. Health* 2; 85–95
16. Method 1601: Detection of Male-specific (F+) and Somatic Coliphage in Water by Two-Step Enrichment Procedure. EPA821-R-01-030 Office of Water, Engineering and Analysis Division, Washington, DC April.

17. Method 1602: Detection of Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure. EPA 821-R-01-029. Office of Water, Engineering and Analysis Division, Washington, DC, April.
18. Ogorzaly L., Tissier A., Bertrand I., Maul A., Gantzer C. 2009 -Relationship between F-specific RNA phage genogroups, faecal pollution indicators and human adenoviruses in river water- *Water Research*, 43:(5), 1257-1264. doi: 10.1016/j.watres.2008.12.011
19. Skraber S, Gassilloud B, Gantzer C. 2004a. Comparison of coliforms and coliphages as tools for assessment of viral contamination in river water. *Appl Environ Microbiol.* 70:3644 – 3649
20. Soller, J.A., Schoen, M.E., Bartrand, T., Ravenscroft, J., Ashbolt, N.J., 2010b. Estimated human health risks from exposure to recreational waters impacted by human and nonhuman sources of faecal contamination. *Water Res.* 44 (16), 4674 – 4691
21. T.H. Jones, V. Muehlhauser, G. Thériault Comparison of ZetaPlus 60S and nitrocellulose membrane filters for the simultaneous concentration of F-RNA coliphages, *Porcine teschovirus* and porcine adenovirus from river water *J. Virol. Methods*, 206 (2014), pp. 5–11
22. Wyer MD, Kay D, Watkins J et al. (2010) Evaluating short-term changes in recreational water quality during a hydrograph event using a combination of microbial tracers, environmental microbiology, microbial source tracking and hydrological techniques: a case study in Southwest Wales, UK. *Water Res* 44: 4783–4795

An Applied Coliphage and Human Viral Pathogen Investigation in Wastewater Discharge and Receiving Waters in the Context of Potential Future Criteria Development

Funding Agency: Hampton Roads Sanitation District

PI: Rachel T. Noble

Project Start Date: December 1, 2017

Project end date: December 1, 2018

Statement of the Problem: Waterborne enteric viruses, in particular norovirus and adenovirus have been cited and speculated as the main causative agents of gastroenteritis in humans at recreational beaches (Soller et al. 2010). Although risk from bacterial pathogens found in contaminated coastal waters is not negligible, it is thought that the very low infectious doses (as low as 1-10 virus particles), combined with high host specificity, and extended viral persistence in coastal receiving waters (e.g. Fong and Lipp, 2005) makes viral pathogens a more serious concern. Extensive research has documented the risks associated with enteric viruses, including adenovirus, enterovirus, rotavirus, and norovirus to name a few. It has been suggested that because human viral pathogens persist in contaminated receiving waters for longer periods than the currently utilized fecal indicator bacteria (FIB), that FIB are ineffectual proxies for pathogenic viruses (e.g. Baggi et al. 2001, Harwood et al. 2005, Anderson et al. 2005). Methodological limitations prevent the desirable multiple target viral analysis that could provide vital information for controlling viral pathogens from specific sources (such as stormwater and sewage discharge), determining human health risks based on assessments of human virus loading and exposure (such as during epidemiological studies). A range of issues prevent human viral pathogens from being easily quantified in sewage effluent, wastewater, stormwater, and coastal receiving waters. The lack of ability to culture noroviruses, difficulties in sample processing and concentration across complex water matrices, and major differences between molecular and culture dependent methods are some of the most prominent hurdles to successful viral pathogen quantification. Coliphage (bacteriophage that infect *E. coli* bacteria) have been previously cited as a potential fecal viral indicator. While coliphage are not as easily quantified as FIB in complex water matrices, they benefit from being quantifiable in a range of water types (drinking, groundwater, recreational waters) using previously validated methods (EPA Method 1601 and EPA Method 1602). Furthermore, coliphage (specifically F+ coliphage) have been identified as having significant relationships to human health outcomes in recent epidemiological studies conducted in Southern California (Colford et al. 2007, Griffith et al. in preparation). Based upon the previously raised issues, USEPA has suggested the need to develop new coliphage-based criteria for recreational waters for the protection of public health. USEPA is in the process of actively developing these new criteria in the next calendar year. Any new criteria development for viruses in water, whether for recreation, wastewater discharge, or drinking, would revolutionize the management of water globally. Currently, risk associated with water is only managed through the use of FIB concentrations.

Two recent summits have been conducted in the past nine months on the issues related to the development of new criteria for viral indicators. In specific studies, relationships between coliphage and human pathogenic enteric viruses have been noted, but they are not consistent across studies. Ogorzaly

et al. (2009) found a positive correlative relationship between F-RNA coliphage, genotype II, bacterial indicators, and human adenovirus. Love et al. (2010) found a weak positively correlated relationship between enterococci and coliphage densities. However, other studies, Espinosa et al. 2009 Jiang and Chu 2001, Hot et al., 2003) have demonstrated that no relationship between coliphages and human viral pathogens existed. One limitation of many of the existing studies is that different classes of methods have been utilized for virus quantification. Recently Jones et al. (2014) compared 5 currently published methods for recovery of coliphage by either plaque assay or RT PCR and found that the recovery of spiked river samples varied from <1% to 52%. A second limitation is that detection limits of some approaches have hampered the ability to compare concentrations of enteric viruses and coliphage at the lower concentrations that are expected in coastal receiving waters. Grabou et al. (1998) found that F-RNA coliphage outnumbers cytopathogenic enteric virus by a factor of 100, which may explain why there is a lack of a correlative relationship in many studies. Finally, many human enteric viral pathogens have strong noted seasonalities, e.g. norovirus is known as the “winter super-bug”, and adenovirus and enterovirus are more prominently found in sewage in the summer and fall (e.g. Skraber et al. 2004, Jiang and He, 2007), whereas coliphage densities in sewage have a tendency to be more consistent year-round (Noble et al. unpublished data). Given the limitations and issues faced by both USEPA for implementation of a new virus based standard and the potential impact on wastewater treatment plants nationally, it is vital to thoroughly assess the available literature in the context of data gaps. Secondly, given the fact that enteric viruses are important at low concentrations (low infectious dose) it is vital to conduct real-world assessments of the relationships of coliphage and human enteric viruses in receiving waters at realistic concentrations observed in coastal receiving waters. Existing studies of coliphage/human enteric virus relationships that have been conducted by inoculating laboratory held mesocosms with artificially high concentrations of both virus types, and examining relationships of decay may not be appropriate ways to interpret the dynamics of each virus type in coastal receiving waters. There is a need to 1) use real world studies to address questions of persistence, coliphage regrowth, and seasonal variations, 2) include both somatic and F+ coliphage measurements, using both culture and molecular methods for quantification, and 3) to address questions related to enteric virus and coliphage persistence with the most advanced and sensitive methods (i.e. ddPCR).

Objective 1: Characterize and quantify viral indicators, bacterial pathogens, and their relationship throughout different HRSD WWTPs.

- Simultaneously quantify male-specific and somatic coliphage, as well as adenovirus, norovirus (genogroups I and II), Salmonella sp. , Campylobacter sp. at specific points throughout the treatment system in three different treatment plants
- The three treatment plants to be investigated over the course of this project are: 1) James River Treatment Plant (secondary treatment at design capacity of 20 MGD), 2) Virginia Initiative Plant (VIP, secondary treatment at design capacity of 40 MGD), and 3) Boat Harbor WWTP (secondary treatment at design capacity of 20 MGD)
- Nansemond WWTP will be evaluated for the last 2 months of the study.
- Incorporation of redundant methodological approaches and highly replicated sampling design
- Conduct dry weather assessment every month during dry weather (treatment flow does not exceed prior 3 day average)

- Use of advanced sampling approaches and state of the art digital PCR technology using standardize/optimized approaches to quantify all targets
- Sample collection will be an adaptive process. Samples could be distributed to priority time periods (i.e. bathing season, high use shellfish harvesting periods) dependent on initial data
- Analyses to be conducted by HRSD: *E. coli*, Fecal Coliforms, Enterococcus, coliphage by method 1602, norovirus genogroup I and genogroup II, adenovirus, HF183, human polyomavirus, free chlorine, combined chlorine, ammonia, relevant environmental parameters (salinity, turbidity, temperature, dissolved oxygen)

QA/QC

- Molecular samples ddPCR samples will be analyzed in triplicate. Culture samples will be analyzed in duplicate
- QA metric information will be included to allow for collaborators to use data
- 10% (minimum) to 20% (if deemed essential for project success by HRSD) of total samples will be used for sample splits with UNC Institute of Marine Sciences. UNC will analyze for adenovirus, and noroviruses (genogroup I and genogroup II)
- HRSD will maintain the project database to allow data use across applicable projects and collaborators
- HRSD must approve content before any data presentations

UNC Chapel Hill Project Costs

The UNC CH per sample cost for the described pathogen analysis is \$1838. The per sample cost includes the previously negotiated 25% indirect cost rate. There will be a minimum 10% of samples will be split with UNC for viral analyses. The contract between UNC Chapel Hill Institute of Marine Sciences (PI Rachel Noble) and HRSD will initially be crafted assuming the minimum 10% splits for virus samples, totaling \$36,760.00. As additional sampling and analyses are added to the project, supplemental funds will be added with the appropriate scope. Invoicing from UNC Chapel Hill to Hampton Roads Sanitation District will occur quarterly.

UNC Cost	Samples	Cost	Total
10% Virus Splits (200 study samples)	20	\$1,838.00	\$36,760.00

References cited:

1. Anderson KL, Whitlock JE, Harwood VJ 2005. Persistence and differential survival of fecal indicator bacteria in subtropical waters and sediments. *Appl. Environ. Microbiol.* 71:3041–3048
2. Baggi F, Demarta A, and R Peduzzi R. 2001. *Persistence of viral pathogens and bacteriophages during sewage treatment: lack of correlation with indicator bacteria.* *Res Microbiol* 152(8):743-75
3. Bofill-Mas S, Calgua B, Clemente-Casares P. et al., 2010. Quantification of human adenoviruses in European recreational waters. *Food Environ Virol* 2: 101–109.
4. Colford JM Jr., Wade TJ, Schiff KC, Wright CC, Griffith JF, Sandhu SK, et al. 2007. Water quality indicators and the risk of illness at beaches with nonpoint sources of fecal contamination. *Epidemiology* 18(1):27–35.
5. Espinosa, AC, Arias, CF, Sánchez-Colón S, & Mazari-Hiriart M. 2009. Comparative Study of Enteric Viruses, Coliphages and Indicator Bacteria for Evaluating Water Quality in a Tropical High-Altitude System. *Environmental Health*, 8:49. <http://dx.doi.org/10.1186/1476-069X-8-49>
6. Fong T., Lipp EK. 2005- Enteric Viruses of Humans and Animals in Aquatic Environments: Health Risks, Detection, and Potential Water Quality Assessment Tools- *Microbiology Molecular Biology Reviews*, 69:(2), 357-371. doi: 10.1128/mubr.69.2.357-371.2005
7. Grabow WOK, Vrey A, Uys M, De Villiers JC. 1998. Evaluation of the application of bacteriophages as indicators of water quality. Report 411/1/99. Pretoria, South Africa: Water Research Commission
8. Griffith JF, Weisberg SB, Arnold BF, Cao Y, Schiff KC, Colford JM. Epidemiologic evaluation of alternate microbial water quality monitoring indicators at three California, *In prep.*
9. Harwood VJ, Levine AD, Scott TM, Chivukula V, Lukasik J, Farrah SR & Rose JB .2005. Validity of the indicator organism paradigm for pathogen reduction in reclaimed water and public health protection. *Appl Environ Microbiol* 71: 3163–3170
10. Havelaar, A.H, Pot-Hogeboom WM, Furuse K, Pot R, and Hormann M P. 1990. Fspecific RNA bacteriophages and sensitive host strains in feces and wastewater of human and animal origin. *J. Appl. Bacteriol.* 69:30-37.
11. Hot, D.; Legeay O, Jacques J, Gantzer C, Caudrelier, Y, Guyard, K, Lange M, Andréoletti, L. 2003. Detection of somatic phages, infectious Enteroviruses and Enterovirus genomes as indicators of human enteric viral pollution in surface water. *Water Research*, 37:19:4703. [http://dx.doi.org/10.1016/S0043-1354\(03\)00439-1](http://dx.doi.org/10.1016/S0043-1354(03)00439-1).
12. Jiang, S., R. Noble and W. Chu. 2001. Human adenoviruses and coliphages in urban runoff-impacted coastal waters of Southern California. *Appl. Environ. Microbiol.* 67:179-184.
13. Jiang, S.C.; Chu, W.; & He, J.-W., 2007. Seasonal Detection of Human Viruses and Coliphage in Newport Bay, California. *Applied and Environmental Microbiology*, 73:20:6468. <http://dx.doi.org/10.1128/AEM.01370-07>.
14. Leclerc, H., S. Edberg, V. Pierzo, and J. M. Delattre. 2000. Bacteriophages as indicators of enteric viruses and public health risk in groundwaters. *J. Appl. Microbiol.* 88:5-21
15. Love, D.C., Lovelace, G.L., Money, E.S., Sobsey, M.D., 2010b. Microbial fecal indicator concentrations in water and their correlation to environmental parameters in nine geographically diverse estuaries. *Water Qual. Exp. Health* 2; 85–95
16. Method 1601: Detection of Male-specific (F+) and Somatic Coliphage in Water by Two-Step Enrichment Procedure. EPA821-R-01-030 Office of Water, Engineering and Analysis Division, Washington, DC April.

17. Method 1602: Detection of Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure. EPA 821-R-01-029. Office of Water, Engineering and Analysis Division, Washington, DC, April.
18. Ogorzaly L., Tissier A., Bertrand I., Maul A., Gantzer C. 2009 -Relationship between F-specific RNA phage genogroups, faecal pollution indicators and human adenoviruses in river water- *Water Research*, 43:(5), 1257-1264. doi: 10.1016/j.watres.2008.12.011
19. Skraber S, Gassilloud B, Gantzer C. 2004a. Comparison of coliforms and coliphages as tools for assessment of viral contamination in river water. *Appl Environ Microbiol.* 70:3644 – 3649
20. Soller, J.A., Schoen, M.E., Bartrand, T., Ravenscroft, J., Ashbolt, N.J., 2010b. Estimated human health risks from exposure to recreational waters impacted by human and nonhuman sources of faecal contamination. *Water Res.* 44 (16), 4674 – 4691
21. T.H. Jones, V. Muehlhauser, G. Thériault Comparison of ZetaPlus 60S and nitrocellulose membrane filters for the simultaneous concentration of F-RNA coliphages, *Porcine teschovirus* and porcine adenovirus from river water *J. Virol. Methods*, 206 (2014), pp. 5–11
22. Wyer MD, Kay D, Watkins J et al. (2010) Evaluating short-term changes in recreational water quality during a hydrograph event using a combination of microbial tracers, environmental microbiology, microbial source tracking and hydrological techniques: a case study in Southwest Wales, UK. *Water Res* 44: 4783–4795

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #3

AGENDA ITEM 5. - Newport News Transportation Center
Acquisition of Real Property – 600 Severn Road, Newport News, VA

- [Purchase Agreement](#)
- [Map](#)

PURCHASE AGREEMENT

THIS CONTRACT FOR PURCHASE AND SALE, made this _____ day of _____ 2017, by and among **HAMPTON ROADS SANITATION DISTRICT** (“HRSD”), a political subdivision of the Commonwealth of Virginia, located at 1434 Air Rail Avenue, Virginia Beach, Virginia 23455 (the “Buyer”), and **TWO-O-SEVEN COMPANY, L.C.**, whose mailing address is 458 Severn Road, #100, Newport News, Virginia, Mathews, Virginia 23602 (“Seller). Collectively, Buyer and Seller shall be referred to as the “Parties.”

AGREEMENT

WITNESSETH: That for and in consideration of the sum of **ONE HUNDRED, TWENTY-FIVE THOUSAND 00/100 DOLLARS (\$125,000.00)** (the “Purchase Price”), cash in hand to be paid to the Seller by the Buyer, the Seller agrees to sell and the Buyer agrees to buy the following property:

600 Severn Road-Parcel ID# 130000601 (“the Property”):

All that certain piece, parcel or tract of land, situate, lying and being in the City of Newport News, Virginia, containing 4.9 acres (+/-) square feet, as conveyed to William H. Ferguson, Jr. et als by Exchange Deed dated May 9, 1977, between Hornsby Oil Co. and William H. Ferguson, Jr., et als, recorded at Deed Boo 955, page 584 in the Clerk’s office for the Circuit Court for the City of Newport News, Virginia. (Acquisition Plat to be attached)

Together with all and singular the buildings and improvements, tenements, hereditaments, rights, privileges and appurtenances thereunto belonging or in anywise appertaining (the “Property”).

1. **EFFECTIVE DATE:** The “Effective Date” of this Contract shall be the date on which all parties have signed this Contract.
2. **INTENDED PURPOSE:** HRSD agrees to buy the real property comprised of 4.9 acres (+/-) known as 600 Severn Road, Newport News, Virginia (the “Property”). After Settlement and closing, HRSD intends to utilize property for relocation of existing infrastructure.
3. **PURCHASE PRICE FOR PROPERTY:** The purchase price (“Purchase Price”) for the Property is ONE HUNDRED, TWENTY-FIVE THOUSAND 00/100 DOLLARS (\$125,000.00); and shall be paid by HRSD to the Seller as follows:

\$	1,000.00	Deposit with the Contract (the “Deposit”)
\$	<u>124,000.00</u>	Remainder to be paid at Settlement by cash or certified funds
\$	125,000.00	Total Purchase Price
4. **DUE DILIGENCE AND INSPECTION PERIOD:** HRSD shall have a due diligence period of up to ninety (90) days after the Effective Date of the contract between Buyer and Seller to conduct such tests, studies, inspections, and other examinations (collectively “Examinations”) of the Property to as HRSD may elect in its sole judgment, to determine the

suitability of the Property for its purposes. Such Examinations may include, but shall not be limited to, appraisal, title examination, soil tests, borings, engineering studies, environmental studies, feasibility studies, surveys, drainage plans, utility services, and ability to obtain all required permits or licenses for the Intended Purpose of the property.

- A. During the Due Diligence Inspection Period, HRSD, its employees, agents, and representatives shall have the right to enter upon the Property at all times to conduct Examinations, subject, however, to providing Seller with prior notice and an opportunity to be present.
- B. In connection with the right to enter upon the Property, HRSD agrees (i) to restore the Property to its prior condition after the performance of any such inspections or tests and (ii) to indemnify, defend and hold the Seller harmless from and against all costs, losses, damages, and expenses, including reasonable attorneys' fees, arising out of the activities of HRSD and/or its employees, agents and representatives on the Property.
- C. HRSD shall obtain a Phase I Environmental Assessment of the Property, a real estate appraisal, and title examination during the Due Diligence Inspection Period, the cost of which shall be paid by HRSD.
- D. If HRSD cannot obtain permits/approval, for the Intended Purpose, HRSD may terminate this Contract by giving written notice to the Seller prior to 5:00 p.m. on the last day of the Due Diligence Inspection Period, in which event the Nonrefundable Deposit shall be retained by Seller and neither party will have any further liability to the other.
- E. Seller agrees to fully cooperate with HRSD to join in any and all application for licenses, permits, approvals, and consents which may be necessary or desirable.

5. CONTINGENCIES: The purchase contemplated in this Agreement is contingent upon the occurrence of the following items. In the event that either one of these events does not occur, then this Contract shall become null and void, the Nonrefundable Deposit (\$1,000) shall be retained by the Seller, and neither party shall have any further liability to the other.

- A. Acceptable Environmental Phase I report.
- B. Conveyance of clear title.
- C. Permits/approvals for Intended Purpose.
- D. The ability to obtain an Owner's Title Insurance Commitment satisfactory to the Buyer.
- E. Each transaction is subject to compliance with state and city statutes, code provisions, and other governing regulations as well as final approval by the HRSD Commission Board.

6. SETTLEMENT/POSSESSION OF THE PROPERTY: Settlement on the purchase of the Property by HRSD shall be made at a location selected by HRSD within thirty (30) days after the contingencies set forth in Section 4 of this Contract have been met. Time is of the

essence. Possession of the Property shall be given to HRSD as such Settlement and Seller shall execute and deliver to HRSD the following:

- A. A duly executed General Warranty Deed conveying the Property to HRSD.
 - B. An owner's affidavit as customarily required by title companies pertaining to mechanic's liens and the absence of tenants in occupancy.
 - C. An owner's affidavit that is acceptable to the title company in order to provide standard "gap" coverage.
 - D. Seller's affidavit that Seller is not a foreign person for the purposes of Section 1445 of the Internal Revenue Code.
 - E. Such additional documents as HRSD or HRSD's title company may reasonably require in order to consummate this transaction and fully comply with this Contract.
7. **EXPENSES:** The Seller shall pay only the expense of preparing the deed, the recordation tax applicable to grantors and Seller's attorney's fees (if applicable). Except as otherwise agreed herein, all other expenses incurred by the Buyer in connection with the Buyer's purchase, including (without limitation), title examination, surveys, appraisal fees, preparation of deeds of trust and notes, title insurance premiums, recording costs and fees of the Buyer's attorney, shall be borne by the Buyer.
8. **ESCROW/PRORATION:** All taxes, storm water fees, utilities, insurance, and other periodic charges, if any, shall be prorated as of the date of settlement.
9. **TITLE:** At settlement, Seller shall convey marketable and insurable (at normal rates) fee simple title to the Property and a General Warranty Deed to the Buyer, free of all encumbrances, tenancies, and liens (except the lien for current taxes), but subject to all covenants, restrictions, easements, and rights-of-way currently of record or apparent on the ground which do not render the title unmarketable. If the examination reveals a title defect of a character that can be remedied by legal action or otherwise within a reasonable time, the Buyer shall give written notice of the same to the Seller. The Seller shall have the option to either (i) terminate this Contract, or (ii) take such action as is necessary to cure such defect. If the defect is not cured within ninety (90) days after the Seller receives notice of the defect, then either party may terminate this Contract at the expiration of such ninety (90) day period. In the event that the Contract is terminated under this paragraph, the Deposit shall be refunded to HRSD and neither party shall have any further liability to any other. The parties agree that the date of Settlement shall be extended if necessary to enable the Seller to cure any title defect, but not for more than ninety (90) days, unless extended by written consents of both the Seller and the Buyer.
- Notwithstanding any other provision of the Contract, HRSD shall examine the title to the Property within thirty (30) days after the Effective Date and unless HRSD notifies the Seller within such thirty (30) day period, HRSD shall be deemed to accept the title to the Property, in its condition as of the Effective Date.
10. **MECHANICS LIENS:** The Seller shall deliver to the Buyer at Settlement an affidavit signed by the Seller that no labor or materials have been furnished to the Property within the

statutory period for the filing of mechanics' or materialmen's liens against the property. If labor or materials have been furnished during the statutory period, the Seller shall deliver to the Buyer an affidavit signed by the Seller furnishing the labor or materials that the costs thereof have been paid.

11. **RISK OF LOSS:** All risk of loss or damage to the Property by fire, windstorm, casualty, or other causes are assumed by the Seller until Settlement.
12. **CONDEMNATION:** If any authority having the right of eminent domain commences negotiations with the Seller or commences legal action against the Seller for the damaging, taking or acquiring of all or a material part of the property, either temporarily or permanently, by condemnation or by exercise of the right of eminent domain, the Seller shall immediately give notice of the same to the Buyer, together with all information and documentation received by the Seller regarding the same. Upon the occurrence of any of the foregoing events, the Buyer shall have the right, at its option, to terminate this Contract by giving notice thereof to the Seller on or before the date of Settlement, in which event the Deposit shall be returned to HRSD and neither party shall have any liability to any other. If the Buyer does not elect to terminate this Contract, the purchase price for the property shall be reduced by the total of any awards, settlement proceeds or other compensation received by the Seller at or prior to Settlement with respect to any damage, taking or acquisition. The risk of condemnation or eminent domain shall be borne by the Seller until Settlement. In the event of any negotiations with any authority regarding the payment of any awards or other sums or regarding any settlement on account of any damage, taking, or acquisition through condemnation or eminent domain, the Seller will inform the Buyer of all such negotiations of which the Seller has notice and will permit the Buyer to take part therein.
13. **FLOOD ZONE:** Buyer is aware that the property it will purchase either partially or wholly may lie in a Flood Zone which may require the Buyer to purchase flood insurance.
14. **ENVIRONMENTAL DISCLOSURE:** Buyer is aware that the uses and development opportunities of the property it will purchase may be limited if such property is covered by the Chesapeake Bay Preservation Act, the Clean Water Act, the Virginia Water Control Act or any other federal, state, or local regulations concerning the environment.
15. **DEFAULT:** If either party defaults under this Contract, the non-defaulting party shall have the right to compel specific performance and shall have all additional rights and remedies available to the non-defaulting party and the non-defaulting party shall be entitled to recover its reasonable attorney's fees, expert fees, and costs.
16. **SURVIVAL:** Unless otherwise indicated, the representations, warranties, covenants, and agreements contained in this Contract shall survive Settlement and delivery and recordation of the deeds provided for herein.

17. **AGENTS AND BROKERS:** Buyer and Seller authorize and direct the settlement agent to disburse to listing company from the settlement proceeds their respective portions of the brokerage fee payable as a result of this sale and closing under this Contract. Buyer and Seller authorize and direct the settlement agent to provide to each of Seller, Buyer, and Listing Company a copy of the unified settlement statement for the transaction.
18. **NOTICES:** Any notice to be given to any party as herein provided shall be deemed to be given when hand delivered, one (1) day after being sent by national courier deliver service (e.g. Federal Express or United Parcel Service), or three (3) days after being duly posted by U.S. registered or certified mail, return receipt request, if sent to the addresses listed on the signature page of this Contract. Any party may change the place designated for the giving of such notices by written notice duly and timely given to all other parties.
19. **ASSIGNMENT:** This Contract may only be assigned by a party upon the written consent of the other party, which consent shall not be unreasonably withheld, conditioned, or delayed. Within a reasonable time after such assignment, the name, address, and telephone number of the assignee shall be provided to the other party in writing. Furthermore, all provisions of this Contract shall be binding on a party's assignee as well as on the original assignor party.
20. **BINDING EFFECT:** All the provisions, conditions, and agreements of this Contract shall be binding upon and inure to the benefit of the legal representatives, heirs, successors, and assigns of the parties.
21. **EXCLUSIVITY:** The parties to the Contract agree that during the time this contract is outstanding and in full force and effect, the Seller will not accept offers or bids for the purchase of the subject property other than with the current listed Buyer, nor negotiate for the offer or acceptance of offers to buy the subject property, and should any unsolicited offer or bid for the purchase of the subject property be received by Seller, Seller shall so inform the sender that the property is under contract and Buyer is not able to accept bid or offers of purchase for the subject property.
22. **CAPTIONS:** The headings appearing in each paragraph of this Contract are intended only for convenience or reference, and are not to be considered in construing this instrument or any paragraph hereof.
23. **GOVERNING LAW:** This Contract shall be governed, interpreted, and construed in accordance with the laws of the Commonwealth of Virginia.
24. **WAIVER:** If on any occasion either party waives any term or condition of this Contract such waiver must be in writing and shall not be construed as a continuing waiver.
25. **SEVERABILITY:** If any provision of this Contract or the application thereof to any person or circumstance is determined to be invalid or unenforceable to any extent, then the remainder of this Contract or the application of such provision to other persons or

circumstances shall be and remain valid and enforceable to the fullest extent permitted by law.

26. **ATTORNEYS FEES AND COSTS:** In the event a dispute arises between the parties under this Contract, the non-prevailing party in such dispute shall pay the prevailing party's costs and expenses, including, but not limited to, its reasonable attorney's fees and expert fees.
27. **COUNTERPARTS AND FACISMILES:** This Contract may be entered into in multiple counterparts, all of which taken together shall constitute one complete agreement. To facilitate execution and delivery of this Contract, the parties may execute and exchange counterparts of the Contact by facsimile, email or other electronic transmission (collectively "Electronic Signature"). All parties agree that Electronic Signatures shall have the same effect as original signatures and shall be considered legally binding upon the parties. The signature or Electronic Signature of any party to any counterpart may be appended to any other counterpart All counterparts so executed shall collectively constitute one agreement, binding on all of the parties, notwithstanding the fact that all the parties have not signed the same original or the same counterpart.
28. **COMPLETE AGREEMENT:** This Contract constitutes the entire agreement and understanding between the parties; all prior negotiations between them have been merged with this Contract; there are no understandings, representations, warranties, or covenants, either oral or written, other than those set forth in this Contract; and no provision of this Contract shall be amended, altered, or waived in any manner unless such amendment, alteration, or waiver is in writing and signed by all parties.
29. **LIMITATION OF OFFER:** This Contract shall terminate at 5:00 p.m. on the tenth (10th) day after the date of this Contract, if not executed by both parties and delivered to both parties prior to such date and time.

WITNESS THE FOLLOWING SIGNATURES AND SEALS. ALL PARTIES HEREBY ACKNOWLEDGE RECEIPT OF A COPY OF THIS CONTRACT.

BUYER:

HAMPTON ROADS SANITATION DISTRICT (HRSD)

By: _____ Date: _____

Name: Edward G. Henifin, P.E.

Title: General Manager

Contact Address: 1434 Air Rail Avenue, Virginia Beach, Virginia 23455

SELLER(S):

TWO-O-SEVEN COMPANY, L.C.

BY _____

COMMONWEALTH OF VIRGINIA

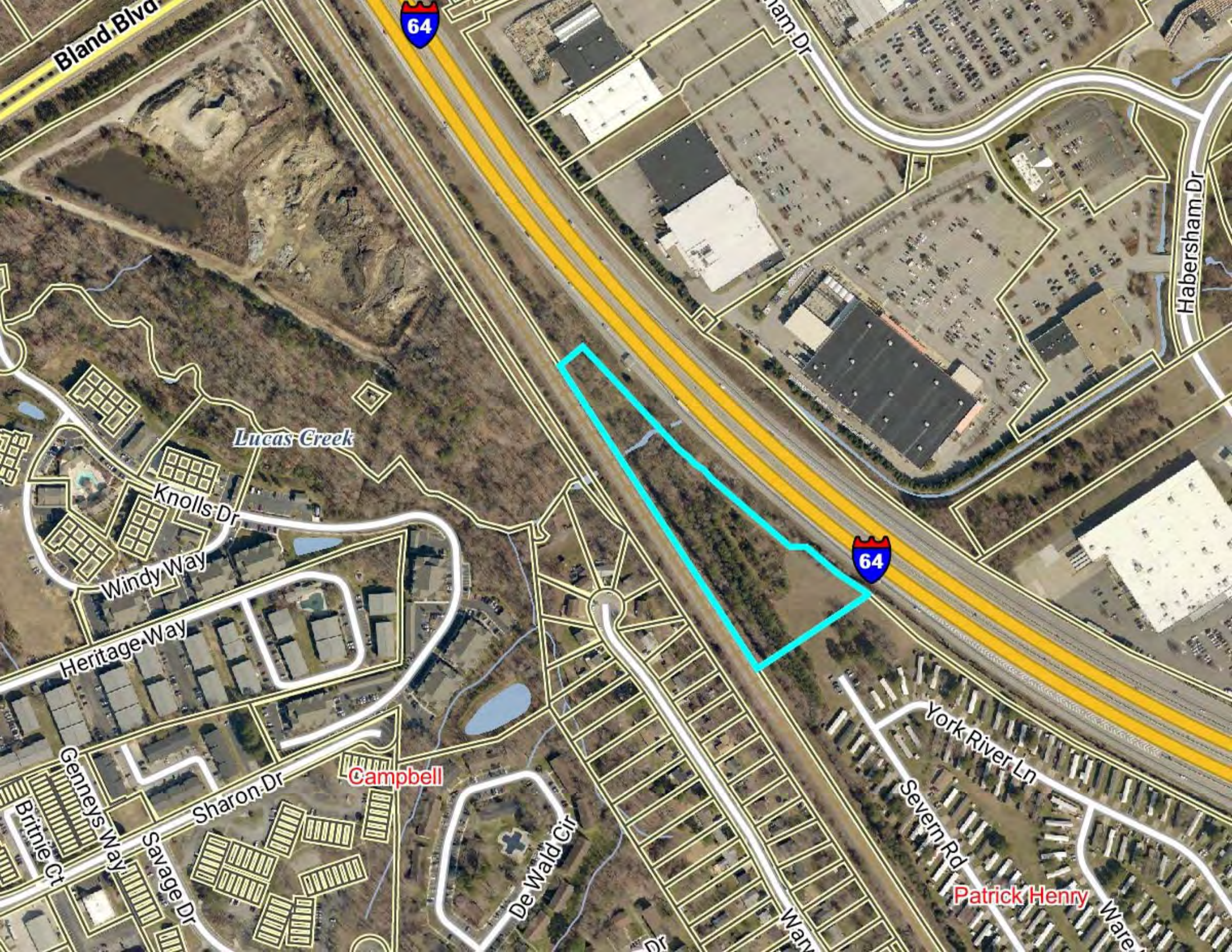
City/County of _____ to-wit:

The foregoing instrument was acknowledged before me this ___ day of _____, 2017, by _____, _____ of TWO-O-SEVEN COMPANY, L.C.

Notary Public Registration No. _____

My commission expires: _____

Receipt of deposit per paragraph 3 above is hereby acknowledged.
_____/_____



64

64

Bland Blvd

Lucas Creek

Knolls Dr

Windy Way

Heritage Way

Genneys Way

Sharon Dr

Campbell

De Wald Cir

York River Ln

Severn Rd

Patrick Henry

Habersham Dr

Britnie Ct

Savage Dr

Way

Ware

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #4

AGENDA ITEM 7. - Regionalization of Wet Weather Capacity
Memorandum of Agreement Amendment

- [MOA February 26, 2014](#)
- [MOA Amendment](#)

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement (“Agreement”) is entered into on this 26th day of February, 2014, by and among the Hampton Roads Sanitation District (“HRSD”); and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Town of Smithfield; and the counties of Gloucester, Isle of Wight, and York; and the James City Service Authority (each a “Locality” and collectively, the “Localities”).

WHEREAS, HRSD provides wastewater transmission and treatment services for the Localities;

WHEREAS, the Localities individually own and operate sanitary sewer collection systems, which collect sewage within their individual jurisdictional boundaries and deliver it to the HRSD sewer system for conveyance and treatment;

WHEREAS, to address regional wet weather sewer capacity requirements, on February 23, 2010, HRSD, the Virginia Department of Environmental Quality and the United States Environmental Protection Agency entered into a Federal Consent Decree;

WHEREAS, the Federal Consent Decree requires, among other things, that HRSD work in consultation with the Localities to develop a Regional Wet Weather Management Plan (“RWWMP”) that will ensure adequate wet weather sewer capacity in HRSD’s portion of the regional sewer system;

WHEREAS, on June 25, 2012, HRSD, the Localities (excluding Norfolk), and the Commonwealth of Virginia executed an Amendment to the September 26, 2007 Special Order By Consent that requires the Localities (excluding Norfolk) and HRSD to, among other things, develop a RWWMP identical to the plan called for in the Federal Consent Decree;

WHEREAS, on March 17, 2005, HRSD, Norfolk and the Commonwealth of Virginia executed a second phase to the December 17, 2001 Special Order by Consent (collectively, the “Norfolk/HRSD Consent Orders”) that required HRSD and Norfolk, to among other things, address wet weather issues in the City of Norfolk with a Long Term Control Plan requiring a minimum annual investment in sewer infrastructure;

WHEREAS, pursuant to the Norfolk/HRSD Consent Orders, the City of Norfolk has made significant financial investments of over \$100 million, though additional capacity-related investments in the Norfolk sewer system are expected as part of further implementation of the Norfolk/HRSD Consent Order (the “Norfolk/HRSD Consent Order Capacity Projects”);

WHEREAS, substantial additional wet weather capacity-related investments in the Norfolk sewer system will still be required to achieve the regional wet weather management capacity requirements in the approved RWWMP (the “Norfolk System RWWMP Projects”);

WHEREAS, during the ongoing planning for the RWWMP, HRSD and the Localities conducted a study to determine if HRSD ownership of the Localities' sewer systems would provide significant capital and operational cost savings to the region's ratepayers under the RWWMP;

WHEREAS, the regional study was completed in the summer of 2013 and estimated that HRSD ownership of the regional sewers could potentially save the overall region's ratepayers more than one billion dollars over a 30-year period in capital and operation/maintenance costs as compared to a scenario where HRSD and the Localities independently seek to address wet weather capacity needs, although the amount of savings varied significantly among the Localities;

WHEREAS, full regionalization of the Localities' sewer systems is unlikely at this time for a variety of reasons;

WHEREAS, a significant portion of the estimated savings from full regionalization can still be obtained for the benefit of the region's ratepayers if HRSD agrees to take sole responsibility for financing and implementing the approved RWWMP across the entire regional sewer system; and

WHEREAS, if HRSD assumes sole responsibility for funding and implementing the approved RWWMP, HRSD will have to raise its regional rates in order to fund the cost of the approved RWWMP, and each Locality which is a party hereto acknowledges that such rate increases will be necessary in order to achieve the more affordable and cost-effective RWWMP (which each Locality will have the opportunity to provide input into and to challenge if it believes the RWWMP is not an affordable and cost-effective approach);

NOW, THEREFORE, in consideration of the premises, mutual covenants and obligations contained herein, HRSD and the Localities do hereby enter into this Agreement for the purpose of defining the roles, responsibilities, and obligations of HRSD and the Localities for the development, financing, and implementation of the RWWMP and the assurance of adequate wet weather sewer capacity in the Regional Sanitary Sewer System in the future.

A. DEFINITIONS

"2007 MOA" means the Memorandum of Agreement dated June 28, 2007, by and among HRSD; the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Town of Smithfield; the counties of Gloucester, Isle of Wight, and York; and the James City Service Authority.

"Board" means the State Water Control Board, a permanent citizens body of the Commonwealth of Virginia as described in Virginia Code §§ 62.1-44.7 and 10.1-1184.

"DEQ" means the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Virginia Code §10.1-1183.

"EPA" means the United States Environmental Protection Agency.

“Federal Consent Decree” means the Amended Consent Decree filed in the United States District Court for the Eastern District of Virginia on February 23, 2010 (Civil Action No. 2:09cv-481), and any subsequent amendments thereto.

“Party” or “Parties” means one or more signatories to this Agreement.

“Regional Sanitary Sewer System” means the collective sanitary sewer systems owned and operated by HRSD and the Localities, including gravity sewer lines, manholes, pump stations, lift stations, pressure reducing stations, force mains, wastewater treatment plants, and all associated appurtenances.

“Special Order By Consent” means the special order by consent dated September 26, 2007, and any subsequent amendments thereto, by and among the Board and HRSD; the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Town of Smithfield; the counties of Gloucester, Isle of Wight, and York; and the James City Service Authority.

“Significant Defect” means a physical condition in the sanitary sewer system owned or operated by a Locality, including: (i) existing or imminent structural failures, cave-ins, and similar defects and (ii) significant sources of inflow and infiltration (including but not limited to missing and/or damaged public clean-outs, missing manhole inserts, direct storm water connections, and unsealed manhole pipe penetrations).

“Warranties” means any warranties and/or rights under bonds or similar instruments securing or assuring the quality, adequacy or timeliness of the design, materials, installation or construction of any improvements conveyed by HRSD to a Locality as contemplated in this Agreement.

B. ROLES AND RESPONSIBILITIES

1. HRSD agrees to:

a. In consultation with the Localities develop a reasonably affordable and cost-effective RWWMP, including the Norfolk System RWWMP Projects, in accordance with this Agreement and Paragraph 10 of the Federal Consent Decree, to achieve the wet weather capacity requirements of the Federal Consent Decree for the affected portions of the Regional Sanitary Sewer System including the Norfolk sewer system;

b. Implement the approved RWWMP in accordance with the approved RWWMP long-term schedule;

c. Design and construct all RWWMP projects in accordance with HRSD Standards and Preferences, the applicable portions of the Hampton Roads Planning District Commission Regional Construction Standards, and Locality preferences, policies, or guidelines with respect to operation and maintenance issues where such preferences, policies, or guidelines have been established and are broadly applied by the Locality;

d. Fully fund implementation of the RWWMP regardless of asset

ownership through a regional HRSD rate applied equally across all HRSD accounts in the Localities;

e. Upon full implementation of the applicable RWWMP facilities for each HRSD treatment plant service area and the successful completion of the Post-RWWMP Performance Assessment for that service area, HRSD shall be responsible for ensuring and maintaining adequate wet weather capacity for those portions of the Regional Sanitary Sewer System in that service area, whether owned or operated by HRSD or a Locality, up to the applicable capacity level defined in the approved RWWMP;

f. Maintain a flow monitoring program in accordance with the Federal Consent Decree;

g. Investigate, in cooperation with affected Localities, any sanitary sewer overflow where system capacity is reasonably suspected of being a contributing cause or the sole cause of such overflow to determine the actual cause or causes (in support of such inquiry, HRSD shall make available to Localities in a timely manner, upon request, any potentially relevant information it may have) and the appropriate response;

h. Provide to the applicable Locality complete copies of record drawings of improvements constructed by HRSD within that Locality pursuant to the RWWMP within thirty (30) days of completion or amendment of such drawings;

i. Convey to each Locality improvements which HRSD may install or construct pursuant to the approved RWWMP, for addition or modification to the Locality's sewer system;

j. Negotiate and obtain customary commercial Warranties for pavement and other project improvements in Locality systems and enforce such Warranties during warranty periods as necessary, provided that following such warranty period, any assets conveyed to a Locality are the sole responsibility of such Locality;

k. Make available to the Localities information HRSD uses in the development and implementation of the RWWMP and any other relevant information HRSD may have;

l. Comply with applicable Locality ordinances and other laws and regulations in the planning, design, and implementation of the RWWMP;

m. Assume regulatory liability for wet weather overflows occurring upon completion of the RWWMP implementation (including the Post RWWMP Implementation Performance Assessment) and which are determined to result from lack of adequate capacity as defined in the RWWMP for such sanitary sewer overflows;

n. Reimburse, to the extent permitted by law, any Locality for reasonable claims paid to any third-party resulting from wet weather overflows occurring upon completion of the RWWMP implementation (including the Post RWWMP Implementation Performance Assessment) and which are determined to result from lack of adequate

capacity as defined in the RWWMP for such sanitary sewer overflows, provided that HRSD retains the right to assert governmental immunity as allowed by law if HRSD determines a claim is unreasonable or due to causes beyond HRSD's control;

o. Provide staff and/or consultant resources to coordinate development and implementation of the approved RWWMP as it applies to each Locality in accordance with the approved RWWMP schedule;

p. Issue in a timely manner and in accordance with established processes any approvals, and timely execute any documents, necessary for implementation by a Locality of improvements or management, operations or maintenance measures as required by the RWWMP or contemplated by the Special Order by Consent, and not unreasonably withhold, condition or delay such approvals or execution of documents;

q. Support the modification of the Special Order by Consent between DEQ, HRSD and the Localities consistent with the changes to the Federal Consent Decree;

r. Consult with the Localities as necessary to facilitate the timely implementation of the approved RWWMP; and

s. Cooperate with Localities when requested to incorporate other locally funded infrastructure improvements as part of any RWWMP project, provided that HRSD can do so consistent with the approved RWWMP schedule and HRSD's project-related costs do not increase by more than ten percent (10%) (a Locality may pay any amount of additional HRSD cost above the 10% threshold in order to satisfy this condition).

2. Each Locality agrees to:

a. Maintain and operate Locality-owned collection system assets and any improvements constructed by HRSD in Locality-owned assets as part of the RWWMP. This obligation shall be performed in accordance with any approved Management, Operations, and Maintenance program and industry accepted practices relating to sewer inspection, Sewer System Evaluation Survey work and repair of Significant Defects (not scheduled to be addressed by the RWWMP within a reasonable period of time but excluding those for which HRSD is responsible under Section B.1.j above);

b. Provide full access to data, information and Locality-owned assets necessary for timely and cost-effective development of the RWWMP. This includes, but is not limited to, flow monitoring data, calibrated hydrologic models, long-term simulations, SSES data and results, Rehabilitation Plans and Preliminary Capacity Assessments including hydraulic models and related calculations;

c. Maintain and calibrate the existing locality-owned flow monitoring equipment (previously required by the Regional Technical Standards) and provide data at regular intervals in a mutually acceptable form, throughout the development of the RWWMP;

d. Provide staff and/or consultant resources to coordinate development and implementation of the approved RWWMP as it applies to each Locality in accordance with the approved RWWMP schedule, subject to appropriation, provided that in the event adequate resources are not appropriated, HRSD shall be relieved of its obligations under Section B.1.a with respect to consultation with the Localities and Section B.1.q of this Agreement;

e. Timely issue any Locality administrative permits in accordance with established processes and, subject to applicable law, timely execute any documents, as necessary for implementation of RWWMP-related improvements in that Locality, and not unreasonably withhold, condition or delay such permits or execution of documents;

f. Accommodate reasonable contractor requests for standard work hours and maintenance of traffic in accordance with existing Locality policies during implementation of RWWMP improvements within the Locality;

g. Support the modification of the September 26, 2007 Special Order by Consent, as amended, between DEQ, HRSD and the Localities consistent with the changes to the Federal Consent Decree;

h. Upon HRSD's request, provide a written letter of support for a modification of HRSD's Federal Consent Decree to establish HRSD's responsibilities consistent with this Agreement;

i. Cooperate with HRSD and the other Localities as necessary to facilitate the timely implementation of the approved RWWMP; and

j. Provide timely notice of and investigate, in cooperation with HRSD, all capacity-related sanitary sewer overflows.

C. REMEDIES AND RESERVATIONS OF RIGHTS

1. If any Party shall fail to perform or observe any of the material terms, conditions, or provisions of this Agreement applicable to it, and said failure is not rectified or cured within thirty (30) days after receipt of written notice thereof from another Party, then the defaulting Party shall be deemed in breach of this Agreement; provided, however, that no Party shall have a right to issue a notice of default pursuant to this Section C.1 until the dispute resolution procedures set forth in Section C.2 below have been exhausted. The Parties agree that, in the event of a material breach of this Agreement, a non-defaulting Party, which is or would be harmed by the breach, may seek injunctive relief or specific performance of the defaulting Party's obligations without the requirement to post a bond. The Parties acknowledge that each Party's performance of its material obligations is valuable and unique and that, for purposes of allowing the non-defaulting Party to seek injunctive relief, the failure of a Party to perform its material obligations hereunder may result in irreparable injury to the other Parties. Nothing in this Agreement shall be deemed to modify, alter, or otherwise affect such other rights and remedies as may be available to the Parties under applicable law or equity.

2. If any dispute arises with respect to the alleged failure of any Party to perform or observe any of the material terms, conditions, or provisions of this Agreement applicable to it, as a condition precedent to instituting a formal action in a court with competent jurisdiction, the parties shall first attempt to resolve the dispute through the dispute resolution procedures contained in this Section C.2. A Party may initiate the dispute resolution procedures of this Section C.2 by providing to the other Parties to the dispute written notice of the existence and nature of the dispute. Within thirty (30) days of such notice, the Parties to the dispute shall meet and attempt in good faith to resolve the dispute. Upon the request of any Party to the dispute, the Parties to the dispute shall participate in non-binding mediation. The mediator shall be selected by mutual agreement of the Parties to the dispute, and the cost of the mediator shall be shared equally by those Parties engaged in the mediation. If the dispute cannot be resolved within sixty (60) days after receipt of written notice of the dispute or any reasonable extension as may be mutually agreed upon by the Parties, then any Party to the dispute may elect to end dispute resolution by providing written notice of such election to the other Parties to the dispute, in which case the dispute resolution procedures shall be deemed to have been exhausted. The dispute resolution procedures may also be deemed exhausted by written agreement of all the Parties to the dispute.

3. Nothing herein shall be construed as or otherwise constitute a waiver or release by any Party of any right, power, immunity, or standing of that Party that may exist pursuant to applicable law or regulation, including, without limitation, such right or standing to appeal or seek review of any case decision or other reviewable determination of the Board, DEQ, EPA, a Court having jurisdiction over the dispute, or any other agency or governmental body related to the matters addressed in this Agreement, the Federal Consent Decree, or the Special Order By Consent.

D. MISCELLANEOUS

1. Amendments to Agreement. Amendments to this Agreement must be in writing and signed by all the Parties.

2. Entire Agreement. This Agreement contains the entire agreement among the Parties with respect to the subject matter hereof and supersedes all prior agreements, written or oral, with respect thereto, including the 2007 MOA.

3. Severability. If any provision of this Agreement is found to be unenforceable, the remainder of this Agreement shall remain in full force and effect.

4. Authority. The Parties represent that they have the authority to enter into this Agreement and that the individuals signing this Agreement on their behalf have the requisite power and authority to bind the Parties to its terms and conditions. This Agreement shall apply to, and be binding upon the Parties, their elected officials, officers, agents, employees, successors, and assigns.

5. Reservation. Except as expressly provided herein, nothing in this Agreement shall be construed to limit or otherwise affect the authority, rights, or responsibilities of the Parties.

6. Notices and Written Communications. All notices and written communication pursuant to this Agreement shall be submitted to the recipients listed in Attachment A. A Party may change its designated notice recipient by so informing all other Parties in writing.

7. Effective Date. This Agreement shall be effective and binding upon its execution by all Parties and shall continue in effect until terminated in accordance with Section D.11.

8. Governing Law. This Agreement shall be governed and construed in accordance with the laws of the Commonwealth of Virginia, without regard to the conflict of laws and rules thereof.

9. Force Majeure. No Party shall be responsible for its failure to fulfill an obligation pursuant to this Agreement to the extent that such failure is due to acts of God; strikes; war or terrorism; the actions of a third party; the actions of another Party; lockouts; or other events not reasonably within the control of the Party claiming force majeure. A Party experiencing a force majeure event that prevents fulfillment of a material obligation hereunder shall (a) give the other Parties prompt written notice describing the particulars of the event; (b) suspend performance only to the extent and for the duration that is reasonably required by the force majeure event; (c) use reasonable efforts to overcome or mitigate the effects of such occurrence; and (d) promptly resume performance of the affected obligation if and when such Party is able to do so.

10. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original as against any Party whose signature appears thereon, and all of which shall together constitute one and the same instrument.

11. Termination. This Agreement shall terminate (a) if the Motion to Amend the Federal Consent Decree contemplated herein is either not filed with the Court by May 31, 2014 or is filed but denied by the Court; (b) if the Federal Consent Decree is not amended as contemplated herein by August 31, 2014; (c) if the State Special Order by Consent is not, by December 31, 2014, either (1) rescinded in its entirety or (2) amended to relieve the Localities of any obligation to develop, fund, and implement the Regional Wet Weather Management Plan; or (d) upon the written agreement of all Parties. If this Agreement is terminated for any reason, except upon the agreement of HRSD, then HRSD reserves the right to assert a force majeure under the Federal Consent Decree.

12. Not for Benefit of Third Parties. This Agreement and each and every provision hereof is for the exclusive benefit of the Parties and not for the benefit of any third party.

13. Binding Effect. This Agreement shall inure to the benefit of the Parties and shall, to the maximum extent permitted by law, be binding on the Parties and their successors and assigns.

[REST OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, HRSD has caused this Agreement to be executed by their duly authorized official as shown below.

Date: 2/26/2014

By: 
General Manager

Commonwealth of Virginia
City/County of Virginia Beach

The foregoing instrument was acknowledged before me this 26th day of February, 2014 by Ted Henifin, General Manager of HRSD, on behalf of HRSD.


Notary Public

My commission expires: August 31, 2017



LIST OF SIGNATORIES

CITY OF CHESAPEAKE

GLOUCESTER COUNTY

CITY OF HAMPTON

ISLE OF WIGHT COUNTY

JAMES CITY COUNTY

CITY OF NEWPORT NEWS

CITY OF NORFOLK

CITY OF POQUOSON

CITY OF PORTSMOUTH

CITY OF SUFFOLK

CITY OF VIRGINIA BEACH

CITY OF WILLIAMSBURG

YORK COUNTY

TOWN OF SMITHFIELD

HAMPTON ROADS SANITATION DISTRICT

This listing of participants is followed by the signature page to be completed by each party.

IN WITNESS WHEREOF, the Party has caused this Agreement to be executed by their duly authorized officials as shown below.

By: _____

Date: _____

Locality: _____

Date: _____

Attest: _____

ATTACHMENT A

List of Individuals to Receive Notices Pursuant to Paragraph D.6:

[List Notice Parties]

**FIRST AMENDMENT TO
MEMORANDUM OF AGREEMENT**

This First Amendment modifies the Memorandum of Agreement (“Agreement”) entered into on the 10th day of March, 2014, by and among the Hampton Roads Sanitation District (“HRSD”); and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the Town of Smithfield; and the counties of Gloucester, Isle of Wight, and York; and the James City Service Authority (each a “Locality” and collectively, the “Localities”).

WHEREAS, the HRSD and the Localities entered into the Agreement for the purpose of realizing the substantial savings for all parties, collectively, that would be obtained by HRSD assuming sole responsibility for financing and implementing an approved Regional Wet Weather Management Plan (“RWWMP”) across the entire region;

WHEREAS, the Agreement sets forth the respective responsibilities of HRSD and the Localities regarding the construction, expansion, operation, and maintenance of the Regional Sanitary Sewer Systems, including that the Localities would remain responsible for conducting the operation and maintenance of their respective systems in accordance with an approved Management, Operations, and Maintenance program and HRSD would assume responsibility for developing, financing, and implementing the RWWMP in the Regional Sanitary Sewer System;

WHEREAS, upon the completion of the RWWMP implementation, HRSD agreed to assume the Localities’ regulatory liability for any wet weather overflows that are determined to result from lack of adequate capacity as defined in the approved RWWMP;

WHEREAS, HRSD is presently undertaking the Sustainable Water Initiative for Tomorrow (“SWIFT”) project, which entails treating water that would otherwise be discharged to the Chesapeake Bay watershed to drinking water standards and adding it to the Potomac aquifer, thereby providing important human health and environment benefits to the region, including reducing the amounts of nutrients and sediment discharged to the Chesapeake Bay, replenishing the region’s stressed groundwater supplies, and slowing or reversing land subsidence related to aquifer compaction;

WHEREAS, on February 21, 2017, the Federal Consent Decree was amended to authorize HRSD to incorporate integrated planning elements in the RWWMP that allow for the prioritization of the SWIFT project over wet weather capacity projects provided that doing so will provide greater human health or environmental benefits to the region;

WHEREAS, on September 29, 2017, HRSD submitted an RWWMP to the U.S. Environmental Protection Agency (“EPA”) and Virginia Department of Environmental Protection (“DEQ”), which prioritizes the implementation of the SWIFT project, in concert with certain high priority wet weather capacity projects, and, consistent with prudent adaptive management principles, reserves the development of a plan for any additional wet weather capacity actions that may be necessary for a Final Measures Plan to be submitted to EPA and DEQ in 2030;

WHEREAS, HRSD and the Localities desire to amend the Agreement to better conform to the RWWMP dated September 29, 2017 by accelerating the date HRSD will assume regulatory liability for wet weather overflows from the Regional Sanitary Sewer System and reaffirming the Localities' continuing obligation to properly maintain their respective systems.

NOW, THEREFORE, pursuant to Section D.1 of the Agreement, HRSD and the Localities do hereby agree to amend the Agreement as follows.

A. REVISIONS TO THE AGREEMENT

1. The following definition is inserted in Section A:

“Wet Weather Overflows” means capacity-related overflows from the Regional Sanitary Sewer System that result from unusually high flows caused by infiltration and/or inflow and not attributed to mechanical or electrical failure, third-party damage, extreme weather events, or similar conditions beyond the hydraulic capacity of the Regional Sanitary Sewer System. Capacity-related overflows specifically exclude those caused in whole or in part by build-ups of debris, sediment, and/or grease that reduce the hydraulic capacity of the system and that can be mitigated through proper operations and maintenance of the system.

2. Subsections e., m., and n. of Section B.1 are amended as follows:

e. Upon approval by the United States District Court for the Eastern District of Virginia (the “Court”) of an amendment to the Federal Consent Decree to adopt the RWWMP approved by EPA and DEQ ~~EPA full implementation of the applicable RWWMP facilities for each HRSD treatment plant service area and the successful completion of the Post RWWMP Performance Assessment for that service area,~~ HRSD shall be responsible for wet weather capacity for those portions of the Regional Sanitary Sewer System in that service area, whether owned or operated by HRSD or a Locality, as further specified in this Section B.1 up to the applicable capacity level defined in the approved RWWMP;

....

m. Assume regulatory liability for Wet Weather Overflows occurring within the Regional Sewer System following approval by the Court ~~completion of the RWWMP implementation (including the Post RWWMP Implementation Performance Assessment) and which are determined to result from lack of adequate capacity as defined in the RWWMP for such sanitary sewer overflows;~~

n. Reimburse, to the extent permitted by law, any Locality for reasonable claims paid to any third party resulting from Wet Weather Overflows occurring

~~on or after the date of the approval of the RWWMP by the Court upon completion of the RWWMP implementation (including the Post RWWMP Implementation Performance Assessment) and which are determined to result from lack of adequate capacity as defined in the RWWMP for such sanitary sewer overflows, provided that HRSD retains the right to assert governmental immunity and/or other applicable defenses as allowed by law if HRSD determines a claim is unreasonable or due to causes beyond HRSD's control;~~

3. The following subsection k. is added to the end of Section B.2:

k. Refrain from requesting or petitioning the Board or DEQ to terminate the Special Order By Consent (December 19, 2014) in accordance with Section E.12 of the same, or consenting to a modification of the Special Order By Consent that eliminates or materially alters the Locality's obligation to implement a Management, Operations, and Maintenance program in accordance with Section D of the same, unless prior written consent to such termination or modification is provided by HRSD.

B. MISCELLANEOUS PROVISIONS

1. Effective Date for this First Amendment. This amendment shall become effective as of the date (1) all Parties provide written assent to this First Amendment and (2) the Court approves an amendment to the Federal Consent Decree that adopts the RWWMP approved by EPA and DEQ, whichever occurs later.

2. Rescission of this First Amendment. It is an express assumption and condition of this First Amendment that the RWWMP submitted by HRSD on September 29, 2017 will be approved by EPA and DEQ and will be incorporated into the Federal Consent Decree through an amendment approved by the Court. If (1) HRSD is compelled by action of EPA, DEQ, and/or the Court to submit a revised RWWMP that is materially different from the RWWMP dated September 29, 2017, and such revised RWWMP is thereafter approved by the Court or (2) the Court imposes an alternate RWWMP on HRSD, HRSD may, at its discretion, notify all Localities in writing within thirty (30) days of such approval/imposition of a materially different RWWMP. Provided such notification states HRSD's intent to rescind the First Amendment in accordance with this section, it will have the effect of rescinding this First Amendment in its entirety. In that case, the Agreement will continue in effect as if this First Amendment were never executed.

3. Remainder of Agreement Unaffected. Except as stated in Section A of this First Amendment, the Agreement remains in full force and effect.

IN WITNESS WHEREOF, the Parties express their assent to this First Amendment by the signatures of their duly authorized officials as of the dates next to their respective signatures as shown below.

[REST OF PAGE INTENTIONALLY LEFT BLANK]

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #5

AGENDA ITEM 8. – Central Environmental Laboratory Briefing – PowerPoint
Presentation



Central Environmental Laboratory (CEL)
Briefing
Stacie Crandall
Chief, Laboratory Division
December 19, 2017

- HRSD Laboratories have provided analytical services for more than 40 years
 - North Shore
 - South Shore
- CEL Built 25 years ago
 - Allowed for expanded analytical capability
 - Organics
 - Automation
 - Low Level Metals (part per billion- ug/L)
 - Current staffing 48 FTEs, 29 dedicated to analysis

- Administration
 - Chief
 - Four Technical Managers
 - Data Management Section
 - Quality Assurance
 - Operations Manager
 - Administrative Coordinator

- Analytical Sections
 - Demand
 - Solids
 - Microbiology
 - Pathogen
 - Wet (classical) Chemistry
 - Nutrients
 - Metals
 - Organics
 - Sample Management

- HRSD Permits
- HRSD Process Monitoring
- SWIFT and Research
- CMAP and surface water projects
- Wastewater Treatability
- Municipal Assistance
- Source Tracking
- Pretreatment and Pollution Prevention
- Regional Water Quality Study
- Community Partners

Accreditation

- Accredited under the Virginia Environmental Laboratory Accreditation Program:
 - 311 analytes in total
 - 268 Non- Potable Water (Wastewater)
 - 30 Solid and Chemical Materials (Biosolids, 503 Program)
 - 13 Drinking Water (SWIFT)
 - Managed by the Quality Assurance group
- SWIFT additional analytes:
 - Over 100 Organics
 - Over 40 Metals, Microbiology and Nutrients

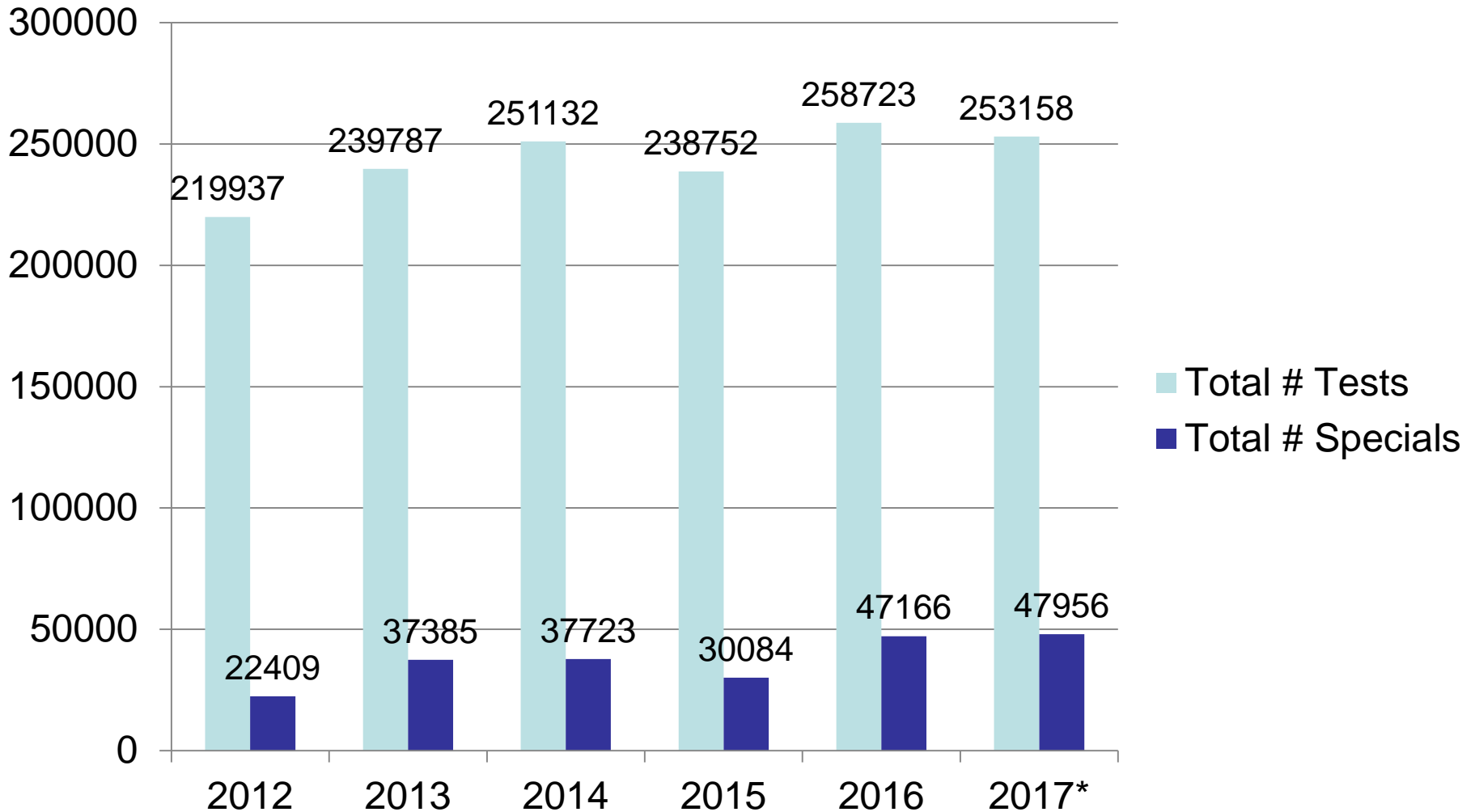
Accreditation Requirements

- Bi-annual onsite assessments (third one scheduled for January 2018)
- Extensive documentation requirements
- Documented Quality Assurance Program
- Standard Operating Procedures (over 100)
- Demonstration of Capability (over 250)
- Double Blind Proficiency Testing
- Corrective and Preventive Action

- Regulatory
 - HRSD Permits
 - Municipal Assistance Program
 - Pretreatment
- SWIFT
- Research and process monitoring and other non-regulatory analyses do not require accreditation

SWIFT

CEL Changes in Types of Work



* Projected Estimate

- All CEL Sections impacted by SWIFT
 - Direct
 - Increased and changed workload
 - Accelerated turnaround times
 - Developed new capabilities and methods
 - Indirect
 - Increased efficiency to accommodate staff shifts
 - Increased flexibility in scheduling and training schedules
 - Changed data handling protocols to manage contract laboratory results
 - Added Quality assurance systems to accommodate accreditation of new analytes

SWIFT Workload Changes

- Received first sample associated with SWIFT in February of 2016
- Restructured staffing to meet accelerated turnaround time throughout the CEL
 - Normal business practice is 14 days
 - Providing two to three day turnaround
 - Turnaround time drives batch size
 - Same calibration for 1 or 20 samples
 - Same quality control for 1 or 20 samples
 - Working toward drinking water accreditation in multiple sections

- Sample Receiving
 - Increase in scheduled man hours
 - Coordination of contract lab shipping - 25 to 75 containers per shipment 3 days/week
 - 42% increase in the number of special samples from 2015 to 2016 attributed to SWIFT and 34% Increase between 2016 and 2017

SWIFT Workload Changes

- Wet Chemistry Section
 - Sample number for SWIFT more than doubled between 2015 and 2017
 - Completed addition of 10 Drinking Water analytes
 - Implemented new instrumentation



SWIFT Workload Changes

- Organics
 - Drinking water method development for seven analytical methods including over 100 analytes
 - New Instrumentation
 - Drinking water method implementation
 - Automated sample preparation procedures



SWIFT Workload Changes

- Metals

- Developing drinking water capability and method development on current instrumentation
 - More stringent QC requirements
 - Instrument set-up changes
- Will be accredited for approximately 30 drinking water analytes



SWIFT Workload Changes

- Pathogen
 - Provides data to confirm human pathogen removal
 - Supported challenge testing of disinfection system earlier in the Pilot Study
 - Approximately 2000 results produced since 2016



How did the CEL Meet SWIFT Challenges?



- Evaluated current projects and programs department wide to determine ties to HRSD Mission and Vision
 - Stopped performing landfill well monitoring for the Municipal Assistance Program
 - Organics and Metals
 - Adjusted routine process monitoring schedules to allow for accelerated turn around time for SWIFT
 - Nutrients and Wet Chemistry
 - Converted part time laboratory assistant position to full time to provide analytical support
 - Added one Laboratory Specialist position

How will the CEL Meet Future Challenges?



- Continue to review scheduling and workload needs
- Continue developing analytical capabilities to perform analyses that are currently contracted
 - New methods
 - New instrumentation and automation
- Adding staff as necessary

- The CEL continues to expand analytical capabilities to meet customer needs, with a current focus on SWIFT
- Continue to evaluate and implement innovative analytical techniques and instrumentation to meet customer and future regulatory needs
 - Coliphage and pathogen analyses
 - Pharmaceutical and Personal Care Products

Questions?

HRSD COMMISSION MEETING MINUTES
December 19, 2017

ATTACHMENT #6

AGENDA ITEM 13. – Informational Items

- a. Management Reports
 - (1) [General Manager](#)
 - (2) [Communications](#)
 - (3) [Engineering](#)
 - (4) [Finance](#)
 - (5) [Information Technology](#)
 - (6) [Operations](#)
 - (7) [Special Assistant for Compliance Assurance](#)
 - (8) [Talent Management](#)
 - (9) [Water Quality](#)
 - (10) [Report of Internal Audit Activities](#)
 - (11) [Report of Financial Statement Audit](#)
- b. [Strategic Planning Metrics Summary](#)
- c. [Effluent Summary](#)
- d. [Air Summary](#)



December 12, 2017

Re: General Manager's Report

Dear Commissioners:

While we continue making significant improvements at the Town of Surry Treatment Plant, including the installation of a new chemical feed system and the rehabilitation of other critical systems, we were unable to fully comply with permit limits once again in November. We continue working with the Department of Environmental Quality (DEQ) to develop the appropriate consent order that will protect DEQ and HRSD as we work together over the coming years to permanently resolve this situation.

This month's reports provide some insight to the ongoing efforts focused on efficiencies and cost reduction at every level throughout HRSD. Nansemond Treatment Plant staff has been working with the Water Technologies and Research Division to reduce methanol usage by allowing the primary clarifiers to underperform. While unorthodox and challenging to our operators, the methanol use has decreased as a result. Work will continue to refine this concept over the coming months.

Another example can be found in the Chesapeake-Elizabeth Treatment Plant section of the Operations Report. The plant staff there has been working with the Technical Services Division to reduce peroxide used for odor control. Results from testing have allowed the peroxide use to be significantly reduced without negatively affecting performance.

These are just two examples of countless efforts (big and small) that highlight the culture of continuous improvement and experimentation that exists within everyone at HRSD. It is this culture that makes HRSD such a great organization and it is this culture that ensures future generations inherit clean waterways and are able to keep them clean.

The highlights of November's activities are detailed in the attached monthly reports.

- A. **Treatment Compliance and System Operations:** All plants met all Virginia Pollutant Discharge Elimination System (VPDES) and air permit requirements during the month with the exception of the Town of Surry Treatment Plant, which experienced a number of permit issues and the Surry County Treatment Plant. Details of these and other minor issues are included in the Operations Director's report.

PO Box 5911, Virginia Beach, VA 23471-0911 • 757.460.7003

Commissioners: Frederick N. Elofson, CPA, Chair • Maurice P. Lynch, PhD, Vice-Chair • Vishnu K. Lakdawala, PhD
Michael E. Glenn • Stephen C. Rodriguez • Willie Levenston, Jr. • Ann W. Templeman • Elizabeth A. Taraski, PhD
www.hrsd.com

B. Internal Communications: I participated in the following meetings/activities with HRSD personnel:

1. A meeting to discuss full-scale Sustainable Water Initiative for Tomorrow (SWIFT) at James River Treatment Plant
2. Several meetings to review the SWIFT monitoring and oversight framework
3. A meeting to review design alternatives for the Providence Road PRS
4. A meeting to discuss an EPA request related to the Integrated Plan
5. Two meetings to prepare for presentations to the rating agencies related to the accelerating plan of finance
6. Hosted 8 tours and SWIFT update briefings for HRSD employees held at the SWIFT Research Center at the Nansemond Treatment Plant
7. Welcomed new employees at two orientation sessions

C. External Communications: I participated in the following meetings/ activities:

1. Participated on a panel at the World Water Tech – North America Summit
2. Presented an overview of HRSD and SWIFT to the Chesapeake Bay Foundation Volunteers as Chesapeake Stewards (VoiCeS) program
3. Presented SWIFT in a webinar to the Virginia Extension Service and the Virginia Soil and Water Conservation District agents
4. Multiple meetings and calls with City of Portsmouth staff regarding Craney Island
5. Delivered a guest lecture on land use planning at a University of Richmond law class
6. Attended the Virginia House Appropriations Committee's annual retreat dinner at Old Dominion University
7. Presented HRSD's credit update to Fitch and Standard and Poor's in preparation for the HRSD bond deal – both affirmed current ratings
8. Participated on a panel at the Climate Adaptation Forum presented by the Environmental Business Council of New England and the University of Massachusetts
9. Participated in several conference call meetings of the nominating committee for Virginia Forever

The agenda for the December meeting includes a briefing by Stacie Crandall, Chief of the Central Environmental Laboratory (CEL). This briefing is in response to a Commissioner request about the sampling and analysis requirements related to SWIFT. I asked Stacie to put that in the larger context of the overall mission and operations of the CEL. Stacie is a recognized national leader in lab practices and another shining star here at HRSD.

I am overdue in providing an update on SWIFT and will include a full briefing on the January agenda. In short, everything continues to track according to our schedule and we have encountered no technical, political or financial barriers to success. We are getting tremendous support from the academic community, giving freely of their time to conduct reviews of our extensive materials. SWIFT continues to feel like a marathon run at an all-out sprint. We are a long way from the finish line but making swift forward progress.

Thanks for your continued dedicated service to HRSD, the Hampton Roads region, the Commonwealth and the environment. **I look forward to seeing you on Tuesday, December 19, 2017 in Virginia Beach.**

Respectfully submitted,

Ted Henifin

Ted Henifin, P.E.
General Manager

TO: General Manager
FROM: Director of Communications
SUBJECT: Monthly Report for November 2017
DATE: December 8, 2017

A. Publicity and Promotion

1. **“VDOT explains upcoming Mathews drainage project”** | November 1, 2017 | Gloucester-Mathews Gazette-Journal
http://www.gazettejournal.net/index.php/news/news_article/vdot_explains_upcoming_mathews_drainage_project
2. **“Utilities Use Multi-faceted Approaches to Please Public, Save Money”** | November 2, 2017 | ENR (Engineering News Record)
<https://www.enr.com/articles/43339-utilities-use-multi-faceted-approaches-to-please-public-save-money>
3. **“BOS considers sewer costs”** | November 9, 2017 | Southside Sentinel (e-edition requires subscription; full story cannot be distributed without copyright permissions)
Summary: According to a report presented to the Middlesex Board of Supervisors (BOS) at their November 8, 2017, the installation of wastewater collection pipes for a Deltaville sewer system will cost an estimated \$10 million – not inclusive of the additional estimated \$7 million that will be paid by HRSD to build a wastewater treatment plant (according to a 2014 HRSD study). HRSD does not build collection systems. The BOS will consider whether HRSD should move forward with another study for the Deltaville area along with five others in consideration for sewer. HRSD would cover the costs for the additional studies, but if Middlesex does not advance the sewer system construction within two years, it would be required to repay HRSD study costs, which range from \$37,500 to \$52,500 for the various study areas.
4. **“Bob White Lane closure starts”** | November 13, 2017 | Suffolk News-Herald
<http://www.suffolknewsherald.com/2017/11/13/bob-white-lane-closure-starts/>
5. **“Takeaways from World Water-Tech Summit”** | November 14, 2017 | Groundwater Canada (www.groundwatercanada.com)
<https://www.groundwatercanada.com/news/top-takeaways-from-world-water-tech-summit-4046>

6. **“Professionals: don’t wait until you graduate”** | November 17, 2017 | Suffolk News-Herald
<http://www.suffolknewsherald.com/2017/11/17/professionals-dont-wait-until-you-graduate/>
7. **“Edwards: Surry plant still not a certainty”** | November 22, 2017 | Smithfield Times (Smithfieldtimes.com – e-edition requires subscription; full story cannot be distributed without copyright permissions)
Summary: S. Wallace Edwards and Sons has not yet determined whether it will rebuild Edwards Virginia Smokehouse in Surry County. Obstacles include a lawsuit and appropriate property. The plant, destroyed by fire in January 2016 has been contracting services with other meat processors. With HRSD now operating Surry County’s wastewater facilities, the smokehouse, which had previously been grandfathered under previous laws, would not be allowed to continue operating as it had in the past.

B. Social Media and Online Engagement

1. Facebook Reach: 2,049
2. Twitter: 5,872 impressions
3. SWIFT website visits: 418
4. LinkedIn: 4,114
5. Construction Project Page Hits: 6,318

C. News Releases, Advisories, Advertisements, Project Notices and Project Websites

1. News Releases/Advisories: 1
 - a. [Portion of Bob White Lane to Close to Traffic](#) (Suffolk)
2. Advertisements: 0
3. Project Notices: 4
 - a. [Kecoughtan Road Gravity Sewer Pipeline Replacement](#) (Hampton)
 - b. [Chesapeake Avenue Force Main Replacement](#) (Hampton and Newport News)
 - c. [Elm Avenue Force Main Replacement \(Portsmouth\)](#)

4. New Project Web Pages/Blogs/Videos: 4
 - a. Portsmouth – [Rodman Avenue Pump Station Rehabilitation](#)
 - b. Chesapeake – [Pump Station Wet Well Rehabilitation Projects](#)
 - c. Norfolk – [Pump Station Wet Well Rehabilitation Projects](#)
 - d. Blog post: [“From Used to Useful”](#)

D. Special Projects and Highlights

1. The Director of Communications joined members of the Safety department for the FBI Weapons of Mass Destruction (WMD) Program Chemical Facility Outreach Exchange (CFOX) training held at the FBI Norfolk Field office.
2. Director attended a Public Relations Society of America (PRSA) Hampton Roads chapter development meeting and participated in a forum discussing The Role of Public Relations and Media in keeping truth in the news.”

E. Internal Communications

1. The Director of Communications and staff continue meeting weekly with web designers, advancing the redesign of the HRSD.com website. Preliminary web design reviews are planned for mid-December. New website launch is tentatively expected for April 2018.
2. Director and staff developed handouts and provided materials for SWIFT Research Center employee construction tours and also participated in the tours.
3. Director participated in architectural treatment meetings for the Providence Road pressure reducing station.
4. Director participated in review of SWIFT Research Center interpretive educational elements.
5. Director conducted bi-weekly communications department status meetings and monthly social media content development and strategy meetings with staff.
6. Staff attended askHRgreen.org Green Learning Guide Workgroup meeting and the Mini-Grants Committee scheduled conference call/meeting.

F. Metrics

1. Educational and Outreach Activities: 3
 - a. What Not to Flush/Competition Review for Brickheadz FIRST Lego Team, 11/2
 - b. What Not to Flush, CHROME Club at Hodges Manor Elementary School, Portsmouth, 11/16
 - c. Middletown Arch Civic League Norchester Avenue Pump Station post-construction update, 11/16

2. Number of Community Partners: 4
 - a. Portsmouth Public Schools
 - b. FIRST Lego Team
 - c. Brickheadz Enrichment Center
 - d. Middletown Arch Civic League

3. Additional Activities Coordinated by Department:
 - a. Combination treatment plant and laboratory tour for Old Dominion University Microbiology Class, 11/6
 - b. Canon Safety and Environmental Fair – 11/9
 - c. Combination treatment plant and laboratory tour for Tidewater Community College Engineering Club and Eastern Virginia Medical School Students, 11/17

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Total Training Hours per Full Time Employee (2) - Current Month	Hours / #FTE	3
M-1.4b	Total Training Hours per Full Time Employee (2) - Cumulative Fiscal Year-to-Date	Hours / #FTE	35.5
M-5.2	Educational and Outreach Events	Number	3
M-5.3	Number of Community Partners	Number	4

Respectfully,

Leila Rice

Director of Communications

TO: General Manager

FROM: Director of Engineering

SUBJECT: Engineering Monthly Report for November 2017

DATE: December 7, 2017

A. General

1. Capital Improvement Program (CIP) spending for the fourth month of Fiscal Year 2018 continues to lag behind planned spending. CIP project spending has increased in recent months and should continue to increase through the rest of the fiscal year.

CIP Spending (\$M):

	Current Period	FYTD
Actual	13.02	37.66
Plan	14.92	63.34

2. The Engineering Department conducted tours of the new SWIFT Research Center for HRSD staff at the Nansemond Treatment Plant. A series of 12 tours were held with the General Manager to update staff on the SWIFT Program, provide a summary of the Engineering Department's role in SWIFT and provide a tour of the construction effort. The tours were well attended and provided staff with a close up look at the construction. This is the third phase of discussions with staff on the importance of SWIFT and how each department at HRSD plays an important role in the success of this critical program.

B. Asset Management Division

1. The Asset Management Implementation Project continues. This is a three-year, \$1.7 million effort to enhance the planning process for repair and replacement of capital assets using a risk-based and data driven methodology. The project team recently conducted a series of workshops with internal staff on the subject of Data Needs Assessment. The purpose of these workshops is to identify what data sets are currently being collected, where they are stored and who is responsible for the data. Understanding the asset management data needs today and in the future, will help the team to better plan for future software selection, storage and integration with other information technology tools used at HRSD.

2. Staff began a review of the current procedures used for collecting data associated with the failure of interceptor sewer pipelines. The data provides for failure forensics and historical analysis associated with the condition of these assets. Staff is developing new tools and procedures to streamline data collection, analysis and the sharing of information throughout HRSD.

C. North Shore and South Shore Design & Construction Divisions

1. Construction efforts are underway to construct the Thermal Hydrolysis Process at the Atlantic Treatment Plant. A vendor from Norway, CAMBI, will provide the equipment necessary to create a Class 'A' biosolids product. The work also includes a Fats, Oils and Grease (FOG) Receiving Facility. We are using a Construction Manager at Risk delivery method, which includes the early selection of a General Contractor to assist during the design and to coordinate the construction effort. A Partnering Meeting was held in November with all of the key project team members. This meeting helped to create a project charter, better define project risks and set clear lines of communication. Construction efforts have begun and include the mobilization of key contractors on site and installation of buried utilities. The CAMBI-provided equipment should arrive in March and the project is slated for completion in fall 2020.
2. Construction efforts continue on the Sustainable Water Recycling Phase 3 (SWIFT Research Center) project. This project is being delivered using a Design-Build method that allows for a fast-track schedule. The contractor is installing the roofing and making preparations for the installation of the metal siding when it arrives. The building is temporarily enveloped in plastic sheeting and plywood (pending installation of the siding) to allow for interior work to continue. Painting, plumbing, electrical, process piping and equipment installation is underway. Site grading and exterior yard piping work is also proceeding. The contractor is using two shifts to keep this project on schedule. A concept plan for the Research Center's interpretive learning material has recently been approved. The project team is working closely to address issues of concern and planning for each of the upcoming phases of construction. The project is scheduled for completion in March 2018.

D. Planning & Analysis Division

1. Staff recently completed a study to make a change to the planned Chesapeake-Elizabeth Closure Program. A review of interceptor system pressures and risks associated with aging infrastructure has resulted in a recommendation to add a new peak wet-weather storage tank. This tank will allow for the elimination of a number of other existing pump station

improvements and will result in reduced pressures in the interceptor system during peak wet-weather events. The new storage tank will be located in the City of Virginia Beach near the Oceana Naval Air Station. Initial discussions with the City have indicated that this program modification will be acceptable. Further efforts are needed before this program change can be finalized, but a quick implementation is needed to allow for the future closure of the Chesapeake-Elizabeth Treatment Plant by 2021.

2. One responsibility of the Planning & Analysis Division is to manage new service requests as part of proposed development in the region. This month the first service requests have been processed for two of HRSD's smallest facilities. New connections have been reviewed and approved for both the Lawnes Point System and the Surry System. A very careful review of the new service requests are needed for these areas due to the very small size and capacity of the associated collection and treatment systems.

E. Strategic Planning Metrics Summary

1. Educational and Outreach Events: 3
 - a. Staff made a SWIFT presentation at the Chesapeake Section Water Environment Association/American Water Works Association (WEA/AWWA) Annual Water Reuse Seminar on November 9.
 - b. Staff made a presentation on HRSD's Asset Management Program at the American Society of Civil Engineers (ASCE) Joint Societies Luncheon on November 29.
 - c. Staff made a SWIFT presentation as part of a panel discussion at the Public Private Partnership (P3) Federal Conference held on November 30.
2. Number of Community Partners: 0
3. Number of Research Partners: 0

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Total Training Hours per Full Time Employee (39) - Current Month	Hours / #FTE	2.54
M-1.4b	Total Training Hours per Full Time Employee (39) - Cumulative Fiscal Year-to-Date	Hours / #FTE	15.03
M-5.2	Educational and Outreach Events	Number	3
M-5.3	Number of Community Partners	Number	0
M-5.4	Number of Research Partners	Number	0

Bruce W. Husselbee, P.E.

Bruce W. Husselbee, P.E.

TO: General Manager
FROM: Director of Finance
SUBJECT: Monthly Report for November 2017
DATE: December 8, 2017

A. General

1. HRSD went "Live" with our new vendors for bill, print, mail and phone/online payments on November 14. Customers now have a cleaner interface, text to pay and other convenient features added to our already extensive billing and payment options. Special thanks to the talented project team and staff from Customer Care Center and Information Technology whose involvement contributed to the completion of this project. Implementation of such a complex system requires dedication, careful planning and outstanding teamwork.

As with every change, some customers have been challenged with the transition to the new system. As a security measure, no payment information was transferred to the new payments vendor. As a result, approximately 115,000 customers need to re-register their payment information and specify their e-bill preferences. A few other issues have arisen over the first month including a lost linkage to individual bank bill-pay systems that previously allowed HRSD bill presentment through the bank's system. Until this can be restored, these customers will receive paper bills but still be able to pay their bill through their bank's web bill pay feature.

2. The conversion to a new bill presentment and payment system has added significant volume to our call center, pushing our service levels well beyond our desired targets. November is already a short month (number of working days reduced due to Veterans Day and the Thanksgiving Holiday) requiring higher daily call volume to handle the typical expected monthly interactions. The added volume due to the new system exaggerated this impact. As wait times grew more calls were abandoned and more customers requested a call back. HRSD customer representatives spend significantly more time on each call back than on a regular incoming call (unsure of the psychology of this, perhaps the time already spent waiting in the queue on a regular incoming call increases the urgency with which the customer wants to handle the transaction). There were some customers in queue for more than an hour on the busiest days in November. Staff expects service levels to improve as more customers are registered for our new online services. In addition, we are delaying some field activity to reduce the call volume and avoid significant delays for customers trying to get service restored. Field activity will resume at normal levels after the initial billing cycles under the new system, early 2018.

3. With water consumption flat compared to last year and the three year average, wastewater revenues continue to be higher than budget. Interest income is higher than budget as short term interest rates continue to rise and we put our capital to work with our yield optimization strategy. Major repairs and capital assets expenses continue to be lower than budget at this time, since many purchases earlier in the fiscal year related to prior year encumbrances.

B. Interim Financial Report

1. Operating Budget for the Period Ended November 30, 2017

	Amended Budget	Current YTD	Current YTD as % of Budget (42% Budget to Date)	Prior YTD as % of Prior Year Budget
Wastewater	\$ 265,662,693	\$ 115,447,403	43%	44%
Surcharge	1,900,000	645,113	34%	53%
Indirect Discharge	2,500,000	1,154,265	46%	45%
Norfolk Sludge	90,000	28,903	32%	30%
Fees	2,935,000	1,206,440	41%	44%
Municipal Assistance	700,000	337,757	48%	30%
Miscellaneous	720,000	546,035	76%	62%
Total Operating Revenue	274,507,693	119,365,916	43%	44%
Non Operating Revenues				
Facility Charge	6,000,000	2,801,375	47%	40%
Interest Income	1,800,000	1,120,681	62%	11%
Build America Bond Subsidy	2,400,000	1,168,524	49%	50%
Other	845,000	796,834	94%	29%
Total Non Operating Revenue	11,045,000	5,887,414	53%	38%
Total Revenues	285,552,693	125,253,330	44%	43%
Transfers from Reserves	9,760,286	4,066,786	42%	42%
Total Revenues and Transfers	\$ 295,312,979	\$ 129,320,116	44%	43%
Operating Expenses				
Personal Services	\$ 53,773,327	\$ 22,974,222	43%	42%
Fringe Benefits	24,700,569	10,414,451	42%	41%
Materials & Supplies	7,399,704	2,937,645	40%	36%
Transportation	1,423,974	459,279	32%	39%
Utilities	11,973,115	4,313,435	36%	33%
Chemical Purchases	10,620,594	3,464,754	33%	34%
Contractual Services	36,900,038	11,319,386	31%	32%
Major Repairs	10,429,168	2,420,761	23%	22%
Capital Assets	1,716,528	711,023	41%	17%
Miscellaneous Expense	2,396,234	1,032,074	43%	37%
Total Operating Expenses	161,333,251	60,047,030	37%	37%
Debt Service and Transfers				
Debt Service	59,949,120	27,594,067	46%	48%
Cost of Issuance Bonds	900,000	123,924	14%	0%
Transfer to CIP	58,802,000	24,500,834	42%	42%
Transfer to General Reserve	14,068,608	5,861,920	42%	0%
Transfer to Risk management	260,000	108,338	42%	42%
Total Debt Service and Transfers	133,979,728	58,189,083	43%	45%
Total Expenses and Transfers	\$ 295,312,979	\$ 118,236,113	40%	40%

2. Notes to Interim Financial Report

The Interim Financial Report summarizes the results of HRSD's operations on a basis of accounting that differs from generally accepted accounting principles. Revenues are recorded on an accrual basis, whereby they are recognized when billed; expenses are generally recorded on a cash basis. No provision is made for non-cash items such as depreciation and bad debt expense.

This interim report does not reflect financial activity for capital projects contained in HRSD's Capital Improvement Program (CIP).

Transfers represent certain budgetary policy designations as follows:

- a. Transfer to CIP: represents current period's cash and investments that are designated to partially fund HRSD's capital improvement program.
- b. Transfers to Reserves: represents the current period's cash and investments that have been set aside to meet HRSD's cash and investments policy objectives.

3. Reserves and Capital Resources (Cash and Investments Activity) for the Period Ended November 30, 2017

	General	Risk Management	Reserve	Capital
Beginning of Period - July 1, 2017	\$ 169,127,728	\$ 3,000,520	\$ 30,760,330	\$ 37,452,225
Add: Current Year Sources of Funds				
Cash Receipts	126,450,196			
Capital Grants				772,729
Line of Credit				-
Bond Proceeds (includes interest)				273,602
Transfers In	494,006	108,338		24,500,834
Sources of Funds	<u>126,944,202</u>	<u>108,338</u>	<u>-</u>	<u>25,547,165</u>
Total Funds Available	<u>\$ 296,071,930</u>	<u>\$ 3,108,858</u>	<u>\$ 30,760,330</u>	<u>\$ 62,999,390</u>
Deduct: Current Year Uses of Funds				
Cash Disbursements	90,993,968			45,518,181
Transfers Out	24,609,172		494,006	-
Uses of Funds	<u>115,603,140</u>	<u>-</u>	<u>494,006</u>	<u>45,518,181</u>
End of Period - November 30, 2017	<u>\$ 180,468,790</u>	<u>\$ 3,108,858</u>	<u>\$ 30,266,324</u>	<u>\$ 17,481,209</u>

4. Capital Improvements Budget and Activity Summary for Active Projects for the Period Ended November 30, 2017

Classification/ Treatment Service Area	Expenditures		Year to Date		Total Expenditures	Outstanding Encumbrances	Available Balance
	Budget	prior to June 30, 2017	FY 2018 Expenditures				
Administration	\$ 55,245,711	\$ 39,641,464	\$ 131,778	\$ 39,773,242	\$ 1,050,697	\$ 14,421,772	
Army Base	158,584,000	120,527,300	1,001,700	121,529,000	5,245,009	31,809,991	
Atlantic	119,731,914	42,154,292	3,132,237	45,286,529	57,586,682	16,858,703	
Boat Harbor	102,484,447	42,142,558	3,312,131	45,454,689	10,211,177	46,818,581	
Ches-Eliz	137,496,317	6,729,890	1,223,531	7,953,421	3,014,803	126,528,093	
James River	75,114,256	50,821,444	2,271,117	53,092,561	4,432,937	17,588,758	
Middle Peninsula	48,482,269	6,398,032	568,371	6,966,403	4,196,921	37,318,945	
Nansemond	76,560,570	33,846,838	1,549,197	35,396,035	4,879,140	36,285,395	
Surry	3,236,000	-	16,043	16,043	55,139	3,164,818	
VIP	272,689,561	229,739,637	9,648,756	239,388,393	14,496,641	18,804,527	
Williamsburg	16,156,843	8,937,934	(315,633)	8,622,301	941,117	6,593,425	
York River	45,537,761	39,366,402	177,712	39,544,114	2,861,176	3,132,471	
General	244,958,797	166,626,066	15,288,741	181,914,807	31,110,006	31,933,984	
	<u>\$ 1,356,278,446</u>	<u>\$ 786,931,857</u>	<u>\$ 38,005,681</u>	<u>\$ 824,937,538</u>	<u>\$ 140,081,445</u>	<u>\$ 391,259,463</u>	

5. Debt Management Overview

	Debt Outstanding (\$000's)				
	Principal Oct 2017	Principal Payments	Principal Draws	Principal Nov 2017	Interest Payments
Fixed Rate					
Senior	\$ 426,563	\$ (5,100)	\$ -	\$ 421,463	\$ (3,674)
Subordinate	296,269	-	-	296,269	-
Variable Rate					
Subordinate	50,000	-	-	50,000	(37)
Line of Credit	-	-	-	-	-
Total	<u>\$ 772,832</u>	<u>\$ (5,100)</u>	<u>\$ -</u>	<u>\$ 767,732</u>	<u>\$ (3,711)</u>

Series 2016 Variable Rate Interest Summary - Variable Rate Debt Benchmark (SIFMA) as of 12/01/17

	SIFMA Index	HRSD	Spread to SIFMA
Maximum	0.97%	1.00%	0.03%
Average	0.25%	0.24%	-0.01%
Minimum	0.01%	0.01%	0.00%
As of 12/01/17	0.97%	1.00%	0.03%

* Since October 20, 2011 HRSD has averaged 24 basis points on Variable Rate Debt

6. Financial Performance Metrics for the Period Ended November 30, 2017

	Current YTD	Policy Minimum
Capital % Cash Funded	42%	15%
General Reserve as % of Operations	112%	75-100%
Risk Management Reserve as % of Projected Claims Costs	25%	25%

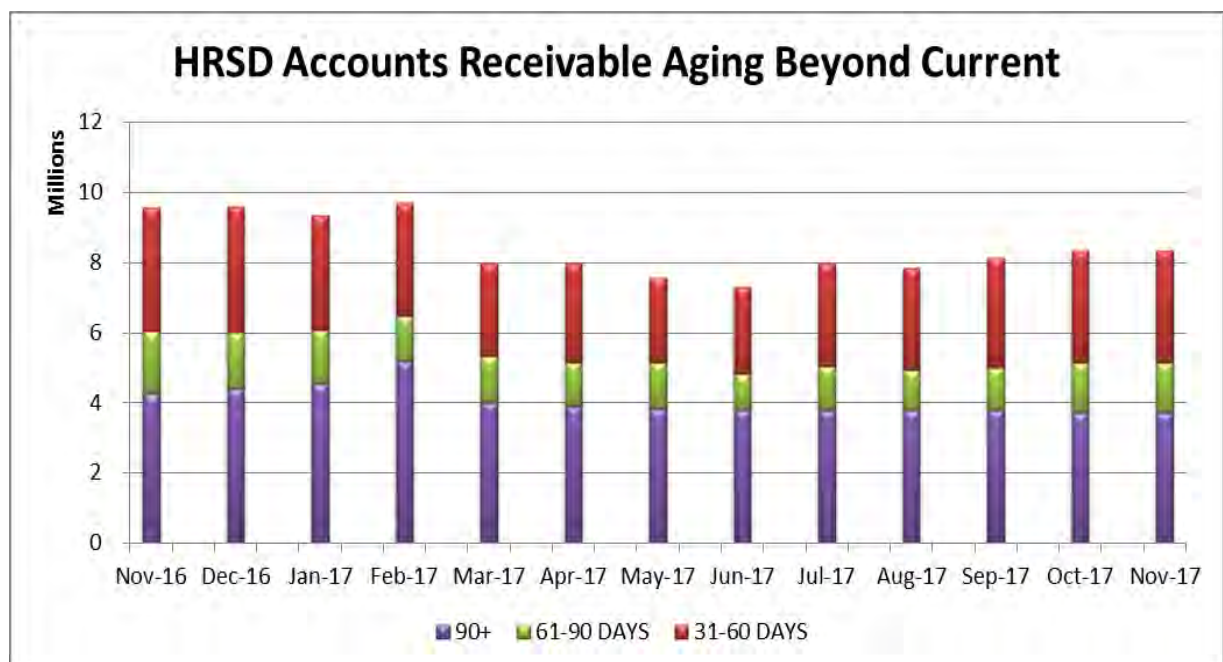
Total Return Strategy						
	Market Value June 30, 2017	YTD Buy/Sell	YTD Change in Market Value	YTD Adjustments	Market Value November 30, 2017	
Investment Activity	\$ 123,844,438	\$ 764,832	\$ (600,977)	\$ -	\$ 124,008,293	
Unrestricted Reserve Fund	30,760,330			(494,006)	30,266,324	
	\$ 154,604,768	\$ 764,832	\$ (600,977)	\$ (494,006)	\$ 154,274,617	

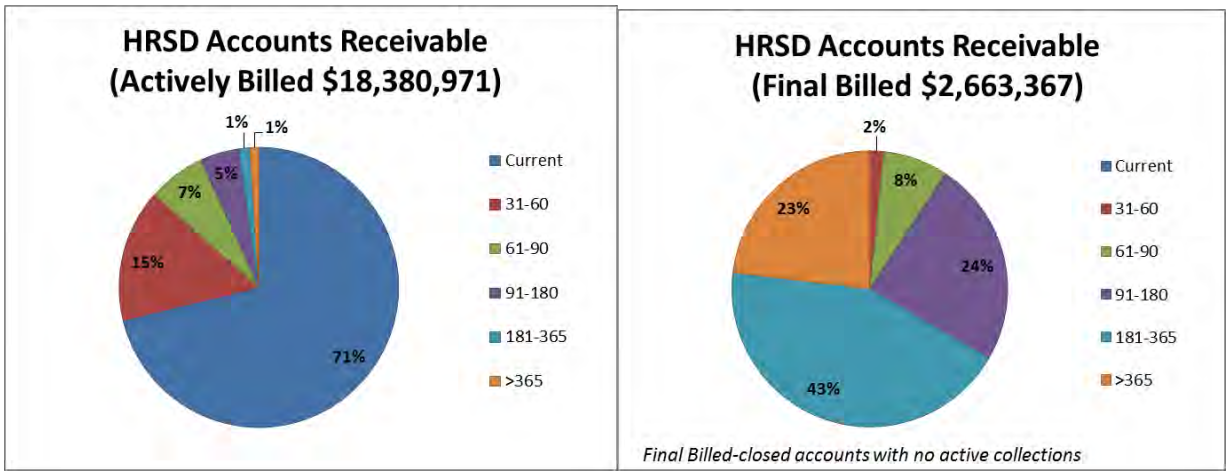
7. Summary of Billed Consumption

Summary of Billed Consumption (,000s ccf)							
Month	2018 Cumulative Budget Estimate	2018 Cumulative Actual	% Difference		% Difference		% Difference
			From Budget	Cumulative 2017 Actual	From 2017	Cumulative 3 Year Average	From 3 Year Average
July	4,427	4,869	10.0%	4,776	1.9%	4,798	1.5%
Aug	8,850	9,939	12.3%	9,275	7.2%	9,525	4.3%
Sept	13,271	14,632	10.3%	14,227	2.8%	14,215	2.9%
Oct	17,689	19,006	7.4%	19,017	-0.1%	18,999	0.0%
Nov	22,104	23,305	5.4%	23,282	0.1%	23,223	0.4%
Dec	26,516	-	N/A	27,761	N/A	27,583	N/A
Jan	30,925	-	N/A	32,036	N/A	31,959	N/A
Feb	35,331	-	N/A	36,263	N/A	35,878	N/A
March	39,734	-	N/A	40,516	N/A	40,678	N/A
Apr	44,135	-	N/A	44,383	N/A	44,834	N/A
May	48,532	-	N/A	48,553	N/A	49,058	N/A
June	52,927	-	N/A	53,373	N/A	53,644	N/A

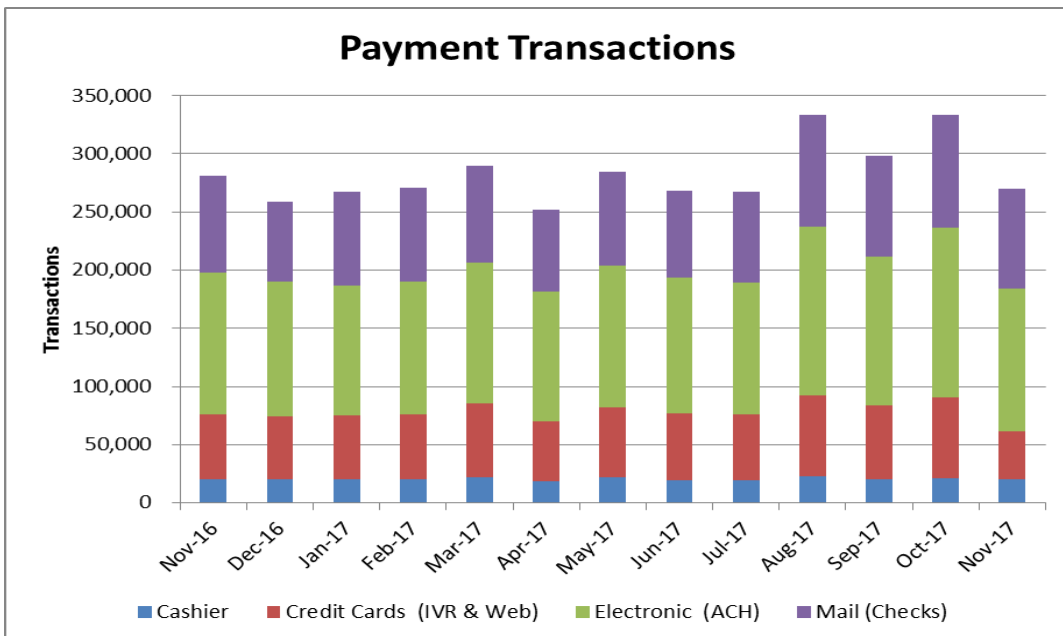
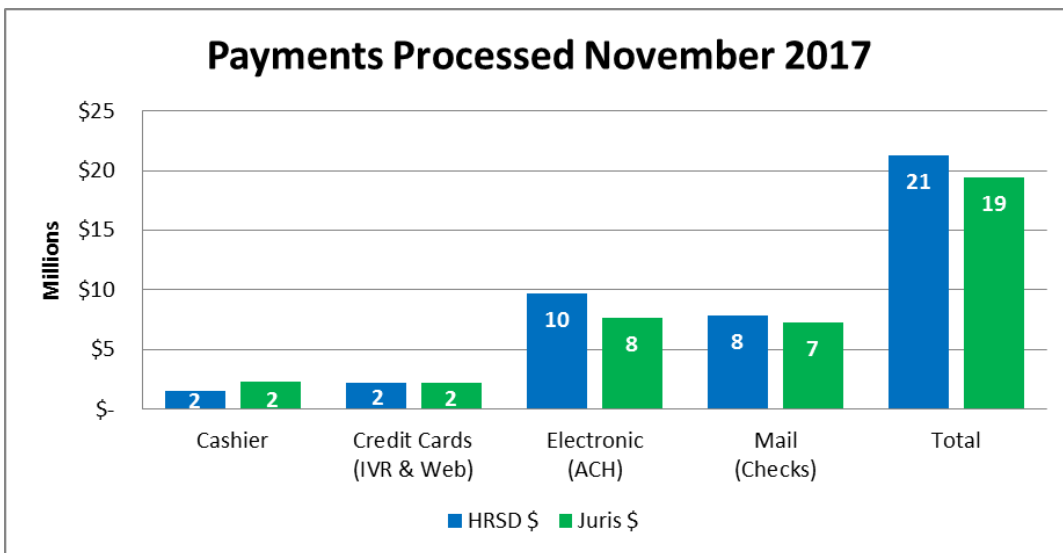
C. Customer Care Center

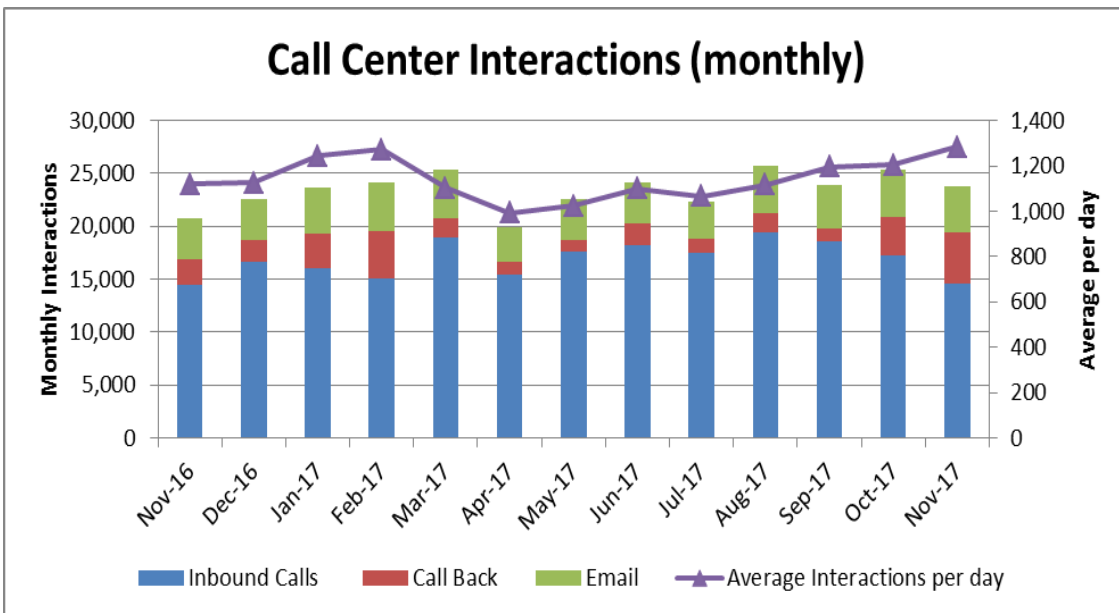
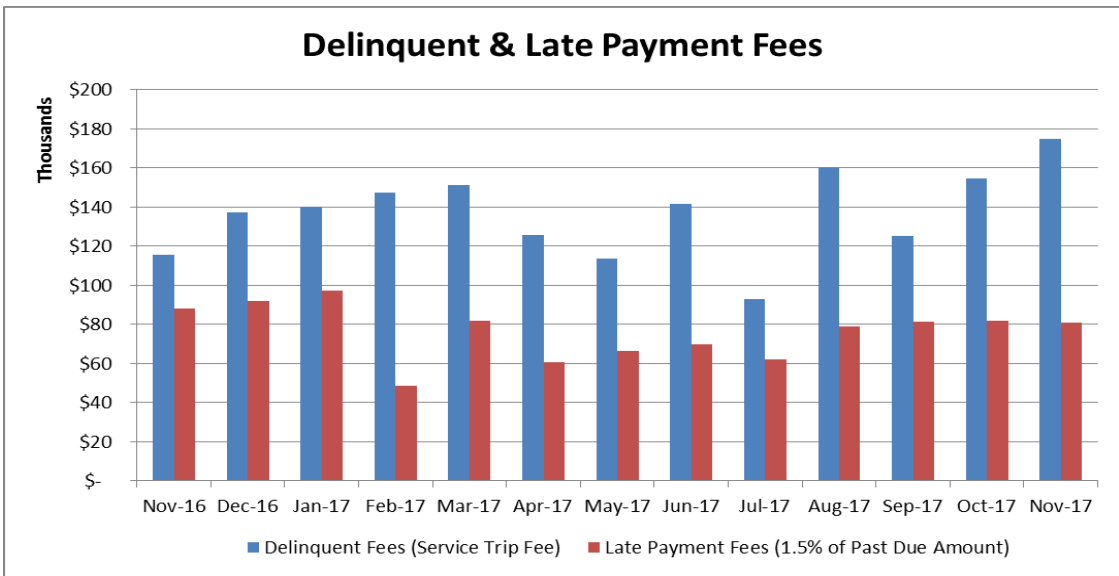
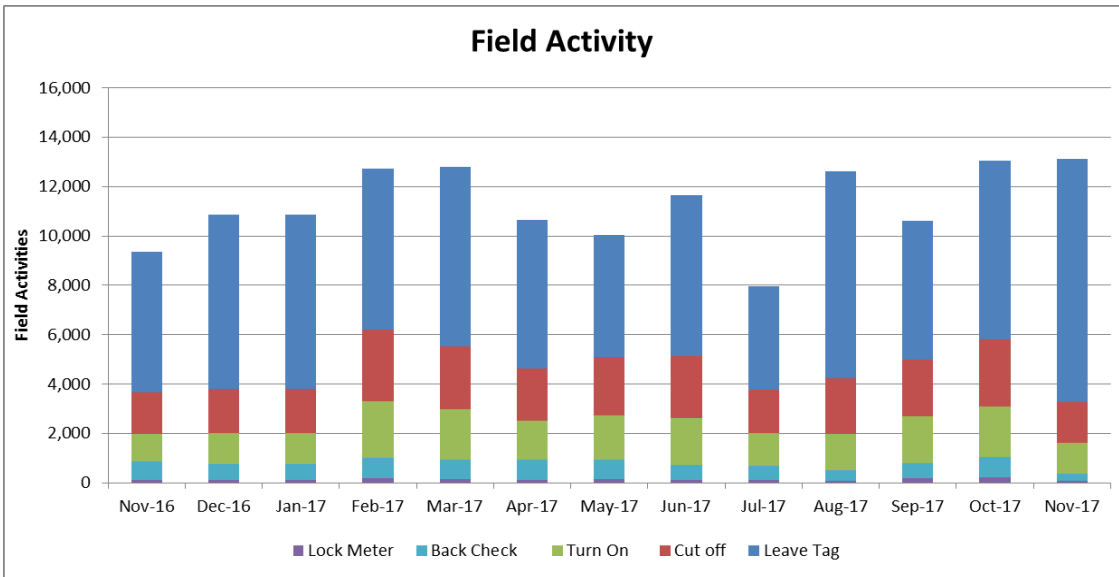
1. Accounts Receivable Overview

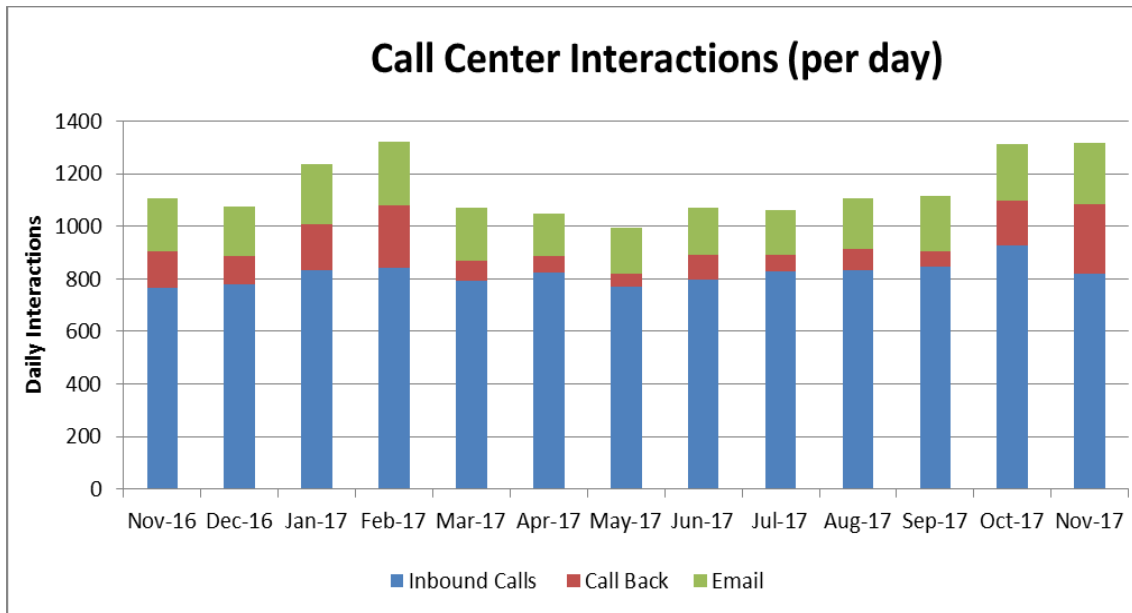




2. Customer Care Center Statistics







Customer Interaction Statistics	Jun	Jul	Aug	Sep	Oct	Nov
Calls Answered within 3 minutes	70%	78%	75%	81%	58%	45%
Average Wait Time (minutes)	2:25	1:46	2:04	1:33	3:51	5:50
Calls Abandoned	9%	8%	8%	7%	13%	18%

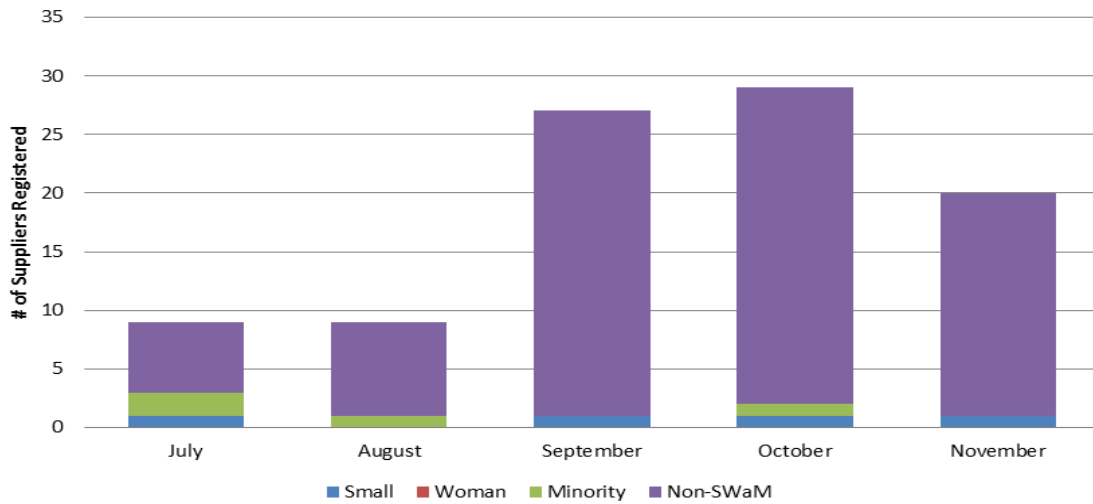
D. Procurement Statistics

Savings	Current Period	FYTD
Competitive Savings ¹	\$155,851	\$434,077
Negotiated Savings ²	\$256,012	\$633,520
Salvage Revenues	\$7,055	\$29,809
Corporate VISA Card - Estimated Rebate	\$15,052	\$97,261

¹ Competitive savings are those savings obtained through the informal/formal bidding process. All bids received (except for the lowest responsive/responsible bid) added together and averaged. The average cost is subtracted from the apparent low responsive/responsible bidder.

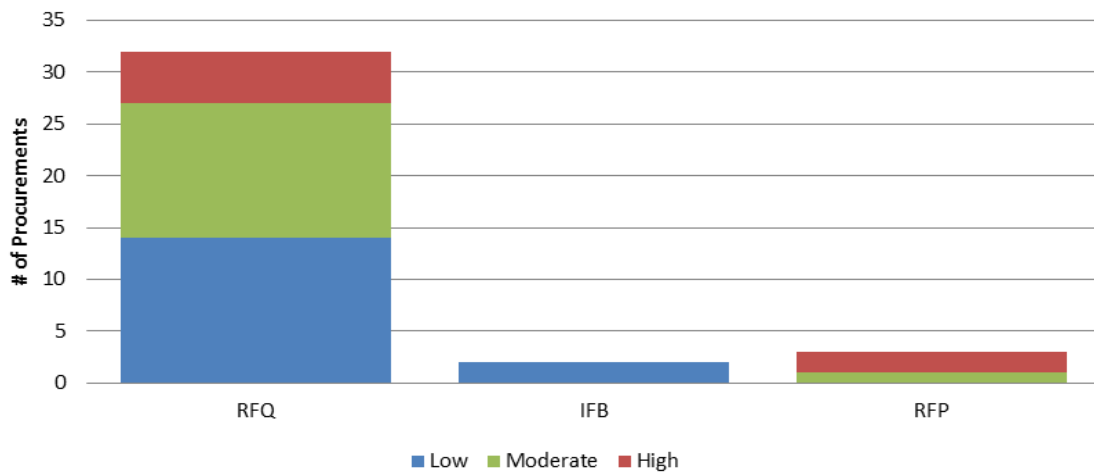
² Negotiated savings are savings obtained during a Request for Proposal process, or if all bids received exceed the budgeted amount, or if only one bid is received.

New Suppliers Registered in ERP

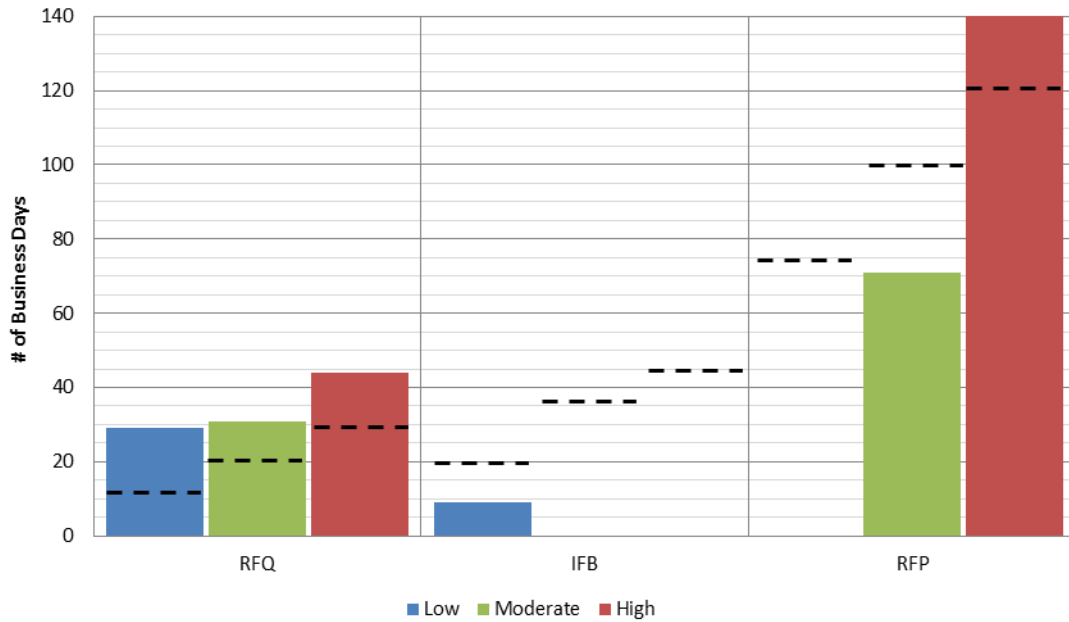


**Increased supplier registration due to supplier outreach at NIGP Forum 8/29/17, Water Jam 9/13/17, VASCUPP® SWaMFest 10/4/17, City of Richmond OMBD and CVMSSDC, Procure Your Business Conference 10/18/17, Virginia Beach Minority Business Council Conference and Expo 11/2/17, CNU SWaM Fair 11/9/17, DGS Forum 11/14/17*

Procurements Completed Based on Complexity



Cycle Time per Method of Procurement and Complexity

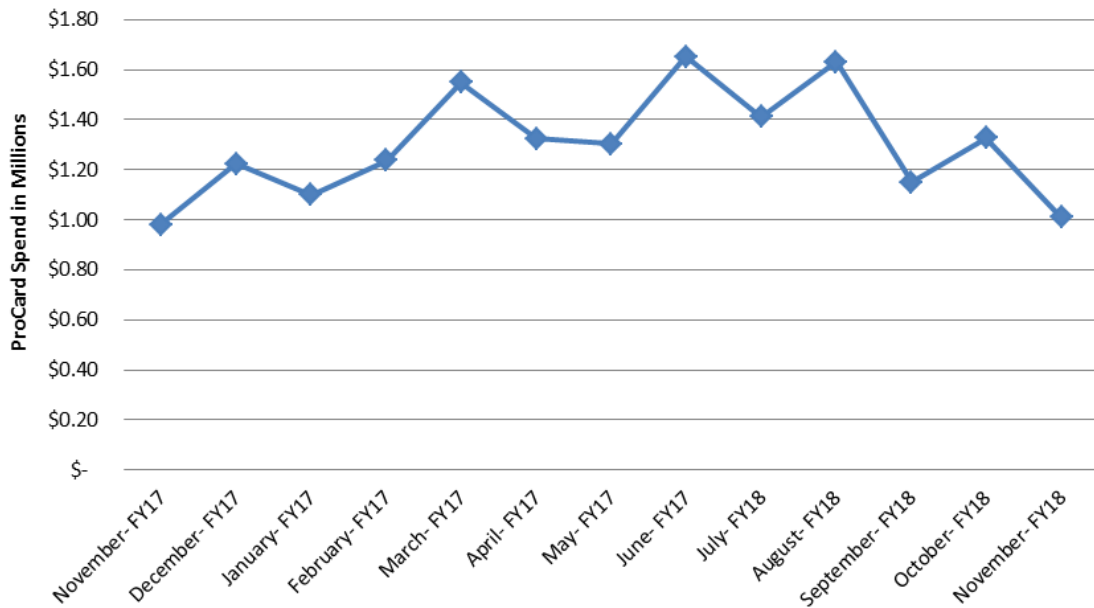


Dashed Line: Target Service Level Cycle Time

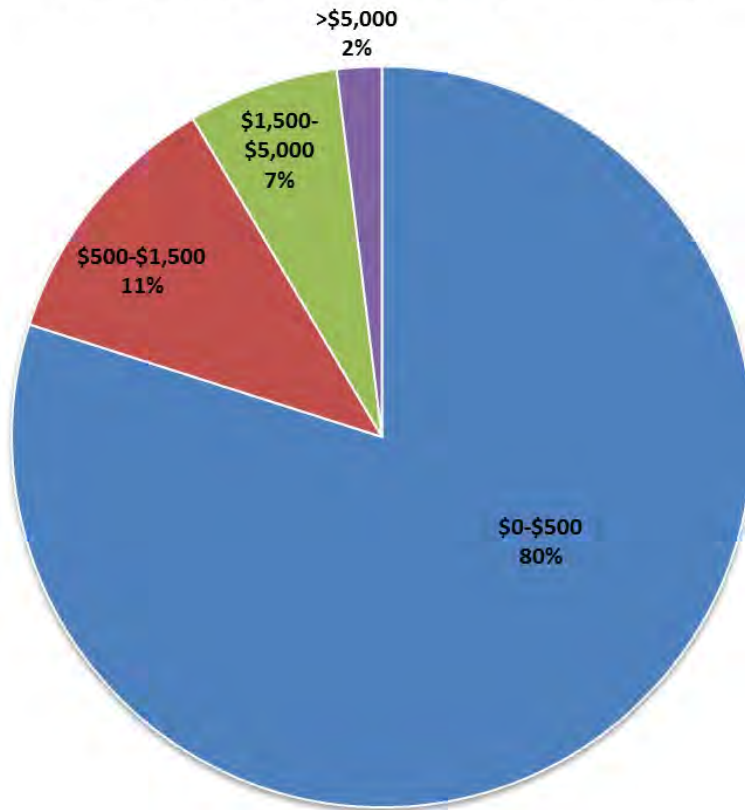
	High	Moderate	Low
RFQ	30	20	12
IFB	45	35	20
RFP	120	100	75

High: Highly technical, time intensive, **Moderate:** Technical, routine, **Low:** Low technical, quick turnaround

ProCard Spend



November ProCard Transaction Dollar Amounts



ProCard Fraud	External Fraud Transactions*	Comments
July	4	Caught by Bank immediately
August	6	Caught by Bank immediately
September	2	One caught by cardholder immediately, one caught by Bank immediately
October	0	
November	0	
Total	14	

***External Fraud:** Fraud from outside HRSD (i.e.: a lost or stolen card, phishing, or identity theft)

Accidental Use, which is anything that is not purchased for use and ownership by HRSD, included two transactions out of 1,991 or 0.1% of all November's ProCard transactions. HRSD was reimbursed for all accidental transactions.

Procurement Client Training		
	Current Period	YTD
ProCard Policy and Process	3	18
Procurement Cycle	0	10
Additional Training Provided	0	0
Total	3	28

E. Business Intelligence – Enterprise Resource Planning (ERP)

1. ERP Helpdesk currently has 276 open work orders in the following statuses: 6 escalated, 70 in progress, 16 on hold, 180 open, 4 waiting on user. ERP Helpdesk received 203 work orders in November. In November, 249 work orders were closed and 36 were closed within one hour.
2. ERP refresher training is in progress for all work centers.
3. ERP staff continues to work with consultants on functionality and improvements to the system.

F. Strategic Planning Metrics Summary

1. Educational and Outreach Events: 2
 - a. 2017 Virginia Beach Minority Business Council Conference and Expo
 - b. 2017 Christopher Newport University SWaM Fair
 - c. Forum 2017 and Supplier Connect Expo

2. Community Partners: 2
 - a. City of Virginia Beach
 - b. Christopher Newport University
 - c. Virginia Department of General Services

3. Monthly Metrics

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Training During Work Hours Per Full Time Employee (101) – Current Month	Hours / #FTE	1.74
M-1.4b	Total Training During Work Hours Per Full Time Employee (101) – Cumulative Fiscal Year-to-Date	Hours / #FTE	25.45
M-5.2	Educational and Outreach Events	Number	3
M-5.3	Number of Community Partners	Number	3
	Wastewater Revenue	Percentage of budgeted	102%
	General Reserves	Percentage of Operating Budget less Depreciation	112%
	Accounts Receivable (HRSD)	Dollars	\$21,044,338
	Aging Accounts Receivable	Percentage of receivables greater than 90 days	17%

Respectfully,
Jay A. Bernas
 Jay A. Bernas, P.E.
 Director of Finance

TO: General Manager

FROM: Director of Information Technology (IT)

SUBJECT: Information Technology Department Report for November 2017

DATE: Friday, December 8, 2017

A. General

1. IT is developing a cybersecurity awareness training program which will provide users with an annual refresher on cybersecurity threats and best practices to avoid them.
2. Staff is retiring a number of servers and archiving required data from the legacy talent management/human resources platform.
3. A broadband cellular modem was installed and configured at a pump station in Surry County. The connection provides for the recording and transmission of water quality test results and basic connectivity to the rest of the HRSD network.
4. Following months of preparation and testing, the new e-Bill and online payment services applications are now online and available to customers.
5. Testing script development and initial configuration of the virtual desktop environment are in process. Performance assessment and error tracking tools are being installed prior to application compatibility and performance testing.
6. Working closely with the director of communications, and a third party web developer, staff is redesigning the HRSD web site. The new site is projected to go live this spring.

B. Strategic Planning Metrics Summary

1. Educational and Outreach Events: 0
2. Number of Community Partners: 0

C. Monthly Metrics

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Training During Work Hours Per Full Time Employee (50) – Current Month	Total Training Hours / # FTE	4.61
M-1.4b	Total Training During Work Hours Per Full Time Employee (50) – Cumulative Fiscal Year-to-Date	Total Training Hours / # FTE	14.84
M-5.2	Educational and Outreach Events	Number	0
M-5.3	Number of Community Partners	Number	0

Respectfully,
Don Corrado

TO: General Manager
FROM: Director of Operations
SUBJECT: Operations Report for November 2017
DATE: December 5, 2017

A. Highlights

On Sunday, December 3, staff from the Small Communities Division (SCD) participated in the West Point Crab Holiday Festival, with the sewer cleaning truck (VacCon), an electrical van and one of the new utility body trucks. This included riding in the Holiday parade and participating in the inaugural “touch-a-truck” with the VacCon. This was a great volunteer effort and an excellent way for Small Communities to connect with its customers.

B. Interceptor Systems

1. North Shore (NS) Interceptor Systems

- a. There were three interceptor complaints and three system alarms during the month. These alarms and complaints were quickly and completely resolved
- b. Staff continued to make repairs and complete upgrades necessary for treatment process corrections and upgrades to the Town of Surry Sewer System.
- c. Staff performed three pump and haul operations of the Lawnes Point Treatment Plant and two for the Town of Surry.

2. South Shore (SS) Interceptor Systems

Staff continues its involvement with the multiple projects associated with the planned Chesapeake-Elizabeth Treatment Plant (CETP) closure. Staff attended multiple meetings on the pressure reducing station upgrades, particularly to address comments on the preliminary engineering reports. Staff worked to establish a flow diversion and construction sequence that will maximize the level of service within the system during construction, and ensure that all projects are completed before the regulatory deadline. Staff also toured Henrico County’s newly constructed, pre-stressed wet weather storage tank.

C. Major Treatment Plant Operations

1. Army Base Treatment Plant (ABTP)

- a. On November 29, a 5,000 gallon overflow occurred when a secondary clarifier was placed into service with the drain valve partially open. In the future, staff will ensure that drain is closed prior to filling tanks, and after returning to service.
- b. The total hydrocarbon (THC) analyzer was replaced on November 16, but the unit failed to operate correctly. The THC analyzer was replaced again on November 17 and is operating correctly.
- c. Repairs to Incinerator #1 are complete.
- d. Staff completed new drain piping and the main water supply line for the administration building renovation project.
- e. Contractor completed a repair and inspection on #2 hypochlorite tank.

2. Atlantic Treatment Plant (ATP)

- a. Construction of the Thermal Hydrolysis Process (THP) is now underway. While digging, contractors struck the 42" bypass line that ties into the Secondary Clarifier Effluent (SCE), filling the hole with SCE. Staff secured a valve upstream of the leak to secure the leak and sump pumps were used to pump the water to a manhole back to the plant drain. Of the 5,000 gallons released, only 50 gallons were not captured.
- b. The plant experienced one odor complaint. It is believed that the odors were the result of maintenance activities on the bio-scrubber for the Combined Heat and Power (CHP) engine. Staff will continue their odor detection assessment activities to include wind direction monitoring and documentation.
- c. There were two reportable issues with the CHP air permit.
 - 1) On November 9, the digester gas for CHP had a Hydrogen Sulfide (H₂S) level above 50 parts per million (ppm) and the CHP engine was immediately turned off. This issued occurred when the plant attempted to start up the bio-scrubber after its bi-annual cleaning. To compensate, staff re-seeded the bio-scrubber by sending gas through the unit, which took several

days. Once the bio-scrubber microorganism population was reestablished, the CHP system was reactivated. The THP project will address this specific issue by allowing staff to recirculate the gas back into the digester system during maintenance work and operational issues. This will also help alleviate off-site odors from the CHP maintenance activities.

2) On November 17, the actuator for the sump drain valve for the bio-scrubber opened without being prompted, causing the bio-scrubber to completely drain, resulting in a loss of the microorganisms necessary for H₂S treatment. Staff contacted the program vendor to solve the programming issue. Staff closed a downstream valve as a preventive measure to avoid a repeat occurrence until repairs are complete.

d. Construction of the new administration building continues. The concrete slab was poured and the structural supports are nearly complete.

3. Boat Harbor Treatment Plant (BHTP)

a. There were two air permit deviations this month. On November 15, the bypass stack was used for three minutes due to a brief power outage. On November 2, a loss of power occurred at the end of the monthly maintenance test for the diesel generation system. The diesel generator system controls failed to transfer the plant electrical loads back to utility power, which resulted in a loss of power and the use of the bypass stack for nine minutes. The utility voltages were higher than normal. Higher utility voltages are typical of lower power consumption by local businesses and cooler weather. New generator controls, which should address this situation, are part of the scheduled switchgear replacement CIP project.

b. On November 28 there was a blockage in the septic line that caused a backup and spill of 4,130 gallons. 830 gallons were not recovered.

c. The coatings work on the odor control ductwork is complete.

d. Staff began polymer testing for the recently completed project of separating the thickened waste solids and primary solids. The purpose of this project is to (1) aid in reducing the phosphorus release that occurs in the holding tanks when the two solid waste streams are combined, and (2) improve the dewatering operation. Historically, these solids were combined in the holding tanks and then

sent to the centrifuges for dewatering. The piping system was modified to facilitate the separation of these solids. The project should reduce the potential for phosphorus release in the solids, as well as decrease the amount of cyanide created within the incineration process. The plant staff hopes to have all of the issues with the split-piping system worked out well before the temperatures increase in the spring.

4. CETP

Staff conducted odor control testing that reduced daily peroxide usage from \$870/day to \$400/day. Peroxide is one of our most expensive chemicals. Staff, with assistance from the Technical Services Division, tested operations at various peroxide feed rates. The results indicated that with a 50 percent reduction in the chemical feed rate, there was no significant increase in odors.

5. James River Treatment Plant (JRTP)

- a. There was one reportable wastewater event when approximately 100 gallons of secondary clarifier effluent overflowed from a plant drain manhole while pumping down secondary clarifier #1 for maintenance. About 30 gallons were recovered.
- b. Staff continued converting Integrated Fixed Film Activated Solids (IFAS) tank #1 from its use as a centrate equalization tank back to use as an IFAS tank. Staff modified the nitrified recycle pipelines, removed struvite, and performed maintenance on mixing equipment for reinstallation into the tank
- c. Staff repaired the worn out #3 return activated solids pump.
- d. Staff coated non-potable water pipelines in the non-potable water building.
- e. Staff continued testing of a HydroFLOW unit, designed to help prevent struvite accumulation on the pipeline transporting centrate from the wet well to the two centrate equalization tanks.
- f. The contractor completed punch list items on the Hydraulic Improvement Project and turned over parts and equipment specified in the contract. The project is now complete.

6. Nansemond Treatment Plant (NTP)

- a. The Virginia Department of Environmental Quality (DEQ) determined HRSD to be in compliance for the ash bulking and storage facility with dust collector.
- b. Staff tested taking the rectangular primary clarifiers out of service while only running the two circular primary clarifiers. The two main reasons behind this experiment were:
 - 1) To thicken in the circular primaries and send the thickened solids directly to the digester, thus stopping all primary solid flow to the Gravity Belt Thickeners (GBTs). This effort resulted in a drastic reduction in odors and corrosive sulfides within the GBT room.
 - 2) To increase the Chemical Oxygen Demand (COD) in the wastewater and reduce the amount of supplemental carbon (methanol) that was thought necessary to achieve the total nitrogen (TKN) target of three milligrams per liter. By creating an environment for “poor” primary solids removal, there should be additional “food” (carbon) for the microorganisms that comes from the primary clarifiers.
- c. Although taking the rectangular clarifiers out of service resulted in “poor” primary clarifier performance and allowed for additional COD to reach the aeration process, the scum system on the circular primaries was overwhelmed and allowed for scum and trash to go through the aeration process and collect on the secondary clarifiers. This caused nuisance odors and performance issues on the clarifiers. Staff has since put one rectangular clarifier back into service and is in the process of designing scum collection improvements on the circular primaries to handle the additional hydraulic loading.

7. Virginia Initiative Plant (VIP)

- a. Contractors and staff isolated two of the anaerobic/anoxic/aerobic process trains to allow replacement of deteriorated sluice gates and anoxic recycle pumps and installation of coarse bubble aeration diffusers as part of the Nutrient Reduction Capital Improvement project.

- b. Contractors started work on Incinerator #1 to repair furnace brickwork, burner ports, door jambs, rabble arms and the bypass damper. Work continues on the off-gas scrubber platform installation.
- c. Staff replaced the Solids Handling Facility THC and oxygen probe.

8. Williamsburg Treatment Plant (WBTP)

- a. Staff completed the coatings work on the upper portion of the steel in the secondary clarifier #3.
- b. Staff completed work on aeration tank #2 and placed it in service. Two of the four aeration tanks now have additional modifications to the nitrate recycle line and aeration control.
- c. Staff drained, cleaned and inspected aeration tank #1, which was modified a year ago to include an anaerobic zone. Staff is making a few small changes to help optimize the existing process and placing the tank back in service next month.

9. York River Treatment Plant (YRTP)

- a. There was one reportable odor issue when the caustic feed pump tripped and was off for an extended period. Staff reset the pump. The outage resulted in one hourly H₂S odor exhaust reading of 10 ppm.
- b. Staff continues to provide maintenance support to the Surry plants.
- c. The Environmental Data Management System is fully implemented and the system generated the November Monthly Plant Operations Report.

D. Small Communities

1. Small Communities Division – Middle Peninsula

a. West Point Treatment Plant (WPTP)

There was a reportable event for loss of dechlorination for approximately 16 minutes on November 6. The process feed line to the bisulfite analyzer came loose, sending cooler process water onto the bisulfite feed pumps. It is believed this cooler water caused condensation to occur inside the feed pump head tripping one of the

leak detector alarms. The pump was put in manual while the line coupling was repaired. Additional steps have been taken in order to better secure the feed line as well as increase alarming on the pumps and automatic activation of a redundant pump.

Design work continues on the tertiary filter project, preparing documents for construction ready bid packages. Additionally, an aeration trial is underway with a self-aspirating air/sludge pump for the aerobic digesters. This trial, if successful, will provide an economical and operationally beneficial replacement to the failing and maintenance-heavy existing coarse bubble system.

b. Urbanna Treatment Plant (UBTP)

Process Train #1 was taken off line for installation of the fine bubble diffuser aeration system, Anaerobic, Anoxic, Oxygenation process (A2O) piping upgrades and additional mixer for possible extended anoxic zone. This construction work is being done in-house and will be a substantial and necessary improvement to the reliability of the biological process at the plant as we continue to see increased nutrient loadings and flow.

c. King William Treatment Plant (KWTP)

The final Preliminary Engineering Report meeting was held for the plant improvements. Design is anticipated to commence.

d. Central Middlesex Treatment Plant (CMTP)

Since the removal of the grinder system in September, the plant has seen a much higher than normal amount of trash collecting in the equalization tank and to a much lesser degree, in the aeration tanks at the plant. Staff is working with the regional jail facility (the main contributor of flow to the plant) to reduce the trash coming out of the facility.

e. Lawnes Point Treatment Plant (LPTP)

Small Communities performed one pump and haul operation of LPTP this month.

2. Surry

a. Town of Surry Treatment Plant

- 1) On November 5, one of the rotating biological contactors broke a chain and was out of service for a few days. As a result, excessive TKN and ammonia concentrations were experienced.
- 2) On November 17, a new chemical feed system was put into operation. The installation of this system included the installation of chemical feed pumps, chemical delivery and storage facilities, and the installation of underground feed piping. Process sampling and testing was performed throughout the month to optimize chemical dosage for copper and zinc removal.
- 3) On November 27, drum filter #2 failed. Staff is working to repair the filter.
- 4) Both ultraviolet systems were completely rehabbed, cleaned and put into full operation.

b. Town of Surry Permit Data

Despite improvements, treatment operations at the Town plant remain challenging. The following summarizes the permit exceedances for the month:

	Limit Type	Unit	Permit Limit	Reported Value	Number of Exceedances
Total Suspended Solids (TSS)	Monthly average	MG/L	10	12	1
TKN	Monthly average	MG/L	3.0	8.6	1
		G/DAY	680	1700	1
	Weekly average	MG/L	4.5	11.7	2
		G/DAY	1000	3300	1
Ammonia	Monthly average	MG/L	1.72	3.72	1
	Weekly average	MG/L	1.72	5.33	2
Total Copper	Monthly average	UG/L	3.8	8.2	1
	Weekly average	UG/L	3.8	8.4	2
				Total	12

c. County of Surry

- 1) The Surry County Wastewater Treatment Facility (WWTF) reported a monthly average discharge of 7.0 ug/L and a weekly average maximum of 8.0 ug/L for total copper during the month of November. The limit for the weekly average maximum and monthly average is 5.9 ug/L. These exceedances (2) are attributed to efforts adjusting the feed of polymer when the plant switches to storm mode versus normal operation mode. The necessary adjustments to the feed rate of polymer have been made to address this issue.
- 2) Staff installed an electronic timer on the chemical feed system. Sand filter and the sand filter output line were repaired.

E. Support Systems

1. Automotive

- a. Staff performed generator building load tests at the North Shore (NS) Operations and the South Shore (SS) Operations Main Office Complexes. All generators operated as designed and were returned to service.
- b. Staff performed load bank tests at Lucas Creek, Morrison, and Providence Road Pump Stations (PSs). All generators operated as designed and were returned to service.
- c. Staff continues coordination with contractor on the pilot program for vehicle (fleet) telematics. A mid-pilot review was conducted discussing parameters for gathering information.

2. Carpentry Shop

Staff completed 11 projects, including the installation of countertops and cabinets in lab rooms #130 and #130B at the Central Environmental Laboratory (CEL), designing and building countertops in the Distributive Control System Operator Lab at VIP and conducting routine preventive maintenance inspecting 21 PS roofs.

3. Condition Assessment

- a. Staff, through use of Closed-Circuit Television (CCTV), inspected two siphon chambers, 2,019 linear feet of gravity force main, completing

North Gravity (NG) line 103, and inspected 22 manholes, completing lines NG103, NG124, and NG236.

- b. Staff performed inspection assessments on coatings projects occurring at ATP, BHTP, NTP and VIP.
- c. Coating of ATP Secondary Clarifier #3 is complete and work has passed all inspections. Contractor has finished all surface prep, application of primer and stripe coats, and has started applying the final topcoat on Secondary Clarifier #4.
- d. Rehabilitation of the odor control piping throughout BHTP continues.
- e. A contractor completed coating work on cells C and D of the #4 Aeration Tank at NTP. Work begins on cell B. Coating of NTP's #2 digester tank roof is complete. Work now begins on the interior of the digester tank.

4. Facilities Maintenance

Renovation of the lunchroom at NTP continues. Tentative completion date is December 31.

F. Electrical and Energy Management (EEM)

1. Staff continues to work with a consultant to design a temporary electrical distribution center at WBTP. The distribution center provides an opportunity to connect alternate power to the plant in the event of catastrophic electrical failure and helps to facilitate the replacement of new main switchgear, which is in the capital improvement plan (CIP).
2. Staff continues to support the construction upgrade at VIP. The team assisted the electrical contractor with removing and replacing a motor control center (MCC) in the observation building.
3. Staff continues work on the replacement of MCC's AB3 and AB4 at ATP. The team completed the cable tray installation, relocated circuits from one of the old MCC's to the new MCC and demolished one of the old MCC's.
4. Staff replaced older, inefficient light fixtures on three of seven high mast poles at NTP with light emitting diode (LED) technology. These light fixtures will operate at one third the cost of the old fixtures.

5. Staff modified a ControlWave[®] programmable logic control (PLC) and operator interface terminal (OIT) at KWTP to allow an operator the ability to change the minimum speed of reuse pumps feeding water to the Nestle Purina Plant.
6. Staff worked with a contractor to remove two existing lighting poles near the parking lot and replace them with lighting fixtures mounted on the South side of the CEL building. The existing light poles were located too close to the utility power lines to repair the poles safely.
7. Seasonal weather conditions continue to create communication issues with the Supervisory Control and Data Acquisition (SCADA) system. The loss of the radio signal from the Master Metering Site (MMPS) located at Chesapeake Avenue and Clyde Street in Hampton is an example of a typical scenario. The team restored the signal by redirecting the radio signal to another receiver located at an adjacent pump station (PS).

G. Water Technology and Research

Process and whole plant modeling is now a very important tool for the design and operation of wastewater treatment facilities. These process models emerged as complex mathematical representations of the activated sludge process in the late 1980s, requiring the application of the first computers for the numerical solution of large numbers of differential equations. Since that time, the original activated sludge models (ASMs) have been modernized to represent the full complexity of contemporary nutrient removal technologies, and model elements have also been developed over the years for other process units (e.g. anaerobic digestion, clarifiers, thickening, dewatering, etc.) such that full plant simulation is possible, both under steady-state and dynamic conditions. Commercially available simulation platforms are now widely used in our field and well understood. Examples include BioWin (EnviroSim Associates Ltd), GPS-X (Hydromantis Environmental Software Solutions, Inc.), and SUMO (Dynamita).

The information contained within the model structure itself and the default stoichiometric and kinetic parameter sets represents for our industry the single most important technical communication tool and repository of process design guidance. This is primarily a result of the worldwide consensus-based approach for updating and validating model structure and modeling approach, led primarily through task forces and meetings hosted by the International Water Association, originating in the late 1980s and continuing even today. As treatment technologies evolve, and as processes get more complex (anammox for example), these models must also evolve, and they continue to get more and more complex, requiring more computing power and more technical sophistication by the model user/developer.

A significant process modeling effort has preceded every major and most minor plant upgrades performed at HRSD over roughly the last 20 years. These modeling efforts demand good process monitoring and wastewater characterization data obtained through sampling and analysis beyond that which is needed for day-to-day plant operation. It is impossible to estimate the capital cost savings that have been recognized at HRSD as a result of more aggressive process designs that would not be possible without the availability these process models. From a treatment plant standpoint, this is arguably one of our most important risk mitigation tools. Process models enhance our understanding of these ever more complex treatment technologies, and thus have also become an important training tool. Currently, there are several process modeling efforts ongoing that are the initial step of major plant upgrades being considered as part of SWIFT-related projects. These include Williamsburg, York River, James River, and Nansemond treatment plants. Next month, we will highlight the scope of these process modeling efforts.

H. MOM Reporting numbers

MOM Reporting #	Measure Name	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
2.7	# of PS Annual PMs Performed (NS)	2	4	4	2	2							
2.7	# of PS Annual PMs Performed (SS)	5	5	6	5	3							
2.7	# of Backup Generator PMs Performed (Target is 4.6)	9	10	10	12	7							
2.8	# of FM Air Release Valve PMs Performed (NS)	108	36	186	204	256							
2.8	# of FM Air Release Valve PMs Performed (SS)	79	153	115	409	140							
2.9	# of Linear Feet of Gravity Clean (Contractor)	0	0	0	0	0							
2.9	# of Linear Feet of Gravity Clean (NS) (Target is 2,417 for HRSD)	11,560	5,608	3,872	3,807	1,837							

MOM Reporting #	Measure Name	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
2.9	# of Linear Feet of Gravity Clean (SS) (Target is 2,417 for HRSD)	5,838	8,330	3,354	0	12,580							
2.9	# of Linear Feet of Gravity CCTV Inspection (HRSD Target 3,300 LF)	9,186	5,796	4,017	2,717	2,019							

I. Strategic Measurement Data

1. Education and Outreach Events: 11

- a. Chesapeake Bay Foundation oyster cage maintenance for oyster gardening program at Boat Harbor Treatment Plant
- b. CETP plant tour for students from Eastern Virginia Medical School and Tidewater Community College (TCC)
- c. JRTP plant tour with emphasis on ANITAMox, inDense, and IFAS systems was provided for wastewater treatment personnel from Fairfax County and engineers from Hazen.
- d. NTP Plant Tour for staff from Fairfax County and staff from Hazen
- e. NTP Tours for the Navy Wastewater Operators – 2
- f. SCD staff participated in the West Point Crab Holiday Festival and Touch-A-Truck
- g. VIP Plant Tour for Old Dominion University ASCE Students
- h. The Electrical Manager attended a board meeting of the Cooperating Hampton Roads Organization for Minorities in Engineering Club (CHROME) on November 21.
- i. EEM staff conducted a tour of ATP's electrical distribution system and electrical machinery for students participating in TCC Mechatronics Program on November 6.
- j. The Electrical Manager facilitated a United Way Campaign meeting on November 7.

2. Community Partners: 7

- a. Virginia Institute of Marine Science
- b. Old Dominion University
- c. Chesapeake Bay Foundation
- d. Eastern Virginia Medical School
- e. Tidewater Community College
- f. Cooperating Hampton Roads Organization for Minorities in Engineering Club (CHROME)
- g. United Way

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Training During Work Hours per Full Time Employee (FTE) (511) – Current Month	Hours / FTE	3.01
M-1.4b	Total Training During Work Hours per FTE (511) – Cumulative Year-to-Date	Hours / FTE	15.14
M-2.3a	Planned Maintenance Total Maintenance Hours	Total Recorded Maintenance Labor Hours	25,410.75
M-2.3b	Planned Maintenance – Preventive and Condition Based	% of Total Maintenance Hours	40.82
M-2.3c	Planned Maintenance - Corrective Maintenance	% of Total Maintenance Hours	26.82
M-2.3d	Planned Maintenance-Projects	% of Total Maintenance Hours	32.36
M- 4.1a	Energy Use: Treatment *reported for October 2017	kWh/MG	2,495
M-4.1b	Energy Use: Pump Stations *reported for October 2017	kWh/MG	166
M-4.1c	Energy Use: Office Building *reported for October 2017	kWh/MG	129
M-5.2	Educational and Outreach Events	Number	11
M-5.3	Number of Community Partners	Number	7

Respectfully submitted,

Steve de Mik
Director of Operations

TO: General Manager
FROM: Special Assistant for Compliance Assurance
SUBJECT: Monthly Report for November 2017
DATE: December 8, 2017

A. Submittals Completed in November 2017 – None

B. Activities

1. **Phase 6 – Rehabilitation Plan.** The Prompt Repair Committee met on **Monday, November 27** to designate any new Prompt Repairs. On-going system rehabilitation work, associated with Prompt Repairs or other items in the Sewer Repair (SR) contract is as follows:
 - SR 037 – Bayshore Lane: Addressing manhole repair issues prior to closing out project.
 - SR 040 – Woodland Avenue: Construction underway to replace sections of pipeline.
2. **Phase 8 – EPA Consent Decree Services.** HRSD continues sharing information with the localities through the regional SharePoint site and flow, pressure and rainfall data portal. A Capacity Team Meeting is scheduled for December 18.
3. **Phase 9 – Supplemental Services.** Management, Operations and Maintenance (MOM) Program elements are ongoing, including the Hydrogen Sulfide (H₂S) Monitoring Program and implementation of a Business Intelligence (BI) system for the Small Communities Division (SCD). This includes a MOM update manual guidance document for use on the next major update, expected in 2018.

The Flow, Pressure and Rainfall (FPR) monitoring program continued in November with data collection and analysis being performed as part of the MOM Program.

Condition assessment work under Phase II of the Force Main Condition Assessment (FMP2) program progressed in November. Force main inspection work order status is as follows:

- FMP2 039 Bowers Hill: Work is in progress to inspect the force main.

- FMP2 043 Kempsville Road: Project complete. The corrosion report is under review by BC.
- FMP2 049 Shore Dr. (Reservoir Group): Work order under development.

Field work planning continued in November under the Gravity Sewer Inspection Phase II Program. The gravity inspection work order status is as follows:

- Draft Work Order GMP2 056 Jefferson Avenue Closed Circuit Television (CCTV) is under development.
- The following Small Communities Division (SCD) work orders are currently in draft and under review:
 - GMP2 SCD 026 Main Pump Station
 - GMP2 SCD 027 Commerce Pump Station
 - GMP2 SCD 028 Central Crossing
 - GMP2 SCD 029 McCauley Park Pump Station
 - GMP2 SCD 030 Kennington Pump Station
 - GMP2 SCD 033 School Pump Station
- Additional SCD work orders are under development
 - GMP2 SCD 031 Urbanna Manholes
 - GMP2 SCD 032 King William Manholes

Work continued on the Fiscal Year 2017 Condition Assessment Annual Report.

C. Next Submittals

1. Annual Public Meeting – January 2018
2. Annual Newsletter – February 2018

D. Program Budget Status

The overall program budget is \$132,985,133, excluding the Master Metering Program. A summary of appropriations and expenses is attached.

E. Strategic Planning Metrics Summary

1. Educational and Outreach Events: 1
 - a. Monthly calls continue with the three other co-chairs coordinating the national WEF Collections Specialty Conference, which will be at the Virginia Beach Convention Center, April 8-11, 2018.

2. Number of Community Partners: 0

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Total Training Hours Per Full Time Employee (1) – Current Month	Total Training Hours / # FTE	0
M-1.4b	Total Training Hours Per Full Time Employee (1) – Cumulative Fiscal Year to Date	Total Training Hours / # FTE	40
M-5.2	Educational and Outreach Events	Number	1
M-5.3	Number of Community Partners	Number	0

Respectfully submitted,

Phil Hubbard, P.E.

Attachments: [Consent Order State & EPA Expenditures](#)

Consent Order State & EPA Expenditures

	Total Appropriation	November 2017 Obligations	Available Balance
Regional Consent Order and Other Consent Order Requirements			
Regional Hydraulic Model	\$108,931,987	\$108,551,628	\$380,359
Manhole Rehab/Replacement Phase I & North Shore Siphon Chamber	\$2,834,000	\$513,591	\$2,320,409
Locality System Monitoring and Condition Assessment	\$21,219,146	\$20,287,625	\$931,521
Subtotal - In progress	\$132,985,133	\$129,352,844	\$3,632,289
Completed Work			
Regional Consent Order and Other Consent Order Requirements		(Included in subtotal above)	
Master Metering Program III		\$2,005,140	
Master Metering Program IV		\$13,628,635	
Total		\$144,986,619	

TO: General Manager
FROM: Director of Talent Management
SUBJECT: Monthly Report for November 2017
DATE: December 8, 2017

A. Human Resources (HR)

1. Recruitment Summary

New Recruitment Campaigns	8
Job Offers Accepted – Internal Selections	8
Job Offers Accepted – External Selections	9
Internal Applications	24
External Applications	131
Average Days to Fill Position	61

2. Enterprise Resource Planning (ERP)

a. HRSD worked with the Managed Services consultant on the following:

- (1) Benefit program setup
- (2) Voluntary long term disability interface
- (3) Cigna interface

b. Staff worked with Oracle Support on new hire and reporting functionality.

c. Staff worked with Information Technology on interface updates.

3. Benefits and Compensation

a. Open Enrollment for the Retiree Supplemental Health Plan began.

b. The Request for Proposal process for Benefits Consulting services continued.

c. HR continued to work with Finance on administrative issues with the long-term disability benefits provider.

- d. The quarterly Employee Assistance Program (EAP) review meeting was held with the EAP provider to review utilization and to clarify administrative and communication procedures.
- e. Staff met with HRSD internal auditors to review the Management Action Plan follow-up process for the Employee Benefits Internal Audit.
- f. The pay table was updated to re-incorporate the Grade 10 job classification.

4. Wellness

a. Participation Activities

Year 3 Participation Activities	Unit	November 2017	Year to Date (March 2017–February 2018)
Biometric Screenings	Number	17	30
Preventive Health Exams	Number	16	60
Preventive Health Assessments	Number	35	270
Coaching Calls	Number	0	0
On-Line Health Improvement Programs	Number	99	561
Web-MD Online Health Tracking	Number	210	1307
Challenges Completed	Number	0	0
Fit-Bit Promotion	Number	2	86

- b. The Wellness Specialist distributed *Great American Smokeout* information to promote smoking cessation for at least one day and to provide resources to help tobacco users quit.
- c. An educational e-mail for National Diabetes Month was sent to all employees, containing information on A1C, blood pressure and cholesterol as well as local diabetes education classes.
- d. Seven biometric screenings were completed for employees with medical loans.

5. Workers Compensation

- a. Six new cases were opened with 18 cases remaining active.
- b. HR staff conducted the final supervisor training session on HRSD Workers Compensation Program and procedures.

6. Employee Relations

- a. Staff continued to partner with work center supervisors and employees to support employee relations, address HR issues, and assist with job descriptions and interview processes. Support was provided for additional re-organization within Operations.
- b. Staff met with supervisors and managers from Army Base, Chesapeake Elizabeth and Virginia Initiative Treatment Plants (TPs) to open discussions on a variety of topics including diversity, recruitment and disciplinary actions. The overall meeting goal was to increase collaboration between HR and work centers to improve consistency and communication when addressing issues.
- c. Bi-weekly meetings with HR, Accounting and Payroll staff began to identify roles and outline HR and Payroll procedures for overlapping work processes such as short-term disability, workers' compensation, and retroactive changes in ERP.

7. General

- a. Staff participated in the following HRSD activities:
 - (1) Talent Management Annual Planning Day
 - (2) Sustainable Water Initiative for Tomorrow (SWIFT) Construction Tour and Progress Update
- c. Staff participated in the following training:
 - (1) Now Care's *Drug and Alcohol Awareness* Training
 - (2) Benefits consultant webinar, *Health Insurance Portability and Accountability Act (HIPPA) 102: Developing a Strategic Response for HIPPA Privacy and Security*
 - (3) A Skill Path Communication Seminar

B. Organization Development and Training (OD&T)

1. Fiscal Year 2019 Annual Planning Days were completed. Documentation will be posted on SharePoint and parking board items submitted to the QST in early December.
2. The HRSD University team completed work with consultants on two pilot e-learning modules and began developing a QST presentation.
3. The Supervisor and Leadership training program was updated to include an *Emotional Intelligence* course. The course will be advertised in December along with a Refresher workshop.
4. The OD&T Manager continued working with the Chesapeake- Elizabeth TP Manager on an abridged Supervisor Workshop for Lead Operators.
5. Work continued with engineering staff on developing an *Effective Collaborative Meeting* workshop.
6. The Project Management Team completed a framework and a training manual template for the project management skills workshop. Program enhancements will be addressed next month.
7. Apprenticeship Program
 - a. Staff worked with Communications on promoting National Apprenticeship Week. Apprentice testimonials were posted to HRSD social media platforms.
 - b. Several Apprenticeship Manual updates were drafted for proposal to the Apprenticeship Committee.
 - c. Staff continued to add historical training and apprenticeship program information into the ERP Learning Management system.
 - d. The Training Superintendent performed the following in relation to Apprenticeship courses:
 - (1) Evaluated *Wastewater Analysis and Wastewater Laboratory* course for conversion to an on-line format and revision of the laboratory component to align with Plant Operator functions
 - (2) Revisions to *Disinfection* curriculum
 - (3) Revisions to *Collection System Maintenance* curriculum

8. The Training Superintendent continued online wastewater treatment training provided by Sacramento State Office of Water Programs.

C. Safety

1. Mishaps and Work Related Injuries

- a. HRSD-Wide Injury Mishap Status to Date (OSHA Recordable)

	<u>2016</u>	<u>2017</u>
Mishaps	42	41
Lost Time Mishaps	8	10
<i>Numbers subject to change pending HR review of each case.</i>		

- b. MOM Program Year Performance Measure Work Related Injuries

November 2017 Injuries For Operations	November 2017 Injuries for Other HRSD Departments	Total Lost Time Injuries Since July 2017	Total HRSD Injuries Since July 2017
5	0	5	21

- c. Follow-up investigations were performed on five reported work-related injuries and one auto accident.

2. HRSD Safety Training

Strategic Planning Measure	Unit	November 2017
Total Safety Training Hours per Full Time Employee (830) All HRSD – November 2017	88.17 Hours / 830 FTE	0.11
Total Safety Training Hours Per Full Time Employee (830) – Cumulative July 2017	2078.77 Hours / 830 FTE	2.50

3. In addition to regularly scheduled safety training and medical monitoring, the following sessions were conducted:
 - a. Ten external briefings for contractors working at TPs and pump stations
 - b. Chemical Hygiene Plan training for new Water Quality employees and Research and Technology interns.
 - c. Virginia Department of Transportation Flagging training for Pretreatment and Pollution Prevention (P3) employees.
4. Safety Inspections, Testing and Monitoring
 - a. Weekly on-site inspections of the following construction sites:
 - (1) Army Base TP
 - (2) Atlantic TP
 - (3) James River TP
 - (4) SWIFT Research Center at Nansemond TP
 - (5) Virginia Initiative Plant (VIP)
 - b. Quarterly safety inspections of the following work centers:
 - (1) Air Rail Avenue Complex
 - (2) Central Environmental Lab
 - (3) North Shore Pump Stations
 - (4) South Shore Pump Stations
 - (5) South Shore P3
 - (6) Surry County TP
 - (7) Technical Services
 - (8) VIP
 - (9) York River TP
 - c. Monitoring and testing for the following:
 - (1) Monthly hood velocity tests on Central Environmental Laboratory and Technical Services lab hoods
 - (2) Air sampling and evaluation of a sodium bisulfite leaks at Boat Harbor and Williamsburg TPs
 - d. Staff continued to evaluate safety needs for the Town of Surry TP.

5. Safety Programs

- a. The electronic version of the 2016 Occupational Health and Safety Administration (OSHA) 300 log summary was submitted to meet OSHA requirements.
- b. Staff continued to review and input audiometric testing results.
- c. Safety and Operations staff met and continued implementation of an on-line Material Safety Data Sheets (MSDS) program at several work centers.
- d. The Safety Coordinator continued maintaining the Operations Safety Accident Tracking report.

6. General

- a. Staff continued developing requirements for Request for Proposals for a Prescription Safety Glasses program and employment related physicals.
- b. The Safety Manager worked with the OD&T Manager to address Account Investigator training needs.
- c. The Safety Manager provided above ground and underground storage tank information to a HRSD insurance carrier.
- c. Safety team members toured the Town of Surry and County TPs.
- d. Staff attended a Federal Bureau of Investigation (FBI) Chemical Facility Outreach Workshop at the Chesapeake FBI office.

D. Monthly Strategic Planning Metrics Summary

1. Education and Outreach Events: 3

- a. City of Suffolk Center for Technical Education Professional Student Conference
- b. Thomas Nelson Community College Facilities Maintenance Tech Program
- c. Tidewater Community College Career Fair

2. Community Partners: 3
 - a. City of Suffolk Technical Education Center
 - b. Thomas Nelson Community College
 - c. Tidewater Community College
3. Monthly Metrics

Item #	Strategic Planning Measure	Unit	November 2017
M-1.1a	Employee Turnover Rate (Total)	Percentage	0.50
M-1.1b	Employee Turnover due to Service Retirements	Percentage	0.25
M-1.4a	Total Training Hours Per Full Time Employee (15) – Current Month	Total Training Hours/ FTE	1.80
M-1.4b	Total Training Hours Per FTE (15) Cumulative Fiscal Year-to-Date	Total Training Hours/ FTE	16.76
M-5.2	Educational and Outreach Events	Number	3
M-5.3	Community Partners	Number	3

Respectfully submitted,
Paula A. Hogg
 Director of Talent Management

TO: General Manager
FROM: Director of Water Quality (WQ)
SUBJECT: Monthly Report for November 2017
DATE: December 8, 2017

A. General

1. Pretreatment and Pollution Prevention (P3) division staff assessed two civil penalties this month.

ALSCO – Virginia Beach

An Enforcement Order was issued to ALSCO, Incorporated in October 2017 for failure to maintain records for three years (discovered during the March 2017 inspection), permit limit exceedances for Oil & Grease (silica get treated hexane extractable material, or SGT-HEM) in June and July 2017, a permit limit exceedance for chemical oxygen demand:biochemical oxygen demand (COD: BOD) ratio in July 2017, and a permit limit exceedance for Chloroform in August 2017. The Enforcement Order contained an invoice totaling \$5,000 in Civil Penalties. Copies of the missing records have been obtained and ALSCO now has produced the required three years of records. The Oil & Grease (SGT-HEM), COD:BOD ratio and Chloroform violations have been addressed and corrective actions have been put into place. The Enforcement Order was accepted and the Civil Penalty was paid in November 2017.

Valley Proteins, Incorporated – Ashland

An Enforcement Order was issued to Valley Proteins, Incorporated in November 2017 for an unauthorized discharge and administrative violation that occurred in June 2017. The Enforcement Order contained an invoice totaling \$2,750 in Civil Penalties. The unauthorized discharge violation resulted from a driver for the company decanting a food service grease control device which is against all locality and HRSD requirements. The administrative violation resulted from a discrepancy in reporting the volume of wastewater discharged on their monthly report. A Show-Cause meeting was held and all violations have been adequately addressed. The Enforcement Order was accepted and the Civil Penalty was paid in November 2017.

2. The Director attended the annual National Association of Clean Water Agencies Clean Water Law Seminar followed by a workshop addressing Clean Water Act (CWA) enforcement issues, all held in Savannah, Georgia. Lee Forsgren, the new Deputy Assistant Administrator (DAA) for EPA's Office

of Water, relayed EPA's latest direction regarding how to treat small, failing waste water treatment systems not unlike the systems found in the Town of Surry or Lawnes Point. Mr. Forsgren indicated that EPA would encourage owners of these systems to regionalize by waiving CWA permit fines to those small systems; the fines presumably being due to permit exceedances that occur because small systems have significant resource limitations. Discussions regarding the concept of wastewater regionalization have been occurring more and more frequently at the national level. HRSD has identified several wastewater facilities that are located within the Hampton Roads region but operate and discharge independently of HRSD. More of these facilities will likely approach HRSD for assistance in the future as regulatory requirements continue to become more stringent.

B. Quality Improvement and Strategic Activities

1. The Sustainability Advocacy Group (SAG) did not report activity for the month of November.
2. The WQ Communication Team continues monitoring and measuring inter-divisional communication issues within the WQ Department.

C. Municipal Assistance

HRSD provided sampling and analytical services to Hanover County to support their Virginia Pollution Discharge Elimination System (VPDES) permit application processes.

D. Strategic Planning Metrics Summary

1. Educational and Outreach Events: 3
 - a. Central Environmental Laboratory (CEL) staff provided a tour of the laboratory to an Old Dominion University (ODU) Microbiology student.
 - b. CEL staff provided a tour of the laboratory to Eastern Virginia Medical Science (EVMS) Environmental Health students in conjunction with the Tidewater Community College (TCC) Engineering Club.
 - c. P3 staff participated in the Canon Health and Safety Expo.
2. Community Partners: 8
 - a. City of Norfolk
 - b. City of Newport News
 - c. Virginia Department of Health Division of Shellfish Sanitation
 - d. Virginia Department of Environmental Quality
 - e. Old Dominion University

- f. City of Suffolk
- g. Elizabeth River Project
- h. Virginia Department of Health Office of Epidemiology

3. Odor Complaints: 2

- a. South Shore Operations, Physical Plant Maintenance, and the Technical Services Division (TSD) responded to a complaint of odors at the Virginia Maritime Association (VMA) building that houses HRSD's Plume Street pump station. The odors observed and reported by VMA staff on November 2 occurred on the first floor and were described as a mothball/sewage type odor. The station was observed operating normally with no unusual odors on November 3rd. A faint wet well odor was observed near the station gate. Staff suspects that normal wet well odors that are typically not a problem coupled with unique atmospheric conditions (an atmospheric inversion with winds creating worst-case dispersion effects including building plume downwash and cavity effects) placed odors at ground level which were then entrained in the first floor of the building. TSD did not measure any hydrogen sulfide (0 PPB) but did observe a very faint mothball odor (source unknown) at VMA's first floor front desk. No further complaints have been made and/or odors observed.
- b. On November 3, HRSD received an odor complaint from Ms. Diana Hoff, a neighbor of the Atlantic Plant. Operations and TSD investigated on November 4 and observed no odors at her residence. However, prevailing winds at the time of the investigation placed her upwind of the plant. The immediate response and follow-up investigation did find onsite odors that have potential to go offsite. Corrective action taken to minimize onsite odors included: refilling the water seal on the acid phase digester; completion of repairs and a return to service of odor scrubber C installed on the sludge storage tank; putting primary covers back in place following maintenance activities; the draining, cleaning, and refilling of out-of-service open tanks with fresh non-potable water (NPW), and ensuring odor ducts were open on in-service covered tanks. No further complaints or contact from Ms. Hoff have been received.

Item #	Strategic Planning Measure	Unit	November 2017
M-1.4a	Training During Work Hours Per Full Time Employee (109) (Current Month)	Total Hours / # FTE	3.01
M-1.4b	Total Training During Work Hours Per Full Time Employee (109) (Cumulative Fiscal Year-to-Date)	Total Hours / # FTE	23.90

Item #	Strategic Planning Measure	Unit	November 2017
M-2.5	North Shore/South Shore Capacity Related Overflows	# within Level of Service	0
M-3.1	Permit Compliance	# of Exceedances: # of Permitted Parameters	4:24,118
M-3.2	Odor Complaints	#	2
M-3.4	Pollutant Removal	Total Pounds Removed	79,267,424
M-3.5	Pollutant Discharge	% Pounds Discharged/Pounds Permitted	16%
M-5.2	Educational and Outreach Events	#	3
M-5.3	Community Partners	#	8
	Average Daily Flow	Total MGD for all Treatment Plants	132.56
	Industrial Waste Related System Issues	#	0

Respectfully submitted,

James Plett, PhD

Director of Water Quality



The following Internal Audit Status document has been prepared by SC&H for the HRSD Commission. Below is a summary of projects in process, upcoming projects, and the status of current management action plan (MAP) monitoring.

I. *Projects in Process*

Engineering Procurement Process Review

- **Tasks Completed (November 2017)**
 - Finalized fieldwork and testing
 - Completed draft final report

- **Upcoming Tasks (December 2017)**
 - Obtain management action plans
 - Finalize report for delivery to HRSD Management and Commission

IT: Network Security/ Cybersecurity

- **Tasks Completed (November 2017)**
 - Process owners reviewed and responded to the draft report; SC&H tasks were on hold pending responses

- **Upcoming Tasks (December 2017)**
 - Review and finalize management action plans and obtain agreement with client
 - Finalize report
 - Determine communication method

Corporate Governance: Ethics Function

- **Tasks Completed (November 2017)**
 - Performed walkthroughs with process owners
 - Requested, obtained, and reviewed fieldwork documentation
 - Prepared audit program and objectives
 - Performed fieldwork procedures

- **Upcoming Tasks (December 2017)**
 - Complete fieldwork
 - Draft final report and observations

Risk Assessment: Year 3 Refresh

- **Tasks Completed (November 2017)**
 - Prepared risk assessment questionnaires and supporting materials
 - Scheduled process owner discussions

- **Upcoming Tasks (December 2017)**
 - Perform risk assessment interviews
 - Review relevant documentation
 - Perform risk assessment analyses
 - Prepare risk ranking and audit plan presentation



II. Upcoming Projects (FY2018)

The following projects are scheduled to be performed during FY2018 based upon the risk assessment previously performed by SC&H.

- Q3- Operations: Treatment Plants
- Q4- Finance and Accounting: Customer Care (Billing, Mail Center & Payments, A/R & Delinquent Accounts)

III. Management Action Plan (MAP) Monitoring

SC&H is performing on-going MAP monitoring for internal audits previously conducted for HRSD. SC&H begins MAP follow-up approximately one year following the completion of each audit and will assess bi-annually.

For each recommendation noted in an audit report, SC&H gains an understanding of the steps performed to address the action plan and obtains evidence to confirm implementation, when available.

The following describes the current project monitoring status and upcoming monitoring timeframes.

Design and Construction: CIP Project Management Review MAP Status

- Audit Report Date: May 11, 2016
- Next Follow-up: September 2017
- Total Recommendations: 13
- Recommendations Closed: 10
- Recommendations Open: 3 (Anticipated to be closed by December 2017)

Biosolids Recycling Program Review MAP Status

- Audit Report Date: October 8, 2016
- Next Follow-up: December 2017; obtained documentation and initial responses November 2017
- Total Recommendations: 8
- Recommendations Closed: 7- validation in process
- Recommendations Open: 1- validation in process

HR Administration of Employee Health Insurance Audit MAP Status

- Audit Report Date: November 22, 2016
- Next Follow-up: Meet with process owners November 28th; follow-up and review planned for December 2017
- Total Recommendations: 15
- Recommendations Closed: TBD- validation in process
- Recommendations Open: TBD- validation in process

Upcoming MAP Monitoring

- Inventory Management
 - Report Date: April 20, 2017
 - Anticipated MAP Follow-up: April 2018



KPMG LLP
Suite 1900
440 Monticello Avenue
Norfolk, VA 23510

November 15, 2017

The Commissioners
Hampton Roads Sanitation District
Virginia Beach, Virginia

Ladies and Gentlemen:

We have audited the financial statements of the Hampton Roads Sanitation District (HRSD) as of and for the year ended June 30, 2017 and 2016, and expect to issue our report thereon under date of November 15, 2017. Under our professional standards, we are providing you with the accompanying information related to the conduct of our audits.

Our Responsibility under Professional Standards

We are responsible for forming and expressing an opinion about whether the financial statements, that have been prepared by management with the oversight of the Hampton Roads Sanitation District Commission (the Commissioners), are presented fairly, in all material respects, in conformity with U.S. generally accepted accounting principles. We have a responsibility to perform our audit of the financial statements in accordance with auditing standards generally accepted in the United States of America. In carrying out this responsibility, we planned and performed the audit to obtain reasonable assurance about whether the financial statements as a whole are free of material misstatement, whether caused by error or fraud. Because of the nature of audit evidence and the characteristics of fraud, we are to obtain reasonable, not absolute, assurance that material misstatements are detected. We have no responsibility to plan and perform the audit to obtain reasonable assurance that misstatements, whether caused by error or fraud, that are not material to the financial statements are detected. Our audit does not relieve management or the Commissioners of their responsibilities.

In addition, in planning and performing our audit of the financial statements, we considered internal control over financial reporting (internal control) as a basis for designing auditing procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements but not for the purpose of expressing an opinion on the effectiveness of HRSD's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of HRSD's internal control.

We also have a responsibility to communicate significant matters related to the financial statement audit that are, in our professional judgment, relevant to the responsibilities of the Commissioners in overseeing the financial reporting process. We are not required to design procedures for the purpose of identifying other matters to communicate to you.

Other Information in Documents Containing Audited Financial Statements

Our responsibility for other information in documents containing HRSD's financial statements and our auditors' report thereon does not extend beyond the financial information identified in our auditors' report, and we have no obligation to perform any procedures to corroborate other information contained in these documents. We have, however, read the other information included in HRSD's Comprehensive Annual Financial Report, and no matters came to our attention that cause us to believe that such information, or its manner of presentation, is materially inconsistent with the information, or manner of its presentation, appearing in the financial statements.



The Commissioners
Hampton Roads Sanitation District
November 15, 2017
Page 2 of 4

Accounting Practices and Alternative Treatments

Significant Accounting Policies

The significant accounting policies used by HRSD are described in note 2 to the financial statements.

Qualitative Aspects of Accounting Practices

We have discussed with the Commissioners and management our judgments about the quality, not just the acceptability, of HRSD's accounting principles as applied in its financial reporting. The discussions generally included such matters as the consistency of HRSD's accounting policies and their application, and the understandability and completeness of HRSD's financial statements, which include related disclosures.

Management Judgments and Accounting Estimates

The preparation of the financial statements requires management of HRSD to make a number of estimates and assumptions relating to the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the period.

Management's estimate of unbilled revenue is based upon historical trends and actual consumption data through June 30, 2017.

Management's estimate of the allowance for uncollectible accounts receivable is based on historical results and adjusted for current factors.

Management's estimate of the net pension liability and disclosures for net OPEB liability are based on assumptions, trends, and current factors developed with the assistance of third party actuarial experts.

Management's estimate of depreciation expense is based on the estimated useful lives of assets.

We evaluated the key factors, trends, and assumptions used to develop the estimates, including possible management bias in developing the estimates, and believe they are reasonable in relation to the financial statements taken as a whole.

Uncorrected Audit Misstatements

In connection with our audit of HRSD's financial statements, we did not propose any adjustments that were recorded by management. We have discussed with management three financial statement misstatements that have not been corrected in HRSD's books and records as of and for the year ended June 30, 2017. We have reported such misstatements to management on a Summary of Audit Misstatements and have received written representations from management that management believes that the effects of the uncorrected financial statement misstatements are immaterial to the financial statements taken as a whole. Attached is a copy of the summary that has been provided to, and discussed with, management.

Disagreements with Management

There were no disagreements with management on financial accounting and reporting matters that would have caused a modification of our report on HRSD's financial statements.



The Commissioners
Hampton Roads Sanitation District
November 15, 2017
Page 3 of 4

Management's Consultation with Other Accountants

To the best of our knowledge, management has not consulted with or obtained opinions, written or oral, from other independent accountants during the year ended June 30, 2017.

Significant Issues Discussed, or Subject to Correspondence, with Management

Major Issues Discussed with Management prior to Retention

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, with you and management each year prior to our retention by you as HRSD's auditors. However, these discussions occurred in the normal course of our professional relationship and our responses were not a condition to our retention.

Material Written Communications

Attached to this letter please find copies of the following material written communications between management and us:

1. Management representation letter
2. Engagement letter for the financial statement audit
3. Engagement letter for Virginia Retirement System census data attestation report
4. Engagement letter for The Department of Environmental Quality biosolid self-insurance agreed upon procedures report

Significant Difficulties Encountered during the Audit

We encountered no significant difficulties in dealing with management in performing our audit.

Independence

Our professional standards and other regulatory requirements specify that we communicate to you in writing, at least annually, all relationships between our firm and HRSD and persons in a financial reporting oversight role at HRSD and provide confirmation that we are independent accountants with respect to HRSD.

We are not aware of any independence-related relationships between KPMG and HRSD other than the professional services that have been provided to HRSD.



The Commissioners
Hampton Roads Sanitation District
November 15, 2017
Page 4 of 4

Confirmation of Audit Independence

We hereby confirm that as of November 15, 2017, we are independent accountants with respect to HRSD under all relevant professional and regulatory standards.

* * * * *

This letter to the Commissioners is intended solely for the information and use of the Commissioners and management and is not intended to be and should not be used by anyone other than these specified parties.

Very truly yours,

KPMG LLP



November 15, 2017

KPMG LLP
440 Monticello Avenue
Suite 1900
Norfolk, Virginia 23510

Ladies and Gentlemen:

We are providing this letter in connection with your audit of the financial statements of the Hampton Roads Sanitation District (HRSD), a component unit of the Commonwealth of Virginia, as of and for the years ended June 30, 2017 and 2016, the remaining fund information, and the related notes to the financial statements, for the purpose of expressing opinions as to whether these financial statements present fairly, in all material respects, the respective financial positions, changes in financial positions, and, where applicable, cash flows of HRSD in accordance with U.S. generally accepted accounting principles.

Certain representations in this letter are described as being limited to matters that are material. Items are considered material, regardless of size, if they involve an omission or misstatement of accounting information that, in the light of surrounding circumstances, makes it probable that the judgment of a reasonable person relying on the information would be changed or influenced by the omission or misstatement.

We confirm, to the best of our knowledge and belief, as of November 15, 2017, the following representations made to you during your audits:

1. We have fulfilled our responsibilities, as set out in the terms of the audit engagement letter dated May 22, 2017, for the preparation and fair presentation of the financial statements in accordance with U.S. generally accepted accounting principles.
2. We have made available to you:
 - a. All records, documentation, and information that is relevant to the preparation and fair presentation of the financial statements.
 - b. Additional information that you have requested from us for the purpose of the audits. Unrestricted access and the full cooperation of personnel within the entity from whom you determined it necessary to obtain audit evidence.
 - d. All minutes of the meetings of HRSD's Commission, or summaries of actions of recent meetings for which minutes have not yet been prepared. All significant board and committee actions are included in the summaries.
3. Except as disclosed to you in writing, there have been no:
 - a. Circumstances that have resulted in communications from HRSD's external legal counsel to HRSD's reporting evidence of a material violation of securities law or breach of fiduciary duty, or similar violation by HRSD's or any agent thereof.
 - b. Communications from regulatory agencies, governmental representatives, employees, or others concerning investigations or allegations of noncompliance with laws and regulations in any jurisdiction, deficiencies in financial reporting practices, or other matters that could have a material adverse effect on the financial statements.
4. There are no:
 - a. Violations or possible violations of laws or regulations, whose effects should be considered for disclosure in the financial statements or as a basis for recording a loss contingency, except as disclosed in the financial statements or footnotes to the financial statements.

Accounting & Finance Division • PO Box 5915, Virginia Beach, VA 23471-0915 • 757.460.7212 • Fax 757.460.8763

Commissioners: Frederick N. Elofson, CPA, Chair • Maurice P. Lynch, PhD, Vice-Chair • Vishnu K. Lakdawala, PhD
Michael E. Glenn • Stephen C. Rodriguez • Willie Levenston, Jr. • Ann W. Templeman • Elizabeth A. Taraski, PhD
www.hrsd.com

- b. Material transactions that have not been properly recorded in the accounting records underlying the financial statements.
 - c. Side agreements or other arrangements (either written or oral) that have not been disclosed to you.
 - d. Events that have occurred subsequent to the date of the statement of net position and through the date of this letter that would require adjustment to or disclosure in the financial statements.
5. The effects of all known actual or possible litigation and claims have been accounted for and disclosed in accordance with paragraphs 96 – 113 of Governmental Accounting Standards Board (GASB) Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements*.
6. We have disclosed to you all known actual or possible litigation, claims, and assessments whose effects should be considered when preparing the financial statements and we have not consulted legal counsel concerning litigation, claims, or assessments.
7. We believe that the effects of the uncorrected financial statement misstatements summarized in the accompanying schedule are immaterial, both individually and in the aggregate, to the financial statements.
8. We acknowledge our responsibility for the design, implementation, and maintenance of programs and controls to prevent, deter, and detect fraud; for adopting sound accounting policies; and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the financial statements and to provide reasonable assurance against the possibility of misstatements that are material to the financial statements whether due to error or fraud. We understand that the term “fraud” includes misstatements arising from fraudulent financial reporting and misstatements arising from misappropriation of assets.

Misstatements arising from fraudulent financial reporting are intentional misstatements, or omissions of amounts or disclosures in financial statements to deceive financial statement users. Misstatements arising from misappropriation of assets involve the theft of an entity’s assets where the effect of the theft causes the financial statements not to be presented in conformity with U.S. generally accepted accounting principles.
9. We have disclosed to you all deficiencies in the design or operation of internal control over financial reporting of which we are aware, which could adversely affect the HRSD’s ability to initiate, authorize, record, process, or report financial data. We have separately disclosed to you all such deficiencies that we believe to be significant deficiencies or material weaknesses in internal control over financial reporting, as those terms are defined in AU-C Section 265, *Communicating Internal Control Related Matters Identified in an Audit*.
10. We have disclosed to you the results of our assessment of the risk that the financial statements may be materially misstated as a result of fraud.
11. We have no knowledge of any fraud or suspected fraud affecting HRSD’s financial statements involving:
 - a. Management
 - b. Employees who have significant roles in internal control over financial reporting, or
 - c. Others where the fraud could have a material effect on the financial statements.
12. We have no knowledge of any allegations of fraud or suspected fraud affecting HRSD’s financial statements received in communications from employees, former employees, analysts, regulators, or others.
13. HRSD’s has no plans or intentions that may materially affect the carrying value or classification of assets, deferred outflows of resources, liabilities, and deferred inflows of resources.

14. We have no knowledge of any officer of HRSD or Commission member, or any other person acting under the direction thereof, having taken any action to fraudulently influence, coerce, manipulate, or mislead you during your audit.
15. We have no loans to executive officers, non-accrued loans, or zero-interest rate loans.
16. Significant assumptions used by us in making accounting estimates are reasonable.
17. We have disclosed to you the identity of our related parties and all the related party relationships and transactions of which we are aware.
18. The following have been properly recorded or disclosed in the financial statements:
 - a. Related party relationships and transactions of which we are aware in accordance with U.S. generally accepted accounting principles, including sales, purchases, loans, transfers, leasing arrangements, guarantees, ongoing contractual commitments, and amounts receivable from or payable to related parties.

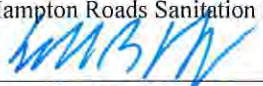
The term "related party" refers to government's related organizations, joint ventures, and jointly governed organizations, as defined in GASB Statement No. 14, *The Financial Reporting Entity*, as amended; elected and appointed officials of the government; its management; members of the immediate families of elected or appointed officials of the government and its management; and other parties with which the government may deal if one party can significantly influence the management or operating policies of the other to an extent that one of the transacting parties might be prevented from fully pursuing its own separate interests. Another party also is a related party if it can significantly influence the management or operating policies of the transacting parties or if it has an ownership interest in one of the transacting parties and can significantly influence the other to an extent that one or more of the transacting parties might be prevented from fully pursuing its own separate interests

- b. Guarantees, whether written or oral, under which HRSD is contingently liable.
 - c. Arrangements with financial institutions involving compensating balances or other arrangements involving restrictions on cash balances, lines of credit or similar arrangements.
 - d. Agreements to repurchase assets previously sold, including sales with recourse.
 - e. Changes in accounting principle affecting consistency.
 - f. The existence of and transactions with joint ventures and other related organizations.
19. HRSD has satisfactory title to all owned assets, and there are no liens or encumbrances on such assets, nor has any asset been pledged as collateral.
 20. HRSD has complied with all aspects of contractual agreements that would have a material effect on the financial statements in the event of noncompliance.
 21. HRSD's reporting entity includes all entities that are component units of HRSD.
 22. We agree with the findings of specialists in evaluating the actuarial determined net pension liability and OPEB disclosures and have adequately considered the qualifications of the specialist in determining the amounts and disclosures used in the basic financial statements and underlying accounting records. We did not give or cause any instructions to be given to specialists with respect to the values or amounts derived in an attempt to bias their work, and we are not otherwise aware of any matters that have had an impact on the independence or objectivity of the specialists.

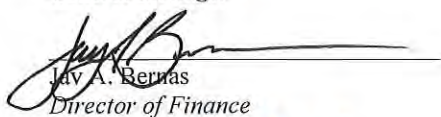
23. We have disclosed to you all accounting policies and practices we have adopted that, if applied to significant items or transactions, would not be in accordance with U.S. generally accepted accounting principles. We have evaluated the impact of the application of each such policy and practice, both individually and in the aggregate, on current period financial statements, and the expected impact of each such policy and practice on future periods' financial reporting. We believe the effect of these policies and practices on the financial statements and our assessment of internal control over financial reporting is not material. Furthermore, we do not believe the impact of the application of these policies and practices will be material to the financial statements in future periods.
24. HRSD is not subject to the audit requirements of Title 2 U.S. Code of Federal Regulations Part 200 (2 CFR 200), Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (the Uniform Guidance) as it did not expend more than \$750,000 in federal awards during the year ended June 30, 2017.
25. We have received opinions of counsel upon each issuance of tax-exempt bonds that the interest on such bonds is exempt from federal income taxes under section 103 of the Internal Revenue Code of 1986, as amended. There have been no changes in the use of property financed with the proceeds of tax-exempt bonds, or any other occurrences, subsequent to the issuance of such opinions, that would jeopardize the tax-exempt status of the bonds. Provision has been made, where material, for the amount of any required arbitrage rebate
26. We acknowledge our responsibility for the presentation of the required supplementary information which includes, Management's Discussion and Analysis, Schedule of Change in Net Pension Liability and related Ratios, Schedule of Employer Contributions, and Schedule of Funding Progress, in accordance with the applicable criteria and prescribed guidelines established by the *Governmental Accounting Standards Board* and:
 - a. Believe the required supplementary information, including its form and content, is fairly presented in accordance with the applicable criteria and prescribed guidelines.
 - b. The methods of measurement or presentation of the required supplementary information have not changed from those used in the prior period
 - c. The significant assumptions or interpretations underlying the measurement or presentation of the required supplementary information are reasonable and appropriate in the circumstances.

Very truly yours,


Hampton Roads Sanitation District



Edward G. Henifin
General Manager



Jay A. Berris
Director of Finance



Carroll L. Acors
Chief of Accounting

Hampton Roads Sanitation District
 Summary of Uncorrected Audit Misstatements
 For Year Ended June 30, 2017

Correcting Entry Required at Current Period End				Statement of Changes in Revenue, Expenses and Net Position- Debit (Credit)			Statement of Net Position Effect - Debit (Credit)					Cash Flow Effect - Increase (Decrease)						
ID	Description of misstatement	Type of misstatement	Accounts	Debit (Credit)	A	Income effect of correcting the statement of net position in prior period (carryforward from prior period)	B	C=A (Only Income Statement accounts)	Income effect according to Rollover (Income Statement) method	Net Position	Current Assets	Noncurrent Assets	Current Liabilities	Noncurrent Liabilities	Operating Activities	Capital and Related Financing Activities	Investing Activities	
									C-B									
1	To correct year end inventory by the projected misstatement noted in MUS Sampling from pricing errors	Projected	Inventory Wastewater Expense	2,572 (2,572)		1,126 (2,572)			(3,698)	(2,572)		2,572			(3,698)			
2	To correct year deferred outflows of resources from amortization of loss on bond refunding	Factual	Deferred outflows Amortization Expense	415 (415)		(72)		(415)	(343)	(415)		415			(343)			
3	To correct the current period balance sheet for management's non-GAAP policy's on capitalized interest	Factual	PPE Interest Expense	15,849 (15,849)		(15,675)		(15,849)	(174)	(15,849)		15,849			(174)			
			Aggregate of uncorrected audit misstatements			(14,621)		(18,836)	(4,215)	(18,836)		18,836			(4,215)			
			Financial statement amounts (per final financial statements)						(52,674)	(654,278)	172,755	1,399,731	(134,353)	(805,685)	101,435	(147,268)		875
			Uncorrected audit misstatements as a percentage of financial statement amounts						8.0%	2.9%	0.0%	1.4%	0.0%	0.0%	-4.2%	0.0%		0.0%



KPMG LLP
Suite 1900
440 Monticello Avenue
Norfolk, VA 23510

Telephone +1 757 616 7000
Fax +1 757 616 7133
kpmg.com

May 19, 2017

Hampton Roads Sanitation District Commission
1434 Air Rail Avenue
Virginia Beach, Virginia 23455-3330

Attention: Mr. Edward G. Henifin, General Manager
Mr. Jay A. Bernas, Director of Finance

Ladies and Gentlemen:

This letter amends our engagement letter dated May 22, 2015, confirming our understanding to provide professional audit services to the Hampton Roads Sanitation District (HRSD) by substituting the attached Appendix I for the Appendix I originally attached to our engagement letter.

The attached Appendix I lists the services to be rendered and related fees to provide each specified service for the identified time period. Except as specified in this letter and in the Appendix I attached to this letter, all provisions of the aforementioned engagement letter remain in effect until either management or we terminate this agreement or mutually agree to the modification of its terms.

Except as otherwise provided for in the engagement letter, neither party may assign, transfer or delegate any of its rights, obligations, claims or proceeds from claims arising under or relating to the engagement letter (including by operation of law, in which case the assigning party will, to the extent legally permissible, give as much advance written notice as is reasonably practicable thereof) without the prior written consent of the other party, such consent not to be unreasonably withheld. Any assignment in violation hereof shall be null and void.

* * * * *

We shall be pleased to discuss this letter with you at any time. For your convenience in confirming these arrangements, we enclose a copy of this letter. Please sign in the space provided and return the copy to us.

Very truly yours,

KPMG LLP

Steven C. Whetstine
Managing Director

Enclosure

ACCEPTED

The Hampton Roads Sanitation District

Authorized Signature

GENERAL MANAGER

Title

6/22/2017

Date



Fees for Services

Based upon our discussions with and representations of management, our fees for services we will perform are estimated as follows:

Audit of the balance sheets of HRSD as of June 30, 2017 and 2016, the related statements of operations, and cash flows for each of the years in the two-year period ended June 30, 2017 and the related notes to the financial statements.	\$59,710
Examination report on HRSD's assertion regarding the completeness and accuracy of census data reported by HRSD to the Virginia Retirement System as of June 30, 2017.	\$5,100
Agreed Upon Procedures report on the assertions contained in the Director of Finance's letter, <i>Letter from Chief Financial Officer</i> , which addresses HRSD's financial assurance requirements for biosolids liability coverage in Virginia.	\$3,550

We propose billing the above related audit fees in installments as follows:

<i>Progress bill to be mailed on</i>	<i>Amount to be billed</i>
<i>June 1, 2017</i>	<i>\$25,000</i>
<i>August 1, 2017</i>	<i>\$25,000</i>
<i>September 1, 2017</i>	<i>\$18,360</i>

Services performed that are outside the scope of the continuing annual audit requirements will be billed as percentage of our standard rates applicable at the time the services are provided. Such services will be billed at the following per hour rate based on the level of experience of the individuals who will perform the services:

<i>Level of Experience</i>	<i>Amount to be billed</i>
<i>Associate</i>	<i>\$100 per hour</i>
<i>Senior Associate</i>	<i>\$150 per hour</i>
<i>Manager</i>	<i>\$200 per hour</i>
<i>Partner</i>	<i>\$250 per hour</i>

We currently expect that incremental services will include the following:

- Audit procedures over HRSD's inventory balances including but not limited to the following: inventory observations and price testing
- Audit procedures over the reporting of pension obligations under GASB 68, *Accounting and Financial Reporting for Pensions - GASB Statements*
- Audit procedures over the reporting of investments under GASB 72, *Fair Value Measurement and Application*



Where KPMG is reimbursed for expenses, it is KPMG's policy to bill clients the amount incurred at the time the good or service is purchased. If KPMG subsequently receives a volume rebate or other incentive payment from a vendor relating to such expenses, KPMG does not credit such payment to the client. Instead, KPMG applies such payments to reduce its overhead costs, which costs are taken into account in determining KPMG's standard billing rates and certain transaction charges which may be charged to clients.



KPMG LLP
Suite 1900
440 Monticello Avenue
Norfolk, VA 23510

Telephone +1 757 616 7000
Fax +1 757 616 7133
kpmg.com

May 19, 2017

PRIVATE

Hampton Roads Sanitation District
1434 Air Rail Avenue
Virginia Beach, Virginia 23455-3330

Attention: Mr. Edward G. Henifin, General Manager
Mr. Jay Bernas, Director of Finance

Ladies and Gentlemen:

This letter (the Engagement Letter) confirms our understanding of the terms of our engagement to report upon our examination of your assertion that the significant elements of census data reported by the Hampton Roads Sanitation District ("HRSD") to the Virginia Retirement System ("VRS") as listed in VNav monthly snapshots during the year ended June 30, 2017 were complete and accurate based on the requirements to be met by participants in the Virginia Retirement System as defined in the *Code of Virginia* Sections 51.1-136. HRSD is responsible for the completeness and accuracy of census data reported to the VRS in accordance with the criteria. Our responsibility is to express an opinion on your assertion that the census data reported VNav monthly snapshots during the year ended June 30, 2017 were complete and accurate based on our examination. The significant elements of the census data reported to the Virginia Retirement System in the VNav monthly snapshots are as follows:

- Employment Changes for Monthly Snapshot - Person Maintenance Screen
 - Other Details
 - Separations – Employment Tab
 - End Date
 - Leaves – Employment Tab
 - End Date
 - Salary Updates – Salary History Tab
 - Start Date
 - Annual Salary
- Enrollments for Monthly Snapshot – Person Maintenance Screen
 - Person Details
 - Name
 - Date of Birth
 - Gender
 - Other Details
 - Employment Tab
 - Job Name
 - Employment Type
 - Employment Status
 - Start Date
 - Salary History Tab
 - Annual Salary



Hampton Roads Sanitation District
May 19, 2017
Page 2 of 7

- Start Date
- Person Account
 - Plan
 - Coverage Start Date
 - Status

The following paragraphs describe the objectives of our engagement and the nature and limitations of the services we will provide.

We will conduct the examination in accordance with standards established by the American Institute of Certified Public Accountants with the objective of expressing an opinion in a written independent accountants' examination report as to whether the significant elements of census data reported by HRSD to the VRS as listed in VNav monthly snapshots during the year ended June 30, 2017 were complete and accurate, in all material respects, based on the requirements to be met by participants in the Virginia Retirement System as defined in the *Code of Virginia* Sections 51.1-136. An examination is designed to obtain reasonable assurance about whether the census data reported to the VRS as measured or evaluated against the criteria is free from material misstatement. Accordingly, we will perform such procedures as we consider necessary in the circumstances to provide a reasonable basis for our opinion. Because of the inherent limitations of an examination engagement together with the inherent limitations of internal control, an unavoidable risk exists that some material misstatements may not be detected even though the examination is properly planned and performed in accordance with the attestation standards.

Our report will be addressed to the Commissioners of HRSD and the Auditor of Public Accounts of the Commonwealth of Virginia ("Auditor of Public Accounts"). We cannot provide assurance that we will render an unmodified opinion. Circumstances may arise in which it is necessary for us to modify our report or withdraw from the engagement. In such circumstances, we will communicate our findings or reasons for modification or withdrawal.

HRSD agrees to provide us with a written assertion about the measurement or evaluation of the subject matter against the criteria. At the conclusion of the engagement, HRSD agrees to supply us with a representation letter that will include:

- a. its responsibility for the assertion about the subject matter based on the criteria,
- b. a statement that all relevant matters are reflected in the measurement or evaluation of the assertion or subject matter,
- c. a statement that all known matters contradicting the assertion or subject matter and any communication from regulatory agencies or others affecting the assertion or subject matter have been disclosed to us, including communications received between the end of the period addressed in the written assertion and the date of our report,
- d. acknowledgment of its responsibility for the assertion and the subject matter, selecting the criteria, when applicable, and determining that such criteria are appropriate for its purposes,
- e. a statement that any known events subsequent to the period (or point in time) of the subject matter being reported on that would have a material effect on the assertion or subject matter have been disclosed to us,
- f. a statement that it has provided us with all relevant information and access,



Hampton Roads Sanitation District
May 19, 2017
Page 3 of 7

- g. if applicable, a statement that it believes the effects of uncorrected misstatements are immaterial, individually and in the aggregate, to the subject matter,
- h. if applicable, a statement that significant assumptions used in making any material estimates are reasonable, and
- i. a statement that it has disclosed to us
 - (i) all deficiencies in internal control relevant to the engagement of which it is aware;
 - (ii) its knowledge of any actual, suspected, or alleged fraud or noncompliance with laws or regulations affecting the subject matter; and
 - (iii) other matters as we may deem appropriate.

If the written assertion and a representation letter are not provided, it may be necessary for us to withdraw from the engagement.

Because of the importance of management's representations to the effective performance of our services, HRSD hereby releases KPMG and its personnel from and against any claims, liabilities, costs, and expenses relating to our services under this letter attributable to any misrepresentations in the representation letter referred to above. In accordance with the foregoing release, KPMG shall not be responsible for any damages suffered or incurred by HRSD that are attributable to any misrepresentations in the representation letter referred to above or any damages that are punitive in nature, or that are not measured by HRSD's actual damages. The provisions of this paragraph shall apply regardless of the form of action, damage, claim, liability, cost, expense, or loss asserted, whether in contract, statute, tort (including but not limited to negligence) or otherwise.

HRSD will indemnify, defend, and hold KPMG and its personnel harmless from and against any and all claims, liabilities, costs, and expenses asserted against KPMG by any third party to the extent resulting from or attributable to any misrepresentations in the representation letter referred to above. The foregoing indemnification obligation shall apply regardless of whether the third party claim alleges a breach of contract, violation of statute or tort (including without limitation negligence) by KPMG.

We understand that our report will not be used, nor will we be referred to as auditors or attestors of the assertion, in any document offering securities for sale.

If, during the performance of our attestation procedures, circumstances arise which make it necessary to withdraw from the engagement, we will communicate to the audit committee our reasons for withdrawal.

Dispute Resolution

KPMG and HRSD acknowledge that it is in their best interests to resolve any dispute, claim or controversy arising out of or relating to this engagement letter (any such dispute, claim or controversy, a "Dispute"), in accordance with the dispute resolution procedures set forth below and agree to use their best efforts so to resolve any such Dispute. Without limitation, such efforts shall include participating in at least 4 hours of non-binding mediation within 21 days of issuance of a written Request for Mediation (or such longer period as the parties may agree).

Any party may initiate mediation of a dispute by providing a written Request for Mediation to the other party or parties. The mediator, as well as the time and place of the mediation, shall be selected by agreement of the



Hampton Roads Sanitation District
May 19, 2017
Page 4 of 7

parties. Absent any other agreement to the contrary, the parties agree to proceed in mediation using the CPR Mediation Procedures (effective April 1, 1998) issued by the Center for Public Resources, with the exception of paragraph 2 which shall not apply to any mediation conducted pursuant to this agreement. As provided in the CPR Mediation Procedures, the mediation shall be conducted as specified by the mediator and as agreed upon by the parties. The parties agree to discuss their differences in good faith and to attempt, with facilitation by the mediator, to reach a consensual resolution of the dispute. The mediation shall be treated as a settlement discussion and shall be confidential. The mediator may not testify for any party in any later proceeding related to the dispute. No recording or transcript shall be made of the mediation proceeding.

Each party shall bear its own costs in the mediation. Absent an agreement to the contrary, the fees and expenses of the mediator shall be shared equally by the parties.

Either party may seek to enforce any written agreement reached by the parties during mediation in any court of competent Jurisdiction.

Notwithstanding the agreement to such procedures, either party may seek injunctive relief to enforce its rights with respect to the use or protection of (i) its confidential or proprietary information or material or (ii) its names, trademarks, service marks or logos, solely in the courts of the State of Virginia or in the courts of the United States located in the State of Virginia. The parties consent to the personal jurisdiction thereof and to sale venue therein only for such purposes.

Other Matters

All disputes between the parties (whether based in contract, tort, statute, regulation, or otherwise and whether pending in court or in an arbitral forum) shall be governed by and construed in accordance with the substantive and procedural laws of the Commonwealth of Virginia, including without limitation, its statutes of limitations, without regard to the conflict of laws and provisions of Virginia or any other state or jurisdiction. In the event that any term or provision of this Engagement Letter shall be held to be invalid, void or unenforceable, then the remainder of the Engagement Letter shall not be affected, and each such term and provision shall be valid and enforceable to the fullest extent permitted by law.

This letter shall serve as HRSD's authorization for the use of e-mail and other electronic methods to transmit and receive information, including confidential information, between KPMG and HRSD and between KPMG and outside specialists or other entities engaged by either KPMG or HRSD. HRSD acknowledges that e-mail travels over the public Internet, which is not a secure means of communication and, thus, confidentiality of the transmitted information could be compromised through no fault of KPMG. KPMG will employ commercially reasonable efforts and take appropriate precautions to protect the privacy and confidentiality of transmitted information.

Further, for purposes of the services described in this letter only, HRSD hereby grants to KPMG a limited, revocable, non-exclusive, non-transferable, paid up and royalty-free license, without right of sublicense, to use all logos, trademarks and service marks of HRSD solely for presentations or reports to HRSD or for internal KPMG presentations and intranet sites.

KPMG is a limited liability partnership comprising both certified public accountants and certain principals who are not licensed as certified public accountants. Such principals may participate in the engagements to provide the services described in this letter.

The documentation for this engagement is the property of KPMG. If KPMG receives a subpoena; other validly issued administrative, judicial, government or investigative regulatory demand or request; or other legal process



Hampton Roads Sanitation District
May 19, 2017
Page 5 of 7

requiring it to disclose HRSD's confidential information ("Legal Demand"), KPMG shall, unless prohibited by law or such Legal Demand, provide prompt written notice to HRSD of such Legal Demand in order to permit it to seek a protective order. So long as KPMG gives notice as provided herein, KPMG shall be entitled to comply with such Legal Demand to the extent required by law, subject to any protective order or the like that may have been entered in the matter. In the event KPMG is requested or authorized by HRSD, or is required by law, rule, regulation or Legal Demand in a proceeding or investigation to which KPMG is not a named party or respondent, to produce KPMG's documents or personnel as witnesses or for interviews, or otherwise to make information relating to the service under the Engagement Letter available to a third party, or HRSD, HRSD shall reimburse KPMG for its professional time, at its then-current standard hourly rates, and expenses, including reasonable attorneys' fees and expenses, incurred in producing documents or personnel or providing information pursuant to such requests, authorizations or requirements.

KPMG, as an accounting firm, has an obligation to comply with applicable professional standards. Certain professional standards, including AICPA Code of Professional Conduct Section 1.700, "Confidential Client Information Rule," adopted by the American Institute of Certified Public Accountants and similar rules adopted by the boards of accountancy of many states, prohibit the disclosure of client confidential information without client consent, except in limited circumstances. KPMG represents to HRSD that KPMG will treat HRSD's confidential information in accordance with applicable professional standards.

KPMG may work with and use the services of other members of the international KPMG network of independent firms and entities controlled by, or under common control with, one or more KPMG member firms (together with KPMG, the "KPMG Firms") to provide services to HRSD. In connection with the performance of services under this Engagement Letter, the KPMG Firms may, in their discretion, utilize the services of third party service providers within or outside of the United States to complete the services under this Engagement Letter. KPMG Firms and such third parties may have access to your confidential information from offshore locations. In addition, KPMG uses third party service providers within and outside of the United States to provide, at its direction, back-office administrative and clerical services to KPMG and these third party service providers may in the performance of such services have access to your confidential information. KPMG represents that it has technical, legal and/or other safeguards, measures and controls in place to protect your confidential information from unauthorized disclosure or use.

You also understand and agree that the KPMG Firms, with the assistance of third parties as outlined above, may use your confidential information obtained to complete this engagement for other purposes, such as improving the delivery of attestation and other services to you and to other clients and for use in presentations to you, other clients and non-clients. When your confidential information is used outside of the KPMG Firms or third parties discussed above for any purpose other than the provision of attestation or other services to you, back-office administrative and clerical services to KPMG or service quality improvement, it will be de-identified so that HRSD cannot be attributed as the source of the information.

Except as otherwise provided for in this Engagement Letter, neither party may assign, transfer or delegate any of its rights, obligations, claims or proceeds from claims arising under or relating to this Engagement Letter (including by operation of law, in which case the assigning party will, to the extent legally permissible, give as much advance written notice as is reasonably practicable thereof) without the prior written consent of the other party, such consent not to be unreasonably withheld. Any assignment in violation hereof shall be null and void.

* * * * *

This Engagement Letter and any exhibits, attachments and appendices hereto, and amendments thereto agreed in writing by the parties, shall constitute the entire agreement between KPMG and HRSD with respect



Hampton Roads Sanitation District
May 19, 2017
Page 6 of 7

to the subject matter hereof and thereof, and supersede all other previous oral and written representations, understandings or agreements relating to the subject matter of this agreement.

Based upon our discussions with and representations of management, we estimate that fees for these services will approximate \$5,100. This estimate is based on the level of experience of the individuals who will perform the services. Circumstances encountered during the performance of these services that warrant additional time or expense could cause us to be unable to deliver the services within the above estimates. We will endeavor to notify you of any such circumstances as they are assessed.

Our fees and expenses will be billed every two weeks as charges are incurred. All invoices shall be paid within 30 days after the date thereof. In the event any invoice is not timely paid as set forth herein, then upon five days prior written notice to you, KPMG may terminate its performance hereunder and will not be responsible for any loss, costs, or expense thereby resulting. It is understood that neither our fees nor the payment thereof will be contingent upon the results of our engagement.

Where KPMG is reimbursed for expenses, it is KPMG's policy to bill clients the amount incurred at the time the good or service is purchased. If KPMG subsequently receives a volume rebate or other incentive payment from a vendor relating to such expenses, KPMG does not credit such payment to the client. Instead, KPMG applies such payments to reduce its overhead costs, which costs are taken into account in determining KPMG's standard billing rates and certain transaction charges which may be charged to clients.

All fees, charges and other amounts payable to KPMG under the Engagement Letter do not include any sales, use, excise, value added, income or other applicable taxes, tariffs or duties, payment of which shall be HRSD's sole responsibility, excluding any applicable taxes based on KPMG's net income or taxes arising from the employment or independent contractor relationship between KPMG and its personnel.



Hampton Roads Sanitation District
May 19, 2017
Page 7 of 7

We shall be pleased to discuss this letter with you at any time. For your convenience in confirming these arrangements, we enclose a copy of this letter. Please sign and return it to us.

Very truly yours,

KPMG LLP

Steven C. Whetstone
Managing Director

SCW:dwc:als

This letter correctly sets forth the understanding of HRSD.

ACCEPTED

The Hampton Roads Sanitation District

Authorized Signature

Title

Date



KPMG LLP
Suite 1900
440 Monticello Avenue
Norfolk, VA 23510

Telephone +1 757 616 7000
Fax +1 757 616 7133
kpmg.com

May 19, 2017

PRIVATE

Hampton Roads Sanitation District
1434 Air Rail Avenue
Virginia Beach, Virginia 23455-3330

Attention: Mr. Edward G. Henifin, General Manager
Mr. Jay Bernas, Director of Finance

Ladies and Gentlemen:

This letter (the Engagement Letter) sets forth our understanding of the terms and objectives of our engagement and the nature and limitations of the services KPMG LLP ("KPMG") will provide.

We will apply the following agreed-upon procedures included in 9 VAC 25-32-820 of the Commonwealth of Virginia's *Virginia Pollution Abatement Permit Regulation* (9 VAC 25-32) to assist the Hampton Road's Sanitation District ("HRSD") in evaluating its assertions contained in the Director of Finance's letter, *Letter from Chief Financial Officer*, which addresses HRSD's financial assurance requirements used to demonstrate financial responsibility for liability coverage as specified in 9 VAC 25-32 arising from clean-up costs, personal injury, and/or property damage resulting from the transport, storage and land application of biosolids in Virginia. HRSD is responsible for the assertions contained in the Director of Finance's letter, *Letter from Chief Financial Officer*. The sufficiency of the procedures is solely the responsibility of the specified user of the report: HRSD. Consequently, we make no representation regarding the sufficiency of the procedures either for the purpose for which our report is being prepared or for any other purpose. Execution of this Engagement Letter will signify HRSD's agreement to the procedures and to their responsibility for the sufficiency of the procedures for their purposes.

1. We will compare the amounts included in items 2a and 2b, respectively, on page 2 of the letter referred to above with the corresponding amounts in the comprehensive annual financial report of HRSD for the years ended June 30, 2017 and 2016, on which we expect to issue an independent auditors' report on, and will indicate whether such amounts were in agreement.
2. We will recalculate the Total Revenue amounts included in item 3a and 3b, respectively, on page 2 of the letter referred to above by summing Total Operating Revenues, Wastewater Facility Charges, Investment Income, the Change in Fair Value of Investments and Bond Interest Subsidy reported in the comprehensive annual financial report of HRSD for the year ended June 30, 2017 and 2016, on which we expect to issue an independent auditors' report on, and will indicate whether such amounts were in agreement.
3. We will recalculate the Cash plus Marketable Securities amount included in item 5 on page 2 of the letter referred to above by summing Cash and Cash Equivalents, Current; Cash and Cash Equivalents – Restricted, Current; Investments, Current; Investments – Restricted, Current; Cash and Cash Equivalents – Restricted, Noncurrent; and Investments, Noncurrent reported in the comprehensive annual financial report of HRSD as of June 30, 2017, on which we expect to issue an independent auditors' report on, and will indicate whether such amounts were in agreement.



Hampton Roads Sanitation District
May 19, 2017
Page 2 of 6

4. We will recalculate the Total Expenditures amount included in item 6 on page 2 of the letter referred to above by summing Total Operating Expenses, Bond Issuance Costs, Interest Expense, and Capital Distributions to Localities reported in the comprehensive annual financial report of HRSD for the year ended June 30, 2017, on which we expect to issue an independent auditors' report on, and will indicate whether such amounts were in agreement.
5. We will recalculate the Annual Debt Service amount included in item 7 on page 2 of the letter referred to above by summing principal paid on capital debt and interest paid on capital debt reported in the comprehensive annual financial report of HRSD for the year ended June 30, 2017, on which we expect to issue an independent auditors' report on, and will indicate whether such amounts were in agreement.

HRSD acknowledges its responsibility for determining the scope of the engagement, including the subject matter and criteria used in evaluating the subject matter, agreeing to the procedures and the sufficiency of such procedures for HRSD's purposes. At the conclusion of the engagement, HRSD agrees to supply us with a representation letter that will include HRSD's assertion about the assertions contained in the Director of Finance's letter, *Letter from Chief Financial Officer*, based on the criteria and will include:

- a. a statement that all known matters contradicting the subject matter or assertion and any communication from regulatory agencies or others affecting the subject matter or assertion have been disclosed to us, including communications received between the end of the period addressed in the written assertion and the date of our report,
- b. a statement acknowledging its responsibility for the subject matter and the assertion, selecting the criteria, when applicable, and determining that such criteria are appropriate for its purposes,
- c. a statement that it has provided us with access to all records relevant to the subject matter and the agreed-upon procedures, and
- d. other matters as we may deem appropriate.

If such a representation letter is not provided, which includes the aforementioned assertion, it may be necessary for us to withdraw from the engagement.

Our engagement to apply agreed-upon procedures will be performed in accordance with the attestation standards established by the American Institute of Certified Public Accountants. Because the agreed-upon procedures referred to above do not constitute an examination or review, we will not express an opinion or conclusion on assertions contained in the Director of Finance's letter, *Letter from Chief Financial Officer*, or on HRSD's compliance with the requirements for financial responsibility for liability coverage as specified in 9 VAC 25-32 arising from clean-up costs, personal injury, and/or property damage resulting from the transport, storage and land application of biosolids in Virginia. Our report will include a statement to that effect. In addition, we have no obligation to perform any procedures beyond those referred to above.

Our written independent accountants' agreed-upon procedures report will include a list of the procedures performed (or reference thereto) and the related findings. Our report will also contain a paragraph indicating that had we performed additional procedures, other matters might have come to our attention that would have been reported to you. We have no responsibility to update our report for events and circumstances occurring after the date of such report.

Our report is intended solely for the use of HRSD, and the Virginia Department of Environmental Quality ("VA DEQ") is not intended for use by those who have not agreed to the procedures and taken responsibility for the



Hampton Roads Sanitation District
May 19, 2017
Page 3 of 6

sufficiency of the procedures for their purposes. Our report will include a statement to that effect. If you request that additional specified users of the report be added, we will require that they acknowledge, in writing, their agreement with the procedures and their responsibility for the sufficiency of the procedures for their purposes.

If we are unable to complete the agreed-upon procedures referred to above, we will discuss the matter with you during the engagement. In such circumstances, we may conclude that we will not issue a report as a result of this engagement.

Because of the importance of management's representations to the effective performance of our services, HRSD hereby releases KPMG and its personnel from and against any claims, liabilities, costs, and expenses relating to our services under this letter attributable to any misrepresentations in the representation letter referred to above. In accordance with the foregoing release, KPMG shall not be responsible for any damages suffered or incurred by HRSD that are attributable to any misrepresentations in the representation letter referred to above or any damages that are punitive in nature, or that are not measured by HRSD's actual damages. The provisions of this paragraph shall apply regardless of the form of action, damage, claim, liability, cost, expense, or loss asserted, whether in contract, statute, tort (including but not limited to negligence) or otherwise.

HRSD will indemnify, defend, and hold KPMG and its personnel harmless from and against any and all claims, liabilities, costs, and expenses asserted against KPMG by any third party to the extent resulting from or attributable to (i) that party's use or possession of, or reliance upon, KPMG's report or other reference to KPMG's services hereunder as a result of HRSD's disclosure of such report or reference thereto other than to the VA DEQ or (ii) any misrepresentations in the representation letter referred to above. The foregoing indemnification obligation shall apply regardless of whether the third party claim alleges a breach of contract, violation of statute or tort (including without limitation negligence) by KPMG.

Dispute Resolution

KPMG and HRSD acknowledge that it is in their best interests to resolve any dispute, claim or controversy arising out of or relating to this engagement letter (any such dispute, claim or controversy, a "Dispute"), in accordance with the dispute resolution procedures set forth below and agree to use their best efforts so to resolve any such Dispute. Without limitation, such efforts shall include participating in at least 4 hours of non-binding mediation within 21 days of issuance of a written Request for Mediation (or such longer period as the parties may agree).

Any party may initiate mediation of a dispute by providing a written Request for Mediation to the other party or parties. The mediator, as well as the time and place of the mediation, shall be selected by agreement of the parties. Absent any other agreement to the contrary, the parties agree to proceed in mediation using the CPR Mediation Procedures (effective April 1, 1998) issued by the Center for Public Resources, with the exception of paragraph 2 which shall not apply to any mediation conducted pursuant to this agreement. As provided in the CPR Mediation Procedures, the mediation shall be conducted as specified by the mediator and as agreed upon by the parties. The parties agree to discuss their differences in good faith and to attempt, with facilitation by the mediator, to reach a consensual resolution of the dispute. The mediation shall be treated as a settlement discussion and shall be confidential. The mediator may not testify for any party in any later proceeding related to the dispute. No recording or transcript shall be made of the mediation proceeding.

Each party shall bear its own costs in the mediation. Absent an agreement to the contrary, the fees and expenses of the mediator shall be shared equally by the parties.



Hampton Roads Sanitation District
May 19, 2017
Page 4 of 6

Either party may seek to enforce any written agreement reached by the parties during mediation in any court of competent Jurisdiction.

Notwithstanding the agreement to such procedures, either party may seek injunctive relief to enforce its rights with respect to the use or protection of (i) its confidential or proprietary information or material or (ii) its names, trademarks, service marks or logos, solely in the courts of the State of Virginia or in the courts of the United States located in the State of Virginia. The parties consent to the personal jurisdiction thereof and to sale venue therein only for such purposes.

Other Matters

All disputes between the parties (whether based in contract, tort, statute, regulation, or otherwise and whether pending in court or in an arbitral forum) shall be governed by and construed in accordance with the substantive and procedural laws of the Commonwealth of Virginia, including without limitation, its statutes of limitations, without regard to the conflict of laws and provisions of the Commonwealth of Virginia or any other state or jurisdiction.

This letter shall serve as HRSD's authorization for the use of e-mail and other electronic methods to transmit and receive information, including confidential information, between KPMG and HRSD and between KPMG and outside specialists or other entities engaged by either KPMG or HRSD. HRSD acknowledges that e-mail travels over the public Internet, which is not a secure means of communication and, thus, confidentiality of the transmitted information could be compromised through no fault of KPMG. KPMG will employ commercially reasonable efforts and take appropriate precautions to protect the privacy and confidentiality of transmitted information.

Further, for purposes of the services described in this letter only, HRSD hereby grants to KPMG a limited, revocable, non-exclusive, non-transferable, paid up and royalty-free license, without right of sublicense, to use all logos, trademarks and service marks of HRSD solely for presentations or reports to HRSD or for internal KPMG presentations and intranet sites.

KPMG is a limited liability partnership comprising both certified public accountants and certain principals who are not licensed as certified public accountants. Such principals may participate in the engagements to provide the services described in this letter.

The documentation for this engagement is the property of KPMG. If KPMG receives a subpoena; other validly issued administrative, judicial, government or investigative regulatory demand or request; or other legal process requiring it to disclose HRSD's confidential information ("Legal Demand"), KPMG shall, unless prohibited by law or such Legal Demand, provide prompt written notice to HRSD of such Legal Demand in order to permit it to seek a protective order. So long as KPMG gives notice as provided herein, KPMG shall be entitled to comply with such Legal Demand to the extent required by law, subject to any protective order or the like that may have been entered in the matter. In the event KPMG is requested or authorized by HRSD, or is required by law, rule, regulation or Legal Demand in a proceeding or investigation to which KPMG is not a named party or respondent, to produce KPMG's documents or personnel as witnesses or for interviews, or otherwise to make information relating to the service under the Engagement Letter available to a third party, or HRSD, HRSD shall reimburse KPMG for its professional time, at its then-current standard hourly rates, and expenses, including reasonable attorneys' fees and expenses, incurred in producing documents or personnel or providing information pursuant to such requests, authorizations or requirements.

KPMG, as an accounting firm, has an obligation to comply with applicable professional standards. Certain professional standards, including AICPA Code of Professional Conduct Section 1.700, "Confidential Client



Hampton Roads Sanitation District
May 19, 2017
Page 5 of 6

Information Rule," adopted by the American Institute of Certified Public Accountants and similar rules adopted by the boards of accountancy of many states, prohibit the disclosure of client confidential information without client consent, except in limited circumstances. KPMG represents to HRSD that KPMG will treat HRSD's confidential information in accordance with applicable professional standards.

KPMG may work with and use the services of other members of the international KPMG network of independent firms and entities controlled by, or under common control with, one or more KPMG member firms (together with KPMG, the "KPMG Firms") to provide services to HRSD. In connection with the performance of services under this Engagement Letter, the KPMG Firms may, in their discretion, utilize the services of third party service providers within or outside of the United States to complete the services under this Engagement Letter. KPMG Firms and such third parties may have access to your confidential information from offshore locations. In addition, KPMG uses third party service providers within and outside of the United States to provide, at its direction, back-office administrative and clerical services to KPMG and these third party service providers may in the performance of such services have access to your confidential information. KPMG represents that it has technical, legal and/or other safeguards, measures and controls in place to protect your confidential information from unauthorized disclosure or use.

You also understand and agree that the KPMG Firms, with the assistance of third parties as outlined above, may use your confidential information obtained to complete this engagement for other purposes, such as improving the delivery of attestation and other services to you and to other clients and for use in presentations to you, other clients and non-clients. When your confidential information is used outside of the KPMG Firms or third parties discussed above for any purpose other than the provision of attestation or other services to you, back-office administrative and clerical services to KPMG or service quality improvement, it will be de-identified so that HRSD cannot be attributed as the source of the information.

Except as otherwise provided for in this Engagement Letter, neither party may assign, transfer or delegate any of its rights, obligations, claims or proceeds from claims arising under or relating to this Engagement Letter (including by operation of law, in which case the assigning party will, to the extent legally permissible, give as much advance written notice as is reasonably practicable thereof) without the prior written consent of the other party, such consent not to be unreasonably withheld. Any assignment in violation hereof shall be null and void.

* * * * *

This Engagement Letter and any exhibits, attachments and appendices hereto, and amendments thereto agreed in writing by the parties, shall constitute the entire agreement between KPMG and HRSD with respect to the subject matter hereof and thereof, and supersede all other previous oral and written representations, understandings or agreements relating to the subject matter of this agreement.

Based upon our discussions with and representations of management, we estimate that fees for these services will be \$3,550. This estimate is based on the level of expertise of the individuals who will perform the services. Circumstances encountered during the performance of these services that warrant additional time or expense could cause us to be unable to deliver the services within the above estimates. We will endeavor to notify you of any such circumstances as they are assessed.

Our fees and expenses will be billed every two weeks as charges are incurred. All invoices shall be paid within 30 days after the date thereof. In the event any invoice is not timely paid as set forth herein, then upon five days prior written notice to you, KPMG may terminate its performance hereunder and will not be responsible for any loss, costs, or expense thereby resulting. It is understood that neither our fees nor the payment thereof will be contingent upon the results of our engagement.



Hampton Roads Sanitation District
May 19, 2017
Page 6 of 6

Where KPMG is reimbursed for expenses, it is KPMG's policy to bill clients the amount incurred at the time the good or service is purchased. If KPMG subsequently receives a volume rebate or other incentive payment from a vendor relating to such expenses, KPMG does not credit such payment to the client. Instead, KPMG applies such payments to reduce its overhead costs, which costs are taken into account in determining KPMG's standard billing rates and certain transaction charges which may be charged to clients.

All fees, charges and other amounts payable to KPMG under the Engagement Letter do not include any sales, use, excise, value added, income or other applicable taxes, tariffs or duties, payment of which shall be HRSD's sole responsibility, excluding any applicable taxes based on KPMG's net income or taxes arising from the employment or independent contractor relationship between KPMG and its personnel.

We shall be pleased to discuss this letter with you at any time. For your convenience in confirming these arrangements, we enclose a copy of this letter. Please sign and return it to us.

Very truly yours,

KPMG LLP

Steven C. Whetstone
Managing Director

This letter correctly sets forth the understanding of HRSD.

ACCEPTED

Hampton Roads Sanitation District

Authorized Signature

Title

Date

Annual Metrics											
Item	Strategic Planning Measure	Unit	Target	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17
M-1.1a	Employee Turnover Rate (Total)	Percentage	< 8%	5.63%	4.09%	6.64%	7.62%	8.22%	9.97%	6.75%	6.66%
M-1.1b	Employee Turnover Rate within Probationary Period		0%		2.22%	8.16%	14.58%	9.68%	0.66%	0.13%	0.90%
M-1.2	Internal Employee Promotion Eligible	Percentage	100%		59%	80%	69.57%	71.43%	64.00%	69.00%	68.00%
M-1.3	Average Time to Fill a Position	Calendar Days	< 30		70	60	52	43.76	51	56	67
M-1.4	Training Hours per Employee - cumulative fiscal year-to-date	Hours	> 40		30.0	43.8	37.5	35.9	42.8	49.0	48.4
M-1.5a	Safety OSHA 300 Incidence Rate Total Cases	# per 100 Employees	< 3.5	6.57	6.15	5.8	11.2	5.07	3.87	7	5.5
M-1.5b	Safety OSHA 300 Incidence Rate Cases with Days Away	# per 100 Employees	< 1.1	0.74	1.13	1.33	0.96	1.4	0.82	1.9	1
M-1.5c	Safety OSHA 300 Incidence Rate Cases with Restriction, etc.	# per 100 Employees	< 0.8	3.72	4.27	2.55	4.5	2	1.76	3.6	2.8
M-2.1	CIP Delivery - Budget	Percentage			113%	96%	124%	149%	160%	151%	156%
M-2.2	CIP Delivery - Schedule	Percentage			169%	169%	161%	150%	190%	172%	173%
M-2.3a	Total Maintenance Hours	Total Available Mtc Labor Hours Monthly Avg			16,495	22,347	27,615	30,863	35,431	34,168	28,786
M-2.3b	Planned Maintenance	Percentage of Total Mtc Hours Monthly Avg			20%	27%	70%	73%	48%	41%	43%
M-2.3c	Corrective Maintenance	Percentage of Total Mtc Hours Monthly Avg			63%	51%	12%	10%	18%	25%	25%
M-2.3d	Projects	Percentage of Total Mtc Hours Monthly Avg			18%	22%	20%	18%	32%	34%	32%
M-2.4	Infrastructure Investment	Percentage of Total Cost of Infrastructure	2%		8.18%	6%	6%	4%	7%	7%	5%
M-3.3	Carbon Footprint	Tons per MG Annual Total			1.61	1.57	1.47	1.46	1.44	1.45	1.58
M-3.6	Alternate Energy	Total KWH			0	0	0	5,911,289	6,123,399	6,555,096	6,052,142
M-4.1a	Energy Use: Treatment	kWh/MG Monthly Avg			2,473	2,571	2,229	2,189	2,176	2,205	2,294
M-4.1b	Energy Use: Pump Stations	kWh/MG Monthly Avg			197	173	152	159	168	163	173
M-4.1c	Energy Use: Office Buildings	kWh/MG Monthly Avg			84	77	102	96	104	97	104
M-4.2	R&D Budget	Percentage of Total Revenue	> 0.5%		1.0%	1.4%	1.0%	1.3%	1.0%	0.8%	1.3%
M-4.3	Total Labor Cost/MGD	Personal Services + Fringe Benefits/365/5-Year Average Daily Flow		\$1,028	\$1,095	\$1,174	\$1,232	\$1,249	\$1,279	\$1,246	\$1,285
M-4.4	Affordability	8 CCF Monthly Charge/ Median Household Income	< 0.5%		0.48%	0.48%	0.41%	0.43%	0.53%	0.55%	0.59%
M-4.5	Total Operating Cost/MGD	Total Operating Expense/ 365/5-Year Average Daily Flow		\$2,741	\$2,970	\$3,262	\$3,316	\$3,305	\$3,526	\$3,434	\$3,592
M-5.1	Name Recognition	Percentage (Survey Result)	100%	67%	71%	N/A	62%	N/A	60%	N/A	N/A
M-5.4	Value of Research	Percentage - Total Value/HRSD Investment			129%	235%	177%	149%	181%	178%	143%
M-5.5	Number of Research Partners	Annual Total Number			42	36	31	33	28	35	15
	Rolling 5 Year Average Daily Flow	MGD		157.8	155.3	152	154.36	155.2	151.51	153.09	154.24
	Rainfall	Annual Total Inches		66.9	44.21	56.21	46.65	46.52	51.95	54.14	66.66
	Billed Flow	Annual Percentage of Total Treated		71.9%	82.6%	78%	71%	73%	74%	72%	73%
	Senior Debt Coverage	Net Revenue/Senior Annual Debt Service	> 1.5	2.51%	2.30%	2.07%	1.88%	1.72%	1.90%	2.56%	3.10%
	Total Debt Coverage	Net Revenue/Total Annual Debt	>1.4	1.67%	1.67%	1.46%	1.45%	1.32%	1.46%	1.77%	1.93%

* To be reported upon completion of the annual financial statements.

Monthly Updated Metrics												FY-18	FY-18
Item	Strategic Planning Measure	Unit	Target	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	Oct-17	Nov-17
	Average Daily Flow	MGD at the Plants	< 249		136	146.5	158.7	156.3	153.5	155.8	153.5	130.6	132.6
	Industrial Waste Related System Issues	Number	0		3	6	6	6	2	4	7	0	0
	Wastewater Revenue	Percentage of budgeted	100%		97%	96%	98%	107%	102%	104%	103%	106%	102%
	General Reserves	Percentage of Operating and Improvement Budget	75% - 100%		72%	82%	84%	92%	94%	95%	104%	112%	112%
	Accounts Receivable (HRSD)	Dollars (Monthly Avg)			\$ 17,013,784	\$ 17,359,488	\$ 18,795,475	\$ 20,524,316	\$ 20,758,439	\$ 22,444,273	\$ 22,572,788	\$21,658,585	\$21,044,338
	Aging Accounts Receivable	Percentage of receivables greater than 90 days			21%	20%	18%	19%	21%	20%	18%	17%	17%
M-2.5	Capacity Related Overflows	Number within Level of Service	0		25	1	30	5	11	16	6	0	0
M-3.1	Permit Compliance	# of Exceedances to # of Permitted Parameters	0		12:55,045	1:51995	2:52491	1:52491	2:52491	2:52,491	9:53236	0:17745	4:24118
M-3.2	Odor Complaints	Number	0		6	2	7	11	5	9	7	0	2
M-3.4	Pollutant Removal (total)	Total Pounds Removed			178,163,629	171,247,526	176,102,248	185,677,185	180,168,546	193,247,790	189,765,922	62,651,908	79,267,424
M-3.5	Pollutant Discharge (% of permitted)	Pounds Discharged/Pounds Removed	< 40%		25%	22%	25%	22%	22%	20%	22%	16%	16%
M-5.2	Educational and Outreach Events	Number			302	184	238	322	334	443	502	54	31
M-5.3	Number of Community Partners	Number			280	289	286	297	321	354	345	45	29

EFFLUENT SUMMARY FOR NOVEMBER 2017

PLANT	FLOW mgd	% of Design	BOD mg/l	TSS mg/l	FC #/UBI	ENTERO #/UBI	TP mg/l	TP CY Avg	TN mg/l	TN CY Avg	TKN mg/l	NH3 mg/l	CONTACT TANK EX
ARMY BASE	9.96	55%	3	3.7	2	2	0.42	0.59	9.0	7.5	NA	NA	12
ATLANTIC	23.02	43%	14	7.8	4	1	NA	NA	NA	NA	NA	NA	5
BOAT HARBOR	12.19	49%	5	4.1	1	1	0.24	0.52	11	13	NA	NA	0
CENT. MIDDLESEX	0.015	62%	<2	1.0	<1	<1	NA	NA	NA	NA	NA	NA	NA
CHES-ELIZ	16.66	69%	14	15	8	1	0.78	1.2	27	30	NA	NA	10
JAMES RIVER	11.69	58%	3	3.2	1	1	0.32	0.47	7.7	8.9	NA	NA	6
KING WILLIAM	0.043	43%	<2	<1.0	NA	<1	0.05	0.04	0.25	0.71	0.19	NA	NA
NANSEMOND	16.80	56%	4	4.5	3	2	0.70	0.89	3.8	6.7	NA	NA	15
SURRY, COUNTY	0.041	63%	2	2.6	NA	2	NA	NA	NA	NA	0.31	<QL	0
SURRY, TOWN	0.045	75%	7	12	NA	40	NA	NA	NA	NA	8.6	3.7	NA
URBANNA	0.051	51%	6	13	1	3	0.90	4.9	31	21	NA	0.09	NA
VIP	22.92	57%	2	2.2	24	3	0.79	0.85	3.9	6.4	NA	NA	4
WEST POINT	0.297	50%	22	13	1	2	3.6	3.1	19	17	NA	NA	0
WILLIAMSBURG	7.06	31%	3	4.1	2	2	1.1	0.76	3.7	4.2	NA	NA	4
YORK RIVER	11.76	78%	2	1.8	<1	2	0.17	0.26	1.6	1.9	NA	NA	2
	<u>132.56</u>												

	% of Capacity
North Shore	52%
South Shore	54%
Small Communities	49%

Tributaries	Tributary Summary					
	Annual Total Nitrogen			Annual Total Phosphorus		
	Discharged	Operational		Discharged	Operational	
	YTD	Projection CY17		YTD	Projection CY17	
	%	Lbs	%	%	Lbs	%
James River	71%	3,995,674	88%	70%	289,365	91%
York River	29%	124,566	43%	61%	14,388	74%
Rappahannock	201%	NA	NA	776%	NA	NA

Permit Exceedances: Total Possible Exceedances, FY18 to Date: 4:24,118*
Pounds of Pollutants Removed in FY18 to Date: 79,267,424
Pollutant Lbs Discharged/Permitted Discharge FY18 to Date: 16%

	Rainfall (inch)		
	<u>North Shore (PHF)</u>	<u>South Shore (ORF)</u>	<u>Small Communities (FYJ)</u>
Month	1.47"	1.17"	1.63"
Normal for Month	2.98"	2.94"	3.12"
Year to Date Total	43.16"	46.76"	43.21"
Normal for YTD	47.02"	46.45"	44.50"

*This measure does not include the Town of Surry facility

AIR EMISSIONS SUMMARY FOR NOVEMBER 2017

MHI PLANT	No. of Permit Deviations below 129 SSI Rule Minimum Operating Parameters								Part 503e Limits		
	BZ Temp	Venturi(s) PD	Precooler Flow	Spray Flow	Venturi Flow	Tray/PBs Flow	Scrubber	Any	THC	THC	BZ Temp
	12 hr ave	12 hr ave	12 hr ave	12 hr ave	12 hr ave	12 hr ave	pH	Bypass	Mo. Ave	DC	Daily Ave
(F)	(in. WC)	(GPM)	(GPM)	(GPM)	(GPM)	(GPM)	3 hr ave	Stack Use	(PPM)	(%)	Days >Max
ARMY BASE	0	0	0	0	0	0	0	0	35	96	0
BOAT HARBOR	0	0	0	n/a	0	0	0	1	5	98	0
CHES-ELIZ	0	0	0	0	0	0	0	0	29	95	0
VIP	0	0	0	n/a	0	0	0	0	88	99	0
WILLIAMSBURG	0	0	0	n/a	0	0	0	0	8	100	0

ALL OPERATIONS

DEQ Reportable Air Incidents:	0
DEQ Request for Corrective Action (RCA):	0
DEQ Warning Letter:	0
DEQ Notice of Violation (NOV):	0
Other Air Permit Deviations:	0
Odor Complaints Received:	2
Odor Scrubber HRSD Exception Events:	5