

ANNUAL REPORT FY 2011



Hampton Roads Sanitation District
1436 Air Rail Avenue
Virginia Beach, VA 23455

October 31, 2011

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1. INTRODUCTION AND PURPOSE

On September 26, 2007, the Hampton Roads Sanitation District (HRSD) entered into a Special Order by Consent (SOC) with the Virginia Department of Environmental Quality (DEQ) and thirteen (13) area Localities for the purpose of resolving certain alleged violations of environmental laws and regulations related to Sanitary Sewer Overflows (SSOs). On February 23, 2010, HRSD entered into an Amended Consent Decree (“Consent Decree”) with the United States of America and the Commonwealth of Virginia for the purpose of fulfilling the objectives of the Clean Water Act and the Virginia State Water Control Law.

As part of both agreements, HRSD is required to perform, among other things, the following tasks:

- Implement a flow, pressure, and rainfall monitoring program;
- Cooperate with the Localities to develop a Regional Hydraulic Model;
- Prepare a plan for and conduct a condition assessment program;
- Construct specified interim system improvements;
- Develop and implement an SSO Response Plan;
- Coordinate with the Localities to develop a Regional Wet Weather Management Plan;
- Update and implement a Management, Operations and Maintenance (MOM) Program; and
- Prepare and submit a variety of periodic and event-driven reports.

This annual report is submitted pursuant to Section XVII of the Consent Decree and Item 7 of Appendix A to the SOC. HRSD has prepared this annual report in accordance with the above requirements to apprise the EPA (representing the United States of America) and the DEQ (representing the Commonwealth of Virginia) of steps taken toward meeting the obligations of the Consent Decree and the SOC. Specifically, this annual report summarizes the work and activities undertaken by HRSD from July 1, 2010, through June 30, 2011, and the resulting benefits to the sanitary sewer system. While there are a few requirements unique to the Consent Decree and SOC (e.g., a Short Term Wet Weather Operational Plan is required in the Consent Decree but not the SOC) that are not expressly mentioned in the other document, in the interest of efficiency, a single report has been prepared herein that satisfies the information called for in both documents.

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2. ACTIVITIES UNDERTAKEN PREVIOUS FISCAL YEAR

2.1 Flow, Pressure, and Rainfall Monitoring Program

2.1.1 QAPP

A revised Data Quality Standards and Procedures (DQSAP) document was submitted to the EPA and DEQ on December 21, 2010. Consent Decree Modification No. 1 related to the mechanics of data reliability calculations was executed by the EPA and DEQ on May 25, 2011. The EPA then provided approval of the DQSAP shortly after the end of the fiscal year (received July 11, 2011). HRSD has implemented the procedures in the approved DQSAP for the Flow, Pressure, and Rainfall Monitoring Program.

2.1.2 Implementation of the FPR Monitoring Plan

In this reporting period, HRSD operated an extensive and complex system of Flow, Pressure, and Rainfall (FPR) sensors completing the 12-month monitoring period on March 11, 2011. The overall network includes approximately 360 flow, pressure, and rainfall gauges. Notifications of changes to the FPR Monitoring Program have been provided to the EPA and DEQ through the Interim and Final Reports, email, and telephone discussions.

Data collection has been ongoing during this reporting period. The data required for the FPR Monitoring Program is processed through the DQSAP to evaluate data validity. An Interim Flow, Pressure, and Rainfall Monitoring Report was prepared as required by the Consent Decree within 30 days of completing the first 5 months of monitoring. This report was submitted to the EPA and DEQ on September 13, 2010, and included data summaries, tables, graphs, and maps documenting the collected information. Comments were received from the EPA and DEQ on November 29, 2010.

The Final Flow, Pressure, and Rainfall Monitoring Report expanded on the information provided in the Interim Report and included the full 12 months of data, as well as complete documentation of the program sites including any changes from the original plan. This report was delivered to the EPA and DEQ on June 9, 2011, with a small number of comments received after the end of the reporting period (September 6, 2011). Both the Interim and Final FPR Monitoring Reports were provided to the Localities for their use.

As part of the SOC, HRSD received approval for the Flow Evaluation Report (FER) from the DEQ on August 16, 2010.

A portal to allow access for the Localities to the HRSD flow, pressure, and rainfall data from the FPR sites (Telog server data) was developed and implemented in February 2009 and continues to be used and enhanced.

2.2 Regional Hydraulic Model and Hydraulic Assessment

2.2.1 Implementation of the Regional Hydraulic Model Plan

The Regional Hydraulic Model (RHM) required by the Consent Decree and SOC was under final development, testing, and calibration during this reporting period. Localities collected and delivered data

regarding their physical collection system and pumping network, analyzed flow data collected during the monitoring period, and delivered flow parameter databases.

Monthly meetings of the Model Users Group (MUG), facilitated by HRSD and attended by the Localities were conducted. Various modeling topics were discussed at these meetings including the process and content for data submittals from Localities to HRSD for the RHM. During the intensive model collaboration period of late 2010 and early 2011, individual meetings were held between HRSD and Localities to resolve any locality-specific issues which took the place of the monthly MUG meetings.

HRSD has made significant progress in the development of a dynamic Regional Hydraulic Model. Three wet weather events (in March, May, and September 2010) have been identified as calibration and verification events during the FPR Monitoring period. A fourth event prior to the start of the monitoring period (occurring in January 2010) has also been evaluated as an RHM calibration or verification event for a limited portion of the system. HRSD has used these events, in conjunction with the facility data and flow parameters, to calibrate the RHM. HRSD reached consensus with the Localities on the RHM calibration in May 2011 and the final calibration was complete by June 30, 2011. The Final RHM Report will be submitted by July 31, 2011.

HRSD led modeling workshops for EPA and DEQ on January 24, 2011 and June 22, 2011 to review progress of the RHM and to discuss the interim and final RHM Reports.

2.2.1.1 Locality Hydraulic Modeling and Input Hydrographs

HRSD has collaborated with the Localities in the development of each Locality's Hydraulic Model in a number of ways in FY 2011. HRSD has worked closely with the Localities to facilitate submittal of updates to the Locality facility data for the RHM. This data has been reviewed and comments have been provided to the Localities. In addition to the facility data, HRSD has facilitated the submission of updated hydrologic flow parameters by each Locality to characterize the dry weather and wet weather flows from the sewer catchments discharging to HRSD. Through the RHM calibration process, HRSD has provided comments to the Localities on adjustments that could be made to the catchment parameters.

2.2.2 Regional Hydraulic Model Report

The report to document the initial development, calibration, and verification of the RHM was completed and submitted to the EPA and DEQ on November 30, 2010. Comments were received from the EPA on February 28, 2011, to be incorporated into the final report. Development of the Final RHM Report was ongoing during this reporting period with a due date of July 31, 2011.

2.3 Condition Assessment Plan

2.3.1 Condition Assessment Plan

With the date of entry of the Consent Decree on February 23, 2010, the Condition Assessment Plan was deemed approved by the EPA and DEQ. No addendum or modified document has been submitted since that date.

2.3.1.1 SSES Plan

HRSD received approval for the SSES Plan from the DEQ on August 16, 2010.

2.3.2 Implementation of the Condition Assessment Plan

2.3.2.1 Condition Assessment Field Activities

See Section 4 of this report for details on the Condition Assessment Field Activities.

2.3.2.2 Prompt Repairs

2.3.2.2.1 Conveyance System

The following programs are in place to identify and address collection system infrastructure deficiencies found during the course of condition assessment field activities that require prompt attention (as defined in the approved Condition Assessment Plan):

2.3.2.2.1.1 Gravity Sewer Internal Inspection

HRSD is assessing its gravity sewer system using CCTV as part of the Condition Assessment Program. Defects are evaluated to determine if they:

- Pose an immediate threat to the environment;
- Pose an imminent threat to the health and safety of the public;
- Create operational problems that may result in SSOs; or
- Contribute to substantial inflow to the system.

If such a defect is identified through the inspection process, it is assessed to determine the appropriate repair necessary. Data received from the condition assessment contractors continues to be reviewed to make that assessment. See Section 4 of this report for details on the Condition Assessment Program Prompt Repair status.

2.3.2.2.1.2 Pump Stations and Pressure Reducing Stations

HRSD routinely inspects its pump stations and pressure reducing stations (PRs) as part of ongoing maintenance activities to identify and address any significant defects. A condition assessment evaluation will be completed by November 26, 2011, which focuses on the mechanical, electrical, instrumentation, and structural assets associated with each pump station. Any defect fitting the categories listed in the Conveyance System section above is similarly evaluated and listed for Prompt Repair as appropriate.

2.3.2.3 Private Property I/I Abatement Program

In the latter part of FY2010 and the first half of FY2011, a special committee composed of representatives from Localities, HRSD, consultants and HRPDC met to develop a regional Private Property I/I Abatement Program per the requirements of the SOC. In December, HRSD proposed that this program be managed on a regional basis with HRSD providing leadership and resources. This change was proposed to make the program more efficient and effective than 14 separate Locality-run programs. Through the end of FY2011, HRSD has worked with Locality representatives to develop a regional program that will reduce I/I from private sources over the long term.

2.3.3 Final Condition Assessment Report

This report will be completed following Condition Assessment Field Activities as shown in the approved schedule from the PCAR.

2.4 Interim System Improvements

Appendix 5 to the Consent Decree lists thirty-three projects that are required to be completed within 8 years of the Date of Entry of the Consent Decree. HRSD has each of these projects scheduled as part of its Capital Improvement Program with completion prior to February 23, 2018. A number of these projects are underway with several in construction during this fiscal year. As required by Paragraph 32 of the Consent Decree, HRSD will provide a certification by a Professional Engineer that each of these projects was completed satisfactorily and in conformance with the scope as originally provided to the EPA and DEQ. In FY2011, HRSD completed several of these projects as detailed in the certification forms in Appendix A. HRSD is on schedule for the remaining projects.

2.5 Management, Operations, and Maintenance Program

Comments were received on the revised MOM Program from the EPA and DEQ on December 7, 2010, and HRSD revised the document again and submitted it to the EPA and DEQ on February 7, 2011. Additional comments were received from the EPA and DEQ on May 3, and a final, revised MOM Program was submitted on July 1, 2011 (Approval received in the following reporting period.)

2.5.1 Implementation of MOM Program

HRSD continues to implement its MOM Program. This includes details pertaining to management, operations, and maintenance of nearly all aspects of HRSD's system, including quantitative performance measures and special programs coordinated in the region such as the HR FOG.

2.5.1.1 HR FOG

HR FOG is a regional effort aimed at fats, oils, and grease (FOG) in the sewer system and is coordinated by the Hampton Roads Planning District Commission that includes participation from HRSD and the Localities. Between FY2009 and FY2011, a model sewer use ordinance, technical design standards, and a Memorandum of Agreement between HRSD and the Localities have been completed pertaining to mutual enforcement of FOG control. HRSD has participated in development of these documents and supports the Localities as they each update their individual Sewer Use Ordinance and get passage through their local governing bodies. HRSD has also supported the region through various training workshops and an education effort to make food service establishments (FSEs) aware of the new requirements.

2.5.2 Quantitative Performance Measures

The revised MOM Plan submitted on July 1, 2011 included many performance measures to determine how HRSD is implementing the program. Paragraph 34 of the Consent Decree established a list of six measures that are subject to stipulated penalties, including: gravity sewer main inspection, air release valve preventative maintenance, gravity sewer cleaning, pumping station annual preventative maintenance, back-up generator annual preventative maintenance, and non-invasive force main inspection near drinking water supply reservoirs. To coincide with HRSD's fiscal year, the tracking of these six measures commenced on July 1, 2010 and the details of this effort is reported in Section 5 of this document.

2.6 Regional Wet Weather Management Plan

There were numerous activities that occurred in FY 2011 that contribute to the ultimate development of the Regional Wet Weather Management Plan (RWWMP). The major activities include the following:

- Collection and analysis of flow, pressure, and rainfall monitoring data;
- Development of hydrologic models by Localities for wet weather system characterization;

- Development and submittal of collection system network data and the flow parameter database by Localities that will be used in the development of the RHM;
- Developing and calibration of the RHM;
- Condition assessment field activities which will lead to the Rehabilitation Plan/Final Condition Assessment Report and the associated peak flow commitment; and
- Discussion at the Capacity Team about the cost and effectiveness of rehabilitation on reducing peak wet weather flows.

2.7 Short Term Wet Weather Operational Plan

HRSD submitted a revised Short Term Wet Weather Operational Plan (STWWOP) to the EPA and DEQ on September 27, 2010. The EPA and DEQ provided comments on this revised plan on December 15, 2010, and HRSD submitted a revised document on June 13, 2011.

In the meantime, HRSD continues to actively coordinate with the Localities and operate its system to maximize available wet weather capacity.

2.8 SSO Emergency Response Plan

On July 26, 2010, HRSD received comments from the EPA and DEQ to the Sanitary Sewer Overflow (SSO) Response Plan. HRSD submitted a revised plan on September 17, 2010 to the EPA and DEQ. This plan was approved by the EPA and DEQ on October 12, 2010, and has been implemented by HRSD. A copy of the approved plan was posted to the www.HRSD.com website.

2.9 Coordination with Localities

There was a wide variety of coordination activities in FY 2011 amongst the regional parties to the SOC. These activities included:

- Numerous meetings of the Capacity Team to discuss SOC and Consent Decree issues, development of Regional Technical Standards (RTS) Interpretations, and providing guidance to the region on RTS issues;
- Monthly Locality coordination meetings were held to discuss issues of mutual concern regarding the SOC and Consent Decree;
- Meetings of the Model Users Group to discuss issues related to modeling;
- Briefings of the Directors' of Utilities Committee to share progress on compliance with the SOC and Consent Decree;
- A regional SharePoint website continues to be updated to collaborate with and provide documents to the regional Locality Team and Capacity Team; and
- Copies of the Interim and Final FPR Monitoring Reports, initial RHM Report, and Semi-Annual and Annual Report were provided from HRSD to the Localities.

2.10 Public Participation

HRSD conducted an annual information meeting regarding the progress of the Consent Decree on January 25, 2011. In addition, HRSD published a newsletter on February 22, 2011, ahead of the one year anniversary of the Date of Entry. Information and approved plans continue to be posted to HRSD's website, which is accessible to the public.

2.11 Post-RWWMP Implementation Monitoring and Performance Assessment

No action has been performed for this item as it is a later requirement of the Consent Decree.

2.12 Reporting

2.12.1 Annual Report

HRSD completed an FY2010 Annual Report as required by both the SOC and Consent Decree, and submitted it to the EPA and DEQ on November 1, 2010. This report covered SOC activities from July 1, 2009, through June 30, 2010, as well as Consent Decree activities from the Date of Entry (February 23, 2010) through June 30, 2010. HRSD received comments from the EPA on February 14, 2011, and submitted a response to comments on April 7, 2011.

2.12.2 Semi-Annual Report

HRSD completed a FY2011 Semi-Annual Report as required by the Consent Decree, and submitted it to the EPA and DEQ on May 1, 2011. This report covered Consent Decree activities from July 1, 2010 through December 31, 2010.

2.12.3 Quarterly Briefing

Quarterly briefings were held per Paragraph 90 of the Consent Decree, on July 28, 2010 and January 19, 2011, with attendance by HRSD, the EPA, and the DEQ. A summary of the briefing was provided for the July 2010 meeting on August 17, 2010. For the January 2011 briefing, a detailed outline of the discussions was distributed by HRSD prior to the meeting (on January 14, 2011).

2.12.4 Technical Calls

Telephone calls to discuss the technical details of the work have been held with DEQ, EPA and HRSD. These calls review the progress of activities under the Consent Decree.

2.13 Summary of Submittals

Table 1 summarizes the status of the documentation that HRSD has submitted to the DEQ under the SOC in FY 2011.

Table 1. Summary of SOC Submittals	
SOC Submittal	Submittal Date
Annual Report	November 1, 2010
Initial RHM Report	November 30, 2010
SSO Response Plan	Revision September 17, 2010
MOM Program	Revision February 7, 2011

Table 2 summarizes the status of the documentation that HRSD has submitted to the EPA and DEQ under the Consent Decree in FY2011.

Table 2. Summary of Consent Decree Submittals	
Consent Decree Submittal	Submittal Date
QAPP/DQSAP	Revision December 21, 2010
Interim FPR Monitoring Report	September 13, 2010
Final FPR Monitoring Report	June 9, 2011
Initial RHM Report	November 30, 2010
STWWOP	Revision September 27, 2010 Revision June 13, 2011
SSO Response Plan	Revision September 17, 2010
MOM Program	Revision February 7, 2011
Annual Report	November 1, 2010
Semi-Annual Report	April 29, 2011
Quarterly Briefings	July 28, 2010 January 19, 2011
Annual Newsletter	February 22, 2011

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3. SUMMARY OF NON-COMPLIANCE

In FY2011, HRSD expended considerable resources in both time and money to achieve the compliance goals of the SOC and Consent Decree. All deliverables were submitted on or before their due dates, including those with short timeframes for response.

From the July 1, 2010 through June 30, 2011, HRSD's Sanitary Sewer System had 43 Sanitary Sewer Discharges (SSDs) and 19 treatment plant discharges that are detailed in Section 6 of this report. Many of these SSDs were caused by circumstances beyond HRSD's control and are force majeure events under the Consent Decree.

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4. CONDITION ASSESSMENT ACTIVITIES DURING FY 2011

HRSD has continued with its Condition Assessment Program in FY2011 with significant progress made in many aspects of the program. The following subsections describe the progress made in each aspect.

4.1 Gravity Main

The inspection contract for gravity pipelines 24-inch diameter and smaller was awarded in December 2009 and began work in January 2010. Through June 30, 2011, more than 158,000 linear feet of gravity sewer main has been inspected using PACP-compliant CCTV techniques. In addition, more than 987 manholes have been inspected using MACP-compliant procedures.

A second contract was awarded in April 2010 for inspection of HRSD's large diameter gravity sewer interceptors and submerged portions of pipelines such as inverted siphons than cannot be inspected using standard CCTV methods. Through June 30, 2011, approximately 55,000 linear feet of gravity sewer main has been inspected in this contract. Combined with the footage in the paragraph above, this inspection accounts for more than 80% of the entire HRSD gravity pipe.

The remainder of the work will be completed not later than the November 26, 2011 milestone.

4.2 Force Main

HRSD's force main inspection program includes a number of activities that proceed through various steps in the assessment process. In FY2010, a contract was awarded to conduct Level 1 and Level 2 inspections as described in the Condition Assessment Program (September 2009). This contract will conduct assessments of the Group 1 and Group 2 segments, the ferrous force main segments within 3,000 feet downstream of an HRSD pumping station ("ferrous segments"), and the force main segments within 500 feet of a drinking water source ("reservoir segments"). Through June 30, 2011, the following assessments have been completed:

- Groups 1 and 2, Level 1 inspection – 143,200 linear feet
- Ferrous Segments, Level 2 inspection – 20,400 linear feet
- Reservoir Segments, Level 1 inspection – 3,921 linear feet

As described in the Condition Assessment Program, following each level of inspection, a determination is made as to additional inspection required, if any. The initial inspections performed to date are being evaluated for follow-up assessment, where needed.

4.3 Pumping Facilities

HRSD completed an initial, detailed inspection of all of its pumping facilities in 2008 prior to the Date of Entry of the Consent Decree. These inspections were in addition to the routine annual inspections performed as part of the MOM Program at every HRSD pumping facility location by HRSD Operations and Maintenance staff. Each annual inspection includes a mechanical inspection, electrical/instrumentation inspection, and SCADA inspection.

HRSD will update the detailed inspections from 2008 by the November 26, 2011 milestone.

4.4 Prompt Repairs

Through the Condition Assessment Program, HRSD has identified 36 defects in the HRSD sanitary sewer system (primarily gravity sewer pipe and manholes) which have been deemed to be Prompt Repairs between July 1, 2010 and June 30, 2011. These 36 defects have been grouped into 14 repair work orders and are currently in various stages of planning, design, or construction. The following Table 3 provides details on these Prompt Repairs.

Table 3. Summary of Prompt Repairs					
Name	Location	Jurisdiction	Line Number	Summary of defect	Status
41st Street	41st Street east of intersection with Jefferson Ave; between MHs NG-112-12175 and NG-112-11783	Hampton	NG-112	Pipe lining failure	Construction in progress
Beach Road	West side of Beach Road opposite intersection with Wade Road between MH NG-088-0 and NG-088-155.	Hampton	NG-088	Pipe connection at manhole needs repair	Construction in progress
	West side of Beach Rd. between intersection with Bonneville Dr. and Catalina Drive between MH NG-088-1654 and NG-088-1863	Hampton	NG-088	Lateral connection to mainline needs repair	
	Approximately in front of 112 Beach Rd between MH NG-088-0636 and NG-088-0970	Hampton	NG-088	Mainline pipe defects	
	Beach Rd. approximately 170 ft. south of Wade Rd. intersection	Hampton	NG-088	Manhole defects	
	West side of Beach Road opposite intersection with Hall Road. Between MHs NG-088-1260 and NG-088-1316	Hampton	NG-088	Mainline punctured by another utility directional drilling	
Various Manholes	North King St.	Hampton	NG-063	Manhole defects	Work order in development
	North King St.	Hampton	NG-078	Manhole defects	
	E. Pembroke Ave. at Washington St.	Hampton	NG-084	Manhole defects	
	Bainbridge Blvd. between Beech St. and Wilton St.	Norfolk	SG-153	Manhole defects	
Jefferson Ave	Jefferson Ave.	Newport News	NG-169	Mainline pipe defects	In design
	Jefferson Ave. between 40th Street and 41st Street	Newport News	NG-114	Mainline pipe defects	
	Jefferson Ave between 39th and 40th Street	Newport News	NG-114	Mainline pipe defects	
Newtown Road	Newtown Rd. at Virginia Beach Blvd (ne corner of intersection)	Virginia Beach	SG-112	Manhole defects	In design
	Newtown Rd. approx. 415 ft. north of Princess Anne Rd.	Virginia Beach	SG-113	Manhole defects	
	Newtown Rd. at Elam Ave.	Virginia Beach	SG-113	Manhole defects	

Table 3. Summary of Prompt Repairs

Name	Location	Jurisdiction	Line Number	Summary of defect	Status
Mercury Blvd	West Mercury Blvd	Hampton	NG-099	Mainline pipe defects	Work order in development
	West Mercury Blvd	Hampton	NG-057	Mainline pipe defects	
	West Mercury Blvd; near Beechwood Rd.	Hampton	NG-057	Mainline pipe defects	
	West Mercury Blvd	Hampton	NG-057	Mainline pipe defects	
	West Mercury Blvd	Hampton	NG-057	Mainline pipe defects	
Various Repairs	North Hope Street	Hampton	NG-160	Pipe lining failure	Work order in development
	Old Atlantic Avenue; near intersection with Liberty Street	Chesapeake	SG-148	Pipe lining failure	
	South of Steamboat Creek Pump Station	Norfolk	SG-102	Manhole defects	
Witchduck	South Witchduck Road	Virginia Beach	SF-141	Corroded FM bolts	Repair completed
Pin Oak Rd	Pin Oak Road; Residential neighborhood	Newport News	NG-175	Mainline Pipe Defects	Work order in development
Bainbridge Blvd	Bainbridge Blvd near I-464	Norfolk	SG-145	Mainline Pipe Defects	Construction in progress
	Bainbridge Blvd near I-464 just upstream of PS	Norfolk	SG-145	Mainline Pipe Defects	
Shell Rd - Hampton	Shell Road	Hampton	NG-141	Mainline Pipe Defects	Work order in development
	Harris Creek Road	Hampton	NG-086	Mainline Pipe Defects	
	Boat Harbor Treatment Plant	Newport News	NG-129	Mainline Pipe Defects	
Pearl Street	Pearl Street near Ligon Street near I-464/I-262 Interchange	Norfolk	SG-202	Mainline Pipe Defects	Work order in development
	Pearl Street near Ligon Street near I-464/I-262 Interchange	Norfolk	SG-202	Mainline Pipe Defects	
Norview	Chesapeake Blvd in Norfolk at intersection with Sewell's Pt and Norview Ave	Norfolk	SG-074	Manhole defects	Work order in development
	Chesapeake Blvd in Norfolk at intersection with Sewell's Pt and Norview Ave	Norfolk	SG-074	Manhole defects	
Deep Creek	Deep Creek force main on suction side of Deep Creek PRS	Chesapeake	SF-143	FM defects	Construction in progress

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5. MOM PERFORMANCE MEASURES FOR FY 2011

HRSD has implemented its MOM Program activities in conjunction with the requirements of the Condition Assessment Program and other aspects of the Consent Decree and SOC programs. Table 4 below provides a status update on the specific Performance Measures listed in Paragraph 34 of the Consent Decree.

Table 4. MOM Performance Measures

Consent Decree Paragraph	Section	Goal	Performance Measure	Target	FY 2011 Actual Performance	Comment	MOM Program Section No.
34.a.	Gravity System CCTV Inspections	Internal inspection of the Gravity System lines provides useful information to assess the condition of the lines allowing proactive measures to be taken to reduce infiltration and identify conditions that may lead to failure.	Perform internal inspection of HRSD gravity sewers, linear feet inspected per year	39,600 linear feet (20%) inspected per year	169,317 LF Inspected	Performance exceeded target	2.9
34.b.	Force Main PM - Air Venting	Force mains must periodically have air and gases vented to prevent loss of efficiency of pump stations and to prevent corrosion of piping due to hydrogen sulfide gas.	Perform air release valve PM, No. of PMs per year	1,550 ARVs vented per year	3,225 ARV PMs	Performance exceeded target	2.8
34.c.	Gravity Sewer Cleaning	Obstructions in Gravity Sewer systems are a primary cause of SSOs in these systems, and the systematic cleaning of the system is necessary to remove debris and accumulations of solids from all sources and reduce SSOs.	Perform cleaning of HRSD gravity sewers to remove debris. Linear feet cleaned per year	26,400 linear feet (20%) cleaned per year	170,818 LF Inspected	Performance exceeded target	2.9
34.d.	Pump Station Annual PMs	Maintain the pump stations to protect the public safety, to protect the environment, reduce SSOs and to achieve the maximum service life from the pump stations.	All pump stations are to receive the Annual Inspection as described in the Interceptor Systems Preventive Maintenance Manual.	81 pump stations inspected per year	83 (102%)	Performance exceeded target	2.7

Table 4. MOM Performance Measures

Consent Decree Paragraph	Section	Goal	Performance Measure	Target	FY 2011 Actual Performance	Comment	MOM Program Section No.
34.d.	Pump Station Annual PMs (Electrical)	Maintain the pump stations electrical equipment to protect the public safety, to protect the environment, reduce SSOs and to achieve the maximum service life from the pump stations.	All pump stations are to receive the Annual Electrical PM as described in the Interceptor Systems Preventive Maintenance Manual.	81 pump stations inspected per year	94 (116%)	Performance exceeded target	2.7
34.e.	Annual PM for Back-up Generators	Preventive maintenance is performed on the emergency generators to protect the safety of the public, to protect the environment and reduce SSOs when electrical power to the pump motors from the public utility has been disrupted.	Each back up generator is to receive an annual preventive maintenance inspection.	55 generators to receive PM per year	105 (191%)	Performance exceeded target	2.7
34.f.	Non-Invasive FM Inspection Near Drinking Water Reservoirs	Inspect Force Mains Near Reservoirs to Identify Conditions that may lead to Problems Prior to Failure.	Perform non-invasive inspections of FMs to identify air pockets and leaks. No. of linear feet of FM inspected per year.	2,400 linear feet inspected per year	3,921 LF Inspected	Performance exceeded target	2.8

The table above incorporates a change in the MOM Program tracking process since the most recent MOM Program submittal. Annual Pump Station PM (mechanical work performed by Interceptor Operations) and Annual Electrical Pump Station PM (electrical and instrumentation work performed by Facility Support) has been divided into two categories as seen in the fourth and fifth lines of the table.

6. SYSTEM PERFORMANCE DURING FY 2011

6.1 Modifications to HRSD Operating Pressures

HRSD has made no changes to its current Pressure Policy as detailed in the most recent version of “Development Plan 2000.”

6.2 STP Performance

The HRSD system was influenced by several significant wet weather events in the first half of FY2011 that led to flow increases at the treatment facilities. In addition, construction related to the nutrient control program was ongoing at several of the treatment plants with minor operational events that contributed to discharges from the facilities. Table 5 (below) provides details on the nineteen (19) discharges from July 1, 2010 to June 30, 2011. The majority of these occurrences were fully treated effluent.

6.3 Conveyance System Performance

For the reporting period of July 1, 2010 through June 30, 2011, HRSD experienced forty-three (43) sanitary sewer discharges (SSDs) from its system. Very significant wet weather events in excess of a 10-year recurrence interval occurred during this period, namely the July 29 event and September 29 to October 1 event. These events are force majeure under the Consent Decree. The latter storm was over a 100-year recurrence event throughout much of the system and resulted in high groundwater conditions and elevated system flows. All of these events are detailed in the Sanitary Sewer Overflow Reporting System (SSORS). Details on these 43 events are available in Table 6. All capacity-related SSOs during this reporting period were beyond the control of HRSD and were caused by rainfall amounts exceeding the available infrastructure systems as well as any reasonable level of service.

6.4 LOP Status

As listed in Appendix 1 of the Consent Decree, seventeen (17) Locality Overflow Points (LOPs) have been identified in the Regional Sanitary Sewer System. Prior to the Preliminary Capacity Assessment Report, HRSD and the specific Locality coordinate any time an LOP activates to review the cause and circumstance of the SSO.

In this reporting period, HRSD has coordinated with the applicable Localities regarding the handful of activations from their LOPs, which are described in more detail below. All of these activations occurred as a result of the September 30 to October 1, 2010, wet weather event which was categorized as between a 25-year to more than 100-year rainfall event throughout the HRSD system.

6.4.1 City of Suffolk: LOP No. 2

LOP 2 relates to City of Suffolk PS 63 and its service area. This LOP activated on September 30, 2010, with 10.37 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. During wet weather events, the pressure in the discharge force main at this pumping station increases to a level beyond the capabilities of the existing facility. The City has implemented a plan to install a bypass pump, conduct SSES and Find and Fix work to reduce I/I in the

collection system, and make improvements to the pumping facility at PS 63. This rainfall event was above a level of service that is feasible to attain.

6.4.2 City of Chesapeake: LOP No. 22

The City of Chesapeake experienced an SSO from their LOP No. 22 at City PS 107 during this reporting period on September 30, 2010. This LOP activated with 9.01 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 25-year, 72-hour rainfall. The wet weather event produced conditions that exceeded the capabilities of the City PS 107. The City is implementing an SSES Program as well as a Find and Fix Program to reduce I/I in the collection system. This rainfall event was above a level of service that is feasible to attain.

6.4.3 City of Portsmouth: LOP No. 35

LOP No. 35 is at Rose Avenue and South Street in Portsmouth. During the wet weather event of September 30, 2010, this LOP activated with 9.54 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The City is currently implementing several projects to address the LOP, including the South Street Project completed in July 2010, installing manhole inserts, performing SSES in the system, and rehabilitating downstream piping. This rainfall event was above a level of service that is feasible to attain.

6.4.4 James City Service Authority: LOP No. 49

JCSA experienced an SSO from their LOP No. 49 at LS3-3 during this reporting period on September 30, 2010. This LOP activated with 10.16 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The wet weather event produced conditions that exceeded the capabilities of the LS3-3. JCSA is implementing an SSES Program as well as a Find and Fix Program to reduce I/I in the collection system. This rainfall event was above a level of service that is feasible to attain.

6.4.5 City of Suffolk: LOP No. 53

The City of Suffolk experienced an SSO from their LOP No. 53 at a manhole at 200 West Constance Road in the collection system of Pump Station 048. This LOP activated on October 1, 2010, with 10.37 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The City has installed a bypass pump which should assist the issue in the future. This rainfall event was above a level of service that is feasible to attain.

6.4.6 James City Service Authority: LOP No. 57

JCSA experienced an SSO from their LOP No. 57 at LS4-2 during this reporting period on September 30, 2010. This LOP activated with 11.36 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The wet weather event produced conditions that exceeded the capabilities of the LS4-2. JCSA is implementing an SSES Program as well as a Find and Fix Program to reduce I/I in the collection system. This rainfall event was above a level of service that is feasible to attain.

6.4.7 James City Service Authority: LOP No. 58

JCSA experienced an SSO from their LOP No. 58 in the JCSA collection system upstream of HRSD's Greensprings Pumping Station during this reporting period on September 30, 2010. This LOP activated with 10.2 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The wet weather event produced conditions that exceeded

the capabilities of the system. JCSA has recently completed a pipelining project including 11,000 LF of 21” pipe and 38 manholes to reduce I/I in this collection system. This rainfall event was above a level of service that is feasible to attain.

6.4.8 City of Portsmouth: LOP No. 65

LOP No. 65 is at Pennock Street and Deep Creek Blvd in Portsmouth. During the wet weather event of September 30, 2010, this LOP activated from two manholes (separate SSORS reports 102728 and 102735) with 9.38 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The City is currently implementing several projects to address the LOP, including the Prentice Park sewer rehabilitation project and performing SSES in the system. This rainfall event was above a level of service that is feasible to attain.

6.4.9 City of Portsmouth: LOP No. 72

LOP No. 72 is at Deep Creek Blvd and Fairview Circle in Portsmouth. During the wet weather event of September 30, 2010, this LOP activated from three manholes (separate SSORS reports 102721, 27238, and 102740) with 10.59 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The City is currently implementing several projects to address the LOP, including the Prentice Park sewer rehabilitation project and performing SSES in the system. This rainfall event was above a level of service that is feasible to attain.

6.4.10 City of Hampton: LOP No. 76

The City of Hampton reported an SSO at LOP as a result of the September 30, 2010 regionally heavy rainfall event, at N. King Street and Macalva Drive. This LOP activated with 16.23 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 100-year, 72-hour rainfall. The wet weather event produced conditions that exceeded the capabilities of the sanitary sewer system. The City is implementing an SSES Program as well as a Find and Fix Program to reduce I/I in the collection system. This rainfall event was above a level of service that is feasible to attain.

6.4.11 City of Chesapeake: LOP No. 84

The City of Chesapeake experienced an SSO from their LOP No. 84 at City PS 227 during this reporting period on September 30, 2010. This LOP activated with 11.17 inches of rain being recorded at a nearby HRSD rainfall gauge during a 72-hour period, translating into an event larger than a 50-year, 72-hour rainfall. The wet weather event produced conditions that exceeded the capabilities of the City PS 227. The City is implementing an SSES Program as well as a Find and Fix Program to reduce I/I in the collection system. This rainfall event was above a level of service that is feasible to attain.

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Table 5. Detailed Listing of HRS D Treatment Plant Unusual Discharges (July 1, 2010 to June 30, 2011)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Comments
7/22/2010	VIP	Aeration effluent backed up and overflowed vault due to faulty check valve. Overflow went onto ground.	10	Operator started the offline pump and pumped down the vault. The majority of the mixed liquor solids was pumped back to the head of the plant. Sand was placed on top of the ground after most of the solids were removed.	800	0	aeration effluent	plant drain system	This was an operations problem that was corrected within 10 minutes
9/9/2010	York River	Spill occurred at the treatment system used to produce reuse water that is sent to Giant Industry. Primary effluent is pumped to the sequence batch reactors (SBR) for treatment. The treated effluent is then decanted into the post-equalization tank where it is then pumped to filtration and chlorination system. The discharge valve on the post-EQ tank failed to open when the level in the tank rose. The treated effluent exited the tank through the tank overflow line into the plant's manhole system. It subsequently overflowed the manhole system.	25	The operator opened the discharge valve manually. Once the valve was opened, the post-EQ tank pump began to operate and the level in the tank dropped. The plant staff checked the valve but could not re-create the problem. It is suspected that a power blip may have caused the	2000	2000	Secondary Effluent	ground/Back Creek	Reclaimed water spill
9/10/2010	York River	Spill occurred at the treatment system used to produce reuse water that is sent to Giant Industry. Primary effluent is pumped to the sequence batch reactors (SBR) for treatment. The treated effluent is then decanted into the post-equalization tank where it is then pumped to filtration and chlorination system. The discharge valve on the post-EQ tank failed to open when the level in the tank rose. The treated effluent exited the tank through the tank overflow line into the plant's manhole system. It subsequently overflowed the manhole system. This is the second failure of the valve within 24 hours.	10	The operator opened the discharge valve manually. Once the valve was opened, the post-EQ tank pump began to operate and the level in the tank dropped. The plant staff left the valve in the open position while they continued their investigation of the problem. A float switch was installed temporarily to operate the post-EQ-tank pumps. The problem was identified to be the actuator which controls the discharge valve. The actuator was dismantled and discovered to have water damage. The actuator was rebuilt and is now working properly.	2000	2000	Secondary Effluent	ground/Back Creek	Reclaimed water spill
9/21/2010	Boat Harbor	Broken fitting on 5-minute chlorine contact tank analyzer pump sprayed NPW onto ground and into storm drain. The metal fitting had corroded and cracked.	1	Operator shut down the pump and switched to another analyzer pump to maintain chlorination. The fitting was replaced. None of the spill was recovered because it either entered the storm drain or soaked into the ground.	200	200	NPW*	James River/ground	Reclaimed water spill
9/30/2010	James River	Pre-aeration tanks #2 and #3 and primary clarifiers #3 and #4 overflowed due to high flows from an extreme rain event. The Williamsburg-Newport News airport recorded 9.39" of rainfall for the day from the remnants of tropical storm Nicole interacting with a low pressure system. The plant is undergoing construction for nutrient removal upgrades and not all of the unit processes were available. Most of the overflows came from the pre-aeration tanks.	930	Plant used four pumps to divert some flow from the primary #3 and #4 trains of the plant to the primary #1 and #2 trains to equalize the flow through the plant. The majority of the tank overflows were contained on plant site and drained back into the plant drain system. A small portion of the overflow reached the storm drain. Plant staff placed bags in the roadway to divert flow back into the plant drain system and away from the storm drain.	625,000	1000	wastewater	Creek leading to Warwick River	Severe wet weather event greater than 50-year recurrence interval

Table 5. Detailed Listing of HRSD Treatment Plant Unusual Discharges (July 1, 2010 to June 30, 2011)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Comments
9/30/2010	Ches-Eliz	Plant opened alternate outfall 002 to prevent process tank overflows due to high plant flows during heavy rain. The remnants of tropical storm Nicole interacted with a low pressure system to produce a record amount of rainfall for the day. Norfolk International Airport recorded 7.85" of rainfall for the day. Plant flow rate exceeded 60 MGD.	920	None required as this is a permitted, approved alternate discharge. All discharge is fully treated, chlorinated and de-chlorinated final effluent. Plant closed short outfall valve when plant flow rate decreased to manageable rate.	10,000,000	10,000,000	Fully treated effluent	Little Creek Harbor	Documented use of a permitted alternate outfall
10/13/2010	York River	A 6" PVC flange burst due to water hammer. The pipe carries NPW which is used to make up the sodium bi-sulfite solution for de-chlorination. The pipe flange is located inside the chemical feed building.	8	Operator closed valves in the line to isolate the pipe. The plant switched to potable water for the bi-sulfite solution makeup water. The piping was repaired and returned to service.	200	200	NPW*	Back Creek	Reclaimed water spill
11/2/2010	York River	Drain line to the final effluent sample sink became plugged and final effluent overflowed onto ground.	28	The final effluent sample pump was shut off and the drain was cleared. The NPW soaked into the ground and could not be recovered.	100	100	NPW*	ground	Reclaimed water spill
12/19/2010	Nansemond	The air compressor for the wet well bubbler level failed which caused the sanitary pumps to not operate. This caused the level in the wet well to rise and briefly overflow the well.	40	The sanitary pumps were placed in manual while the air compressor was replaced. Spill soaked into the ground and could not be recovered.	8	8	wastewater	ground	Small volume spill due to mechanical failure that was corrected
12/21/2010	Atlantic	Final effluent leaked at an estimated rate of 10 gph from the north side of the final effluent channel near the ground at the joint between the old channel and the new channel. Plant had recently undergone expansion construction project which includes building two new chlorine contact tanks. The tanks were built onto the old contact tanks and the effluent channel was extended to include all four of the tanks. It was the joint between the new and old effluent channel that was leaking.	1140	Plant staff established a sump to contain the leak and pump the effluent back into the effluent channel. The construction is still under warranty. Contractor pressure grouted the joint on 12/22/10 and no further leakage has been reported.	190	190	NPW*	ground	Reclaimed water spill
12/30/2010	Williamsburg	The 10-inch gravity thickener supernatant line broke underground. The top of the pipe was corroded by sulfides.	12	Plant stopped all flow to the gravity thickener and pumped the level of the tank down below the weirs of the thickener. Contained and recovered approximately one-half of the spill before it entered the storm drain. Pipe was replaced and the gravity thickener was placed back in service.	1000	500	wastewater	James River	Pipe replaced
1/23/2011	Atlantic	The 4-inch PVC NPW supply pipe froze and burst open. On Friday, 1-21-2011, the contractor was doing renovation work on secondary clarifiers #1 and 2 using the NPW. The contractor ended his work after the dayshift plant staff had gone home for the weekend. The contractor shut off the NPW at the end of the day at the top of the tanks. The plant's standard procedure is to let exposed NPW lines run with a small flow during freezing weather to prevent pipes freezing. The contractor's actions did not follow this procedure. The operators were unaware that the contractor had shut off the NPW for the clarifiers. The area	59	Operator attempted to shut off the valve to this line but the water spray in the area coupled with the cold hindered the operation. The standby operator and Chief Operator were contacted for assistance. The CO directed the operator to shut down the NPW pumps and then try to close the valve. This worked and the valve to the riser pipe was shut securely and the NPW pumps were turned back on. The contractor was directed to leave NPW lines running during cold weather or to notify plant	97600	97600	NPW*	marsh	Reclaimed water spill

Table 5. Detailed Listing of HRSD Treatment Plant Unusual Discharges (July 1, 2010 to June 30, 2011)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Comments
		experienced extreme cold on Saturday and Sunday. The pipe froze and broke. The operator noticed a jump in the NPW flow on the Distributed Control System from an average of 1097 gpm to 2751 gpm. The operator immediately knew that something major had broken loose and investigated. He discovered the broken line.		personnel of NPW line closures prior to freezing conditions.					
3/18/2011	York River	Contractor removed above ground piping from Post-Equalization Tank without notifying the YR Plant staff. Water Reuse Storage Tank Level Controller called for the submersible pumps to run and flow began coming out of a 6" open pipe. Plant operator shut off the pumps as quickly as possible.	5	Submersible pumps at the chlorine contact tank were turned off as quickly as possible. Contractor installed a blind flange over the open end of the pipe. Contractor was instructed to communicate with plant personnel before dismantling pipe to verify conditions within the pipe. Spill soaked into the ground and could not be recovered.	3000	3000	NPW*	ground	Reclaimed water spill
4/6/2011	York River	The sump pump located outside the digester building tripped off. The sump filled up and NPW overflowed onto the surrounding pavement and grassy area. The NPW system is used to supply a jet pump in the emergency generator fuel oil containment area. Some of the NPW soaked into the grassy area adjacent to the sump area.	20	The sump pump was reset and pumping resumed. Approximately 805 gallons of the spill were recovered when pumping resumed. There have been no further problems with the pump.	600	120	NPW*	ground	Reclaimed water spill
4/8/2011	VIP	NPW overflowed through the floor drain into the storm water drain. Plant staff was using NPW to unplug a primary clarifier discharge pipe. The NPW used to unplug the pipe drains back into the plant drain system. Some of the NPW backed up in the drain system and overflowed the floor drain in the south scum pump room. The NPW then flowed out the door and into the storm drain. The floor drain is located in a building separate from where the plant staff was clearing the line. The plant manager observed the water flowing out the door while walking past the building and alerted the staff.	15	Operator secured the NPW flushing water and sandbagged the area around the storm drain.	1000	1000	NPW*	Elizabeth River	Reclaimed water spill
4/14/2011	Army Base	Contractor installed temporary system of piping to pump primary effluent to the aeration tanks. The contractor was testing the system when he discovered a small hole in the 24-inch pipe. Primary clarifier effluent flowed from the hole onto the ground.	20	Contractor secured pumps and installed a repair clamp to the pipe. The primary clarifier effluent soaked into the ground and could not be recovered.	200	200	wastewater	ground	Construction issue
6/12/2011	Nansemond	Spill occurred in centrate building which houses equipment for struvite recovery. There is a sump pump installed in the trough which collects the reactor overflow. The ball check valve on the sump pump became stuck in the open position. Centrate overflowed trough and flowed out the door of the building.	270	Operator repaired check valve upon discovery of problem. Implemented an hourly check to ensure valve continued to work properly. Cleaned up area. Plant submitted work order to have electricians install a high level alarm with both audio and visual light outside to alert plant staff of problems. This building is not visited as part of the operator hourly rounds.	1900	1900	centrate	ground	Isolated incident repaired and preventive measures installed

Table 5. Detailed Listing of HRSD Treatment Plant Unusual Discharges (July 1, 2010 to June 30, 2011)

Date	Location	Description/Cause	Duration of Event (minutes)	Corrective Action	Estimated Quantity Discharged (gallons)	Estimated Quantity to State Waters (gallons)	Type of Overflow	Receiving Water	Comments
6/23/2011	York River	A caulked seam on the centrate treatment tank sprang a leak. The tank was full of NPW for testing purposes.	150	A sump was excavated below the failed seam and a pump was installed to pump the leaking NPW back to the system. Tank was drained.	250	250	NPW*	ground	Reclaimed water spill
6/24/2011	Chesapeake-Elizabeth	Short outfall was opened during testing of temporary final effluent pumps. A section of the outfall piping is being replaced and the temporary pumping system was installed. Contractor was testing the pumps to ensure peak flow capacity. DEQ was notified prior to test.	16	None required as this is a permitted, approved alternate discharge. Short outfall was closed after testing was completed. DEQ was notified as required by permit. All discharge was fully treated, chlorinated, and de-chlorinated final effluent.	390000	390000	fully treated final effluent	Little Creek Harbor	Documented use of a permitted alternate outfall

*NPW – Non-potable water (treated effluent)

Table 6. Detailed Listing of HRSD SSOs (July 1, 2010 to July 30, 2011)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO*	Discharge Quantity**	Amount Reaching State Waters**	DEQ IR
7/29/2010 18:30	Bridge Street Pump Station	4701 Victoria Blvd	Salters Creek	Hampton	Capacity-Weather Related	Heavy rainfall from storms in area caused pump station to overflow. All three pumps failed due to high temperatures from the heat. Rain gauge at Bayshore Pump Station recorded 3.3" of rain in two hours. Estimated flow rate: 35 gal/min	6 hour(s) 0 minute(s)	Reset pumps. Station operated properly after pumps were reset. However, flow was too high due to storm and station overflowed via tidal gate until flows dropped.	12,600	12,600	SSORS#2011-T-102642
7/29/2010 18:44	Manhole	King Street between Donald Street & MacAlva Drive	Back River	Hampton	Capacity-Weather Related	Heavy rains from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3" of rain in two hours. Estimated overflow rate: 9 gal/min	4 hour(s) 42 minute(s)	Checked Langley Circle Pump Station to ensure pumps are operating properly. Started by-pass pump at station to facilitate pumping.	2,538	2,538	SSORS#2011-T-102644
7/29/2010 18:44	Manhole	King Street at MacAlva	Back River	Hampton	Capacity-Weather Related	Heavy rains from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3" of rain in two hours. Estimated overflow rate: 71 gal/min	4 hour(s) 42 minute(s)	Checked Langley Circle Pump Station to ensure pumps are operating properly. Started by-pass pump to facilitate pumping.	20,022	20,022	SSORS#2011-T-102645
7/29/2010 18:53	Center Avenue Pump Station	315 Center Avenue	James River	Newport News	Capacity-Weather Related	Heavy rains from storms in area caused pump station to overflow. Rain gauge at Copeland Park Pump Station recorded 5.83" of rain in two hours. Estimated overflow rate: 75 gal/min	3 hour(s) 42 minute(s)	Checked pump station to ensure pumps are operating properly. Start and stop times adjusted after review of records. Corrected location of station from Norfolk to Newport News.	16,650	16,650	SSORS#2011-T-102643
7/29/2010 20:30	Manhole	Sunset Road and Kecoughtan Road	Sunset Creek	Hampton	Capacity-Weather Related	Heavy rains from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3" of rain in two hours. Estimated overflow rate: 5 gal/min	1 hour(s) 45 minute(s)	Checked Claremont Avenue Pump Station to ensure pumps are operating properly.	525	525	SSORS#2011-T-102647
7/29/2010 20:35	Manhole	Chesapeake Avenue and Clyde Street	James River	Hampton	Capacity-Weather Related	Heavy rains from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3" of rain in two hours. Estimated overflow rate: 10 gal/min	1 hour(s) 49 minute(s)	Checked Claremont Avenue Pump Station to ensure pumps are operating properly.	1,090	1,090	SSORS#2011-T-102648
7/30/2010 8:00	Force Main	2401 Corprew Avenue and Madison Avenue	Elizabeth River - Eastern Branch	Norfolk	Infrastructure	Informed by City of Norfolk of force main leak of 20" cast iron pipe. Initial estimate of flow is 100 gal/min. As of 3:30 pm, appears as though incident is under control. From 8:00 am-9:15am the flow was 100 gal/min at which point flow was controlled using bypass pump to divert flow to city gravity system. Flow began again from 9:50 - 9:55 am at 100 gal/min because 6" bypass pump became clogged. Flow has been under control since that time. Work is on-going to repair line which has a 8" crack along the side of the pipe at the spring line level.	12 hour(s) 25 minute(s)	Crew on site - assembling equipment and attempting to divert flow. Initially set up 6" bypass pump to pump into city gravity system. Then valved system to isolate pipe. Contracted pump and haul trucks to maintain well levels at various pump stations. Removed damaged section of pipe and replaced with 12' of ductile iron pipe and dresser couplings. Vacuum on site to contain and remove as much of the spill as possible. Flow figures updated on 8/5/2010. HRSD crew returned to site to clean the sand/sediment from the city system where bypass pumping had occurred on 7/30. It was discovered that the manhole was part of the storm drain system instead of the sanitary system. It was incorrectly identified during the spill event due to the presence of a insert/dust trap within the manhole. These inserts are normally placed in the sanitary sewer manholes to prevent I/I from entering through the manhole lid. The levels in the manhole were also high on 7/30 due to the storms experienced in the area on 7/29 so the flow direction could not be determined. Upon discovery, HRSD recovered as much as possible from the stormwater system. It should be noted that this manhole was the only one in the vicinity and it was necessary to use it to keep wastewater out of the street during the spill event.	55,000	33,400	SSORS#2011-T-102649

Table 6. Detailed Listing of HRSD SSDs (July 1, 2010 to July 30, 2011)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO*	Discharge Quantity**	Amount Reaching State Waters**	DEQ IR
9/30/2010 7:27	Upstream of Bridge Street Pump Station	4701 Victoria Blvd	Salters Creek	Hampton	Capacity-Weather Related	PS overflowing at tide gate due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Freeman PS recorded 16.23" of rainfall during 48-hour period with 13.85" of rain received on 9/30.	36 hour(s) 57 minute(s)	Checked pump station to ensure pumps were operating properly. Start time is based on alarm.	665,400	665,400	SSORS#2011-T-102694
9/30/2010 7:43	Fords Colony Pump Station	430 Hempstead Road	Powhatan Creek	James City	Capacity-Weather Related	Manhole beside pump station overflowed due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at station recorded 10.48" of rainfall during 48-hour period with 7.08" of rain received on 9/30.	19 hour(s) 50 minute(s)	Checked pump station and all pumps were operating properly. Report was delayed due to confusion of ownership of manhole. There are multiple manholes in swamp and most are owned by JCSA. It was originally thought that manhole belonged to JCSA and they were notified. Overflow stopped at 1:56 pm but restarted at 8:45 pm. Corrected location on update.	39,050	39,050	SSORS#2011-T-102725
9/30/2010 8:45	Manhole	MacAlva and N. King Street	Back River	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 50 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	25 hour(s) 15 minute(s)	Checked Langley Circle Pump Station to ensure pumps were operating properly. The bypass pump set up at station to facilitate high flow conditions did not start automatically. Crew started pump manually upon arrival at site.	151,500	151,500	SSORS#2011-T-102693
9/30/2010 8:45	3 manholes	Ballentine and Virginia Beach Blvd	Elizabeth River	Norfolk	Capacity-Weather Related	Two MHs are overflowing due to high flows caused by rain. Each manhole flow rate is initially estimated at 25 gpm. A third MH began overflowing at an initial estimated rate of 15 gpm at 12:43 pm. Area received large amount of rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Virginia Beach Blvd PS recorded 12.12" of rainfall during 48-hour period with 10.51" of rain received on 9/30.	7 hour(s) 0 minute(s)	Checked Norchester pump station to ensure all pumps were operating, including Godwin pump installed for high flow conditions.	16,800	16,800	SSORS#2011-T-102698
9/30/2010 8:47	Manhole	1275 North King Street	Back River	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 25 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	25 hour(s) 13 minute(s)	Checked Langley Circle Pump Station to ensure pumps were operating properly. The bypass pump set up at station to facilitate high flow conditions did not start automatically. Crew started pump manually upon arrival at site.	37,825	37,825	SSORS#2011-T-102692
9/30/2010 8:49	Manhole	Donald and N. King Street	Back River	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 100 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	25 hour(s) 11 minute(s)	Checked Langley Circle Pump Station to ensure pumps were operating properly. Bypass pump set up at station to facilitate high flow conditions did not start automatically. Crew started pump manually upon arrival at site.	158,655	158,655	SSORS#2011-T-102691
9/30/2010 9:59	Manhole	Sunset Road and Kecoughtan Road	Sunset Creek	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 10 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Freeman Pump Station recorded 16.23" of rainfall during 48-hour period with 13.85" of rain received on 9/30.	22 hour(s) 42 minute(s)	Checked pump station and downstream gravity system. Modified initial flow rate estimate to 5 gpm.	6,810	6,810	SSORS#2011-T-102695
9/30/2010 10:00	Manhole	E. Chamberlain and N. Hope Street	Mill Creek	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 50 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Bayshore PS recorded 12.42" of rainfall during 48-hour period with 10" of rain received on 9/30.	31 hour(s) 0 minute(s)	Checked Willard Avenue pump station to ensure pumps were operating properly. Also checked gravity system downstream. Modified initial flow rate estimate to 100 gpm.	186,000	186,000	SSORS#2011-T-102700
9/30/2010 10:00	Manhole	Yukon and N. Hope Street	Mill Creek	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 50 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Bayshore Pump Station recorded 12.42" of rainfall during 48-hour period with 10" of rain being received on 9/30.	31 hour(s) 0 minute(s)	Checked Willard Avenue pump station to ensure pumps were operating properly. Also checked gravity system downstream. Modified initial flow rate estimate to 100 gpm.	186,000	186,000	SSORS#2011-T-102701

Table 6. Detailed Listing of HRSD SSOs (July 1, 2010 to July 30, 2011)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO*	Discharge Quantity**	Amount Reaching State Waters**	DEQ IR
9/30/2010 10:30	Baysshore Pump Station	720 Baysshore Lane	Chesapeake Bay	Hampton	Capacity-Weather Related	Two manholes beside pump station are overflowing due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Manhole beside station is overflowing at initial estimated rate of 20 gpm. Manhole across the street is overflowing at initial estimated rate of 15 gpm. Rain gauge at Baysshore PS recorded 12.42 " of rainfall during 48-hour period with 10" of rain received on 9/30.	23 hour(s) 0 minute(s)	Checked pump station to ensure pumps were operating properly. Manhole across the street from station stopped overflowing at 1:00 pm on 9/30. Manhole beside station stopped overflowing at 9:30 am on 10/1.	48,900	48,900	SSORS#2011-T-102697
9/30/2010 10:51	Manhole	134 South 5th Street	Shingle Creek	Suffolk	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 1 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Suffolk pump station recorded 9.75" of rainfall during 48-hour period with 7.2" of rain received during 9/30. Flow rate estimate modified to 5 gpm.	20 hour(s) 45 minute(s)	Checked Suffolk pump station to ensure all pumps were operating properly. An auxiliary Godwin pump is installed at station for high flow conditions.	6,255	6,255	SSORS#2011-T-102714
9/30/2010 11:09	Center Avenue Pump Station	315 Center Avenue	James River	Newport News	Capacity-Weather Related	Pump station overflowing at initial rate of 178 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	18 hour(s) 51 minute(s)	Checked pump station to ensure pumps were operating properly. Flow estimate is calculated using data from recently installed weir meter.	1,301,187	1,301,187	SSORS#2011-T-102696
9/30/2010 11:28	Manhole	Bainbridge Blvd and Park Avenue	Suffletown Creek to Elizabeth River	Chesapeake	Capacity-Weather Related	Manhole overflowing at an initial estimated rate of 10 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Ferebee Pump Station recorded 12.5" of rainfall during 48-hour period with 10.59" of rain received on 9/30.	15 hour(s) 17 minute(s)	Checked Park Avenue pump station to ensure pumps were operating properly, including Godwin pump installed for high flow conditions. Manhole stopped overflowing at 11:32 am but started overflowing again at 12:14 am.	1,550	1,550	SSORS#2011-T-102712
9/30/2010 12:15	Manhole	N. King Street at I-64	Bright's Creek	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 50 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received during 9/30.	23 hour(s) 45 minute(s)	Checked Washington Street pump station. All pumps were operating properly.	14,250	14,250	SSORS#2011-T-102718
9/30/2010 12:43	Pump Station	5808 Monroe Place	Lafayette River	Norfolk	Capacity-Weather Related	Station high water alarm due to high flow caused by rain from remnants of TS Nicole interacting with low pressure system. Manhole in front of Pump Station recorded 11.95" of rainfall during a 48-hour period with 10" of rain received on 9/30.	24 hour(s) 28 minute(s)	Crew could not estimate flow rate due to flooding. All pumps at the station were operating properly, including Godwin pump installed for high flow conditions.	-1	-1	SSORS#2011-T-102713
9/30/2010 13:00	Manhole	Ivy Home Road and Victoria Blvd	Sunset Creek	Hampton	Capacity-Weather Related	Manhole overflowing at an initial estimated rate of 2 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Freeman Pump Station recorded 16.23" of rainfall during 48-hour period with 13.85" of rain received on 9/30.	14 hour(s) 24 minute(s)	Checked bypass pipe and bypass pump at Hampton pump station #1.	1,728	1,728	SSORS#2011-T-102717
9/30/2010 13:55	Manhole	42 Franklin Road	James River	Newport News	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 50 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Flow rate dropped to estimated 10 gpm by 2:10 pm. Rain gauge at Copeland Park PS recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	18 hour(s) 15 minute(s)	Checked Center Avenue pump station to ensure pumps were operating properly.	54,750	54,750	SSORS#2011-T-102705
9/30/2010 14:00	Manhole	3904 Chesapeake Avenue	James River	Hampton	Capacity-Weather Related	Manhole overflowing at initial estimated rate of 25 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Copeland Park pump station recorded 10.75" of rainfall during 48-hour period with 8.7" of rain received on 9/30.	18 hour(s) 45 minute(s)	Checked Claremont pump station to ensure pumps were operating properly. Also checked gravity system downstream.	22,500	22,500	SSORS#2011-T-102706

Table 6. Detailed Listing of HRSD SSDs (July 1, 2010 to July 30, 2011)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO*	Discharge Quantity**	Amount Reaching State Waters**	DEQ IR
9/30/2010 14:00	Manhole	3748 Chesapeake Avenue	James River	Hampton	Capacity-Weather Related	MH overflowing at initial estimated rate of 25 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system.	18 hour(s) 45 minute(s)	Checked Claremont pump station to ensure pumps were operating properly. Also checked gravity system downstream.	22,500	22,500	SSORS#2011- T-102707
9/30/2010 16:11	Chesapeake Blvd Pump Station	5734 Chesapeake Blvd	Wayne Creek	Norfolk	Capacity-Weather Related	Station overflowing at initial estimated rate of 10 gpm due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Luxembourg Pump Station recorded 11.95" of rainfall during 48-hour period with 10" of rain received on 9/30.	22 hour(s) 28 minute(s)	Checked pump station to ensure all pumps were operating properly, including Godwin pump set up for high flow conditions. The fuel line on the Godwin pump ruptured at approximately 6:39 am on 10/1 which caused overflow rate to increase dramatically. The fuel line was repaired and the pump placed back in service by 10:05 am which slowed the overflow rate.	72,708	72,708	SSORS#2011- T-102739
9/30/2010 21:41	Fort Eustis Pump Station	1619 Taylor Road	James River	Newport News	Capacity-Weather Related	MH at PS overflowing at initial estimated rate of 150 gpm due to high flow caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at Fort Eustis pump station recorded 8.56" of rainfall during 48-hour period with 5.91" of rain received on 9/30.	2 hour(s) 33 minute(s)	Checked pump station to ensure pumps were operating properly.	22,950	22,950	SSORS#2011- T-102726
10/1/2010 3:00	Manhole	221 Locust Street	Shingle Creek	Suffolk	Capacity-Weather Related	Manhole overflowed at estimated rate of 1 gpm due to high flows from rain caused by remnants of TS Nicole interacting with low pressure system. Rain gauge at Suffolk Pump Station recorded 9.75" of rainfall during 48-hour period with 7.2" of rain received on 9/30.	3 hour(s) 30 minute(s)	Checked Suffolk pump station to ensure all pumps were operating. An auxiliary Godwin pump is installed at station for high flow conditions. Delay in reporting due to miscommunication within HRSD.	210	210	SSORS#2011- T-102788
10/26/2010 11:30	Air Vent	Little Neck Road near Virginia Beach Blvd	Lynnhaven River	Virginia Beach	Infrastructure	Crew was excavating 2-inch air vent to replace the old cast iron riser pipe when the saddle failed and the vent blew out. The tapping saddle bolts had deteriorated.	0 hour(s) 5 minute(s)	Stopped flow by installing wooden plug. A new saddle was installed. Recovered part of the spill that was in the gutter pan. The rest of the spill went into the storm drain.	1,950	1,700	SSORS#2011- T-102836
10/27/2010 13:45	Manhole	633 41st Street	Hampton Roads Harbor	Newport News	Third Party Action	T.A. Sheets Construction Company is replacing a section of the HRSD gravity line on 41st Street between Jefferson and Madison Avenues. During this process, T.A. Sheets lost a plug in the line and had to put a camera in to locate the plug. During this procedure, they had trouble reinstalling the bypass line. After removing the camera, the line surcharged and sewage came out of an upstream manhole.	0 hour(s) 1 minute(s)	Bypass system was reinstalled and the pumps were turned on. Report was modified to change SSO classification to third party action instead of maintenance-other.	100	100	SSORS#2011- T-102839
11/4/2010 13:20	Force main	2800 West Avenue	James River	Newport News	Infrastructure	12" cast iron force main failure. Pipe had a crack in it. Release was intermittent following pump cycles at the upstream pump station.	0 hour(s) 40 minute(s)	Vaccon truck responded to site and contained flow. A sump was excavated and pumps were set up to send flow into a nearby sanitary sewer manhole until permanent repair can be made. Eight-foot section of force main was replaced on 10/5.	1,000	1,000	SSORS#2011- T-102846
11/24/2010 14:30	Force main	9115 Mace Avenue	Mason Creek	Norfolk	Damage By Others	WE Kurling was boring across Mace Ave and penetrated the HRSD 20-inch FM. The line had been marked properly. The contractor did not dig down to confirm the location of the pipe prior to boring across the road.	3 hour(s) 0 minute(s)	HRSD crew excavated pipe and inserted wooden plug to stop the spill. A steel plate was clamped over the wooden plug and bound to the pipe for a temporary repair. HRSD will coordinate with City of Norfolk to make permanent repairs at a later date. Crew monitored the excavation daily to ensure temporary repair was intact.	2,400	2,400	SSORS#2011- T-102875
11/28/2010 12:00	Force main	3714 Robin Hood Road	Wayne Creek	Norfolk	Infrastructure	Ball valve on air vent came apart and caused spill.	2 hour(s) 47 minute(s)	Wooden plug was installed to stop spill. City of Norfolk and HRSD PS were turned off in order to make repairs. An expandable plug was inserted into the riser and the ball valve was replaced. Crew cleaned up area and recovered part of spill. There was a delay in notification to HRSD of the event. Answering service called wrong number. City of Norfolk notified HRSD directly and HRSD duty person was on site within 15 minutes and inserted the wooden plug to stop flow.	8,400	7,725	SSORS#2011- T-102876

Table 6. Detailed Listing of HRSD SSOs (July 1, 2010 to July 30, 2011)

Date and Time of Incident	Location	Sewer System Component	Potential Receiving Waters	Spilled In Jurisdiction	SSO Classification	Description of Incident from SSORS	SSO Duration	Action Taken and Explanation of SSO*	Discharge Quantity**	Amount Reaching State Waters**	DEQ IR
12/3/2010 10:00	Air Vent	3644 Robin Hood Road	Wayne Creek	Norfolk	Infrastructure	Corporation stop broke on air vent. HRSD employee observed a small puddle beside the air vent casting when he was driving in to work. Crew was sent to investigate and determined air vent was slowly leaking below the ball valve. Leak flow rate increased when crew attempted to insert plug into air vent riser	0 hour(s) 20 minute(s)	HRSD contacted City of Norfolk to turn off city pump station and HRSD closed isolation valve. Vaccon was already on site and the majority of spill was recovered. Crew excavated down to the top of the pipe and installed a new corporation stop.	3,000	464	SSORS#2011-T-102882
12/21/2010 10:30	force main	West Avenue at 31st Street	James River	Newport News	Infrastructure	12-inch cast iron force main leaking intermittently when nearby pump station operates. Leak is approximately 1 gpm. There was a crack in the circumference of the pipe which caused the leak.	1 hour(s) 0 minute(s)	Dug sump to contain and collect spill. Pipe was excavated for repair. Pipe was repaired using full circle clamp. Vaccon was used to clean the area and lime was spread.	100	50	SSORS#2011-T-102908
1/14/2011 8:00	Force main	Kiln Creek Parkway & Drivers Lane	golf course water hazard	York	Damage By Others	Contractor was exposing force main to install line stop and hit a corporation stop on the pipe that was not in the drawings.	0 hour(s) 15 minute(s)	Contractor installed plug to stop spill. HRSD installed tapping saddle and new corporation stop for permanent repair. Area was limed. Spill entered a water hazard on the Kiln Creek Golf Course. Time of event was corrected.	100	100	SSORS#2011-T-102930
1/28/2011 20:00	road	Elm Avenue & Boleourt Road	James River/ground	Newport News	Third Party Action	Contractor was relining gravity pipe. A subcontractor was pumping sewage from a manhole and discharging to a downstream manhole as part of the operation. After the vactor truck was filled and moved from manhole, it was observed that the suction/dischARGE line was not secured and releasing sewage along the roadway. Truck driver was flagged down after travelling approximately 700 feet.	0 hour(s) 5 minute(s)	Truck was stopped and valve was secured. Portion of spill was recovered. Remainder entered storm drain or soaked into the ground. Area was limed. HRSD staff responded to ensure cleanup was done properly by contractor. Initial notification reported 100 gallons lost but was modified to 200 gallons upon further interviews with contractor. personnel on site at time of event.	400	200	SSORS#2011-T-102950
2/12/2011 9:04	Force main	1515 Runnymede Road near Shirland Avenue	Lafayette River	Norfolk	Infrastructure	10-inch cast iron force main had a crack in the circumference. Tree root was lying across top of pipe.	1 hour(s) 56 minute(s)	Crew excavated and installed a full circle clamp on pipe. Part of spill was recovered using Vaccon. Area was cleaned and limed. Topsoil was brought in to restore resident's yard.	265	200	SSORS#2011-T-102961
2/16/2011 11:15	Force main	2751 Colechester Crescent & Norchester Ave	Elizabeth River	Norfolk	Infrastructure	8-inch CIP FM leaking. Pipe had a crack in the circumference.	0 hour(s) 49 minute(s)	Dug a sump to contain leak. Recovered part of spill and cleaned area. Installed full circle clamp on 2/17/2011 to complete the repair.	150	100	SSORS#2011-T-102965
4/4/2011 10:34	Force main	East Olney Road near 800 Tidewater Drive	Elizabeth River	Norfolk	Infrastructure	Force main leaking intermittently at estimated rate of 25 gpm. 20" cast iron force main had 3-foot crack on top of bell joint of the pipe. Pipe leaked approximately every three minutes.	1 hour(s) 56 minute(s)	Crew on site. Bringing in equipment for containment and repair. Vaccon contained spill while crew excavated pipe and installed two full circle clamps. A system shutdown was coordinated with city of Norfolk and the pipe was permanently repaired on 4/7 by cutting out damaged section and replacing it. This force main is scheduled to be replaced under the CIP.	1,450	1,450	SSORS#2011-T-103016
4/14/2011 16:20	Gravity line	633 41st Street	Ground	Newport News	Third Party Action	Failure of temporary gravity line connection installed by contractor. This caused a section of 24-inch gravity main to be displaced and water filled the bottom of the excavation prior to continuing to flow into the downstream gravity line. The water level in the trench varied with the pump cycles from upstream pump stations.	2 hour(s) 20 minute(s)	HRSD isolated pump stations and contractor installed inflatable plug in the upstream manhole to isolate flow. Contractor then replaced the section of pipe that had been displaced. Contractor pumped out excavation as much as possible. Pipe was lying on a bed of rock so it is impossible to determine how much of the spill soaked into ground under the rock. Flow was restored to pipe after repair.	-1	-1	SSORS#2011-T-103036
5/25/2011 11:00	Wythe Creek Rd	Wythe Creek Rd, north of Winder Farm Rd.	Soaked into ground. Site was near Brick Kiln Creek.	Hampton	Infrastructure	Leaking corp-stop on exposed section of pipe.	1 hour(s) 0 minute(s)	System was isolated and the corp-stop was replaced. Lime was spread on the affected area.	25	25	SSORS#2011-T-103068

*Comments have been added for the Annual Report that were not part of SSORS original report.

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7. PLANNED ACTIVITIES FOR FY2012

HRSD will be continuing the overall program outlined in the Consent Decree and SOC in FY2012. The following sub-sections provide specifics on this work.

7.1 Flow, Pressure, and Rainfall Monitoring Program

7.1.1 Implementation of the FPR Monitoring Plan

Although not required by the Consent Decree, HRSD will likely continue to collect data from flow, pressure, and rainfall sensors in FY2012, and will likely continue to operate a portal to allow access for the Localities to the HRSD flow, pressure, and rainfall data from the FPR sites (Telog server data). In FY2012, HRSD will modify the network and delete and/or relocate some monitoring points.

7.1.2 LOP Status

In FY2012, HRSD will continue to coordinate with Localities following activation of an LOP in the Localities system. This will include meeting with the Locality to review the occurrence, assist with evaluation of the problem, and help the Locality with interim or final solutions to mitigate the LOP. This information will be documented in the upcoming annual reports.

7.2 Regional Hydraulic Model and Hydraulic Assessment

The Final RHM Report required by the Consent Decree will be submitted by July 31, 2011.

Monthly meetings of the Model Users Group, facilitated by HRSD and attended by the Localities will continue to be held as needed.

7.3 Condition Assessment Plan

7.3.1 Implementation of the Condition Assessment Plan

7.3.1.1 Condition Assessment Field Activities

The planned Condition Assessment Field Activities will continue to be performed in FY2012. This will include:

- Gravity Sewer Inspection
- Force Main Inspection
- Pumping Facility Inspection
- Other Condition Assessment Field Activities listed in the SSES Plan and Condition Assessment Plan (CAP).

The targeted completion date for a portion of these activities is November 26, 2011.

7.3.1.2 Prompt Repairs

As the Condition Assessment Field Activities are performed, HRSD will continue to review the data for issues that meet the criteria set forth in the CAP and SOC for Prompt Repair. Once a defect is identified as requiring Prompt Repair, HRSD will implement an action plan to make the improvements necessary.

7.3.1.3 Private Property I/I Abatement Program

In FY2012, HRSD will continue to develop a Private Property I/I Abatement Program to be implemented within each jurisdiction. This will include the process for estimating peak flow reduction commitments.

7.4 Interim System Improvements

HRSD will continue to design and construct the projects listed in Appendix 5 of the Consent Decree that are required to be completed within 8 years of the Date of Entry. The Verification of Completion for these projects will be included in upcoming Annual Reports as the projects are completed.

7.5 Management, Operations, and Maintenance Program

7.5.1 MOM Plan

In FY2012, HRSD has submitted a revised MOM Program (July 1, 2011) and will receive final approval from the EPA and DEQ (received on September 27, 2011).

7.5.2 Implementation of MOM Program

HRSD will continue to implement its MOM Program per the approved submittal.

7.5.3 Quantitative Performance Measures

In FY2012, HRSD will continue tracking the performance measures to determine how HRSD is implementing the program. This will include the list of six measures that are subject to stipulated penalties per Paragraph 34 of the Consent Decree.

7.6 Regional Wet Weather Management Plan

With the completion of the RHM in FY2011, HRSD will be utilizing this tool in FY2012 to conduct a Preliminary Capacity Assessment of the Specific Portions of the Regional Sewer System. This will include identification of storm events that produce the 2, 5, and 10-year peak flows, addition of growth through 2030 to the RHM, and making other adjustments to the facilities that represent the appropriate model conditions (e.g., valving scenarios and recent system improvements). The Preliminary Capacity Assessment is due to the EPA and DEQ in July 2012. Per Minor Revision No. 1 to the SOC, HRSD will provide boundary condition for these scenarios to the Localities by October 31, 2011.

The complex evaluation of system improvements, including reaching regional consensus on a level of service, that will be conducted in FY 12-13 combined with the need for 14 different governing bodies to approve portions of the plan, will make meeting the November 2013 completion schedule very challenging.

7.7 Short Term Wet Weather Operational Plan

HRSD will address EPA and DEQ's final comments on the STWWOP and expects to receive approval in FY2012. The plan, as submitted, is currently being implemented.

7.8 SSO Emergency Response Plan

HRSD will continue to implement its approved SSO Response Plan. An annual update to the plan will be submitted in October 2011.

7.9 Coordination with Localities

HRSD will continue to actively participate and facilitate a wide variety of coordination activities in FY2012 amongst the regional parties to the SOC. These activities include:

- Meetings of the Capacity Team to discuss SOC issues, develop Regional Technical Standards Interpretations, and provide guidance to the region on RTS and Consent Decree issues;
- Monthly Locality coordination meetings to discuss issues of mutual concern regarding the SOC and Consent Decree;
- Meetings of the Model Users Group to discuss issues related to modeling;
- Periodic briefings of the Directors' of Utilities Committee to share progress on compliance with the Consent Decree and SOC; and
- Maintain a regional SharePoint website to collaborate with and provide documents to the regional Locality Team and Capacity Team.

7.10 Public Participation

HRSD will have an annual information meeting and publish a newsletter by the next anniversary of the Date of Entry, February 23, 2012. Information and approved plans continue to be posted to HRSD's website which is accessible to the public.

7.11 Reporting

HRSD will prepare a Semi-Annual Report in addition to this Annual Report in FY2012. Quarterly Briefings will be held with the EPA and DEQ in July and January of FY2012.

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8. FORESEEABLE ISSUES RELATED TO UPCOMING COMPLIANCE DEADLINES AND MILESTONES

8.1 Condition Assessment Program

Assessment of HRSD's interceptor force mains has proven to be very challenging. Significant issues related to adequate velocities, pipeline access, coordination with localities' operations, and technology limitations have been experienced. Level 1 inspections have been conducted and nearly all Level 2 inspections are either completed or underway where Level 1 inspections identified potential issues. Based on our current assessment of progress, it is likely that HRSD will complete all the Level 1 and 2 inspections contained in the November 26, 2011 field work milestone in the Preliminary Condition Assessment Report. Through our regular monthly calls, we have informed EPA and DEQ that it is possible, but unlikely, that any Level 3 inspections that arise from the Levels 1 and 2 inspections will be complete by November 26, 2011. Level 3 inspections are only required if the Level 2 results indicate a potential material risk of failure and the pipe segment is not scheduled for renewal. The results of the highly invasive Level 3 inspections are only needed to further define the scope of renewal.

Depending on the number of Level 3 inspections required, there is likely not sufficient time in the schedule to permit accomplishment of all Level 3 inspections identified before the interim milestone of November 26, 2011. As such, we anticipate identifying all segments within the scope associated with the interim milestone as requiring a Level 3 inspection by November 26, 2011. If any remain, HRSD may conduct some Level 3 inspections to further define the scope of these replacement/rehabilitation projects as additional data to be used in preparation of the final Condition Assessment Report, due February 12, 2013 and/or the Report Update due February 12, 2014. In some instances, the Level 3 work may be deferred until the design phase of the renewal project.

8.2 Regional Wet Weather Management Plan

The extensive coordination with Localities and the resultant adjustments related to calibration of the RHM have reinforced the complex and highly interactive nature of assessing capacity and planning for capacity enhancements in this large and complex system. HRSD remains concerned about the schedule for delivering the Regional Wet Weather Management Plan by November 26, 2013. Localities have until November 26, 2012 to make their peak flow commitments which are key to conducting the level of service analysis. Gaining consensus on a mutually acceptable level of service during the RWWMP development will be very challenging and will involve extensive interaction with numerous stakeholders – especially the Localities. Even after the consensus on level of service is achieved, alternatives to achieve that level of service must be developed. The selected solution set must then be integrated with Locality capacity enhancements to achieve a schedule that makes sense. This interactive process, coordinated with 14 Localities with widely varying technical capabilities, will be difficult and time consuming. The process to achieve consensus on model calibration, a relatively simple intermediate step in comparison, has reinforced the challenging nature of this process.

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9. SIGNIFICANT ISSUES THAT REQUIRE A CHANGE IN THE CONSENT DECREE REQUIREMENTS

9.1 Stipulated Penalties

EPA has produced a demand for Stipulate Penalties related to SSOs for the period of the Date of Entry through June 30, 2010. HRSD has invoked the Dispute Resolution Process in this matter. HRSD's position is that these SSOs were beyond the control of HRSD and represent force majeure. For the capacity related SSOs, HRSD's system has the hydraulic capacity that is inherent in the pumps and pipes that are installed. HRSD exercises a diligent standard of care to properly maintain and operate these facilities. Where feasible, these facilities have been supplemented by portable pumping equipment to enhance the capacity of the system. Until the enhancements developed in the approved RWWMP are implemented, there is nothing else that HRSD can do to ameliorate these SSOs.

Other SSOs have been caused by the unexpected failure of system components. HRSD's maintenance program diligently performs scheduled preventive maintenance activities that are designed to minimize unexpected failures with outstanding results. However, no amount of maintenance can eliminate failures in mechanical and electrical components. These failures are also beyond HRSD's ability to control.

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10. SUMMARY OF SYSTEM BENEFITS FOR PREVIOUS FISCAL YEAR

As reported in the earlier sections of this report, HRSD continues to make important strides in the process of preparing a Regional Wet Weather Management Plan and overall system improvement. Some of the major milestones include:

- Completion of a large Flow, Pressure, and Rainfall Monitoring Program, with 12 months of data collection through March 11, 2011;
- Regulatory approval and use of robust Data Quality Standards and Procedures;
- Submission of an Interim and Final Flow, Pressure, and Rainfall Monitoring Report based on the flow and rainfall data collected;
- Maintenance of a web portal to allow Localities access to HRSD flow, pressure, and rainfall data;
- Implementation of multiple contracts for inspection of HRSD's gravity sewers, manholes, and force mains;
- Completion of the condition assessment of more than 213,000 LF of gravity sewer, 980 manholes, and 167,000 LF of force main inspected;
- Development of a calibrated Regional Hydraulic Model suitable for capacity assessment;
- Coordination with Localities on submission of Sewer Facility and Flow Parameter data to construct the Regional Hydraulic Model;
- Completion of several Interim System Improvements as required by the Consent Decree;
- Submission of a revised MOM Program and its implementation in FY2011;
- Implementation of an approved SSO Response Plan;
- Ongoing use of a web portal to share information between HRSD and the Localities;
- Submission of an Annual Report and Semi-Annual Report;
- Quarterly Briefings with the EPA and DEQ;
- Bi-weekly Capacity Team and monthly Locality Team meetings to foster cooperation and coordination in the region; and
- Development of a regional Private Property I/I Abatement Program plan.

HRSD will continue in FY 2012 with implementation of the Consent Decree and SOC Program to develop a Regional Wet Weather Management Plan in coordination with the Localities for overall system benefit.

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APPENDIX A. INTERIM SYSTEM IMPROVEMENTS



Interim System Improvements
Verification of Completion

As required by Section IX of the Amended Consent Decree dated February 23, 2010, a set of Interim System Improvements have been identified that must be completed within 8 years of the Date of Entry. Paragraph 32 of that section requires a written certification of completion of each project or group of projects. For capital projects in excess of \$1,000,000, Paragraph 87a of the Consent Decree requires that verification be made by a Professional Engineer that the project was completed satisfactorily.

From July 1, 2010 through June 30, 2011, the following projects have been completed satisfactorily and consistent with the scope provided to the EPA and DEQ in the Consent Decree:

<u>Ref No.</u>	<u>CIP No.</u>	<u>Project Name</u>	<u>Project Cost</u>	<u>Completion Date</u>
Ref 6 and 7	YR-104, YR108	Route 171 interceptor Force Main, Kiln Creek Interceptor Force Main	\$11,543,923 (Combined total see below)	April 27, 2011

References 6 and 7 were completed under two separate construction contracts. These contracts were "Kiln Creek Interceptor Force Main and Route 171 Interceptor Force Main - Contract A" and "Kiln Creek Interceptor Force Main and Route 171 Interceptor Force Main - Contract B." Contract A provided for installation of the force main around Tabb High School during the summer months when school was out of session. Contract B provided installation of the remainder of the force main. The division of work was different from the original individual CIP descriptions included in the Consent Decree; however, the combined work of these two projects equaled the scope of the Interim System Improvements Reference Nos. 6 and 7.

Hereby verified by


David Cooley, PE (No. 044550)
Chief of Design and Construction, North Shore
Hampton Roads Sanitation District





Cleaning wastewater every day for a better Bay.

Interim System Improvements
Verification of Completion

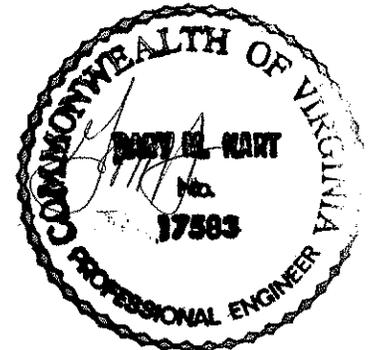
As required by Section IX of the Amended Consent Decree dated February 23, 2010, a set of Interim System Improvements have been identified that must be completed within 8 years of the Date of Entry. Paragraph 32 of that section requires a written certification of completion of each project or group of projects. For capital projects in excess of \$1,000,000, Paragraph 87a of the Consent Decree requires that verification be made by a Professional Engineer that the project was completed satisfactorily.

Through June 30, 2011, the following projects have been completed satisfactorily and consistent with the scope provided to the EPA and DEQ in the Consent Decree:

<u>Ref No.</u>	<u>CIP No.</u>	<u>Project Name</u>	<u>Project Cost</u>	<u>Completion Date</u>
9	AT-108	Eastern Branch Sections A & B, Green Run Section C, and 24- Inch Kempsville Road Force Main Replacements	\$ 5,543,013	(Substantial Completion) January 22, 2011
13 / 14	AT-112	Hilltop / Point O' Woods Interceptor Force Main Replacement- Phases I & II	\$ 13,017,276	(Substantial Completion) May 7, 2011

Hereby verified by

Gary Hart, PE (No. 017583)
Chief of Design and Construction, South Shore
Hampton Roads Sanitation District



**Appendix 5
Interim System Improvements**

Ref No.	CIP Proj. No.	Project Title	Estimate
1	BH-111	Claremont Avenue Pump Station Rehabilitation	\$ 1,500,000
2	AT-100	Atlantic Pressure Reducing Station Emergency Generator Replacement	\$ 1,000,000
3	AT-113-2	Lake Ridge Interceptor Force Main Section B - Contract 2 (Land)	\$ 3,000,000
4	YR-100	Big Bethel Road to J Clyde Morris Boulevard Interceptor Force Main Replacement	\$ 2,500,000
5	JR-109-1	Williamsburg-James River Connection Force Main Section II and Lucas Creek-Woodhaven Interceptor Force Main Replacements - Phase I	\$ 4,000,000
6	YR-108	Route 171 Interceptor Force Main	\$ 8,000,000
7	YR-104	Kiln Creek Interceptor Force Main	\$ 7,000,000
8	VIP-120	H 12-Inch Interceptor Force Main Replacement and Gravity Sewer Chesterfield Blvd. Replacement	\$ 11,000,000
9	AT-108	Eastern Branch Sections A & B, Green Run Section C, and 24-Inch Kempsville Road Force Main Replacements	\$ 6,000,000
10	VIP-106	North Trunk Sewer Section W 8-Inch and 12-Inch Force Mains and Larchmont Force Mains (Formerly Siphon Lines) Replacements	\$ 2,000,000
11	VIP-105	North Trunk Sewer Section R 6-Inch Interceptor Force Main and 10-Inch Gravity Replacement	\$ 1,000,000
12	VIP-104	North Trunk Sewer Section D 24-Inch Interceptor Force Main Replacement	\$ 8,000,000
13	AT-112-2	Hilltop/Point O'Woods Interceptor Force Main Replacements; Section B	\$ 6,000,000
14	AT-112-1	Hilltop/Point O'Woods Interceptor Force Main Replacements; Section A	\$ 5,000,000
15	WB-107	Williamsburg Interceptor Force Main Contract A Replacement	\$ 6,000,000
16	BH-100	33rd Street Pump Station Replacement/Rehabilitation	\$ 3,000,000
17	VIP-133	Sanitary Sewer System Portsmouth VA Contract A Clifford Street Force Main	\$ 1,000,000
18	BH-114	James River Diversion 35th Street Phase III and Boat Harbor Outlet Sewer Relocation I-664 Rehabilitation	\$ 2,000,000
19	BH-112	Hampton Trunk Sewer Division A Replacement	\$ 1,000,000
20	JR-106	Lucas Creek Pump Station Upgrade	\$ 2,000,000
21	VIP-131*	South Trunk Sewer Section C-42 inch Force Main Replacement	\$ 4,000,000
22	AB-105	Section W Force Main Replacement	\$ 1,000,000
23	YR-101	Coliseum Drive Pressure Reducing Station	\$ 6,000,000
24	JR-100	Center Avenue Pump Station Replacement	\$ 4,000,000
25	VIP-130*	Norchester St Pump Station Replacement/Rehabilitation	\$ 2,000,000
26	AT-114*	Providence Road Pressure Reducing Station Modifications	\$ 2,000,000
27	BH-101	58th Street Connecting Sewer Rehabilitation	\$ 1,000,000
28	BH-116	Bridge St. Pump Station Replacement/Rehabilitation	\$ 2,000,000
29	VIP-132*	South Trunk Sewer Section G-36 inch Force Main Replacement	\$ 3,000,000
30	GN-128	Interceptor Systems Pump Station Control and SCADA Upgrades and Enhancements	\$ 10,000,000
31	NP-106*	Wilroy Pressure Reducing Station, Pughsville PRS Upgrades, Suffolk PS Upgrades	\$ 12,000,000
32	AB-100	Army Base 24-Inch and 20-Inch Transmission Main Replacements	\$ 7,000,000
33	JR-108	Normandy Lane Interceptor Force Main Replacement	\$ 7,000,000
			\$ 140,000,000
* As of date of lodging, preliminary engineering work indicates these projects may require significant change in scope. HRSD will provide appropriate notice to plaintiffs pursuant to Paragraph 30.			

