



March 21, 2014

TO: SMITHFIELD TOWN COUNCIL

**FROM: PETER M. STEPHENSON, AICP, ICMA-CM
TOWN MANAGER**

**SUBJECT: MARCH 2014 COMMITTEE MEETINGS WILL BE HELD AT THE SMITHFIELD
CENTER LOCATED AT 220 NORTH CHURCH STREET, SMITHFIELD, VA**

MONDAY, March 24th, 2014

Approximately 4:00 P.M.

Police Members: Tynes (CH), Chapman, Gregory

- TAB # 1**
1. Public Comment
 2. Operational Updates
 3. Proposed Fee of \$100 for Advertisement of Street Closures
 4. Street Light/Speed Survey on Great Springs Road
 5. Amendment to Olden Days Festival Special Event Application

Immediately following the conclusion of the above meeting:

Water and Sewer Members: Gregory (CH), Smith, Tynes

- TAB # 2**
1. Public Comment
 2. Preliminary Engineering Report on the Reverse Osmosis Plant by Jamie Weist of Kimley-Horn and Associates, Inc.

Immediately following the conclusion of the above meeting:

Finance Members: Pack (CH), Gregory, Cook

- TAB # 3**
- TAB # 4**
- TAB # 5**
- TAB # 6**
- TAB # 7**
1. Public Comment
 2. February Financial Statements and Graphs
 3. February Cash Balances
 4. Invoices Over \$10,000 Requiring Council's Authorization:
 - a. Robinson Farmer Cox Associates PLLC (Audit Services) \$23,000.00
 5. Preliminary Financial Analysis Bond Refunding VML/VACo
 6. Draft Ordinance to Adopt VML/VACo Investment Pool Trust Fund
 7. Budget Discussion – Revenues
 8. Closed Session

TUESDAY, March 25th, 2014

4:00 p.m.

Parks & Recreation

Members: Chapman (CH), Pack, Tynes

- 1. Public Comment
- TAB # 8** 2. Operational Update - Parks and Recreation Committee Report
- TAB # 9** 3. Request Use of Clontz Park for Annual Fireworks Display, Thursday, July 3rd, 2014
- TAB # 10** 4. Proposed Kayak Rental Sales and Storage Shed
- TAB # 11** 5. Windsor Castle Park Amenities Survey Results
- 6. Windsor Castle Park Trail Signage

Immediately following the conclusion of the above meeting:

Public Works

Members: Smith (CH), Cook, Tynes

- 1. Public Comment
- TAB # 12** 2. Award of Street Maintenance Contract
- TAB # 13** 3. Sidewalk Extension – South Church Street to Station Bridge Park Entrance

Immediately following the conclusion of the above meeting:

Public Buildings & Welfare

Members: Cook (CH), Chapman, Smith

- 1. Public Comment
- TAB # 14** 2. Pinewood Heights Phase II Update
- TAB # 15** 3. Pinewood Heights Redevelopment Plan
- 3. Proposed Smithfield 2020 Banner Project

***** Additional Item Not Listed on Committee but will be on Council's April 1st Agenda*****

- Approval of March 4th Town Council Minutes
-

From: Matthew Rogers
Sent: Tuesday, March 18, 2014 11:22 AM
To: Steven G. Bowman
Cc: ahowell@smithfieldva.gov
Subject: Lighting/Speed Survey - Great Springs Road

Sir,

A preliminary lighting and speed surveys were conducted for Great Springs Road. I will present the finding in the body of this email as the results are simple to report. The following is a result of the surveys conducted by Officer Phillips:

Traffic Survey - February 24, 2014

Survey Began - 1615 hours

Survey Ended - 1745 hours

Posted speed limit - 40 mph

Total number of cars observed: 50

Minimum speed 32 mph

Maximum speed 57 mph

Average speed 44 mph

During the time of the traffic survey four (4) drivers were issued summonses.

Lighting Survey - February 24, 2014

There are two light poles from Fairway drive to the Town line(Cypress Creek Golf course maintenance entrance). These poles appear to be erected at/near the entrance of Fox Ridge Lane and provide lighting for the intersections of Fairway Drive/Great Springs Road and Fox Ridge Lane/Great Springs Road. There are NO lighting sources presently at the site of the new Rescue Squad building.

Diagrams and further explanation can be created if required.

Respectfully,

Matthew B. Rogers
Patrol Lieutenant
Smithfield Police Department
913 S. Church Street

Smithfield, VA 23430

(757)357-3247

mrogers@smithfieldva.gov

PRELIMINARY ENGINEERING REPORT FOR THE

Town of Smithfield Reverse Osmosis Water Treatment Plant

Prepared for



Prepared by



Kimley-Horn
and Associates, Inc.



March 2014

Table of Contents

I. Executive Summary	1
II. Introduction	2
III. Silica Scaling Evaluation	3
IV. Phosphate Treatment Processes	5
V. Concentrate Discharge Evaluation	7
VI. Permeate Calcium Addition	7
VII. Membrane Cleaning System	9
VIII. Hydrogen Sulfide Analysis	10
IX. Permeate Header, SI Flow Meter	10

Appendices

I. Site Visit Notes and Photos	
II. Raw Water Quality Data	
III. Avista Investigation Data	
IV. Toray Projection Results	
V. Stage 3 Removal Train Modification Photo Sketches	
VI. Phosphorous Treatment Technical Paper	
VII. Train Cleaning System Photo Sketches	
VIII. Train Permeate Header	
IX. GIS Exhibit of Concentrate Discharge Route	

I. Executive Summary

The Town of Smithfield's water treatment plant (WTP) is experiencing operational inefficiencies related to silica scaling on the reverse osmosis treatment membranes, water quality in-consistencies, and high costs associated with concentrate discharge fees. This preliminary engineering report recommends the improvements summarized below.

A. Silica Scaling Evaluation — Based on this analysis, it is recommended that the third stage of the reverse osmosis (RO) train be disconnected and the unit operated in a two-stage configuration. Initially, the vessels can be left in place and the membranes should be removed and properly stored in a sodium bisulfide solution. The discharge end of the Stage 2 concentrate header, which serves as the Stage 3 feed water pipe, should be connected to the Stage 3 or final concentrate line. These piping modifications are shown in [Appendix V](#). The most significant issue associated with the elimination of the third stage of this train is the modification of the operating program and SCADA screens. It is recommended that the software be modified initially to expect zero flow in the third stage and that the other operating variables be modified to allow the system to operate in a two-stage configuration. After approximately 4 to 5 months of successful operation, the SCADA screens in the operating software can be permanently modified.

A planning level estimate of the cost to implement this recommendation is \$15,000.

B. Phosphate Treatment Processes — The recommended process at the Smithfield WTP is alum reaction, coagulation, and precipitation. This process has been researched, subjected to trial testing, and is in use in wastewater treatment. The recommended physical design criteria are 3 parts per million (ppm) of alum per part phosphorous, 15 minutes of mixing time, and 4 hours of settlement time. The required dose of alum is 10 ppm (based on the concentration of phosphate in the concentrate and several other criteria).

Assuming that the plant produces 1,150,000 gallons per day (gpd) of permeate at an 80 percent recovery rate, concentrate flow would be approximately 200 gallons per minute (gpm) or 290,000 gpd. The recommended 15-minute mixing time requires a mixing tank of approximately 3,000 gallons (measuring approximately

10 feet square and 5 feet deep). Mixing energy can be provided by multiple high velocity jets using residual concentrate pressure to place the concentrate into the mixing tank. The recommended settling time of 4 hours requires a settling basin of approximately 48,000 gallons. Settling can be provided by a 4-foot-deep basin with an area of approximately 1,600 square feet (measuring 40 feet by 40 feet or 15 feet wide and 105 feet long). The configuration of these basins would be determined during design of the facilities. Treated concentrate would be decanted from the surface at the end of the settling basin and discharged to Cypress Creek.

There are too many unknowns to estimate the cost to implement this method of phosphate treatment at this time.

It is recommended that jar/scale/bench scale testing be conducted on concentrate produced at the water plant to confirm the effectiveness of the alum/coagulation treatment process. This bench scale testing also will allow confirmation or modification of the design parameters stated above, and allow preparation of an opinion of probable cost (OPC).

Discharge of the concentrate to Cypress Creek would use the existing 8-inch pipe installed during the initial WTP construction from the south portion of the WTP site eastward toward the creek ([Appendix IX](#)). The pipe would terminate in a diffuser located in the center of Cypress Creek or in a submerged open pipe on the east shore. Modifications would be required to the sanitary lift station pumps when concentrate flow is removed from the wet well.

The settled sludge would be removed by pumping as a high solids content liquid. This material would not be hazardous and would not contain biologically active materials.

Once bench scale testing for phosphorous is complete and bioassay testing is conducted, we will be able to determine the required discharge permitting process.

C. Concentrate Discharge Evaluation — It is recommended that bioassay testing be conducted on concentrate produced at the water plant in order to determine the permitting process required.

Discharge of the reverse osmosis concentrate into Cypress Creek will require a permit from the Virginia

Department of Environmental Quality (DEQ) because the creek is considered waters of the Commonwealth. In general, this involves a national pollutant discharge elimination system (NPDES) permit and the regulations provide procedures as well as standards of quality that must be met. Virginia DEQ has enacted a general permit (VAG 64) that provides a reduced permitting process for concentrate from a drinking water treatment plant. The regulations also provide the option of a process called an individual permit process. This can be used to acquire an individual permit for discharge of concentrate into waters of the Commonwealth although this process is somewhat more detailed and time-consuming than the expedited process known as a general permit using the VAG 64 process.

D. Permeate Calcium Addition — We recommend the elimination of the lime slaker and the purchase of liquid calcium, calcium hydroxide, which is fed directly into the finished water by a chemical metering pump (similar to those that are already in use for chlorine and scale inhibitor). The liquid calcium is delivered in a consistent strength of 30 percent calcium and diluted to a consistent concentration of 15 percent prior to use. This means that only the speed of the chemical metering pump must be varied to change the amount of calcium being introduced into the finished water. This proposed system also would reduce maintenance and operating effort by eliminating the slaker and its multiple components and will reduce the amount of operator attention required to keep the pH of the finished water at a consistent value.

Conversion to a liquid calcium system will require the demolition and removal of the lime slaker, installation of a 280-gallon storage tank, and installation of two chemical metering pumps. The tank should be placed inside the building to protect it from freezing.

A planning level estimate of the cost to implement this recommendation is \$50,000. This recommendation will be included in the town's future CIP.

E. Membrane Cleaning System — The installation of permanent piping is recommended to reduce the amount of hose required, and simplify and reduce the time required for cleaning of the membranes. More specifically, we recommend vertical PVC pipes be installed on each end of the train that allow connection to the horizontal feed and concentrate headers by installation of an open spool with victaulic style joints.

These vertical pipes would be connected to a supply pipe and a return pipe located on the floor next to the train. Hoses would be installed from the cleaning pump discharge pipe and an extended cleaning return pipe to these new horizontal supply and return pipes, a distance of about 10 feet. *Appendix VII* includes six photo schematics that show the general configuration and alignment of this recommended pipe.

A planning level estimate of the cost to implement this recommendation is \$10,000.

F. Hydrogen Sulfide Analysis — Based on the descriptions provided by water plant staff, detected hydrogen sulfide appears to be created by stagnant and warm conditions in the extremities of the distribution system. There does not appear to be hydrogen sulfide present in the finished water produced at the plant.

No action is recommended at this time regarding this matter.

G. Various Plant Operational Improvements

Permeate Header — It is recommended that the vertical permeate header be reconfigured and an “up-leg” be created in this piping that will keep the train flooded when it is out of service and eliminate the need for the pressure sustaining valve in the pipe trench. Elimination of the train draining is important to maintain the membranes in good operating condition. Permeate back pressure increases the feed pressure requirement and, therefore, the operating cost. The recommended arrangement would eliminate or reduce the permeate back pressure.

A planning level estimate of the cost to implement this recommendation is \$10,000. See *Appendix VIII*.

Scale Inhibitor Flow Meter — It is recommended that the scale inhibitor flow meter be relocated to a point near the point of injection. This will allow the flow meter to sense a reduction in scale inhibitor flow to the problems in the piping.

A planning level estimate of cost to implement this recommendation is \$2,500.

II. Introduction

The Town of Smithfield owns and operates a water treatment plant (WTP) that uses reverse osmosis for the removal of fluoride and other naturally occurring constituents in its drinking water to meet the requirements set forth in a Consent Order and requirements of the Virginia Department of Health (VDH). Approximately 20 percent of the water produced at this plant is raw water blended with water treated by the reverse osmosis treatment process. The reverse osmosis treatment process has a rated capacity of 1,150,000 gpd and, with the 345,000 gpd of blend, the total water plant capacity is 1,495,000 gpd. The plant has been in operation for approximately two years.

The plant is experiencing silica scaling in the reverse osmosis treatment unit causing membrane fouling and inefficient operations. Orifices have been placed in the permeate discharge of Stages 1 and 2 of the treatment train to create artificial back pressure in an attempt to correct the persistent fouling.

The concept in place during initial planning of the facility was to discharge concentrate into the nearby Cypress Creek which ultimately discharges to the Pagan River. The presence of phosphorus in the raw water prohibited the Town from obtaining a Virginia Pollutant Discharge Elimination System (VPDES) permit from the Department of Environmental Quality (DEQ) for discharge to the creek. The plant was placed into service with a metered concentrate discharge to Hampton Roads Sanitation District (HRSD) due to the high phosphorus levels, costing the Town nearly \$250,000 per year in disposal fees.

Calcium addition is currently performed by mixing dry lime with water and adding the resulting calcium slurry into the plant's clearwell. This presents operational difficulties in the addition of a consistent quality and proper amount of lime and results in variations in the quality of water to customers.

The Town's operations staff currently uses hoses to clean the membranes, which is cumbersome and inefficient.

Currently some amount of hydrogen sulfide is detected in the water during the summer months. The hydrogen sulfide is detected in the extremities of the distribution system.

The existing chemical room floor is depressed approximately 6 inches to serve as a containment area for any spills of the chemicals being handled in the room. This arrangement

makes it difficult to move bulk chemicals around the room. The train vertical permeate header is configured to allow air to enter the train when it is off-line. The scale inhibitor flow meter is installed at a location where it would not detect a leak in the scale inhibitor injection piping.

III. Silica Scaling Evaluation

The Smithfield reverse osmosis facility was installed in order to remove fluoride from the raw water. Silica is also present in the raw water which has a strong effect on the performance and operation of a reverse osmosis treatment process. The silica limits the recovery of a reverse osmosis system which means that a lower portion of the raw water can be sent to the customers and a greater portion of the raw water must be set to disposal. In many locations where reverse osmosis treatment is implemented, this reduction in recovery does not present a significant problem to the utility. However, at the Smithfield facility, concentrate is sent to HRSD for disposal and the cost of this disposal is based on the volume of water being sent. Accordingly, there is significant incentive to reduce the amount of concentrate in order to reduce the operating cost associated with the HRSD billing. At this facility, an increase in recovery in order to produce a decrease in concentrate, to reduce disposal cost can result in damage to the membranes due to silica scaling.

Kimley-Horn collected information and data on the existing reverse osmosis train array, operation, history, and maintenance. A computer simulation was created using the Toray projection software which was selected because the membranes in the reverse osmosis train are manufactured by Toray. By manipulating the train array and membrane placement, Kimley-Horn performed an analysis of various options. Current raw water quality data was used in this program. A train array was developed that allows maximum recovery to be achieved without projections of the silica depositing on the tail end membranes. A description has been prepared of the modifications and changes that would be required to the existing train array to achieve the recommended array developed as outlined below.

1. There are various complete and partial water quality analyses of the raw water serving this facility. For the purposes of this report and the analysis prepared for this report, the water quality analysis published by Avista and dated 11/10/11 was used. This water quality is presented in *Appendix II*. This report is primarily focused on silica scaling and silica in the raw water is the primary factor

in this matter. In regard to silica concentrations in the Smithfield raw water, the various water quality reports are relatively uniform in showing that the raw water contains approximately 40 ppm (milligrams per liter) of silica (reported as silica dioxide).

2. Classic water chemistry predicts that silica will precipitate, which is the mechanism by which scale forms on a membrane surface, when it reaches 100 percent of its saturation limit (approximately 170 ppm at the conditions present in the feedwater at Smithfield WTP). Scale inhibitor chemicals are added to the feed water and the purpose of these chemicals is to retard, or prevent in this case, precipitation of silica. The performance of scale inhibitor chemicals is largely based on testing by the scale inhibitor producer; therefore predicting the maximum concentration of a compound that can be allowed using a specific scale inhibitor must come from the scale inhibitor producer. In this case, the scale inhibitor is produced by Avista Technologies and they have indicated that concentrations of up to 240 ppm of silica can be kept in solution by their VITEC 4000 product. In support of this theory, Avista installed test units (Black Boxes) on the second and third stage of the train at the Smithfield WTP. These test units were allowed to operate for 6 weeks and, during that period, no silica scaling was observed. The test units were loaded with the same membrane material used in the train membranes. The results of the Black Box testing confirmed Avista's claim that silica concentration as high as 240 ppm can be allowed under the conditions present in the reverse osmosis system at Smithfield. The Black Box test reports are presented in [Appendix III](#).

Silica scaling occurs routinely on the membranes at this plant. Information indicates that the first stage membranes have not been cleaned since operations began, the second stage has been cleaned twice, and the third stage has been cleaned approximately six times. This information could appear to cast doubt on the claim by Avista that the scale inhibitor product in use can prevent scaling on these membranes. The plant currently is operating at approximately 80 percent recovery which would limit silica to well below the expected maximum concentration of 240 ppm. During the initial operation of the facility, an issue occurred that caused significant scaling on the membranes. The train water flow meters apparently were not operating properly and the system operated well above 80 percent recovery. This caused significant scaling on the membranes which

then was removed by rigorous cleaning procedures. It is quite possible that this early scaling and rigorous cleaning left the membranes in a condition that promotes scaling. Results from the Black Box testing confirm that undamaged membranes do not appear to accumulate silica scale even at the higher concentrations of silica.

The existing reverse osmosis train is configured with three stages, which means that the concentrate from Stage 1 is sent to a second stage for additional concentration; the concentrate from the Stage 2 is sent to a third stage for further concentration. This can lead to lower or higher flows in the discharge end of the membrane vessels, depending on membrane conditions and several other factors. Sometime after the train was placed into operation, the Stage 3 vessels were modified to contain four membranes by removing two membranes that were severely scaled. Additionally, orifices were placed in the first and second stage permeate headers to reduce permeate flow in these stages and direct more feed flow into the third stage. It is possible that these flow conditions, as well as the early damage to the membranes, may be contributing to the persistent scaling issue in the third stage membranes.



RO Train Feed End

Kimley-Horn developed a computer simulation of the Smithfield train using the Toray projecting software and the Avista raw water quality data. This model was then manipulated to provide predicted operating conditions at increased recoveries with the three-stage configuration and increased recoveries in a two-stage configuration. The predictive model indicated that operating conditions using a two-stage configuration should have no hydraulic or chemistry difficulties. This issue was discussed with representatives of Toray who confirmed that a two-stage array should be sufficient.

All of the analytical data implies that the system should operate adequately in a two-stage array at recoveries up to approximately 84 percent. There is a concern that the previous damage to the membranes will continue to promote scaling in the tail end of the second stage vessels. Monitoring of performance data and periodic autopsy of the second stage tail end membranes will allow monitoring of this issue.

RECOMMENDATION

Based on our analysis, it is recommended that the third stage of the reverse osmosis train be disconnected and the unit operate in a two-stage configuration. Initially, the vessels can be left in place and the membranes should be removed and properly stored in a sodium bisulfide solution. The discharge end of the Stage 2 concentrate header, which serves as the Stage 3 feed water pipe, should be connected to the Stage 3 or final concentrate line. These piping modifications are shown in [Appendix V](#). The most significant issue associated with the elimination of the third stage of this train is the modification of the operating program and SCADA screens. It is recommended that the software be modified initially to expect zero flow in the third stage and that the other operating variables be modified to allow the system to operate in a two-stage configuration. After approximately 4 to 5 months of successful operation, the SCADA screens in the operating software could be changed permanently.

A planning level estimate of the cost to implement this recommendation is \$20,000, assuming that plant staff does most of the piping work on the train.

IV. Phosphate Treatment Processes

During the initial planning of this WTP, it was assumed that the concentrate would be discharged into Cypress Creek adjacent to the plant site. Pipeline construction of a gravity outfall to the creek began, but was terminated after completion of approximately 500 feet of the outfall was constructed. Prior to the implementation of this plan, regulations were enacted to essentially eliminate any new discharges of significant amounts of phosphorous into tributaries of the Chesapeake Bay. The regulations either prohibit or make it very difficult to permit discharges that place more than 300 pounds of phosphorous per year into the receiving water body. For design purposes, the concentrate from the Smithfield WTP is assumed to have 8.0 ppm of phosphorous and at its rated capacity of 1,150,000 gpd and 80 percent recovery, the concentrate would place approximately 7,000 pounds per year into Cypress Creek. It is necessary to remove approximately 96 percent of the phosphorous to discharge less than 300 pounds per year at the WTP design production rate. This is based on the water quality testing presented by Avista. It is recommended that additional testing be completed to establish a reliable value for phosphorous in the concentrate.

Kimley-Horn collected background information and, using current concentrate water quality data, conducted a literature search of the available treatment processes for removal of phosphorus from a stream of clean water. The available techniques were analyzed to determine their applicability to the situation at the plant. This analysis focused on achieving the current water quality requirements for discharge into waters of the Commonwealth of Virginia.

The criteria used to judge the applicability of various treatment processes were:

- Phosphorous removal efficiency of at least 96 percent
- Capital cost to construct and implement
- Ease of operation and similarity to water treatment operations
- Space requirements
- Operating costs

There are three basic processes to reduce phosphorous concentration in water: biological, physical and chemical.

In the **biological process**, bacteria or other biological organisms that consume phosphorous are cultivated in a tank or pond and the wastewater to be treated is directed through it. These organisms reduce the phosphorous present and then the by-product that results from the consumption of the phosphorous must be removed from the water.

In the **physical process**, the phosphorous is removed from the flow stream by physical filtration. This filtration process can be as fine as membranes and as coarse as sand/gravel filters. For this process to be effective, the phosphorous present in the water to be treated must be attached to particulate matter. Generally, less than 10 percent of the phosphorous is attached to physical particles.

In the **chemical treatment process**, the phosphorous is generally converted to a larger physical particle by reacting with a chemical added to the wastewater stream. After the phosphorous has been converted to a larger physical particle, it will precipitate or settle out of the water stream that is being treated.

Biological processes were eliminated, as they generally require a long detention time with the consequent large space requirement and use a process that is quite unfamiliar to water plant operation.

Physical filtration processes were eliminated since they only remove the particulate phosphorous present in the water, which is a very small portion of the phosphorous present in the concentrate. Membrane filtration was eliminated as it produces a liquid waste that requires disposal.

While a number of chemical processes are available, there are few systems currently in operation and none were found that treat a clean water similar to concentrate. Most phosphorous removal applications are used to treat stormwater runoff, which has a distinctly different character of water and flow patterns than the concentrate generated at this water plant.

RECOMMENDATION

The recommended process for the Smithfield WTP is alum reaction, coagulation, and precipitation. This process has been researched and subjected to trial testing and is used in wastewater treatment. A published paper is included in **Appendix VI** on this recommended process. The basis of this process is a well-known and dependable reaction of aluminum and phosphate into aluminum phosphate; that reaction creates a floc that will settle in a liquid medium. The aluminum for this reaction is provided by injecting aluminum

sulfate, or alum, into the water. The effectiveness of the treatment process depends on an adequate dose of alum, adequate time and energy to mix the alum with the water containing phosphate, and adequate time in a body of water with low horizontal velocity so that the particles containing the phosphate will settle out of the water. The concentration of phosphate and the rate of flow in the concentrate are both consistent which will allow the alum dose to be constant. This process offers a significant operating advantage in the treatment of concentrate as it does not present the need to continuously measure the phosphorous concentration in order to properly vary the rate of alum added.

The recommended physical design criteria include 15 minutes of mixing time and 4 hours of settlement time. The required dose of alum is based on the concentration of phosphate in the concentrate and several other criteria. Jar testing is needed to provide a reliable method of predicting the required dose of alum.

The value of 1.4 ppm reported by Avista is significantly higher than the earlier undocumented reports. It is recommended that additional testing be conducted to determine with confidence the level of phosphorus present in the raw water. The dose of alum will vary and should be established based on jar testing to determine the optimum dose.

Assuming that the plant produces 1,150,000 gpd of permeate at 80 percent recovery, concentrate flow would be approximately 200 gpm or 290,000 gpd. The recommended mixing time of 15 minutes requires an approximately 3,000 gallon mixing tank measuring approximately 10 feet square and 5 feet in depth. Mixing energy can be produced by multiple high velocity jets using residual concentrate pressure to place the concentrate into the mixing tank. The recommended settling time of 4 hours requires a settling basin approximately 48,000 gallons. Settling can be provided by a 4-foot deep basin with an area of approximately 1,600 square feet (measuring 40 feet by 40 feet or 15 feet in width and 105 feet in length). The configuration of these basins would be determined during the design of the facilities. Treated concentrate would be decanted from the surface at the end of the settling basin and discharged to Cypress Creek.

Currently, there are too many unknowns to estimate the cost to implement this method of phosphate treatment.

It is recommended that bench scale testing be conducted on concentrate produced at the water plant to confirm the effectiveness of the alum/coagulation treatment process.

This bench scale testing also will allow confirmation or modification of the design parameters stated above.

The settled sludge would be removed by pumping as a high solids content liquid. This material would not be hazardous and would not contain biologically active materials.

Once bench scale testing for phosphorous is complete and bioassay testing is conducted, we will be able to determine the required discharge permitting process.

Concentrate discharge to Cypress Creek would use the existing 8-inch pipe installed during the initial WTP construction from the south portion of the WTP site eastward toward the creek. This pipe was installed and previously used to flush the wells and currently terminates about 500 feet from the plant and about 1,000 feet from the center of Cypress Creek. The extension of this pipe would generally follow the 16-inch finished water main. The pipe would terminate in a diffuser located in the center of the Cypress Creek or a submerged open pipe on the east shore. A figure depicting this layout is shown in [Appendix IX](#). It is recommended that the concentrate pipe in the building pipe trench be extended using 6-inch PVC through the trench and installed to exit through the west end of the building. From there the pipe would be extended to the mixing and settling basins; the location of these basins will be established during the design of the phosphorous treatment facilities. Discharge of treated concentrate from the setting basin is recommended to be tied into the existing 8-inch pipe and flowed into Cypress Creek by gravity. Modifications will be required to the sanitary lift station pumps when concentrate flow is removed from the wet well.

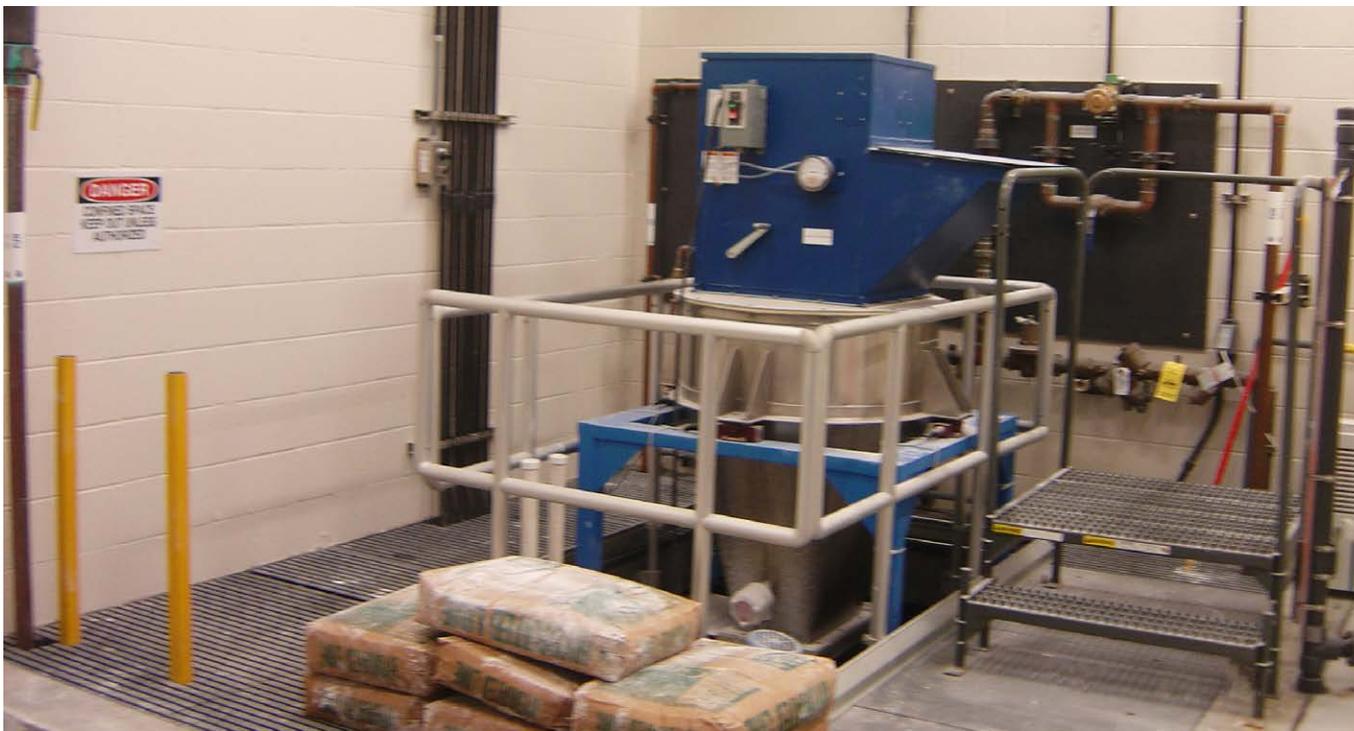
V. Concentrate Discharge Evaluation

Discharge of the reverse osmosis concentrate into Cypress Creek will require a permit from Virginia DEQ as the creek is considered waters of the Commonwealth. In general, this involves an NPDES permit and the regulations provide procedures as well as standards of quality that must be met.

Based on available water quality data, the concentrate meets the requirements for all numerical standards except phosphorous. Section III presents a treatment process that could reduce the phosphorous concentration in the concentrate to meet the water quality requirement and make the concentrate eligible for a discharge permit.

Virginia DEQ has enacted a general permit (VAG 64) that provides a reduced permitting process for concentrate from a drinking water treatment plant. The regulations also provide the option of a process called an individual permit process. This can be used to acquire an individual permit for discharge of concentrate into waters of the Commonwealth although this process is somewhat more detailed and time consuming than the expedited process for acquiring a general permit using the VAG 64 process. The concentrate must meet the numerical standards for discharge into waters of the state to qualify for the VAG 64 process. As previously stated, assuming that the phosphorous concentration will be reduced, the concentrate will meet the numerical standards. The second step involves bioassay testing, both acute and chronic. The VAG 64 permitting process cannot be used if there is chronic or acute toxicity present in the concentrate. This testing would be conducted using concentrate produced at the water plant that has not been treated to reduce phosphorus levels using the alum coagulation process described in Section III of this report.

The Virginia DEQ regulations do not include a numerical limit for fluoride in water being discharged into waters of the Commonwealth. It is likely that the elevated levels of fluoride present in this concentrate, approximately 15 ppm, will produce either acute or chronic toxicity results during the bioassay testing process. If this occurs, the VAG 64 permitting process cannot be used for concentrate from this facility which will then require use of the individual permit process. The individual permit process allows for the use of a mixing zone in order to address acute or chronic toxicity. A mixing zone is generally required to meet stated parameters



Existing Lime Feed System

upstream and downstream of the outfall pipe in tidally-influenced waters such as the proposed discharge location in Cypress Creek. It is likely that a diffuser will be required on the discharge pipe in order to distribute the concentrate across a majority of the cross section of Cypress Creek.

RECOMMENDATIONS

It is recommended that bioassay testing be conducted on concentrate produced at the water plant to determine the necessary permitting process.

VI. Permeate Calcium Addition

Kimley-Horn investigated alternative methods of adding calcium to the water to achieve a more stable finished water product. The intent was to identify a system that could replace the current system using bag calcium and a dry material feeder.

Existing Process

Lime is added to the finished water, which is a blend of reverse osmosis permeate and raw water, in order to increase the pH of that blend to a value of approximately 8.1. The raw water, which had been delivered to the customers for decades prior to installation of the reverse osmosis plant,

typically registered a pH of approximately 8.1 and the goal of the water system is to continue delivering a soft water with a pH of approximately 8.1. It should be noted that raising the pH with the addition of calcium also restores some amount of hardness that was removed during the reverse osmosis treatment process.

The current method of adding lime to the finished water uses the process of mixing powdered lime, which is calcium oxide (CaO), with water to form a slurry and then adding that slurry, which is calcium hydroxide [Ca(OH)₂], into the finished water. Calcium oxide is delivered to the water plant in bags and then bags are loaded manually into the dry hopper of the lime slaker. The lime slaker then uses a screw conveyor to feed a consistent and controllable quantity of dry lime into a tank that also is receiving a consistent and controllable amount of water. The lime and water are mixed continuously to achieve a consistent concentration of lime in the tank. A number of factors, most notably a change in relative humidity, can interrupt the dry lime feeding process which then affects the concentration of calcium in the lime slurry.

RECOMMENDED PROCESS

An alternate approach involves the elimination of the lime slaker and the purchase of liquid calcium as calcium hydroxide, which is then fed directly into the finished water

by a chemical metering pump similar to those that are already in use for the chlorine and scale inhibitor. The liquid calcium is delivered in a consistent strength of 30 percent calcium and diluted to a consistent concentration of 15 percent prior to injection. This means that only the speed of the chemical metering pump must be varied in order to change the amount of calcium being placed into the finished water. This proposed system would also reduce the maintenance and operating effort by eliminating the slaker and its multiple components as well as the amount of operator attention required to keep the pH of the finished water at a consistent value.

On average, the plant uses approximately 50 pounds per day of calcium which is the equivalent of approximately 10 gallons of 30 percent strength calcium hydroxide or approximately 20 gallons of 15 percent strength calcium hydroxide. Typically, the calcium hydroxide is delivered at 30 percent concentration and diluted to approximately 15 percent concentration prior to use in the water treatment process. This will require approximately 280 gallons of storage to provide a two-week supply of liquid calcium hydroxide.

Converting to a liquid calcium system will require the demolition and removal of the lime slaker, installation of a

280-gallon storage tank, and installation of two chemical metering pumps. The tank should be placed inside the building to protect it from freezing. Control system modifications are expected to be minimal. The control system will operate the chemical metering pump to a speed based on plant production in the same manner that the chlorine and scale inhibitor pumps are controlled.

A planning level estimate of the cost to implement this recommendation is \$50,000. This recommendation will be considered in the Town's future CIP.

Liquid calcium can be estimated at a cost of \$0.30 per pound of calcium. The weight of calcium used at the water plant would not change.

VII. Membrane Cleaning System

Kimley-Horn investigated the extent of piping that would be required to create a piped in place cleaning system. The intent was to replace the hoses that currently must be used when cleaning the membranes.



Existing Cleaning System

Existing System

The existing membrane cleaning system includes a mixing tank, a cleaning pump, and connection points on the train feed/concentrate headers for connection of hoses. In order to clean the membranes, hoses must be installed from the cleaning pump discharge piping to each feed header on the train and from each concentrate header on the train to the cleaning tank inlet. These hoses must be relocated as each portion of the train is cleaned since the capacity of the cleaning system allows it to clean only 12 vessels at a time. This means there are two operations to clean the first stage, a single operation to clean the second stage, and a single operation to clean the third stage. This four set-up process is time-consuming and requires significant manual labor on the part of the operating staff.

Existing Cleaning System

RECOMMENDED IMPROVEMENTS

It is recommended that permanent piping be installed to reduce the amount of hose required and simplify and reduce the time required for cleaning of the membranes. Vertical PVC pipes installation on each end of the train is recommended to allow connection to the horizontal feed and concentrate headers with the installation of an open spool with victaulic style joints. These vertical pipes would be connected to supply and return pipes located on the floor next to the train. Hoses would be installed from the cleaning pump discharge pipe and the extended cleaning return pipe to these new horizontal supply and return pipes, a distance of about 10 feet. *Appendix VII* includes six photo schematics that show the general configuration and alignment of this recommended pipe.

A planning level estimate of the cost to implement this recommendation is \$18,000.

VIII. Hydrogen Sulfide Analysis

Kimley-Horn investigated the reports of hydrogen sulfide present in the raw water which could be passing through the membranes and present in the drinking water during the summer months.

EXISTING CONDITIONS

Hydrogen sulfide is periodically detected in the water during the summer months in the extremities of the distribution system. However, hydrogen sulfide is not routinely detected and seems to be present only during the warmer months.

RECOMMENDED ACTIONS

Based on the descriptions provided by water plant staff, the hydrogen sulfide being detected appears to be created by stagnant and warm conditions in the extremities of the distribution system. There does not appear to be hydrogen sulfide present in the finished water produced at the plant.

No action is recommended at this time regarding this matter.

IX. Permeate Header, SI Flow Meter

Permeate Header

EXISTING CONDITION

The train permeate header is vertically oriented. The permeate headers from each stage connect to this vertical pipe which then discharges down into the plant permeate header in the pipe trench. The downward flow direction in this pipe allows the reverse osmosis vessels to drain when off-line which can cause oxidation within the membranes that require more frequent cleaning. It is our understanding that a pressure sustaining valve was added in the pipe trench in part to accommodate this issue and also to create positive back pressure on the permeate side of the membranes.



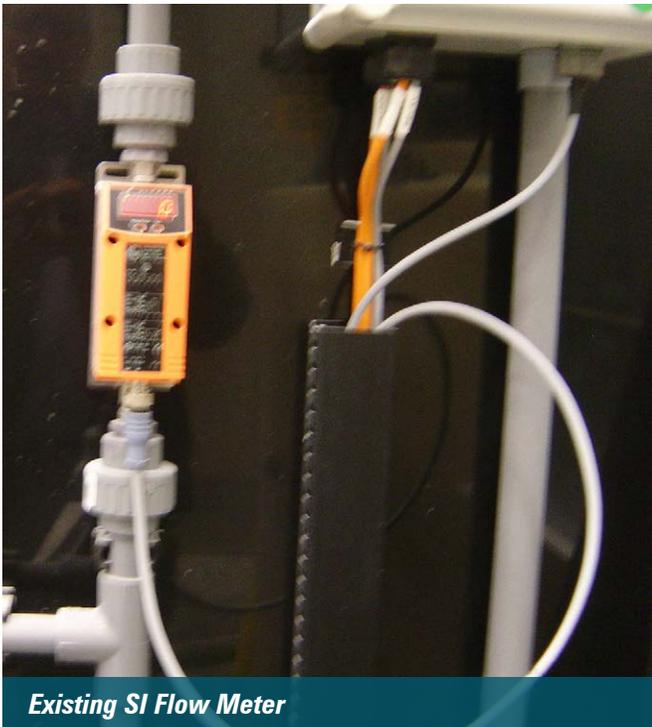
Existing Permeate Pipe

RECOMMENDED MODIFICATIONS

It is recommended that the vertical permeate header be reconfigured and an “up-leg” be created in this piping that will keep the train flooded when it is out of service and eliminate the need for the pressure sustaining valve in the pipe trench. Elimination of the train draining is important to maintain the membranes in good operating condition. Permeate back pressure increases the feed pressure requirement and, therefore, the operating cost. The recommended arrangement would eliminate or reduce the permeate back pressure.

Appendix VIII to this report presents a photo schematic showing the recommended improvements.

A planning level estimate of the cost to implement this recommendation is \$5,000.



Existing SI Flow Meter

Scale Inhibitor Flow Meter

EXISTING CONDITION

The scale inhibitor flow meter is located at the scale inhibitor metering pump. This means that a leak or rupture in the scale inhibitor piping from the meter to the point of injection near the reverse osmosis train will reduce scale inhibitor flow to the feedwater and not register as an alarm condition to the control system. Any reduction in the amount of scale inhibitor placed into the feedwater can cause serious damage to the membranes.

Additionally, the scale inhibitor flow rate does not appear to be sent to the SCADA system, which can then be programmed to alarm the operations staff or shut down the train when flow falls below a preset value for a preset length of time.

RECOMMENDED MODIFICATIONS

It is recommended that the scale inhibitor flow meter be relocated near the point of injection. This will allow the flow meter to detect a reduction in scale inhibitor flow to the problems in the piping.

It is also recommended that the analog value for scale inhibitor flow be sent to the SCADA system and programming be created to alarm or take actions at various levels of flow.

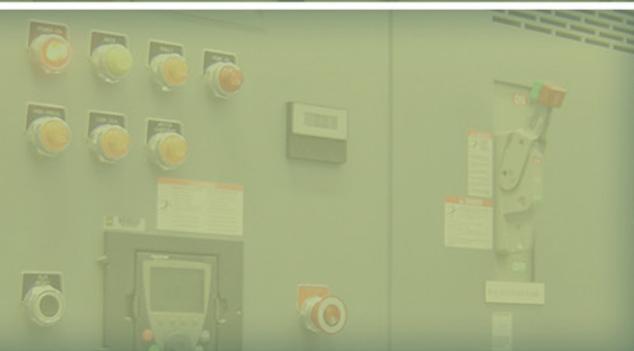
A planning level estimate of cost to implement this recommendation is \$2,500.

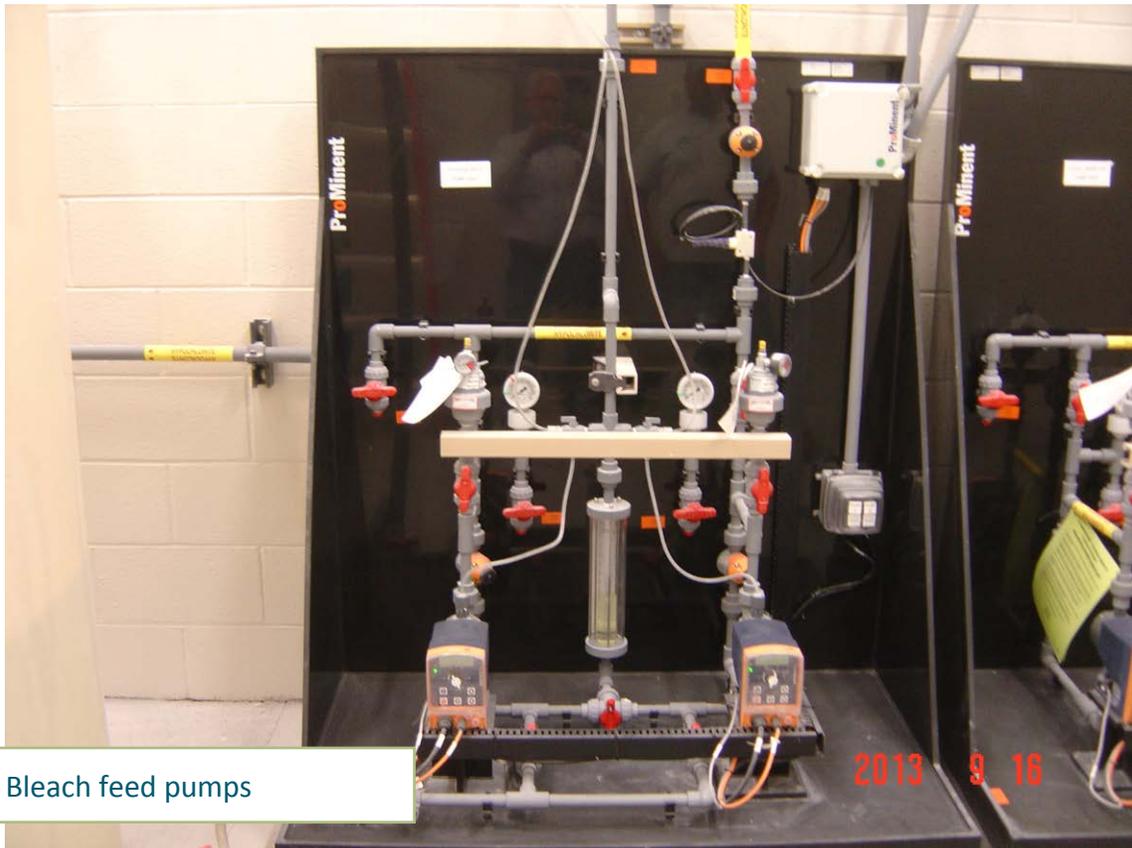
Appendices



Appendix I

Site Visit Notes and Photos





Bleach feed pumps



Smithfield cleaning filter – control



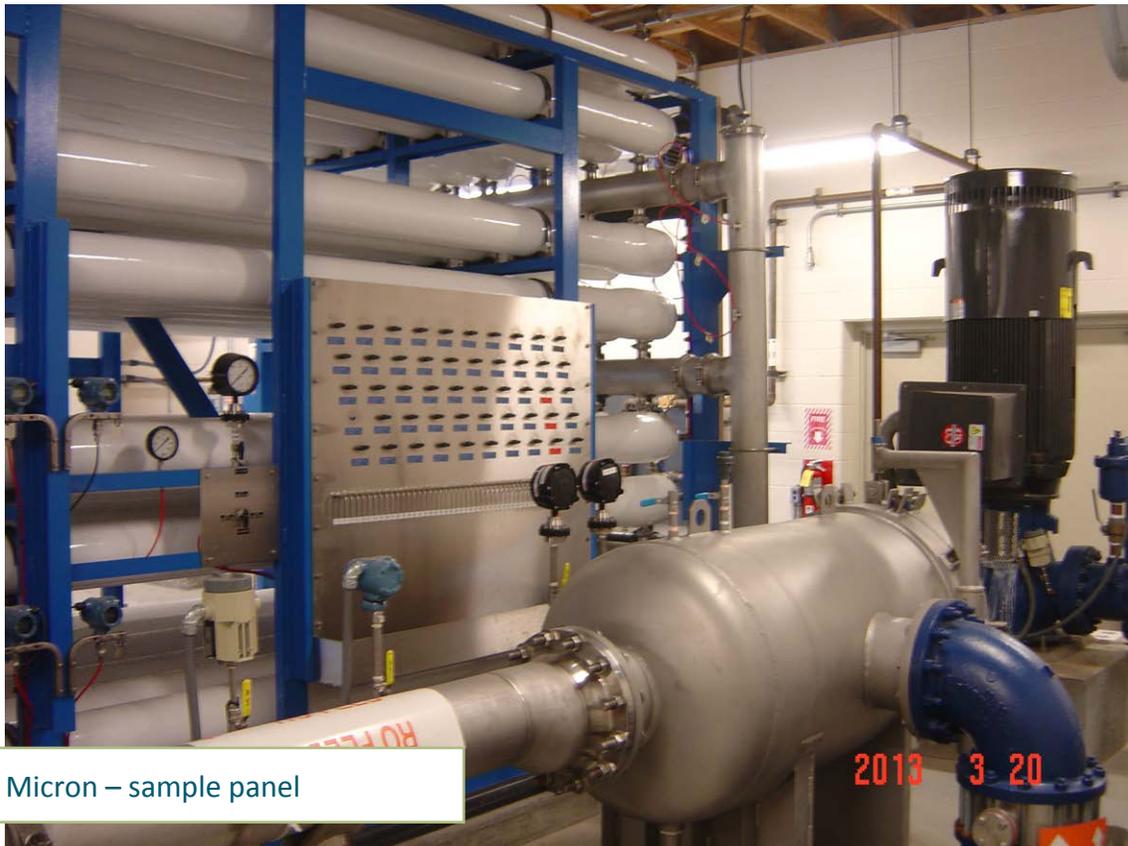
Concentrate air gap



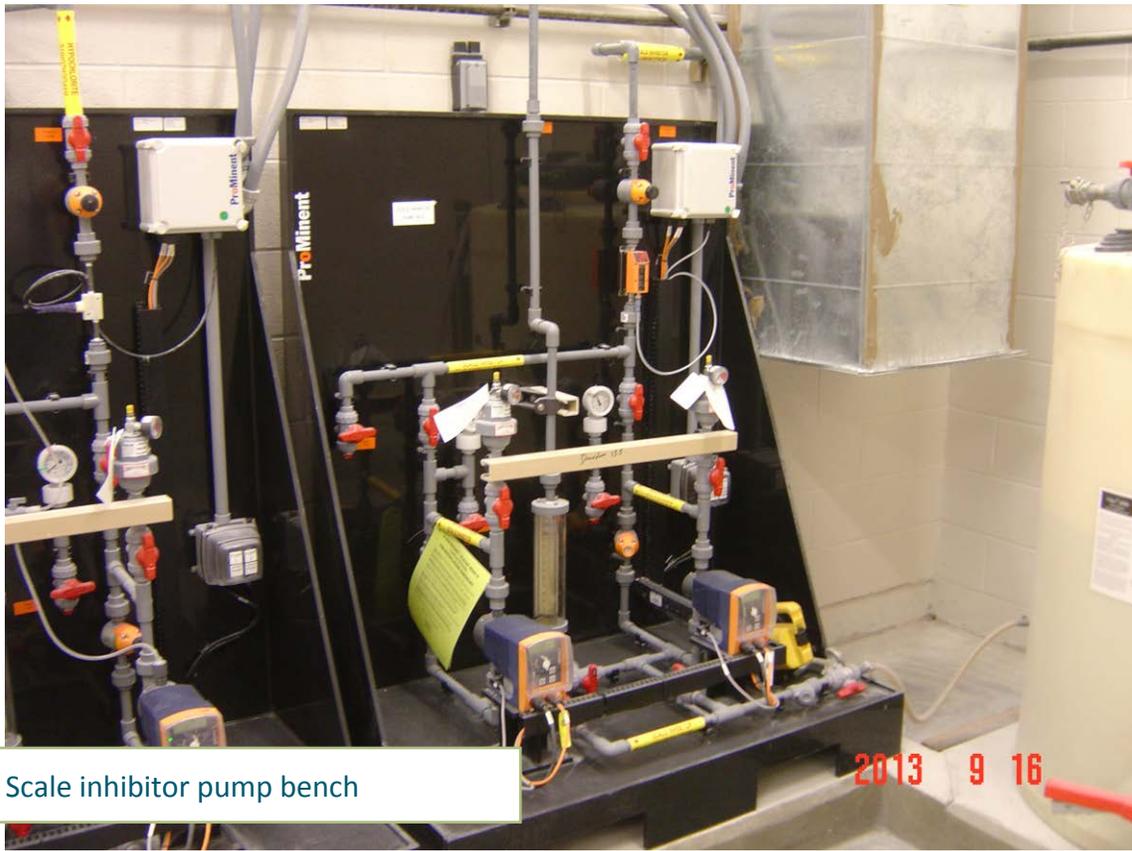
Feed piping



Lime system



Micron – sample panel



Scale inhibitor pump bench



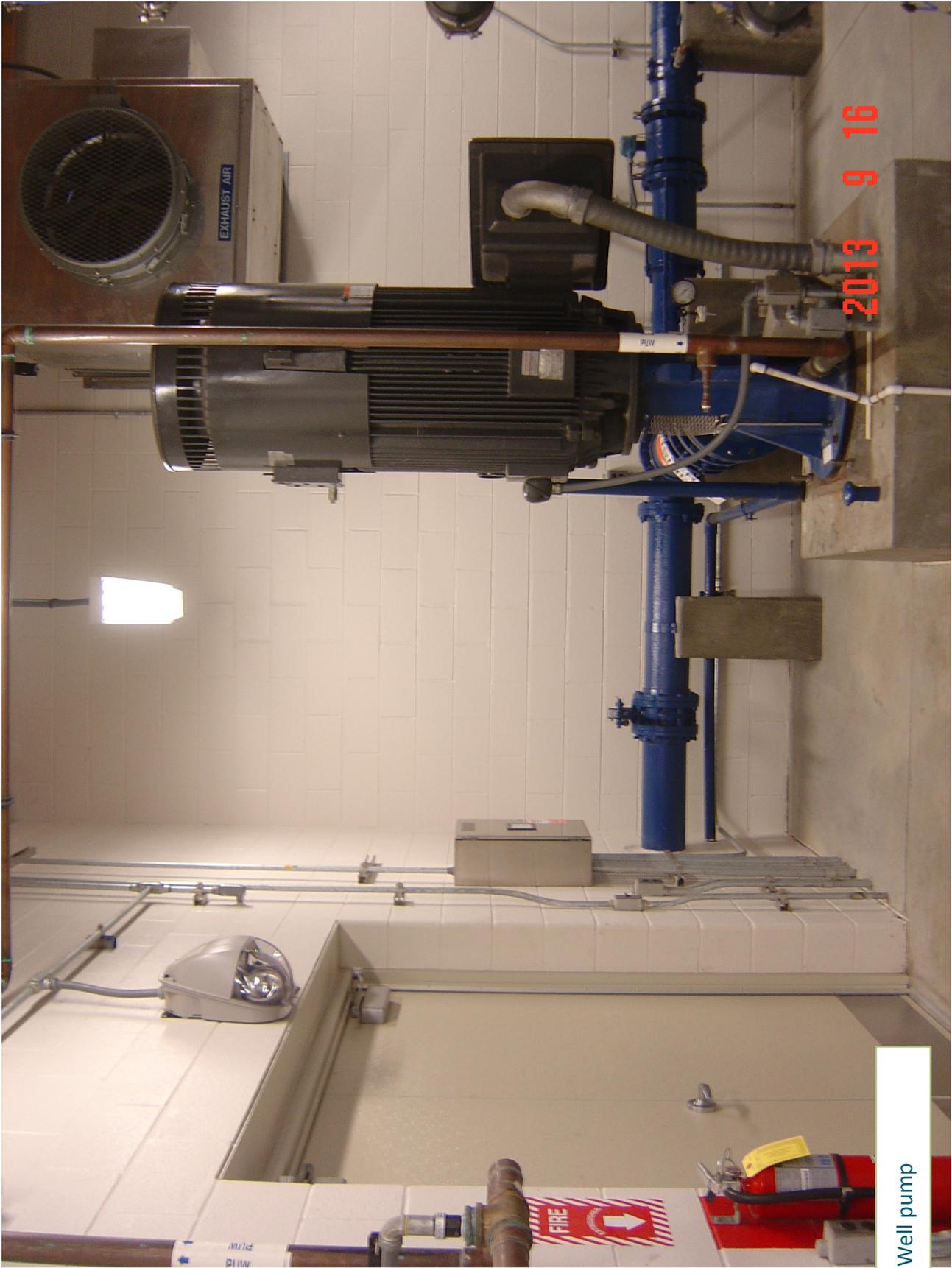
SI flow meter



Train feed end



Train permeate end



Well pump

SITE MEETING NOTES
SMITHFIELD WTP
9/16/2013

1. Jamie Weist and I met with Jack Reed and Gary Gandee at the Smithfield WTP today for approximately 2 1/2 hours.
2. Avista has reportedly conducted additional water quality testing at the plant.
3. Jason Bailey is the contact for Avista.
4. Avista installed a black box at this site and it has since been removed and therefore there should be data gathered from the black box.
5. There are reports that the pH changed in the raw water between design and startup. This could also have been an incorrect lab report during the information used for design.
6. If there is going to be additional raw water quality testing conducted on our recommendation, both wells should be tested.
7. The aquifer into which these wells penetrate is the Potomac aquifer.
8. The purpose of the blend is to place stability into the RO permeate. The numerical limitation is 1.0 ppm fluoride in the combined product water.
9. There is very little hardness in the raw water and customers have become accustomed to that lack of hardness.
10. There is a significant difference in performance of the current solid lime feed system on a small change in relative humidity within the room. The difficulty is in getting a screw conveyor to feed a precise and consistent amount of solid lime.
11. There is no CO₂ added to the RO permeate.
12. Staff operates the lime addition system to raise the pH to 8.1 which is the pH that the customers were accustomed to in the past.
13. Blended water going to the clearwell is approximately 7.2 pH.
14. Staff is not aware of the "problem with copper" that had been referenced in previous discussions on concentrate disposal.
15. The intended discharge location is approximately 1/4 mile from plant. The piping to this location was never completed.
16. Consideration needs to be given to extending the pipe into the Creek and installing a diffuser so that a mixing zone can be acquired for at least fluoride.
17. The concentrate and all wastewater from the site go into the same wet well and therefore if concentrate is sent elsewhere there may be the need to install some additional piping.
18. Concentrate flow is approximately 290,000 GPD or 200 GPM.
19. Regarding sending concentrate to the Smithfield packing plant, it is 4 to 5 miles away and those in the meeting did not believe the Smithfield has a need for water. Smithfield operates their own wells and water treatment system.
20. No one in the meeting is aware of what was referred to in earlier reports is a concentrator.
21. The H₂S reported as being in the system during the summer appears to be in the distribution piping and not at the plant. It seems to relate to dead ends and very low flow areas of the system. At this point it is a nonissue.
22. There are four elevated tanks in the system.
23. The cost of water to customers of this system is approximately \$5/1000 gal.
24. Data seen on the screen today during operation of the plant is as follows.
 - a. Stage I feedwater pressure 146 PSI
 - b. stage I permeate flow 576 GPM
 - c. stage II feedwater pressure 136 PSI
 - d. stage II permeate flow 203 GPM
 - e. stage 3 feet pressure 129 PSI
 - f. stage III permeate flow 12 GPM

- g. concentrate pressure 120 PSI
 - h. 80% recovery
25. A connection is needed for permeate return on each stage instead of on the overall permeate line.
 26. Scale inhibitor is delivered in 55 gallon drums and it is diluted to some amount in the day tank.
 27. A drain is needed from the chemical containment area and the floor needs to be raised in the chemical containment area.
 28. The rated capacity of the plant is 800 GPM.
 29. The plant operates in an automatic mode with no operator assistance needed.
 30. A concept on the piped in place cleaning system would be piping at the cleaning system and piping at the train with the connection on the floor being hose.
 31. Avista believes that the scaling is due to poor flow characteristics; i.e., concentration polarization.
 32. It would be good to know the hardness of the finished water.
 33. The plant has been producing drinking water for two years during which lead and copper testing has been conducted with no hits. This implies the water is not aggressive.
 34. There are no noted complaints of the soft water.
 35. The operators believe that the lime addition was for taste and odor.
 36. The wells are 1800 GPM, 250 hp.

Notes prepared by J Potts.

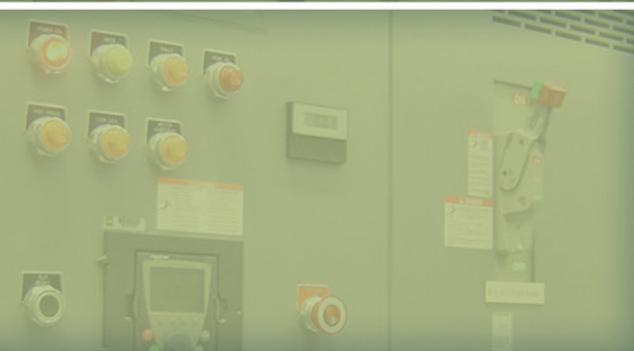
SMITHFIELD WTP NOTES
MARCH 20, 2013

1. The plant uses Avista Vitec 4000 scale inhibitor.
2. The plant is approximately 1 1/2 years old.
3. There have been no membranes replaced as of yet.
4. There are two wells, one was existing and one drilled for this project. Each well is capable of providing enough water for two trains.
5. The original concept was to discharge concentrate into a nearby creek. The presence of phosphorus prevented that from happening.
6. Concentrate currently goes to HRSD and the cost of approximately \$250,000 per year.
7. Smithfield very much would like to find a way of removing phosphorus and being able to go back into the Creek.
8. All of the waste from the plant site, including concentrate, goes into large pump station which then goes into the HRSD force main system.
9. In stage 3 there are now four elements per vessel.
10. The original basis for the plant was to remove fluoride and the Town was under a Consent Order to reduce fluoride.
11. The system uses free chlorine, not chloramines.
12. Ben Movahed and ITT are responsible for the membrane plant.
13. The current array of the train is 24:12:6:6 element.
14. Orifices have been placed in the permeate discharge of stages 1&2 to create artificial back pressure.
15. There is a belief at this plant that the pH of the concentrate significantly affects the solubility of silica in the concentrate.
16. Permeate goes to the clearwell.
17. Feed pressure is approximately 140 PSI.
18. There is an overall permeate back pressure valve on the line going from the train into the clearwell.
19. They have never cleaned stage 1.
20. Stage 2 has been cleaned about two times.
21. The membranes are Toray TM 720 400.
22. There are currently hoses for cleaning.
23. Plant staff would very much like to see a piped in place cleaning system to eliminate the hoses.
24. There is currently some amount of hydrogen sulfide believe present in the water during the summer. There is no method of removing hydrogen sulfide except for chlorination.
25. There should be a review of summer conditions to determine if hydrogen sulfide is present.
26. Calcium addition is performed by adding calcium slurry into the clearwell.
27. Staff would like a better method of adding hardness and alkalinity to the water.
28. There is approximately a 20% raw water blend. This is expressed as 800 gpm of RO and 240 gpm of blend.
29. Relocate scale inhibitor meter and add a flow alarm on the meter.

Prepared by John E Potts

Appendix II

Raw Water Quality Data





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 San Marcos, CA 92069
 Telephone: (760) 744-0536
 Fax: (760) 744-0619
 spiestch@avistatech.com
 www.avistatech.com

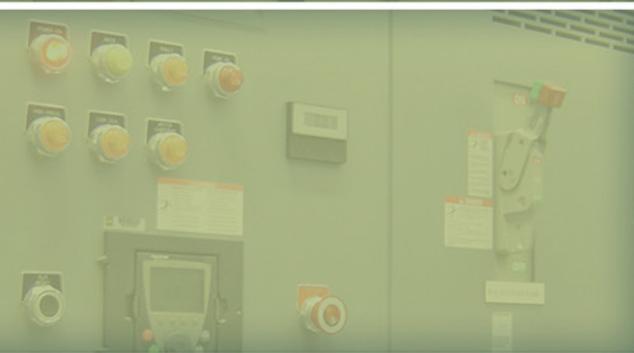
Water Analysis

Customer:	Smithfield	Date:	11/10/11
PO Number:	20871	WO #:	101711-2
Location:	Virginia	Sample ID:	RO feed

Parameter	As Ion (mg/L)	Detection Limit (mg/L)
Sodium (Na)	250	0.19
Potassium (K)	4.3	0.37
Calcium (Ca)	1.3	0.05
Magnesium (Mg)	0.41	0.012
Iron (Fe)	0.028	0.015
Manganese (Mn)	0.0028	0.00075
Barium (Ba)	0.026	0.0004
Strontium (Sr)	0.037	0.005
Aluminum (Al)	ND	0.006
Chloride (Cl)	84	0.25
Sulfate (SO ₄)	30	0.2
Bicarbonate (ppm)	488	2.0
Nitrate (NO ₃)	ND	0.25
Fluoride (F)	3.5	0.014
Silica (SiO ₂)	39	0.028
Phosphate (PO ₄)	1.4	0.4
pH	8.1	N/A

Appendix III

Avista Investigation Data



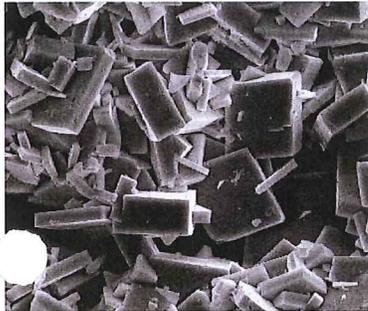
Foulant Analysis Report



Completed for:

Smithfield

Black Box SN# 1014
Feed - 3rd Stage



September 2013
WO#072413-4

USA:

Avista Technologies, Inc.

Phone: 760 744-0536

info@avistatech.com

United Kingdom:

Avista Technologies (UK) Ltd.

Phone: 44 (0) 131 4496677

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F O C U S E D S O L U T I O N S

SUMMARY

Two black boxes were placed on the RO system at Smithfield. Black box Serial Number (SN#) 1014 was positioned on the feed end of the third stage and was online for approximately eight weeks. At the end of the eight weeks, the black box was removed from the RO system and samples were harvested and analyzed to determine the extent of the fouling. Below is a list of findings.

- The normalized water passage for black box #1014 showed a slight increase in flow and slight improvement in rejection.
- Flat sheet samples harvested from the black box produced normal water passage and normal salt passage when compared to new Toray 720-400 flat sheet samples.
- Fourier Transform Infrared (FT-IR) spectroscopy analysis of the membrane surface identified bands associated with organic material (proteins and carbohydrates), a stronger band between 1100 and 900 cm^{-1} indicative of the presence of silica, and bands attributed by the membrane material itself.
- Scanning Electron Microscope (SEM) images revealed isolated patches of foulant material across the membrane surface. Granular and smooth foulant deposits were observed within these isolated patches. The smooth textured foulant is indicative of a high organic content. Some portions of the membrane surface were also virtually free of foulant material. Close up SEM (12000x) imaging of the granular foulant deposits revealed an underlying layer of smooth textured foulant material.
- Energy Dispersive X-ray (EDX) analysis determined that silica, aluminum and iron were more prevalent in the granular foulant deposits while only trace amounts of silicon and aluminum were identified in the smooth foulant deposits.
- Chromatic Elemental Imaging (CEI) of the granular material displayed a combination of clay (aluminum silicates), excess silica and iron oxide within the granular foulant deposits. The membrane material itself, represented by alternating carbon and sulfur, was visible in regions lacking foulant material.
- Based on the normal water passage observed during the initial flat sheet cell testing it was determined that cleaning was not required at this time.

Wet Test

The black box was wet tested before and after the duration it was online at Smithfield. Below are the pre and post test data results.

Toray TM720-400 SN#1014	Water Passage Constant "A" Value	Rejection
Pre Test	7.16E-05	97.3%
Post Test	7.82E-05	98.2%

Testing conducted on 2000 ppm NaCl solution at 150 psi

Flat Sheet Cell Testing

Flat sheet samples are harvested from the full element and compared to a baseline average of new Toray TM720-400 flat sheet samples. The table below shows baseline performance data.

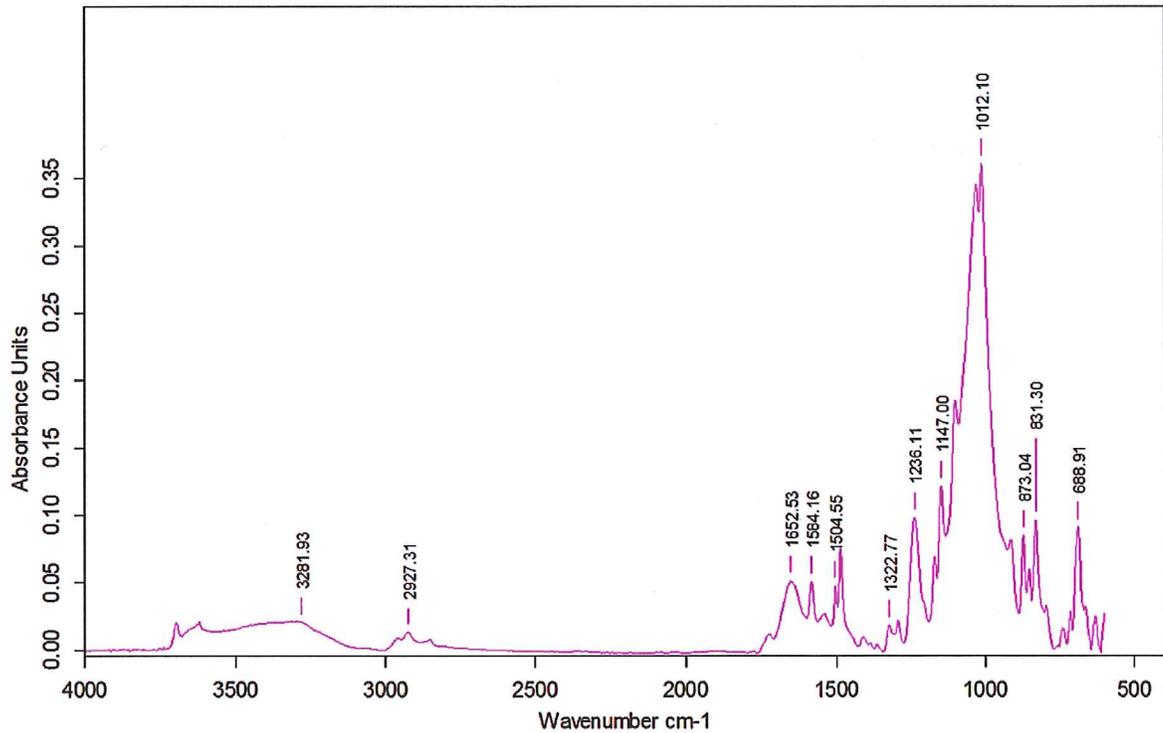
Toray TM720-400 SN#1014	Water Passage Constant "A" Value	Salt Passage Constant "B" Value
Flat Sheet Baseline	8.14E-05 Normal	5.81E-06 Normal
Average Toray TM720-400 Flat Sheets	5.92 to 8.53 E-05 Normal Range*	2.77 to 6.58E-06 Normal Range*

*Normal Range determined experimentally with ten new TM720-400 flat sheets. Flat sheet samples were tested on 2000 ppm NaCl solution.

Fourier Transform Infrared Spectroscopy Analysis

Fourier Transform Infrared Spectroscopy (FT-IR) analysis identifies the functional groups of organic and inorganic foulant constituents. FT-IR is a measurement technique whereby spectra are collected based on measurements of the temporal coherence of a radiative source, using time-domain measurements of the electromagnetic radiation or other type of radiation.

FT-IR spectrum of the membrane surface of SN#1014 identified bands associated with organic material, proteins and carbohydrates, a strong band between 1100 and 900 cm^{-1} indicating the presence of silica and several bands attributed to the membrane material itself.



FT-IR spectral image of foulant on the membrane surface

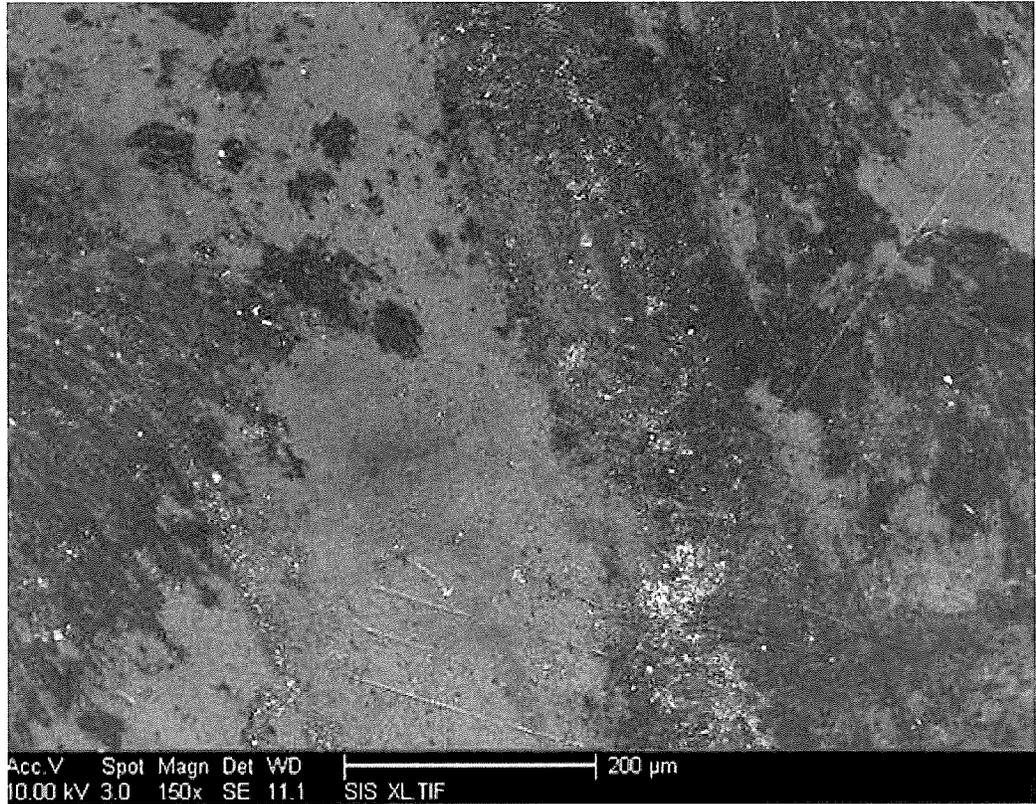
Peaks	Yes	No	Weak
C-H			X
C-N	X		
N-H	X		
C-C	X		
C=C	X		
H-C-OH	X		
N-H-C=O	X		
N-C=O	X		
C-O-C	X		
Si-O	X		

Testing to Identify Inorganic Foulant Constituents

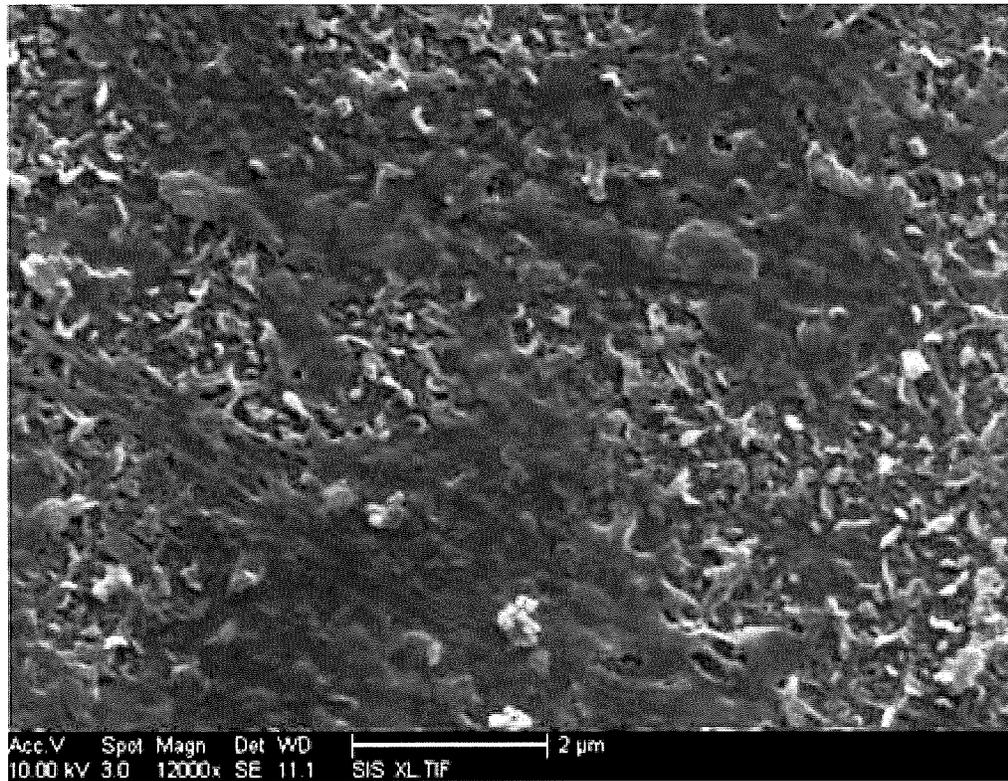
Energy Dispersive X-ray (EDX) analysis is conducted in conjunction with scanning electron microscopy (SEM) to identify inorganic foulant constituents. The electron beam in the microscope causes specimens to emit x-rays including those from the k, l and m atomic shells. Spectrometer counts of these x-rays, which are said to be "characteristic" of the elements present in the specimen, can be used to calculate composition for a full qualitative analysis.

Elements (wt. %)	Membrane Surface (Magnification 150x)	Close up Smooth Deposits (Magnification 12000x)	Close up Granular Deposits (Magnification 1500x)
Carbon	66.81	64.66	58.61
Oxygen	25.86	29.03	31.62
Sulfur	5.90	6.16	5.89
Silicon	0.87	0.11	2.39
Aluminum	0.30	0.04	0.82
Iron	0.26	ND*	0.67

*ND-Below detection limit



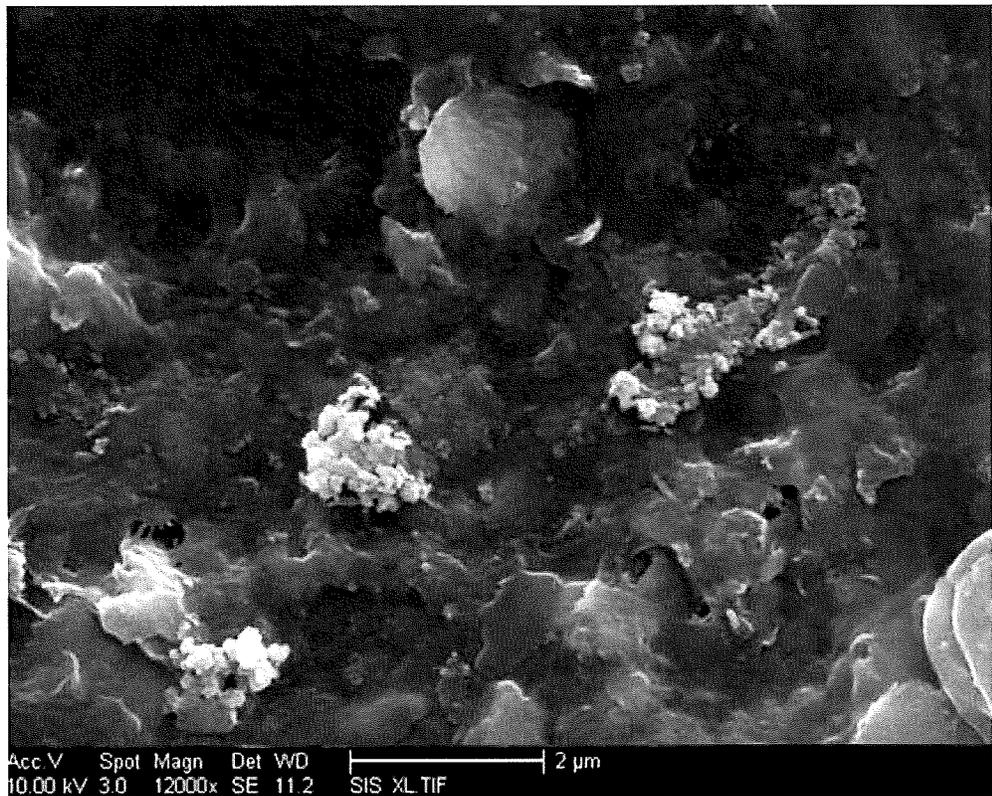
SEM image (150x) of the membrane surface



Close up SEM image (12000x) of the smooth deposits on the membrane surface



Close up SEM image (1500x) of the granular material on the membrane surface



Close up SEM (12000x) of the granular foulant

Chromatic Elemental Imaging (CEI):

Chromatic Elemental Imaging (CEI) is an analytical technique used to resolve the spatial distribution of elements in a foulant sample. In this technique, a beam of focused electrons is accelerated across the surface of a foulant sample and interacts with the sample's inorganic elements by causing the elements to emit electrons. Since each element has its own unique atomic shell, a particular element's electron emission from its atomic shell generates a characteristic X-ray spectrum that allows for its identification. CEI assigns each element a color and provides a high resolution image of their exact location in a sample. An element's color intensity in a Chromatic Elemental Image is largely influenced by its concentration in the foulant sample; elements present in a higher percentage will be colorized with greater intensity in the image. CEI can uniquely identify the distinct elements in a mixed foulant sample containing a number of inorganic deposits. This technique also reveals the location and concentration of different elements relative to each other in a sample.



CEI image (1500x) of the membrane surface of SN# 1014

Testing Comments and Interpretation

Scanning Electron Microscope (SEM) images revealed isolated patches of foulant material across the membrane surface (150x). Granular and smooth foulant deposits were observed within these isolated patches. The smooth textured foulant is indicative of a high organic content. Some portions of the membrane surface were also virtually free of foulant material. Close up SEM (12000x) imaging of the granular foulant deposits revealed an underlying layer of smooth textured foulant material.

Energy Dispersive X-ray (EDX) analysis determined that silicon, aluminum and iron were more prevalent in the granular foulant while only trace amounts of silicon and aluminum were identified in the smooth foulant deposits.

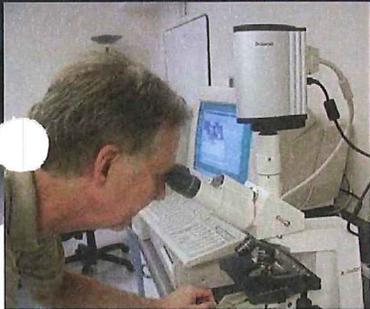
Chromatic Elemental Imaging (CEI) of the granular material displayed a combination of clay (aluminum silicates), excess silica and iron oxide within the granular foulant deposits. The membrane material itself, represented by alternating carbon and sulfur, was visible in regions lacking foulant material or where the foulant material was relatively thin.

Cleaning Study Results:

Flat sheet membrane samples harvested from the full element are placed in a cell test apparatus and cleaned with various Avista chemicals to determine the most effective cleaner combinations and the amount of time required for an effective cleaning.

Based on the normal flow produced by the flat sheet samples during the initial cell testing it was determined that cleaning was not required at this time.

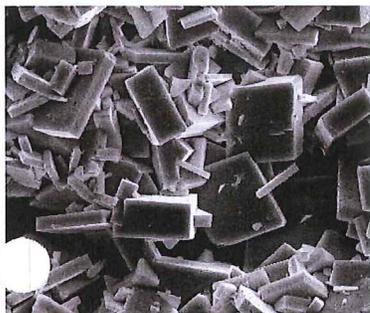
Foulant Analysis Report



Completed for:

Smithfield

Black Box SN# 1013
Concentrate-3rd Stage



September 2013
WO#072413-4

USA:

Avista Technologies, Inc.

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Avista Technologies (UK) Ltd.

Phone: 44 (0) 131 4496677

info@avistatech.co.uk



F O C U S E D S O L U T I O N S

SUMMARY

Two black boxes were placed on the RO system at Smithfield. Black box Serial Number (SN#) 1013 was positioned on the concentrate end of the third stage and was online for approximately six weeks. At the end of the six weeks, the black box was removed from the RO system and samples were harvested and analyzed to determine the extent of the fouling. Below is a list of findings.

- The normalized water passage for black box #1013 showed a slight increase in flow and slight improvement in rejection.
- Flat sheet samples harvested from the black box produced normal water passage and normal salt passage in comparison to new Toray TM720-400 flat sheet samples.
- Fourier Transform Infrared (FT-IR) spectroscopy analysis of the membrane surface identified bands associated with organic material (predominantly carbohydrates), a stronger band between 1100 and 900 cm^{-1} indicative of the presence of silica, and bands attributed by the membrane material itself.
- Scanning Electron Microscope (SEM) images of the membrane surface showed that the foulant material was unevenly distributed. Isolated patches of smooth and granular material were detected across the membrane surface and some areas of the membrane surface contained no foulant material at all. The smooth texture of the foulant is indicative of organic material. Close up SEM imaging (24000x) of the granular patches determined that they were composed of both smooth and granular foulant.
- Energy Dispersive X-ray (EDX) analysis of the granular and smooth patches of foulant determined that silicon, aluminum and iron were present in the granular patches and only trace amounts of silicon were present in the isolated smooth patches.
- Chromatic Elemental Imaging (CEI) of the granular patches identified silica, clay (aluminum silicates) and iron oxides within the patches. The membrane material itself, represented by carbon and sulfur, was visible in regions lacking foulant material.
- Cleaning was not required at this time as flat sheet samples harvested from the black box produced normal water passage upon baseline cell testing.

Wet Test

The black box was wet tested before and after the duration it was online at Smithfield. Below are the pre and post test data results.

Toray TM720-400 SN#1013	Water Passage Constant "A" Value	Rejection
Pre Test	6.26E-05	97.6%
Post Test	7.00E-05	97.9%

Testing conducted on 2000 ppm NaCl solution at 150 psi

Flat Sheet Cell Testing

Flat sheet samples are harvested from the full element and compared to a baseline average of new Toray TM720-400 flat sheet samples. The table below shows baseline performance data.

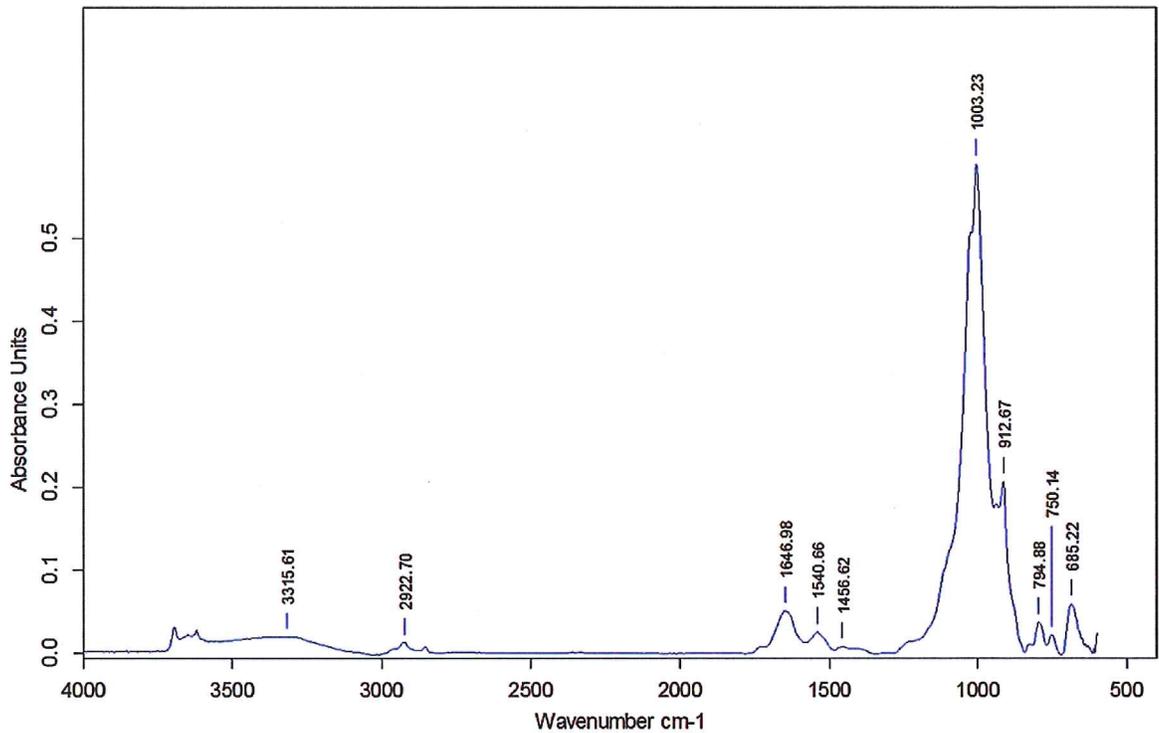
Toray TM720-400 SN#1013	Water Passage Constant "A" Value	Salt Passage Constant "B" Value
Flat Sheet Baseline	8.05E-05 Normal	3.17E-06 Normal
Average Toray TM720-400 Flat Sheets	5.92 to 8.53 E-05 Normal Range*	2.77 to 6.58E-06 Normal Range*

*Normal Range determined experimentally with ten new TM720-400 flat sheets. Flat sheet samples were tested on 2000 ppm NaCl solution.

Fourier Transform Infrared Spectroscopy Analysis

Fourier Transform Infrared Spectroscopy (FT-IR) analysis identifies the functional groups of organic and inorganic foulant constituents. FT-IR is a measurement technique whereby spectra are collected based on measurements of the temporal coherence of a radiative source, using time-domain measurements of the electromagnetic radiation or other type of radiation.

FT-IR spectrum of the membrane surface of SN#1013 located bands associated with organic material, primarily carbohydrates, a stronger band between 1100 and 900 cm^{-1} indicating the presence of silica and several bands attributed to the membrane material itself.



FT-IR spectral image of foulant on the membrane surface

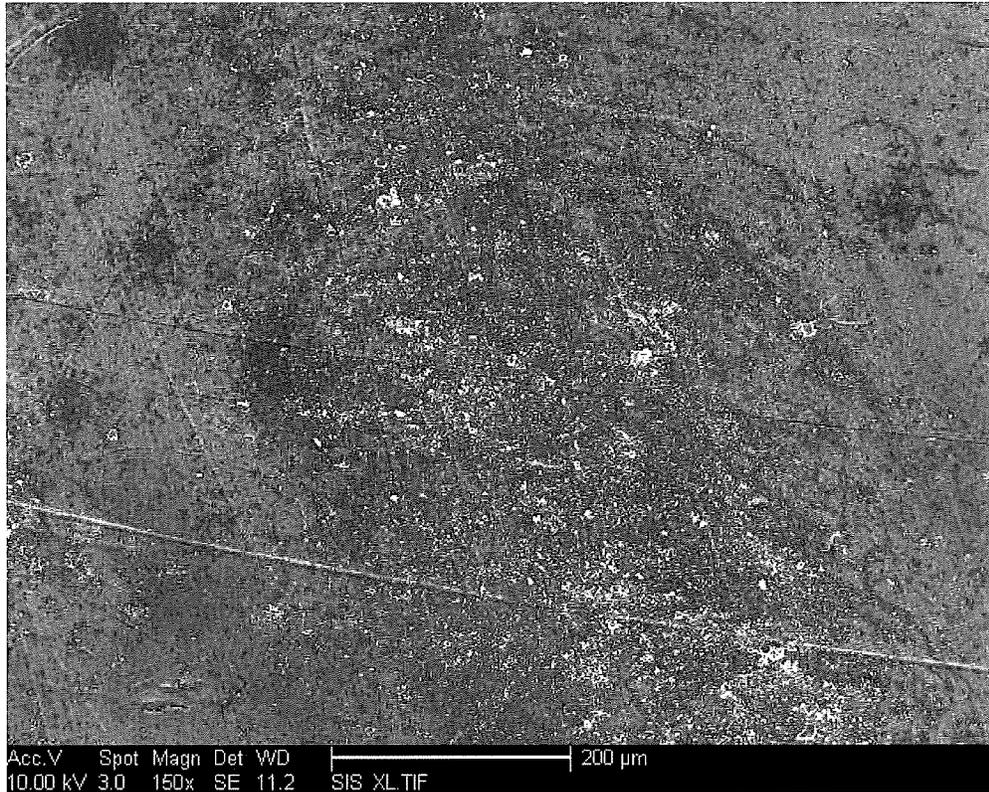
Peaks	Yes	No	Weak
C-H			X
C-N			X
N-H	X		
C-C	X		
C=C	X		
H-C-OH	X		
N-H-C=O			X
N-C=O	X		
C-O-C	X		
Si-O	X		

Testing to Identify Inorganic Foulant Constituents

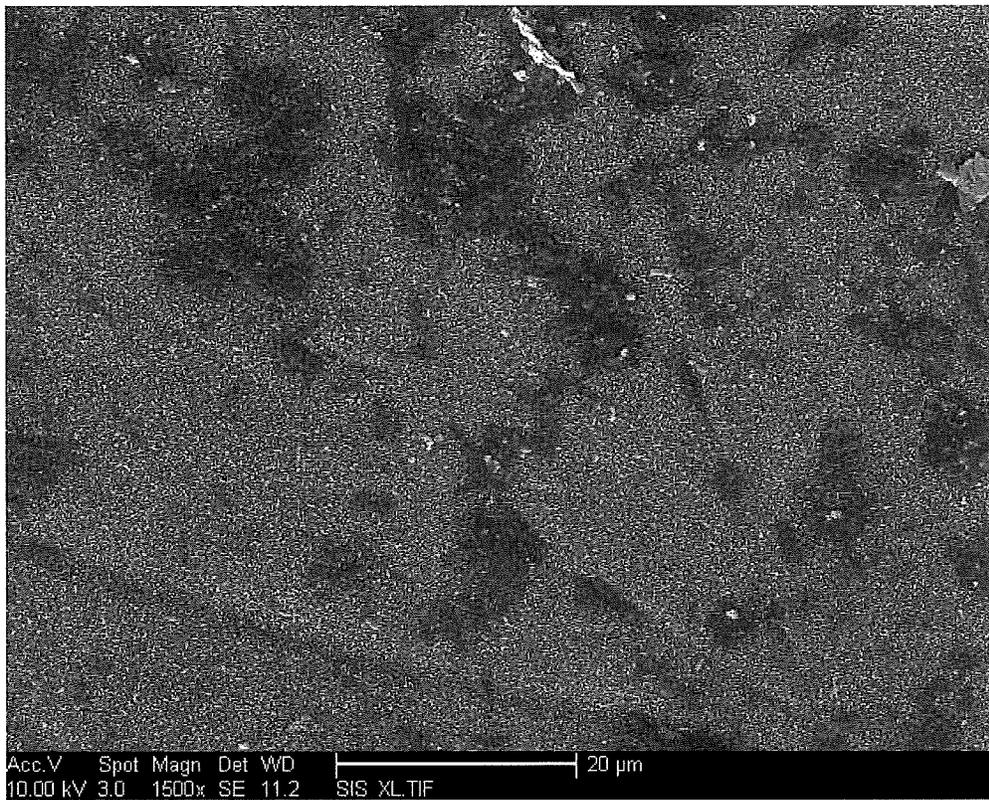
Energy Dispersive X-ray (EDX) analysis is conducted in conjunction with scanning electron microscopy (SEM) to identify inorganic foulant constituents. The electron beam in the microscope causes specimens to emit x-rays including those from the k, l and m atomic shells. Spectrometer counts of these x-rays, which are said to be "characteristic" of the elements present in the specimen, can be used to calculate composition for a full qualitative analysis.

Elements (wt. %)	Membrane Surface (Magnification 150x)	Close up of Smooth Deposits (Magnification 1500x)	Close up of Granular Deposits (Magnification 1500x)
Carbon	62.52	66.41	46.89
Oxygen	29.55	26.41	39.16
Sulfur	6.15	6.70	3.95
Silicon	1.44	0.48	7.09
Aluminum	ND*	ND*	2.06
Iron	0.34	ND*	0.85

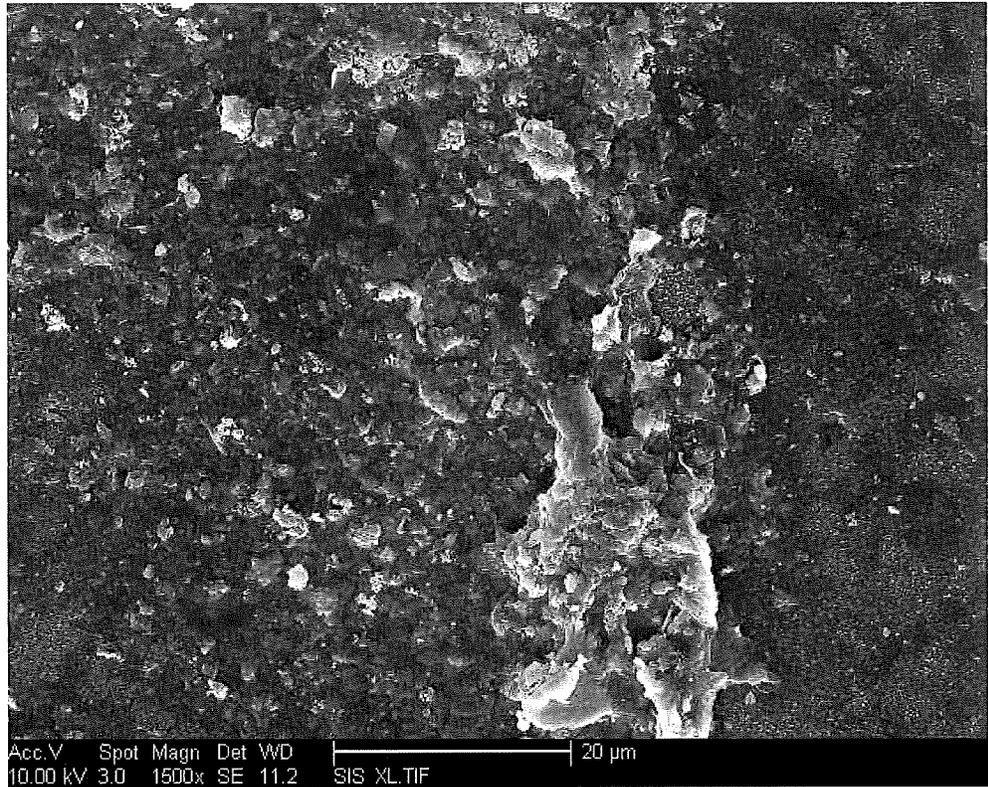
*ND-Below detection limit



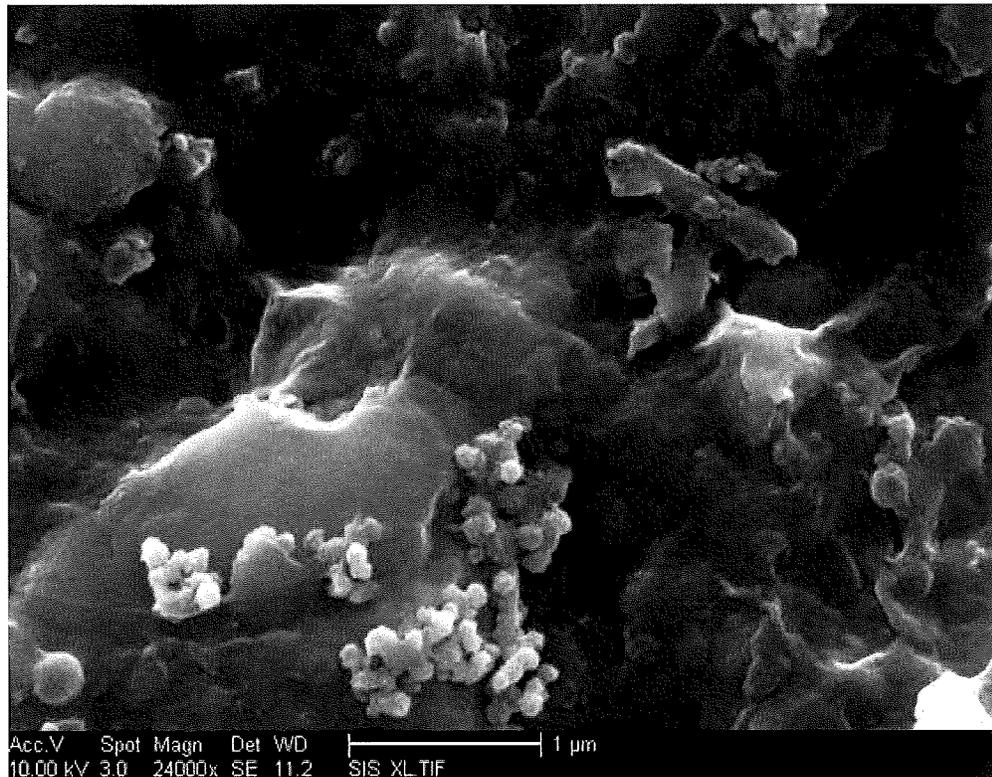
SEM image (150x) of the membrane surface



Close up SEM image (1500x) of the smooth deposits on the membrane surface



Close up SEM image (1500x) of the granular material on the membrane surface



Close up SEM (24000x) of the granular foulant

Chromatic Elemental Imaging (CEI):

Chromatic Elemental Imaging (CEI) is an analytical technique used to resolve the spatial distribution of elements in a foulant sample. In this technique, a beam of focused electrons is accelerated across the surface of a foulant sample and interacts with the sample's inorganic elements by causing the elements to emit electrons. Since each element has its own unique atomic shell, a particular element's electron emission from its atomic shell generates a characteristic X-ray spectrum that allows for its identification. CEI assigns each element a color and provides a high resolution image of their exact location in a sample. An element's color intensity in a Chromatic Elemental Image is largely influenced by its concentration in the foulant sample; elements present in a higher percentage will be identified with greater intensity in the image. CEI can uniquely identify the distinct elements in a mixed foulant sample containing a number of inorganic deposits. This technique also reveals the location and concentration of different elements relative to each other in a sample.



CEI image (1500x) of the granular foulant

Testing Comments and Interpretation

SEM images of the membrane surface showed that the foulant material was unevenly distributed. Isolated patches of smooth and granular material were detected across the membrane surface and some areas of the membrane surface contained virtually no foulant material. The smooth textured foulant is indicative of organic content. Close up SEM imaging (24000x) of the granular patches determined that they were composed of both smooth and granular foulant.

Energy Dispersive X-ray (EDX) analysis of the granular and smooth patches of foulant determined that silicon, aluminum and iron were located predominantly in the granular patches rather than the smooth patches. Only trace amounts of silicon were detected in the smooth patches of foulant.

Chromatic Elemental Imaging (CEI) of the granular patches identified silica, clay (aluminum silicates) and iron oxides within the patches. The membrane material itself, represented by carbon and sulfur, was visible in regions lacking foulant material.

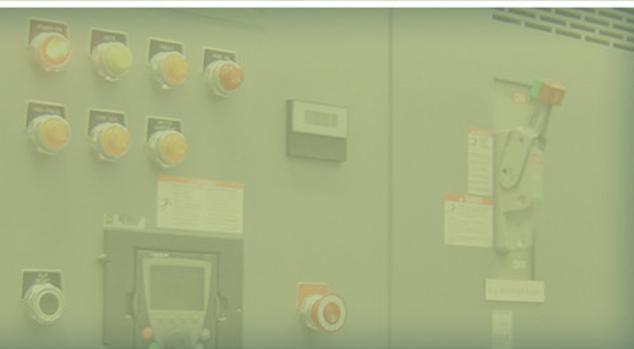
Cleaning Study Results:

Flat sheet membrane samples harvested from the full element are placed in a cell test apparatus and cleaned with various Avista chemicals to determine the most effective cleaner combinations and the amount of time required for an effective cleaning.

Due to the lack of visual foulant material on the membrane surface and the flat sheet baseline results (normal water passage) a cleaning was not required at this time.

Appendix IV

Toray Projection Results





System Overview Report

Project	95:Smithfield Report	
Case	1	2 stage and 3 stage
Revision	0	2 stage 80 % 0 years
Feed Water Type	Brackish Well	
Warnings and Errors	Warnings:2, Errors:0. See Important Notes at end /E	
Database Info :	Project Database : C:\Users\john.potts\Documents\TorayDS2 App_Data\DS2.sdf Membrane Database (V.20105) :C:\Users\john.potts\Documents\TorayDS2 App_Data\TorayMembrane.sdf.	

		Overall	Pass 1
Raw water TDS	mg/l	907.7	907.7
Feed EC @77F / @68.00F	uS	1,076.8 / 954	1,076.8 / 954
Feed Pressure	psi	0.0	156.0
Temperature	deg F	68.00	
Total DP	psi	16.297	16.297
Brine Pressure	psi	139.7	139.7
Fouling Max	0.00 yrs		0.955
SP % Increase (Max)	0.00 yrs		0.00%
Recovery	%	79.99%	80.0%
Feed Flow	gal/min	1,000	1,000
Product Flow	gal/min	799.9	799.9
Average Flux	gfd	13.279	13.279
Concentrate Flow	gal/min	200.1	200.1
Product TDS	mg/l	8.003	8.003
Concentrate TDS	mg/l	4,513	4,513
Primary HP Pump kW	kilowatt	84.85	84.85
Power Consumption	kWh/m ³	0.467	0.467

Ions		Feed	Net Feed	Conc	Product
Ca	mg/l	1.300	1.300	6.472	0.0064
Mg	mg/l	0.400	0.400	1.991	0.002
Na	mg/l	253.8	253.8	1,260	1.989
K	mg/l	4.300	4.300	21.23	0.0651
Ba	mg/l	0.03	0.03	0.149	0.0001
Sr	mg/l	0.04	0.04	0.199	0.0002
NH4	mg/l	0.0	0.0	0.0	0.0
Fe	mg/l	0.03	0.03	0.150	0.0
HCO3	mg/l	488.0	488.0	2,421	4.738
CO3	mg/l	0.310	0.310	8.471	3.01E-05
CO2	mg/l	78.24	78.24	77.33	77.48
Cl	mg/l	84.66	84.66	420.6	0.633

SO4	mg/l	30.00	30.00	149.6	0.0898
NO3	mg/l	0.0	0.0	0.0	0.0
F	mg/l	3.500	3.500	17.314	0.0446
Br	mg/l	0.0	0.0	0.0	0.0
PO4	mg/l	1.400	1.400	6.989	0.0021
SiO2	mg/l	40.00	40.00	198.2	0.433
B(Boron)	mg/l	0.0	0.0	0.0	0.0
TDS	mg/l	907.7	907.7	4,513	8.003
Feed EC @77F / @68.00F	uS	1,077 / 954	1,077 / 954	4,814 / 4,275	15.2 / 12.9
pH	pH	7.000	7.000	7.655	5.118
Osmotic Press (DS1 / Pitzer)	psi	7.700 / 8.03	7.700 / 8.03	37.689 / 36.27	0.060 / 0.55
LSI / SDSI		-1.75 / -1.82	-1.75 / -1.82	0.10 / 0.03	-7.88 / -8.11
CaSO4 / SrSO4 %	%	0.0% / 0.0%	0.0% / 0.0%	0.1% / 0.2%	0.0% / 0.0%
BaSO4 / SiO2 %	%	29.2% / 43.5%	29.2% / 43.5%	273.5% / 172.3%	
Pitzer % Solubility	Calcite/Dolomite	1% / 0%	1% / 0%	65% / 75%	
Pitzer % Solubility	CaSO4/SrSO4	0% / 0%	0% / 0%	0% / 0%	

Stage/Bank Data	Pass1	Stage 1	Stage 2
Lead Element Type		TM720-400	TM720-400
Last Element Type		TM720-400	TM720-400
Total Elements	216	144	72
Total Vessels	36	24	12
Elements per Vessel		6	6
Feed Flow	gal/min	1,000	432.0
Product Flow	gal/min	568.0	232.0
Average Flux	gfd	14.142	11.552
Brine Flow	gal/min	432.0	200.1
Recovery %	%	56.80 %	53.69 %
Feed Pressure	psi	156.0	147.2
dP Elements	psi	8.823	7.474
Boost Pressure	psi	0.0	0.0
Piping Loss	psi	0.0	0.0
Net (Boost - dP piping)	psi	0.0	0.0
Brine Pressure	psi	147.2	139.7
Permeate Pressure	psi	5.000	5.000
Feed TDS	mg/l	907.7	2,098
Perm TDS	mg/l	5.276	14.681
Lead Element	Pass1	Stage 1	Stage 2
Feed Flow	gal/min	41.67	36.00
Product Flow	gal/min	4.188	3.577
Product TDS	mg/l	3.734	8.994
Flux	gfd	15.016	12.826
Last Element	Pass1	Stage 1	Stage 2
Product Flow	gal/min	3.670	2.804

Product TDS	mg/l	7.834	24.40
Brine/Product Ratio	ratio	4.905	5.946
Brine Flow	gal/min	18.002	16.674
Net Driving Pressure	psi	122.8	93.70
Beta		1.199	1.158

Chemicals 100%. Disclaimer: These estimated dose rates are provided as a courtesy to Toray DS2 users and are not guaranteed.

No Chemicals Added

Warnings

1. Conc Stiff Davis Index = 0.03 Warning - the Stiff Davis Index (SDSI) is greater than 0. Scale inhibitor required.
2. Conc SiO2 % Sat'n = 172.33 Warning - concentrate silica exceeds saturation.

Errors

Disclaimer :

The program is intended to be used by persons having technical skill, at their own discretion and risk. The projections, obtained with the program, are the expected system performance, based on the average, nominal element performance and are not automatically guaranteed.

Toray shall not be liable for any error or miscalculation in the program.

The obtained results cannot be used to raise any claim for liability or warranty.

It is the users responsibility to make provisions against fouling, scaling and chemical attacks, to account for piping and valve pressure losses, feed pump suction pressure and permeate backpressure. For questions please contact us:

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Toray Asia Pte. Ltd. / TEL +65-6725-6450 FAX +65-6725-6363
 27F Prudential Tower, 30 Cecil Street, Singapore 049712

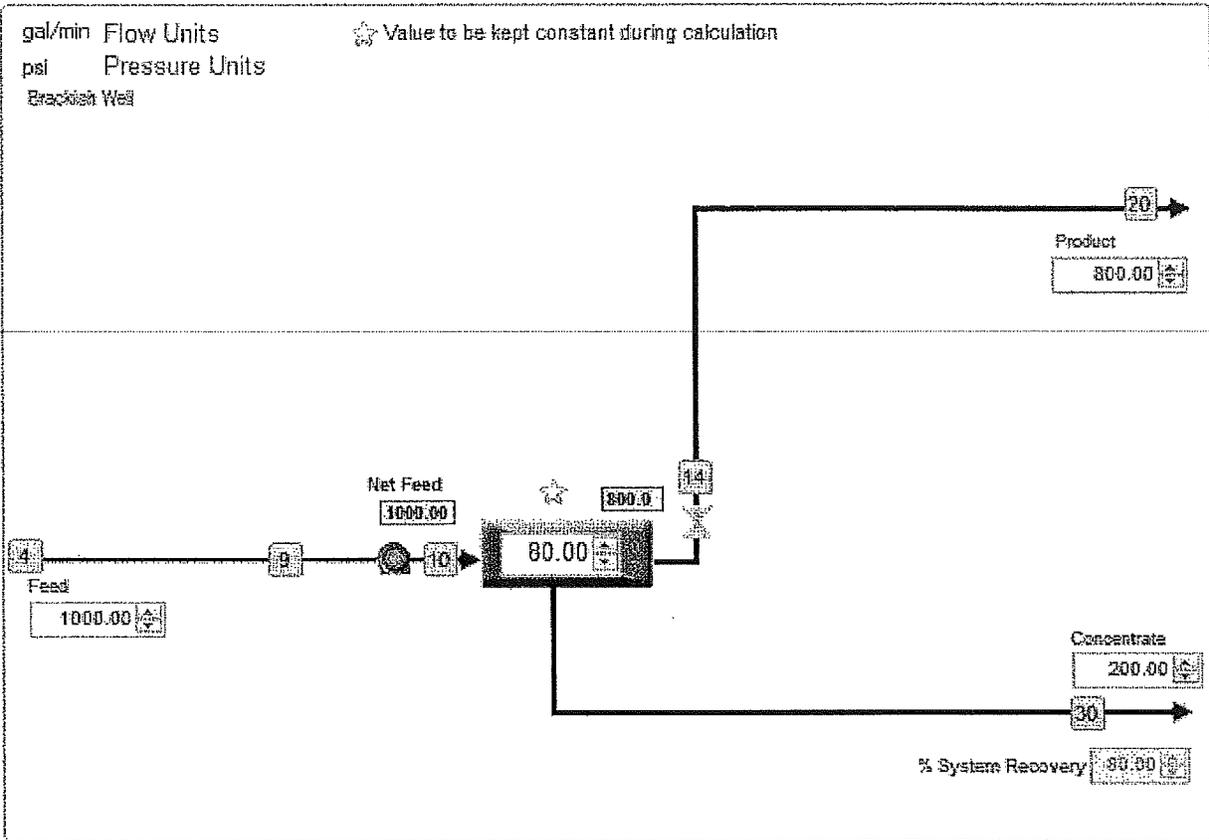
Toray Bluestar Membrane Co., Ltd. /Tel +86-10-80485216 Fax +86-10-80485217
 Zone B, Tianzhu Airport Industrial Zone, Beijing 101318, China

<http://www.toraywater.com/>

Date/Time :	12/23/2013 12:23:17 PM
Project	95:Smithfield Report
Case :	1:2 stage and 3 stage
Revision :	0:2 stage 80 % 0 years
User name :	KIMLEY-HORN\john.potts
Prepared for :	Report

Notes :	Various
Membrane Database	
Version Number:	20105
ReleaseDate:	12/9/2011 3:50:00 PM
UpdateBy:	P Metcalfe, T Kurai, T Wolfe
Toray DS2 version :	2.0.1.28

Flow Diagram:





System Overview Report

Project	95:Smithfield Report		
Case	1	2 stage and 3 stage	
Revision	1	2 stage 84 % 3 years	
Feed Water Type	Brackish Well		
Warnings and Errors	Warnings:2, Errors:0. See Important Notes at end /E		
Database Info :	Project Database : C:\Users\john.potts\Documents\TorayDS2 App_Data\DS2.sdf Membrane Database (V.20105) :C:\Users\john.potts\Documents\TorayDS2 App_Data\TorayMembrane.sdf.		

		Overall	Pass 1		
Raw water TDS	mg/l	908.4	908.4		
Feed EC @77F / @68.00F	uS	1,077.8 / 955	1,077.8 / 955		
Feed Pressure	psi	0.0	164.5		
Temperature	deg F	68.00			
Total DP	psi	14.948	14.948		
Brine Pressure	psi	149.5	149.5		
Fouling Max	3.00 yrs		0.955		
SP % Increase (Max)	3.00 yrs		33.10%		
Recovery	%	83.99%	84.0%		
Feed Flow	gal/min	1,000	1,000		
Product Flow	gal/min	839.9	839.9		
Average Flux	gfd	13.942	13.942		
Concentrate Flow	gal/min	160.1	160.1		
Product TDS	mg/l	11.371	11.371		
Concentrate TDS	mg/l	5,624	5,624		
Primary HP Pump kW	kilowatt	89.46	89.46		
Power Consumption	kWh/m ³	0.469	0.469		
Ions		Feed	Net Feed	Conc	Product
Ca	mg/l	1.300	1.300	8.069	0.0095
Mg	mg/l	0.400	0.400	2.483	0.0029
Na	mg/l	254.0	254.0	1,571	2.951
K	mg/l	4.300	4.300	26.35	0.0963
Ba	mg/l	0.03	0.03	0.186	0.0002
Sr	mg/l	0.04	0.04	0.248	0.0003
NH4	mg/l	0.0	0.0	0.0	0.0
Fe	mg/l	0.03	0.03	0.187	0.0
HCO3	mg/l	488.0	488.0	3,013	6.549
CO3	mg/l	0.311	0.311	13.359	6.92E-05
CO2	mg/l	78.24	78.24	78.63	77.06
Cl	mg/l	85.02	85.02	526.1	0.941

SO4	mg/l	30.00	30.00	186.7	0.133
NO3	mg/l	0.0	0.0	0.0	0.0
F	mg/l	3.500	3.500	21.51	0.066
Br	mg/l	0.0	0.0	0.0	0.0
PO4	mg/l	1.400	1.400	8.727	0.0031
SiO2	mg/l	40.00	40.00	246.6	0.618
B(Boron)	mg/l	0.0	0.0	0.0	0.0
TDS	mg/l	908.4	908.4	5,624	11.371
Feed EC @77F / @68.00F	uS	1,078 / 955	1,078 / 955	5,947 / 5,282	19.5 / 16.9
pH	pH	7.000	7.000	7.735	5.253
Osmotic Press (DS1 / Pitzer)	psi	7.707 / 8.04	7.707 / 8.04	46.846 / 44.78	0.087 / 0.58
LSI / SDSI		-1.75 / -1.82	-1.75 / -1.82	0.34 / 0.25	-7.40 / -7.63
CaSO4 / SrSO4 %	%	0.0% / 0.0%	0.0% / 0.0%	0.2% / 0.3%	0.0% / 0.0%
BaSO4 / SiO2 %	%	29.2% / 43.5%	29.2% / 43.5%	356.8% / 214.4%	
Pitzer % Solubility	Calcite/Dolomite	1% / 0%	1% / 0%	112% / 215%	
Pitzer % Solubility	CaSO4/SrSO4	0% / 0%	0% / 0%	0% / 0%	

Stage/Bank Data	Pass1	Stage 1	Stage 2
Lead Element Type		TM720-400	TM720-400
Last Element Type		TM720-400	TM720-400
Total Elements	216	144	72
Total Vessels	36	24	12
Elements per Vessel		6	6
Feed Flow	gal/min	1,000	399.8
Product Flow	gal/min	600.2	239.7
Average Flux	gfd	14.944	11.937
Brine Flow	gal/min	399.8	160.1
Recovery %	%	60.02 %	59.95 %
Feed Pressure	psi	164.5	155.9
dP Elements	psi	8.574	6.374
Boost Pressure	psi	0.0	0.0
Piping Loss	psi	0.0	0.0
Net (Boost - dP piping)	psi	0.0	0.0
Brine Pressure	psi	155.9	149.5
Permeate Pressure	psi	5.000	5.000
Feed TDS	mg/l	908.4	2,268
Perm TDS	mg/l	6.687	23.10
Lead Element	Pass1	Stage 1	Stage 2
Feed Flow	gal/min	41.67	33.32
Product Flow	gal/min	4.425	3.763
Product TDS	mg/l	4.402	12.618
Flux	gfd	15.866	13.494
Last Element	Pass1	Stage 1	Stage 2
Product Flow	gal/min	3.868	2.784

Product TDS	mg/l	10.666	42.92
Brine/Product Ratio	ratio	4.308	4.792
Brine Flow	gal/min	16.659	13.343
Net Driving Pressure	psi	129.8	93.37
Beta		1.221	1.180

Chemicals 100%. Disclaimer: These estimated dose rates are provided as a courtesy to Toray DS2 users and are not guaranteed.

No Chemicals Added

Warnings

1. Conc Stiff Davis Index = 0.25 Warning - the Stiff Davis Index (SDSI) is greater than 0. Scale inhibitor required.
2. Conc SiO₂ % Sat'n = 214.41 Warning - concentrate silica exceeds saturation.

Errors

Disclaimer :

The program is intended to be used by persons having technical skill, at their own discretion and risk. The projections, obtained with the program, are the expected system performance, based on the average, nominal element performance and are not automatically guaranteed.

Toray shall not be liable for any error or miscalculation in the program.

The obtained results cannot be used to raise any claim for liability or warranty.

It is the users responsibility to make provisions against fouling, scaling and chemical attacks, to account for piping and valve pressure losses, feed pump suction pressure and permeate backpressure. For questions please contact us:

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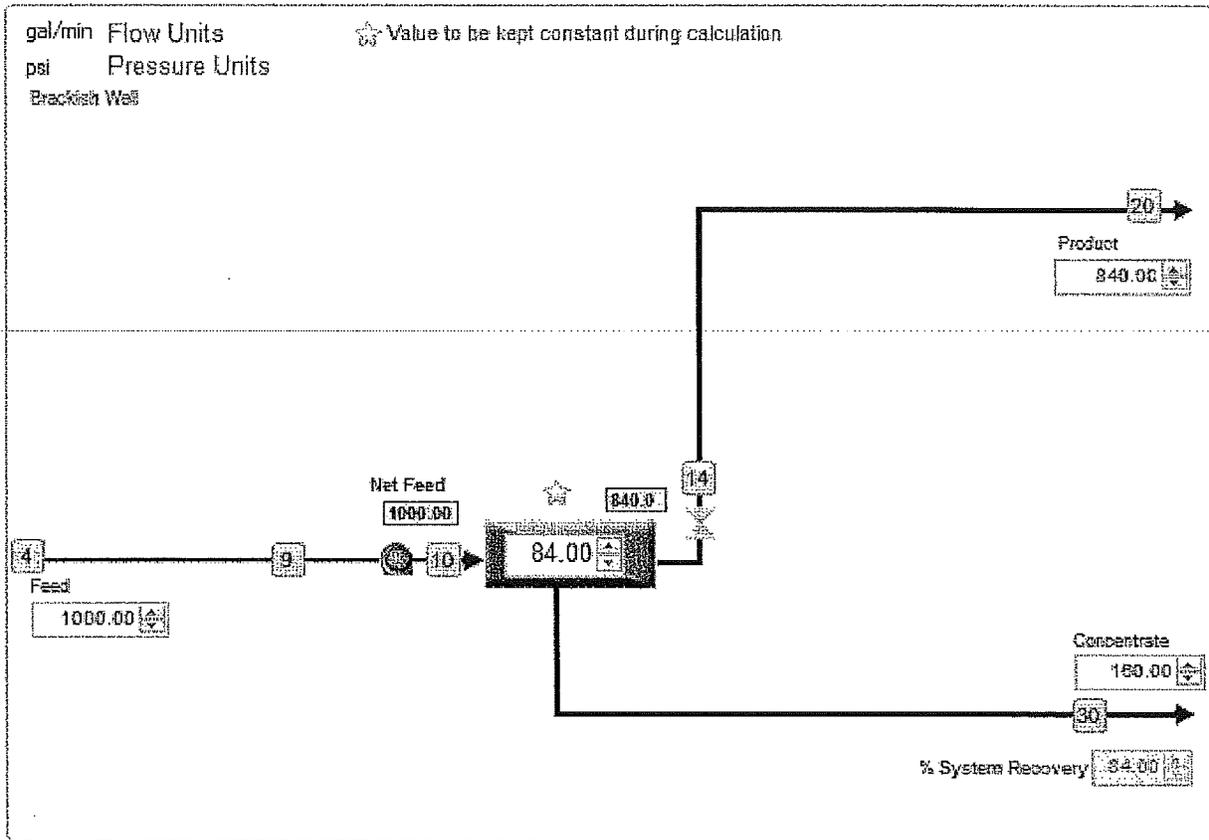
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Zone B, Tianzhu Airport Industrial Zone, Beijing 101318, China

<http://www.toraywater.com/>

Date/Time :	12/23/2013 12:41:09 PM
Project	95:Smithfield Report
Case :	1:2 stage and 3 stage
Revision :	1:2 stage 84 % 3 years
User name :	KIMLEY-HORN\john.potts
Prepared for :	Report

Notes :	Various
Membrane Database	
Version Number:	20105
ReleaseDate:	12/9/2011 3:50:00 PM
UpdateBy:	P Metcalfe, T Kurai, T Wolfe
Toray DS2 version :	2.0.1.28

Flow Diagram:





System Overview Report

Project	95:Smithfield Report	
Case	1	2 stage and 3 stage
Revision	0	2 stage 80 % 0 years
Feed Water Type	Brackish Well	
Warnings and Errors	Warnings:2, Errors:0. See Important Notes at end /E	
Database Info :	Project Database : C:\Users\john.potts\Documents\TorayDS2 App_Data\DS2.sdf Membrane Database (V.20105) :C:\Users\john.potts\Documents\TorayDS2 App_Data\TorayMembrane.sdf.	

		Overall	Pass 1		
Raw water TDS	mg/l	907.7	907.7		
Feed EC @77F / @68.00F	uS	1,076.8 / 954	1,076.8 / 954		
Feed Pressure	psi	0.0	139.7		
Temperature	deg F	68.00			
Total DP	psi	32.00	32.00		
Brine Pressure	psi	107.7	107.7		
Fouling Max	0.00 yrs		0.955		
SP % Increase (Max)	0.00 yrs		0.00%		
Recovery	%	79.99%	80.0%		
Feed Flow	gal/min	1,000	1,000		
Product Flow	gal/min	799.9	799.9		
Average Flux	gfd	11.381	11.381		
Concentrate Flow	gal/min	200.1	200.1		
Product TDS	mg/l	8.810	8.810		
Concentrate TDS	mg/l	4,516	4,516		
Primary HP Pump kW	kilowatt	75.98	75.98		
Power Consumption	kWh/m ³	0.418	0.418		
Ions		Feed	Net Feed	Conc	Product
Ca	mg/l	1.300	1.300	6.468	0.0072
Mg	mg/l	0.400	0.400	1.990	0.0022
Na	mg/l	253.8	253.8	1,259	2.222
K	mg/l	4.300	4.300	21.20	0.0727
Ba	mg/l	0.03	0.03	0.149	0.0002
Sr	mg/l	0.04	0.04	0.199	0.0002
NH4	mg/l	0.0	0.0	0.0	0.0
Fe	mg/l	0.03	0.03	0.150	0.0
HCO3	mg/l	488.0	488.0	2,426	5.166
CO3	mg/l	0.310	0.310	8.685	3.83E-05
CO2	mg/l	78.24	78.24	75.70	76.69
Cl	mg/l	84.66	84.66	420.3	0.706

SO4	mg/l	30.00	30.00	149.5	0.100
NO3	mg/l	0.0	0.0	0.0	0.0
F	mg/l	3.500	3.500	17.293	0.0497
Br	mg/l	0.0	0.0	0.0	0.0
PO4	mg/l	1.400	1.400	6.987	0.0023
SiO2	mg/l	40.00	40.00	198.0	0.482
B(Boron)	mg/l	0.0	0.0	0.0	0.0
TDS	mg/l	907.7	907.7	4,516	8.810
Feed EC @77F / @68.00F	uS	1,077 / 954	1,077 / 954	4,814 / 4,275	16.2 / 14.1
pH	pH	7.000	7.000	7.665	5.114
Osmotic Press (DS1 / Pitzer)	psi	7.700 / 8.03	7.700 / 8.03	37.695 / 36.26	0.066 / 0.60
LSI / SDSI		-1.75 / -1.82	-1.75 / -1.82	0.11 / 0.04	-7.74 / -7.97
CaSO4 / SrSO4 %	%	0.0% / 0.0%	0.0% / 0.0%	0.1% / 0.2%	0.0% / 0.0%
BaSO4 / SiO2 %	%	29.2% / 43.5%	29.2% / 43.5%	273.2% / 172.2%	
Pitzer % Solubility	Calcite/Dolomite	1% / 0%	1% / 0%	67% / 78%	
Pitzer % Solubility	CaSO4/SrSO4	0% / 0%	0% / 0%	0% / 0%	

Stage/Bank Data	Pass1	Stage 1	Stage 2	Stage 3
Lead Element Type		TM720-400	TM720-400	TM720-400
Last Element Type		TM720-400	TM720-400	TM720-400
Total Elements	252	144	72	36
Total Vessels	42	24	12	6
Elements per Vessel		6	6	6
Feed Flow	gal/min	1,000	495.3	285.4
Product Flow	gal/min	504.7	209.9	85.30
Average Flux	gfd	12.567	10.454	8.496
Brine Flow	gal/min	495.3	285.4	200.1
Recovery %	%	50.47 %	42.38 %	29.89 %
Feed Pressure	psi	139.7	130.4	120.6
dP Elements	psi	9.316	9.800	12.880
Boost Pressure	psi	0.0	0.0	0.0
Piping Loss	psi	0.0	0.0	0.0
Net (Boost - dP piping)	psi	0.0	0.0	0.0
Brine Pressure	psi	130.4	120.6	107.7
Permeate Pressure	psi	5.000	5.000	0.0
Feed TDS	mg/l	907.7	1,832	3,174
Perm TDS	mg/l	5.246	11.460	23.38
Lead Element	Pass1	Stage 1	Stage 2	Stage 3
Feed Flow	gal/min	41.67	41.28	47.57
Product Flow	gal/min	3.728	3.189	2.678
Product TDS	mg/l	3.882	8.137	17.441
Flux	gfd	13.365	11.434	9.602
Last Element	Pass1	Stage 1	Stage 2	Stage 3
Product Flow	gal/min	3.270	2.629	2.064

Product TDS	mg/l	7.338	16.403	31.53
Brine/Product Ratio	ratio	6.312	9.047	16.159
Brine Flow	gal/min	20.64	23.78	33.35
Net Driving Pressure	psi	108.8	87.23	68.37
Beta		1.163	1.119	1.075

Chemicals 100%. Disclaimer: These estimated dose rates are provided as a courtesy to Toray DS2 users and are not guaranteed.

No Chemicals Added

Warnings

1. Conc Stiff Davis Index = 0.04 Warning - the Stiff Davis Index (SDSI) is greater than 0. Scale inhibitor required.
2. Conc SiO2 % Sat'n = 172.16 Warning - concentrate silica exceeds saturation.

Errors

Disclaimer :

The program is intended to be used by persons having technical skill, at their own discretion and risk. The projections, obtained with the program, are the expected system performance, based on the average, nominal element-performance and are not automatically guaranteed.

Toray shall not be liable for any error or miscalculation in the program.

The obtained results cannot be used to raise any claim for liability or warranty.

It is the users responsibility to make provisions against fouling, scaling and chemical attacks, to account for piping and valve pressure losses, feed pump suction pressure and permeate backpressure. For questions please contact us:

Toray Industries, Inc. RO Membrane Products Dept.
 8-1, Mihama 1-chome, Urayasu, Chiba 279-8555 Japan
 TEL +81-47-350-6030 FAX +81-47-350-6066

Toray Membrane USA, Inc.
 13435 Danielson St., Poway, CA, 92064, USA
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 27F Prudential Tower, 30 Cecil Street, Singapore 049712

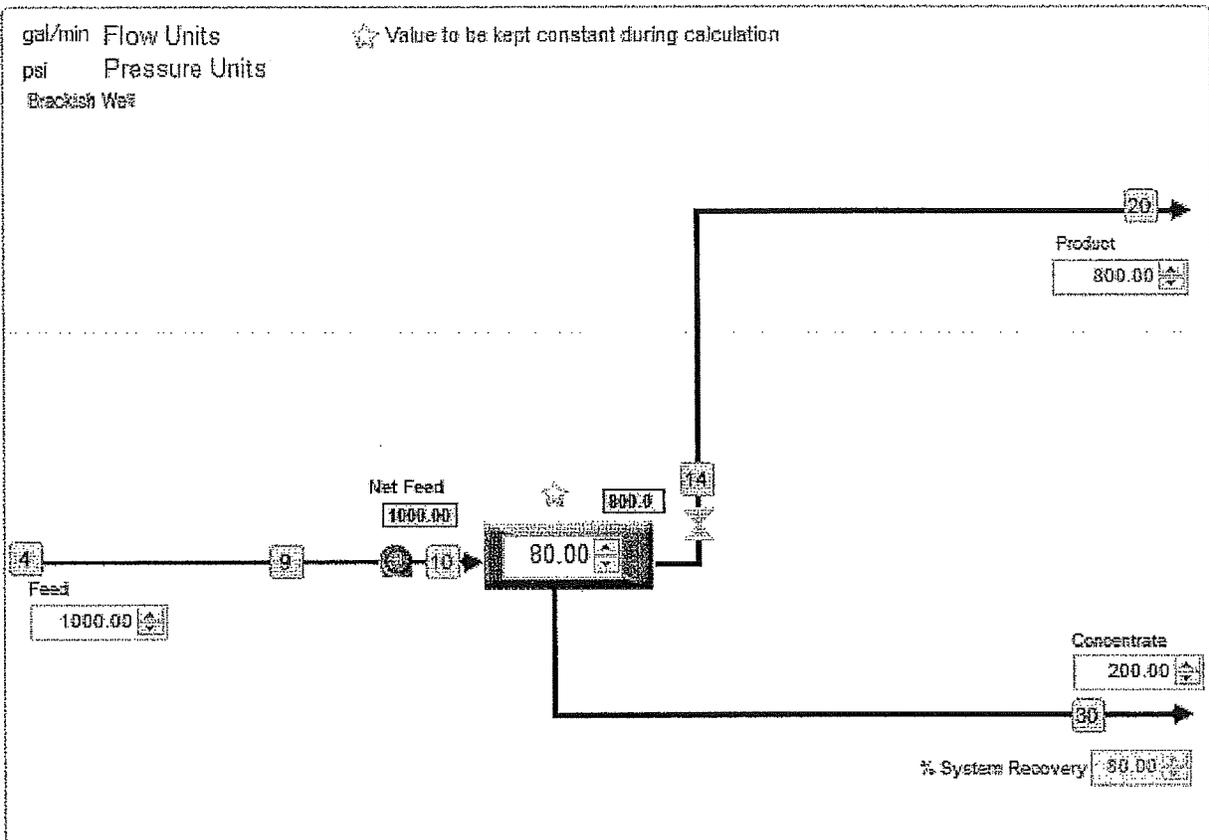
Toray Bluestar Membrane Co., Ltd. /Tel +86-10-80485216 Fax +86-10-80485217
 Zone B, Tianzhu Airport Industrial Zone, Beijing 101318, China

<http://www.toraywater.com/>

Date/Time :	12/23/2013 12:49:38 PM
Project	95:Smithfield Report
Case :	1:2 stage and 3 stage
Revision :	0:2 stage 80 % 0 years
User name :	KIMLEY-HORN\john.potts
Prepared for :	Report

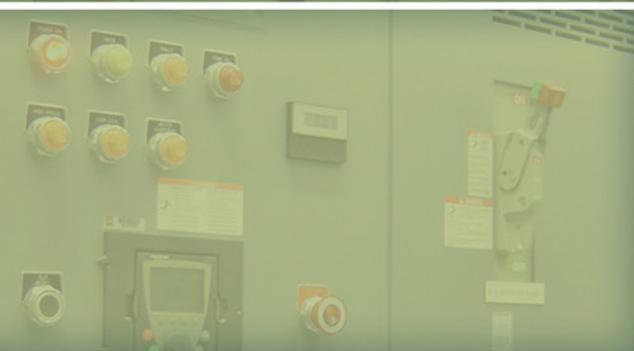
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ReleaseDate:	12/9/2011 3:50:00 PM
UpdateBy:	P Metcalfe, T Kurai, T Wolfe
Toray DS2 version :	2.0.1.28

Flow Diagram:



Appendix V

Stage 3 Removal Train Modification Photo Sketches





Install 3" /4" SS pipe connection
from Stage 2 to final concentrate

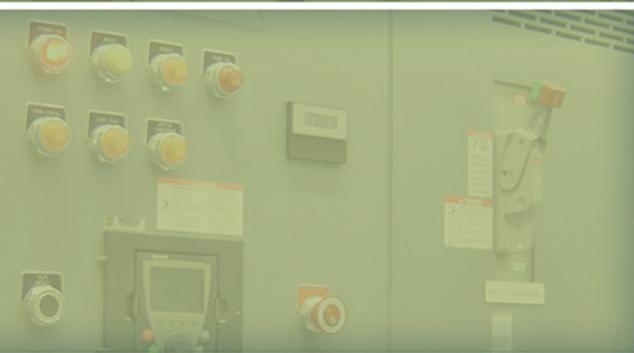
APPENDIX V
Smithfield WTP
Stage 3 Removal —
Concentrate End



APPENDIX IV
Smithfield WTP
Stage 3 Removal — Permeate End

Appendix VI

Phosphorous Treatment Technical Paper



Technologies to Remove Phosphorus from Wastewater

Peter F. Strom

Professor of Environmental Science, Rutgers University

August 2006

This brief literature review examines treatment technologies available for wastewater treatment plants to remove phosphorus. Although it is not meant to be exhaustive or complete, it does include some of the newest available reports on P removal.

Treatment technologies presently available for phosphorus removal include:

Physical:

filtration for particulate phosphorus
membrane technologies

Chemical:

precipitation
other (mainly physical-chemical adsorption)

Biological

assimilation
enhanced biological phosphorus removal (EBPR)

The greatest interest and most recent progress has been made in EBPR, which has the potential to remove P down to very low levels at relatively lower costs. Membrane technologies are also receiving increased attention, although their use for P removal has been more limited to date. The question of sludge handling and treatment of P in side streams is also being addressed.

A. Physical Treatment

1. Filtration for particulate P

Assuming that 2-3% of organic solids is P, then an effluent total suspended solids (TSS) of 20 mg/L represents 0.4-0.6 mg/L of effluent P (Strom, 2006b). In plants with EBPR the P content is even higher. Thus sand filtration or other method of TSS removal (e.g., membrane, chemical precipitation) is likely necessary for plants with low effluent TP permits (Reardon, 2006).

2. Membrane technologies

Membrane technologies have been of growing interest for wastewater treatment in general, and most recently, for P removal in particular. A recent 3 day national Water Environment Research Foundation (WERF) workshop on achieving low effluent nutrient levels devoted an entire session (4 papers) to this topic (WERF, 2006). In addition to

removing the P in the TSS, membranes also can remove dissolved P. Membrane bioreactors (MBRs, which incorporate membrane technology in a suspended growth secondary treatment process), tertiary membrane filtration (after secondary treatment), and reverse osmosis (RO) systems have all been used in full-scale plants with good results. Reardon (2006) reported on several plants achieving <0.1 mg/L TP in their effluent, and suggested the current reliable limits of technology are 0.04 mg/L for MBRs and tertiary membrane filtration, and 0.008 mg/L for RO.

B. Chemical Treatment

1. Precipitation

Chemical precipitation has long been used for P removal. The chemicals most often employed are compounds of calcium, aluminum, and iron (Tchobanoglous et al., 2003). Chemical addition points include prior to primary settling, during secondary treatment, or as part of a tertiary treatment process (Neethling and Gu, 2006). Song et al. (2002), using thermodynamics, modeled the effects of P and Ca concentration, pH, temperature, and ionic strength on theoretical removal. Researchers (e.g., Hermanowicz, 2006) generally agree, however, that the process is more complex than predicted by laboratory pure chemical experiments, and that formation of and sorption to carbonates or hydroxides are important factors. In fact, full-scale systems may perform better than the 0.05 mg/L limit predicted (Neethling and Gu, 2006). Takács (2006) suggests the limit is probably 0.005-0.04 mg/L.

A major concern with chemical precipitation for P removal continues to be the additional sludge that is produced. This can be dramatic, especially if the method selected is lime application during primary treatment (Tchobanoglous et al., 2003). Use of alum after secondary treatment can be predicted to produce much less sludge, but the increase could still be problematic (Strom, 2006a).

2. Other

The precipitation methods described above rely in part on sorption to achieve the low concentrations observed. Möller (2006) reported on an iron reactive filtration system achieving <0.01 mg/L TP at a 1.2 MGD (average flow) plant. Woodard (2006) described a magnetically enhanced coagulation process that may achieve <0.03 mg/L TP based on long term pilot tests.

Gas concrete (produced from mixtures of silica, sand, cement, lime, water, and aluminum cake) waste was used to remove phosphate from pure aqueous solutions (Oguz et al., 2003). High phosphate removal ($> 95\%$ in 10 min, batch system) was obtained from a 33 mg/L P solution, but direct applicability to wastewater treatment (lower concentrations, possible interferences) was not investigated. The gas concrete's removal efficiency can be regenerated at low pH, with the resulting concentrated phosphate solution potentially a source of recycled phosphate. Similarly, iron oxide tailings were found to be effective for phosphorus removal from both pure solutions and liquid hog manure (Zeng et al., 2004).

C. Biological Treatment

1. Assimilation

Phosphorus removal from wastewater has long been achieved through biological assimilation – incorporation of the P as an essential element in biomass, particularly through growth of photosynthetic organisms (plants, algae, and some bacteria, such as cyanobacteria). Traditionally, this was achieved through treatment ponds containing planktonic or attached algae, rooted plants, or even floating plants (e.g., water hyacinths, duckweed). This continues to be an area of research (e.g., Awuah et al., 2004), although less so in the northeastern USA. Land application of effluent during the growing season has also been used, and constructed wetlands are now an established practice as well. In all of these cases, however, it is necessary to remove the net biomass growth in order to prevent eventual decay of the biomass and re-release of the P (Strom, 2006a). Interestingly, assimilation was not discussed at the WERF (2006) workshop.

2. EBPR

As indicated in the introduction, the greatest recent and present interest has been in enhanced biological phosphorus removal. This is because of its potential to achieve low or even very low (<0.1 mg/L) effluent P levels at modest cost and with minimal additional sludge production. Removal of traditional carbonaceous contaminants (BOD), nitrogen, and phosphorus can all be achieved in a single system, although it can be challenging to achieve very low concentrations of both total N and P in such systems.

A detailed review of EBPR microbiology is given in Mino et al. (1998). Mulkerrins et al. (2003) also have reviewed the process. To summarize (Strom, 2006a and 2006b), phosphate accumulating organisms (PAOs) store polyphosphate as an energy reserve in intracellular granules. Under anaerobic conditions, in the presence of fermentation products, PAOs release orthophosphate, utilizing the energy to accumulate simple organics and store them as polyhydroxyalkanoates (PHAs) such as poly- β -hydroxybutyrate (PHB). Under aerobic conditions, the PAOs then grow on the stored organic material, using some of the energy to take up orthophosphate and store it as polyphosphate. Thus PAOs, although strictly aerobic, are selected for by having an up-front anaerobic zone in an activated sludge type of biological treatment process. The PAOs are able to compete with other aerobes under these conditions because of their ability to sequester a fraction of the available organic material under the initial anaerobic conditions, while out-competing the anaerobes because of the much higher energy yield from aerobic vs. fermentative metabolism.

The phosphate in EBPR is removed in the waste activated sludge, which might have 5% or more P (dry weight) as opposed to only 2-3% in non-EBPR sludges. EBPR has been demonstrated in several systems (Tchobanoglous et al., 2003), such as the various Bardenpho processes (also remove N), the A/O and A/A/O or A2O (removes N) processes, sequencing batch reactors (SBRs), and the PhoStrip process (which combines EBPR with phosphate stripping and chemical removal). Simultaneous biological nutrient removal (SBNR) has also been observed in treatment systems, such as the Orbal™

oxidation ditch, not specifically designed for nutrient removal. SBNR recently has been examined in some detail (Littleton et al., 2000, 2001, 2002a, 2002b, 2003a, 2003b, accepted I, accepted II; Strom et al., 2004)

James Barnard (2006), developer of the Bardenpho process, recently moderated a session on the capabilities and constraints of EBPR, and discussed the requirements for achieving effluent P concentrations <0.1 mg/L. He emphasized the need for production of volatile fatty acids by fermentation in order to assure their availability for the PAOs. Some of the factors contributing to the difficulty of achieving very low levels of both N and P simultaneously were pointed out, including secondary release of P in anoxic zones. The need to select for PAOs over the competing glycogen accumulating organisms (GAOs) was also discussed, with the following factors favoring GAOs: high sludge age, high temperature, longer un-aerated detention times, stronger wastes with low organic N, polysaccharides fed to the anaerobic zone, and low pH.

Neethling et al. (2005) examined the factors that influence the reliability of EBPR in full-scale plants. They concluded that P “concentrations <0.1 mg/L can be achieved for extended periods (more than a month), 0.03 mg/L for a week, and even below 0.02 mg/L for several sequential days. Excursions above these levels are common.” A sufficient BOD/P ratio ($>25:1$) is one requirement for reliable high removal efficiencies. This might be achieved by BOD augmentation through fermentation or addition of a fermentable substrate. Control of recycle streams is also necessary, so that they do not bring too much P back to the EBPR process. They also concluded that while GAOs can be problematic, their presence does not preclude good P removal.

Randall (2006) also discussed the use of carbon augmentation in EBPR. Short chain volatile fatty acids (VFAs), particularly acetic and propionic acids, are most desirable. Some carbon sources, such as some sugars and alcohols, may lead to production of GAOs, bulking, or excessive exocellular polymer production. VFAs may be generated in the sewer system, arise from industrial discharges, be added directly, or be generated on-site. For many plants, on-site generation in the anaerobic zone may be sufficient. Alternatively, fermentation of the primary sludge, primary effluent, or some of the activated sludge might be practiced. In the PhoStrip process, fermentation also occurs in the stripping tank.

Cold weather can provide a challenge for many biological treatment processes. However, the Kalispell, Montana, wastewater treatment plant has maintained a long-term average effluent phosphorus concentration of 0.11 mg/L (Emrick, 2006) with a Bardenpho process modification (UCT). This area has only 91 frost-free days per year, with average winter high and low temperatures of 30 and 15°F, respectively.

Akin and Ugurlu (2003) examined nutrient removal in a laboratory sequencing batch reactor (SBR) system with a new operational mode: simultaneous feeding and decanting. The synthetic wastewater contained glucose and acetate as carbon sources, and 20 mg/L P (COD/P ratio = 20). Filtered effluent P concentrations below 1 mg/L (and as low as 0.1 mg/L) were achieved under some operational conditions.

Converting a non-P removing activated sludge to EBPR by acclimatization to alternating anaerobic and aerobic conditions takes 40-100 days, but many EBPR systems experience start-up failure or breakdown (Dabert et al., 2005). Bioaugmentation (inoculating with previously adapted microorganisms) was found to speed up the process for a laboratory SBR by about 15 days compared to a non-augmented control.

Optimization of dissolved oxygen, sludge age, and nitrate-N concentration for efficient phosphorus removal were tested at an A2O wastewater treatment plant in Guilin, China, (Li et al., 2005). Results showed that DO must be controlled in the anaerobic phase, nitrate-nitrogen concentration must be decreased in the anaerobic section, and a sludge age of 8-10 days was preferable to 15 days.

Kuba et al. (1997) examined the role of denitrifying phosphorus removing bacteria (DPB) in wastewater treatment plants using batch tests with activated sludge from two plants in the Netherlands. DPBs appeared to be of little importance in one plant, but contributed substantially to P removal in the other.

D. Sludges and Side Streams

There is some concern about the effects of solids management processes and return side streams on the ability to remove P to low levels. Processes that destroy organic material (such as digestion) have the potential to release the particulate organic-P present as soluble organic or inorganic P. In particular, anaerobic conditions are likely to release soluble P from EBPR sludges and iron precipitates (ferrous phosphate is much more soluble than ferric phosphate). Any released P may then be returned to the main wastewater treatment process in high concentrations through recycle side streams, thus requiring removal a second time. Non-continuous processes may also lead to variable loadings from side streams. A number of these issues were discussed by Narayanan (2006).

In some cases, these problems, particularly with anaerobic digestion, have not been as severe as originally anticipated, or could be controlled (deBarbadillo, 2006). This appears in part to be related to the formation of the mineral struvite, $MgNH_4PO_4$. Struvite has long been known for its potential to cause clogging in anaerobic digesters (Vaccari et al., 2006), where ammonium and phosphate are released as the organic matter is degraded. However, it appears that formation of this mineral in digesters at EBPR plants may lead to its precipitation as small granules that remain with the sludge, rather than the release of soluble P to the supernatant where it would be recycled. This is apparently enhanced by the liberation of Mg^{2+} by PAOs as a major associated cation during phosphate release (Liao et al., 2003).

Another approach is to remove the P from the recycle stream. Britton et al. (2005) demonstrated treatment of anaerobic digester supernatant in pilot scale using a fluidized bed reactor. Phosphate was recovered in the form of struvite through the addition of magnesium chloride and pH adjustment. Liao et al. (2003) looked at release of P directly from EBPR sludge by several methods for possible P recovery. Takiguchi et

al. (2004) tested thermal (70°C) treatment followed by precipitation with Ca in a lab-scale.

Acknowledgments

I would like to thank Erin Murphy and Amy Boyajian for their contributions to this review.

Literature Cited

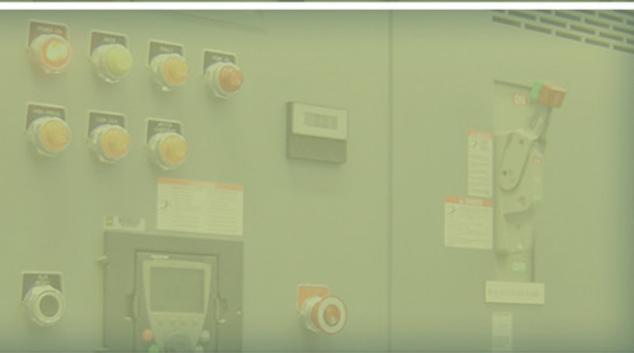
- Akin, B.S. and A. Ugurlu. 2003. Biological removal of carbon, nitrogen and phosphorus in a sequencing batch reactor. *Journal of Environmental Science and Health*, **38**, 1479-1489.
- Awuah, E., M. Oppong-Peprah, H.J. Lubberding, and H.J. Gijzen. 2004. Comparative performance studies of water lettuce, duckweed, and algal-based stabilization ponds using low-strength sewage. *Journal of Toxicology & Environmental Health*, **67**, 1727-1739.
- Barnard, J. 2006. Requirements for achieving effluent phosphorus of less than 0.1 mg/L. Session P1 in WERF, 2006.
- Britton, A., F.A. Koch, D.S. Mavinic, A. Adnan, W.K. Oldham, and B. Udala. 2005. Pilot-scale struvite recovery from anaerobic digester supernatant at an enhanced biological phosphorus removal wastewater treatment plant. *Journal of Environmental Engineering & Science*, **4**, 265-277.
- Dabert, P., J.P. Delgenes, and J.J. Godon. 2005. Monitoring the impact of bioaugmentation on the start up of biological phosphorus removal in a laboratory scale activated sludge ecosystem. *Applied Microbiology & Biotechnology*, **66**, 575-588.
- deBarbadillo, C. 2006. Biological phosphorus removal at the McDowell Creek WWTP. Session P1 in WERF, 2006.
- Emrick, J. 2006. Cold weather BNR limits. Session P1 in WERF, 2006.
- Hermanowicz, S. 2006. Chemical fundamentals of phosphorus precipitation. Session P2 in WERF, 2006.
- Kuba, T., M.C.M. van Loosdrecht, F.A. Brandse, and J.J. Heijnen. 1997. Occurrence of denitrifying phosphorus removing bacteria in modified UCT-type wastewater treatment plants. *Water Research*, **31**, 777-786.
- Li, J., H. Ren, X. Wang, Q. Liu, and Q. Xie. 2005. Technique for biological phosphorus removal. *Pollution Engineering*, **37**, 14-17.
- Liao, P.H., D. Mavinic, and F.A. Koch. 2003. Release of phosphorus from biological nutrient removal sludges: A study of sludge pretreatment methods to optimize phosphorus release for subsequent recovery purposes. *Journal of Environmental Engineering & Science*, **2**, 369-381.
- Littleton, H.X., G.T. Daigger, P.F. Strom, & R.M. Cowan. 2000. Evaluation of autotrophic denitrification and heterotrophic nitrification in simultaneous biological

- nutrient removal systems. Proceedings, WEFTEC 2000, 73rd Annual Conference, Water Environment Federation, Anaheim, CA, Session 19, 21 pp. [CD-ROM].
- Littleton, H.X., G.T. Daigger, & P.F. Strom. 2001. Application of computational fluid dynamics to closed loop bioreactors - analysis of macro-environment variations in simultaneous biological nutrient removal systems. Proceedings, WEFTEC 2001, 74th Annual Conference, Water Environment Federation, Atlanta, GA [CD-ROM].
- Littleton, H.X., G.T. Daigger, P.F. Strom. & R.M. Cowan. 2002a. Evaluation of autotrophic denitrification, heterotrophic nitrification, and PAOs in full scale simultaneous biological nutrient removal systems. *Water Science & Technology* **46**(1-2):305–312.
- Littleton, H.X., G.T. Daigger, P.F. Strom & R. Jin. 2002b. Simulation of BIO P removal in CFD environment: Analysis of macro-environment variations in simultaneous biological nutrient removal systems. Proceedings, WEFTEC 2002, 75th Annual Conference, Water Environment Federation, Chicago [CD-ROM].
- Littleton, H.X., G.T. Daigger, P.F. Strom, & R.A. Cowan. 2003a. Evaluation of autotrophic denitrification, heterotrophic nitrification, and biological phosphorus removal in full scale simultaneous biological nutrient removal systems. *Water Environment Research* **75**:138-150.
- Littleton, H.X., G.T. Daigger, & P.F. Strom. 2003b. Summary paper: Mechanisms of simultaneous biological nutrient removal in closed loop bioreactors. Proceedings, WEFTEC 2003, 76th Annual Conference, Water Environment Federation, Los Angeles [CD-ROM].
- Littleton, H.X., G.T. Daigger, & P.F. Strom. Accepted. Application of computational fluid dynamics to closed loop bioreactors: I. Characterization and simulation of fluid flow pattern and oxygen transfer. *Water Environment Research*.
- Littleton, H.X., G.T. Daigger, & P.F. Strom. Accepted. Application of computational fluid dynamics to closed loop bioreactors: II. Simulation of biological phosphorus removal using computational fluid dynamics. *Water Environment Research*.
- Mino, T., M. C. M. van Loosdrecht, and J. J. Heijnen. 1998. Review paper: Microbiology and biochemistry of the enhanced biological phosphate removal process. *Water Research*, **32**, 3193-3207.
- Möller, G. 2006. Absolute (1000 Fold) Phosphorus removal: performance, mechanisms and engineering analysis of iron-based reactive filtration and coupled CEPT at the Hayden, ID WWTP. Session P2 in WERF 2006.
- Mulkerrins, D., A.D.W. Dobson, and E. Colleran. 2003. Parameters affecting biological phosphate removal from wastewaters. *Environment International*, **30**, 249-260.
- Narayanan, B. 2006. Solids treatment and recycle streams in BPR plants. Session P1 in WERF, 2006.
- Neethling, J.B., B. Bakke, M. Benisch, A. Gu, H. Stephens, H.D. Stensel, and R. Moore. 2005. Factors Influencing the Reliability of Enhanced Biological Phosphorus Removal. Final Report, Water Environment Research Foundation, Alexandria, VA.

- Neethling, J.B. and A. Gu. 2006. Chemical phosphorus removal constraints – Introduction. Session P2 in WERF, 2006.
- Oguz, E., A. Gurses, and N. Canpolat. 2003. Removal of phosphate from wastewaters. *Cement & Concrete Research*, **33**, 1109-1113.
- Randall, A.A. 2006. Carbon augmentation for biological phosphorus removal to low concentrations. Session P1 in WERF, 2006.
- Reardon, R. 2006. Technical introduction of membrane separation processes for low TP limits. Session P3 in WERF, 2006.
- Song, Y., H.H. Hahn, and E. Hoffmann. 2002. Effects of solution conditions on the precipitation of phosphate for recovery, a thermodynamic evaluation. *Chemosphere*, **48**, 1029-1035.
- Strom, P.F., H.X. Littleton, & G.T. Daigger. 2004. Characterizing Mechanisms of Simultaneous Biological Nutrient Removal during Wastewater Treatment. Water Environment Research Foundation, Alexandria, VA.
- Strom, P.F. 2006a. Introduction to phosphorus removal. Invited Presentation for Wastewater Treatment Operator's Workshop, 91st Annual Meeting, NJWEA, Atlantic City, NJ.
- Strom, P.F. 2006b. Phosphorus removal techniques. Invited Presentation for Water Quality Trading, 91st Annual Meeting, NJWEA, Atlantic City, NJ.
- Takács, I. 2006. Modeling chemical phosphorus removal processes. Session P2 in WERF, 2006.
- Takiguchi, N., M. Kishino, A. Kuroda, J. Kato, and H. Ohtake. 2004. A Laboratory-scale test of anaerobic digestion and methane production after phosphorus recovery from waste activated sludge. *Journal of Bioscience & Bioengineering*, **97**, 365-368.
- Tchobanoglous, G., F.L. Burton, and H.D. Stensel. 2003. Metcalf & Eddy, Inc.'s Wastewater Engineering: Treatment, Disposal, and Reuse, 4th Edition. McGraw-Hill, Inc., New York. 1819 pp.
- Vaccari, D.A., P.F. Strom, and J.E. Alleman. 2006. Environmental Biology for Engineers and Scientists. John Wiley & Sons, Inc., New York. 931 pp.
- WERF. 2006. Water Environment Research Foundation Workshop 05-CTS-1W, Nutrient Removal: How Low Can We Go & What Is Stopping Us from Going Lower? March 9-11, 2006, Washington, DC.
- Woodard, S. 2006. Magnetically enhanced coagulation for phosphorus removal. Session B2 in WERF, 2006.
- Zeng, L., X. Li, and J. Liu. 2004. Adsorptive removal of phosphate from aqueous solutions using iron oxide tailings. *Water Research*, **38**, 1318-1327.

Appendix VII

Train Cleaning System Photo Sketches



APPENDIX VII

Smithfield WTP

Sketch No. 1 of Proposed Cleaning
Pipe Extension



See continuation
Sketch No. 2

Proposed 6" cleaning
return line – support from
floor similar to existing

APPENDIX VII

Smithfield WTP

Sketch No. 2 of Proposed Cleaning
Pipe Extension

Proposed 6" cleaning
return line – support from
floor similar to existing

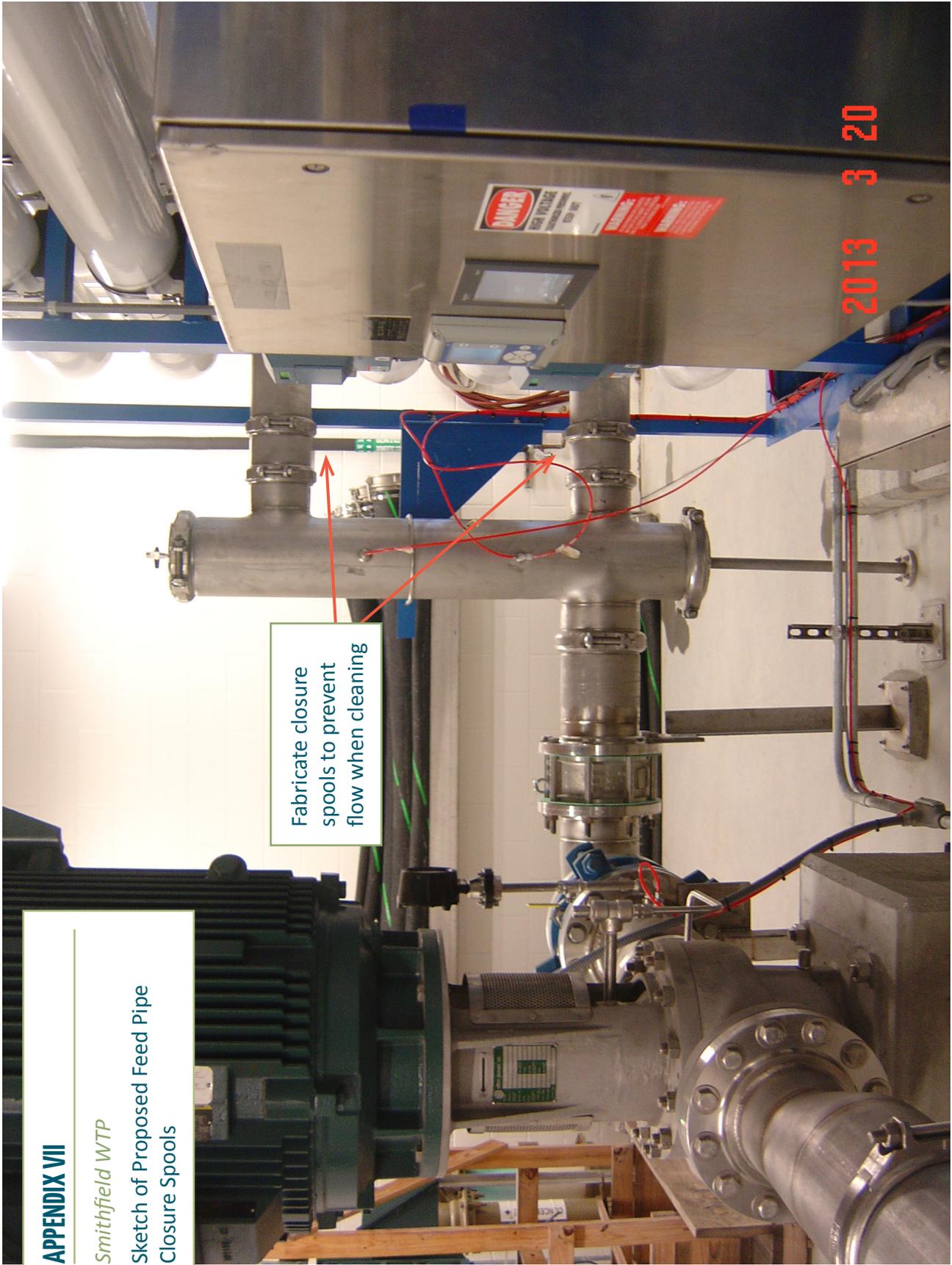
Install Camlok
similar to existing



APPENDIX VII

Smithfield WTP

Sketch of Proposed Feed Pipe
Closure Spools

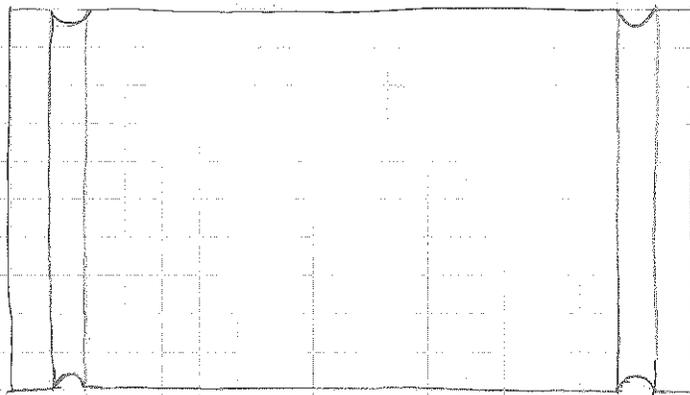




APPENDIX VII

Smithfield WTP

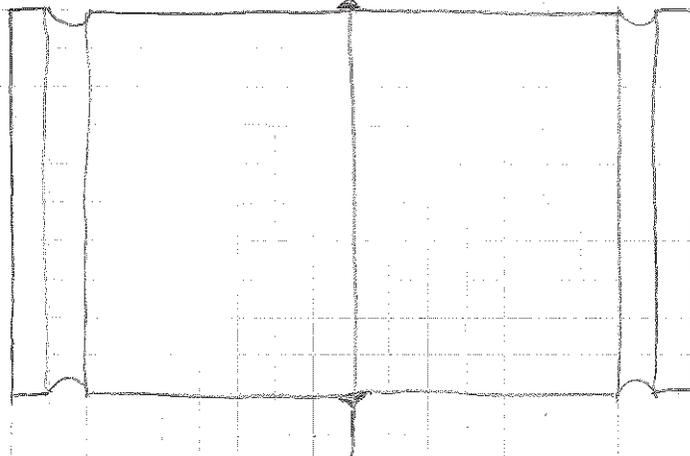
Pipe Closure Spool



4" PIPE, 4'⁵/₈' LONG
 6" PIPE, 5'⁷/₈' LONG
 PIPE IS SCH. 10 316SS

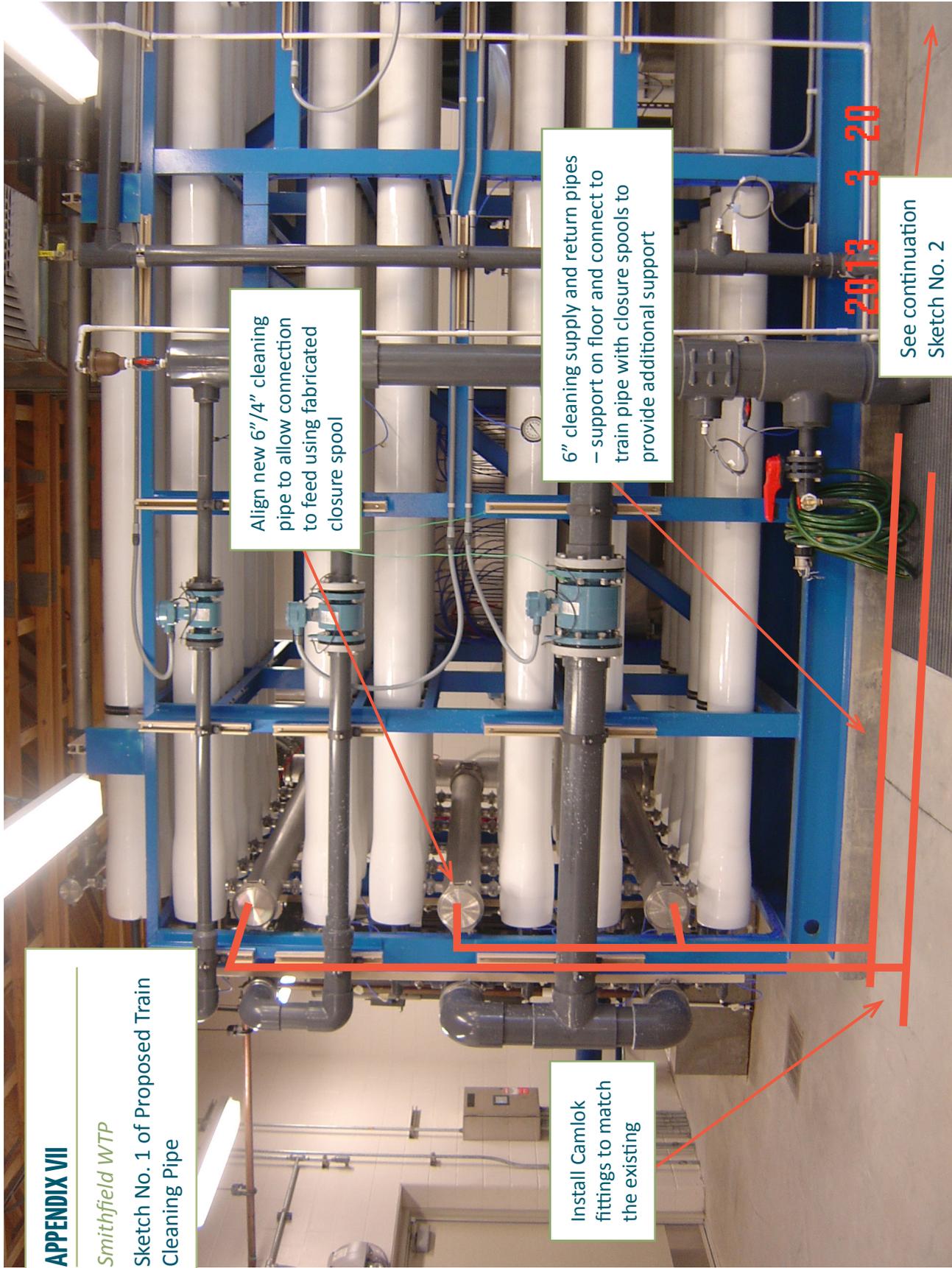
CLEANING SPOOL A

¹/₈" THK 316 SS PL
 4" PIPE, 5' SQ
 6" PIPE, 7' SQ



FULL BEAD
 FILLET WELD

CLEANING SPOOL B



APPENDIX VII
Smithfield WTP
Sketch No. 1 of Proposed Train
Cleaning Pipe

Align new 6" / 4" cleaning pipe to allow connection to feed using fabricated closure spool

6" cleaning supply and return pipes – support on floor and connect to train pipe with closure spools to provide additional support

Install Camlok fittings to match the existing

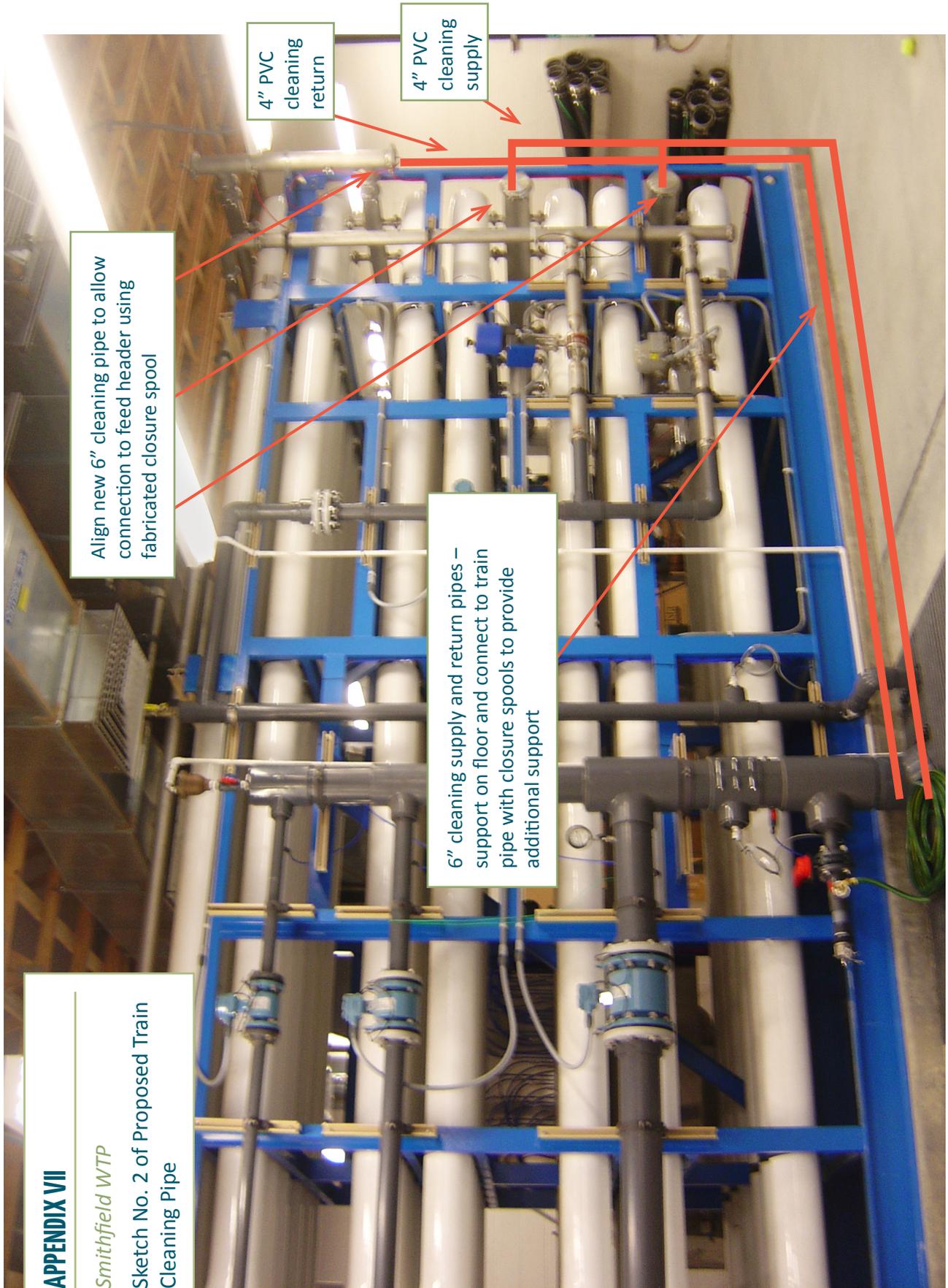
See continuation Sketch No. 2

2013 3 20

APPENDIX VII

Smithfield WTP

Sketch No. 2 of Proposed Train
Cleaning Pipe



Align new 6" cleaning pipe to allow connection to feed header using fabricated closure spool

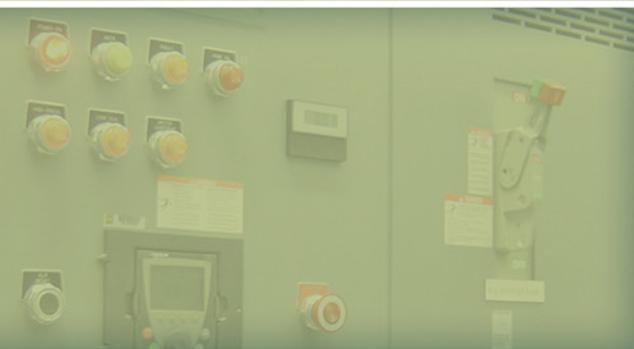
4" PVC cleaning return

4" PVC cleaning supply

6" cleaning supply and return pipes -- support on floor and connect to train pipe with closure spools to provide additional support

Appendix VIII

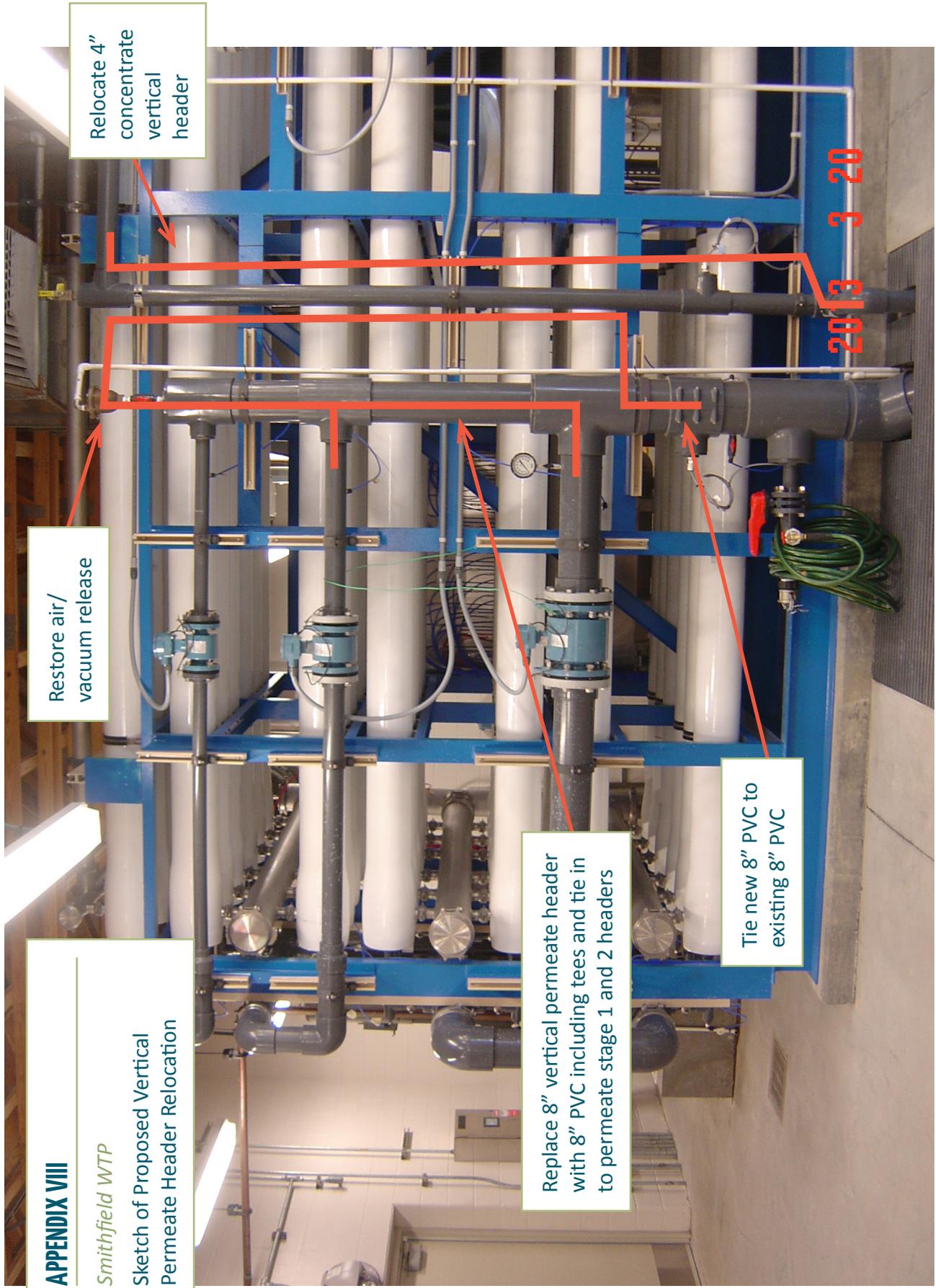
Train Permeate Header Photo Sketch



APPENDIX VIII

Smithfield WTP

Sketch of Proposed Vertical Permeate Header Relocation



Relocate 4" concentrate vertical header

Restore air/vacuum release

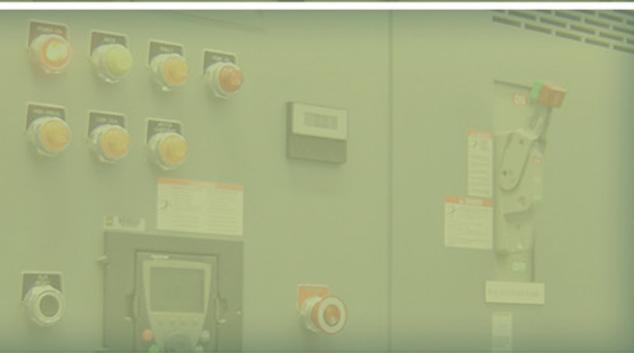
Replace 8" vertical permeate header with 8" PVC including tees and tie in to permeate stage 1 and 2 headers

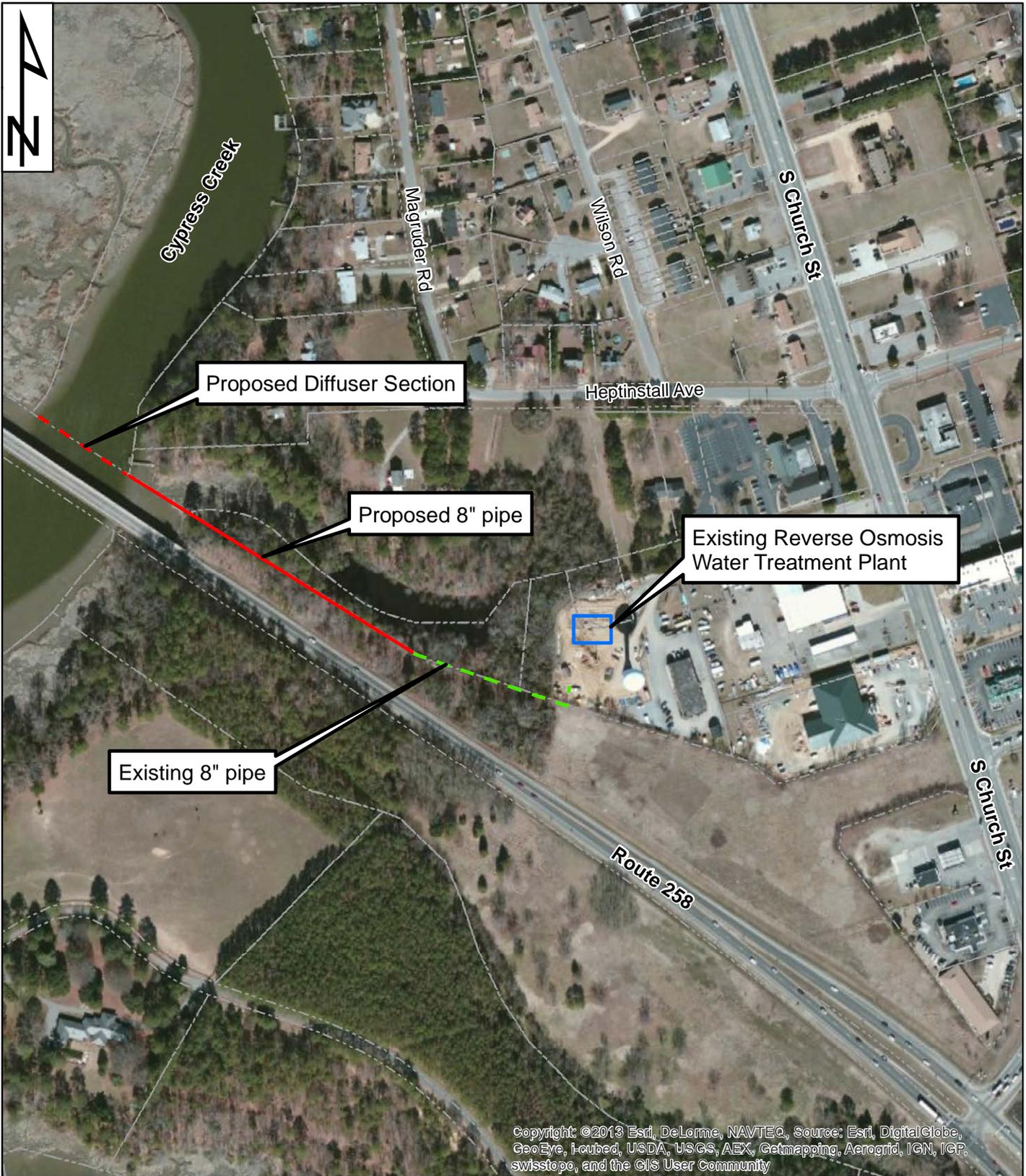
Tie new 8" PVC to existing 8" PVC

2013 3 20

Appendix IX

GIS Exhibit of Concentrate Discharge Route





Appendix IX

Scale:



Concentrate Discharge Route Smithfield, Virginia



Kimley-Horn
and Associates, Inc.



 Kimley-Horn
and Associates, Inc.



Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Revenue				
General Fund revenues				
General Fund revenues				
Real Estate Tax				
Current RE Tax	1,660,000.00	1,640,778.10	19,221.90	98.84%
Delinquent RE Tax	20,000.00	17,264.42	2,735.58	86.32%
Current RE Penalty	6,500.00	2,699.58	3,800.42	41.53%
Delinquent RE Penalty	2,000.00	2,347.36	(347.36)	117.37%
Current RE Interest	1,000.00	185.10	814.90	18.51%
Delinquent RE Interest	3,400.00	3,987.83	(587.83)	117.29%
Total Real Estate Taxes	1,692,900.00	1,667,262.39	25,637.61	98.49%
Personal Property Tax				
Current PP Tax	838,000.00	833,294.36	4,705.64	99.44%
Delinquent PP Tax	35,000.00	12,407.80	22,592.20	35.45%
Current PP Penalty	13,500.00	10,375.47	3,124.53	76.86%
Delinquent PP Penalty	6,000.00	3,265.83	2,734.17	54.43%
Current PP Interest	650.00	196.84	453.16	30.28%
Delinquent PP Interest	4,320.00	1,839.43	2,480.57	42.58%
Total Personal Property Tax	897,470.00	861,379.73	36,090.27	95.98%
Miscellaneous Receipts Over/Short	15.00	(9.80)	24.80	-65.33%
Total Over/Short	15.00	(9.80)	24.80	-65.33%
Other Taxes				
Franchise Tax	119,855.00	-	119,855.00	0.00%
Cigarette Tax	130,000.00	109,289.10	20,710.90	84.07%
Transient Occupancy Tax	142,000.00	89,662.40	52,337.60	63.14%
Meals Tax-4%	794,270.00	579,293.55	214,976.45	72.93%
Meals Tax-2%	397,135.00	289,646.77	107,488.23	72.93%
Communications Tax	245,000.00	119,917.84	125,082.16	48.95%
Rolling Stock	13.00	15.75	(2.75)	121.15%
Rental Tax	1,300.00	508.43	791.57	39.11%
Sales Tax	243,000.00	146,395.83	96,604.17	60.25%
Consumption Tax	47,500.00	30,734.54	16,765.46	64.70%
Utility Tax	194,500.00	117,726.57	76,773.43	60.53%
Total Other Local Taxes	2,314,573.00	1,483,190.78	831,382.22	64.08%
Licenses, Permits & Privilege Fees				
Business Licenses	330,000.00	117,176.68	212,823.32	35.51%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Business Licenses Penalty	6,420.00	2,858.80	3,561.20	44.53%
Business Licenses Interest	645.00	1,435.47	(790.47)	222.55%
Permits & Other Licenses	13,000.00	6,627.80	6,372.20	50.98%
WC Dog Park Registration	2,200.00	1,575.00	625.00	71.59%
Consultant Review Fees	5,000.00	4,253.80	746.20	85.08%
Vehicle License Tags	-	6.00	(6.00)	100.00%
Vehicle License	135,500.00	119,265.19	16,234.81	88.02%
Total Licenses, permits and privilege fees	492,765.00	253,198.74	239,566.26	51.38%
<u>Fines & Costs</u>				
Public Defender Fee	-	-	-	0.00%
Fines & Costs	57,000.00	42,284.43	14,715.57	74.18%
Total Fines & Forfeitures	57,000.00	42,284.43	14,715.57	74.18%
<u>From Use of Money and Property</u>				
General Fund Interest	6,400.00	5,094.57	1,305.43	79.60%
Beautification Fund Interest	85.00	111.38	(26.38)	131.04%
Rentals	15,685.00	9,365.64	6,319.36	59.71%
Smithfield Center Rentals	143,000.00	91,879.96	51,120.04	64.25%
Smithfield Center Vendor Programs	4,500.00	1,750.00	2,750.00	38.89%
Kayak Rentals	-	7,092.25	(7,092.25)	100.00%
Special Events	1,000.00	4,268.00	(3,268.00)	426.80%
Fingerprinting Fees	1,000.00	660.00	340.00	66.00%
Sale of Equipment	1,000.00	3,927.51	(2,927.51)	392.75%
Lease of Land	525.00	500.00	25.00	95.24%
Total revenue from use of money and property	173,195.00	124,649.31	48,545.69	71.97%
<u>Miscellaneous Revenue</u>				
Other Revenue	2,200.00	1,141.93	1,058.07	51.91%
Cash Proffer Revenues	-	24,255.00	(24,255.00)	#DIV/0!
Obici Foundation Wellness Grant	12,500.00	15,500.00	(3,000.00)	124.00%
Virginia Municipal Group Safety Grant	3,861.00	4,000.00	(139.00)	103.60%
Total Miscellaneous Revenue	18,561.00	44,896.93	(26,335.93)	241.89%
<u>From Reserves</u>				
Restricted Reserves-Police Department	-	14,868.15	(14,868.15)	0.00%
Reserves-Pinewood Escrow	14,618.00	9,073.28	5,544.72	62.07%
From Operating Reserves	529,075.00	-	529,075.00	0.00%
Total From Reserves	543,693.00	23,941.43	519,751.57	4.40%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
<u>Intergovernmental Virginia</u>				
Law Enforcement	161,533.00	80,766.00	80,767.00	50.00%
Litter Control Grant	3,765.00	3,321.00	444.00	88.21%
Police Block Grants-State	1,000.00	1,022.43	(22.43)	102.24%
Fire Programs	19,461.00	-	19,461.00	0.00%
VCA Grant	5,000.00	5,000.00	-	100.00%
DCA Grant (Dam)	17,000.00	-	17,000.00	0.00%
SNAP Program	-	2,931.00	(2,931.00)	#DIV/0!
Fuel Refund (state)	865.00	12.32	852.68	1.42%
Total State Revenue	208,624.00	93,052.75	115,571.25	44.60%
<u>Intergovernmental Federal</u>				
Federal Grants	5,000.00	4,065.52	934.48	81.31%
Pinewood Heights CDBG Relocation Grant-Phase II	500,194.00	132,626.00	367,568.00	26.51%
Federal Fuel Income	1,000.00	-	1,000.00	0.00%
Total Federal Revenue	506,194.00	136,691.52	369,502.48	27.00%
<u>Other Financing Sources</u>				
<u>Operating Transfers In</u>				
Transfer In for Debt Service	-	-	-	0.00%
Total Operating Transfers In	-	-	-	#DIV/0!
<u>Other Financing Sources</u>				
Note Proceeds-HVAC Financing (Smithfield Center)	-	-	-	0.00%
General Obligation Bond-Capital Asset financing (ball fields)	400,000.00	-	400,000.00	0.00%
Insurance Recoveries	-	9,145.75	(9,145.75)	100.00%
Total Other Financing Sources	400,000.00	9,145.75	390,854.25	2.29%
<u>Contributions</u>				
CHIPS Contributions	2,500.00	100.00	2,400.00	4.00%
Contributions-Employee Awards	-	-	-	0.00%
Contributions-IOW County (ball fields)	25,000.00	-	25,000.00	0.00%
Total Contributions	27,500.00	100.00	27,400.00	0.36%
Total General Fund Revenue	7,332,490.00	4,739,783.96	2,592,706.04	64.64%
Less Revenues, Loan Funds, Grants and Contributions related to capital projects				
General Obligation Bond-HVAC Financing	-	-	-	
General Obligation Bond-Land Acquisition	(400,000.00)	-	(400,000.00)	

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Cash Proffer Revenues	-	(24,255.00)	24,255.00	
Meals Tax (2%) allocated to Special Projects	(397,135.00)	(289,646.77)	(107,488.23)	
Pinewood Heights Reserves	(14,618.00)	(9,073.28)	(5,544.72)	
Contributions to Ball Fields (IOW)	(25,000.00)	-	(25,000.00)	
Pinewood Heights Relocation Project -Grant	(500,194.00)	(132,626.00)	(367,568.00)	
Total Non-operating Revenues	(1,336,947.00)	(455,601.05)	(881,345.95)	34.08%
Total General Fund Operating Revenues	5,995,543.00	4,284,182.91	1,711,360.09	71.46%
General Fund Budget Expenses				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
GENERAL GOVERNMENT				
<u>Town Council</u>				
Salaries	40,000.00	24,645.00	15,355.00	61.61%
FICA	3,500.00	2,166.31	1,333.69	61.89%
Employee Wellness/Assistance Plan	1,800.00	1,092.00	708.00	60.67%
Legal Fees	32,000.00	15,424.69	16,575.31	48.20%
Election Expense	3,000.00	-	3,000.00	-
Maintenance contracts	695.00	-	695.00	-
Advertising	30,000.00	7,521.51	22,478.49	25.07%
Professional Services	1,500.00	6,358.00	(4,858.00)	423.87%
Records Management maint & upgrades-software (to be moved)	8,484.00	7,245.00	1,239.00	85.40%
Site Plan Review	5,000.00	562.50	4,437.50	11.25%
Communications	3,500.00	477.77	3,022.23	13.65%
Insurance	27,435.00	19,972.50	7,462.50	72.80%
Supplies	20,000.00	9,910.19	10,089.81	49.55%
Travel & Training	6,000.00	5,105.36	894.64	85.09%
Subscriptions/Memberships	9,100.00	8,383.00	717.00	92.12%
Council Approved Items	16,000.00	5,538.70	10,461.30	34.62%
Public Defender Fees	2,000.00	(120.00)	2,120.00	-6.00%
Bank Charges	625.00	16.00	609.00	2.56%
SpecialProjects	2,500.00	2,460.63	39.37	98.43%
Smithfield CHIPS program	3,772.00	3,140.00	632.00	83.24%
Update Town Charter & Code	2,000.00	1,692.00	308.00	84.60%
Annual Christmas Parade	400.00	185.10	214.90	46.28%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Council Approved Hwy	-	-	-	-
Total Town Council	219,311.00	121,776.26	97,534.74	55.53%
<u>Town Manager</u>				
Salaries	216,840.00	131,486.88	85,353.12	60.64%
FICA	17,350.00	10,385.93	6,964.07	59.86%
VSRS	25,100.00	16,561.73	8,538.27	65.98%
Health	37,455.00	24,337.50	13,117.50	64.98%
Auto Expense	500.00	313.81	186.19	62.76%
Maintenance Contracts	1,700.00	563.20	1,136.80	33.13%
Communications	15,500.00	8,415.03	7,084.97	54.29%
Insurance	2,910.00	2,015.79	894.21	69.27%
Supplies	5,500.00	2,562.59	2,937.41	46.59%
Dues & Subscriptions	2,940.00	2,196.78	743.22	74.72%
Computer & technology expenses	16,000.00	7,169.09	8,830.91	44.81%
Travel & Training	7,800.00	4,417.15	3,382.85	56.63%
Other	100.00	31.66	68.34	31.66%
TM Allocated to Hwy	-	-	-	0.00%
Total Town Manager	349,695.00	210,457.14	139,237.86	60.18%
<u>Treasurer</u>				
Salaries	258,170.00	153,463.00	104,707.00	59.44%
FICA	20,655.00	12,277.34	8,377.66	59.44%
VSRS	29,230.00	17,916.56	11,313.44	61.30%
Health	32,840.00	18,700.73	14,139.27	56.94%
Audit	11,500.00	-	11,500.00	0.00%
Depreciation Software	2,700.00	-	2,700.00	0.00%
Communications	8,080.00	4,783.06	3,296.94	59.20%
Data Processing	18,000.00	11,710.20	6,289.80	65.06%
Service Contracts	18,500.00	11,479.86	7,020.14	62.05%
Insurance	2,510.00	1,738.71	771.29	69.27%
Supplies	15,000.00	6,066.87	8,933.13	40.45%
Dues & Subscriptions	2,300.00	1,334.16	965.84	58.01%
Credit Card Processing	1,000.00	1,628.54	(628.54)	162.85%
Cigarette Tax Stamps	2,565.00	2,473.20	91.80	96.42%
Travel & Training	2,000.00	58.45	1,941.55	2.92%
Other	100.00	10.54	89.46	10.54%
Treasurer Alloc to Hwy	-	-	-	0.00%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Total Treasurer	425,150.00	243,641.22	181,508.78	57.31%
<u>PUBLIC SAFETY</u>				
<u>Police Department</u>				
Salaries	1,322,140.00	829,584.35	492,555.65	62.75%
FICA	105,775.00	64,809.98	40,965.02	61.27%
VSRS	139,100.00	90,924.54	48,175.46	65.37%
Health Insurance	185,950.00	116,333.58	69,616.42	62.56%
Pre-employ screening/Emp Medical	2,000.00	-	2,000.00	0.00%
Uniforms	24,000.00	13,038.38	10,961.62	54.33%
Service Contracts	37,000.00	32,203.10	4,796.90	87.04%
Communications	65,000.00	30,416.44	34,583.56	46.79%
Computer & Technology Expenses	10,000.00	2,069.83	7,930.17	20.70%
Insurance	51,935.00	35,976.12	15,958.88	69.27%
Ins. - LODA	10,962.00	10,961.37	0.63	99.99%
Materials & Supplies	30,500.00	9,247.79	21,252.21	30.32%
Dues & Subscriptions	6,500.00	3,427.88	3,072.12	52.74%
Equipment	15,000.00	3,295.56	11,704.44	21.97%
Radio & Equipment repairs	3,500.00	-	3,500.00	0.00%
Vehicle Maintenance	50,000.00	24,228.84	25,771.16	48.46%
Gas	85,000.00	40,984.90	44,015.10	48.22%
Tires	7,500.00	1,549.50	5,950.50	20.66%
Travel & Training	27,500.00	17,036.39	10,463.61	61.95%
Special Events	500.00	154.59	345.41	30.92%
Police Grants	24,478.00	14,998.00	9,480.00	61.27%
Investigation expenses	5,000.00	2,295.93	2,704.07	45.92%
Other	500.00	689.62	(189.62)	137.92%
Total Police Department	2,209,840.00	1,344,226.69	865,613.31	60.83%
<u>Fire Department</u>				
Fuel Fund & Travel	13,000.00	-	13,000.00	0.00%
State Pass Thru	19,461.00	-	19,461.00	0.00%
Total Fire Department	32,461.00	-	32,461.00	0.00%
<u>Contributions-Public Safety</u>				
Coast Guard Auxiliary	250.00	250.00	-	100.00%
Rescue Squad-shared maintenance	-	-	-	0.00%
E911 Dispatch Center	118,950.00	58,669.97	60,280.03	49.32%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Fire Department Rescue Truck	10,000.00	10,000.00	-	100.00%
Total Contributions-Public Safety	129,200.00	68,919.97	60,280.03	53.34%
PARKS, RECREATION & CULTURAL				
Smithfield Center				
Salaries	186,170.00	108,651.81	77,518.19	58.36%
FICA	14,895.00	9,033.39	5,861.61	60.65%
VSRS	16,365.00	10,803.04	5,561.96	66.01%
Health	20,780.00	13,493.18	7,286.82	64.93%
Uniforms	1,200.00	212.55	987.45	17.71%
Contracted Services	23,000.00	10,586.86	12,413.14	46.03%
Retail Sales & Use Tax	500.00	300.00	200.00	60.00%
Utilities	30,000.00	13,237.69	16,762.31	44.13%
Communications	21,500.00	9,665.38	11,834.62	44.96%
Computer & technology expenses	2,500.00	1,079.99	1,420.01	43.20%
Insurance	4,810.00	3,331.95	1,478.05	69.27%
Kitchen Supplies	4,000.00	632.99	3,367.01	15.82%
Office Supplies/Other Supplies	4,000.00	2,341.40	1,658.60	58.54%
Food Service & Beverage Supplies	8,000.00	3,416.92	4,583.08	42.71%
AV Supplies	1,000.00	97.14	902.86	9.71%
Repairs & Maintenance	40,000.00	17,422.83	22,577.17	43.56%
Systems Maintenance (HVAC, AV, Generator)	10,000.00	-	10,000.00	0.00%
Landscaping	12,000.00	7,916.94	4,083.06	65.97%
Travel & Training	2,000.00	2,315.00	(315.00)	115.75%
Programming Expenses	1,000.00	-	1,000.00	0.00%
Advertising	20,000.00	12,061.97	7,938.03	60.31%
Refund event deposits	3,500.00	2,398.13	1,101.87	68.52%
Credit card processing expense	4,500.00	2,406.14	2,093.86	53.47%
Total Smithfield Center	431,720.00	231,405.30	200,314.70	53.60%
Contributions-Parks, Recreation and Cultural				
Farmers Market	3,000.00	-	3,000.00	0.00%
BSV Parking Lot	-	4,990.00	(4,990.00)	100.00%
TUMC Parking Lot	1,500.00	375.00	1,125.00	25.00%
Hampton Roads Partnership	1,960.00	-	1,960.00	0.00%
Isle of Wight Arts League	10,000.00	10,000.00	-	100.00%
Library	10,000.00	3,315.90	6,684.10	33.16%
Total Contributions-Park, Recreation and Cultural	26,460.00	18,680.90	7,779.10	70.60%
Windsor Castle Park				

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Salaries	73,820.00	45,145.46	28,674.54	61.16%
FICA	5,910.00	3,544.46	2,365.54	59.97%
VSRS	8,505.00	5,797.02	2,707.98	68.16%
Health	13,870.00	8,732.50	5,137.50	62.96%
Contracted Services	5,000.00	3,173.17	1,826.83	63.46%
Grass Cutting	30,000.00	18,055.04	11,944.96	60.18%
Kayak Expenses	-	353.88	(353.88)	#DIV/0!
Professional Services	1,000.00	2,184.27	(1,184.27)	218.43%
Utilities	5,000.00	2,148.54	2,851.46	42.97%
Supplies	2,500.00	821.02	1,678.98	32.84%
Repairs & Maintenance	40,000.00	35,087.06	35,592.22	87.72%
Total Windsor Castle Park	185,605.00	125,042.42	91,241.86	67.37%
<u>Other Parks & Recreation</u>				
Jersey Park Playground	1,000.00	-	1,000.00	0.00%
Pinewood Playground	500.00	-	500.00	0.00%
Clontz Park	1,600.00	849.45	750.55	53.09%
Community Wellness Initiative	35,000.00	36,174.78	(1,174.78)	103.36%
SNAP Program	-	707.25	(707.25)	100.00%
Waterworks Dam	34,000.00	15,814.90	18,185.10	46.51%
Haydens Lane Maintenance	2,900.00	4,760.90	(1,860.90)	164.17%
Veterans War Memorial	1,000.00	432.84	567.16	43.28%
Fireworks	2,000.00	2,000.00	-	100.00%
Total Parks & Recreation	78,000.00	60,740.12	17,259.88	77.87%
COMMUNITY DEVELOPMENT				
Pinewood Heights				
Non-CDBG Contributed Operating Expenses				
<u>Administration</u>				
Management Assistance	12,000.00	3,807.21	8,192.79	31.73%
Monitoring/Closeout	2,500.00	-	2,500.00	0.00%
<u>Permanent Relocation</u>				
Owner Occupied Households	107,826.00	43,797.48	64,028.52	40.62%
Renter Occupied Households	134,155.00	9,073.28	125,081.72	6.76%
Moving Costs	13,900.00	3,800.00	10,100.00	27.34%
Relocation Specialist	10,633.00	10,797.50	(164.50)	101.55%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Acquisition				
Owner Acquisition	-	71,681.56	(71,681.56)	100.00%
Acquisition Specialist	15,000.00	2,018.00	12,982.00	13.45%
Clearance & Demolition	29,000.00	5,500.00	23,500.00	18.97%
Subtotal Non CDBG	325,014.00	150,475.03	174,538.97	46.30%
CDBG Contributed Operating Expenses				
Permanent Relocation				
Owner Occupied Households	230,394.00	49,626.00	180,768.00	21.54%
Renter Occupied Households	-	-	-	-
Acquisition				
Owner Occupied	-	71,000.00	(71,000.00)	100.00%
Clearance & Demolition				
	-	-	-	0.00%
		-	-	0.00%
Subtotal CDBG	230,394.00	120,626.00	109,768.00	52.36%
Total Pinewood Heights Contributions	555,408.00	271,101.03	284,306.97	48.81%
Contributions-Community Development				
APVA Courthouse Contribution	5,000.00	-	5,000.00	0.00%
Chamber of Commerce	6,000.00	6,000.00	-	100.00%
Christian Outreach	14,000.00	14,000.00	-	100.00%
Genieve Shelter	9,000.00	-	9,000.00	0.00%
TRIAD	1,650.00	1,650.00	-	100.00%
Tourism Bureau	209,976.00	104,988.00	104,988.00	50.00%
Western Tidewater Free Clinic	33,339.00	33,339.00	-	100.00%
YMCA Projects	50,000.00	50,000.00	-	100.00%
Total Contributions-Community Development	328,965.00	209,977.00	118,988.00	63.83%
PUBLIC WORKS				
Planning, Engineering & Public Works				
Salaries	203,530.00	133,288.90	70,241.10	65.49%

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
FICA	16,285.00	10,785.78	5,499.22	66.23%
VSRS	24,750.00	16,425.65	8,324.35	66.37%
Health	33,600.00	21,499.35	12,100.65	63.99%
Uniforms	2,000.00	1,515.91	484.09	75.80%
Contractual	9,125.00	7,766.86	1,358.14	85.12%
GIS	1,200.00	-	1,200.00	0.00%
Recycling-new contract	212,725.00	142,676.94	70,048.06	67.07%
Trash Collection-new contract	227,555.00	150,443.89	77,111.11	66.11%
Street Lights	5,000.00	711.01	4,288.99	14.22%
Communications	15,000.00	6,585.75	8,414.25	43.91%
Safety Meetings	5,000.00	1,780.19	3,219.81	35.60%
Insurance	8,060.00	5,583.27	2,476.73	69.27%
Materials & Supplies	6,000.00	1,936.00	4,064.00	32.27%
Repairs & Maintenance	9,000.00	1,499.48	7,500.52	16.66%
Gas & Tires	10,500.00	5,143.82	5,356.18	48.99%
Travel & Training	6,000.00	2,631.82	3,368.18	43.86%
Litter Control Grant	3,765.00	-	3,765.00	0.00%
Dues & Subscriptions	2,000.00	551.00	1,449.00	27.55%
Other	1,000.00	2,221.39	(1,221.39)	222.14%
Public Works Alloc to Hwy	-	-	-	-
Total Public Works	802,095.00	513,047.01	289,047.99	63.96%
PUBLIC BUILDINGS				
Public Buildings				
Salaries	21,235.00	13,436.95	7,798.05	63.28%
FICA	1,700.00	1,144.92	555.08	67.35%
Contractual	9,000.00	10,770.12	(1,770.12)	119.67%
Communications	1,750.00	803.47	946.53	45.91%
Utilities	47,000.00	26,686.00	20,314.00	56.78%
Insurance	3,176.00	2,757.05	418.95	86.81%
Materials & Supplies	3,000.00	822.33	2,177.67	27.41%
Materials & Supplies-Town Manager	-	12.52	(12.52)	100.00%
Materials & Supplies-Police Department	-	449.25	(449.25)	100.00%
Materials & Supplies-Town Hall	-	100.63	(100.63)	100.00%
Materials & Supplies-Public Works	-	80.00	(80.00)	100.00%
Materials & Supplies-Public Restrooms	-	436.37	(436.37)	100.00%
Repairs & Maintenance	29,289.00	18,397.24	10,891.76	62.81%
Rent Expense-Office Space	4,800.00	3,200.00	1,600.00	66.67%
Other	1,000.00	820.08	179.92	82.01%
Alloc Costs to Hwy	-	-	-	-

Town of Smithfield				
General Fund Operating Budget				
Description	Adopted Budget 2013/2014	Actual as of 02/28/14	Remaining Budget	% of budget
Total Public Buildings	121,950.00	79,916.93	42,033.07	65.53%
OTHER FINANCING USES				
Other Financing Uses				
Transfers to Operating Reserves		951,858.58	(951,858.58)	100.00%
Transfers to Restricted Reserves-Special Projects (Pinewood)	-	132,970.02	(132,970.02)	-
Transfers to Restricted Reserves-S Church Street Project	-	-	-	-
Total Transfers To Reserves	-	1,084,828.60	(1,084,828.60)	100.00%
DEBT SERVICE				
Debt Service				
Principal Retirement				
Public Building Acquisition	19,914.00	-	19,914.00	0.00%
HVAC	15,300.00	10,119.34	5,180.66	66.14%
Ball Fields	73,750.00	-	73,750.00	-
Line of Credit Retirement-interest	5,000.00	-	5,000.00	0.00%
Ball field financing?				
Interest and fiscal charges				
Public Building Acquisition	33,195.00	16,597.07	16,597.93	50.00%
HVAC	2,370.00	1,716.32	653.68	72.42%
Ball Fields	14,650.00	-	14,650.00	0.00%
Total Debt Service	164,179.00	28,432.73	135,746.27	17.32%
Total General Fund Expenses	6,060,039.00	4,612,193.32	1,478,524.96	76.11%
Less Expenses related to capital projects:				
Legal Fees	-	-	-	
Professional Fees	-	-	-	
Pinewood Heights Relocation Project Expenses	(555,408.00)	(271,101.03)	(284,306.97)	
Pinewood Heights Line of Credit Expenses	(5,000.00)	-	(5,000.00)	
Total Non-operating Expenses	(560,408.00)	(271,101.03)	(289,306.97)	48.38%
Total General Fund Operating Expenses	5,499,631.00	4,341,092.29	1,189,217.99	78.93%
Net Operating Reserve (+/-)	495,912.00	(56,909.38)	522,142.10	-11.48%
Net Reserve (+/-)	1,272,451.00	127,590.64	1,114,181.08	10.03%

	Adopted Budget 2013/2014	Actual 2/28/2014	Remain Budget	% of Budget
Net Operating Reserves (Deficit)	1,272,451.00	127,590.64	1,144,860.36	10.03%
Capital Outlay General Fund				
GENERAL GOVERNMENT				
COMMUNITY DEVELOPMENT				
Pinewood Heights Relocation-CIP				
Non CDBG Capital Acquisition				
Owner Occupied Units	(1,237.00)		(1,237.00)	0.00%
Renter Occupied Units	(158,019.00)		(158,019.00)	0.00%
Vacant Lots	-		-	-
Appraisal/Legal	(7,170.00)	(3,275.00)	(3,895.00)	45.68%
Subtotal Non CDBG Capital Acquisition	(166,426.00)	(3,275.00)	(163,151.00)	1.97%
CDBG Capital Acquisition-MY2				
Owner Occupied Units	(269,800.00)	(24,000.00)	(245,800.00)	8.90%
Renter Occupied Units		-	-	-
Vacant Lots		-	-	-
Subtotal CDBG Capital Acquisition	(269,800.00)	(24,000.00)	(245,800.00)	8.90%
Total Pinewood Heights Relocation CIP	(436,226.00)	(27,275.00)	(408,951.00)	6.25%
TOWN COUNCIL				
DOCSTAR server	(7,650.00)		(7,650.00)	0.00%
TREASURER				
Computer Equipment System upgrades				
AS400 Server	(45,000.00)		(45,000.00)	0.00%
PARKS, RECREATION AND CULTURAL				
Smithfield Center upgrades	(28,000.00)		(28,000.00)	0.00%
Smithfield Center Asphalt Repairs	(6,000.00)		(6,000.00)	0.00%
Public Park Improvements (Clontz Park, Tot Lots, Waterworks Lake)	(25,000.00)		(25,000.00)	0.00%
Windsor Castle Park-outbuildings	(100,000.00)		(100,000.00)	0.00%
PUBLIC SAFETY				
Police				
Police Vehicles	(101,700.00)	(94,603.14)	(7,096.86)	93.02%
Copier	(10,000.00)		(10,000.00)	-
PUBLIC WORKS				
Vehicles and Equipment	(5,000.00)		(5,000.00)	0.00%
Work Order System	(6,250.00)	(5,712.50)	(537.50)	91.40%

	Adopted Budget	Actual	Remain	% of
	2013/2014	2/28/2014	Budget	Budget
PW Security Gate	(2,625.00)		(2,625.00)	0.00%
GIS/Mapping	(12,000.00)		(12,000.00)	0.00%
James/Washington Street Improvements	(5,000.00)		(5,000.00)	0.00%
Pinewood Heights-Stormwater Management	(75,000.00)		(75,000.00)	0.00%
Public Ball Fields	(400,000.00)		(400,000.00)	0.00%
N/S Church St Streetscape Improvements	-	-	-	0.00%
PUBLIC BUILDINGS				
Office Space Improvements-Town Hall	(7,000.00)		(7,000.00)	0.00%
Net Capital Outlay	(1,272,451.00)	(127,590.64)	(1,144,860.36)	10.03%
Net Reserves (Deficit) after capital outlay	-	(0.00)	-	0.20

Town of Smithfield				
Sewer Fund Budget				
	Adopted Budget	Balance as of	Remaining	% of
	2013/2014	02/28/14	Budget	budget
Revenue				
Operating Revenues				
Sewer Charges	699,025.00	463,913.67	235,111.33	66.37%
Sewer Compliance Fee	489,559.00	336,511.36	153,047.64	68.74%
Miscellaneous Revenue	500.00	457.03	42.97	91.41%
Connection fees	31,600.00	11,160.00	20,440.00	35.32%
Total Operating Revenue	1,220,684.00	812,042.06	408,641.94	66.52%
Town of Smithfield				
Sewer Fund Budget				
Description	Adopted Budget	Balance as of	Remaining	% of
	2013/2014	02/28/14	Budget	budget
Expenses				
Operating Expenses				
Salaries	226,915.00	134,998.30	91,916.70	59.49%
FICA	18,155.00	10,665.57	7,489.43	58.75%
VSRS	26,245.00	16,774.34	9,470.66	63.91%
Health	38,750.00	24,206.02	14,543.98	62.47%
Uniforms	2,500.00	1,198.92	1,301.08	47.96%
Audit & Legal Fees	14,750.00	4,121.56	10,628.44	27.94%
HRPDC sewer programs	872.00	918.00	(46.00)	105.28%
Maintenance & Repairs	50,000.00	24,200.52	25,799.48	48.40%
VAC Truck Repairs & Maintenance	7,500.00	4,333.93	3,166.07	57.79%
Data Processing	14,000.00	8,782.19	5,217.81	62.73%
Dues & Subscriptions	150.00	30.00	120.00	20.00%
Utilities	43,500.00	24,042.18	19,457.82	55.27%
SCADA Expenses	6,000.00	3,255.13	2,744.87	54.25%
Telephone	12,000.00	6,021.26	5,978.74	50.18%
Insurance	16,140.00	11,180.40	4,959.60	69.27%
Materials & Supplies	46,000.00	13,854.04	32,145.96	30.12%
Truck Operations	14,000.00	6,327.51	7,672.49	45.20%
Travel & Training	4,000.00	83.33	3,916.67	2.08%
Contractual	3,250.00	1,539.90	1,710.10	47.38%
Miscellaneous	600.00	377.04	222.96	62.84%
Bad Debt Expense	5,000.00	-	5,000.00	0.00%
Bank service charges	325.00	-	325.00	0.00%

Town of Smithfield				
Sewer Fund Budget				
	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Total Sewer Fund Operating Expenses before D&A Exp.	550,652.00	296,910.14	253,741.86	53.92%
Operating Income before D&A Expense	670,032.00	515,131.92	154,900.08	76.88%
Depreciation & Amort. Exp.	772,720.00	378,643.00	394,077.00	49.00%
Operating Income (Loss)	(102,688.00)	136,488.92	(239,176.92)	-132.92%
Nonoperating Revenues (Expenses)				
Pro-rata Share Fees	-	8,000.00	(8,000.00)	100.00%
Availability Fees	82,400.00	28,840.00	53,560.00	35.00%
Insurance Reimbursements	-	-	-	0.00%
Contributed Capital-Smithfield Foods Rev Ln	21,733.00	-	21,733.00	0.00%
Interest Revenue	3,250.00	2,977.15	272.85	91.60%
Interest Expense	(39,351.00)	(21,350.20)	(18,000.80)	54.26%
Total Nonoperating Revenues (Expenses)	68,032.00	18,466.95	49,565.05	27.14%
Net Income (loss)	(34,656.00)	154,955.87	(189,611.87)	-447.13%
WORKING ADJUSTMENTS TO CAFR				
(FOR INTERNAL USE ONLY)				
Restricted revenues:				
Pro-rata Share Fees	-	(8,000.00)	8,000.00	#DIV/0!
Availability Fees	(82,400.00)	(28,840.00)	(53,560.00)	35.00%
Contributed Capital-Smithfield Foods Rev Ln	(21,733.00)	-	(21,733.00)	0.00%
Compliance Fee	(489,559.00)	(336,511.36)	(153,047.64)	68.74%
Bad Debt Expense	5,000.00	-	5,000.00	0.00%
Depreciation & Amort. Exp.	772,720.00	378,643.00	394,077.00	49.00%
Additional debt service costs-principal expense	(74,700.00)	(74,700.00)	-	100.00%
Total adjustments to CAFR	109,328.00	(69,408.36)	178,736.36	-63.49%
Working adjusted income	74,672.00	85,547.51	(10,875.51)	114.56%

	Adopted Budget 2013/2014	Actual 2/28/2014	Remaining Budget	% of Budget
Sewer Fund				
Working adjusted income	74,672.00	85,547.51	(10,875.51)	114.56%
Sewer SSO Consent Order	(325,000.00)	(48,199.50)	(276,800.50)	14.83%
Storage Shed	-	(1,987.08)	1,987.08	100.00%
Construction Standards Update	(4,201.00)	-	(4,201.00)	0.00%
Work Order System	(6,250.00)	(5,712.50)	(537.50)	91.40%
PW Security Gate	(2,625.00)	-	(2,625.00)	0.00%
Arc Flash	-	(35,000.00)	35,000.00	100.00%
Sewer Capital Repairs	(100,000.00)	(5,205.00)	(94,795.00)	5.21%
Pump Station Upgrades	(100,000.00)	(50,292.30)	(49,707.70)	50.29%
Truck/Equipment	(10,000.00)	-	(10,000.00)	0.00%
Net Capital Outlay	(548,076.00)	(146,396.38)	(401,679.62)	26.71%
Net Reserves (Deficit) after capital outlay	(473,404.00)	(60,848.87)	(412,555.13)	12.85%
Funding from Development Escrow	-	-	-	
Reserves from Sewer Capital Escrow Account	200,000.00	43,582.00	156,418.00	21.79%
Funding from Sewer Compliance Fee	325,000.00	43,999.50	281,000.50	13.54%
Draw from operating reserves		-	-	
Funding from Bond Escrow (released from refinance)		-	-	
Net Cashflow	51,596.00	26,732.63	24,863.37	51.81%

Town of Smithfield				
Water Fund Budget				
Description	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Revenue				
Operating Revenue				
Water Sales	1,453,834.00	967,194.69	486,639.31	66.53%
Debt Service Revenue	187,896.00	168,790.20	19,105.80	89.83%
Miscellaneous	500.00	2,651.80	(2,151.80)	530.36%
Connection fees	13,200.00	4,870.00	8,330.00	36.89%
Application Fees	5,000.00	3,761.00	1,239.00	75.22%
Total Operating Revenue	1,660,430.00	1,147,267.69	513,162.31	69.09%
Town of Smithfield				
Water Fund Budget				
Description	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Expenses				
Salaries	348,720.00	216,137.62	132,582.38	61.98%
FICA	27,900.00	17,108.01	10,791.99	61.32%
VSRS	38,530.00	23,292.38	15,237.62	60.45%
Health	49,735.00	30,433.25	19,301.75	61.19%
Uniforms	3,255.00	1,521.13	1,733.87	46.73%
Contractual	15,000.00	9,381.75	5,618.25	62.55%
Legal & Audit	20,000.00	4,241.56	15,758.44	21.21%
Maintenance & Repairs	21,000.00	4,213.92	16,786.08	20.07%
Water Tank Maintenance	100,000.00	76,404.96	23,595.04	76.40%
Professional Services	1,000.00	10,114.36	(9,114.36)	1011.44%
Regional Water Supply Study	2,580.00	1,839.00	741.00	71.28%
Data Processing	14,000.00	8,782.19	5,217.81	62.73%
Utilities	1,500.00	848.68	651.32	56.58%
Communications	15,045.00	5,991.24	9,053.76	39.82%
Insurance	25,200.00	17,456.37	7,743.63	69.27%
Materials & Supplies	114,400.00	27,963.14	86,436.86	24.44%
Gas and Tires	14,500.00	8,341.07	6,158.93	57.52%
Dues & Subscriptions	1,000.00	645.95	354.05	64.60%
Bank service charges	325.00	8.00	317.00	2.46%
Travel and Training	5,500.00	144.48	5,355.52	2.63%
Miscellaneous	9,500.00	8,849.93	650.07	93.16%
RO Annual costs	470,673.00	253,488.47	217,184.53	53.86%
Bad debt expense	7,500.00	-	7,500.00	0.00%
Total Water Fund Operating Expenses before D&A Exp.	1,306,863.00	727,207.46	579,655.54	55.65%

Town of Smithfield				
Water Fund Budget				
Description	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Operating Income before D&A Expense	353,567.00	420,060.23	(66,493.23)	118.81%
Depreciation & Amortization Expense	365,000.00	220,228.79	144,771.21	60.34%
Operating Income (Loss)	(11,433.00)	199,831.44	(211,264.44)	-1747.85%
Nonoperating Revenues (Expenses)				
Pro-Rata Share Fees	-	8,000.00	(8,000.00)	#DIV/0!
Availability Fees	54,400.00	19,040.00	35,360.00	35.00%
Interest Revenue	5,925.00	4,458.13	1,466.87	75.24%
Interest Expense	(123,720.00)	(70,425.12)	(53,294.88)	56.92%
Total Nonoperating Revenues (Expenses)	(63,395.00)	(38,926.99)	(24,468.01)	61.40%
Net Income (Loss)	(74,828.00)	160,904.45	(235,732.45)	-215.03%
WORKING ADJUSTMENTS TO CAFR				
(FOR INTERNAL USE ONLY)				
Restricted revenues:				
Pro-rata Share Fees	-	(8,000.00)	8,000.00	#DIV/0!
Availability Fees	(54,400.00)	(19,040.00)	(35,360.00)	35.00%
Bad Debt Expense	7,500.00	-	7,500.00	0.00%
Debt Service Revenue	(187,896.00)	(168,790.20)	(19,105.80)	89.83%
Depreciation & Amort. Exp.	365,000.00	220,228.79	144,771.21	60.34%
Additional debt service costs-principal expense	(322,275.00)	(245,690.39)	(76,584.61)	76.24%
Total adjustments to CAFR	(192,071.00)	(221,291.80)	29,220.80	115.21%
Working adjusted income	(266,899.00)	(60,387.35)	(206,511.65)	22.63%

	Adopted Budget 2013/2014	Actual 2/28/2014	Remain Budget	% of Budget
Water Fund				
Net Operating Reserves (Deficit)	(266,899.00)	(60,387.35)	(206,511.65)	22.63%
Construction Standards Update	(4,201.00)		(4,201.00)	0.00%
Discharge Analysis	(25,000.00)		(25,000.00)	0.00%
Vehicle/Equipment	(10,000.00)		(10,000.00)	0.00%
Work Order System	(6,250.00)	(5,712.50)	(537.50)	91.40%
Public Works Security Gate	(2,625.00)		(2,625.00)	0.00%
RO Security Gate	(10,000.00)		(10,000.00)	0.00%
Roofing Repairs		(7,550.00)	7,550.00	100.00%
System Improvements	(50,000.00)		(50,000.00)	0.00%
Water line replacement (Cypress Creek Bridge)	(110,000.00)	-	(110,000.00)	-
Net Capital Outlay	(218,076.00)	(13,262.50)	(204,813.50)	6.08%
Net Reserves (Deficit) after capital outlay	(484,975.00)	(73,649.85)	(411,325.15)	15.19%
Operating Reserves		-	-	-
Water Development Escrow	25,000.00	-	25,000.00	-
Water Capital Escrow	160,000.00	-	160,000.00	-
Debt Service fees applied to debt	331,758.00	246,195.78	85,562.22	74.21%
Net Cashflow	31,783.00	172,545.93	(140,762.93)	542.89%

Town of Smithfield				
Highway Fund				
Description	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Revenue				
Interest Income	250.00	139.91	110.09	55.96%
Revenue - Commwlth of VA	1,003,519.92	516,556.34	486,963.58	51.47%
Total Highway Fund Revenue	1,003,769.92	516,696.25	487,073.67	51.48%
Town of Smithfield				
Highway Fund				
Description	Adopted Budget 2013/2014	Balance as of 02/28/14	Remaining Budget	% of budget
Expenses				
Salaries	248,065.00	150,716.83	97,348.17	60.76%
FICA	19,845.00	11,875.11	7,969.89	59.84%
VSRS	29,090.00	17,965.03	11,124.97	61.76%
Health	45,290.00	28,837.72	16,452.28	63.67%
Uniforms	3,100.00	1,430.02	1,669.98	46.13%
Engineering	-	-	-	-
Grass	31,400.00	13,600.00	17,800.00	43.31%
Maintenance	327,682.42	246,790.23	80,892.19	75.31%
Asphalt/Paving		109,561.52	(109,561.52)	
Ditching		76,835.96	(76,835.96)	
Traffic Control devices		17,072.54	(17,072.54)	
Other (maintenance)		222.93	(222.93)	
Other (lawnmowers, landscaping, etc)		40,213.71	(40,213.71)	
Structures and Bridges		-	-	
Ice and Snow removal		2,019.67	(2,019.67)	
Administrative		863.90	(863.90)	
Street Lights	110,000.00	59,125.05	50,874.95	53.75%
Insurance	19,440.00	13,466.34	5,973.66	69.27%
VAC Truck Repairs	2,500.00	1,444.64	1,055.36	57.79%
Gas and Tires	10,000.00	5,816.38	4,183.62	58.16%
Stormwater Management Program (regional)	1,786.00	1,664.00	122.00	93.17%
Joint Cost Allocation	-	-	-	-
Overhead Allocation	-	-	-	-
Total Highway Fund Expense	848,198.42	552,731.35	295,467.07	65.17%
Net Reserves (+/-)	155,571.50	(36,035.10)	191,606.60	-23.16%

	Adopted Budget 2013/2014	Actual 2/28/2014	Remain Budget	% of Budget
HIGHWAY				
Net Operating Reserves (Deficit)	155,571.50	(36,035.10)	191,606.60	-23.16%
Construction Standards Update	(4,201.00)		(4,201.00)	0.00%
New Truck	(8,750.00)		(8,750.00)	0.00%
PW Security Gate	(2,625.00)		(2,625.00)	0.00%
Entrance Corridor Beautification	(5,000.00)		(5,000.00)	0.00%
Work order system	(6,250.00)	(5,712.50)	(537.50)	91.40%
Storm Drain Replacement - Nottingham	(20,745.50)	(20,745.50)	-	100.00%
Pinewood Stormwater Drainage	(100,000.00)		(100,000.00)	0.00%
Lawnmower	(8,000.00)	(7,945.00)	(55.00)	99.31%
Net Capital Outlay	(155,571.50)	(34,403.00)	(121,168.50)	22.11%
Net Reserves (Deficit) after capital outlay	0.00	(70,438.10)	70,438.10	
Carryover from FY2013		<u>110,821.55</u>		
Net Adjusted Reserves (deficit)		40,383.45		

Notes: February 2014

GENERAL FUND

Revenues:

Current RE Tax

Through March 18, we have posted \$1,644,983 of real estate tax collections (99.10%). Delinquent notices have been processed, however, we still have 3 sizable (\$18,295) delinquent business accounts that if paid would bring us up to budget. Am working with the Town Attorney to contact those account holders.

Delinquent RE Tax

Delinquent real estate collections of \$19,440 (97.20%) have been posted through March 18, 2014. We have collected \$5,093 since delinquent notices were mailed. Have provided a list to the Town Attorney of those with 3 years of delinquent RE taxes.

Current PP Tax

Current personal property collections of \$835,832 (99.74%) have been posted through March 18. This includes \$240,795 in personal property tax relief from the state. The delay in mailing delinquent RE tax notices subsequently delayed the mailing of delinquent PP, but they have been processed and the clerks are now working those collections.

Delinquent PP Tax

Delinquent collections of \$12,033 have been posted through March 18, 2014. This amount is slightly lower than what is showing in the February financial statements because of abatements processed for prior year that have been refunded (credit balance). We are currently working on the next batch of supplements and we will be doing DMV stops next month, so I expect this number to increase closer to the budget level.

Franchise Tax

As in previous years, franchise tax will not be collected until the last quarter of the fiscal year.

Transient Occupancy

Transient occupancy appears to be below budget for 3 quarters; however, we are missing payment from one hotel for the quarter ending December 31, 2013 that was due on January 20, 2014. Per the owner, payment was mailed on the due date; however, evidence of a stop payment has not been produced nor has a replacement check been received. We have made contact several times and have had Peter make contact as well.

Communications Tax

There is a 2 month delay in receipt of communications tax from the state. The February statements reflect collection of the July through December 2013 communications tax.

Sales Tax

There is also a delay in sales tax that comes from the state but is passed to the Town through IOW County. February statements reflect sales tax for July through December 2013. Through February, we are \$14,558 above sales tax receipts for the same period in FY2013.

Consumption/Utility Tax

Consumption and utility taxes reflect receipts for July through January. These taxes are higher than FY2013 by \$6269. These taxes tend to remain fairly consistent from year to year and will probably balance out close to budget in the remaining months of the fiscal year.

Business licenses

Business license tax is due on April 15, so the majority of this revenue will be paid during the last quarter of the fiscal year. Notices for license renewals have been mailed and collections have started for 2014. We have collected \$120,192 through March 18.

Permits & other licenses

Permits are running slightly below budget and last year's total of \$9558 through February. Last year's permits included a large land disturbance permit and a ROW permit for VICO Construction for Harvest Fellowship Baptist Mission Improvements.

Dog Park Registrations

Dog park registrations are in line with 2013. We have collected \$1785 through March 18 compared to \$1491 last year. Total collections for FY2013 were \$2403.

Review Fees

Review fees have been collected for 4 sites this fiscal year:
L and L Marine-Carver Avenue
Smithfield Foods-test kitchen
OC Inc-home on Smithfield Blvd.
Smithfield Manor Townhomes LLC-Phase 5
Par 3 Development Group-Dollar General on W Main St.

Vehicle Licenses

Collections through March 18 total \$120,575 (88.99%). This number should increase as supplements are processed and delinquents are collected. The total for 2013 was \$137,129.

Fines & Costs

Fines for February represent payments for July 2013 through January 2014. Currently, we have received \$8,472 more than the same period in 2013.

Rentals

Rent is below budget at this point in the fiscal year, but should slightly exceed budget by year end. In January, the Charter rental payment increased from \$696.73 to \$717.63 per month, and the NDS annual payment of \$1200 (for use of space on our water tower) is not paid until the spring.

Smithfield Center Rentals

Smithfield Center Rentals of \$91,880 are lower than the same period last year of \$98,162. This is an improvement from prior month and is only slightly below budget (67%).

Smithfield Center Vendor Rentals

This line item is notably lower than February 2013 collections of \$4,500.

Kayak Rentals

Kayak rentals since July 2013 total \$7092.25 which when added to the June 2013 receipts of \$1044 equal \$8136.25 for the first season. This was a very popular activity at the park and a successful venture for the Town.

Special Events

This line item represents the fees and labor reimbursements paid by private organizations for

events held in the Town. Since this was the first full year that we charged for these events, the budget was just an estimate and will be adjusted accordingly for next fiscal year.

Sale of Equipment

Sold numerous item to date but the largest dollar sales were a 2000 Ford F250 PU (\$2820) and a sewer grinder pump (\$500).

Cash Proffer Revenues

The Town received \$24,000 from builders for Church Square and \$255 from HHJV LLC that were passed through to fire/rescue. Budget will be adjusted at year end.

Obici Foundation Wellness Grant

During July 2013, received \$10,000 of the \$12,500 budgeted for this year. In January \$4500 was reimbursed to Obici Healthcare for items that could not be addressed in Round 11. In February received an additional \$10,000 for round 12, so we will exceed budget by \$3000.

VML Safety Grant

The Town received a VML safety grant of \$4,000 which exceeds budget of \$3861. Budget was based on FY2013 actual.

Restricted Reserves-Police Department

The Smithfield Police Department was presented with \$24000 by Farmers Bank in FY2013 for their assistance with the 2013 bank robbery. This money is being utilized by the PD in the current fiscal year with expenses reflected under Police Grant Expense.

Reserves-Pinewood Escrow

The Pinewood Escrow reserve funds were set aside in Phase I to pay the 42 month rent and utility supplement required for market rate renters. We currently only have one market rate renter still being supplemented, and that supplement will end in the fall of 2014.

Law Enforcement Grant

This grant is paid quarterly. The next payment will be in March 2014, so we will meet budget by fiscal year end.

Litter Control Grant

The Town received litter grant of \$3321. Budget based on prior year allocation.

Fire Programs

Fire Programs is a pass through revenue for our local fire department. Application has been made for those funds, so they should be received before the fiscal year end.

DCA Grant (Dam)

We have had some small expenses for the Waterworks Lake Dam this year, but I need to check with Peter on the status of this account for 2013. It may need to be rolled into 2014.

SNAP Program

This represents state money received to match grant money for the food voucher program at the Farmers Market as part of the wellness initiative.

Federal Grants

The PD has received 3 grants this year from traffic safety totaling \$4065.52.

Pinewood Heights CDBG Relocation Grant-Phase II

The Town received \$132,626 from the VDHCD for reimbursement of owner and acquisition and relocation costs for one property in Phase II MY1.

Insurance Recoveries-

The Town was reimbursed by VML for damages to 2 police vehicles-one hit by a deer and one by a raccoon.

Expenses:

ALL DEPARTMENTS

Insurance

The first 3 quarters of VML property/casualty/workers' compensation insurance have been paid and account for approximately 75% of budget.

Subscriptions/Memberships

Most annual dues and subscriptions are paid in the first few months of the fiscal year which accounts for the high percentage of expense to date in this line item for most departments.

Town Council

Professional Services

Paid Clerk Nexsen \$5,008 for services through October 16, 2013 for South Church Street Streetscapes Improvements. This project was effectively closed out in FY2013 so this invoice is being expensed against professional services (non-budgeted). Also includes \$1350 for training for cable channel upgrades (budgeted).

Records Management

Payment for software upgrade and training. Total expense for this item was a little more than budgeted which puts it over the threshold for capital expense. May move this item to capital when budget amendments are made.

Travel & Training

Includes \$1720 to VML to register 4 council members for October conference
Includes \$3311.36 to Bank of America for Marriott lodging for VML conference

Special Projects

For Olden Days, the expenses included \$1,281.04 paid to All Virginia for dumpsters, \$102.00 to Farmers Service for bales of wheat straw, & \$668.67 to IOW for portable toilets and sinks, \$139.00 paid out for food expenses. Paid \$93.20 to Roeda Signs for Town Special Events. In September paid \$82.40 to Isle of Wight County for fence permit at the Farmers Market. February costs consisted of \$94.32 for a lunch meeting with the Fraziers.

Smithfield CHIPS program

Paid \$2,830.00 to VCE-Isle of Wight County for 4-H Camp for children sponsored by CHIPS.

Update Town Charter & Code

The Town paid Municipal Code Corporation \$1,042.00 to update Town's Charter & Code and paid \$650 for the annual fee to have internet access to the Code.

Treasurer

Credit Card Processing

Credit card processing has exceeded budget for the year. Activity has picked up since we added the credit card machine at the window. In past years we only collected real estate and personal property taxes online, but now we are able to accept payments for all transactions. We have also added the water account so we can take credit cards for deposits.

Cigarette Tax Stamps

Purchased one case of cigarette tax stamps in January. This purchase should take us through the rest of the fiscal year.

Public Safety

Police Department

Service Contracts

Includes required annual maintenance fee to Sungard Public Sector Inc for \$19,722.08, ID Networks for \$4434, and leads online for \$2,128.

Insurance-LODA

This is the additional insurance premium as required by the Line of Duty Act.

Fire Department

Fuel Fund & Travel

This item represents a contribution the Town makes to the fire department for the number of runs made during the fiscal year. This money is redistributed by the fire department to the volunteers participating in those runs to offset fuel costs and wear on their vehicles. We usually pay this in May or June.

State passthru funds

We have filed a request with the state for the 2014 funds. Distribution will be before the fiscal year end.

Contributions-Public Safety

E911 Dispatch Center

Paid \$50,762.50 in February (as approved by Council) towards the 2014 annual contribution. The remaining balance represents monthly payments of E911 communications tax to IOW.

Fire Department Rescue Truck

Paid in full in February as per Council approval.

Parks Recreation & Cultural

Smithfield Center

Travel and Training

Reimbursed Amy Musick \$766.00 for ODU class related to parks and recreational management and paid \$635 to IACCA for conference registration. Paid another \$914 to Old Dominion University for spring class for Amy Musick.

Contributions-Parks, Rec, & Cultural

BSV Parking Lot

Payment of \$4990 to Hercules Fence for the BSV Parking lot used for Farmers Market

Isle of Wight Arts League

This is a matching grant of \$5000 from the Town and \$5000 from the state. Both the local and state funds have been forwarded to the arts league.

Windsor Castle-Professional Services

Includes \$1740 to Frazier Associates for site visit to Windsor Castle and \$444.27 to the Smithfield Station for lodging for Ron King (playground).

Windsor Castle-repairs & maintenance

In December, the Town paid \$9,610 to James River Grounds Management to replace dead trees at Windsor Castle Park. Other notable costs include \$19,500 paid to Goodrich and Sons in November to take down trees in the park and haul away.

Community Wellness Initiative

We have closed Round 11 and are getting close to closing round 12 of the Obici Foundation Grant. This line item represents grant covered expenses and required matching from the Town. It is exceeding budget because of cross over between grants.

SNAP Program

This expense is part of the Smithfield On the Move Grant. SNAP is used to fund vouchers for qualified individuals at the Farmers Market. Part of this cost is reimbursed from the state and shows as revenue.

Waterworks Dam

\$15300 paid to Draper Aden Associates for engineering work related to the dam. Part of this expense is expected to be reimbursed through grant funds.

Haydens Lane Maintenance

Includes \$4452.20 to C.L. Smith for brick walk repairs.

Community Development

Pinewood Heights

Activity is picking up on this project. We acquired 45 Carver in February and relocated the homeowner in early March.

TRIAD, Chamber of Commerce, Christian Outreach, & Western Tidewater Free Clinic

Total annual budgeted contributions have been paid to each of these organizations. Genieve Shelter and Courthouse will be paid in March.

Tourism Bureau

Paid \$104,988 to Isle of Wight County as per Council approval in February for 1/2 of the Town's allocated budget for 2014.

YMCA

This budgeted contribution was paid in full in February as per Council approval.

Public Works

Uniforms

Uniforms are running slightly above budget because of lined bibs that were purchased for the men and charged 1/2 to safety and 1/2 to uniforms.

Contractual

Includes \$2100 for second installment for public works accreditation. This was not a budgeted item.

Other

Includes \$1170 to Southern Shores for cutting overgrown lots in town. Those have been billed to property owners.

Public Buildings

Contractual

Includes \$2149.68 to Fonality for annual software & support agreement for the phone system. Also includes \$1020.80 for anti-spam software renewal for all departments for 1 year (not budgeted in this line item). This line item also includes contracted maintenance with workplace essentials for mats in the public restrooms. This was not originally budgeted. In March we paid \$3,326 to Windsor Fire Extinguisher for annual inspections at the PD, TM, and Town Hall offices including program dialers, monthly fees, and panic/holdup buttons. This was \$1063 higher than 2013 charges to Windsor Fire & SimplexGrinnel.

Other Financing Uses

Transfers to Operating Reserves

We have collected \$951,858 more in revenue than was spent as of February 28, 2014. Reserves as of January 2013 were \$1,866,420 but included a \$400,000 contribution for South Church Street and over \$400,000 for the sale of land.

Transfers to Reserves-Special Projects

This represents monies taken in from meals tax that have not yet been expended on the Pinewood Project. This line item will disappear as we close on remaining properties.

Capital:

Police

Police Vehicles

This expense represents the purchase of three police vehicles.

SEWER

Revenues

Sewer Charges

Sewer revenues of \$463,914 are \$7,672 lower than February 2013 (\$471,586). This is an improvement over January year-to-date revenues (\$12,000 lower) moving us closer towards budget. Year-to-date consumption dropped from 134,663,193 in 2013 to 131,815,959 in 2014.

Connection Fees

Connection fees are collected sporadically throughout the fiscal year. To date the Town has collected on 7 connections at \$1580 and one at \$100. Last year this time, we had collected on 20 connections.

Expenses

HRPDC Sewer Programs

This reflects the annual billing from the HRPDC. This line item was increased from the original budget submitted by HRPDC.

Insurance

Represents 3 quarterly payments to VML for property/casualty and workers' compensation insurance.

Nonoperating Revenues (Expenses)

Pro-rata share fees

Received \$8000 from Dominion Building Corp for Lots 28-32 Smithfield Manor.

Interest Expenses

Represents 1st of 2 interest payments for the year for the 2004 GO Refunding Bond.

Additional Working Adjustments to CAFR

Additional debt service costs-principal expense

Represents full payment of principal portion of the 2004 GO Refunding Bond for the year.

Sewer Capital

Storage Shed

This line item was not budgeted, but it is being funded from sale of scrap metal and govdeals items by the public utilities department.

ARC Flash Upgrades

Work done by REW to prevent ARC Flash at substations. Will come out of sewer capital repairs budget but listed separately to show detail.

Pump Station Upgrades

Paid \$43582 to REW in November for control panel upgrades at Watson and Cypress Creek Pump Stations.

WATER

Revenues

Water Charges

Water revenues of \$967,194 increased \$88,515 from February 2013's total of \$878,679. Consumption decreased from 173,654,567 in FY2013 to 172,269,721 in current year. Of that decrease, Gatling Pointe remained relatively flat dropping slightly from 31,730,800 gallons through February 2013 compared to 30,137,300 in 2014. Revenue from Gatling Pointe was almost exactly the same at \$190,068 for 2013 and \$190,199 for 2014 as the rate was increased from \$5.99 to \$6.41 per 1,000 gallons.

Miscellaneous

Included is the sale of scrap metal for \$2,426.80. Also includes purchase of new register and radio read at Harvest Fellowship (\$150.00) , a water meter box (\$50) for 300 Queen Court, and a \$25 returned check charge.

Connection Fees

As with sewer, the Town has only collected on 7 accounts at \$660 and 1 at \$250. Last year the Town had collected on 20 connections through February.

Expenses

Professional services

This represents \$10,114.36 paid to Kimley-Horn for analysis done on the RO discharge alternatives.

Regional Water Program

Annual billing from HRPDC. This budgeted amount actually decreased from the original budget submitted by HRPDC.

Insurance

Represents 3 quarterly payments to VML for property/casualty and workers' compensation insurance.

Miscellaneous

Includes a lump sum payment to VDH-Waterworks Technical Assistance Fund (\$8,670.05). This is billed annually and is based on the number of water customers in the town's system. The rate for this billing is \$2.95 per connection.

Nonoperating Revenues (Expenses)

Pro-rata share fees

Received \$8000 from Dominion Building Corp for Lots 28-32 Smithfield Manor.

Interest Expense

Represents both semi-annual payments of the two VML-VACO loans and the 1st semi-annual payment of the 2004 GO Refunding Bond. This account will balance to budget when year end accrued interest entries are made.

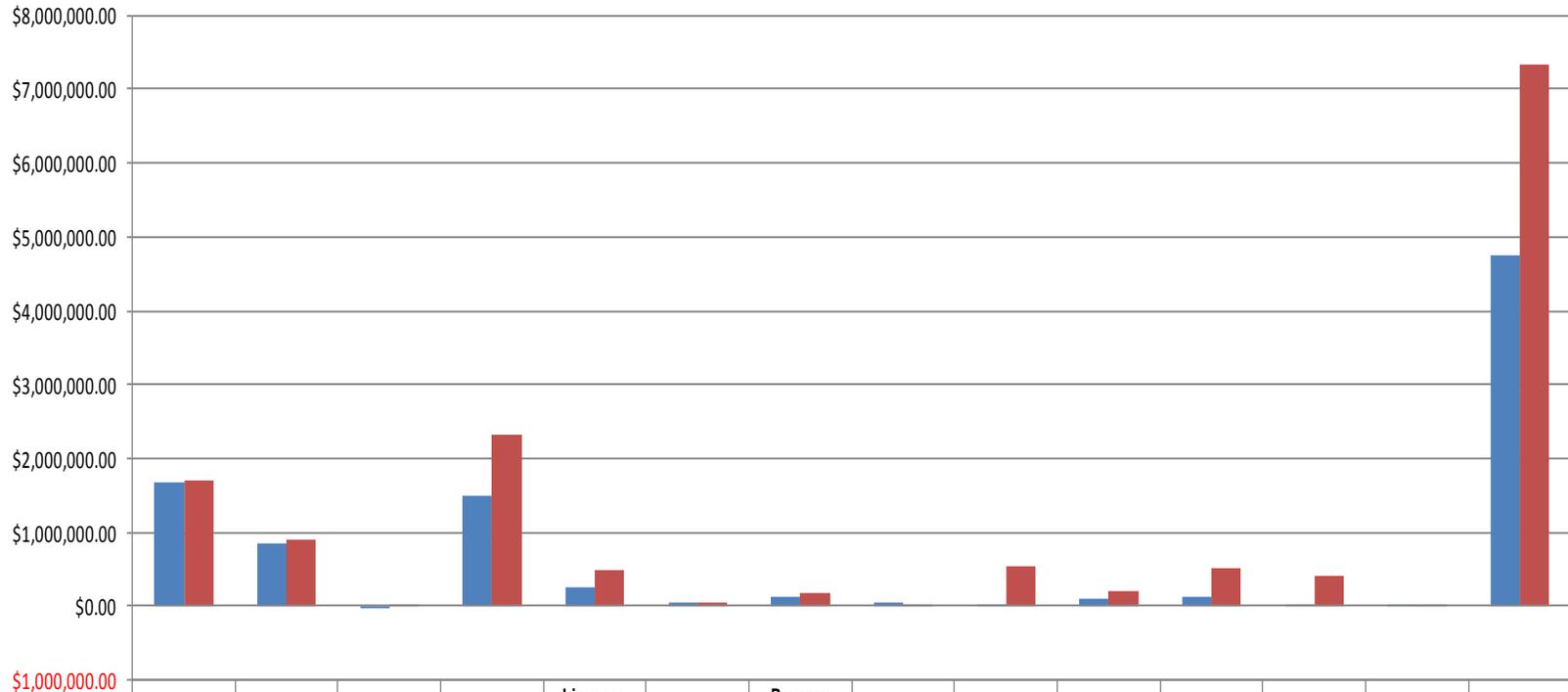
Additional Working Adjustments to CAFR

Additional debt service costs-principal expense

Made up of 2 debt service principal payments for the VML-VACO Loans 1 and 2 as well as one principal payment for the water portion of the 2004 GO Refunding Bond. There is only one principal payment left for the year (VML VACO Loan 2).

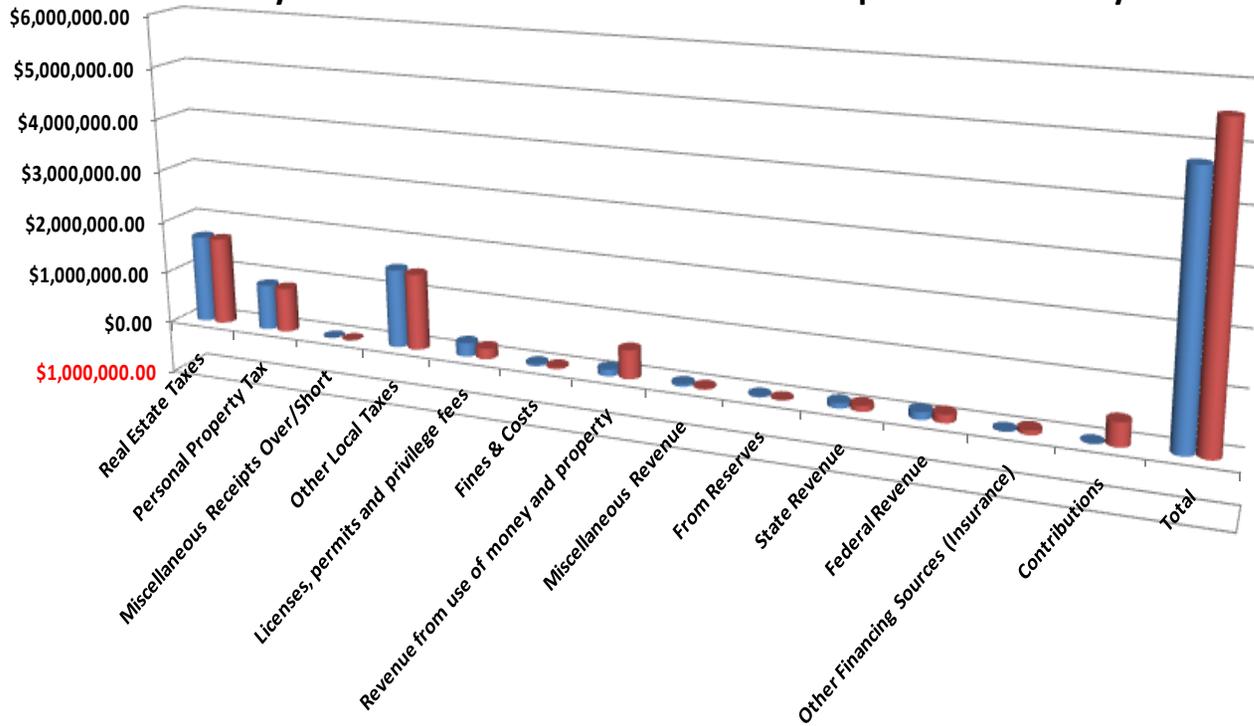
FEBRUARY 2014 FINANCIAL GRAPHS

February 2014 YTD General Fund Revenues Compared to Budget



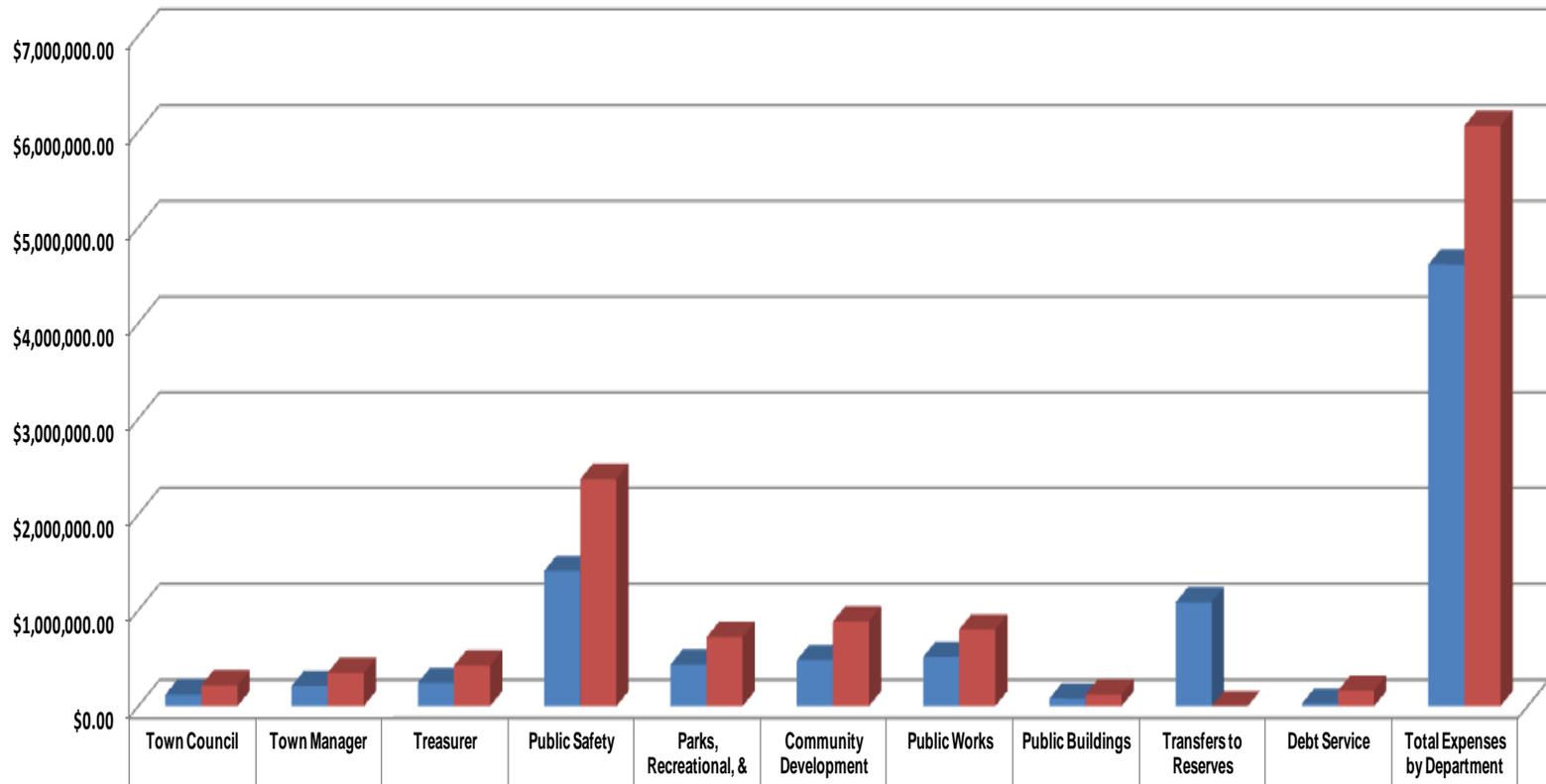
	Real Estate Taxes	Personal Property Tax	Misc. Receipts Over/Short	Other Local Taxes	Licenses, permits and privilege fees	Fines & Costs	Revenue from use of money and property	Misc. Revenue	From Reserves	State Revenue	Federal Revenue	Other Financing Sources	Contributions	Total
February 2014 Actual	\$1,667,262	\$861,379	\$(10)	\$1,483,191	\$253,199	\$42,284	\$124,649	\$44,899	\$23,941	\$93,053	\$136,691	\$9,146	\$100	\$4,739,784
Budget	\$1,692,900	\$897,470	\$15	\$2,314,573	\$492,765	\$57,000	\$173,195	\$18,561	\$543,693	\$208,624	\$506,194	\$400,000	\$27,500	\$7,332,490

February 2014 YTD General Fund Revenue Compared to February 2013



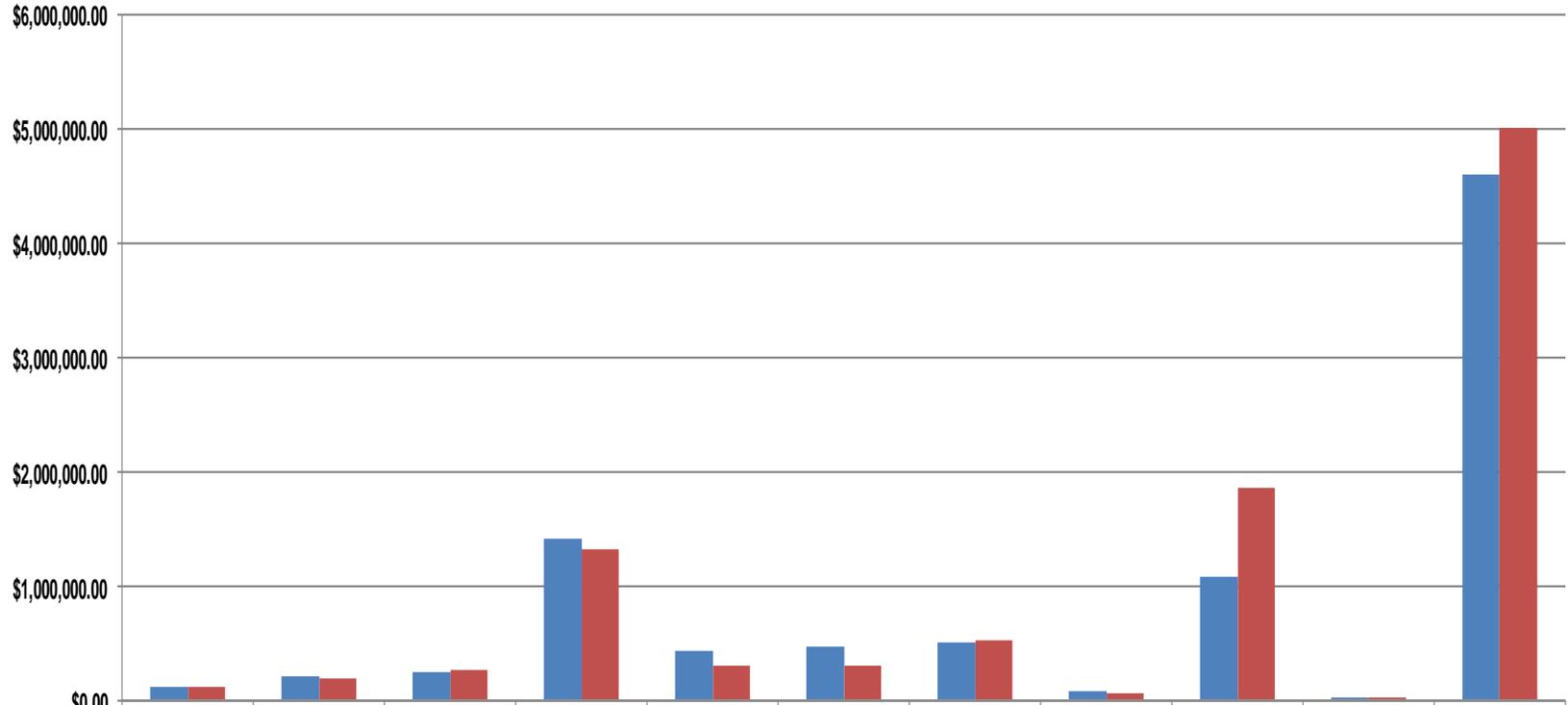
	Real Estate Taxes	Personal Property Tax	Miscellaneous Receipts Over/Short	Other Local Taxes	Licenses, permits and privilege fees	Fines & Costs	Revenue from use of money and property	Miscellaneous Revenue	From Reserves	State Revenue	Federal Revenue	Other Financing Sources (Insurance)	Contributions	Total
February 2014 Actual	\$1,667,262	\$861,379	\$(10)	\$1,483,191	\$253,199	\$42,284	\$124,649	\$44,899	\$23,941	\$93,053	\$136,691	\$9,146	\$100	\$4,739,784
February 2013 Actual	\$1,663,441	\$843,079	\$(71)	\$1,441,958	\$201,213	\$33,833	\$536,661	\$27,627	\$9,745	\$102,983	\$150,102	\$84,299	\$432,170	\$5,527,040

February 2014 YTD General Fund Operating Expenses Compared to Budget



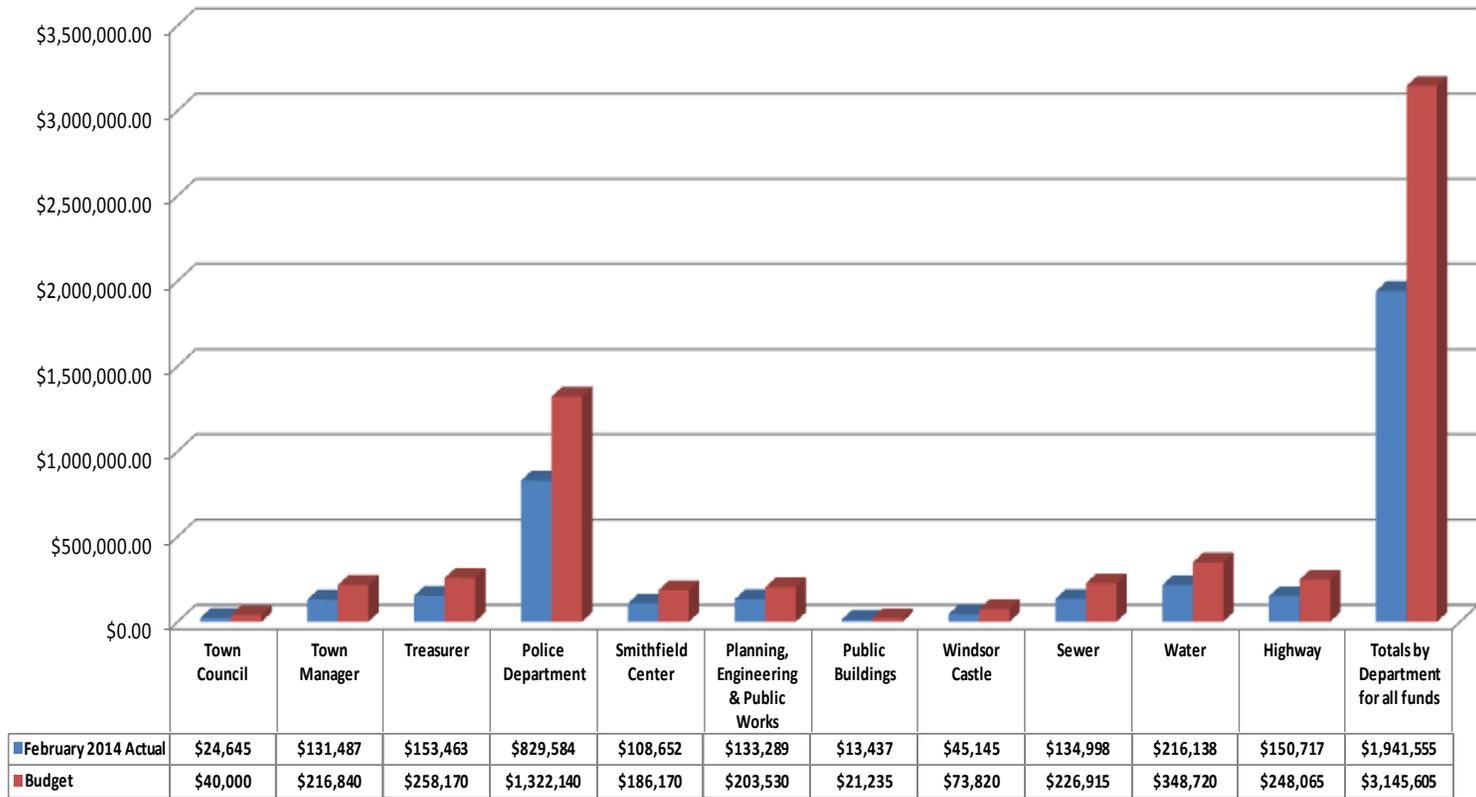
	Town Council	Town Manager	Treasurer	Public Safety	Parks, Recreational, & Cultural	Community Development	Public Works	Public Buildings	Transfers to Reserves	Debt Service	Total Expenses by Department
February 2014 Actual	\$121,776	\$210,457	\$243,641	\$1,413,147	\$435,869	\$481,078	\$513,047	\$79,917	\$1,084,829	\$28,433	\$4,612,194
Budget	\$219,311	\$349,695	\$425,150	\$2,371,501	\$721,785	\$884,373	\$802,095	\$121,950	\$-	\$164,179	\$6,060,039

February 2014 YTD General Fund Operating Expenses Compared to February 2013

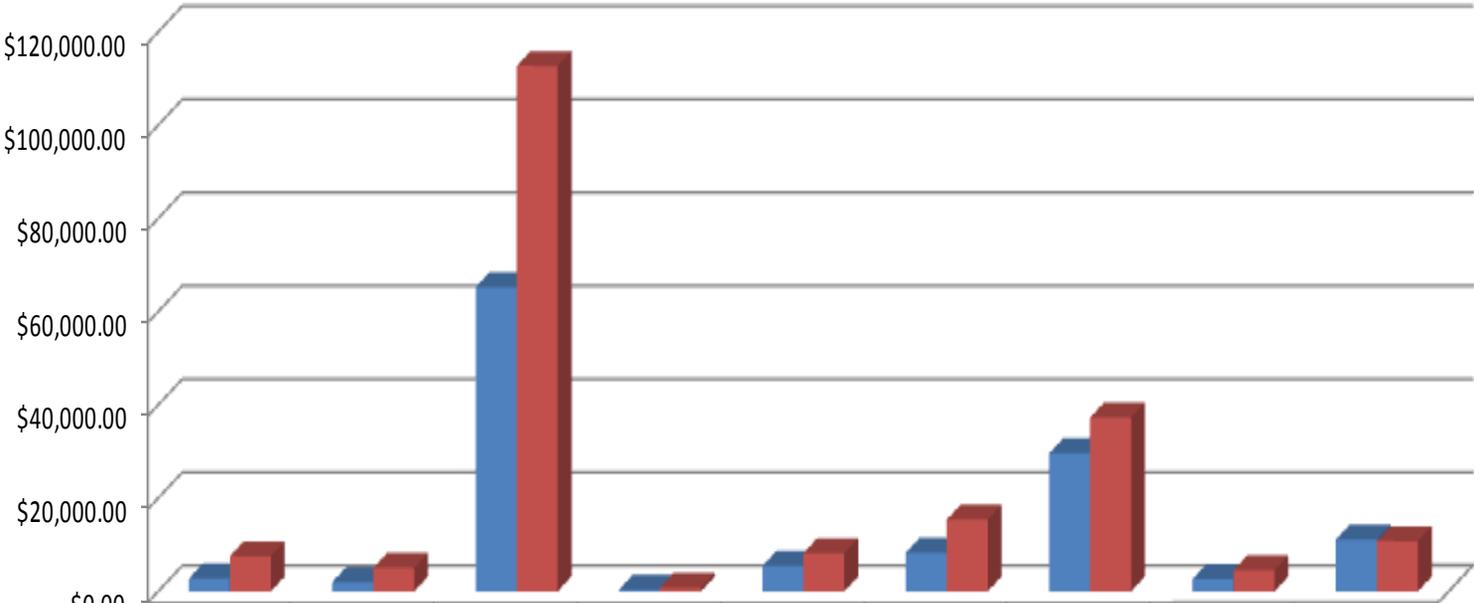


	Town Council	Town Manager	Treasurer	Public Safety	Parks, Recreational, & Cultural	Community Development	Public Works	Public Buildings	Transfers to Reserves	Debt Service	Total Expenses by Department
February 2014 Actual	\$121,776	\$210,457	\$243,641	\$1,413,147	\$435,869	\$481,078	\$513,047	\$79,917	\$1,084,829	\$28,433	\$4,612,194
February 2013 Actual	\$113,658	\$196,197	\$264,978	\$1,329,470	\$309,484	\$306,850	\$529,087	\$68,441	\$1,866,421	\$32,513	\$5,017,099

February 2014 YTD Salaries to Budget by Department

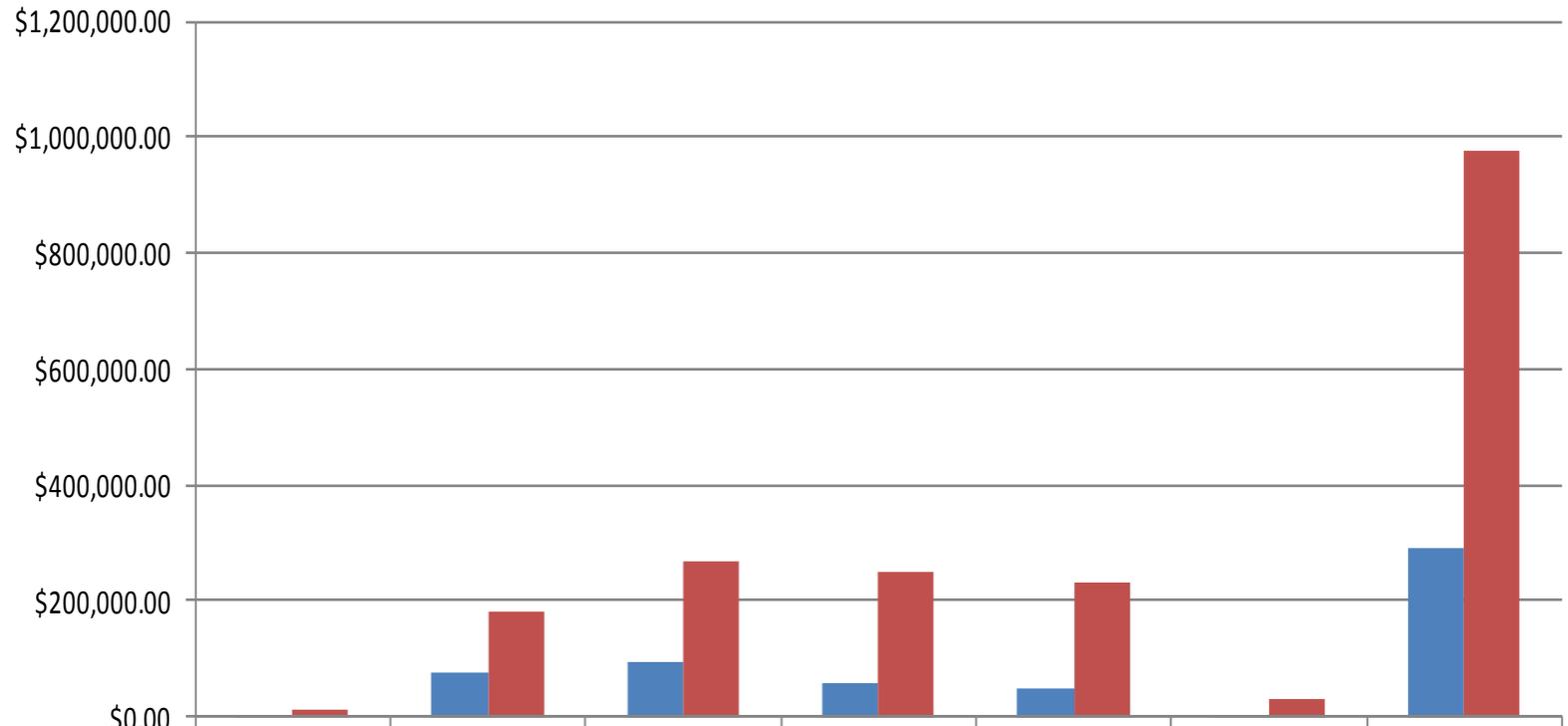


February YTD Overtime Compared to Budget



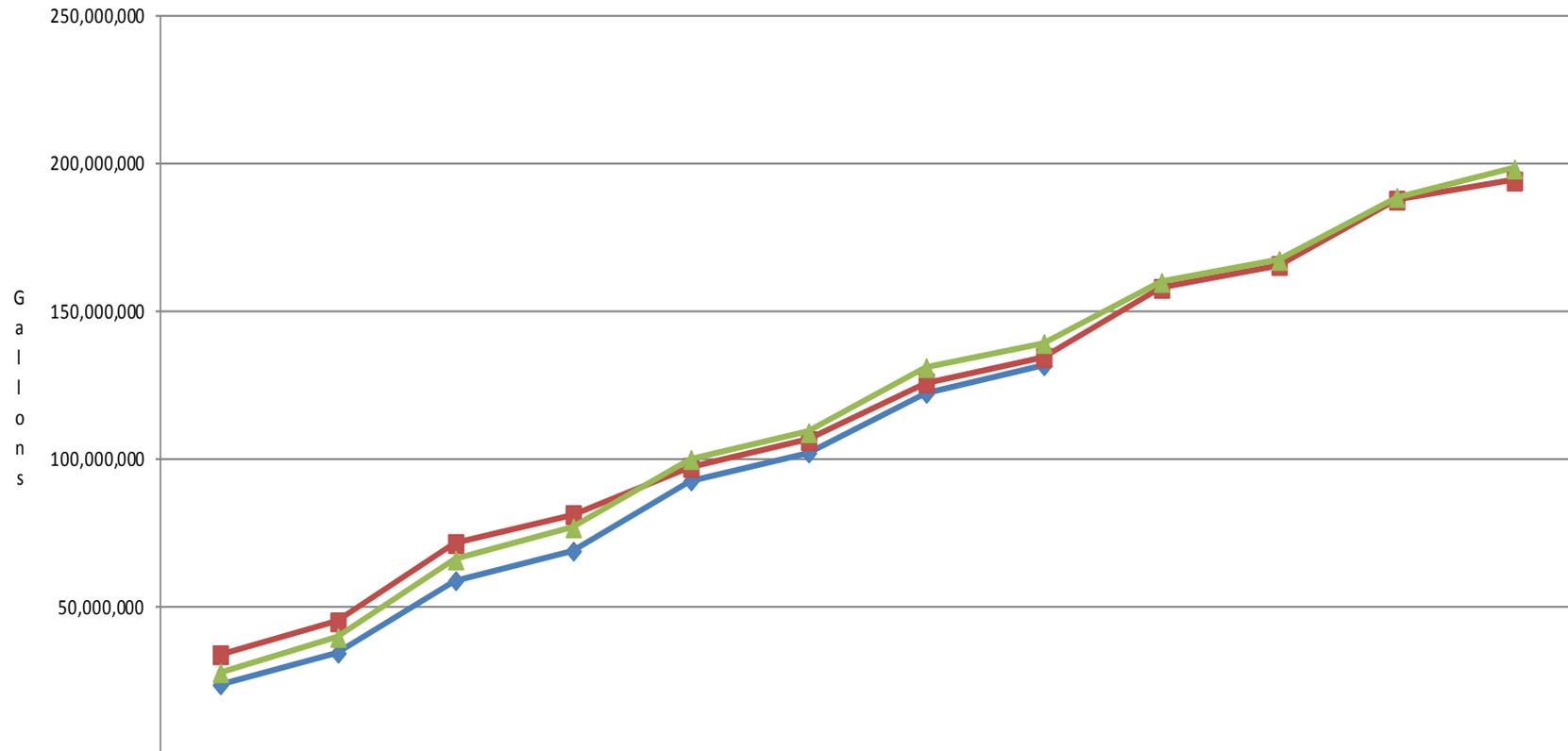
	Town Manager	Treasurer	Police Dpt.	Smithfield Center	Planning, Engineering & PW	Sewer	Water	Windsor Castle	Highway
February YTD Actual	\$2,781	\$2,004	\$65,264	\$401	\$5,460	\$8,318	\$29,616	\$2,668	\$11,153
Budget	\$7,562	\$5,044	\$112,710	\$838	\$8,216	\$15,414	\$37,319	\$4,575	\$10,789

February YTD Pinewood Heights Expenses MY 1 Phase II



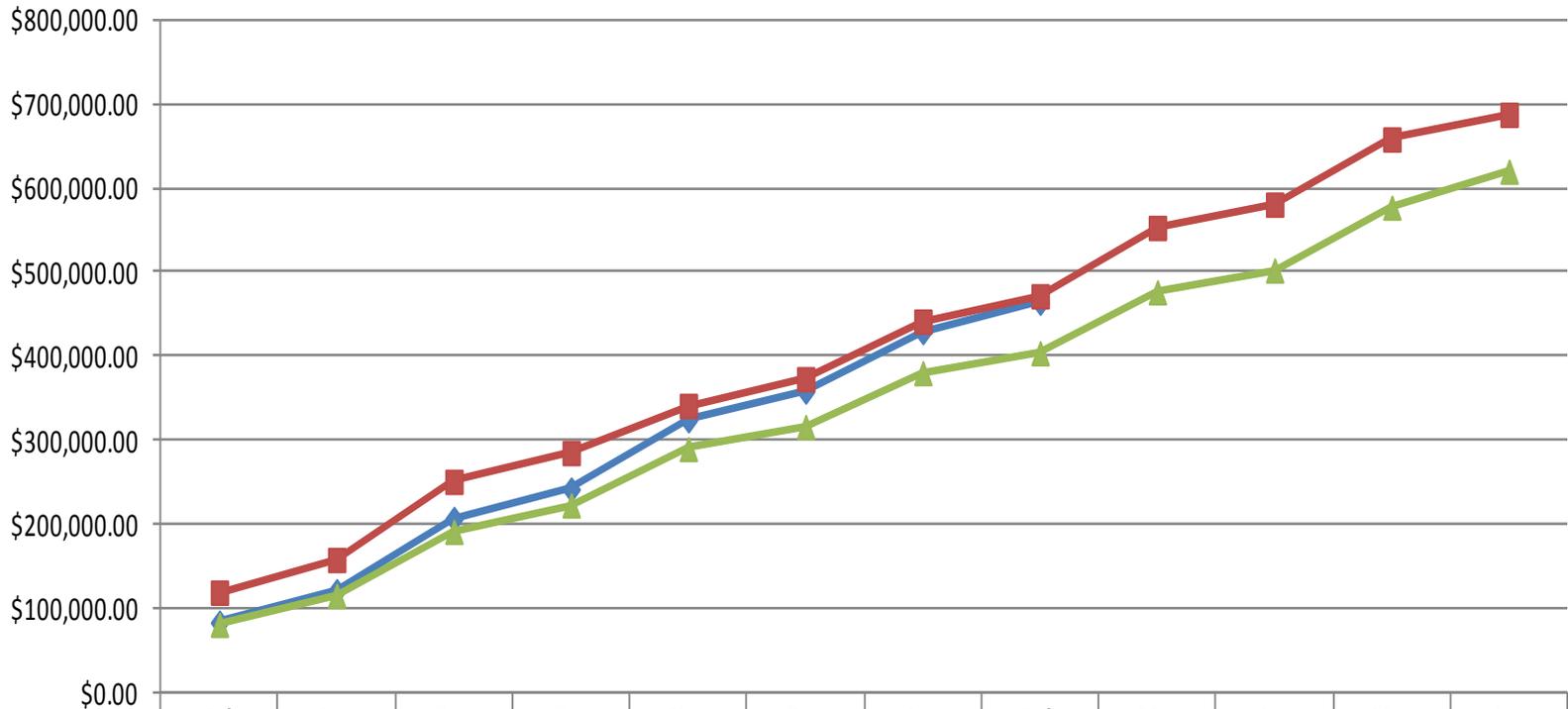
	Administration	Acquisition-Non CDBG	Acquisition-CDBG	Permanent Relocation-Non CDBG	Permanent Relocation-CDBG	Clearance & Demolition	Total YTD MY1 Phase II
February YTD Actual	\$3,807	\$76,975	\$95,000	\$58,395	\$49,626	\$5,500	\$289,303
Budget	\$14,500	\$181,426	\$269,800	\$251,896	\$230,394	\$29,000	\$977,016

February 2014 YTD Sewer Consumption Compared to FY 2012 & FY 2013-Cumulative



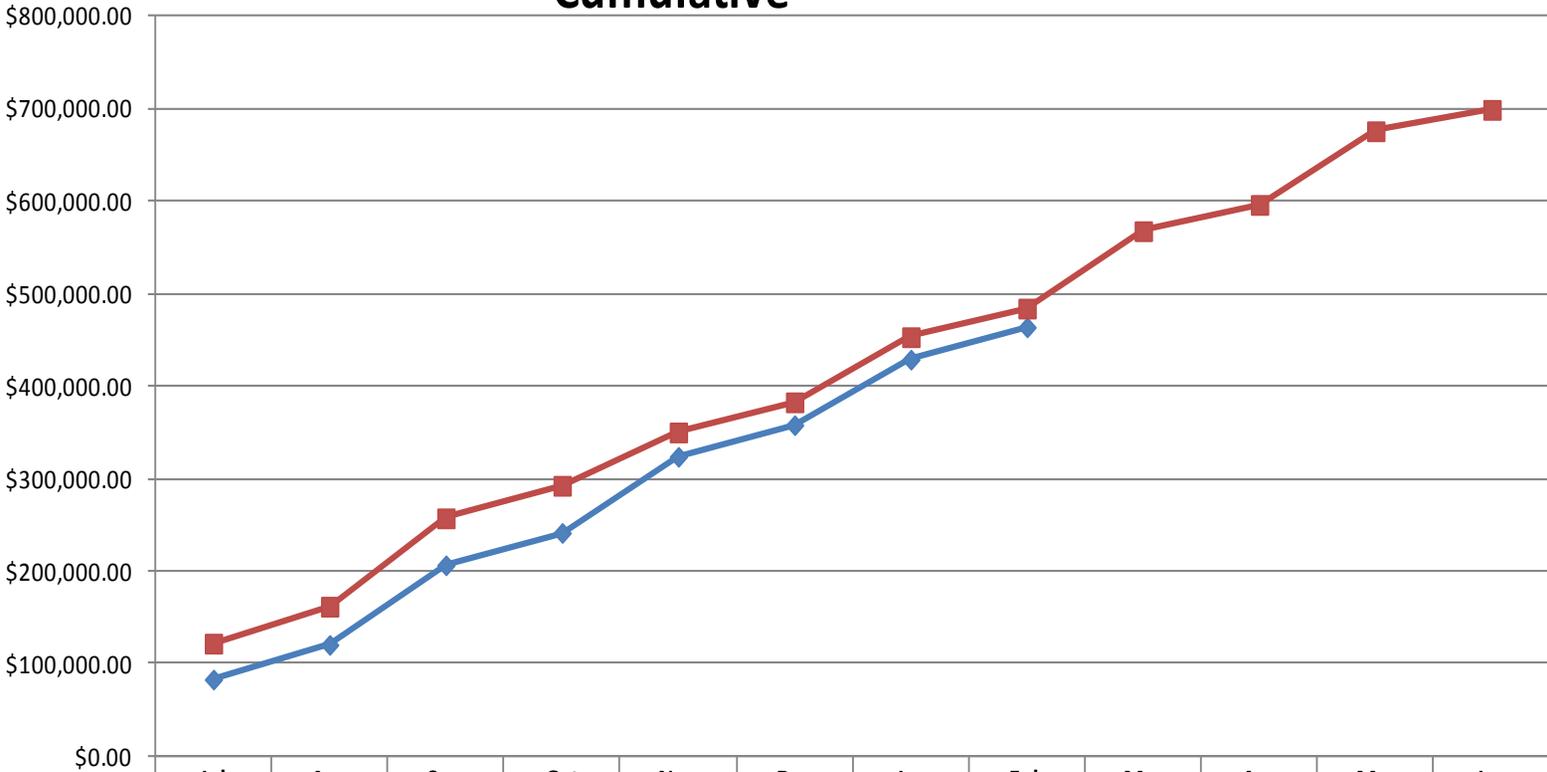
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual 2014	23,711,729	34,435,081	58,989,250	69,008,854	92,808,851	102,276,394	122,469,679	131,815,959				
Actual 2013	33,911,769	45,062,012	71,593,279	81,409,491	97,395,860	106,483,452	126,026,878	134,663,193	158,036,732	165,808,355	187,913,876	194,386,925
Actual 2012	27,823,246	39,800,726	66,015,985	76,887,610	100,046,367	109,153,641	131,185,269	139,374,388	160,052,488	167,499,468	188,827,259	198,463,933

February 2014 YTD Sewer Charges Compared to FY 2012 & FY 2013-Cumulative



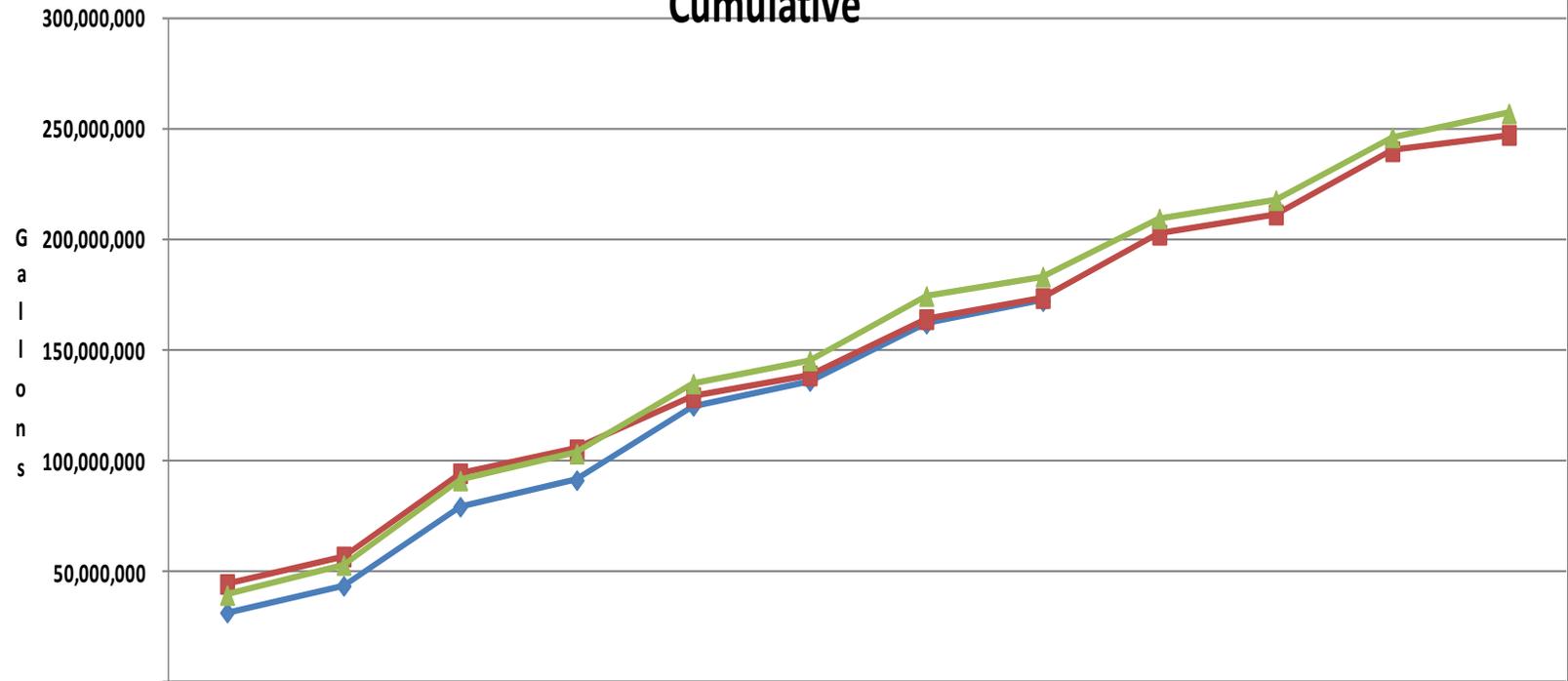
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual 2014	\$83,143	\$120,581	\$206,649	\$241,641	\$323,955	\$358,154	\$428,999	\$463,914				
Actual 2013	\$118,797	\$157,727	\$250,727	\$285,025	\$341,149	\$372,882	\$441,445	\$471,585	\$553,055	\$580,733	\$658,298	\$687,639
Actual 2012	\$80,521	\$115,171	\$191,175	\$222,639	\$289,759	\$316,129	\$380,159	\$403,869	\$476,417	\$502,434	\$577,243	\$620,009

February 2014 Sewer Charges Compared to Pro-Rated Budget- Cumulative



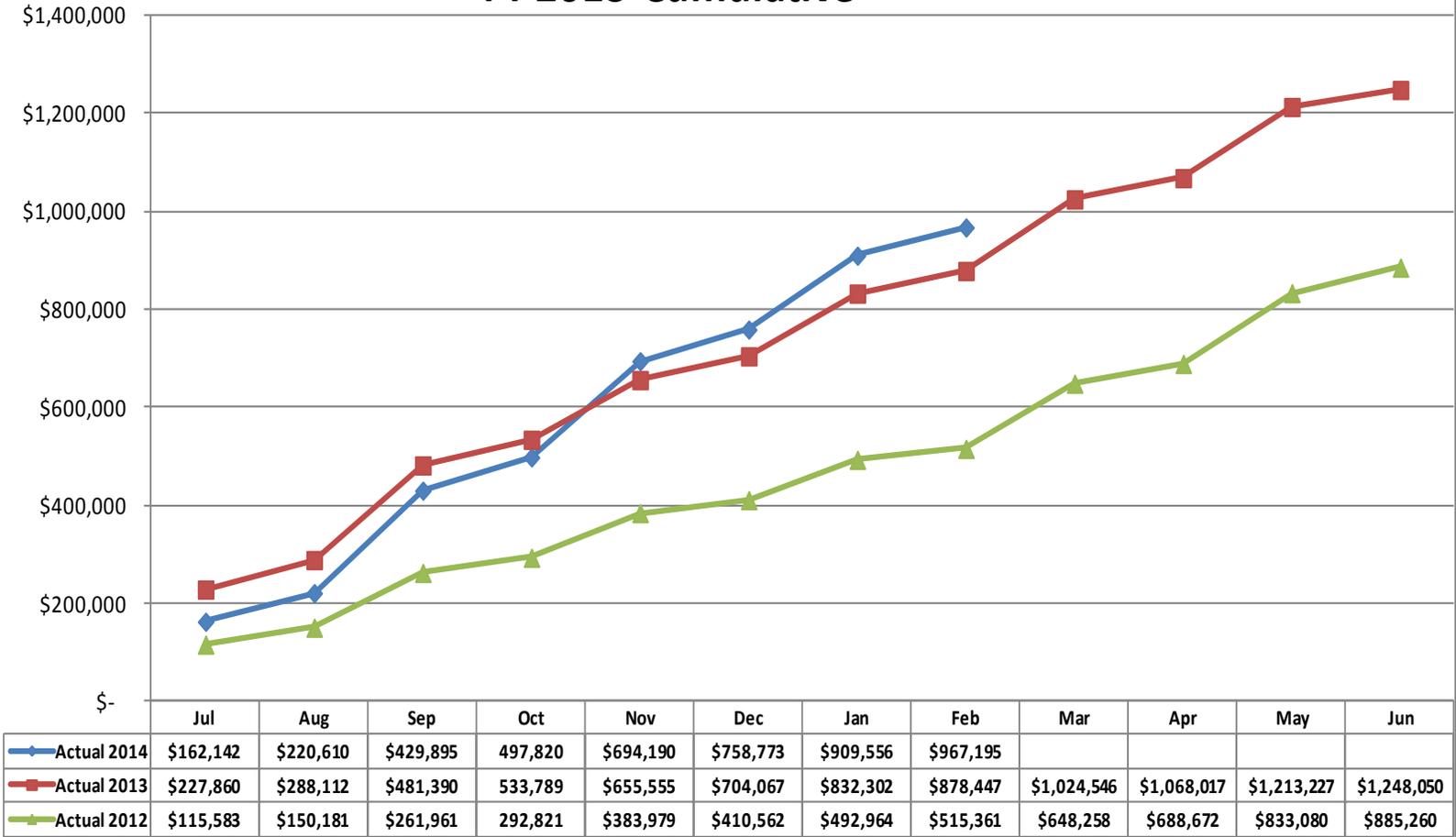
Actual	\$83,143	\$120,581	\$206,649	\$241,641	\$323,955	\$358,154	\$428,999	\$463,914				
Pro-rated budget	\$121,976	\$161,949	\$257,438	\$292,655	\$350,281	\$382,863	\$453,261	\$484,208	\$567,857	\$596,275	\$675,916	\$699,025

February 2014 YTD Water Consumption Compared to FY 2012 & FY 2013- Cumulative

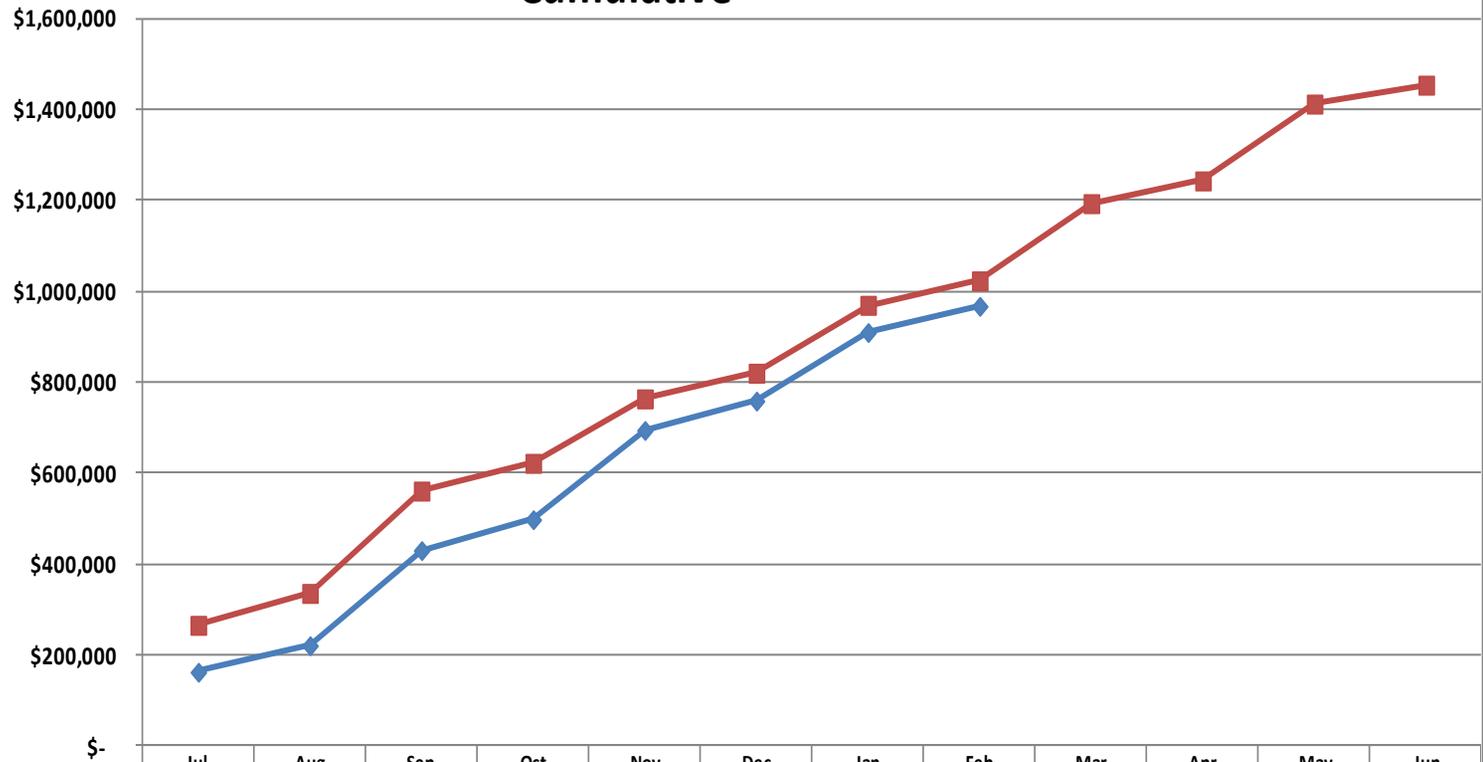


	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual 2014	31,749,642	43,797,350	79,515,677	91,492,884	125,007,681	136,230,872	162,124,684	172,269,721				
Actual 2013	44,653,181	57,074,240	94,602,553	105,404,177	128,910,557	138,750,710	164,151,162	173,654,567	202,238,523	211,359,247	239,897,757	247,266,148
Actual 2012	39,688,782	53,256,900	91,356,629	103,459,078	135,117,221	145,533,600	174,583,031	183,366,490	209,554,614	217,888,180	246,182,751	256,982,334

February 2014 YTD Water Charges Compared to FY 2012 & FY 2013-Cumulative

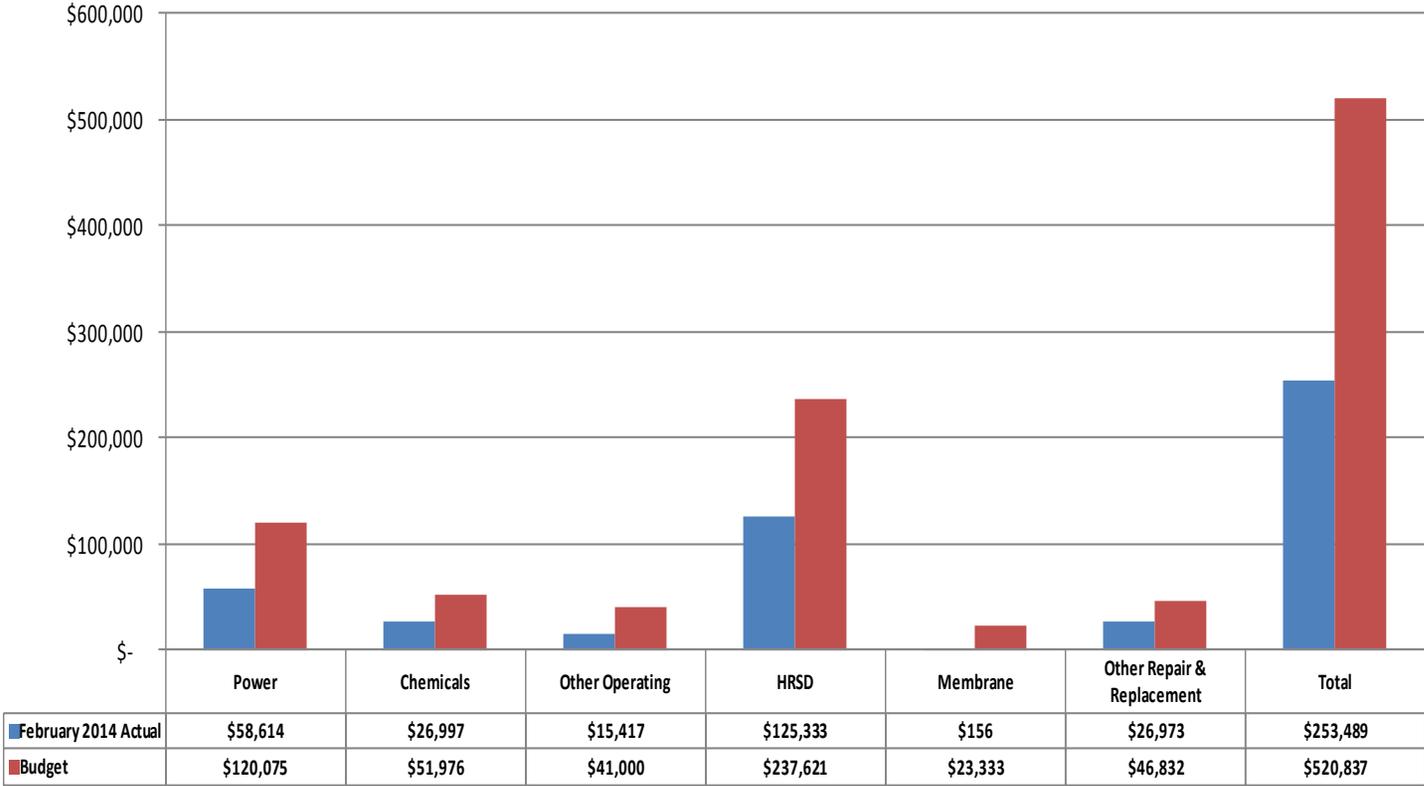


February 2014 YTD Water Charges Compared to Pro-Rated Budget- Cumulative

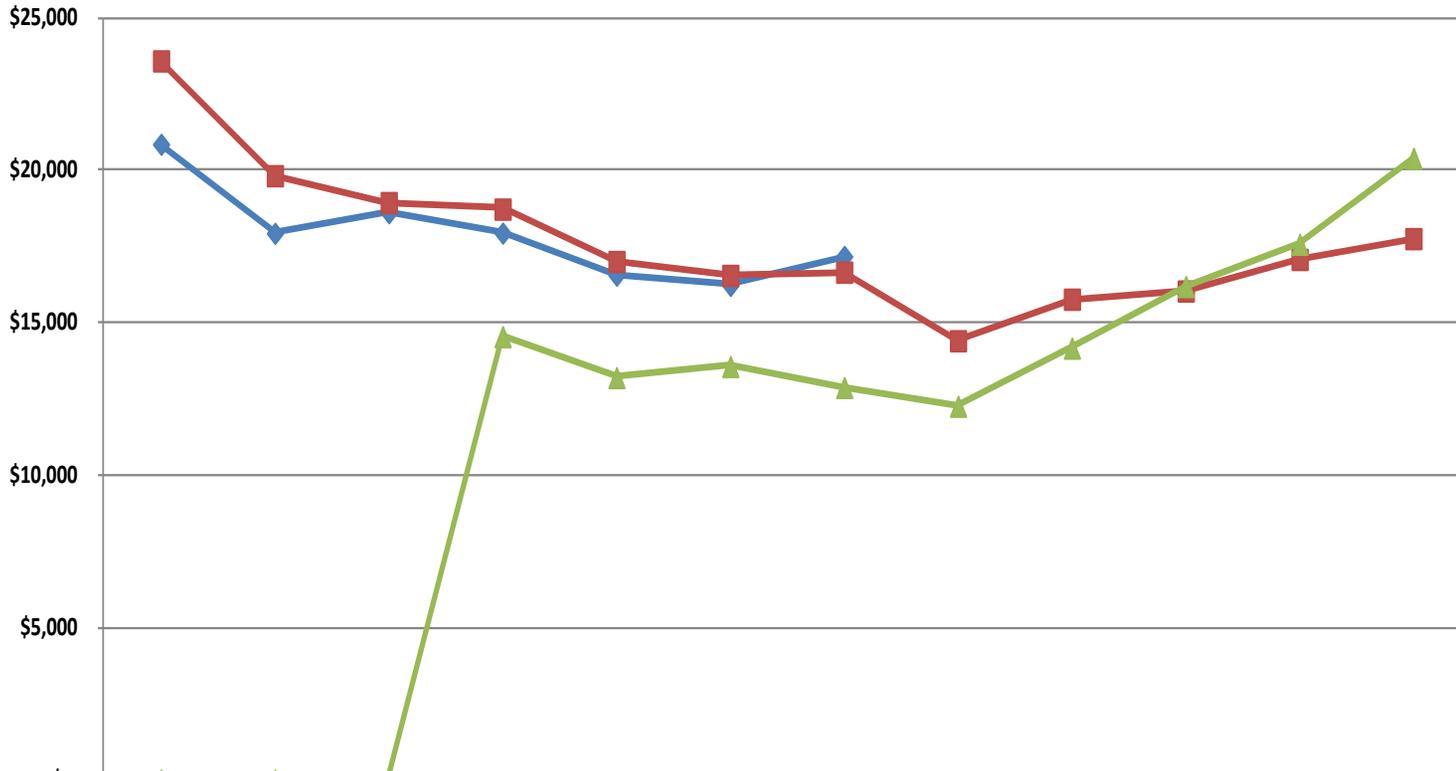


	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Actual	\$162,142	\$220,610	\$429,895	497,820	\$694,190	\$758,773	\$909,556	\$967,195				
Pro-rated budget	\$265,431	\$335,618	\$560,764	621,803	\$763,647	\$820,158	\$969,536	\$1,023,290	\$1,193,208	\$1,243,229	\$1,412,223	\$1,453,834

February 2014 YTD RO Expenses by Category



HRSD EXPENSES FOR RO PLANT FY2014, FY2013 AND FY2012



	July	August	September	October	November	December	January	February	March	April	May	June
FY 2014	\$20,859	\$17,938	\$18,614	\$17,945	\$16,566	\$16,230	\$17,181					
FY 2013	\$23,596	\$19,829	\$18,947	\$18,732	\$17,014	\$16,558	\$16,665	\$14,415	\$15,778	\$16,045	\$17,082	\$17,764
FY 2012	\$-	\$-	\$-	\$14,550	\$13,207	\$13,571	\$12,883	\$12,268	\$14,173	\$16,196	\$17,580	\$20,399

CASH BALANCES AS OF FEBRUARY 2014					
ACCOUNT NAME	BANK NAME	ACCOUNT BALANCE	Current Month	Prior Year	ADJUSTED BALANCES
			Interco. Balances	Interco./Interdep Balances	
Water	Farmers Bank	1,136,538.29	(359,494.33)	(489,510.60)	287,533.36
Water-Debt Service	Farmers Bank	1,153,563.17	22,671.91	-	1,176,235.08
Water Capital Escrow (availability fees)	TowneBank	306,033.60	-	-	306,033.60
Water Treatment Plant Escrow	TowneBank	111,372.24	-	-	111,372.24
Water Development Escrow	TowneBank	84,906.20	-	-	84,906.20
Subtotal Water		2,792,413.50	(336,822.42)	(489,510.60)	1,966,080.48
Sewer	Farmers Bank	221,890.19	(15,719.71)	(313,335.93)	(107,165.45)
Sewer Development Escrow	TowneBank	337,764.83	-	-	337,764.83
Sewer Capital Escrow (availability fees)	TowneBank	806,659.32	-	-	806,659.32
Sewer Compliance	Farmers Bank	434,893.25	58,066.83	-	492,960.08
Subtotal Sewer		1,801,207.59	42,347.12	(313,335.93)	1,530,218.78
Highway	Farmers Bank	126,513.66	(86,856.03)	-	39,657.63
General Fund	Farmers Bank	2,741,759.11	291,090.82	816,333.33	3,849,183.26
Payroll	Farmers Bank	38,779.81	-	-	38,779.81
Money Market-General Fund	TowneBank	2,180.39	-	-	2,180.39
Business Super Now-General Fund	Farmers Bank	33,037.40	-	-	33,037.40
Money Market-General Fund	Farmers Bank	288,737.40	-	-	288,737.40
General Fund Capital Escrow Account	TowneBank	214,087.53	-	-	214,087.53
Certificate of Deposit	Farmers Bank	525,841.43	-	-	525,841.43
Certificate of Deposit-Police Dept	Farmers Bank	36,597.38	-	-	36,597.38
Special Project Account (Pinewood)	Farmers Bank	19,930.23	132,970.02	-	152,900.25
Pinewood Heights Escrow	Farmers Bank	19,722.12	-	-	19,722.12
SNAP Account	Farmers Bank	2,975.75	-	-	2,975.75
S. Church Street Account	TowneBank	42,729.51	(42,729.51)	-	-
Subtotal General Fund		3,966,378.06	381,331.33	816,333.33	5,164,042.72
Beautification Fund	Farmers Bank	7,833.31	-	-	7,833.31
Money Market-Beautification	Farmers Bank	61,227.08	-	(13,486.80)	47,740.28
Subtotal Beautification		69,060.39		(13,486.80)	55,573.59
TOTAL ALL FUNDS		8,755,573.20	-	0.00	8,755,573.20

Robinson Farmer Cox Associates PLLC

CERTIFIED PUBLIC ACCOUNTANTS A PROFESSIONAL LIMITED LIABILITY COMPANY
PO Box 6580
Charlottesville VA 22906
434-973-8314

Town of Smithfield, VA
c/o Ellen Minga
P.O. Box 246
Smithfield, VA 23431

Invoice No. 44156
Date 03/10/2014
Client No. 051900

For Professional Services Rendered as Follows:

VENDOR # 3423
ACCOUNT # 4-100-12410-3120
DEPT HEAD ed
TOWN MANAGER _____

Audit of the financial statements for year ended June 30, 2013.

Current Invoice Amount \$ 23,000.00

0 - 30	31 - 60	61 - 90	91 - 120	Over 120	Balance
23,000.00	0.00	0.00	0.00	0.00	23,000.00

*If paying by check, please include your Client Number.
For your convenience, we also accept all major credit cards in amounts up to \$20,000.00.
Please call Accounting @ 434-973-8314 if you would like to pay by a credit or debit card.*

Finance charges will be assessed after thirty days.

You may provide an email address if you prefer paperless invoicing.



VML/VACO Finance - Fixed Rate Loan Program
Town of Smithfield, Virginia
General Obligation Refunding Bond, Series 2014

Advance Refunding of 2004 Callable Bonds
and
Advance Refunding of 2005 Callable Bonds

VML/VACo Finance - Fixed Rate Loan Program
 Town of Smithfield, Virginia
 General Obligation Refunding Bond, Series 2014
 Advance Refunding of Series 2004 and Series 2005 Bonds

Preliminary

Summary of Preliminary Financial Analysis

	<u>Series 2005 Bonds</u>	<u>Series 2004 VRA Bonds</u>
Outstanding Par - Callable Bonds Only <i>(as of 2/1/2014)</i>	\$2,115,000	\$880,000
Interest Rates	4.00% to 4.50%	4.225% to 5.100%
Optional Call Date	8/1/2015	10/1/2014
Optional Call Price	100%	100%

	<u>Summary of Debt Service Savings</u>	
Total Debt Service Savings	\$80,198	\$65,465
Net Present Value Savings	\$68,443	\$53,377
Net PV Savings as % of Refunded Par	3.24%	6.07%
Average Annual Debt Service Savings	\$6,237	\$7,331

VML/VACo Finance - Fixed Rate Loan Program
Town of Smithfield, Virginia
General Obligation Refunding Bond, Series 2014
Advance Refunding of Series 2004 and Series 2005 Bonds

Preliminary

Summary of Series 2014 Fixed Rate Loan - Preliminary Financing Terms and Assumptions

Program	VML/VACo Fixed Rate Loan Program
Bank	TBD through competitive bidding process
Borrower	Town of Smithfield
Par Amount	Series 2004 VRA Bonds \$921,000 Series 2005 Bonds <u>\$2,262,000</u> Total \$3,183,000
Security Pledge	General Obligation
Purpose	1) Advance Refunding of VRA 2004 Bonds - Callable Bonds only 2) Advance Refunding of Series 2005A Bonds - Callable Bonds Only
Tax-Exempt/Taxable	Tax-Exempt
Bank Qualified/Non-BQ	Bank Qualified
Indicative Interest Rate <i>(Including Loan Servicing Fee)</i>	2.75%, based on current market conditions
Interest Payments Due	Semi-annually, in arrears on February 1 & August 1 each year, commencing August 1, 2014
Principal Payments Due	Annually, on August 1 each year, commencing August 1, 2014
Amortization	Fully amortizing over term with level annual savings.
Final Maturity	1) 8/1/2022 2) 8/1/2025

VML/VACo Finance - Fixed Rate Loan Program
Town of Smithfield, Virginia
General Obligation Refunding Bond, Series 2014
Advance Refunding of Series 2004 and Series 2005 Bonds

Preliminary

Estimated Sources & Uses of Funds

Sources of Funds:	Series 2005A	Series 2004 VRA	Total
VML/VACo Fixed Rate Loan, 2014	2,262,000.00	921,000.00	\$ 3,183,000.00
Uses of Funds:			
Cost of Investment Escrow	2,243,205.00	901,592.00	\$ 3,144,797.00
Cash Deposit to Escrow	4.00	4.00	\$ 8.00
Estimated Costs of Issuance*	18,750.00	18,750.00	\$ 37,500.00
Rounding	<u>41.00</u>	<u>654.00</u>	<u>\$ 695.00</u>
Total Uses of Funds	<u>2,262,000.00</u>	<u>921,000.00</u>	<u>\$ 3,183,000.00</u>

* Includes Bond Counsel, Verification Agent, Escrow Agent, Program Closing Costs, and miscellaneous expenses.

VML/VACo Finance - Fixed Rate Loan Program
Town of Smithfield, Virginia
General Obligation Refunding Bond, Series 2014
Advance Refunding of Series 2004 and Series 2005 Bonds

Preliminary

Series 2014 Debt Service Schedule, Combined

Fiscal Yr	Coupon Date	Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Fiscal Debt Service	Outstanding Debt
	5/1/2014	-		-	-	-	3,183,000.00
	8/1/2014	48,000.00	2.75	21,883.12	69,883.12	-	3,135,000.00
2015	5/1/2015	-		43,106.25	43,106.25	112,989.37	3,135,000.00
	8/1/2015	131,000.00	2.75	43,106.25	174,106.25	-	3,004,000.00
2016	2/1/2016	-		41,305.00	41,305.00	215,411.25	3,004,000.00
	8/1/2016	309,000.00	2.75	41,305.00	350,305.00	-	2,695,000.00
2017	2/1/2017	-		37,056.25	37,056.25	387,361.25	2,695,000.00
	8/1/2017	320,000.00	2.75	37,056.25	357,056.25	-	2,375,000.00
2018	2/1/2018	-		32,656.25	32,656.25	389,712.50	2,375,000.00
	8/1/2018	327,000.00	2.75	32,656.25	359,656.25	-	2,048,000.00
2019	2/1/2019	-		28,160.00	28,160.00	387,816.25	2,048,000.00
	8/1/2019	336,000.00	2.75	28,160.00	364,160.00	-	1,712,000.00
2020	2/1/2020	-		23,540.00	23,540.00	387,700.00	1,712,000.00
	8/1/2020	341,000.00	2.75	23,540.00	364,540.00	-	1,371,000.00
2021	2/1/2021	-		18,851.25	18,851.25	383,391.25	1,371,000.00
	8/1/2021	356,000.00	2.75	18,851.25	374,851.25	-	1,015,000.00
2022	2/1/2022	-		13,956.25	13,956.25	388,807.50	1,015,000.00
	8/1/2022	296,000.00	2.75	13,956.25	309,956.25	-	719,000.00
2023	2/1/2023	-		9,886.25	9,886.25	319,842.50	719,000.00
	8/1/2023	233,000.00	2.75	9,886.25	242,886.25	-	486,000.00
2024	2/1/2024	-		6,682.50	6,682.50	249,568.75	486,000.00
	8/1/2024	240,000.00	2.75	6,682.50	246,682.50	-	246,000.00
2025	2/1/2025	-		3,382.50	3,382.50	250,065.00	246,000.00
2026	8/1/2025	<u>246,000.00</u>	2.75	<u>3,382.50</u>	<u>249,382.50</u>	<u>249,382.50</u>	-
		3,183,000.00		539,048.12	3,722,048.12	3,722,048.12	

Advance Refunding of Series 2004 Bonds -
Callable Bonds Only

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi of VRA Series 2004 @ 2.75% Indicative Rate
 Refunding Savings Report
 \$921,000.00

Dated: 05/01/2014
 Delivered: 05/01/2014

Calendar Date	Principal Repayment	Coupon Rate	Interest Payment	Total Debt Service	Fiscal Total Debt Service	Prior Debt Service	Savings	Cumulative Savings
08/01/2014	18,000.00	2.750	6,331.88	24,331.88				
02/01/2015			12,416.25	12,416.25				
04/01/2015					36,748.13	43,561.40	6,813.27	6,813.27
08/01/2015	111,000.00	2.750	12,416.25	123,416.25				
02/01/2016			10,890.00	10,890.00				
04/01/2016					134,306.25	141,448.90	7,142.65	13,955.93
08/01/2016	114,000.00	2.750	10,890.00	124,890.00				
02/01/2017			9,322.50	9,322.50				
04/01/2017					134,212.50	141,771.25	7,558.75	21,514.68
08/01/2017	117,000.00	2.750	9,322.50	126,322.50				
02/01/2018			7,713.75	7,713.75				
04/01/2018					134,036.25	141,510.55	7,474.30	28,988.98
08/01/2018	120,000.00	2.750	7,713.75	127,713.75				
02/01/2019			6,063.75	6,063.75				
04/01/2019					133,777.50	140,882.50	7,105.00	36,093.98
08/01/2019	122,000.00	2.750	6,063.75	128,063.75				
02/01/2020			4,386.25	4,386.25				
04/01/2020					132,450.00	139,890.00	7,440.00	43,533.98
08/01/2020	124,000.00	2.750	4,386.25	128,386.25				
02/01/2021			2,681.25	2,681.25				
04/01/2021					131,067.50	138,642.50	7,575.00	51,108.98
08/01/2021	131,000.00	2.750	2,681.25	133,681.25				
02/01/2022			880.00	880.00				
04/01/2022					134,561.25	142,012.50	7,451.25	58,560.23
08/01/2022	64,000.00	2.750	880.00	64,880.00				
10/01/2022					64,880.00	71,785.00	6,905.00	65,465.23
	921,000.00		115,039.38	1,036,039.38		1,101,504.60	65,465.23	
		+ Accrued Interest						
	921,000.00		115,039.38	1,036,039.38		1,101,504.60	65,465.23	

Present Value Savings discounted at	2.7505608 %	Equals	53,377.47	(Net of Accrued Interest)
Discounted Savings as a Percentage of Refunded Bonds			6.0656 %	
Discounted Savings as a Percentage of Refunding Bonds			5.7956 %	
Escrow Yield			0.0502930	
Arbitrage Yield Limit (AYL)			2.7505608	

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi of VRA Series 2004 @ 2.75% Indicative Rate
 Escrow Verification Report
 \$901,592.00

Dated: 05/01/2014
 Delivered: 05/01/2014

<i>Calendar Date</i>	<i>Escrow Acct Beg Balance</i>	<i>Investment Purchases</i>	<i>Investment Receipts</i>	<i>Escrowed Debt Svc Req</i>	<i>Escrow Acct End Balance</i>
5/1/2014	901,596.00	901,592.00	0.00	0.00	4.00
10/1/2014	4.00		901,780.96	901,780.70	4.26
			901,780.96	901,780.70	

<i>Issuer Contribution to Escrow</i>	4.00
<i>True Interest Cost (TIC)</i>	2.7505569
<i>Arbitrage Yield Limit (AYL)</i>	2.7505608
<i>IRR From Date of Receipt.</i>	0.0502930
<i>IRR From Date of Disbursement.</i>	0.0491638

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi of VRA Series 2004 @ 2.75% Indicative Rate
 Escrow Securities Report

Dated: 05/01/2014
 Delivered: 05/01/2014

\$901,592.00

<i>Num</i>	<i>Type</i>	<i>Fund ID</i>	<i>Face Value</i>	<i>Purchase Date</i>	<i>Coupon Rate</i>	<i>Maturity Date</i>	<i>Yield</i>	<i>Price (100)</i>	<i>Purchase Price</i>	<i>Accrued Interest</i>	<i>Total Cost</i>
1	SLGC	SLGC	901,592.00	5/1/2014	0.049957	10/1/2014		100.0000000	901,592.00		901,592.00
<i>5/1/2014 Totals</i>			901,592.00						901,592.00		901,592.00
Grand Totals			901,592.00						901,592.00		901,592.00

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi of VRA Series 2004 @ 2.75% Indicative Rate
 Summary of Refunded Bonds
 \$925,000.00

Type	Maturity #	Principal	Coupon Rate	Maturity Date	Call Price	Called?	Call Date	Amount Called
Serial Bonds	1	75,000.00	2.900	10/1/2004	100.000	N		
	2	65,000.00	3.023	10/1/2005	100.000	N		
	3	70,000.00	3.029	10/1/2006	100.000	N		
	4	70,000.00	3.557	10/1/2007	100.000	N		
	5	75,000.00	3.633	10/1/2008	100.000	N		
	6	75,000.00	3.817	10/1/2009	100.000	N		
	7	80,000.00	3.975	10/1/2010	100.000	N		
	8	85,000.00	4.029	10/1/2011	100.000	N		
	9	85,000.00	4.394	10/1/2012	100.000	N		
	10	90,000.00	4.433	10/1/2013	100.000	N		
	11	95,000.00	4.100	10/1/2014	100.000	N		
	12	100,000.00	4.225	10/1/2015	100.000	Y	10/01/2014	100,000.00
	13	105,000.00	4.886	10/1/2016	100.000	Y	10/01/2014	105,000.00
	14	110,000.00	4.901	10/1/2017	100.000	Y	10/01/2014	110,000.00
	15	115,000.00	5.100	10/1/2018	100.000	Y	10/01/2014	115,000.00
	16	120,000.00	5.100	10/1/2019	100.000	Y	10/01/2014	120,000.00
	17	125,000.00	5.100	10/1/2020	100.000	Y	10/01/2014	125,000.00
	18	135,000.00	5.100	10/1/2021	100.000	Y	10/01/2014	135,000.00
	19	70,000.00	5.100	10/1/2022	100.000	Y	10/01/2014	70,000.00
<i>Totals: Serial Bonds</i>		1,745,000.00						
<i>SMITHFILED- Totals</i>		1,745,000.00						
Grand Totals:		1,745,000.00						880,000.00

VML/VACo Finance, Town of Smithfield
Series 2004 VRA Bonds
Debt Service Schedule, Callable Bonds
As of 4/1/2014

Fiscal Yr	Coupon Date	Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Fiscal Debt Service	Outstanding Debt
	10/1/2014	-		21,780.70	21,780.70	-	880,000.00
2015	4/1/2015	-		21,780.70	21,780.70	43,561.40	880,000.00
	10/1/2015	100,000.00	4.225	21,780.70	121,780.70	-	780,000.00
2016	4/1/2016	-		19,668.20	19,668.20	141,448.90	780,000.00
	10/1/2016	105,000.00	4.886	19,668.20	124,668.20	-	675,000.00
2017	4/1/2017	-		17,103.05	17,103.05	141,771.25	675,000.00
	10/1/2017	110,000.00	4.901	17,103.05	127,103.05	-	565,000.00
2018	4/1/2018	-		14,407.50	14,407.50	141,510.55	565,000.00
	10/1/2018	115,000.00	5.100	14,407.50	129,407.50	-	450,000.00
2019	4/1/2019	-		11,475.00	11,475.00	140,882.50	450,000.00
	10/1/2019	120,000.00	5.100	11,475.00	131,475.00	-	330,000.00
2020	4/1/2020	-		8,415.00	8,415.00	139,890.00	330,000.00
	10/1/2020	125,000.00	5.100	8,415.00	133,415.00	-	205,000.00
2021	4/1/2021	-		5,227.50	5,227.50	138,642.50	205,000.00
	10/1/2021	135,000.00	5.100	5,227.50	140,227.50	-	70,000.00
2022	4/1/2022	-		1,785.00	1,785.00	142,012.50	70,000.00
2023	10/1/2022	<u>70,000.00</u>	5.100	<u>1,785.00</u>	<u>71,785.00</u>	<u>71,785.00</u>	-
		880,000.00		221,504.60	1,101,504.60	1,101,504.60	

VML/VACo Finance, Town of Smithfield
 General Obligation Refunding Bond, Series 2014
 Advance Refunding of Series 2004 and Series 2005 Bonds
 Combined Debt Service Schedule - Non-callable Series 2004 and Series 2014

Preliminary

Fiscal Yr	Coupon Date	Non-callable, Series 2004 Bonds				Adv Refunding Loan, Series 2014				Dated 5/1/14		Combined: Non-callable 2004 and Series 2014		Outstanding Debt
		Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Periodic Debt Service	Fiscal Debt Service			
2014	5/1/2014	-		-	-	-		-	-	-		-	-	1,016,000.00
	8/1/2014	-		-	-	18,000.00	2.75	6,331.87	24,331.87	24,331.87		-	-	998,000.00
	10/1/2014	95,000.00	4.10	1,947.50	96,947.50	-		-	-	96,947.50		-	-	903,000.00
2015	2/1/2015	-		-	-	-		12,416.25	12,416.25	12,416.25		133,695.62	-	903,000.00
	8/1/2015	-		-	-	111,000.00	2.75	12,416.25	123,416.25	123,416.25		-	-	792,000.00
2016	2/1/2016	-		-	-	-		10,890.00	10,890.00	10,890.00		134,306.25	-	792,000.00
	8/1/2016	-		-	-	114,000.00	2.75	10,890.00	124,890.00	124,890.00		-	-	678,000.00
2017	2/1/2017	-		-	-	-		9,322.50	9,322.50	9,322.50		134,212.50	-	678,000.00
	8/1/2017	-		-	-	117,000.00	2.75	9,322.50	126,322.50	126,322.50		-	-	561,000.00
2018	2/1/2018	-		-	-	-		7,713.75	7,713.75	7,713.75		134,036.25	-	561,000.00
	8/1/2018	-		-	-	120,000.00	2.75	7,713.75	127,713.75	127,713.75		-	-	441,000.00
2019	2/1/2019	-		-	-	-		6,063.75	6,063.75	6,063.75		133,777.50	-	441,000.00
	8/1/2019	-		-	-	122,000.00	2.75	6,063.75	128,063.75	128,063.75		-	-	319,000.00
2020	2/1/2020	-		-	-	-		4,386.25	4,386.25	4,386.25		132,450.00	-	319,000.00
	8/1/2020	-		-	-	124,000.00	2.75	4,386.25	128,386.25	128,386.25		-	-	195,000.00
2021	2/1/2021	-		-	-	-		2,681.25	2,681.25	2,681.25		131,067.50	-	195,000.00
	8/1/2021	-		-	-	131,000.00	2.75	2,681.25	133,681.25	133,681.25		-	-	64,000.00
2022	2/1/2022	-		-	-	-		880.00	880.00	880.00		134,561.25	-	64,000.00
2023	8/1/2022	-		-	-	64,000.00	2.75	880.00	64,880.00	64,880.00		64,880.00	-	-
		95,000.00		1,947.50	96,947.50	921,000.00		115,039.37	1,036,039.37	1,132,986.87		1,132,986.87		

Advance Refunding of Series 2005 Bonds -
Callable Bonds Only

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi Series 2005 Bonds @ 2.75% Indicative Rate
 Refunding Savings Report
 \$2,262,000.00

Dated: 05/01/2014
 Delivered: 05/01/2014

Calendar Date	Principal Repayment	Coupon Rate	Interest Payment	Total Debt Service	Fiscal Total Debt Service	Prior Debt Service	Savings	Cumulative Savings
08/01/2014	30,000.00	2.750	15,551.25	45,551.25				
02/01/2015			30,690.00	30,690.00	76,241.25	87,837.50	11,596.25	11,596.25
08/01/2015	20,000.00	2.750	30,690.00	50,690.00				
02/01/2016			30,415.00	30,415.00	81,105.00	87,837.50	6,732.50	18,328.75
08/01/2016	195,000.00	2.750	30,415.00	225,415.00				
02/01/2017			27,733.75	27,733.75	253,148.75	259,337.50	6,188.75	24,517.50
08/01/2017	203,000.00	2.750	27,733.75	230,733.75				
02/01/2018			24,942.50	24,942.50	255,676.25	262,137.50	6,461.25	30,978.75
08/01/2018	207,000.00	2.750	24,942.50	231,942.50				
02/01/2019			22,096.25	22,096.25	254,038.75	259,637.50	5,598.75	36,577.50
08/01/2019	214,000.00	2.750	22,096.25	236,096.25				
02/01/2020			19,153.75	19,153.75	255,250.00	261,837.50	6,587.50	43,165.00
08/01/2020	217,000.00	2.750	19,153.75	236,153.75				
02/01/2021			16,170.00	16,170.00	252,323.75	258,737.50	6,413.75	49,578.75
08/01/2021	225,000.00	2.750	16,170.00	241,170.00				
02/01/2022			13,076.25	13,076.25	254,246.25	260,337.50	6,091.25	55,670.00
08/01/2022	232,000.00	2.750	13,076.25	245,076.25				
02/01/2023			9,886.25	9,886.25	254,962.50	260,975.00	6,012.50	61,682.50
08/01/2023	233,000.00	2.750	9,886.25	242,886.25				
02/01/2024			6,682.50	6,682.50	249,568.75	256,025.00	6,456.25	68,138.75
08/01/2024	240,000.00	2.750	6,682.50	246,682.50				
02/01/2025			3,382.50	3,382.50	250,065.00	256,037.50	5,972.50	74,111.25
08/01/2025	246,000.00	2.750	3,382.50	249,382.50	249,382.50	255,468.75	6,086.25	80,197.50
2,262,000.00			424,008.75	2,686,008.75		2,766,206.25	80,197.50	
			+ Accrued Interest					
2,262,000.00			424,008.75	2,686,008.75		2,766,206.25	80,197.50	

<i>Present Value Savings discounted at</i>	2.7503843 %	<i>Equals</i>	68,443.27	<i>(Net of Accrued Interest)</i>
<i>Discounted Savings as a Percentage of Refunded Bonds</i>			3.2361 %	
<i>Discounted Savings as a Percentage of Refunding Bonds</i>			3.0258 %	
<i>Escrow Yield</i>			0.1296200	
<i>Arbitrage Yield Limit (AYL)</i>			2.7503843	

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi Series 2005 Bonds @ 2.75% Indicative Rate
 Escrow Verification Report
 \$2,243,205.00

Dated: 05/01/2014
 Delivered: 05/01/2014

<i>Calendar Date</i>	<i>Escrow Acct Beg Balance</i>	<i>Investment Purchases</i>	<i>Investment Receipts</i>	<i>Escrowed Debt Svc Req</i>	<i>Escrow Acct End Balance</i>
5/1/2014	2,243,209.00	2,243,205.00	0.00	0.00	4.00
8/1/2014	4.00		43,919.17	43,918.75	4.42
2/1/2015	4.42		43,918.30	43,918.75	3.97
8/1/2015	3.97		2,158,918.39	2,158,918.75	3.61
			2,246,755.86	2,246,756.25	

<i>Issuer Contribution to Escrow</i>	4.00
<i>True Interest Cost (TIC)</i>	2.7503843
<i>Arbitrage Yield Limit (AYL)</i>	2.7503843
<i>IRR From Date of Receipt.</i>	0.1296196
<i>IRR From Date of Disbursement.</i>	0.1294861

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi Series 2005 Bonds @ 2.75% Indicative Rate
 Escrow Securities Report

Dated: 05/01/2014
 Delivered: 05/01/2014

\$2,243,205.00

<i>Num</i>	<i>Type</i>	<i>Fund ID</i>	<i>Face Value</i>	<i>Purchase Date</i>	<i>Coupon Rate</i>	<i>Maturity Date</i>	<i>Yield</i>	<i>Price (100)</i>	<i>Purchase Price</i>	<i>Accrued Interest</i>	<i>Total Cost</i>
1	SLGC	SLGC	43,202.00	5/1/2014	0.040000	8/1/2014		100.0000000	43,202.00		43,202.00
2	SLGC	SLGC	42,487.00	5/1/2014	0.090000	2/1/2015		100.0000000	42,487.00		42,487.00
3	SLGS	SLGS	2,157,516.00	5/1/2014	0.130000	8/1/2015		100.0000000	2,157,516.00		2,157,516.00
<i>5/1/2014</i>		<i>Totals</i>	2,243,205.00						2,243,205.00		2,243,205.00
Grand Totals			2,243,205.00						2,243,205.00		2,243,205.00

VML/VACo Finance, Town of Smithfield [Est]
 Adv Refi Series 2005 Bonds @ 2.75% Indicative Rate

Summary of Refunded Bonds

\$2,265,000.00

Type	Maturity #	Principal	Coupon Rate	Maturity Date	Call Price	Called?	Call Date	Amount Called
Serial Bonds	1	125,000.00	3.250	8/1/2006	100.000	N		
	2	130,000.00	3.250	8/1/2007	100.000	N		
	3	135,000.00	3.250	8/1/2008	100.000	N		
	4	140,000.00	3.250	8/1/2009	100.000	N		
	5	140,000.00	3.250	8/1/2010	100.000	N		
	6	145,000.00	3.500	8/1/2011	100.000	N		
	7	150,000.00	3.500	8/1/2012	100.000	N		
	8	155,000.00	3.750	8/1/2013	100.000	N		
	9	165,000.00	4.000	8/1/2014	100.000	N		
	10	170,000.00	4.000	8/1/2015	100.000	N		
	11	175,000.00	4.000	8/1/2016	100.000	Y	08/01/2015	175,000.00
	12	185,000.00	4.000	8/1/2017	100.000	Y	08/01/2015	185,000.00
	13	190,000.00	4.000	8/1/2018	100.000	Y	08/01/2015	190,000.00
	14	200,000.00	4.000	8/1/2019	100.000	Y	08/01/2015	200,000.00
	15	205,000.00	4.000	8/1/2020	100.000	Y	08/01/2015	205,000.00
	16	215,000.00	4.000	8/1/2021	100.000	Y	08/01/2015	215,000.00
	17	225,000.00	4.500	8/1/2022	100.000	Y	08/01/2015	225,000.00
	18	230,000.00	4.250	8/1/2023	100.000	Y	08/01/2015	230,000.00
	19	240,000.00	4.250	8/1/2024	100.000	Y	08/01/2015	240,000.00
	20	250,000.00	4.375	8/1/2025	100.000	Y	08/01/2015	250,000.00
<i>Totals: Serial Bonds</i>		3,570,000.00						
<i>SMITHFILED- Totals</i>		3,570,000.00						
Grand Totals:		3,570,000.00						2,115,000.00

VML/VACo Finance, Town of Smithfield
Series 2005A Bonds
Debt Service Schedule, Callable Bonds
As of 2/1/2014

Fiscal Yr	Coupon Date	Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Fiscal Debt Service	Outstanding Debt
	8/1/2014	-		43,918.75	43,918.75	-	2,115,000.00
2015	2/1/2015	-		43,918.75	43,918.75	87,837.50	2,115,000.00
	8/1/2015	-		43,918.75	43,918.75	-	2,115,000.00
2016	2/1/2016	-		43,918.75	43,918.75	87,837.50	2,115,000.00
	8/1/2016	175,000.00	4.000	43,918.75	218,918.75	-	1,940,000.00
2017	2/1/2017	-		40,418.75	40,418.75	259,337.50	1,940,000.00
	8/1/2017	185,000.00	4.000	40,418.75	225,418.75	-	1,755,000.00
2018	2/1/2018	-		36,718.75	36,718.75	262,137.50	1,755,000.00
	8/1/2018	190,000.00	4.000	36,718.75	226,718.75	-	1,565,000.00
2019	2/1/2019	-		32,918.75	32,918.75	259,637.50	1,565,000.00
	8/1/2019	200,000.00	4.000	32,918.75	232,918.75	-	1,365,000.00
2020	2/1/2020	-		28,918.75	28,918.75	261,837.50	1,365,000.00
	8/1/2020	205,000.00	4.000	28,918.75	233,918.75	-	1,160,000.00
2021	2/1/2021	-		24,818.75	24,818.75	258,737.50	1,160,000.00
	8/1/2021	215,000.00	4.000	24,818.75	239,818.75	-	945,000.00
2022	2/1/2022	-		20,518.75	20,518.75	260,337.50	945,000.00
	8/1/2022	225,000.00	4.500	20,518.75	245,518.75	-	720,000.00
2023	2/1/2023	-		15,456.25	15,456.25	260,975.00	720,000.00
	8/1/2023	230,000.00	4.250	15,456.25	245,456.25	-	490,000.00
2024	2/1/2024	-		10,568.75	10,568.75	256,025.00	490,000.00
	8/1/2024	240,000.00	4.250	10,568.75	250,568.75	-	250,000.00
2025	2/1/2025	-		5,468.75	5,468.75	256,037.50	250,000.00
2026	8/1/2025	<u>250,000.00</u>	4.375	<u>5,468.75</u>	<u>255,468.75</u>	<u>255,468.75</u>	-
		2,115,000.00		651,206.25	2,766,206.25	2,766,206.25	

VML/VACo Finance, Town of Smithfield
 General Obligation Refunding Bond, Series 2014
 Advance Refunding of Series 2004 and Series 2005 Bonds
 Combined Debt Service Schedule - Non-callable Series 2005A and Series 2014

Preliminary

Fiscal Yr	Coupon Date	Non-callable, Series 2005A Bonds				Adv Refunding Loan, Series 2014				Dated 5/1/14			Combined: Non-callable 2005A and Series 2014	
		Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Principal Payment	Coupon Rate	Interest Payment	Periodic Debt Service	Periodic Debt Service	Fiscal Debt Service	Outstanding Debt		
2014	5/1/2014	-		-	-	-		-	-	-	-	-	-	2,597,000.00
	8/1/2014	165,000.00	4.00	6,700.00	171,700.00	30,000.00	2.75	15,551.25	45,551.25	217,251.25	-	-	-	2,402,000.00
2015	2/1/2015	-		3,400.00	3,400.00	-		30,690.00	30,690.00	34,090.00	251,341.25	-	-	2,402,000.00
	8/1/2015	170,000.00	4.00	3,400.00	173,400.00	20,000.00	2.75	30,690.00	50,690.00	224,090.00	-	-	-	2,212,000.00
2016	2/1/2016	-		-	-	-		30,415.00	30,415.00	30,415.00	254,505.00	-	-	2,212,000.00
	8/1/2016	-		-	-	195,000.00	2.75	30,415.00	225,415.00	225,415.00	-	-	-	2,017,000.00
2017	2/1/2017	-		-	-	-		27,733.75	27,733.75	27,733.75	253,148.75	-	-	2,017,000.00
	8/1/2017	-		-	-	203,000.00	2.75	27,733.75	230,733.75	230,733.75	-	-	-	1,814,000.00
2018	2/1/2018	-		-	-	-		24,942.50	24,942.50	24,942.50	255,676.25	-	-	1,814,000.00
	8/1/2018	-		-	-	207,000.00	2.75	24,942.50	231,942.50	231,942.50	-	-	-	1,607,000.00
2019	2/1/2019	-		-	-	-		22,096.25	22,096.25	22,096.25	254,038.75	-	-	1,607,000.00
	8/1/2019	-		-	-	214,000.00	2.75	22,096.25	236,096.25	236,096.25	-	-	-	1,393,000.00
2020	2/1/2020	-		-	-	-		19,153.75	19,153.75	19,153.75	255,250.00	-	-	1,393,000.00
	8/1/2020	-		-	-	217,000.00	2.75	19,153.75	236,153.75	236,153.75	-	-	-	1,176,000.00
2021	2/1/2021	-		-	-	-		16,170.00	16,170.00	16,170.00	252,323.75	-	-	1,176,000.00
	8/1/2021	-		-	-	225,000.00	2.75	16,170.00	241,170.00	241,170.00	-	-	-	951,000.00
2022	2/1/2022	-		-	-	-		13,076.25	13,076.25	13,076.25	254,246.25	-	-	951,000.00
	8/1/2022	-		-	-	232,000.00	2.75	13,076.25	245,076.25	245,076.25	-	-	-	719,000.00
2023	2/1/2023	-		-	-	-		9,886.25	9,886.25	9,886.25	254,962.50	-	-	719,000.00
	8/1/2023	-		-	-	233,000.00	2.75	9,886.25	242,886.25	242,886.25	-	-	-	486,000.00
2024	2/1/2024	-		-	-	-		6,682.50	6,682.50	6,682.50	249,568.75	-	-	486,000.00
	8/1/2024	-		-	-	240,000.00	2.75	6,682.50	246,682.50	246,682.50	-	-	-	246,000.00
2025	2/1/2025	-		-	-	-		3,382.50	3,382.50	3,382.50	250,065.00	-	-	246,000.00
2026	8/1/2025	-		-	-	246,000.00	2.750	3,382.50	249,382.50	249,382.50	249,382.50	-	-	-
		335,000.00		13,500.00	348,500.00	2,262,000.00		424,008.75	2,686,008.75	3,034,508.75	3,034,508.75			

AN ORDINANCE TO ADOPT THE VACO/VML VIRGINIA INVESTMENT POOL TRUST FUND FOR THE PURPOSE OF INVESTING MONEYS BELONGING TO OR WITHIN THE [CITY/COUNTY/TOWN]'S CONTROL, OTHER THAN SINKING FUNDS, IN CERTAIN AUTHORIZED INVESTMENTS IN ACCORDANCE WITH SECTION 2.2-4501 OF THE VIRGINIA CODE.

WHEREAS, Section 15.2-1500 of the Virginia Code provides, in part, that every locality shall provide for all the governmental functions of the locality, including, without limitation, the organization of all departments, offices, boards, commissions and agencies of government, and the organizational structure thereof, which are necessary to carry out the functions of government; and

WHEREAS, Section 2.2-4501 of the Virginia Code provides that all municipal corporations and other political subdivisions may invest any and all moneys belonging to them or within their control, other than sinking funds, in certain authorized investments; and

WHEREAS, Section 15.2-1300 of the Virginia Code provides that any power, privilege or authority exercised or capable of exercise by any political subdivision of the Commonwealth of Virginia may be exercised and enjoyed jointly with any other political subdivision of the Commonwealth having a similar power, privilege or authority pursuant to agreements with one another for joint action pursuant to the provisions of that section; and

WHEREAS, any two or more political subdivisions may enter into agreements with one another for joint action pursuant to the provisions of Section 15.2-1300 of the Virginia Code provided that the participating political subdivisions shall approve such agreement before the agreement may enter into force; and

WHEREAS, the City of Chesapeake, Virginia and the City of Roanoke, Virginia have determined to jointly establish and participate in the VACo/VML Virginia Investment Pool (the “Trust Fund”) for each such city; and

WHEREAS, it appearing to the [name of governing body] of the [City/County/Town] of _____ that it is otherwise in the best interests of the [City/County/Town] of _____ to become a participating locality in the Trust Fund; and

WHEREAS, _____, the duly elected [Treasurer/Chief Investment Officer] of the [City/County/Town] of _____, has the authority and responsibility under Virginia law to determine the manner in which [City/County/Town] funds under his (her) control will be invested;

NOW, THEREFORE THE [GOVERNING BODY] OF THE [CITY/COUNTY/TOWN] OF _____ HEREBY ORDAINS:

§ 1 That the [name of governing body] of the [City/County/Town] of _____ does hereby establish a trust pursuant to Section 2.2-4501 of the Virginia Code for the purpose of investing moneys determined to derive the most benefit from this investment strategy, belonging to it or within its control, other than sinking funds, in certain authorized investments, in the form set forth in the VACo/VML Virginia Investment Pool Trust Fund Agreement (the “Agreement”), a copy of which is attached here as Exhibit A.

§ 2 That the [name of governing body] of the [City/County/Town] of _____ does hereby agree to become a “Participating Political Subdivision” in the “VACo/VML Virginia Investment Pool ” (hereinafter, the “Trust Fund”), as further defined in the Agreement.

§ 3 That the [name of governing body] of the [City/County/Town] of _____ does hereby designate the [Treasurer/Chief Investment Officer] of the [City/County/Town] of _____ to serve as the trustee of the [City/County/Town] of _____ with respect to the Trust Fund and to determine what funds under the Treasurer's control shall be invested in the Trust Fund.

§ 4 That the [name of governing body] of the [City/County/Town] of _____ does hereby authorize the [Treasurer/Chief Investment Officer] to execute and deliver the Trust Joinder Agreement for Participating Political Subdivisions under VACo/VML Virginia Investment Pool ("Trust Joinder Agreement"), a copy of which is attached hereto as Exhibit B.

§ 5 This ordinance shall be in force and effect upon its adoption or passage.

Exhibits: VACo/VML Virginia Investment Pool Trust Fund Agreement ("Exhibit A")
Trust Joinder Agreement ("Exhibit B")

Parks and Recreation Committee Report

March 2014

Parks and Recreation Committee Items

1. Operational Update –Parks and Rec Committee Report
2. Clontz Park - Fireworks Display on Thu, July 3rd
3. Windsor Castle Park Signage
4. Kayak Rental Sales Structure
5. Windsor Castle Amenities Survey Results

Event Listing

Event Listing (since last committee meetings)

OTP	Day	Date	Event Type	Location	Event Stats
	Mon	Feb 24	Committee Meetings	Smithfield Center	
	Tue	Feb 25	Committee Meetings	Smithfield Center	
	Fri	Feb 28	JROTC Banquet	Smithfield Center	
	Sat	Mar 1	Retirement Banquet	Smithfield Center	
	Tue	Mar 4	WCFB Meeting	Smithfield Center	
			Town Council	Smithfield Center	
	Wed	Mar 5	Staff Meeting	Smithfield Center	
	Thu	Mar 6	Dominion Safety Meeting	Smithfield Center	
OTP	Sat	Mar 8	IOW Academy Gala	Smithfield Center	350 people, 1 officer
	Mon	Mar 10	Wine Fest Ticket Stuffing	Smithfield Center	
	Tue	Mar 11	Center Staff Meeting	Smithfield Center	
			Pinewood Heights Meeting	Smithfield Center	
	Wed	Mar 12	VDACS Pesticide Recert	Smithfield Center	
	Sat	Mar 15	Delta Sigma Theta Ball	Smithfield Center	
	Mon	Mar 17	Little Zion Revival	Smithfield Center	
	Tue	Mar 18	Little Zion Pastors Meeting	Smithfield Center	
			Little Zion Revival	Smithfield Center	
	Wed	Mar 19	Chamber Trade Show	Smithfield Center	
	Thu	Mar 20	Smithfield Women’s Club	Smithfield Center	
	Fri	Mar 21	Wedding Reception	Smithfield Center	

Upcoming Open to the Public Events

Day	Date	Event Type	Location
Wed	Apr 2	Smithfield Center Client Appreciation Night	Smithfield Center
Sat	Apr 5	YMCA Triathlon	Town Streets
Sat	Apr 12	Wine and Brew Fest	Windsor Castle Manor Riverfront
Wed	Apr 16	Post Legislative Breakfast	Smithfield Center

Parks and Recreation Committee Report

March 2014

Windsor Castle Park

Fishing Pier Patron Parking-update by Bill Hopkins

Windsor Castle Concept Plan Update

Survey Results are included in the Parks & Recreation Committee Packet.

Programming

Kayak Rentals

The 2014 Kayak Season will run May 3 to September 28, 2014.

Will start search for staff in April 2014.

Two tandem kayaks have been purchased to give us a fleet of 9 boats.

A shed to operate kayak rentals will be included in the budget for FY 15.

(Funding proposal submitted to WCFB included in Parks & Recreation Committee Packet.)

Total Revenue for the 2013 Season	= \$ 7674.77
Kayak Staff Hours 2013 Season	= \$ 3868
Net	= \$ 3806.67



ISLE OF WIGHT COUNTY FAIR

13036 Nike Park Road Carrollton, VA 23314
(757) 357-2291 / Fax (757) 265-0112

February 21, 2014

Town of Smithfield
Attn: Peter Stephenson, Town Manager
P.O. Box 246
Smithfield, VA 23431

Dear Mr. Stephenson:

This letter is to request use of Clontz Park for the annual July 3, 2014 fireworks display. The start time of the show is 9:30pm. We have contracted with American Fireworks Company to provide the show. County Staff will be on site the morning of July 3rd and I am requesting that the entrance to Clontz Park be unlocked by 8:00am so the shooting crew may have ample time to set up.

For your knowledge, our office has been in contact with Rusty Chase, Emergency Services Representative for Isle of Wight County, requesting his services at Clontz Park. We would appreciate if you would issue any permits that may be necessary for this event.

Thank you for your time and assistance with this event. If you should have any questions, please give me a call at 757-357-5959 or 757-376-0316.

Thank you,

Lauren Bailess
Fair/Events Coordinator

Windsor Castle Kayak Rentals Storage Funding Proposal

The Windsor Castle Kayak Rentals had an amazing first season. We grossed over \$ 7000 and the net income was close \$ 4000 (Exhibit A). It was very popular and adds to the charm of Smithfield and our beautiful park.

And our beautiful park should only have operations that are presented at their very best. Unfortunately in 2013, kayak sales operated out of the Smithfield Center van and a kayak trailer that did not set forth the best image. The staff using the Center van as a base of operations did not make them approachable or make this operation appear professional. The trailer also posed the problem of not being able to secure the kayaks overnight. Chains and locks were used but because of the shape of kayaks, it is very difficult to truly secure them with chains. Someone wanting to take one of the kayaks, valued between \$ 600-\$ 1000, could have easily done so by wiggling the vessel back and forth to free it. For 2014, we will have to use the same system unless we are able to put a permanent structure at this site.

Town staff has been researching options for securing the kayaks and providing a base of operations for our kayak rental staff. We have found that a shed with a front porch which would work well for both of these purposes (Exhibit B). The estimated cost for one of these structures is around \$ 6000. The problem is we will not be able to purchase the structure until July 1, 2014 because this item was not in the budget for this fiscal year, and the kayak season will start Saturday, May 3rd.

I am requesting the Windsor Castle Foundation Board contribute the full estimated cost of \$6000 to the town so this structure may be purchased before May 1, 2014. Then the town would budget a contribution to the Foundation for half of the total, to be paid July 2014. After the town makes the \$ 3000 contribution to the Foundation in July 2014, the Foundation will only have spent \$ 3000 towards this project. With your assistance we can start the season off right, with a rental sales area that fits beautifully into our gorgeous park. Please consider this request and let me know what questions or concerns you may have.

Amy Murrill Musick
 Director, Smithfield Center and Outdoor Venues
 757-449-4861
amusick@smithfieldva.gov

Exhibit A -Kayak Season 2013



June 1-9	\$ 208.00
June 14-16	\$ 342.00
June 21-23	\$ 468.60
June 28-30	\$ 177.95
July 3-7	\$ 849.76
July 12-14	\$ 283.96
July 19-21	\$ 424.06
July 26-28	\$ 683.82
Aug 2- 4	\$ 762.55
Aug 9-11	\$ 594.85
Aug 16-18	\$ 365.71
Aug 24-26	\$ 628.62
Aug 30-Sep 1	\$ 570.03
Sep 7-8	\$ 565.16
Sep 14-15	\$ 523.39
Sep 28-29	\$ 59.05
Oct 5-6	\$ 167.26
Oct 12-13	\$ 0
Total Revenue for the 2013 Season	= \$ 7674.77
Kayak Staff Hours 2013 Season	= \$ 3868
Net	= \$ 3806.67

Exhibit B –Shed Design Example



We would like to get a shed that measures 12x24, with an A Frame roof, and a porch.





To see all the details that are visible on the screen, use the "Print" link next to the map.



1" = 40'

Kayak Storage Funding Proposal
Exhibit C, Page 2

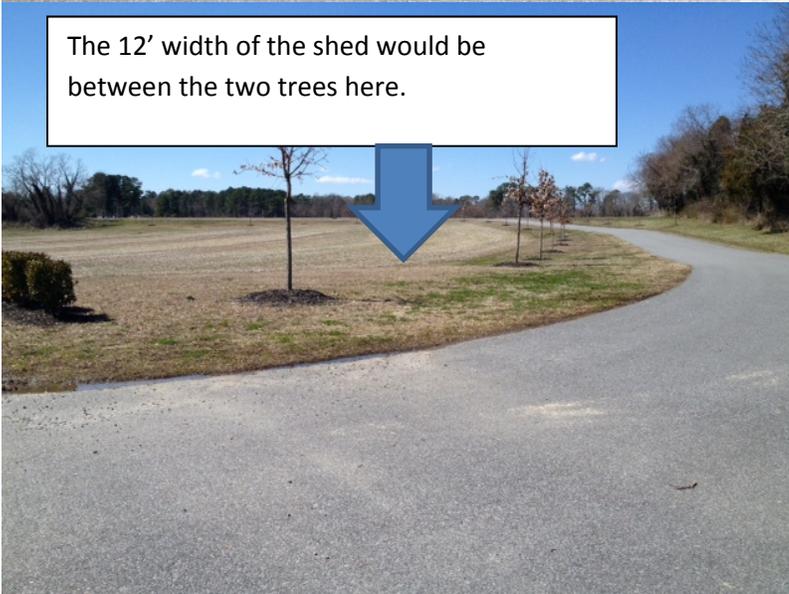
The back edge of the shed would start here, in the grassy area.



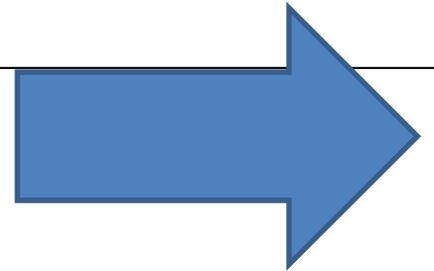
The front edge/ porch of the shed is here.



The 12' width of the shed would be between the two trees here.



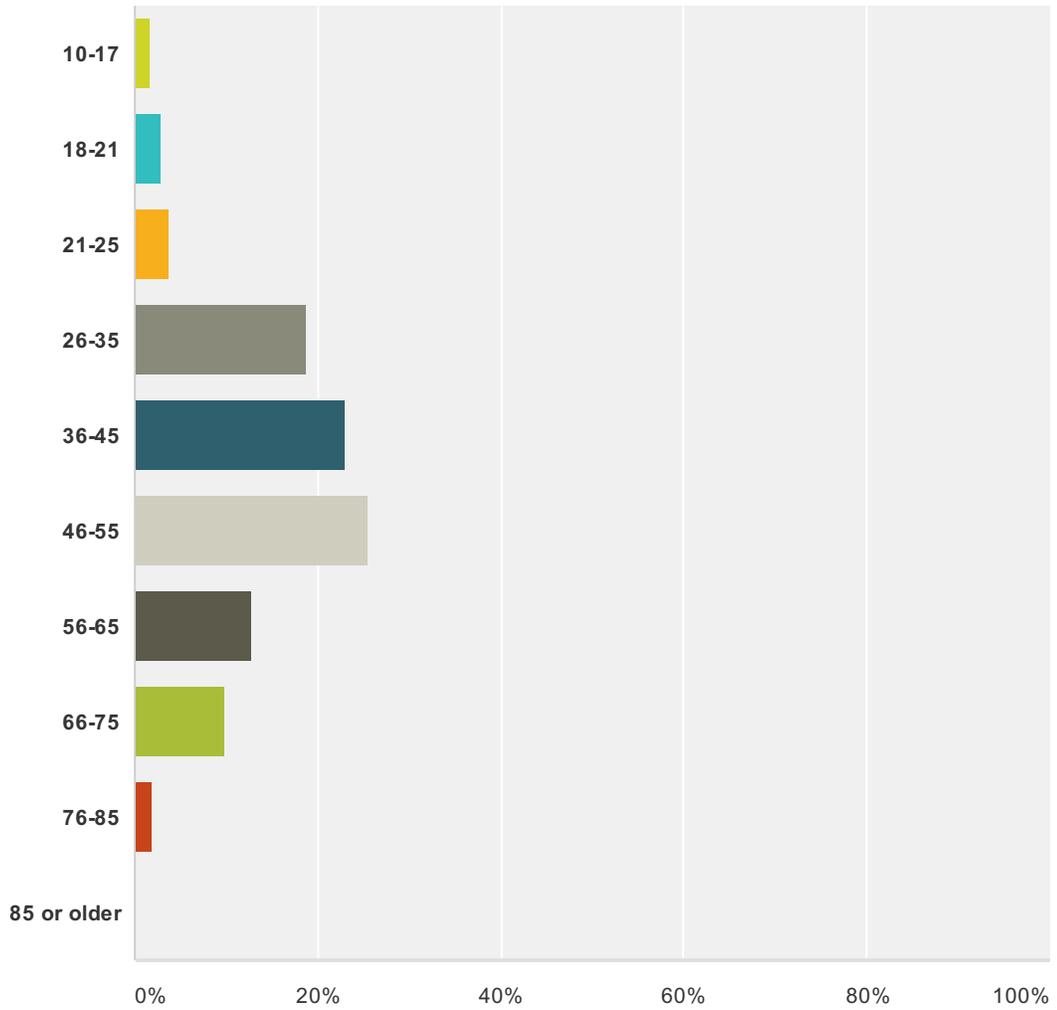
Kayak launch and trail are to this side in all photos.



Windsor Castle Park Master Plan Survey

Q1 Please provide your age group.

Answered: 314 Skipped: 0

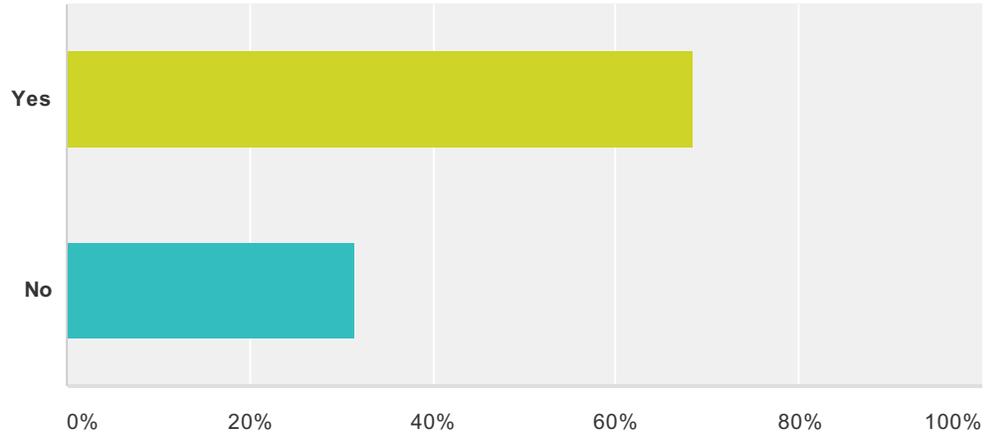


Answer Choices	Responses
10-17	1.59% 5
18-21	2.87% 9
21-25	3.82% 12
26-35	18.79% 59
36-45	22.93% 72
46-55	25.48% 80
56-65	12.74% 40
66-75	9.87% 31
76-85	1.91% 6
85 or older	0% 0
Total	314

Windsor Castle Park Master Plan Survey

Q2 Do you have children in your family (may be children, grandchildren etc.)?

Answered: 314 Skipped: 0



Answer Choices	Responses
Yes	68.47% 215
No	31.53% 99
Total	314

Windsor Castle Park Master Plan Survey

Q3 What is your street address and zip code? (only 4 survey submissions from this address will be accepted)

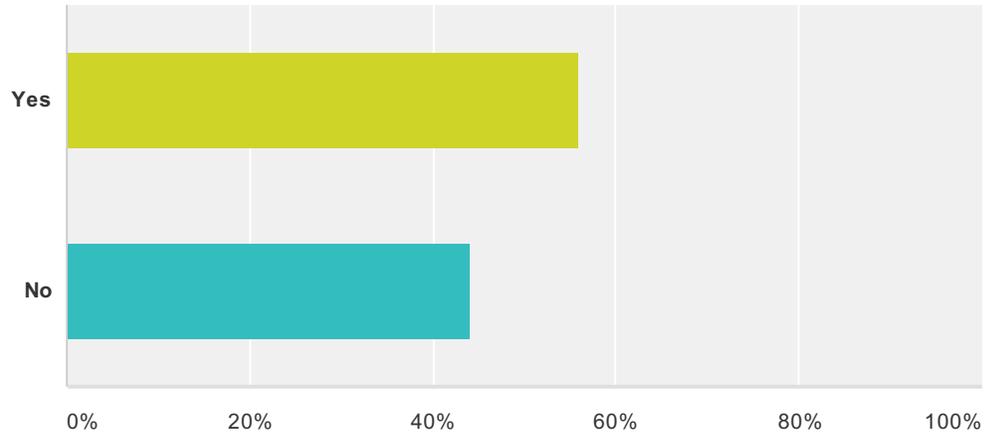
Answered: 314 Skipped: 0

Answer Choices	Responses
Street Address	100% 314
Zip Code	100% 314

Windsor Castle Park Master Plan Survey

Q4 Are you a resident of the Town of Smithfield (do you pay property tax to the town and the county)?

Answered: 314 Skipped: 0

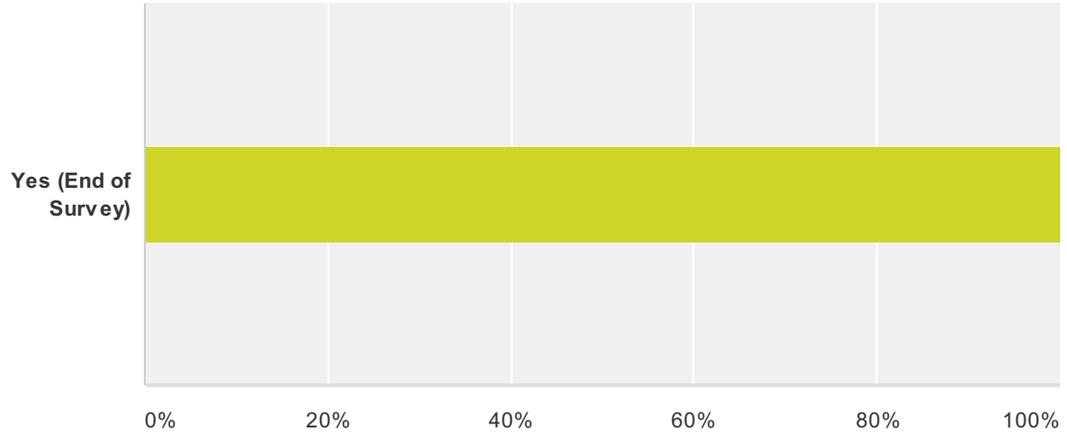


Answer Choices	Responses	
Yes	56.05%	176
No	43.95%	138
Total		314

Windsor Castle Park Master Plan Survey

Q5 Do you feel none of the proposed amenities are needed for the park? By clicking yes, you are opting out of rating the proposed amenities in Question 6.

Answered: 20 Skipped: 294

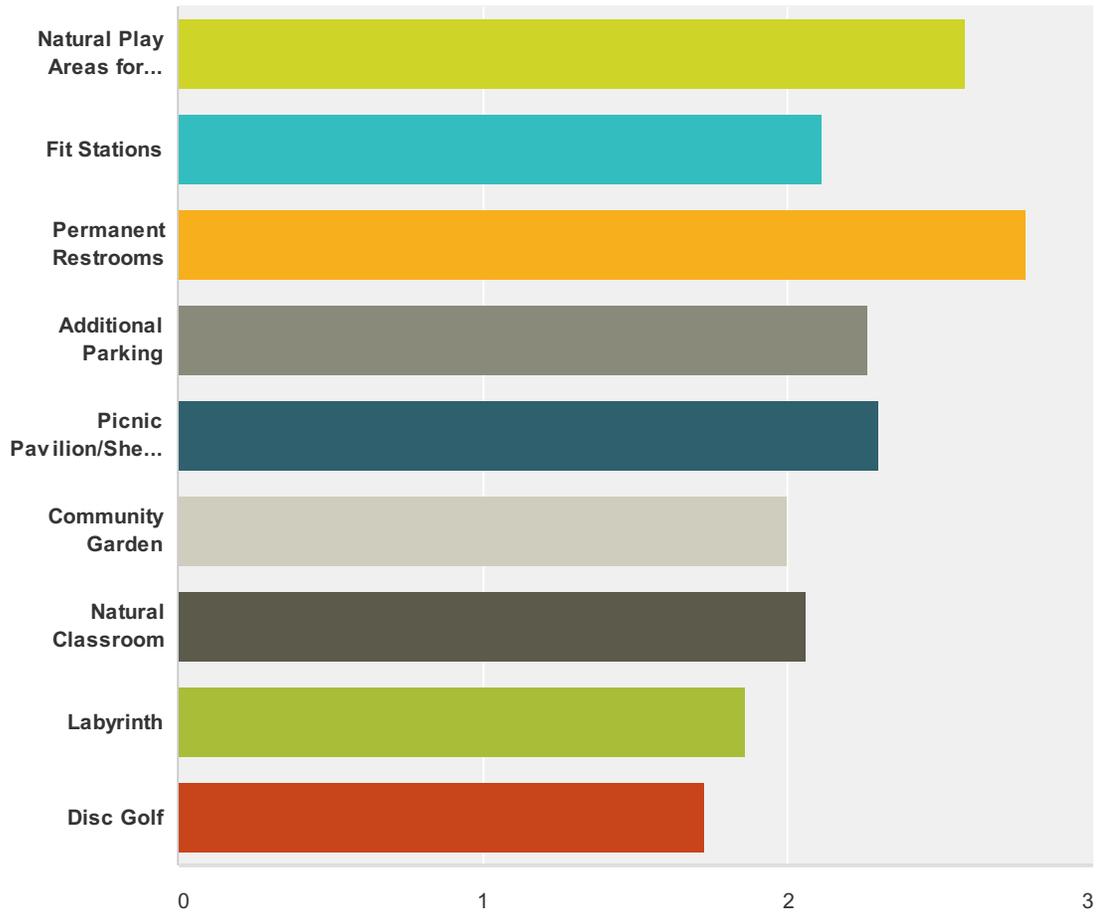


Answer Choices	Responses
Yes (End of Survey)	100% 20
Total	20

Windsor Castle Park Master Plan Survey

Q6 How do you feel about each of the following proposed amenities:

Answered: 281 Skipped: 33



	SHOULD NOT be included the master plan	Neutral	Definetly INCLUDE in the master plan	Total	Average Rating
Natural Play Areas for Children	11.96% 33	18.48% 51	69.57% 192	276	2.58
Fit Stations	26.81% 74	35.51% 98	37.68% 104	276	2.11
Permanent Restrooms	5.40% 15	11.51% 32	83.09% 231	278	2.78
Additional Parking	13.00% 36	48.01% 133	38.99% 108	277	2.26
Picnic Pavilion/Shelter	16.48% 45	37.36% 102	46.15% 126	273	2.30
Community Garden	27.70% 77	44.96% 125	27.34% 76	278	2.00
Natural Classroom	24.55% 68	45.13% 125	30.32% 84	277	2.06
Labyrinth	33.94% 94	45.85% 127	20.22% 56	277	1.86

Windsor Castle Park Master Plan Survey

Disc Golf	48.19% 133	30.80% 85	21.01% 58	276	1.73
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#	Comments for "Natural Play Areas for Children"	Date
1	all parks should have a play area, this part of the initial plan	3/21/2014 1:38 PM
2	a play area that utilizes the natural surroundings would help foster imaginative play and also would stand out from the many traditional play areas locally.	3/15/2014 3:27 PM
3	Natural Playscapes fit into the theme and landscape. Further, it promotes fitness and natural learning together.	3/15/2014 12:30 AM
4	one small area near picnic area, mostly for smallish children	3/14/2014 12:04 PM
5	too elaborate, picnic area and open field are enough	3/14/2014 11:56 AM
6	We need more activities for kids	3/13/2014 10:05 PM
7	engages kids to be outside	3/13/2014 9:10 AM
8	My grand kids live out of town, so for me this isn't an issue	3/13/2014 8:49 AM
9	Because kids should be able to play there	3/12/2014 8:18 PM
10	Let the kids play in the woods.	3/12/2014 7:02 PM
11	1 play area only	3/12/2014 4:46 PM
12	The only play area available locally is Nike Park	3/10/2014 10:49 AM
13	The object is to get kids outside to play instead of indoors.	3/10/2014 9:23 AM
14	A natural playground, no rubber plastic stuff, would fit in.	3/9/2014 7:50 PM
15	The park itself is a natural area for play.	3/9/2014 7:00 PM
16	Good addition but design very important	3/9/2014 7:54 AM
17	Fun place to take kids	3/9/2014 7:33 AM
18	because children need as many places as possible to play	3/8/2014 9:10 AM
19	My children do not always want to walk around the trails and there is nothing else for them to do at the park, so we usually end up going to another park that has a playground.	3/8/2014 8:34 AM
20	Children need to play	3/7/2014 9:14 PM
21	There is no nice playground in the area	3/7/2014 2:40 PM
22	Natural play areas are definitely not needed at all. We have ball parks, the YMCA, tennis courts, school and after-school activities that allow plenty of play. Just walking the park is play for my grandchildren (ages 7, 5 and 2) with all of the natural items they find (pine cones, rocks, whatever attracts their attention).	3/7/2014 10:10 AM
23	i have children that use the park	3/7/2014 3:34 AM
24	What is a park without kids?	3/5/2014 3:36 PM
25	We have a park near the library.	3/5/2014 6:28 AM
26	Children should be encouraged to play outside!	3/4/2014 1:14 PM
27	a good option with smaller children	3/3/2014 8:54 AM
28	There is currently a dog park at the park but no place for children to play.	3/3/2014 8:51 AM
29	Liability. Many children are left unattended by parents. Too much can happen.	3/3/2014 8:31 AM
30	encourage fitness for our children in natural setting	3/3/2014 7:40 AM
31	I think the park already offers a natural play area for children. Why invest another \$300,000.00. What will the maintenance costs be?	3/2/2014 8:59 AM
32	You have a dog play park. Why not a kids park????	3/2/2014 7:56 AM

Windsor Castle Park Master Plan Survey

33	A resource for children is a "no brainer."	3/1/2014 3:20 PM
34	Kids need the area to grow and learn about others.	3/1/2014 11:39 AM
35	Natural playground would be good for childrens activities	2/28/2014 5:09 PM
36	Love the slide concept and other ideas that incorporate the natural environment	2/28/2014 2:13 PM
37	Are actual rocks used (boulders)? Safety concern.	2/26/2014 10:49 PM
38	It is a neat concept and will lead kids to play outside of the box	2/26/2014 10:05 PM
39	This would encourage family outings to the park and town.	2/26/2014 7:52 PM
40	With how our society is growing in the technological world, our children need places outdoors where they can get away from the video games and tv shows.	2/26/2014 4:23 PM
41	Promotes physical activity I while encouraging an appreciation of the outdoors	2/26/2014 3:52 PM
42	This is a no-brainer -- there should obviously be play areas for children in a park!	2/26/2014 2:01 PM
43	In the proper location gets the children off video games	2/25/2014 2:33 PM
44	It would encourage kids to get out into nature and play and exercise. They will learn to appreciate our natural surroundings instead of plastic unattractive play areas.	2/25/2014 8:49 AM
45	Not much for children currently	2/24/2014 9:08 AM
46	Encouragement of physical activity in a natural setting	2/24/2014 8:40 AM
47	Smfd needs activities for children	2/22/2014 4:33 PM
48	children should be encouraged to use the park	2/22/2014 7:30 AM
49	A natural playground would fit well into the landscape and provide a much-needed amenity for the community. I love the natural idea, reminds me of those all-wood parks that looked like castles, pirate ships, etc. growing up. It will allow kids to use their imaginations.	2/21/2014 11:41 AM
50	should not be turned into an amusement park, that was not the original intent.	2/21/2014 9:51 AM
51	There are other places for kids to play in Smithfield. This this area natural please.	2/20/2014 7:50 PM
52	Promotes healthy kids, playing in nature!	2/20/2014 7:37 PM
53	great to have kids play but also keeps park looking nice	2/20/2014 6:31 PM
54	Children need an area to exercise	2/20/2014 5:30 PM
55	im 23 and would play on this, its a fun way to show kids that you can make anything you want out of natural resources.	2/20/2014 5:05 PM
56	Will spoil the natural beauty of the park	2/20/2014 3:32 PM
57	what a nice place for parent & child to enjoy the outdoors.	2/20/2014 11:26 AM
58	we need more areas outdoors for our children to enjoy and remain active	2/19/2014 10:30 PM
59	Uniqueness will attract repeat visitors	2/19/2014 10:17 PM
60	Kids need to start playing outside again without being paralyzed by the fear they might fall, get dirty, etc.	2/19/2014 8:33 PM
61	currently there are no good play areas for kids in the park	2/19/2014 3:56 PM
62	My children would love them	2/18/2014 9:29 PM
63	If WCP is an important part of their childhood, then when our children grow up, they will be more inclined to take care of the park in the future.	2/18/2014 5:06 PM
64	believe this draws unsupervised children and teens. and even supervised the peace and quiet will be disrupted	2/17/2014 11:17 PM
65	Walkers and joggers love this trail. It would be nice to have the natural play areas for the younger children.	2/17/2014 2:43 PM
66	We love WCP, but would REALLY love a play area for kids.	2/16/2014 8:01 PM

Windsor Castle Park Master Plan Survey

67	A place for families to come together and enjoy the park with their children.	2/14/2014 9:40 PM
68	park is not a playground	2/14/2014 5:43 PM
69	Enjoying the outdoors is critical for children. Not all families have the means or logistics to let their children play at their residences or in their neighborhoods (which can also be dangerous). It would be great for families to have somewhere public yet safe for their kids to go play.	2/14/2014 3:59 PM
70	The Town/County does not upkeep the playgrounds that have now.	2/14/2014 2:03 PM
71	Will take away from the natural beauty!	2/14/2014 1:18 PM
72	Adds a dimension that would allow children to enjoy the park as well	2/14/2014 11:24 AM
73	Get's my kids excited to go to the park, from which I can coerce them into hiking on some of the trails.	2/13/2014 11:53 PM
74	Great way go incorporate the land into playing and get the kids out moving. I even want to play on those structures!	2/13/2014 9:51 PM
75	my kids love the park this would just make it even better for them.	2/13/2014 7:08 PM
76	will make it nice for children	2/13/2014 6:45 PM
77	aren't there enough play areas for children and the area	2/13/2014 5:36 PM
78	There really is not a play area for kids in Smithfield.	2/13/2014 5:34 PM
79	To further attract families to visit the park	2/13/2014 4:15 PM
80	Areas for kids to play are badly needed, and prefer that they look "natural" as opposed to a "traditional" playground.	2/13/2014 3:54 PM
81	Would be nice to share the park with my kids	2/13/2014 3:40 PM
82	Kids need a place to play	2/13/2014 3:26 PM
83	The park in itself is a natural play area. Plenty of other options exist for children in this area (to include Nike Park and Huntington Park)	2/13/2014 2:10 PM
84	I have young children and it would make the park even more fun for them!	2/13/2014 2:06 PM
85	it is a peaceful enviornment	2/13/2014 1:27 PM
86	Families need a nice place to play and be active	2/13/2014 1:05 PM
87	Fine, as long as it's natural and nicely integrated in the park	2/13/2014 12:56 PM
88	This would be great for the children in the community.	2/13/2014 12:47 PM
89	Imagination is far better than planned play area. Future upkeep costs.	2/13/2014 12:20 PM
90	There is a Dog Park, why isn't there something for kids	2/13/2014 12:11 PM
91	A park needs a playground	2/2/2014 9:36 PM
#	Comments for "Fit Stations"	Date
1	this will not be utilized very much	3/21/2014 1:38 PM
2	There are so many other good options to promote fitness, why settle for the status quo in such a beautiful and unique setting.	3/15/2014 12:30 AM
3	does not fit my image of a passive park	3/14/2014 7:10 PM
4	will show too much, already located near YMCA & not used there with running and walking	3/14/2014 12:04 PM
5	Great idea	3/13/2014 10:05 PM
6	I enjoy walking the trails as part of an exercise routine, the stations would add to that routine	3/13/2014 8:49 AM
7	As long as the structures do not require the destruction of trees.	3/12/2014 10:15 PM
8	You should have a place where you can kinda workout	3/12/2014 8:18 PM
9	Use tree to stretch against. Eye sore	3/12/2014 7:02 PM
10	I walk there three times a week and would definitely stop to do the fitness stations	3/10/2014 10:49 AM

Windsor Castle Park Master Plan Survey

11	Depends on how they blend in with the environment.	3/9/2014 7:50 PM
12	Unnecessary. Just a boondoggle for some contractor.	3/9/2014 7:00 PM
13	Would detract from trails	3/9/2014 7:54 AM
14	Exercise and kids love it	3/9/2014 7:33 AM
15	this will only benefit and enforce the trails and walking paths already there	3/8/2014 9:10 AM
16	Kids and adults alike could get a use out of this	3/7/2014 9:14 PM
17	The natural beauty of the park would be disturbed, and there's plenty of "fit" options in the park walking, running the trails, bike trails, fishing and layacking. The YMCA and other opportunities exist for citizines to partake of. The natural beauty of the paark would NOT be enhanced by fit stations.	3/7/2014 10:10 AM
18	husband and i would enjoy	3/7/2014 3:34 AM
19	encourage a healthy lifestyle	3/5/2014 10:59 PM
20	Every park that I have seen these in, they are always being used.	3/5/2014 3:36 PM
21	Fit stations are already near the YMCA.	3/4/2014 1:14 PM
22	Intrudes on natural character of trails	3/4/2014 12:41 PM
23	Can we afford it. Will children be alone or watched	3/3/2014 11:26 AM
24	Many runners and walkers would enjoy an addition of stations to their fitness routines.	3/3/2014 8:31 AM
25	I travel often and see never see these used. They start to look shabby	3/3/2014 2:55 AM
26	No need.....Creative runners can do pushups, pullups, situps, crunches, squats, etc in the already available areas along the trail.	3/2/2014 8:59 AM
27	These are NEVER used	3/2/2014 7:56 AM
28	Too many, potentially too dangerous	3/1/2014 6:35 PM
29	We need safe places to exercise other than paid gyms.	3/1/2014 11:39 AM
30	detracts from natural beauty of Park	2/28/2014 5:09 PM
31	Perfect addition to the walking trails	2/28/2014 11:49 AM
32	Not all individuals can afford memberships to a workout facility.	2/26/2014 4:23 PM
33	Not convinced people will use them	2/26/2014 2:01 PM
34	I work out, would allow variety	2/26/2014 1:37 PM
35	I am not sure fit station use will warrant the expense and maintenance associated with installing them.	2/26/2014 11:18 AM
36	I have serious doubts as to the amount of use.	2/25/2014 2:33 PM
37	Young adults and adults will benefit from the fit stations. There are a lot of runners and walkers in the park who would use the fit stations on a regular basis.	2/25/2014 8:49 AM
38	These often go unused at other parks	2/24/2014 9:08 AM
39	Incompatible with quiet enjoyment of walking trails.	2/24/2014 9:03 AM
40	Encouragement of physical activity for all ages	2/24/2014 8:40 AM
41	There are enough fitness gyms and personal workout plans for individuals, resources can be used better in other areas.	2/23/2014 9:05 PM
42	great warmup areas for joggers	2/22/2014 4:33 PM
43	more appropriate in a different park	2/22/2014 7:30 AM
44	Even though they are supposed to be off the trail, they will disructe the flow of the trail, with people congregating around the fit stations. Plus, these seems dated to me, like they were popular in the 80s.	2/21/2014 11:41 AM

Windsor Castle Park Master Plan Survey

45	Same as above.	2/21/2014 9:51 AM
46	No thanks	2/20/2014 7:50 PM
47	promotes healthy citizens	2/20/2014 6:31 PM
48	There are fit stations beside Riverside Hospital. They are NEVER in use. Will you have insurance for those who are injured?	2/20/2014 5:14 PM
49	this world is too fat lets make Town of Smithfield healthiest in the Nation!! fit station is one step closer	2/20/2014 5:05 PM
50	These stations exist at the YMCA and I do not see people using them there so it seems that they would not be used in the park either.	2/20/2014 4:15 PM
51	Will spoil the natural beauty of the park	2/20/2014 3:32 PM
52	My whole family would use these. We use the ones in Nike park now, but would like to us fit stations in conjunction with running Windsor Castle park trails.	2/19/2014 8:33 PM
53	a lot of people use the park to exercise (run, jog, walk) and I think a fit area would get a lot of use too	2/19/2014 3:56 PM
54	It will overpower the natural ambiance and serenity of the park	2/18/2014 7:09 PM
55	Benefits those who run/walk the trails and encourages a healthy lifestyle without significant impact.	2/18/2014 5:06 PM
56	it is something most people already coming to park would use and enjoy, as most are there for exercise	2/17/2014 11:17 PM
57	I walk many trails in the area and enjoy using the stations that other parks offer	2/17/2014 2:02 PM
58	limited use	2/14/2014 5:43 PM
59	I don't view this as necessary. I think the walking and bike trails provide enough means of exercise for the park. Anything more than that is overkill.	2/14/2014 3:59 PM
60	No Need	2/14/2014 2:03 PM
61	This is a nature park, not a gym.	2/14/2014 1:18 PM
62	I would use it, increases uses of the trails	2/14/2014 11:24 AM
63	I enjoy running on the trails. Nice to have additional fitness options available.	2/13/2014 11:53 PM
64	i never see people using these at nike park. i don't think they would be used.	2/13/2014 7:08 PM
65	There is a fit station at Nike Park. Just go there.	2/13/2014 5:34 PM
66	I support this as long as these stations are off the path and do not take away from the park atmosphere	2/13/2014 5:20 PM
67	So many folks use the park for exercise already, this would allow for a more complete workout.	2/13/2014 3:54 PM
68	See them in many parks. NO ONE uses. Plus there is fitness stations at Nike already	2/13/2014 3:40 PM
69	Not necessary at all. It will take away from the natural beauty of the park	2/13/2014 2:10 PM
70	i dont need a bunch of guys showing me up and making me look like a wus	2/13/2014 1:27 PM
71	People need to be more active	2/13/2014 1:05 PM
72	Takes away from the natural character of the park	2/13/2014 12:56 PM
73	Too many in this town and county already exists. See empty Riverview Park	2/13/2014 12:20 PM
74	Not necessary	2/13/2014 12:18 PM
75	not needed, intrudes against natural setting	2/12/2014 2:51 PM
#	Comments for "Permanent Restrooms"	Date
1	portable toilets are meant to be temporary, it is time for permanent restrooms	3/21/2014 1:38 PM
2	They would be nicer than the portable ones.	3/15/2014 7:31 PM
3	Families with young children and the elderly will be able to spend more time utilizing the park.	3/15/2014 12:30 AM

Windsor Castle Park Master Plan Survey

4	Who will foot bill for maintainance	3/14/2014 7:10 PM
5	weigh cost & do what is best	3/14/2014 12:04 PM
6	The temporary ones are smelly and awful	3/13/2014 10:05 PM
7	promotes people spending more time there	3/13/2014 9:10 AM
8	Don't like port a potties	3/13/2014 8:49 AM
9	In the 21st century this is something people expect.	3/12/2014 10:15 PM
10	People should be able to go to the restrooms	3/12/2014 8:18 PM
11	Because people should not have to worry about not knowing where the restrooms	3/12/2014 8:04 PM
12	Not needed. Current rest are all we need. Less to maintain	3/12/2014 7:02 PM
13	The porta potties are the cleanest around, but the park has many many visitors. It would be nice for something permanent.	3/10/2014 10:49 AM
14	Would be nice.	3/9/2014 7:50 PM
15	This is the one amenity that is really needed.	3/9/2014 7:00 PM
16	Good for picnics other events	3/9/2014 2:57 PM
17	Needed improvement	3/9/2014 7:54 AM
18	U gotta go	3/9/2014 7:33 AM
19	especially if there is a childrens area so that little omne can use the restroom with mms and dads able to bring there kids	3/8/2014 9:10 AM
20	The convenience of permanent restrooms would be nice, especially if they were near the playground. Toddlers aren't really meant to use port-a-potties.	3/8/2014 8:34 AM
21	Obvious reasons port o potties are gross	3/7/2014 2:40 PM
22	Every time I walk the park or bring the dog to the dog area I use the restroom. A permanent, MAINTAINED, restroom would be wonderful.	3/7/2014 10:10 AM
23	my son is 3, he currently uses the trees. my 1yr old not yet.	3/7/2014 3:34 AM
24	you never know sometimes when the urge hits you	3/5/2014 10:59 PM
25	They are always needed.	3/5/2014 3:36 PM
26	These are needed.	3/5/2014 6:28 AM
27	Allows people to use the park for a longer amount of time.	3/4/2014 1:14 PM
28	Current portable restrooms are not sufficient	3/4/2014 12:41 PM
29	If the money is not theredon't do it!	3/3/2014 11:26 AM
30	This would make a nice addition for events at WCP.	3/3/2014 8:31 AM
31	basic need	3/3/2014 7:40 AM
32	Maintenance and cleaning problem and expense.	3/3/2014 2:55 AM
33	Restrooms are okay as long as they conform to the natural beauty of the park. Who will maintain and clean them? I assume they will be septic based? Who will pay for the installation cost?	3/2/2014 8:59 AM
34	Sometimes you just gotta go....	3/2/2014 7:56 AM
35	Needed replacement for stinky porta-potties!	3/1/2014 3:20 PM
36	Self explanatory.	3/1/2014 11:39 AM
37	Visitors to park will stay longer	2/28/2014 5:09 PM
38	Every park needs a permanent restroom area	2/28/2014 11:49 AM
39	it provides ease of use and allows for longer visits.	2/26/2014 7:52 PM

Windsor Castle Park Master Plan Survey

40	They ARE necessary. Permanent restrooms will benefit parents with babies in strollers, and is overall cleaner.	2/26/2014 4:23 PM
41	The park is used often for various events. Something permanent would add to its appeal	2/26/2014 3:52 PM
42	Permanent restrooms are a feature everyone needs and will use	2/26/2014 2:01 PM
43	The current temporary facilities are disgusting and often unusable.	2/26/2014 11:18 AM
44	at the Kayak ramp area	2/26/2014 8:38 AM
45	This is a natural progression in the maturation of the park	2/25/2014 2:33 PM
46	If you add play areas for children there must be permanent restrooms.	2/25/2014 8:49 AM
47	Better for families	2/24/2014 9:08 AM
48	Convenience, especially those with children and for the elderly	2/24/2014 8:40 AM
49	I am fine with portable toilets, permanent public restrooms present maintenance, vandalism, sexual deviant behavior (anonymous meeting up for sexual encounters which is a huge issue at Newport News Park) issues	2/23/2014 9:05 PM
50	people running/jogging sometimes "gotta go"	2/22/2014 4:33 PM
51	the present restroom is unattractive	2/22/2014 7:30 AM
52	Portapotties get gross in the hot summer, and the public restrooms in town are too far away.	2/21/2014 11:41 AM
53	The port o potties are fine. The ones currently there are not an eye sore and has a wash station.	2/20/2014 7:50 PM
54	when nature calls you should have a facility	2/20/2014 6:31 PM
55	Everyone has to go to the bathroom at inopportune times - nice to be prepared.	2/20/2014 5:14 PM
56	nobody likes portapotties	2/20/2014 5:05 PM
57	I have seen the permanent restroom structure at Nike Park and it is filthy. It also seems to be a place that offer too much opportunity for mischief.	2/20/2014 4:15 PM
58	The restrooms are needed.	2/20/2014 3:32 PM
59	permanent/maintained rest rooms increase the over all class of the park, check out the potties at the black school house on main!	2/20/2014 11:26 AM
60	When you gotta go, you gotta go!	2/19/2014 10:17 PM
61	I have wished for a restroom many times while running the trail.	2/19/2014 8:33 PM
62	Since I use the park every day, the permanent restrooms (at least by the dog park) would be nice. If you do add a play area, parents would definitely want that for the younger children.	2/17/2014 2:43 PM
63	more to maintain	2/17/2014 2:02 PM
64	Permanent bathrooms are generally cleaner.	2/16/2014 8:01 PM
65	I'd like to see them but I'm afraid they would not be maintained or vandalized.	2/14/2014 9:40 PM
66	much cleaner than outhouse	2/14/2014 5:43 PM
67	Permanent restrooms will attract more people to utilize the park and elevate the park.	2/14/2014 3:59 PM
68	Obviously needed. Porta-potties aren't exactly high class.	2/14/2014 3:29 PM
69	Necessary!	2/14/2014 1:18 PM
70	no-brainer	2/14/2014 11:24 AM
71	I'm the only guy in a house full of women. I seriously detest listening to them gripe about the current port-o-lets.	2/13/2014 11:53 PM
72	with more events in the park these are needed.	2/13/2014 7:08 PM
73	Definite need	2/13/2014 6:45 PM
74	If you build a play area, you need restrooms.	2/13/2014 5:34 PM

Windsor Castle Park Master Plan Survey

75	Necessary if one spends hours in the park	2/13/2014 4:15 PM
76	Used porta potty recently and was very full and no water to wash my hands. Ew.	2/13/2014 3:40 PM
77	its just common sense that where people gather they need a place to use a bathroom!	2/13/2014 2:26 PM
78	I only think they are useful as an alternative to the portable ones but not necessary.	2/13/2014 2:10 PM
79	people have to go	2/13/2014 1:27 PM
80	Restrooms are needed in an public park	2/13/2014 1:05 PM
81	Self explanatory	2/13/2014 12:56 PM
82	It would look nicer than the porta potties	2/13/2014 12:47 PM
83	Too costly upkeep.	2/13/2014 12:20 PM
84	Necessary	2/13/2014 12:18 PM
85	A park needs a restroom, especially during winter	2/2/2014 9:36 PM
#	Comments for "Additional Parking"	Date
1	the park attendance is increasing and the parking lot fills up frequently	3/21/2014 1:38 PM
2	When there is an event or a warm, sunny day, it would be helpful to have extra parking.	3/15/2014 7:31 PM
3	I am not aware of the current capacity/use ratio.	3/15/2014 12:30 AM
4	probably needed at main parking area	3/14/2014 12:04 PM
5	For events	3/13/2014 10:05 PM
6	Green space is a better option.	3/13/2014 5:48 PM
7	I go early in the mornings, so parking isn't an issue for me	3/13/2014 8:49 AM
8	There are times when the current parking is at capacity.	3/12/2014 10:15 PM
9	I do not feel strongly on this that is because I do not have a car	3/12/2014 8:18 PM
10	Have never had issues with parking.	3/12/2014 7:02 PM
11	There is plenty of space to create extra parking.	3/10/2014 10:49 AM
12	Probably could use some more.	3/9/2014 7:50 PM
13	There is plenty of parking. We don't need to spend money to create more parking. Most of the time I go to the current parking lot, it's almost empty.	3/9/2014 7:00 PM
14	Near areas that are for rental....venues for weddings, town events	3/9/2014 6:46 PM
15	Not needed for time being	3/9/2014 7:54 AM
16	because the more amenities the more people because smithfield resident will not be the only ones using it the whole county wuill come	3/8/2014 9:10 AM
17	There's plenty of parking right now in several places, and along the street if need be. Monies should be used for other items instead.	3/7/2014 10:10 AM
18	More parking equals more people using the park	3/5/2014 3:36 PM
19	I can walk to the park in nice weather.	3/4/2014 1:14 PM
20	Again don't spend money you don't have..park is fine now!	3/3/2014 11:26 AM
21	Cars are starting to park along Jericho Road because of the use of the Park	3/3/2014 7:31 AM
22	Not needed	3/3/2014 2:55 AM
23	Any new amenity will drive the need for additional parking. Keep this in mind as you plan. Parking is already an issue on Saturdays and Sundays.	3/2/2014 8:59 AM
24	No need	3/2/2014 7:56 AM
25	more parking would be fine, but why does it have to be asphalt?	2/28/2014 5:09 PM

Windsor Castle Park Master Plan Survey

26	I've never struggled to find a parking place at the park.	2/28/2014 12:30 PM
27	I havent been to the park during one of their events, so i wouldnt know if there is a need for more parking. However, adding more parking can never be a terrible thing unless its in the way of a park feature or in the way of a beautiful view.	2/26/2014 4:23 PM
28	at the kayak ramp area	2/26/2014 8:38 AM
29	Adding playgrounds without parking doesn't make sense	2/25/2014 2:33 PM
30	Current parking is rarely full to capacity; If additional parking is added, should be pervious pavers for water quality	2/24/2014 9:08 AM
31	Protect the fields from event parking damage.	2/24/2014 9:03 AM
32	So that the park is more accessible	2/24/2014 8:40 AM
33	There is plenty of room to expand parking and on the weekends it is especially needed.	2/23/2014 9:05 PM
34	If you're adding amenities, you'll attract more people	2/22/2014 4:33 PM
35	this is probably necessary for festivals or groups	2/22/2014 7:30 AM
36	With more amenities, more people will come and more parking will be needed.	2/21/2014 11:41 AM
37	I use the park everyday and have NEVER had a problem finding parking.	2/20/2014 7:50 PM
38	Depends on how many more spots you are going to do. Think ahead. After the crush of the opening, will the additions be utilized?	2/20/2014 5:14 PM
39	nobody wants to park on the street/ however may not need it?	2/20/2014 5:05 PM
40	The traffic on Jericho Road is awful already because it is too narrow for all of the cars that drive on that road and I don't think we should promote more traffic by creating more parking. It seems there are more than enough spaces as it is since the ones that exist are often empty.	2/20/2014 4:15 PM
41	Is parking a problem?	2/20/2014 3:32 PM
42	as park grows in popularity orginal lots will fill & not everyone wants to park across from station, who can control lot access based on their activities	2/20/2014 11:26 AM
43	There is plenty of parking. I never have an issue finding a spot.	2/19/2014 3:26 PM
44	I would limit the paved areas. So far, parking has not seemed to be a problem.	2/18/2014 5:06 PM
45	I walk the trail every day. I have never found parking to be a problem.	2/17/2014 2:43 PM
46	I think it is fine as it is	2/17/2014 2:02 PM
47	Badly needed – especially during summer	2/16/2014 8:01 PM
48	Maybe leave a space available near future amenities for future development if needed.	2/14/2014 9:40 PM
49	parking seems sufficient	2/14/2014 5:43 PM
50	I think for every day use there is enough parking, but as the park is being used more and more for large functions and festivals, the need for more parking presents itself.	2/14/2014 3:59 PM
51	You've got plenty.	2/14/2014 3:29 PM
52	Nessary!	2/14/2014 1:18 PM
53	not opposed, but would need to see an actual need first	2/14/2014 11:24 AM
54	Seems to be enough parking but would be nice to have for big events	2/13/2014 5:20 PM
55	theres not enough parking already	2/13/2014 2:26 PM
56	Additional parking makes sense if surveys/studies exist showing that existing capacity is consistently exceeded.	2/13/2014 2:10 PM
57	not needed yet	2/13/2014 1:27 PM
58	More people will visit the park	2/13/2014 1:05 PM
59	Not needed, plenty of additional parking in town	2/13/2014 12:56 PM

Windsor Castle Park Master Plan Survey

60	Off site parking on Main St already. Extend Shuttle bus times.	2/13/2014 12:20 PM
61	Current parking insufficient	2/2/2014 9:36 PM
#	Comments for "Picnic Pavilion/Shelter"	Date
1	there should be a 25' x 25' shelter at the play/picninc area	3/21/2014 1:38 PM
2	Enjoying the natural beauty and scenery while eating as a group is a positive experience for families and groups.	3/15/2014 12:30 AM
3	Trash, maintainance,	3/14/2014 7:10 PM
4	don't need covered area, if raining not going to park anyway. If too much sun, go in shade of trees. More tables might be needed	3/14/2014 12:04 PM
5	For picnics and events	3/13/2014 10:05 PM
6	Would be nice to have a covered area	3/13/2014 8:49 AM
7	Not needed. Current picnic tables are adequate. Just more to maintain.	3/12/2014 7:02 PM
8	Not sure; would depend on the structure, where, how lage, etc.	3/9/2014 7:50 PM
9	There are already picnic areas.	3/9/2014 7:00 PM
10	If decided then keep natural to fit into environment	3/9/2014 6:46 PM
11	Must be designed appropriately	3/9/2014 7:54 AM
12	Shelters are nice when tartly done	3/9/2014 7:33 AM
13	so families can make a day of being there	3/8/2014 9:10 AM
14	Picnic shelters are okay as long as the live trees are not disturbed in any way.	3/7/2014 10:10 AM
15	outdoor social center would be nice	3/7/2014 3:34 AM
16	Used a lot now.	3/5/2014 3:36 PM
17	This is a walking park. Keep the open spaces.	3/5/2014 6:28 AM
18	Could make money for the park?	3/4/2014 1:14 PM
19	I believe it is fine!	3/3/2014 11:26 AM
20	I worry about the litter this may bring to the park.	3/3/2014 8:51 AM
21	Is it necessary? Would it attract loitering in the evening? Just things to think about.	3/3/2014 8:31 AM
22	We currently have picnic tables that are not used	3/3/2014 7:31 AM
23	Already picnic areas that are rarely used. Also cleaning issue	3/3/2014 2:55 AM
24	Picnic lunches on blankets are great...or bring your own portable tables and chairs. No need for additional picnic areas. I rarely see them being used.	3/2/2014 8:59 AM
25	The large one shown is a monstrosity that does not belong at WCP.	3/1/2014 3:20 PM
26	Could bring extra revenue to keep the park clean.	3/1/2014 11:39 AM
27	Weather would not spoil outdorr activities	2/28/2014 5:09 PM
28	This would be a great feature for use year round.	2/28/2014 11:49 AM
29	A large pavilion would be great for weddings and other social events!	2/26/2014 4:23 PM
30	at the kayak ramp area	2/26/2014 8:38 AM
31	Again, mom and dad need someplace comfortable to wait	2/25/2014 2:33 PM
32	Families will bring their kids to play and exercisè and will need places to eat or have birthday parties.	2/25/2014 8:49 AM
33	move to waterfront area, out of the woods!	2/24/2014 3:17 PM
34	I don't see many picnicens at the park	2/24/2014 9:08 AM

Windsor Castle Park Master Plan Survey

35	Beautiful location to enjoy with family	2/24/2014 8:40 AM
36	This would serve groups well and be a possible income source for Smithfield if they charged a reservation fee.	2/23/2014 9:05 PM
37	Great feature for day trippers	2/22/2014 4:33 PM
38	This would go hand-in-hand with other amenities. If you build a playground, this would compliment it well and give families a place to hold birthday parties and reunions.	2/21/2014 11:41 AM
39	Because I use the park everyday, I notice that seldom is the picnic area already in place being used. I think it will bring the wrong crowd to the area and increase litter.	2/20/2014 7:50 PM
40	promotes groups lingering in park which can cause criminal issues	2/20/2014 6:31 PM
41	Are you renting the shelters? Who will be cleaning up the messes left behind? Will you have rules for potential renters that have been signed?	2/20/2014 5:14 PM
42	great place for any age group to enjoy for any reason on any day rain or shine	2/20/2014 5:05 PM
43	The picnic tables and grill that are in the park now are not used.	2/20/2014 4:15 PM
44	I don't want any trees sacrificed!	2/20/2014 3:32 PM
45	BarBQ grills, trash, size of group will dominate space, cleanup, maintence	2/20/2014 11:26 AM
46	While this could be a benefit, it could also generate a problem with trash and upkeep.	2/18/2014 5:06 PM
47	groups can have somewhere to enjoy a picnic/gathering together	2/17/2014 2:02 PM
48	It would be nice...	2/16/2014 8:01 PM
49	This would be great. Low cost. High enjoyment return for all age groups on the community.	2/14/2014 9:40 PM
50	potential for a hangout, crowds, litter	2/14/2014 5:43 PM
51	There picnic areas currently in place are enough. The area is pretty shaded, so you don't need shelter to provide shade. If it's raining or looking like inclement weather, people probably won't be heading out for a picnic, and thus there wouldn't be a need for shelter.	2/14/2014 3:59 PM
52	There are already picnic tables in place that I never see used.	2/14/2014 2:03 PM
53	again, adds another dimension / use of the park / generate renew	2/14/2014 11:24 AM
54	it would bring in revenue to pay for the upkeep, nothing in this area for family gatherings	2/13/2014 2:26 PM
55	That is not what the park was established/intended for by the person who so kindly gave it to us.	2/13/2014 2:10 PM
56	Draws too many loiterers. Future costs.	2/13/2014 12:20 PM
57	No need	2/13/2014 12:18 PM
58	It is needed	2/2/2014 9:36 PM
#	Comments for "Community Garden"	Date
1	this would require too much upkeep and would need to be fenced for deer	3/21/2014 1:38 PM
2	Linking nature, food and nutrition is a positive experience for Smithfield's citizens, young and old and provides the opportunity for additional grant opportunities.	3/15/2014 12:30 AM
3	alot of community gardens are allowed to become overgrown and unsightly.	3/14/2014 7:10 PM
4	offered and not wanted before, they make upkeep difficult	3/14/2014 12:04 PM
5	deer, grow at home	3/14/2014 11:56 AM
6	Beautiful and healthy	3/13/2014 10:05 PM
7	Not something I would use	3/13/2014 8:49 AM
8	I believe people would be more inclined to grow at their homes in a garden or in pots rather than drive to a garden.	3/12/2014 10:15 PM
9	Heck no!!!!	3/12/2014 8:18 PM
10	Because people may forget about their gardens and it will be full of weeds	3/12/2014 8:04 PM

Windsor Castle Park Master Plan Survey

11	Not needed in Smithfield.	3/12/2014 7:02 PM
12	Could be okay	3/9/2014 7:50 PM
13	A nice idea for more community participation.	3/9/2014 7:00 PM
14	Impossible to control appearance	3/9/2014 7:54 AM
15	A Community garden would be great if it is well managed. It should be near the parking area, in full sun and good drainage. This concept is not new: saw it well used in Germany. Fences would have to be used to keep the plentiful deer out.	3/7/2014 10:10 AM
16	my yard is too small. kids would enjoy watching plants grow	3/7/2014 3:34 AM
17	We don't have one and they are very popular.	3/5/2014 3:36 PM
18	This would never work.	3/5/2014 6:28 AM
19	Difficult to maintain in character with park	3/4/2014 12:41 PM
20	Will it be paid for by individuals who use it????	3/3/2014 11:26 AM
21	We would love to work on this committee to help in any way to begin a community garden.	3/3/2014 9:57 AM
22	More positive if this is on space already cleared that would not infringe with wooded areas and landscape w/ appropriate drainage	3/3/2014 8:54 AM
23	people not always responsible to keep up their portion of the work.	3/3/2014 7:40 AM
24	Brings community together; great learning experience for children.	3/1/2014 3:20 PM
25	Good, but participants must be committed to keep it up	2/28/2014 5:09 PM
26	In time these plots will become overgrown, aid to the out of control white tail deer population in our county and just become an eye sore. It is placing too much responsibility in the public to maintain their individual plots.	2/26/2014 9:55 PM
27	Our local community would embrace this type of project.	2/26/2014 7:52 PM
28	Most folks have gardens that want them; may also take away from Farmers Mkt	2/24/2014 9:08 AM
29	Maintenance burden; high risk of deminishing / limited interest over time.	2/24/2014 9:03 AM
30	A great way to provide education of our local plants	2/24/2014 8:40 AM
31	A community garden sounds nostalgic and nice, but the percentage of people that would actually use and participate would be very low in the 2 to 3% in my opinion	2/23/2014 9:05 PM
32	most Smd residents have yards large enough for gardens	2/22/2014 4:33 PM
33	It's a nice idea, but it seems like a lot of hassle and build-up for something that might not be used to capacity and would likely wane in popularity over time.	2/21/2014 11:41 AM
34	This is a nature park not a farm.	2/21/2014 9:51 AM
35	The place naturally produces colors.	2/20/2014 7:50 PM
36	most people in community has space even if just in potting plants to have small gardens	2/20/2014 6:31 PM
37	Too messy if not taken care of. I certainly wouldn't want to see it first thing coming in from any entrance.	2/20/2014 5:14 PM
38	wonderful skill we all need to know/learn and very fun and pretty	2/20/2014 5:05 PM
39	There is a children's garden in Cape Charles, Va which is such a great idea to get kids working outside and give them a sense of accomplishment when they grow their own fruits and veggies.	2/20/2014 4:15 PM
40	If placed next to parking and water, I think the garden is a great idea.	2/20/2014 3:32 PM
41	How would you decided who could have a garden there, will it become an eyesore if not kept weeded and picked.	2/20/2014 2:40 PM
42	Great idea but what is the water source?	2/20/2014 2:12 PM
43	upkeep, weeds, once over grown volunteers become scarce	2/20/2014 11:26 AM
44	not appealing to a large audience	2/17/2014 11:17 PM

Windsor Castle Park Master Plan Survey

45	not enough people close by to monitor/maintain the garden.	2/17/2014 2:02 PM
46	I'd love one. Who's going to maintain it properly?	2/14/2014 9:40 PM
47	lack of use, maintained by who?	2/14/2014 5:43 PM
48	We have a great Farmer's Market program that provides ample opportunity to obtain fresh, local produce.	2/14/2014 3:59 PM
49	Not needed keep it natural	2/14/2014 2:03 PM
50	Are you kidding us. The park is in Smithfield, not in NY	2/14/2014 1:18 PM
51	not unless it does not take up space that can be used for other recreation, and the expense is low	2/14/2014 11:24 AM
52	we are not a big city...most people have somewhere	2/14/2014 4:50 AM
53	Would add a level of community to the park	2/13/2014 5:20 PM
54	The park itself is a natural garden. Again, it does not serve the intent of why the park was established by the person who so kindly gave it to us.	2/13/2014 2:10 PM
55	Great learning tool	2/13/2014 2:06 PM
56	I think it would great for those who cannot have their own garden	2/13/2014 12:47 PM
57	Too much strife between leasee's and public. Animal protection fencing ect.	2/13/2014 12:20 PM
58	Not wanted; not necessary	2/13/2014 12:18 PM
59	This is a wonderful idea for people who do not have gardens space.	2/13/2014 12:11 PM
60	probably won't be used and will turn into a weed garden	2/10/2014 9:39 AM
#	Comments for "Natural Classroom"	Date
1	Natural classrooms are a part of best practice in early education programs. The park could become a wonderful center for Natural Learning Initiatives and training events. Ma conference could be hosted as a way to raise funds for the park	3/15/2014 12:30 AM
2	not needed, can stop at bench areas or use picninc tables, more expense and upkeep, can use natural area	3/14/2014 12:04 PM
3	not needed	3/14/2014 11:56 AM
4	Cool idea	3/13/2014 10:05 PM
5	Would be nice b ut not necessary.	3/13/2014 5:48 PM
6	Excessive.	3/12/2014 10:15 PM
7	Be creative with what is there now.	3/12/2014 7:02 PM
8	Would be a good learning experience for children and adults as well.	3/9/2014 7:50 PM
9	The entire park is a natural classroom.	3/9/2014 7:00 PM
10	Too disruptive to environment	3/9/2014 7:54 AM
11	Classes can use pavilion.	3/8/2014 4:35 PM
12	The park itself is a natural classroom that is every changing. Why should we pay extra money to junk it up? The Park is meant to be appreciated and enjoyed AS IT IS!	3/7/2014 10:10 AM
13	give people a better understanding of our environment	3/5/2014 10:59 PM
14	Great for boy/girl scouts and science classes.	3/5/2014 3:36 PM
15	Many possible uses.	3/4/2014 1:14 PM
16	Intrudes on park; won't be used much	3/4/2014 12:41 PM
17	Once again \$\$\$\$	3/3/2014 11:26 AM
18	only if it does not alter landscape significantly	3/3/2014 8:54 AM
19	This would be wonderful for mini programs and lectures. Prince William County has this.	3/3/2014 8:31 AM

Windsor Castle Park Master Plan Survey

20	I am a teacher!	3/3/2014 7:40 AM
21	God already provided that!	3/2/2014 8:59 AM
22	Many trees will have to be cut down	3/1/2014 6:35 PM
23	Little or no demand for this - waste of money and trees	3/1/2014 3:20 PM
24	Not all education opportunities would be sitting, but rather walking through the park	2/28/2014 5:09 PM
25	Nice idea for the kids	2/28/2014 11:49 AM
26	Should encourage natural classrooms onsite at schools for continued learning all year. This would have to be a fieldtrip and \$\$ not likely.	2/24/2014 9:08 AM
27	Absolutely, classes on our climate/area plants and general info...a great way to invite preschool/elementary children involved in planting etc	2/24/2014 8:40 AM
28	My son is in the Cub Scouts and I love this idea for natural groups such as 4H, Cub Scouts, Boy Scouts, church groups, etc.	2/23/2014 9:05 PM
29	It would be a useful addition for classes or festivals	2/22/2014 7:30 AM
30	no thanks	2/20/2014 7:50 PM
31	nothing wrong with blankets and kids/adults sitting in "nature"	2/20/2014 6:31 PM
32	Would be a "field trip" for school kids. Otherwise who is paying for the naturalist to come in for a program? If you do get a naturalist, who's going to come?	2/20/2014 5:14 PM
33	all about mother nature, kids should learn to keep everything environmentally friendly	2/20/2014 5:05 PM
34	The park is already a natural classroom.	2/20/2014 3:32 PM
35	For the classroom to be used by schools they would have to have time and school buses. Have the schools been involved in this discussion?	2/20/2014 2:12 PM
36	school/home school & church outings. discussion groups not just plopped in the field or by the side of the parking lot	2/20/2014 11:26 AM
37	The versatility of this space is great. Will add to the wedding destination push	2/19/2014 10:17 PM
38	It wouldn't get used very much for how much space it would take up.	2/19/2014 8:33 PM
39	a great community resource	2/19/2014 4:04 PM
40	kids from the neighborhoods and schools in the area could use this a lot	2/19/2014 3:56 PM
41	This could provide opportunities for school programs, scout programs, and much more. It would not have to be large and could be made to fit in with the landscape of the park.	2/18/2014 5:06 PM
42	Just don't feel it will be utilized.	2/17/2014 2:43 PM
43	the park is a classroom	2/14/2014 5:43 PM
44	I think the picnic tables are a good alternative/substitution for a natural classroom. On the other hand, an outdoor amphitheater would be nice, especially for Smithfield Music concert series in the summer/fall.	2/14/2014 3:59 PM
45	Why??? Would anyone want this	2/14/2014 2:03 PM
46	The park IS a Natural Classroom AS IS!	2/14/2014 1:18 PM
47	Sounds great for the young kids, could be a great place to have other classes as well	2/13/2014 9:51 PM
48	Education in nature is always a good idea. It adds to the park and educates our children on the park	2/13/2014 5:20 PM
49	I'm ok with this if it doesn't cost anything and does not alter the park in ANY way. It would be purely supported by volunteers and not receive any funding.	2/13/2014 2:10 PM
50	Education for children and the community about our area	2/13/2014 1:05 PM
51	It already is!	2/13/2014 12:20 PM
52	Plenty of other places to go	2/13/2014 12:18 PM

Windsor Castle Park Master Plan Survey

#	Comments for "Labyrinth"	Date
53	no one ever uses them	2/10/2014 9:39 AM
1	in all of the places i have seen labyrinth areas they appear to be little more than a decorative feature. it doesn't seem to fit with the feel of the park. if the intent is to have a place of contemplation then there are several miles of serene walking trails that would serve the same purpose.	3/15/2014 3:27 PM
2	A Labyrinth brings art, interesting plants and interaction into the park, contribution to the park experience.	3/15/2014 12:30 AM
3	maintainance.	3/14/2014 7:10 PM
4	This is a nice amenity that could be used for meditation and could be a potential fundraiser by offering personalized bricks	3/14/2014 12:33 PM
5	major upkeep for something seldom used, just walk in park	3/14/2014 12:04 PM
6	totally unnecessary	3/14/2014 11:56 AM
7	Lovely	3/13/2014 10:05 PM
8	would be something different to highlight	3/13/2014 9:10 AM
9	Excessive, not relevant.	3/12/2014 10:15 PM
10	Just more to maintain and become run down over time.	3/12/2014 7:02 PM
11	Might be okay if done properly.	3/9/2014 7:50 PM
12	This is really ugly.	3/9/2014 7:00 PM
13	Entertaining	3/9/2014 2:57 PM
14	If it can be built on field area or existing open area	3/9/2014 7:54 AM
15	Don't think it will be well-used.	3/8/2014 4:35 PM
16	Again, this "feature" would junk up and destroy the natural beauty of this gem of a Park. Don't muck it up!	3/7/2014 10:10 AM
17	I have no idea what this is	3/5/2014 3:36 PM
18	Not needed	3/4/2014 12:41 PM
19	Why fix what is not broken or really needed.	3/3/2014 11:26 AM
20	distracts from the park's "natural" presence. Would not want to see more natural landscape removed.	3/3/2014 8:54 AM
21	Not necessary.	3/3/2014 8:31 AM
22	Only if the town uses it as a money maker.	3/2/2014 8:59 AM
23	Too much too quickly	3/1/2014 6:35 PM
24	The kids would love it!	3/1/2014 3:20 PM
25	It is OK not sure how much it would be used by children	2/28/2014 5:09 PM
26	Kids would love it for something different	2/26/2014 10:05 PM
27	Not appealing to broad age groups	2/26/2014 2:01 PM
28	I seriously doubt anyone would use	2/25/2014 2:33 PM
29	Useless	2/24/2014 9:08 AM
30	churches could use a labyrinth	2/22/2014 7:30 AM
31	I do not see it being used much and will require up-keep that would be better spent on other features	2/21/2014 1:49 PM
32	no thanks	2/20/2014 7:50 PM
33	it is a very peaceful option as long as not over done	2/20/2014 6:31 PM

Windsor Castle Park Master Plan Survey

34	Could take up a lot of space - eventually it would be quite lovely - but you would have to buy plants fairly mature to utilize it within a five-year time period. Would you have a fence around it so the plants don't get walked on if you do plant small plants?	2/20/2014 5:14 PM
35	always wanted one this would be awesome	2/20/2014 5:05 PM
36	Will spoil the natural beauty of the park	2/20/2014 3:32 PM
37	plenty of areas to meditate without this taking up space.	2/19/2014 10:40 PM
38	Think it is a great concept, but not sure the commitment is there to properly maintain it	2/19/2014 10:17 PM
39	I like the solitary nature of this attraction. Peaceful.	2/19/2014 8:33 PM
40	i think it would be fun and great entertainment for families	2/19/2014 3:56 PM
41	too high maintenance	2/17/2014 11:17 PM
42	Fun and educational!	2/16/2014 8:01 PM
43	lack of use, take away from natural park	2/14/2014 5:43 PM
44	The whole park (including esp. the current "lookout" areas) to me provides a place for reflection and relaxation. I think the addition of a labyrinth for these purposes would be extraneous.	2/14/2014 3:59 PM
45	Too gimmicky.	2/14/2014 3:29 PM
46	No that is just silly	2/14/2014 2:03 PM
47	Must un-natural of all these ideas!	2/14/2014 1:18 PM
48	All ages can play in a labyrinth, and having it set up with interesting things along the way makes it interactive	2/13/2014 9:51 PM
49	Does not go with the natural setting of the park.	2/13/2014 5:20 PM
50	Why in the world would you want a labyrinth? It would only spoil the natural beauty of the park.	2/13/2014 2:10 PM
51	Kids would love this	2/13/2014 2:06 PM
52	It already can be if you get off of the paths.	2/13/2014 12:20 PM
53	Unnecessary	2/13/2014 12:18 PM
54	too much maintenance	2/10/2014 9:39 AM
#	Comments for "Disc Golf"	Date
1	no room	3/21/2014 1:38 PM
2	this would be great if it could be placed in a wooded area without disturbing many trees. the disc golf course at bennetts creek in suffolk is a good example of a well done course.	3/15/2014 3:27 PM
3	It is an opportunity for additional fitness opportunities and socialization!	3/15/2014 12:30 AM
4	liability to tax payers. on the same parr as a basketball court.	3/14/2014 7:10 PM
5	absolutely no! too disturbing to others using paths	3/14/2014 12:04 PM
6	does not fit in this nature park	3/14/2014 11:56 AM
7	We need activities for teens and young people	3/13/2014 10:05 PM
8	Encourages element of problem behavior.	3/13/2014 5:48 PM
9	It would destroy the natural beauty of the park by the destruction of trees, etc. Might be a safety issue for walkers and runners.	3/12/2014 10:15 PM
10	Use some other park or school grounds.	3/12/2014 7:02 PM
11	Definitely against. Too close to walkers and runners; big liability if someone is hurt; have seen the one in Suffolk and it's terrible. Our park is NOT for this type of activity. Let's keep it natural as possible!!!!	3/9/2014 7:50 PM
12	A horrible idea for our beautiful little park. This would be a real assault on our park.	3/9/2014 7:00 PM
13	Not a good idea at all	3/9/2014 7:54 AM

Windsor Castle Park Master Plan Survey

14	Absolutely, imperatively SHOULD NOT BE INSTALLED IN THE PARK!! This is a fad, and Smithfield does NOT need to be shouldered with the expense of keeping up with a fad years from now. This idea is totally against the original premise of the park and should NEVER be installed!	3/7/2014 10:10 AM
15	teens enjoy	3/7/2014 3:34 AM
16	It is a self sustaining entity for the park	3/6/2014 11:51 AM
17	anything that encourages outside activities is positive	3/5/2014 10:59 PM
18	I have seen these and they are fun and get lots of use.	3/5/2014 3:36 PM
19	Terrible idea	3/4/2014 12:41 PM
20	Because it is stupid!	3/3/2014 11:26 AM
21	Distracts from the park's natural settings/environment. Other existing open areas outside park better suited.	3/3/2014 8:54 AM
22	This is good "healthy" fun. Much needed in this town.	3/3/2014 8:31 AM
23	Ugly	3/3/2014 2:55 AM
24	No way....take that to Nike Park,,,,,it was full of Frisbee players on 1 March 2014.	3/2/2014 8:59 AM
25	No need for this	3/2/2014 7:56 AM
26	Makes park active instead of passive	3/1/2014 6:35 PM
27	I don't believe for a minute you would put it in the open, as Josh, the advocate "expert" for it emphasized that it is the trees and other obstacle that make it fun, and it is absolutely incompatible with the woodlands, as much understory would be destroyed. Also Josh emphasized that it would be a home for competitive tournaments, which is forbidden in a passive park.	3/1/2014 3:20 PM
28	It would be contrary to natural tranquillity of the park. To create more use there would eventually have to be competition and tournaments.	2/28/2014 5:09 PM
29	Would bring added enjoyment for children without getting rid of the "natural" feel of the park, because not much more equipment is necessary.	2/28/2014 12:30 PM
30	I think it would bring a lot more people to visit the park	2/26/2014 10:05 PM
31	Not something the masses would use.	2/26/2014 3:52 PM
32	This is a great hobby !!!	2/26/2014 1:39 PM
33	Great for all ages	2/25/2014 3:09 PM
34	It disrupts the natural habitat, birds and small animals need the undergrowth to survive	2/25/2014 2:33 PM
35	Don't need flying discs to watch out for, dogs chasing	2/24/2014 3:17 PM
36	more liability for other park users, disruptive to more passive pursuits, etc.	2/24/2014 9:08 AM
37	A passing fad. And incompatible with the intended use of the park for quiet enjoyment of the trails.	2/24/2014 9:03 AM
38	Disc golf is fun, low cost, low maintenance, and encourages exercise in community involvement with others.	2/23/2014 9:05 PM
39	great activity for young people	2/22/2014 4:33 PM
40	more appropriate in a different park	2/22/2014 7:30 AM
41	I don't care whether its considered active or passive, but I think there are plenty of disc golf options in Hampton Roads. Not everything and every amenity has to be at our finger tips. Plus, too many amenities will attract too many people. I think the focus should be on what this community wants, not what might attract tourists.	2/21/2014 11:41 AM
42	I'm sure there hundreds of people waiting in line for a disc golf course, might as well put up a ferris wheel and merry-go-round.	2/21/2014 9:51 AM
43	Please leave the area natural. Placing all of these 'additions' to the area will take away from its natural beauty. There is already a place in Smithfield with most of the additions listed above. If they want to have the above item go to Nike Park.	2/20/2014 7:50 PM
44	Other parks I see this in they seem under utilized and to me are an eyesore	2/20/2014 7:18 PM

Windsor Castle Park Master Plan Survey

45	if you have disc golf then how can u say no to other sports like basketball courts tennis courts baseball field soccer field vollyball pits. opens to many conflicts	2/20/2014 6:31 PM
46	Yuck. Go to a field and have at it.	2/20/2014 5:14 PM
47	so fun and gives residents something to do	2/20/2014 5:05 PM
48	Isle of Wight County already has a park that is dedicated to sporting events which can incorporate disc golf.	2/20/2014 4:15 PM
49	I find the disc golf the most offensive of all the proposed amenities. This does not belong in the park. Flying discs will be very disruptive and will ruin the peace and tranquility of the park.	2/20/2014 3:32 PM
50	Will disrupt the peacefulness of the park	2/20/2014 2:40 PM
51	Time for Smithfield to expand and include this fast growing sport	2/20/2014 2:12 PM
52	we have enough other parks for these type of activities	2/20/2014 11:26 AM
53	Feel 9 holes would be sufficient	2/19/2014 10:40 PM
54	Would bring in younger outdoors folks...good people to add to a community	2/19/2014 10:17 PM
55	18 hole	2/18/2014 8:54 PM
56	This will greatly disturb the natural serenity of the park. Also, it creates a hazard for small children and people nearby	2/18/2014 7:09 PM
57	This issue has been decisive from the start. I am concerned that it would impact others who want to use the park, especially if it started to draw team competitions.	2/18/2014 5:06 PM
58	TACKY	2/18/2014 3:35 PM
59	other ones in area, newport news, suffolk get very little use	2/17/2014 11:17 PM
60	There are so many walkers and joggers who love the natural feel of this park! I'd hate to see anything that could possibly take away from this.	2/17/2014 2:43 PM
61	i have been to NN Park when it is being used and the participants were very loud and sometimes using language not appropriate to the climate that we currently enjoy at Windsor Castle Park	2/17/2014 2:02 PM
62	Not really into this.	2/16/2014 8:01 PM
63	We don't need amusement park.....	2/15/2014 6:46 AM
64	Takes up too much park space for a hobby with few participants.	2/14/2014 9:40 PM
65	very limited use, hazard, clearing of natural areas	2/14/2014 5:43 PM
66	My husband and I frequently go to Bennets Creek or other local parks for disc golf. This a growing trend in recreation and will bring new people to the area. It is a low maintenance attraction and can be enjoyed by a wide age range of participants.	2/14/2014 3:59 PM
67	I'd like to play closer to home instead of going to Suffolk, Williamsburg, and Newport News. I should also note that I DO NOT want to clear anyway any of the underbrush, as has been suggested by a few anti-disc golf folks. I like Suffolk's course because it is hard and full of underbrush & trees.	2/14/2014 3:29 PM
68	Heck No we do not need disc golf in the middle of the trail where people run	2/14/2014 2:03 PM
69	Put this in a play area in Nike park, not in this Bucalic place.s	2/14/2014 1:18 PM
70	if confined to open spaces / fields	2/14/2014 11:24 AM
71	field of play too large for size of this park. Park should be kept as close to natural landscaping as possible.	2/13/2014 11:53 PM
72	Great cardiovascular game for the kids	2/13/2014 9:51 PM
73	i don't think this is the right place for this.	2/13/2014 7:08 PM
74	I don't think that's the crowd you want there	2/13/2014 5:36 PM
75	Does not go with the natural setting of the park.	2/13/2014 5:20 PM
76	Sorry, don't know what it is	2/13/2014 4:15 PM

Windsor Castle Park Master Plan Survey

77	This is the most obsurd suggestion of all. I read the articles discussing why the Pro-Disc Golf people support this and their justification is rediculous. Put it in Nike Park if it's so important that we have one in the area.	2/13/2014 2:10 PM
78	its just to much	2/13/2014 1:27 PM
79	Too disruptive to others	2/13/2014 1:08 PM
80	Not only no but quantum dimension infinity NO!	2/13/2014 12:20 PM
81	Other venues available; liability.	2/13/2014 12:18 PM
82	A ridiculous concept. Plenty of other available locations, i.e. near new ball fields, abandoned or for sale fair acreage.	2/12/2014 2:51 PM
83	don't want to be hit in the head while walking the dog	2/10/2014 9:39 AM

Windsor Castle Park Master Plan Survey

Q7 Write in additional amenities you would like to see at the park.

Answered: 96 Skipped: 218

#	Responses	Date
1	only above amenities	3/21/2014 1:38 PM
2	Programs such as Horizons Hampton Roads and Learners to Leaders could include Natural Learning Initiatives into their programs, expanding their curriculums and the experiences for the children they serve, and utilizing all of the items you are proposing.	3/15/2014 12:30 AM
3	None. Please leave as is! a wonderful place to meet nature at its best. Pay attention to what is wanted by benefactor. I feel that many amenities and details were added to the plans because the company that drew the plan would like to build all the things designed in it. Be careful with expense of upkeep by the town even if funds are raised to construct amenities.	3/14/2014 12:04 PM
4	Leave the park alone! It just right as it is!	3/14/2014 11:56 AM
5	Leave the park as natural as it is	3/14/2014 7:58 AM
6	Canoes to rent and bike path	3/13/2014 10:05 PM
7	Leave the park as is. It does not anything else, it's a great place to go. Allocate the funds to the school arts program, band, sports, downtown areas, boat ramps.	3/12/2014 7:02 PM
8	Disc Golf will be the most used amenity.	3/12/2014 4:49 PM
9	I like the Natural Park. Any amenities takes away from the Natural Park.	3/12/2014 4:46 PM
10	More benches on the walking trail.	3/12/2014 3:35 PM
11	None. We have a beautiful little park, a real treasure for our community. Most of these proposed amenities would really be assaults on the park. Let's not "fix" something that isn't "broken."	3/9/2014 7:00 PM
12	I want the park left alone! It is perfect just as it is!	3/9/2014 6:52 PM
13	Electrical. For venue use Overall, I would like to see it stay natural for hiking, walking, fishing, kayaking. I would like to see improvements for area used as weddings sites. Brings in income for park improvements but doesn't damage area	3/9/2014 6:46 PM
14	More mountain bike trails	3/9/2014 2:15 PM
15	Interpretive signs about wildlife common to the park. Family restroom (toilet, sink, changing table, all in one gender-neutral room).	3/8/2014 4:35 PM
16	None	3/7/2014 11:13 PM
17	The park is gorgeous as it is. The citizens of Smithfield are extremely fortunate to have this gem in our midst. I've been walking the Windsor Castle Park for many years (with permission from the owners) and have long admired this property. It's a joy to be able to walk it in its entirety and admire the beauty and nature in all seasons.	3/7/2014 10:10 AM
18	Leave the park as it is with the exception of adding rest rooms.	3/5/2014 6:28 AM
19	More geocaching!	3/4/2014 1:14 PM
20	When there is \$ to pay for it and NOT DISTROY the wonderful natural park that it is and so many enjoy. Then let us vote on it!	3/3/2014 11:26 AM
21	Thank you. We love spending time there and are excited about the new ideas proposed.	3/3/2014 9:57 AM
22	We use the park almost daily in the summer time and have spoke with many people about the park. Everyone we spoke with love the park just as it is.	3/3/2014 7:31 AM
23	None	3/3/2014 2:55 AM
24	Keep the park natural and truly passive. More is not always better.	3/2/2014 8:59 AM

Windsor Castle Park Master Plan Survey

25	Children are our future they need space to grow and develop outdoors. It would give more opportunity for less TV and video games.	3/1/2014 11:39 AM
26	I thought a "Fairy Garden" was a good idea to encourage the imagination and creativity of children.	2/28/2014 5:09 PM
27	leave as pristine as possible	2/28/2014 4:37 PM
28	More walking trails but I think there is no more room for more trails, haha	2/28/2014 11:49 AM
29	Benches to sit on throughout, water fountains and more trees on outside of park along main road.	2/26/2014 7:52 PM
30	A few water fountains along the trail.	2/26/2014 1:42 PM
31	more handicap accessible amenities	2/26/2014 8:38 AM
32	Outdoor play ground with water features for the kids to play in.	2/25/2014 8:49 AM
33	Permanent bathroom facilities, a picnic pavilion and/or gazebo down by the waterfront/kayak launch.	2/24/2014 3:17 PM
34	Permanent stage for events Restore manor house and rent out for events, offer tours, etc.	2/24/2014 9:08 AM
35	We really enjoy the park. Thank you!	2/24/2014 8:40 AM
36	Gazebo or other covered structure in the vicinity of the kayak ramp so the elderly could park there, take a stroll AND have a place to rest and enjoy the scenery	2/24/2014 7:31 AM
37	The current kayak launch is four star quality, I have launched my kayak from Suffolk, Virginia Beach, Newport News, Williamsburg, and Windsor Castle Park has absolutely the best kayak launch in the entire	2/23/2014 9:05 PM
38	Currently we most frequently use the dog park. I would like to see that part of the nature trail is suitable for walkers and wheelchairs. I would like to see more community events at the park. A good example would be the Stary Nights Dinners and concerts offered at Veritas Winery near Charlottesville.	2/22/2014 4:59 PM
39	More trash cans along the trails.	2/22/2014 10:35 AM
40	Water (drinking) fountain. Not an amenity, but more garbage cans along the trail.	2/21/2014 11:41 AM
41	Don't mess up a beautiful park, spent the money on Windsor Castle renovations. That will enhance the park.	2/21/2014 9:51 AM
42	Thanks for the survey!	2/20/2014 7:50 PM
43	Leave it as a nature walking/running trail.	2/20/2014 6:48 PM
44	Pet park should be enlarged. Large fall craft show annually. Bike rental for 10 to 20 bikes by Kyake rental. Flower/Butterfly gardens.	2/20/2014 6:31 PM
45	Yoga classes	2/20/2014 6:05 PM
46	Tennis courts with lights for playing at night	2/20/2014 5:14 PM
47	Water Fountains would be great and the dog park needs to have more grass and less mud when it rains you cant take your dog for at least a week. Dog park should be bigger also.	2/20/2014 5:05 PM
48	The park is a wonderful natural treasure. Save it for the next generation.	2/20/2014 3:32 PM
49	slow & steady wins the race	2/20/2014 11:26 AM
50	Better bike path	2/20/2014 6:09 AM
51	Bigger play area for kids. Check out what they did at Elm Creek Natural Park Reserve in Maple Grove, Minnesota. Wonderful area fir kids with park benches, bike trails and hiking trails and pavilions and picnic areas.	2/19/2014 10:30 PM
52	My favorite thing in this proposal is the natural slide for the kids. I like that they can climb up a hill (not steps) with grass and rocks, then slide down real fast. What could be more simply fun than that?	2/19/2014 8:33 PM
53	keep it as natural as possible! It gets used a lot just the way it is, a peaceful beautiful place to walk or run!!!!	2/19/2014 7:24 PM
54	More trails/areas for bike riding	2/19/2014 3:54 PM

Windsor Castle Park Master Plan Survey

55	I wish to see the park remain as natural as it is now, no trees being removed. I enjoy the walking paths and dog park.	2/18/2014 5:42 PM
56	I feel anything added should cause minimal change to the natural feel of the part.	2/18/2014 2:41 PM
57	A nice Playground that has seating area for adults. Nature classes for children.	2/18/2014 2:13 PM
58	NONE- The beauty and joy of Windsor Castle Park is in its simplicity and quiet. Please do not destroy this by trying to be all things to all people.	2/17/2014 2:02 PM
59	Multi-purpose trails to include horses	2/17/2014 1:57 PM
60	I think the park is fantastic just the way it is. I use the trails, kayak launch, and fishing pier as often as possible.	2/14/2014 5:43 PM
61	Amphitheater.	2/14/2014 3:59 PM
62	This park is perfect the way it is. Don't mess up a great idea.	2/14/2014 1:18 PM
63	Horse trails	2/14/2014 8:51 AM
64	horse activities	2/14/2014 7:10 AM
65	Horseback riding trail	2/14/2014 5:40 AM
66	horse trails	2/14/2014 12:42 AM
67	Roller - Coasters would be my preference, but if not possible, I'd like to see additional signs identifying local plants and trees.	2/13/2014 11:53 PM
68	Horse trails would be a great amenity!	2/13/2014 9:51 PM
69	Horse trails	2/13/2014 9:04 PM
70	Horse Trails and trailer parking with picnic tables and a water supply.	2/13/2014 7:39 PM
71	Horse trails	2/13/2014 7:29 PM
72	Keep it simple	2/13/2014 7:09 PM
73	A paved or easy to ride on cycle path for little children to ride their bikes on so they don't have to practise on the road in their neighborhoods.	2/13/2014 7:08 PM
74	Horseback riding trails. Many in this area own horses and look for places to ride.	2/13/2014 7:01 PM
75	Horse trails	2/13/2014 7:01 PM
76	horseback riding trails	2/13/2014 6:45 PM
77	horse trails	2/13/2014 6:35 PM
78	Horse Trails	2/13/2014 6:34 PM
79	Horse trails and/or arena	2/13/2014 6:31 PM
80	Horse trails	2/13/2014 6:04 PM
81	Horse trails	2/13/2014 6:03 PM
82	Would love love love to see horse trails!!!	2/13/2014 5:45 PM
83	Horse trail	2/13/2014 5:43 PM
84	Horse trails and or riding arena	2/13/2014 5:41 PM
85	Horse trails! You have a large population of equestrians that could really enjoy such an amenity.	2/13/2014 5:36 PM
86	I would like to see some horse activity. I would love to ride or buggy ride my little horse. We need to see more of this.	2/13/2014 5:34 PM
87	I would not want to see too much stuff put into the area. I love the trees and quietness of the park. I just would like another play area in the area. We usually go to NN.	2/13/2014 5:34 PM
88	Horse back riding trails	2/13/2014 5:04 PM
89	seats around dog park	2/13/2014 2:26 PM

Windsor Castle Park Master Plan Survey

90	The only man-made amenity I can think of that would do this park justice is a statue erected in the name of Mr. Luter with a placard below it vowing to never alter the park in any unnatural way. I'm sorry if I seem irritated by these proposals but some people need to leave things alone and not feel compelled to "improve" something that doesn't need improving on. Please read the article written by Mr. Luter on this subject over and over until it sinks in.	2/13/2014 2:10 PM
91	nothing. I think the park is great just how it is. Far to often we try to improve things. The beauty of this park is its untouched setting.	2/13/2014 1:27 PM
92	For me the park is about a secure and safe place to walk outdoors in a quiet environment and that's all. I don't think it needs to turn into an attraction that is a one-stop-shop for every possible activity to satisfy everyone. Keep it simple and SERENE.	2/13/2014 1:12 PM
93	Focus should be on simply maintaining the park.	2/13/2014 12:44 PM
94	Allow tree stands for wildlife observations and all night permits without camping facilities. As pristine as possible. Consult a wetlands expert to advise of the regulations and associated costs for any development. That should change peoples minds. I was the crew chief on the original boundary survey (EB Holley, CLS) too much has been developed already. My opinion.	2/13/2014 12:20 PM
95	leave the trails as they are	2/10/2014 9:39 AM
96	A pile of dirt for the kids to play on.	2/2/2014 9:36 PM

DATE MARCH 24, 2014
TO SMITHFIELD TOWN COUNCIL- PUBLIC WORKS COMMITTEE
FROM WILLIAM T. HOPKINS, III
DIR. OF PLANNING, ENGINEERING, & PUBLIC WORKS
SUBJECT STREET MAINTENANCE CONTRACT

Each year the town engages the services of a street maintenance contractor to supplement the capabilities of our public works staff and equipment. The town had a contract with The Blair Brothers for the 2013/2014 fiscal year and the contract will expire on April 7, 2014; therefore it was necessary to advertise a Request for Proposals.

The street maintenance contract includes the following type of work:

Sidewalk Repairs and traffic controls as required.

Clearing and grading roadway and outfall ditches which include seeding and erosion & sedimentation controls, i.e. silt fence, straw bales, etc. Traffic controls as required.

Road Repairs and patching which includes traffic controls.

Road Overlay with 1 ½ to 2 inches of SM2-A asphalt. Traffic controls as required.

The town received proposals from:

The Blair Brothers	Suffolk, VA
Carson Caroline	Suffolk, VA

Staff interviewed both applicants and thoroughly reviewed their qualifications and proposals. Due to previous experience with the town's roadway systems, knowledge of drainage issues and the fact that Carson Caroline would have to subcontract out the majority of work, I recommend awarding the street maintenance contract to The Blair Brothers. This contract has a right to renew for four additional years.



MONTHLY PROGRESS REPORT FOR MARCH 2014

Locality: Town of Smithfield

Contract #: 11-10 MY1

Prepared by: Michael Paul Dodson, CFM

Project Name: Pinewood Heights Phase II

Contract Completion Date: 04/20/2014

Date: 03/15/2014

FINANCIALS

CDBG Contract Amount: \$624,720 Leverage Amount: \$826,755
CDBG Amount Expended: \$257,152 Leverage Amount Expended: \$332,762

CUMLATIVE CONSTRUCTION PROGRESS
{INSERT PROJECT SPECIFIC PRODUCTS HERE}

ADMINISTRATIVE ACTIVITY

Management Plan: Is project on schedule as shown in PMP? Yes No If no, update will be furnished by: / /

When was the last Management Team meeting? 03/11/2014 Next meeting? 03/14/2014

Budget: Is project proceeding within the approved budget? Yes No If no, revision will be furnished by: / /

Technical Assistance Required? Yes No If yes, in what area(s)?

Status: The demolition of 41/42 Carver Street has been completed. The Town owns 43 and 46 Carver Street. 43, 45, and 46 Carver Street has been boarded/secured. The Town has received acceptance of its offers to buy 47, 48 and 51 Carver Street; we are working on the relocations for all owners and tenants. The owners of 47 and 51 Carver are moving to new homes and closing is scheduled for the end of April. The tenants at 48 Carver Street are working with all parties to find a new home. The tenants at 40 Carver have signed a contract to buy a home and the residents at 39 Carver are Section 8 and have been referred to IOW Social Services for relocation. A follow up letter to the owner of 39 and 30 Carver Street resulted in a phone call and the owner has received (and said) he will return the signed acceptance offer to the Town. All relocation work is being done in tandem with acquisition offers so that the residents are quickly moved into their new residence and the old structures are demolished.

Are problems anticipated? Locating relocation properties for all households has been a challenge however the process is moving forward. It appears all owners will be willing to sell and that by April 30th all relocations will be selected. It will simply be getting the new homes ready and inspected so the residents can relocate into their new homes.

Other comments: None.

Project Specific Products:

Owner-Occupied Acquisition (Goal=5)

Owner Occupied Homes

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Preliminary Acquisition Letters Sent 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Appraisals Completed 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Review Appraisals Completed 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Offer to Purchase Letters Sent 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Offers Accepted 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Properties Closed On 3

1) 41 Carver 2) 45 Carver 3) 46 Carver

Tenant-Occupied Acquisition (Goal=5)

Tenant Occupied Homes

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver 5) 39 Carver

Preliminary Acquisition Letters Sent 5

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver 5) 39 Carver

Appraisals Completed 5

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver 5) 39 Carver

Review Appraisals Completed 4

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver

Offer to Purchase Letters Sent 4

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver

Offers Accepted 4

1) 42 Carver 2) 43 Carver 3) 48 Carver 4) 40 Carver

Properties Closed On 2

1) 42 Carver 2) 43 Carver

Owner-Occupied Relocation (Goal=5)

Owner Occupied Homes

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Household Surveys Completed 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Income Verifications Completed 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Eligibility of Relocation Letters Sent 5

1) 41 Carver 2) 45 Carver 3) 46 Carver 4) 47 Carver 5) 51 Carver

Comparable Units Found and Inspected 4
1) 41 Carver 2) 45 Carver 3) 46 Carver 5) 51 Carver
Households Relocated 3
1) 41 Carver 2) 45 Carver 3) 46 Carver

Market-Rate, Renter-Occupied Relocation (Goal=2)

Market-Rate Occupied Homes
1) 48 Carver 2) 40 Carver
Household Surveys Completed 2
1) 48 Carver 2) 40 Carver
Income Verifications Completed 2
1) 48 Carver 2) 40 Carver
Eligibility of Relocation Letters Sent 2
1) 48 Carver 2) 40 Carver
Comparable Units Found and Inspected 2
1) 48 Carver 2) 40 Carver
Households Relocated 0

Section 8, Renter-Occupied Relocation (Goal=3)

Section 8 Occupied Homes
1) 42 Carver 2) 43 Carver 3) 39 Carver
Household Surveys Completed 3
1) 42 Carver 2) 43 Carver 3) 39 Carver
Income Verifications Completed 2
1) 42 Carver 2) 43 Carver
Eligibility of Relocation Letters Sent 2
1) 42 Carver 2) 43 Carver
Comparable Units Found and Inspected 2
1) 42 Carver 2) 43 Carver
Households Relocated 2
1) 42 Carver 2) 43 Carver

Demolition (Goal=10)

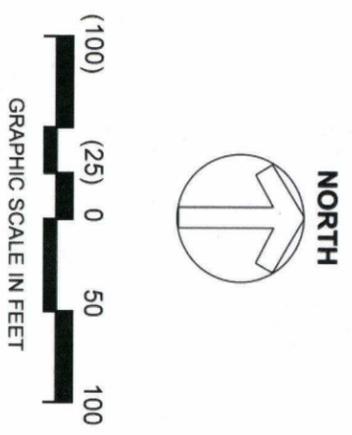
Units to be Demolished
1) 39 Carver 2) 40 Carver 3) 41 Carver 4) 42 Carver 5) 43 Carver 6) 45 Carver
7) 46 Carver 8) 47 Carver 9) 48 Carver 10) 51 Carver
Units that have been Demolished 2
1) 41 Carver 2) 42 Carver

PROJECT STATUS MAP
 Pinewood Heights Phase II Redevelopment Project
 Multi-Year 1
 Town of Smithfield, Virginia

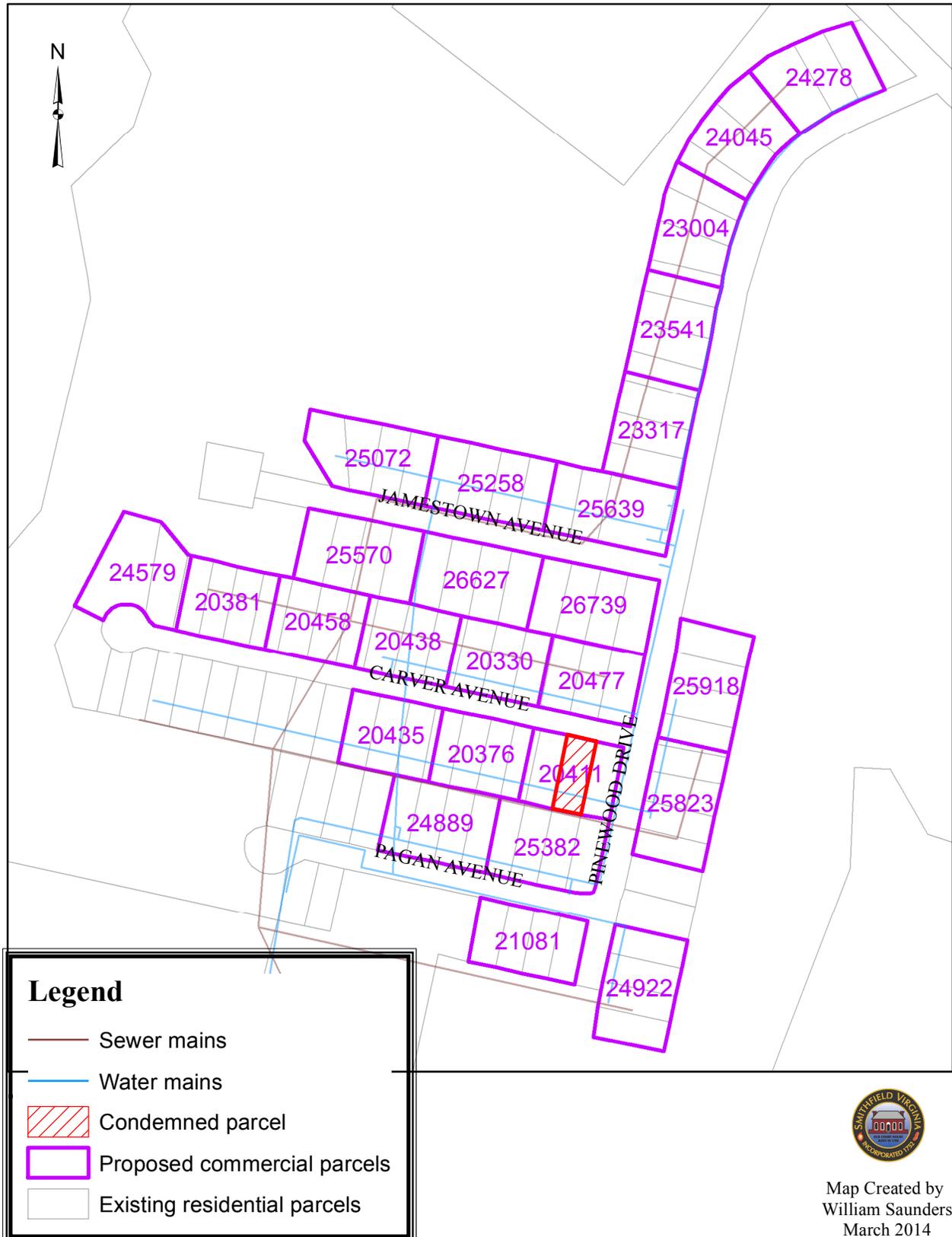


LEGEND
 - - - PHASE II BOUNDARY

- STATUS:**
- PRELIM ACQ LETTER RECEIVED BY OWNER
 - APPRAISAL COMPLETE
 - OFFER TO PURCHASE ACCEPTED
 - OFFER TO PURCHASE DECLINED
 - RELOCATION COMPLETE
 - DEMOLITION COMPLETE
 - PROPERTIES TO BE ACQUIRED IN MY2
 - OWNER OCCUPIED
 - R RENTER OCCUPIED
 - 8 SECTION 8 TENANT
 - * MOVED TO MY2



Pinewood Heights Commercial Subdivision



Map Created by
William Saunders
March 2014