SEMI-ANNUAL REPORT
FY 2011

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

April 29, 2011
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# Table of Contents

1. Introduction and Purpose .................................................................................................................. 1-1

2. Major Compliance Achievements ........................................................................................................ 2-1
   2.1 Flow, Pressure, and Rainfall Monitoring Program ................................................................. 2-1
   2.1.1 QAPP ................................................................................................................................. 2-1
   2.1.2 Implementation of the FPR Monitoring Plan ..................................................................... 2-1
   2.2 Regional Hydraulic Model and Hydraulic Assessment ............................................................. 2-2
       2.2.1 Implementation of the Regional Hydraulic Model Plan .................................................. 2-2
       2.2.2 Regional Hydraulic Model Report ................................................................................... 2-2
   2.3 Condition Assessment Plan ........................................................................................................ 2-2
       2.3.1 Implementation of the Condition Assessment Plan ......................................................... 2-2
       2.3.2 Final Condition Assessment Report ................................................................................ 2-3
   2.4 Interim System Improvements .................................................................................................... 2-3
   2.5 Management, Operations, and Maintenance Program ............................................................ 2-3
       2.5.1 MOM Plan ......................................................................................................................... 2-3
       2.5.2 Implementation of MOM Program ..................................................................................... 2-3
       2.5.3 Quantitative Performance Measures ................................................................................ 2-3
   2.6 Regional Wet Weather Management Plan .................................................................................. 2-4
   2.7 Short Term Wet Weather Operational Plan ................................................................................ 2-4
   2.8 SSO Emergency Response Plan ................................................................................................ 2-4
   2.9 Coordination with Localities ....................................................................................................... 2-4
   2.10 Public Participation .................................................................................................................... 2-5
   2.11 Post-RWWMP Implementation Monitoring and Performance Assessment ........................ 2-5
   2.12 Reporting ............................................................................................................................... 2-5
       2.12.1 Annual Report .................................................................................................................. 2-5
       2.12.2 Quarterly Briefing ............................................................................................................ 2-5
   2.13 Summary of Submittals ............................................................................................................. 2-5

3. Compliance Deadlines and Milestones .............................................................................................. 3-1

4. Condition Assessment Activities ........................................................................................................ 4-1
   4.1 Gravity Main .......................................................................................................................... 4-1
   4.2 Force Main ............................................................................................................................ 4-1
   4.3 Pumping Facilities .................................................................................................................. 4-1
   4.4 Prompt Repairs ....................................................................................................................... 4-2

5. System Performance .......................................................................................................................... 5-1
   5.1 STP Performance ..................................................................................................................... 5-1
   5.2 Conveyance System Performance ............................................................................................ 5-1
   5.3 LOP Status ............................................................................................................................. 5-1
       5.3.1 City of Suffolk: LOP No. 2 ............................................................................................... 5-1
       5.3.2 City of Chesapeake: LOP No. 22 ..................................................................................... 5-1
       5.3.3 City of Portsmouth: LOP No. 35 ..................................................................................... 5-2
5.3.4 James City Service Authority: LOP No. 49 .......................................................... 5-2
5.3.5 James City Service Authority: LOP No. 57 .......................................................... 5-2
5.3.6 James City Service Authority: LOP No. 58 .......................................................... 5-2
5.3.7 City of Portsmouth: LOP No. 65 .......................................................... 5-2
5.3.8 City of Portsmouth: LOP No. 72 .......................................................... 5-3
5.3.9 City of Hampton: LOP No. 76 .......................................................... 5-3
5.3.10 City of Chesapeake: LOP No. 84 .......................................................... 5-3

6. PLANNED ACTIVITIES .......................................................... 6-1
   6.1 Flow, Pressure, and Rainfall Monitoring Program .............................................. 6-1
      6.1.1 QAPP .......................................................... 6-1
      6.1.2 Implementation of the FPR Monitoring Plan .................................................. 6-1
      6.1.3 LOP Status .......................................................... 6-1
   6.2 Regional Hydraulic Model and Hydraulic Assessment ........................................ 6-1
   6.3 Condition Assessment Plan .......................................................... 6-2
      6.3.1 Implementation of the Condition Assessment Plan ........................................ 6-2
   6.4 Interim System Improvements .......................................................... 6-2
   6.5 Management, Operations, and Maintenance Program .................................... 6-2
      6.5.1 MOM Plan .......................................................... 6-2
      6.5.2 Implementation of MOM Program .......................................................... 6-2
      6.5.3 Quantitative Performance Measures .......................................................... 6-2
   6.6 Regional Wet Weather Management Plan .................................................... 6-2
   6.7 Short Term Wet Weather Operational Plan .................................................... 6-3
   6.8 SSO Emergency Response Plan .......................................................... 6-3
   6.9 Coordination with Localities .......................................................... 6-3
   6.10 Public Participation .......................................................... 6-3

7. FORESEEABLE ISSUES RELATED TO UPCOMING COMPLIANCE DEADLINES AND MILESTONES ....7-1
   7.1 Condition Assessment Program .......................................................... 7-1
   7.2 Regional Hydraulic Model .......................................................... 7-1
   7.3 Regional Wet Weather Management Plan .................................................... 7-1

8. SIGNIFICANT ISSUES THAT REQUIRE A CHANGE IN THE CONSENT DECREE REQUIREMENTS .....8-1
   8.1 Data Quality Standards .......................................................... 8-1
   8.2 Stipulated Penalties .......................................................... 8-1
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 to address sanitary sewer overflows throughout the Hampton Roads region.

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 semi-annual report is submitted pursuant to Section XVII of the Consent Decree. HRSD has prepared this semi-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. Specifically, this semi-annual report summarizes the work and activities undertaken by HRSD from July 1, 2010, through December 31, 2010.
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2. MAJOR COMPLIANCE ACHIEVEMENTS

2.1 Flow, Pressure, and Rainfall Monitoring Program

2.1.1 QAPP

As required by Paragraph 13 of the Consent Decree, HRSD developed and submitted a Quality Assurance Program Plan (QAPP) within 15 days of the decree date of entry. This document, entitled the Data Quality Standards and Procedures (DQSAP), was submitted to the EPA and DEQ on March 9, 2010. It includes details on how data quality reviews are performed, the data reliability calculations, and how data issues are resolved. Comments were received from the EPA and DEQ on June 28, 2010, and a revised document was submitted December 21, 2010. Final approval is pending from the EPA and DEQ. A Consent Decree modification related to the mechanics of data reliability calculations was signed by HRSD and returned to the EPA after this reporting period (in April 2011).

2.1.2 Implementation of the FPR Monitoring Plan

In this reporting period, HRSD continued to operate an extensive and complex system of Flow, Pressure, and Rainfall (FPR) sensors after an official start date of March 12, 2010 to the one year monitoring period. 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 Report, email, and telephone discussions. A complete listing of changes from the approved FPR Monitoring Plan will be provided in the Final FPR Monitoring Report in June 2011.

Data collection has been ongoing through December 31, 2010, and will continue through March 11, 2011. The data 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, and will be addressed in the Final Report.

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 was under development and testing 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, 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. In addition, individual meetings were held between HRSD and Localities to resolve any locality-specific issues.

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 potential 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 a potential 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. Although much of the work was completed by December 31, 2010, the final calibration will be done in the second half of FY2011, culminating in an RHM Report in July 2011.

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 Regional Hydraulic Model. 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. This data has been reviewed by HRSD and comments have been provided to the Localities.

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.

2.3 Condition Assessment Plan

2.3.1 Implementation of the Condition Assessment Plan

2.3.1.1 Condition Assessment Field Activities

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

2.3.1.2 Prompt Repairs

2.3.1.2.1 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):

2.3.1.2.1.1 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.

2.3.1.2.1.2 Pump Stations and Pressure Reducing Stations

HRSD routinely inspects its pump stations and pressure reducing stations (PRSs) 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 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. HRSD is on schedule; however, consistent with the overall schedule, no projects were completed during the first half of FY2011. A complete update for the fiscal year will be provided in the Annual Report.

2.5 Management, Operations, and Maintenance Program

2.5.1 MOM Plan

As part of the SOC, a MOM Program document was submitted to the DEQ on December 23, 2008. Comments were received on August 20, 2009, and the Consent Decree required a revised submittal within 120 days of the Date of Entry (June 23, 2010). HRSD has revised the MOM Program and submitted an updated document to the EPA and DEQ ahead of schedule on May 20, 2010. Comments were received again from the EPA and DEQ on December 7, 2010, and HRSD revised the document for resubmittal in February 2011 (the status will be covered in HRSD’s upcoming Annual Report).

2.5.2 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.

2.5.3 Quantitative Performance Measures

The revised MOM Plan submitted on May 20, 2010 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. Work has been underway to implement and track these performance measures and the results will be
presented in the FY2011 Annual Report. HRSD believes it is on track to meet all the performance measures identified in Paragraph 34 of the Consent Decree.

2.6 Regional Wet Weather Management Plan

Although there were no activities conducted in this reporting period specifically about the Regional Wet Weather Management Plan (RWWMP) (because it is a later deliverable under the Consent Decree), there were numerous activities that occurred in the first half of FY 2011 that contribute to the ultimate development of the 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 testing of the RHM;
- Condition assessment field activities which will lead to the Final Condition Assessment Report and the associated peak flow commitment;
- Discussion at the Capacity Team about the cost and effectiveness of rehabilitation on reducing peak wet weather flows; and
- A Quarterly Briefing was held on July 28, 2010, with the EPA and DEQ to review progress of the program.

2.7 Short Term Wet Weather Operational Plan

Paragraph 60 of the Consent Decree requires HRSD to submit a revised Short Term Wet Weather Operational Plan within 180 days of receipt of comments from the EPA. The original plan was submitted as part of the Unilateral Administrative Order in October 2007. Comments were received from the EPA on March 29, 2010, and HRSD submitted a revised document on September 27, 2010. The EPA and DEQ provided comments on this revised plan on December 15, 2010, with a required revision date in June 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. 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 the first half of 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 FPR Monitoring Report, initial RHM Report, and Annual Report were provided from HRSD to the Localities.

### 2.10 Public Participation

HRSD will conduct an annual information meeting and publish a newsletter by February 23, 2011, 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.

#### 2.12.2 Quarterly Briefing

A quarterly briefing was held per Paragraph 90 of the Consent Decree, on July 28, 2010, with attendance by HRSD, the EPA, and the DEQ. A summary of the discussions was published by HRSD and submitted to the EPA and DEQ on August 17, 2010.

### 2.13 Summary of Submittals

Table 1 summarizes the status of the documentation that HRSD has submitted to the EPA and DEQ under the Consent Decree in the first half of FY2011.

<table>
<thead>
<tr>
<th>Consent Decree Submittal</th>
<th>Submittal Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>QAPP/DQSAP</td>
<td>Revision December 21, 2010</td>
</tr>
<tr>
<td>Interim FPR Monitoring Report</td>
<td>September 13, 2010</td>
</tr>
<tr>
<td>Initial RHM Report</td>
<td>November 30, 2010</td>
</tr>
<tr>
<td>STWWOP</td>
<td>Revision September 27, 2010</td>
</tr>
<tr>
<td>SSO Response Plan</td>
<td>Revision September 17, 2010</td>
</tr>
<tr>
<td>Annual Report</td>
<td>November 1, 2010</td>
</tr>
<tr>
<td>Quarterly Briefing</td>
<td>July 28, 2010</td>
</tr>
</tbody>
</table>
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In the first half of FY2011, HRSD expended considerable resources in both time and money to achieve the compliance goals of the Consent Decree. All deliverables were submitted on or before their due dates and all milestones were met, including those with short timeframes for response.
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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 was awarded in December 2009 and began work in January 2010. Through December 31, 2010, more than 158,000 linear feet of gravity sewer main has been inspected using PACP-compliant CCTV techniques. In addition, more than 800 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 December 31, 2010, more than 34,000 linear feet of gravity sewer main has been inspected in this contract. Combined with the footage in the paragraph above, this inspection total accounts for more than 70% of the entire HRSD gravity pipe.

The remainder of the work is expected to be completed in FY2011 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 December 31, 2010, the following assessments have been completed:

- Groups 1 and 2, Level 1 inspection – 75,000 linear feet
- Ferrous Segments, Level 2 inspection – 2,950 linear feet
- Reservoir Segments, Level 1 inspection - 650 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 completion deadline.

4.4 Prompt Repairs

Through the Condition Assessment Program, HRSD has identified 23 defects in the HRSD sanitary sewer system (primarily gravity sewer pipe and manholes) which have been deemed to be Prompt Repairs between July 1 and December 31, 2010. These 23 defects have been grouped into 8 repair work orders and are currently in various stages of planning, design, or construction. The following Table 2 provides details on these Prompt Repairs.

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Jurisdiction</th>
<th>Line Number</th>
<th>Summary of defect</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>41st Street</td>
<td>41st Street east of intersection with Jefferson Ave: between MHs NG-112-12175 and NG-112-11783</td>
<td>Hampton</td>
<td>NG-112</td>
<td>Pipe lining failure</td>
<td>In construction</td>
</tr>
<tr>
<td>Beach Road</td>
<td>West side of Beach Road opposite intersection with Wade Road between MH NG-088-0 and NG-088-155.</td>
<td>Hampton</td>
<td>NG-088</td>
<td>Pipe connection at manhole needs repair</td>
<td>Contractor mobilizing</td>
</tr>
<tr>
<td></td>
<td>West side of Beach Rd. between intersection with Bonneville Dr. and Catalina Drive between MH NG-088-1654 and NG-088-1863</td>
<td>Hampton</td>
<td>NG-088</td>
<td>Lateral connection to mainline needs repair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approximately in front of 112 Beach Rd between MH NG-088-0636 and NG-088-0970</td>
<td>Hampton</td>
<td>NG-088</td>
<td>Mainline pipe defects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beach Rd. approximately 170 ft. south of Wade Rd. intersection</td>
<td>Hampton</td>
<td>NG-088</td>
<td>Manhole defects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West side of Beach Road opposite intersection with Hall Road. Between MHs NG-088-1260 and NG-088-1316</td>
<td>Hampton</td>
<td>NG-088</td>
<td>Mainline punctured by another utility directional drilling</td>
<td></td>
</tr>
<tr>
<td>Various Manholes</td>
<td>North King St.</td>
<td>Hampton</td>
<td>NG-063</td>
<td>Manhole defects</td>
<td>Work order in development</td>
</tr>
<tr>
<td></td>
<td>North King St.</td>
<td>Hampton</td>
<td>NG-078</td>
<td>Manhole defects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Pembroke Ave. at Washington St.</td>
<td>Hampton</td>
<td>NG-084</td>
<td>Manhole defects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bainbridge Blvd. between Beech St. and Wilton St.</td>
<td>Norfolk</td>
<td>SG-153</td>
<td>Manhole defects</td>
<td></td>
</tr>
<tr>
<td>Jefferson Ave</td>
<td>Jefferson Ave.</td>
<td>Newport News</td>
<td>NG-169</td>
<td>Mainline pipe defects</td>
<td>In design</td>
</tr>
<tr>
<td></td>
<td>Jefferson Ave. between 40th Street and 41st Street</td>
<td>Newport News</td>
<td>NG-114</td>
<td>Mainline pipe defects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jefferson Avenue between 39th and 40th Street</td>
<td>Newport News</td>
<td>NG-114</td>
<td>Mainline pipe defects</td>
<td></td>
</tr>
<tr>
<td>Newtown Road</td>
<td>Newtown Rd. at Virginia Beach Blvd (ne corner of intersection)</td>
<td>Virginia Beach</td>
<td>SG-112</td>
<td>Manhole defects</td>
<td>In design</td>
</tr>
<tr>
<td></td>
<td>Newtown Rd. approx. 415 ft. north of Princess Anne Rd.</td>
<td>Virginia Beach</td>
<td>SG-113</td>
<td>Manhole defects</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Location</td>
<td>Jurisdiction</td>
<td>Line Number</td>
<td>Summary of defect</td>
<td>Status</td>
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<tr>
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<td>--------</td>
</tr>
<tr>
<td>Newtown Rd. at Elam Ave.</td>
<td>Virginia Beach</td>
<td>SG-113</td>
<td>Manhole defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Mercury Blvd</td>
<td>Hampton</td>
<td>NG-099</td>
<td>Mainline pipe defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. Mercury Blvd, Hampton VA</td>
<td>Hampton</td>
<td>NG-057</td>
<td>Mainline pipe defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Mercury Blvd, Hampton, VA; near Beechwood Rd.</td>
<td>Hampton</td>
<td>NG-057</td>
<td>Mainline pipe defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Mercury Blvd, Hampton VA</td>
<td>Hampton</td>
<td>NG-057</td>
<td>Mainline pipe defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. Mercury Blvd, Hampton, VA</td>
<td>Hampton</td>
<td>NG-057</td>
<td>Mainline pipe defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Hope Street</td>
<td>North Hope Street, Hampton, VA</td>
<td>Hampton</td>
<td>NG-160</td>
<td>Pipe lining failure</td>
<td></td>
</tr>
<tr>
<td>Old Atlantic Ave</td>
<td>Old Atlantic Avenue, Chesapeake, VA; near intersection with Liberty Street</td>
<td>Chesapeake</td>
<td>SG-148</td>
<td>Pipe lining failure</td>
<td></td>
</tr>
</tbody>
</table>
5. SYSTEM PERFORMANCE

5.1 STP Performance

The HRSD system was influenced by several significant wet weather events in the first half of FY11 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 3 (below) provides details on the discharges from July 1 to December 31, 2010. The majority of these occurrences were fully treated effluent.

5.2 Conveyance System Performance

For the reporting period of July 1 through December 31, 2010, HRSD experienced 28 capacity-related sanitary sewer overflows (SSOs) 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. 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 28 events are available in Table 4. 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.

5.3 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 during 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.

5.3.1 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.

5.3.2 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.

5.3.3 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.

5.3.4 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.

5.3.5 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.

5.3.6 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.

5.3.7 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.
5.3.8  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.

5.3.9  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.

5.3.10 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>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Description/Cause</th>
<th>Duration of Event (minutes)</th>
<th>Corrective Action</th>
<th>Estimated Quantity Discharged (gallons)</th>
<th>Estimated Quantity to State Waters (gallons)</th>
<th>Type of Overflow</th>
<th>Receiving Water</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/22/2010</td>
<td>VIP</td>
<td>Aeration effluent backed up and overflowed vault due to faulty check valve. Overflow went onto ground.</td>
<td>10</td>
<td>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.</td>
<td>800</td>
<td>0</td>
<td>aeration effluent</td>
<td>plant drain system</td>
<td>This was an operations problem that was corrected within 10 minutes</td>
</tr>
<tr>
<td>9/9/2010</td>
<td>York River</td>
<td>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.</td>
<td>25</td>
<td>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 problem.</td>
<td>2000</td>
<td>2000</td>
<td>Secondary Effluent</td>
<td>ground/Back Creek</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>9/10/2010</td>
<td>York River</td>
<td>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.</td>
<td>10</td>
<td>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.</td>
<td>2000</td>
<td>2000</td>
<td>Secondary Effluent</td>
<td>ground/Back Creek</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>9/21/2010</td>
<td>Boat Harbor</td>
<td>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.</td>
<td>1</td>
<td>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.</td>
<td>200</td>
<td>200</td>
<td>NPW*</td>
<td>James River/ground</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>9/30/2010</td>
<td>James River</td>
<td>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&quot; 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.</td>
<td>930</td>
<td>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.</td>
<td>625,000</td>
<td>1000</td>
<td>wastewater</td>
<td>Creek leading to Warwick River</td>
<td>Severe wet weather event greater than 50-year recurrence interval</td>
</tr>
<tr>
<td>9/30/2010</td>
<td>Ches-Eliz</td>
<td>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 Inter Airport recorded 7.85&quot; of rainfall for the day. Plant flow rate exceeded 60 MGD.</td>
<td>920</td>
<td>All discharge is fully treated, chlorinated and de-chlorinated final effluent. Plant closed short outfall valve when plant flow rate decreased to manageable rate.</td>
<td>10,000,000</td>
<td>10,000,000</td>
<td>Fully treated effluent</td>
<td>Little Creek Harbor</td>
<td>Documented use of a permitted alternate outfall</td>
</tr>
</tbody>
</table>
Table 3. Detailed Listing of HRSD Treatment Plant Unusual Discharges (July 1 to December 31, 2010)

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Description/Cause</th>
<th>Duration of Event (minutes)</th>
<th>Corrective Action</th>
<th>Estimated Quantity Discharged (gallons)</th>
<th>Estimated Quantity to State Waters (gallons)</th>
<th>Type of Overflow</th>
<th>Receiving Water</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/13/2010</td>
<td>York River</td>
<td>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.</td>
<td>8</td>
<td>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.</td>
<td>200</td>
<td>200</td>
<td>NPW*</td>
<td>Back Creek</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>11/2/2010</td>
<td>York River</td>
<td>Drain line to the final effluent sample sink became plugged and final effluent overflowed onto ground.</td>
<td>28</td>
<td>The final effluent sample pump was shut off and the drain was cleaned. The NPW soaked into the ground and could not be recovered.</td>
<td>100</td>
<td>100</td>
<td>NPW*</td>
<td>ground</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>12/19/2010</td>
<td>Nansemond</td>
<td>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.</td>
<td>40</td>
<td>The sanitary pumps were placed in manual while the air compressor was replaced. Spill soaked into the ground and could not be recovered.</td>
<td>8</td>
<td>8</td>
<td>wastewater</td>
<td>ground</td>
<td>Small volume spill due to mechanical failure that was corrected</td>
</tr>
<tr>
<td>12/21/2010</td>
<td>Atlantic</td>
<td>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.</td>
<td>1140</td>
<td>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.</td>
<td>190</td>
<td>190</td>
<td>NPW*</td>
<td>ground</td>
<td>Reclaimed water spill</td>
</tr>
<tr>
<td>12/30/2010</td>
<td>Williamsburg</td>
<td>The 10-inch gravity thickener supernatant line broke underground. The top of the pipe was corroded by sulfides.</td>
<td>12</td>
<td>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.</td>
<td>1000</td>
<td>500</td>
<td>wastewater</td>
<td>James River</td>
<td></td>
</tr>
</tbody>
</table>

*NPW – Non-potable water (treated effluent)
<table>
<thead>
<tr>
<th>Date and Time of Incident</th>
<th>Location</th>
<th>Sewer System Component</th>
<th>Potential Receiving Waters</th>
<th>Spilled In Jurisdiction</th>
<th>SSO Classification</th>
<th>Description of Incident from SSORS</th>
<th>SSO Duration</th>
<th>Action Taken and Explanation of SSO*</th>
<th>Discharge Quantity**</th>
<th>Amount Reaching State Waters**</th>
<th>DEQ IR</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/29/2010 18:30</td>
<td>Bridge Street Pump Station</td>
<td>4701 Victoria Blvd</td>
<td>Salters Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rain in two hours. Estimated overflow rate: 35 gal/min</td>
<td>6 hours</td>
<td>Reset pumps. Station operated properly after pumps were reset. However, flow was too high due to storm and station overflowed via tidal gate until flow dropped.</td>
<td>12,800</td>
<td>12,800</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>7/29/2010 18:53</td>
<td>Center Avenue Pump Station</td>
<td>315 Center Avenue</td>
<td>James River</td>
<td>Newport News</td>
<td>Capacity-Weather Related</td>
<td>Heavy rain from storms in area caused pump station to overflow. Rain gauge at Copeland Park Pump Station recorded 5.9&quot; of rain in two hours. Estimated overflow rate: 75 gal/min</td>
<td>3 hours</td>
<td>Checked pump station to ensure pumps are operating properly. Start and stop times adjusted after review of records. Connected location of station from Norfolk to Newport News.</td>
<td>16,650</td>
<td>16,650</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>7/29/2010 18:44</td>
<td>Manhole</td>
<td>King Street between Donald &amp; MacAlva Drive</td>
<td>Back River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>Heavy rain from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3&quot; of rain in two hours. Estimated overflow rate: 9 gal/min</td>
<td>4 hours</td>
<td>Checked Langley Circle Pump Station to ensure pumps are operating properly. Started by-pass pump at station to facilitate pumping.</td>
<td>2,538</td>
<td>2,538</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>7/29/2010 18:44</td>
<td>Manhole</td>
<td>King Street at MacAlva</td>
<td>Back River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>Heavy rain from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3&quot; of rain in two hours. Estimated overflow rate: 71 gal/min</td>
<td>4 hours</td>
<td>Checked Langley Circle Pump Station to ensure pumps are operating properly. Started by-pass pump to facilitate pumping.</td>
<td>20,022</td>
<td>20,022</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>7/29/2010 20:30</td>
<td>Manhole</td>
<td>Sunrise Road and Kesoughtian Road</td>
<td>Sunset Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>Heavy rain from storms in area caused manhole to overflow. Rain gauge at Bayshore PS recorded 3.3&quot; of rain in two hours. Estimated overflow rate: 5 gal/min</td>
<td>1 hour</td>
<td>Checked Claremont Avenue Pump Station to ensure pumps are operating properly</td>
<td>525</td>
<td>525</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>7/29/2010 20:35</td>
<td>Manhole</td>
<td>Chesapeake Avenue and Clyde Street</td>
<td>James River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>Heavy rainfall from storms in area caused pump station to overflow. Rain gauge at Bayshore PS recorded 3.3&quot; of rain in two hours. Estimated overflow rate: 10 gal/min</td>
<td>1 hour</td>
<td>Checked Claremont Avenue Pump Station to ensure pumps are operating properly</td>
<td>1,000</td>
<td>1,000</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>9/30/2010 6:40</td>
<td>Manhole</td>
<td>Donald and N. King Street</td>
<td>Back River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 6.7&quot; of rain received on 9/30.</td>
<td>25 hours</td>
<td>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.</td>
<td>158,655</td>
<td>158,655</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>9/30/2010 8:47</td>
<td>Manhole</td>
<td>1275 North King Street</td>
<td>Back River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 6.7&quot; of rain received on 9/30.</td>
<td>25 hours</td>
<td>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.</td>
<td>37,825</td>
<td>37,825</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>9/30/2010 8:45</td>
<td>Manhole</td>
<td>MacAlva and N. King Street</td>
<td>Back River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 6.7&quot; of rain received on 9/30.</td>
<td>25 hours</td>
<td>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.</td>
<td>151,500</td>
<td>151,500</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>9/30/2010 7:27</td>
<td>Upstream of Bridge Street Pump Station</td>
<td>4701 Victoria Blvd</td>
<td>Salters Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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 16.22&quot; of rainfall during 48-hour period with 13.95&quot; of rain received on 9/30.</td>
<td>25 hours</td>
<td>Checked pump station to ensure pumps were operating properly. Start time is based on alarm</td>
<td>665,400</td>
<td>665,400</td>
<td>SSORS#201</td>
</tr>
<tr>
<td>Date and Time of Incident</td>
<td>Location</td>
<td>Sewer System Component</td>
<td>Potential Receiving Waters</td>
<td>Spilled In Jurisdiction</td>
<td>SSO Classification</td>
<td>Description of Incident from SSORS</td>
<td>SSO Duration</td>
<td>Action Taken and Explanation of SSO*</td>
<td>Discharge Quantity**</td>
<td>Amount Reaching State Waters**</td>
<td>DEQ IR</td>
</tr>
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<td>---------</td>
</tr>
<tr>
<td>9/30/2010 9:59</td>
<td>Manhole</td>
<td>Sunset Road and Racoon Road</td>
<td>Sunset Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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 16.25&quot; of rainfall during 48-hour period with 13.85&quot; of rain received on 9/30.</td>
<td>22 hour(s) 42 minute(s)</td>
<td>Checked pump station and downstream gravity system. Modified initial flow rate estimate to 5 gpm.</td>
<td>6,810</td>
<td>6,810</td>
<td>SSORS6001 1-T-102895</td>
</tr>
<tr>
<td>9/30/2010 11:00</td>
<td>Center Avenue Pump Station</td>
<td>315 Center Avenue</td>
<td>James River</td>
<td>Newport News</td>
<td>Capacity-Weather Related</td>
<td>Pump station overflowing at initial rate of 117 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&quot; of rainfall during 48-hour period with 8.7&quot; of rain received on 9/30.</td>
<td>18 hour(s) 51 minute(s)</td>
<td>Checked pump station to ensure pumps were operating properly. Flow estimate is calculated using data from recently installed weir meter.</td>
<td>1,301,187</td>
<td>1,301,187</td>
<td>SSORS6001 1-T-102895</td>
</tr>
<tr>
<td>9/30/2010 10:30</td>
<td>Bayshore Pump Station</td>
<td>720 Bayshore Lane</td>
<td>Chesapeake</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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 Bayshore PS recorded estimated flow of 12-42&quot; of rainfall during 48-hour period with 10&quot; of rain received on 9/30.</td>
<td>23 hour(s) 0 minute(s)</td>
<td>Checked pump station to ensure pumps were operating properly. Manhole across the street stopped overflowing at 11:00 pm on 9/30. Manhole beside station stopped overflowing at 9:30 am on 10/1.</td>
<td>48,900</td>
<td>48,900</td>
<td>SSORS6001 1-T-102895</td>
</tr>
<tr>
<td>9/30/2010 8:45</td>
<td>3 manholes</td>
<td>Ballentine and Virginia Beach Blvd</td>
<td>Elizabeth River</td>
<td>Norfolk</td>
<td>Capacity-Weather Related</td>
<td>Two manholes 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&quot; of rainfall during 48-hour period with 10.51&quot; of rain received on 9/30.</td>
<td>7 hour(s) 0 minute(s)</td>
<td>Checked Norwich pump station to ensure all pumps were operating, including Godwin pump installed for high flow conditions.</td>
<td>16,900</td>
<td>16,900</td>
<td>SSORS6001 1-T-102895</td>
</tr>
<tr>
<td>9/30/2010 10:00</td>
<td>Manhole</td>
<td>E. Chamberlain and N. Hope Street</td>
<td>Mill Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 10&quot; of rain received on 9/30.</td>
<td>31 hour(s) 0 minute(s)</td>
<td>Checked Waverly Avenue pump station to ensure pumps were operating properly. Also checked gravity system downstream. Modified initial flow rate estimate to 100 gpm.</td>
<td>186,000</td>
<td>186,000</td>
<td>SSORS6001 1-T-102700</td>
</tr>
<tr>
<td>9/30/2010 10:00</td>
<td>Manhole</td>
<td>Yukon and N. Hope Street</td>
<td>Mill Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 10&quot; of rain being received on 9/30.</td>
<td>31 hour(s) 0 minute(s)</td>
<td>Checked Waverly Avenue pump station to ensure pumps were operating properly. Also checked gravity system downstream. Modified initial flow rate estimate to 100 gpm.</td>
<td>186,000</td>
<td>186,000</td>
<td>SSORS6001 1-T-102700</td>
</tr>
<tr>
<td>9/30/2010 13:55</td>
<td>Manhole</td>
<td>42 Franklin Road</td>
<td>James River</td>
<td>Newport News</td>
<td>Capacity-Weather Related</td>
<td>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 12:10 pm. Rain gauge at Copeland Park PS recorded 10.75&quot; of rainfall during 48-hour period with 8.7&quot; of rain received on 9/30.</td>
<td>18 hour(s) 15 minute(s)</td>
<td>Checked Center Avenue pump station to ensure pumps were operating properly.</td>
<td>54,750</td>
<td>54,750</td>
<td>SSORS6001 1-T-102701</td>
</tr>
<tr>
<td>9/30/2010 14:00</td>
<td>Manhole</td>
<td>3004 Chesapeake Avenue</td>
<td>James River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 8.7&quot; of rain received on 9/30.</td>
<td>18 hour(s) 45 minute(s)</td>
<td>Checked Claremont pump station to ensure pumps were operating properly. Also checked gravity system downstream.</td>
<td>22,500</td>
<td>22,500</td>
<td>SSORS6001 1-T-102700</td>
</tr>
<tr>
<td>9/30/2010 14:00</td>
<td>Manhole</td>
<td>3746 Chesapeake Avenue</td>
<td>James River</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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.</td>
<td>18 hour(s) 45 minute(s)</td>
<td>Checked Claremont pump station to ensure pumps were operating properly. Also checked gravity system downstream.</td>
<td>22,500</td>
<td>22,500</td>
<td>SSORS6001 1-T-102700</td>
</tr>
<tr>
<td>9/30/2010 11:28</td>
<td>Manhole</td>
<td>Bainbridge Blvd and Park Avenue</td>
<td>Scuffletown Creek to Elizabeth River</td>
<td>Chesapeake</td>
<td>Capacity-Weather Related</td>
<td>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 Firebee Pump Station recorded 12.5&quot; of rainfall during 48-hour period with 10.59&quot; of rain received on 9/30.</td>
<td>15 hour(s) 17 minute(s)</td>
<td>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.</td>
<td>1,590</td>
<td>1,590</td>
<td>SSORS6001 1-T-102712</td>
</tr>
</tbody>
</table>
### Table 4. Detailed Listing of HRSD Capacity Related SSOs (July 1 to December 31, 2010)

<table>
<thead>
<tr>
<th>Date and Time of Incident</th>
<th>Location</th>
<th>Sewer System Component</th>
<th>Potential Receiving Waters</th>
<th>Spilled In Jurisdiction</th>
<th>SSO Classification</th>
<th>Description of Incident from SSORS</th>
<th>SSO Duration</th>
<th>Action Taken and Explanation of SSO*</th>
<th>Discharge Quantity**</th>
<th>Amount Reaching State Waters***</th>
<th>DEQ IR</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/30/2010 12:43</td>
<td>Monroe Place Pump Station</td>
<td>Monroe Place</td>
<td>Lafayette River</td>
<td>Norfolk</td>
<td>Capacity-Weather Related</td>
<td>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 station was overflowing and under water. Rain gauge at Luxembourg Pump Station recorded 11.95&quot; of rainfall during a 48-hour period with 10% of rain received on 9/30.</td>
<td>24 hour(s) 28 minute(s)</td>
<td>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.</td>
<td>-1</td>
<td>-1</td>
<td>SSORS9601 1-T-102713</td>
</tr>
<tr>
<td>9/30/2010 10:51</td>
<td>Manhole</td>
<td>134 South 5th Street</td>
<td>Shingle Creek</td>
<td>Suffolk</td>
<td>Capacity-Weather Related</td>
<td>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 5.75&quot; of rainfall during 48-hour period with 7.2&quot; of rain received during SSO.</td>
<td>20 hour(s) 28 minute(s)</td>
<td>Checked Suffolk pump station to ensure all pumps were operating properly. An auxiliary Godwin pump is installed at station for high flow conditions.</td>
<td>6,255</td>
<td>6,255</td>
<td>SSORS9601 1-T-102714</td>
</tr>
<tr>
<td>9/30/2010 13:00</td>
<td>Manhole</td>
<td>Ivy Home Road and Victoria Blvd</td>
<td>Sunset Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 13.85&quot; of rain received on 9/30.</td>
<td>14 hour(s) 24 minute(s)</td>
<td>Checked bypass pipe and bypass pump at Hampton pump station #1.</td>
<td>1,728</td>
<td>1,728</td>
<td>SSORS9601 1-T-102717</td>
</tr>
<tr>
<td>9/30/2010 12:15</td>
<td>Manhole</td>
<td>N. King Street at I-64</td>
<td>Brights Creek</td>
<td>Hampton</td>
<td>Capacity-Weather Related</td>
<td>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 station recorded 10.75&quot; of rainfall during 48-hour period with 6.7&quot; of rain received during SSO.</td>
<td>23 hour(s) 45 minute(s)</td>
<td>Checked Washington Street pump station. All pumps were operating properly.</td>
<td>14,250</td>
<td>14,250</td>
<td>SSORS9601 1-T-102716</td>
</tr>
<tr>
<td>9/30/2010 7:43</td>
<td>Fort Eustis Pump Station</td>
<td>430 Hampstead Road</td>
<td>Powhatan Creek</td>
<td>James City</td>
<td>Capacity-Weather Related</td>
<td>Manhole beside pump station overflowing due to high flows caused by rain from remnants of TS Nicole interacting with low pressure system. Rain gauge at station recorded 10.48&quot; of rainfall during 48-hour period with 7.08&quot; of rain received on 9/30.</td>
<td>19 hour(s) 50 minute(s)</td>
<td>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.</td>
<td>36,050</td>
<td>36,050</td>
<td>SSORS9601 1-T-102725</td>
</tr>
<tr>
<td>9/30/2010 21:41</td>
<td>Fort Eustis Pump Station</td>
<td>1619 Taylor Road</td>
<td>James River</td>
<td>Newport News</td>
<td>Capacity-Weather Related</td>
<td>Manhole at station 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 8.98&quot; of rainfall during 48-hour period with 5.91&quot; of rain received on 9/30.</td>
<td>2 hour(s) 33 minute(s)</td>
<td>Checked pump station to ensure pump was operating properly.</td>
<td>22,950</td>
<td>22,950</td>
<td>SSORS9601 1-T-102726</td>
</tr>
<tr>
<td>9/30/2010 16:11</td>
<td>Chesapeake Blvd Pump Station</td>
<td>5734 Chesapeake Blvd</td>
<td>Wayne Creek</td>
<td>Norfolk</td>
<td>Capacity-Weather Related</td>
<td>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&quot; of rainfall during 48-hour period with 10% of rain received on 9/30.</td>
<td>22 hour(s) 33 minute(s)</td>
<td>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 10:30 am which caused overflow rate to increase dramatically. The fuel line was repaired and the pump placed back in service by 10:55 am which slowed the overflow rate.</td>
<td>72,708</td>
<td>72,708</td>
<td>SSORS9601 1-T-102739</td>
</tr>
<tr>
<td>10/1/2010 3:00</td>
<td>Manhole</td>
<td>221 Locust Street</td>
<td>Shingle Creek</td>
<td>Suffolk</td>
<td>Capacity-Weather Related</td>
<td>Manhole overflowing at initial 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&quot; of rainfall during 48-hour period with 7.2&quot; of rain received on 9/30.</td>
<td>3 hour(s) 30 minute(s)</td>
<td>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.</td>
<td>210</td>
<td>210</td>
<td>SSORS9601 1-T-102788</td>
</tr>
</tbody>
</table>

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

**SSO volumes are calculated using a discharge rate that often fluctuates during the duration of the event.
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HRSD will be continuing the overall program outlined in the Consent Decree in the remainder of FY11. The following sub-sections provide specifics on this work.

6.1 Flow, Pressure, and Rainfall Monitoring Program

6.1.1 QAPP

A revised Data Quality Standards and Procedures (DQSAP) document was submitted to the EPA and DEQ on December 21, 2010. Modified Consent Decree language to calculate data reliability has been agreed to by the EPA, DEQ, and HRSD. The DQSAP is being applied.

6.1.2 Implementation of the FPR Monitoring Plan

HRSD will continue to collect data from its network of flow, pressure, and rainfall sensors through March 11, 2011. Within 90 days of the end of the monitoring period, HRSD will submit a Final Flow, Pressure, and Rainfall Monitoring Report.

HRSD will 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 the remainder of FY2011.

6.1.3 LOP Status

In the remainder of FY2011, HRSD will continue to coordinate with Localities following activation of an LOP in the Localities system. This will include coordinating 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 Report.

6.2 Regional Hydraulic Model and Hydraulic Assessment

The Regional Hydraulic Model (RHM) required by the Consent Decree and SOC will continue to be developed and finalized in the second half of FY 2011. Numerous coordination sessions with the Localities are planned to review the Locality-delivered data regarding their physical collection system network and flow parameter databases. On or before July 31, 2011, a Final RHM Report will be submitted to the DEQ and EPA documenting the model development and calibration efforts.

Meetings of the Model Users Group, facilitated by HRSD and attended by the Localities will continue to be held as needed, following calibration of the RHM. HRSD also intends to hold a Modeling Workshop with the EPA and DEQ in the second half of FY2011.
6.3 Condition Assessment Plan

6.3.1 Implementation of the Condition Assessment Plan

6.3.1.1 Condition Assessment Field Activities

The planned Condition Assessment Field Activities will continue to be performed in the second half of FY2011. This will include:

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

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

6.3.1.2 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 for Prompt Repair. Once a defect is identified as requiring Prompt Repair, HRSD will implement an action plan to make the improvements necessary.

6.4 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 will be included in upcoming Annual Reports as the projects are completed.

6.5 Management, Operations, and Maintenance Program

6.5.1 MOM Plan

In the second half of FY2011, HRSD will submit a revised MOM Program document by the February 2011 deadline and await EPA and DEQ approval.

6.5.2 Implementation of MOM Program

HRSD will continue to implement its MOM Program.

6.5.3 Quantitative Performance Measures

In the second half of FY2011, 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.

6.6 Regional Wet Weather Management Plan

By July 31, 2011, HRSD will have completed a calibrated Regional Hydraulic Model and will begin the Preliminary Capacity Assessment that will be required to be completed in July 2012. The main efforts strictly related to the RWWMP are planned for FY2012-13. The complex evaluation of system improvements, including reaching regional consensus on a level of service, that will be conducted in FY2012-13 combined
with the need for 14 different governing bodies to approve portions of the plan, will make meeting this schedule very challenging.

6.7 Short Term Wet Weather Operational Plan

HRSD will revise the STWWOP based on EPA and DEQ comments and submit it by the June 2011 deadline.

6.8 SSO Emergency Response Plan

HRSD will continue to implement the approved SSO Response Plan.

6.9 Coordination with Localities

HRSD will continue to actively participate and facilitate a wide variety of coordination activities in FY 2011 amongst the regional parties to the SOC. These activities included:

- 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 will be 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;
- 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.

6.10 Public Participation

HRSD will have an annual information meeting and publish a newsletter by the one year anniversary of the Date of Entry, February 23, 2011. Information and approved plans continue to be posted to HRSD’s website which is accessible to the public.
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7. FORESEEABLE ISSUES RELATED TO UPCOMING
COMPLIANCE DEADLINES AND MILESTONES

7.1 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 some Level 2 inspections are 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 unlikely that any Level 3 inspections that arise from the Levels 1 and 2 inspection 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. There is not sufficient time in the schedule to permit accomplishment of Level 3 inspections 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. 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.

7.2 Regional Hydraulic Model

The calibration of the Regional Hydraulic Model is ongoing. Extensive coordination with all Localities has been ongoing and numerous adjustments have been made to the model inputs to achieve an adequate calibration. As expected, the calibration standards contained in the RHM Plan are not met at all calibration sites for all events. In addition, some calibration sites have been removed, replaced and/or relocated. The changes in the calibration network have been discussed with EPA and DEQ in numerous technical calls and will be documented in the Final FPR Monitoring Report per Paragraph 17.b. of the Consent Decree. The model calibration results will be discussed in the RHM Report.

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

8.1 Data Quality Standards

There has been a lengthy discussion of the data quality standards related to the FPR Program. EPA, DEQ and HRSD have agreed to a revision in the way that the standards are applied. After the reporting period covered by this Semi Annual Report, HRSD signed and returned a Consent Decree modification to EPA and is awaiting a fully executed copy.

8.2 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. 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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